

## MSBA 60% CONSTRUCTION DOCUMENTS SUBMITTAL

## Northeast Metropolitan Regional Vocational High School

JANUARY 13, 2023







January 20, 2023

Nina Pappacostas – Project Coordinator Massachusetts School Building Authority 40 Broad Street, Suite 500 Boston, MA 02109

RE: NEMT High School Project 60% Construction Documents Submittal

Dear Ms. Pappacostas:

On behalf of the Northeast Metropolitan Regional Vocational School District, attached please find the project's 60% Construction Documents (CD) Submittal for the NEMT High School Project. This submittal has been compiled by DRA Architects in collaboration with PMA Consultants, Gilbane Building Company, and District/School Administration with input from the School Building Committee. Please note that the School Building Committee voted to approve submittal of the 60% CD package to the MSBA on 1/19/2023. PMA has coordinated and reviewed the materials within and finds this submittal to be complete and in accordance with all MSBA requirements.

Throughout the design process, recommendations to the architect by the OPM and CMR have included those pertaining to constructability, operability, bid-ability, clarity, site logistics and access during construction, technical accuracy, efficiency, coordination, and cost effectiveness. The package includes review comments from PMA, Gilbane Building Company, and CES (Commissioning Agent). Per MSBA requirements, the MSBA's DD Review and the project team's response is included in this package.

Please note the District has increased the total project budget as a result of a Chapter 74 Vocational Instructional Space Facility Expansion Grant Award in the amount of \$7,499,922. That said, the Proposed Project as documented within the 60% CD submittal exceeds the District's Budget as outlined in the MSBA Project Scope & Budget Agreement and MSBA Project Funding Agreement in this amount. The resulting total project budget has increased from \$317,422,620 (PFA) to \$324,922,542. The Proposed Project as documented within this submission is within the revised budget stated above.

We look forward to the MSBA's review of this submission. As always, please feel free to contact me with any questions or concerns.

Best Regards,

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Joseph DeSantis Director PMA Consultants – OPM

### 6B.0 TABLE OF CONTENTS

**MSBA 60% CONSTRUCTION DOCUMENTS SUBMITTAL** 

6B.0 TABLE OF CONTENTS

#### 6B.1.1 BASIC PROJECT INFORMATION

6B.1.1 - 01 | Basic Project Information

#### 6B.2.1 OPM SUBMITTAL REVIEW & COORDINATION

- 6B.2.1 01 OPM's Designer Submission Review
- 6B.2.1 02 OPM's Coordinated Design Review
- 6B.2.1 03 Commissioning Consultants Review
- 6B.2.1 04 MSBA's Design Development Review
  - 04a Copy of MSBA DD Review w/ Designer Comments
    - 04b Comments Addressed Since DD Review

#### 6B.2.2 PROJECT SCHEDULE

6B.2.2 - 01 | Project Schedule

#### 6B.2.3 PROJECT SCOPE & BUDGET

- 6B.2.3 01 | Cost Estimate Reconciliation
- 6B.2.3 **02** Cost Estimate Comparison
- 6B.2.3 03 Cost Estimate CM-R
- 6B.2.3 04 Cost Estimate Designer
- 6B.2.3 05 Updated Project Budget
- 6B.2.3 **06** Description of Early-Bid Package
- 6B.2.3 07 Value Engineering

#### 6B.3.1 GENERAL REQUIREMENTS

- 6B.3.1 01 | Updated Work Plan
- 6B.3.1 **02** Basis of Design Narratives
  - 02a Civil
    - 02b Site
    - 02c Architectural
  - 02d Structural
  - 02e MEP-FP
  - 02f Technology & Security
- 6B.3.1 **03** Building Code Analysis
- 6B.3.1 04 Proprietary Items
- 6B.3.1 05 Interior Color Theory Statement
- 6B.3.1 06 Structural Load Calculations
- 6B.3.1 07 Structural Peer Review RFP
- 6B.3.1 **08** Energy Model Calculations 6B.3.1 - **09** Life Cycle Cost Analysis
  - Energy & Water
- 6B.3.1 10 HVAC Heat Gain & Loss Calculations
- 6B.3.1 11 Total Electrical Load Calculations
- 6B.3.1 **12** Security & Visual Access Requirements 12a Security Narrative
- 12b Fire Department Meeting Notes
- 6B.3.1 **13** Facility & Maintenance Requirements
- 6B.3.1 14 Quality Control Narratives

#### 6B.3.2 SPACE SUMMARY

6B.3.2 - 01 Updated Space Summary 6B.3.2 - **02** Space Measurement Analysis w/ **Designer Certification** 6B.3.2 - **03** Comparison of Current Design w/ **Final Educational Program** 6B.3.2 - **04 DESE Approved SPED Spaces** 6B.3.2 - **05 DESE Approved Public Day Education** 6B.3.2 - **06 DESE Approved Chapter 74 Spaces** 6B.3.2 - **07** Confirmation of Scheduled DESE meeting Comparison of Current Design w/ DESE 6B.3.2 - **08** Approved Chapter 74 Program Spaces

#### 6B.3.3 PROJECT APPROVALS

- 6B.3.3 **01** Project Approvals Narrative 01a Civil
- 6B.3.3 02 Utility Company Narrative
- 6B.3.4 See 6B.2.3-04 for Designer's Cost Estimate
- 6B.3.5 60% CONSTRUCTION DOCUMENT DRAWINGS 6B.3.5 - 01 | Drawing List
- 6B.3.6 60% CONSTRUCTION DOCUMENT PROJECT MANUAL 6B.3.6 - 01 | Project Manual Table of Contents

#### 6B.3.7 PROJECT COORDINATION

6B.3.7 - **01** Designer Confirmation that Science Labs Comply with MSBA Guidelines

Basic Project Information **01** 

# **6B.1.1** BASIC PROJECT INFORMATION

## BASIC PROJECT INFORMATION BASIC PROJECT INFORMATION

### **6B.1.1-01** BASIC PROJECT INFORMATION

#### Enrollment

The proposed new Northeast Metropolitan Regional Vocational High School will serve 1,600 students in grades 9 thru 12.

#### **Gross Area**

386,630 SF. Refer to Space Summary which can be found in section 6B.3.2-01 of this submittal.

#### **Project Type**

A new 1,600 student vocational high school will be replacing the existing school. The project will be constructed in numerous phases. Early phases will include early site preparation and structural steel. Once the new high school is constructed the existing school will be abated then demolished. Athletic fields will be constructed where the existing school was located.

#### **Delivery Method**

The construction delivery method for the new school is Construction Manager at Risk (CM-R). Gilbane Building Company was selected as the CM-R for this project. Approval from the Office of Inspector General, for this construction delivery method, can be found in section 6B.3.3-01a of this submittal.

#### **Chapter 74 Meeting**

Northeast Metro Tech has a scheduled meeting with MSBA and DESE on January 26<sup>th</sup>, 2023 to review floor plan layouts for Chapter 74 programs.

- OPM's Designer Submission Review 01
- OPM's Coordinated Design Review 02

Commissioning Consultants Review 03

- MSBA Design Development Review 04
  - 04a Copy of MSBA DD Review w/ Designer Comments
  - 04b Comments Addressed Since DD Review

# **6B.2.1** OPM SUBMITTAL REVIEW & COORDINATION

## OPM SUBMITTAL REVIEW & COORDINATION OPM'S DESIGNER SUBMISSION REVIEW

#### 6B.2.1-01 OPM Recommendation to Approve Submission:

As outlined in the OPM cover letter, PMA has reviewed and fully recommends/approves this 60% CD submission to the MSBA. PMA has verified that this submittal is in accordance with the MSBA Module 6 Guidelines. This submission was approved by the School Building Committee on 1/19/2023.

### OPM SUBMITTAL REVIEW & COORDINATION OPM'S COORDINATED DESIGN REVIEW



### **NORTHEAST METRO TECH – 60% CD REVIEW COMMENTS**

| Date:        | 1/20/2023  |
|--------------|--|
| Project:     | Northeast Metropolitan Regional Vocational High School Project     |
| Subject:     | 60% CD Cost Estimate Set - PMA Review Comments (11/21/22 Set Date) |
| Prepared by: | PMA Consultants  |

| Item No.      | Ref Drawing.           | Date Opened | Document Set | Review Comment   | Action by                             | Comment Response | Status |
|---------------|------------------------|-------------|--------------|--|---------------------------------------|------------------|--------|
| 1.0 Civil     |                        |             |              |  |                                       |                  |        |
| 1.0.1         | C-401                  | 8/19/2022   | DD           | As discussed via email on 7/27/22, the fire hydrant at the SW corner of the building can be shifted South or in the adjacent island to allow for deletion of ~275' of 8" DI piping which would allow for cost savings. | Nitsch                                |                  | Open   |
| 1.0.2         | C-400                  | 8/19/2022   | DD           | Confirm diameter of flared end pipe at FES-2.  | Nitsch                                |                  | Open   |
| 1.0.3         | C-402                  | 8/19/2022   | DD           | PMA believes generator will not located as shown per discussions with WMGLD. Please confirm generator/location should be adjusted.   | Nitsch/Bala                           |                  | Open   |
| 1.0.4         | C-503                  | 8/19/2022   | DD           | As noted, detention basin detail needs to be incorporated into Civil drawings.   | Nitsch                                |                  | Open   |
| 1.0.5         | C-402 & C-406          | 1/20/2023   | 60% CD       | Please confirm Gilbane PRE RFI #3 has been addressed related to drainage.  | Nitsch                                |                  | Open   |
| 1.0.6         | GENERAL                | 1/20/2023   | 60% CD       | DRA to confirm building location has reference point to baseline survey.   | Nitsch                                |                  | Open   |
| 1.0.7         | GENERAL                | 1/20/2023   | 60% CD       | DRA to confirm with GBCO logistics/site utilization plans for<br>construction material to be separate drawings/not included in Civil Set   | Nitsch                                |                  | Open   |
| 2.0 Traffic   |                        |             |              |  |                                       |                  |        |
| 3.0 Landscape |                        |             |              |  |                                       |                  |        |
| 3.0.1         | L-301                  | 8/19/2022   | DD           | See attached DCR Added Swing Gates document. Per DCR request, please incorporate a new manual swing gate at the Farm Street to new driveway connection and Spruce Path (breakheart path) to new driveway connection.   | Warner Larson                         |                  | Open   |
| 3.0.2         | L305                   | 8/19/2022   | DD           | Foul pole only called out on 3rd base line, not 1st base line.   | Warner Larson                         |                  | Open   |
| 3.0.3         | L305                   | 8/19/2022   | DD           | Gate in Right Field could have a approximate size for Base of Design.  | Warner Larson                         |                  | Open   |
| 3.0.4         | L305                   | 8/19/2022   | DD           | Fence in Right field ends shy of Scoreboard, should this wrap around entire field?   | Warner Larson                         |                  | Open   |
| 3.0.5         | L302/L303 & T-0-<br>01 | 11/28/2022  | 60% CD       | Change manual sliding vehicular gate to automatic and manual swing gate to automatic arm per TN/DD.  | Warner Larson & 3SI                   |                  | Open   |
| 3.0.6         | L301 and L302          | 1/20/2023   | 60% CD       | Per meeting with DCR and NEMT, drawings to be updated to include chain and posts at driveway and entry and entry to general site.  | Warner Larson                         |                  | Open   |
| 3.0.7         | ALL                    | 1/20/2023   | 60% CD       | Landscape/Architectural/Civil/Structural Drawings should be updated to reflect owner request changing tennis courts to new storage building. Note for 90% CD drawing package   | Warner Larson,<br>Nitsch, DRA,<br>EDG |                  | Open   |
| 3.0.8         | L302, L601, C602       | 1/20/2023   | 60% CD       | Please confirm Gilbane PRE RFI #2 has been addressed related to guardrail details at the segmented retaining wall.   | Warner Larson,<br>Nitsch              |                  | Open   |



| Item No.           | Ref Drawing.    | Date Opened          | Document Set | Review Comment  | Action by | Comment Response | Status            |
|--------------------|-----------------|----------------------|--------------|---|-----------|------------------|-------------------|
| 4.0 Architecture   |                 |                      |              |   |           |                  |                   |
| 4.0.1              | GENERAL         | 8/19/2022            | DD           | Demolition drawings under Civil and Landscape drawings - should these be changed to the Architectural set (per MSBA DD checklist)?  | DRA       |                  | Open              |
| 4.0.2              | GENERAL         | 8/19/2022            | DD           | Hazardous Materials/Abatement Drawings Missing.   | DRA       |                  | Open              |
| 4.0.3              | A1-0-0          | 8/19/2022            | DD           | Under Typ. Partition notes> MASONRY partitions, there is an incorrect reference under flags 8.0-12.1 referencing details being on sheet A1-0-4 (which is not a partition drawing). Please update notes under those flags to correctly reference A1-0-0 or future/correct partition drawing. | DRA       |                  | Open              |
| 4.0.4              | A1-0-0          | 8/19/2022            | DD           | Will partition details also make reference to 3 5/8" metal stud on the detail itself (meaning- will the stud have a callout indicating it is a stud on bottom of detail or elsewhere?). Partition details look good.  | DRA       |                  | Open              |
| 4.0.5              | A1-0-1          | 8/19/2022            | DD           | Furnture for cafeteria should be shown on overall floor plan here   | DRA       |                  | Open              |
| 4.0.6              | A1-0-1 : A1-0-5 | 8/19/2022            | DD           | Overall/floor plans look good, team to discuss if overall plans for each floor should be color coded by program.  | DRA       |                  | Open              |
| 4.0.7              | A1-0-5          | 8/19/2022            | DD           | Overall roof plan is missing structural grid lines (other overall plans have grid lines greyed out in background).  | DRA       |                  | Open              |
| 4.0.8              | A3-2-1:A3-2-14  | 8/19/2022            | DD           | Wall Section drawings should be rotated in order for sections to be legible<br>without rotating screen or hard drawings in hand (should be reviewing wall<br>sections from bottom floor-top floor without needing to rotate page).<br>Without rotating, drawing is impossible to read.      | DRA       |                  | Open              |
| 4.0.9              | GENERAL         | 8/19/2022            | DD           | Mobilization/Enabling under Civil and Landscape drawings - should these be changed to the Architectural set (per MSBA DD checklist)?  | DRA       |                  | Open              |
| 4 <del>.0.10</del> | GENERAL         | <del>8/19/2022</del> | ĐĐ           | Record Item: Final seletion of Graphic Arts printer to be coordinated with construction / location within building depending on weight limitations.   | DRA       |                  | <del>Closed</del> |
| 4.0.11             | GENERAL         | 8/19/2022            | DD           | Confirm quantity of student lockers carried vs. required in general hallways.   | DRA       |                  | Open              |
| 4.0.12             | A1-2-1A         | 8/19/2022            | DD           | Review and slope of insulation on media center roof, concern on water<br>pooling with some areas currently designated to slope towards center and do<br>not see roof drains in the center glass area  | DRA       |                  | Open              |
| 4.0.13             | A1-2-1A         | 8/19/2022            | DD           | Sloping/proposed drainage pattern for media center is appears complex, team to review ways to simplify (i.e. all pitch towards roof edge?)  | DRA       |                  | Open              |
| 4.0.14             | A1-2-1A         | 8/19/2022            | DD           | Slope/drainage pattern missing in shaded area from column lines J-RD1   | DRA       |                  | Open              |
| 4.0.15             | GENERAL         | 8/19/2022            | DD           | Roof plans are missing walkway pads, please incorporate proposed walkway design into roof drawings for each specific part of the building (A, B, C, D)  | DRA       |                  | Open              |
| 4.0.16             | GENERAL         | 8/19/2022            | DD           | Roof drawings should indicate elevations on each specific roof  | DRA       |                  | Open              |
| 4.0.17             | GENERAL         | 8/19/2022            | DD           | Drawings do not indicate locations of skylights. Please review and confirm no skylights are intended to occur at NEMT (besides media center glass dome piece)   | DRA       |                  | Open              |
| 4.0.18             | GENERAL         | 8/19/2022            | DD           | PMA did not see on the drawings and does not believe there are penthouses proposed for NEMT but ask DRA to confirm  | DRA       |                  | Open              |
| 4.0.19             | GENERAL         | 8/19/2022            | DD           | PMA did not see on the drawings and does not believe there are chimneys proposed for NEMT but ask DRA to confirm  | DRA       |                  | Open              |
| 4.0.20             | A1-0-5          | 8/19/2022            | DD           | Roof Hatch is confirmed for A roof (and presumably this is access to B roof),<br>but asks DRA to review and confirm access to general roofs area for C/D is<br>based off doorway off main staircase in NE portion of the building   | DRA       |                  | Open              |



| ltem No. | Ref Drawing.               | Date Opened | Document Set | Review Comment  | Action by | Comment Response | Status |
|----------|----------------------------|-------------|--------------|---|-----------|------------------|--------|
| 4.0.21   | A1-2-1A                    | 8/19/2022   | DD           | Please advise on access to green roof above cafeteria   | DRA       |                  | Open   |
| 4.0.22   | A1-2-1A to A1-2-<br>1D     | 8/19/2022   | DD           | While unrelated to installation of roof, layouts for future roof areas that are to receive solar panels needs to be provided/indicated. Potentially background hatch indicating future areas to receive PVs?  | DRA       |                  | Open   |
| 4.0.23   | GENERAL                    | 8/19/2022   | DD           | DRA to review if gutters/heat trace is required along roof edges that overhang<br>areas around the building to avoid icicles in winter/potential impalement<br>situation  | DRA       |                  | Open   |
| 4.0.24   | A2-0-1 to A2-1-8           | 8/19/2022   | DD           | Building elevations are missing major mechanical equipment/any potential rooftop structure hiding mechanical units  | DRA       |                  | Open   |
| 4.0.25   | A2-0-1 to A2-1-9           | 8/19/2022   | DD           | Building elevations need to incorporate control/expansion joints in section views   | DRA       |                  | Open   |
| 4.0.26   | A2-2-1                     | 8/19/2022   | DD           | Typ. science lab elevation needs to include notations for wall monitor/markerboards/tackboards/appliances   | DRA       |                  | Open   |
| 4.0.27   | GENERAL                    | 8/19/2022   | DD           | RCPs needs cover sheet or legend on first drawing indicating each fixture (smoke sensor, lighting pendant, sprinkler head, fans, supply/return grilles, FA strobes, etc.)   | DRA       |                  | Open   |
| 4.0.28   | A8-1-0C                    | 8/19/2022   | DD           | RCPs on this level missing ceiling lighting layout for most spaces (typ.)   | DRA       |                  | Open   |
| 4.0.29   | A8-1-0C                    | 8/19/2022   | DD           | RCP material for miscellaneous rooms missing (Boiler Room, Elect. Main, Metal Fab, etc.)  | DRA       |                  | Open   |
| 4.0.31   | A1-0-1                     | 8/19/2022   | DD           | It appears the Lower Level Plan should note "Area C & D".   |           |                  | Open   |
| 4.0.32   | A1-1-0C, A1-1-0D<br>& TYP  | 8/19/2022   | DD           | Title under floor plan and highlighted building key plan appear that they need<br>to be updated to reflect Area C lower level. See A1-1-0D for similar issue. Can<br>DRA review all floor plan titles and highlighted building key plans match?   | DRA       |                  | Open   |
| 4.0.33   | A8-1-0C                    | 8/19/2022   | DD           | In general, most RCPs in most areas on this drawing need to be progressed in<br>next update to show general lighting layout, fire protection heads, mechanica<br>information (think classroom fans). Some RCPs in specific rooms/hallways<br>have ceiling heights but others are missing  | l dra     |                  | Open   |
| 4.0.34   | A8-1-0D                    | 8/19/2022   | DD           | Auto Tech. missing ceiling height   | DRA       |                  | Open   |
| 4.0.35   | A8-1-0D                    | 8/19/2022   | DD           | In general, most RCPs in most areas on this drawing need to be progressed in<br>next update to show general lighting layout, fire protection heads, mechanica<br>information (think classroom fans), miscellaneous devices, etc. Some RCPs in<br>specific rooms/hallways have ceiling heights but others are missing                  | I DRA     |                  | Open   |
| 4.0.36   | A8-1-1A                    | 8/19/2022   | DD           | Lobby ceiling material that transitions into corridor needs detail to show transition   | DRA       |                  | Open   |
| 4.0.37   | A8-1-1A                    | 8/19/2022   | DD           | Cafeteria ceiling material changes needs detail section view highlighting transition  | DRA       |                  | Open   |
| 4.0.38   | A8-1-1A through<br>A8-1-1D | 8/19/2022   | DD           | In general, most RCPs in areas on this drawing need to be progressed in next<br>update to show fire protection heads, mechanical information (think<br>classroom fans), miscellaneous devices, etc. Most RCPs in specific<br>rooms/hallways have ceiling heights but others are missing   | DRA       |                  | Open   |
| 4.0.41   | A8-1-1C                    | 8/19/2022   | DD           | Transition detail showing condition of corridor ceiling into openeing prior to Auditorium entrance required   | DRA       |                  | Open   |
| 4.0.43   | A8-1-2A through<br>A8-1-2D | 8/19/2022   | DD           | In general, most RCPs in areas on this drawing need to be progressed in next<br>update to show lighting layout, fire protection heads, mechanical information<br>(think classroom fans), miscellaneous devices, etc. Most RCPs in specific<br>rooms/hallways have ceiling heights but other small rooms are missing (i.e.<br>Storage) | DRA       |                  | Open   |



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|----------|----------------------------|-------------|--------------|--|-----------|------------------|--------|
| 4.0.47   | A8-1-3A through<br>A8-1-3D | 8/19/2022   | DD           | In general, most RCPs in areas on this drawing need to be progressed in next<br>update to show lighting layout, fire protection heads, mechanical information<br>(think classroom fans), miscellaneous devices, etc. Most RCPs in specific<br>rooms/hallways have ceiling heights but other small rooms are missing (i.e.<br>Storage)                      | DRA       |                  | Open   |
| 4.0.48   | A8-1-3A                    | 8/19/2022   | DD           | Special focus on ceiling heights/devices/lighting layout for Media Center need to be honed in on at next drawing set.  | DRA       |                  | Open   |
| 4.0.51   | A8-1-3C                    | 8/19/2022   | DD           | Special focus on ceiling heights/devices/lighting layout for Auditorium/Stage need to be honed in on at next drawing set.  | DRA       |                  | Open   |
| 4.0.52   | A8-1-3D                    | 8/19/2022   | DD           | Special focus on ceiling heights/devices/lighting layout for Gymnasium need to be honed in on at next drawing set.   | DRA       |                  | Open   |
| 4.0.53   | A8-1-4A through<br>A8-1-4D | 8/19/2022   | DD           | In general, most RCPs in areas on this drawing need to be progressed in next<br>update to show lighting layout, fire protection heads, mechanical information<br>(think classroom fans), miscellaneous devices, etc. Most RCPs in specific<br>rooms/hallways have ceiling heights but other small rooms are missing  | DRA       |                  | Open   |
| 4.0.54   | A6-2-1 to A6-2-3           | 8/19/2022   | DD           | Most door schedules still need to reference Hardware set's that will go along with each door.  | DRA       |                  | Open   |
| 4.0.55   | A6-3-1 to A6-3-<br>7       | 8/19/2022   | DD           | Window/storefront/curtainwall details still needed for jamb/head details   | DRA       |                  | Open   |
| 4.0.66   | GENERAL                    | 1/20/2023   | 60% CD       | Please confirm Gilbane PRE RFI #4 has been addressed related to elevation discepancies.  | DRA       |                  | Open   |
| 4.0.67   | GENERAL                    | 1/20/2023   | 60% CD       | DRA to provide early site bid package drawings when available (site first, then structural steel/foundations package).   | DRA       |                  | Open   |
| 4.0.68   | GENERAL                    | 1/20/2023   | 60% CD       | PMA acknowledging DRA is not providing demolition plans, building being demo'ed entirely and demolition/hazardous materials specifications still to be provided. PMA also acknowledging that DRA has included demo/site prep on Landscape L104 plan for reference as well.   | DRA       |                  | Open   |
| 4.0.69   | GENERAL                    | 1/20/2023   | 60% CD       | PMA/DRA/GILBANE working through coordination of Architectural drawings<br>elevations vs. landscape/civil plans (DRA preference to keep Architectural<br>baseline/landscape separate but make plenty of notes indicating what the<br>first floor elevation on architecturals equals landscape, but Gilbane has<br>expressed concern with this methodology), | DRA       |                  | Open   |
| 4.0.70   | A1-1-0C                    | 1/20/2023   | 60% CD       | Question mark next to wire mesh partition should be removed.   | DRA       |                  | Open   |
| 4.0.71   | GENERAL                    | 1/20/2023   | 60% CD       | Team to discuss door stops/any required blocking (limit any damage to walls behind doors).   | DRA       |                  | Open   |
| 4.0.72   | A1-1-1C                    | 1/20/2023   | 60% CD       | Recommend callout for key areas such as multi-purpose room, stage.   | DRA       |                  | Open   |
| 4.0.73   | A1-1-1B                    | 1/20/2023   | 60% CD       | Recommend callout for detailing for large scale plan for main entry area.  | DRA       |                  | Open   |
| 4.0.74   | A1-1-1A                    | 1/20/2023   | 60% CD       | Recommend callout for detail for large scale plan for rotunda/school main office space   | DRA       |                  | Open   |
| 4.0.75   | A1-1-1A                    | 1/20/2023   | 60% CD       | Recommend callout for detail for large scale plan for main entry vestibule/lobby space.  | DRA       |                  | Open   |
| 4.0.76   | A1-2-1A                    | 1/20/2023   | 60% CD       | Pre vegetated roof note project NW corner is incorrect/needs revising.   | DRA       |                  | Open   |
| 4.0.77   | A1-2-1D                    | 1/20/2023   | 60% CD       | Error on a section view line or callout between grid lines 16-17.7 (needs removal).  | DRA       |                  | Open   |
| 4.0.78   | A1-2-1C                    | 1/20/2023   | 60% CD       | Suggest removing walkway pad where ladder is by grid line 7.2  | DRA       |                  | Open   |
| 4.0.79   | A2-0-1                     | 1/20/2023   | 60% CD       | Mechanical units still need to be shown on building elevations   | DRA       |                  | Open   |



| ltem No.         | Ref Drawing.              | Date Opened | Document Set | Review Comment   | Action by | Comment Response | Status |
|------------------|---------------------------|-------------|--------------|--|-----------|------------------|--------|
| 4.0.80           | A1-2-1B                   | 1/20/2023   | 60% CD       | Missing mechanical unit callout plan east between grid lines 16 and 17.7   | DRA       |                  | Open   |
| 4.0.81           | A2-0-1                    | 1/20/2023   | 60% CD       | Need coordination of full building height elevation against site/landscape elevation notes.  | DRA       |                  | Open   |
| 4.0.82           | A2-0-1 through<br>A2-1-8  | 1/20/2023   | 60% CD       | Tracking site grading/architectural drawings elevation coordination (previous comment above about PMA/DRA/Gilbane tracking concern on different elevations between architectural drawings vs. site)  | DRA       |                  | Open   |
| 4.0.83           | A2-0-1 through<br>A2-1-8  | 1/20/2023   | 60% CD       | Expansion joint between column lines AA and Y.9 not shown on SOME<br>building elevation views where these column lines exist. Asking DRA to add<br>this expansion joint for any building elevation that has these column lines.<br>Example: South elevation (detail 4 on A2-1-2)                                 | DRA       |                  | Open   |
| 4.0.84           | A2-2-1 through            | 1/20/2023   | 60% CD       | Interior elevations look good but still need to note<br>tackboards/markerboards/etc. on classroom/science room spaces.   | DRA       |                  | Open   |
| 4.0.85           | A2-2-6                    | 1/20/2023   | 60% CD       | Detail 2 appears to have incorrect reference to Multipurpose room.   | DRA       |                  | Open   |
| 4.0.86           | GENERAL                   | 1/20/2023   | 60% CD       | Highlighted key plan does not accurately reflect the floor plan location shown<br>on several drawings (example: A1-1-0C, Area C displayed; however, Area A<br>highlighted on key plan).  | DRA       |                  | Open   |
| 4.087            | A1-1-1C                   | 1/20/2023   | 60% CD       | Per Early Childhood Programming Meeting on 10/5/22, PMA believes<br>department leaders had requested multiple tack boards. The current design<br>appears to include only (1) 8' tackboard. Please confirm if additional<br>tackboards are required to meet the department leaders needs.                         | DRA       |                  | Open   |
| 4.0.88           | A8-1-2A                   | 1/20/2023   | 60% CD       | Per Design & Visual Communications Programming Meeting on 10/3/22,<br>high ceilings in the Photo/Storage room were requested. A ceiling height<br>is not listed for this space. Please confirm ceiling height and verify it meets<br>staff needs   | DRA       |                  | Open   |
| 4.0.89           | A3-2-1 through<br>A3-2-19 | 1/20/2023   | 60% CD       | Wall Sections look good dimension wise as well as reinforcing, façade, etc. but<br>need some sections need to call out flashing, and additionally details for<br>transition of materials are required to be circled on sections/referred to<br>details page (good example are upper walls into overhang detail). | DRA       |                  | Open   |
| 4.0.90           | A3-2-4                    | 1/20/2023   | 60% CD       | Wall Section 1 on this page indicates granite veneer, should be arriscraft.  | DRA       |                  | Open   |
| 4.0.91           | A5-3-1                    | 1/20/2023   | 60% CD       | Detail G needs revising, does not show flashing detail.  | DRA       |                  | Open   |
| 4.0.92           | A5-3-1                    | 1/20/2023   | 60% CD       | Detail A roof thickness does not add up to 6 1/2" total, PMA calculates 6".<br>Please clarify intent or if something is missing.   | DRA       |                  | Open   |
| 4.0.93           | GENERAL                   | 1/20/2023   | 60% CD       | Window, Curtainwall, Storefront, and Partition types are highlighted.<br>Schedules still required.   | DRA       |                  | Open   |
| 4.0.94           | GENERAL                   | 1/20/2023   | 60% CD       | Storefront details still required  | DRA       |                  | Open   |
| 4.0.95           | GENERAL                   | 1/20/2023   | 60% CD       | Ramp plans/section/details required for exterior ramp from lower to upper campus, and loading dock area.   | DRA       |                  | Open   |
| 4.0.96           | GENERAL                   | 1/20/2023   | 60% CD       | DRA to confirm location of guardrail/handrail details.   | DRA       |                  | Open   |
| 4.0.97           | GENERAL                   | 1/20/2023   | 60% CD       | RCP's still need to coordinate with mechanical drawings (i.e. classroom fans, diffusers should be better highlighted).   | DRA       |                  | Open   |
| 5.0 Equipment    |                           |             |              |  |           |                  |        |
| 5.0.1            | EQ2.14                    | 1/20/2023   | 60% CD       | Per Health Assisting Programming Meeting on 10/5/22, data drops were<br>added at each bed. The drawings appear to reflect this for the beds<br>surrounding the shop spacel; however, a data drop is not show for the Mock<br>Apt room. Please confrim if a data drop is required here.                           | DRA       |                  | Open   |
| 6.0 Theater      |                           |             |              |  |           |                  |        |
| 7.0 Food Service |                           |             |              |  |           |                  |        |



| ltem No.      | Ref Drawing.  | Date Opened | Document Set | Review Comment   | Action by | Comment Response | Status |
|---------------|---|-------------|--------------|--|-----------|------------------|--------|
| 8.0 Structure |   |             |              |  |           |                  |        |
| 8.0.1         | GENERAL   | 8/19/2022   | DD           | Non-PV roof areas should have their steel designed accordingly to account for the load reduction.  | EDG       |                  | Open   |
| 8.0.2         | GENERAL   | 8/19/2022   | DD           | No detail for the unique architectural feature of the roof structure of the Media Center. (at a minimum the peak of the roof)  | EDG       |                  | Open   |
| 8.0.3         | GENERAL   | 8/19/2022   | DD           | No detail for the unique architectural feature of the roof structure of the Auditorium. (or no % slope shown that steel will be erected as)                              | EDG       |                  | Open   |
| 8.0.4         | GENERAL   | 8/19/2022   | DD           | Fireproofing to be said that it is required at the underside of structural decks at the roof level only.   | EDG       |                  | Open   |
| 8.0.5         | GENERAL   | 8/19/2022   | DD           | All beams and columns should be sized. Columns are mostly sized by the schedules that pertain to each drawing, but beams could be sized more often for full clarity      | EDG       |                  | Open   |
| 8.0.6         | S1-1-4C   | 8/19/2022   | DD           | Diagonal and horizontal bridging should indicate sizing  | EDG       |                  | Open   |
| 8.0.7         | S1-1-4C   | 8/19/2022   | DD           | Framing around skylights should indicate sizing  | EDG       |                  | Open   |
| 8.0.8         | S1-1-4D   | 8/19/2022   | DD           | Diagonal and horizontal bridging should indicate sizing  | EDG       |                  | Open   |
| 8.0.9         | S2-0-1  | 8/19/2022   | DD           | Sections to have title's to each box indicating what it relates too  | EDG       |                  | Open   |
| 8.0.10        | S2-0-2  | 8/19/2022   | DD           | Sections to have title's to each box indicating what it relates too  | EDG       |                  | Open   |
| 8.0.11        | S2-0-3  | 8/19/2022   | DD           | Sections to have title's to each box indicating what it relates too  | EDG       |                  | Open   |
| 8.0.12        | S3-0-1  | 8/19/2022   | DD           | Sections to have title's to each box indicating what it relates too  | EDG       |                  | Open   |
| 8.0.13        | All foundation<br>plans (S1-1-OOC<br>through S1-1-1C) | 1/20/2023   | 60% CD       | Soil bearing pressure /live loads required for SOG areas (indicate any limitations or how bedrock affects this)  | EDG       |                  | Open   |
| 8.0.14        | All foundation<br>plans (S1-1-OOC<br>through S1-1-1C) | 1/20/2023   | 60% CD       | Numerous footings through most foundation plans missing top of footing elevations, please address and have all footings top of footing elevation in next submission.     | EDG       |                  | Open   |
| 8.0.15        | All mezanine<br>framing<br>drawings                   | 1/20/2023   | 60% CD       | Mezzanine framing plan needs to indicate design loads. Typical throughout all mezzanine drawings.  | EDG       |                  | Open   |
| 8.0.16        | All framing<br>drawings (S1-1-C<br>through S1-1-5D)   | 1/20/2023   | 60% CD       | Dimensional spacing should be indicated as "EQ" for equal to indicate similar spacing between beam members.  | EDG       |                  | Open   |
| 8.0.17        | S1-1-2A   | 1/20/2023   | 60% CD       | Missing notes for typ. framing sections, as well as what hatches for different areas mean.   | EDG       |                  | Open   |
| 8.0.18        | S1-1-3A   | 1/20/2023   | 60% CD       | Suggest cleaning up column line 18 intersection with N.3-P.7 (believe trying to highlight opening)   | EDG       |                  | Open   |
| 8.0.19        | S1-1-3A   | 1/20/2023   | 60% CD       | Suggest cleaning up column line 9 intersection with N-Q(believe trying to highlight opening)   | EDG       |                  | Open   |
| 8.0.20        | S1-1-3A   | 1/20/2023   | 60% CD       | Media center area missing 3 column line notes on southeast end of rotunda  | EDG       |                  | Open   |
| 8.0.21        | S1-1-3B   | 1/20/2023   | 60% CD       | Need to clean up openings with steel members next to courtyard (Column<br>Lines V-W, intersections with 9 and 18)  | EDG       |                  | Open   |
| 8.0.22        | GENERAL   | 1/20/2023   | 60% CD       | Dimensions are still needed for most if not all openings highlighted on framing plans (some large openings have dimensions). Typical comment for most drawings.          | EDG       |                  | Open   |
| 8.0.23        | GENERAL   | 1/20/2023   | 60% CD       | DRA to coordinate with EDG regarding requirements for slab depression at gymnasium floor (DRA to confirm specified wood floor and slab depression are fully coordinated) | EDG       |                  | Open   |



| ltem No.      | Ref Drawing.    | Date Opened | Document Set | Review Comment  | Action by | Comment Response | Status |  |  |
|---------------|-----------------|-------------|--------------|---|-----------|------------------|--------|--|--|
| 8.0.24        | S1-1-0C         | 1/20/2023   | 60% CD       | Clean up of existing dimensions / adding dimensions for various wall<br>segments required for concrete retaining wall on Column Lines Y.9-AA<br>through DD  | EDG       |                  | Open   |  |  |
| 8.0.25        | S1-1-0D         | 1/20/2023   | 60% CD       | Dimensions required to indicate thickness of concrete retaining wall between column lines Z-DD.9  | EDG       |                  | Open   |  |  |
| 8.0.26        | GENERAL         | 1/20/2023   | 60% CD       | DRA to confirm only underside of roof decking is to have cementitious fireproofing applied (all areas not required).  | EDG       |                  | Open   |  |  |
| 8.0.27        | S1-1-5C         | 1/20/2023   | 60% CD       | DRA to shade correct section of roof framing shown on this plan (incorrect shading currently)   | EDG       |                  | Open   |  |  |
| 8.0.28        | S1-1-5D         | 1/20/2023   | 60% CD       | DRA to shade correct section of roof framing shown on this plan (incorrect shading currently)   | EDG       |                  | Open   |  |  |
| 8.0.29        | S1-1-5A through | 1/20/2023   | 60% CD       | DRA to include callout for mechanical units on roof for typical mech.<br>Equipment support detail (detail 5 on S0-0-8)  | EDG       |                  | Open   |  |  |
| 8.0.30        | GENERAL         | 1/20/2023   | 60% CD       | DRA/PMA to discuss concrete compressive strength requirements (4500psi vs 4000psi)  | EDG       |                  | Open   |  |  |
| 8.0.31        | GENERAL         | 1/20/2023   | 60% CD       | DRA not R12 indicates no pipes or conduit to be placed in slabs on grade or elevated slabs. Seems to conflict with any potential underslab electric/plumbing on any grade levels. Coordination discussion required. | EDG       |                  | Open   |  |  |
| 9.0 GeoTech   |                 |             |              |   |           |                  |        |  |  |
| 10.0 Plumbing |                 |             | 1            |   |           |                  |        |  |  |
| 10.0.1        | GENERAL         | 8/19/2022   | DD           | I rap Primers are suggested for all floor drains.   | BALA      |                  | Open   |  |  |
| 10.0.2        | GENERAL         | 8/19/2022   | DD           | are going "up"  | BALA      |                  | Open   |  |  |
| 10.0.3        | GENERAL         | 8/19/2022   | DD           | No waterhammer arrestors are indicated in drawings  | BALA      |                  | Open   |  |  |
| 10.0.4        | GENERAL         | 8/19/2022   | DD           | drawings? Assuming this means a wall hung fire hydrant?   | BALA      |                  | Open   |  |  |
| 10.0.5        | P1-0-0A         | 8/19/2022   | DD           | Missing Hot Water lines to sinks in Servery   | BALA      |                  | Open   |  |  |
| 10.0.6        | P1-0-0A         | 8/19/2022   | DD           | Missing Cold Water lines to sinks in Servery  | BALA      |                  | Open   |  |  |
| 10.0.7        | P1-0-0A         | 8/19/2022   | DD           | Missing Gas lines to appliances in Servery  | BALA      |                  | Open   |  |  |
| 10.0.8        | P1-0-0A         | 8/19/2022   | DD           | Bathrooms off Kitchen missing sinks   | BALA      |                  | Open   |  |  |
| 10.0.9        | P1-0-0A         | 8/19/2022   | DD           | Bathrooms off Kitchen missing HW/CW lines   | BALA      |                  | Open   |  |  |
| 10.0.10       | P1-0-0A         | 8/19/2022   | DD           | Toilets in bathroom missing water line connection   | BALA      |                  | Open   |  |  |
| 10.0.11       | P1-0-0A         | 8/19/2022   | DD           | HW/CW lines missing to sink in Cosmetology Bathroom   | BALA      |                  | Open   |  |  |
| 10.0.12       | P1-0-0B         | 8/19/2022   | DD           | Is there a code requirement that the Fire Protection service should be tagged to the Fire Protection subcontractor/drawings?  | BALA      |                  | Open   |  |  |
| 10.0.13       | P1-0-0B         | 8/19/2022   | DD           | There is a circle not labeled in B102 "Plumb-Comp Air", is this a gas/oil interceptor? If so, should be labeled.  | BALA      |                  | Open   |  |  |
| 10.0.14       | P1-0-0B         | 8/19/2022   | DD           | Should be a TY fitting at the meeting of piping from Gas/Oil separator and sanitary exit coming from HVAC Tech B103   | BALA      |                  | Open   |  |  |
| 10.0.15       | P1-0-0B         | 8/19/2022   | DD           | Gas/Oil Separator fixture comes into the HVAC Tech B103 shop and does not connect to anything. Should have some sort of connection called out   | BALA      |                  | Open   |  |  |
| 10.0.16       | P1-0-0B         | 8/19/2022   | DD           | Gas/Oil Separator fixture comes into the Electrical B104 shop and does not connect to anything. Should have some sort of connection called out  | BALA      |                  | Open   |  |  |
| 10.0.17       | P1-0-0B         | 8/19/2022   | DD           | Cleanout should have correct identification symbol in Office B119   | BALA      |                  | Open   |  |  |



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|----------|--------------|-------------|--------------|---|-----------|------------------|--------|
| 10.0.18  | P1-0-0B      | 8/19/2022   | DD           | Sanitary drain piping to sinks are not complete. Includes shop sinks, Culinary Arts sinks, floor drains   | BALA      |                  | Open   |
| 10.0.19  | P1-0-0B      | 8/19/2022   | DD           | Lack of floor drains in electrical and HVAC shop?   | BALA      |                  | Open   |
| 10.0.20  | P1-0-0C      | 8/19/2022   | DD           | Should the sanitary line have TY's to branch off to each floor drain? Currently just the main shown, however the branches will also be under slab.  | BALA      |                  | Open   |
| 10.0.21  | P1-0-0C      | 8/19/2022   | DD           | In automotive shop, there is a piece of pipe at the bottom of the drawing that leads to no where, from no where. BALA to confirm  | BALA      |                  | Open   |
| 10.0.22  | P1-0-0C      | 8/19/2022   | DD           | Sanitary line is open ended in Auto Tech between 8.2 and 10 column lines.<br>BALA to confirm  | BALA      |                  | Open   |
| 10.0.23  | P1-0-0C      | 8/19/2022   | DD           | interceptor - if so, should be labeled with piping included. Another symbol to the left of it that's a square, and another one to the left of that. Those are   | BALA      |                  | Open   |
| 10.0.24  | P1-0-0D      | 8/19/2022   | DD           | "Garage waste" line in Auto tech (between column lines 21.8 and 20.2) coming from the Gas/Oil interceptor is open ended, leading no where   | BALA      |                  | Open   |
| 10.0.25  | P1-1-0C      | 8/19/2022   | DD           | There is 1 plumbing line shown to go to the plumbing fixtures in Auto Body<br>TLT 579. Is this Domestic water, vents, or drains? All of these should be<br>labeled and shown for each plumbing fixture. | BALA      |                  | Open   |
| 10.0.26  | P1-1-0C      | 8/19/2022   | DD           | Plumbing line that crosses horizontally through Weights Room and Related CR<br>Room is not labeled or sized   | BALA      |                  | Open   |
| 10.0.27  | P1-1-0C      | 8/19/2022   | DD           | Should there be a valve symbol shown in the line for "master compressed air shutoff for Auto Collision area"?   | BALA      |                  | Open   |
| 10.0.28  | P1-1-0C      | 8/19/2022   | DD           | Should compressed air line be shown as run to paint booths? Currently shows a line going through only 1 booth.  | BALA      |                  | Open   |
| 10.0.29  | P1-1-0C      | 8/19/2022   | DD           | "interior Hose Bib", water line should be shown for this?   | BALA      |                  | Open   |
| 10.0.30  | P1-1-0C      | 8/19/2022   | DD           | Plumbing line that crosses horizontally through Metal Fab and goes into Tool<br>Crib/Metal Fab Bathroom is not sized or labeled   | BALA      |                  | Open   |
| 10.0.31  | P1-1-0C      | 8/19/2022   | DD           | Floor Drains are not labeled in Boiler Room   | BALA      |                  | Open   |
| 10.0.32  | P1-1-0C      | 8/19/2022   | DD           | Sink P-3C does not show HW/CW lines to the sink.  | BALA      |                  | Open   |
| 10.0.33  | P1-1-0C      | 8/19/2022   | DD           | None of the plumbing lines that go down the hallway from north to south are sized   | BALA      |                  | Open   |
| 10.0.34  | P1-1-0C      | 8/19/2022   | DD           | None of the plumbing lines that go down the hallway from north to south are labeled, except for TW and TWR.   | BALA      |                  | Open   |
| 10.0.35  | P1-1-0C      | 8/19/2022   | DD           | Boilers are not shown? This is major equipment that should be shown on the DD drawings, including the plumbing lines required to serve it   | BALA      |                  | Open   |
| 10.0.36  | P1-1-0D      | 8/19/2022   | DD           | Plumbing lines down the hallway (drawing plan northwest) are not labeled or sized   | BALA      |                  | Open   |
| 10.0.37  | P1-1-0D      | 8/19/2022   | DD           | Bathroom for the Auto Tech shop has a sink and a water fountain outside the bathroom, neither of those have plumbing lines run to it  | BALA      |                  | Open   |
| 10.0.38  | P1-1-0D      | 8/19/2022   | DD           | Besides compressed air and storm drains, most of the piping is not labeled or sized   | BALA      |                  | Open   |
| 10.0.39  | P1-1-0D      | 8/19/2022   | DD           | "8" storm dn" and "8" vent for radon mitigation" are pointing at the same pipe, should there be two arrows?   | BALA      |                  | Open   |
| 10.0.40  | P1-1-0D      | 8/19/2022   | DD           | In Auto Tech, there are two floor drains - one next to P-8 and one in bathroom. Is that a sufficient amount of floor drains for an Auto Shop?   | BALA      |                  | Open   |
| 10.0.41  | P1-1-1A      | 8/19/2022   | DD           | No plumbing lines (hw/cw/vent/drain) shown to sink PX-1 in Duplicating 175 of media Center. All should be labeled and sized   | BALA      |                  | Open   |



| ltem No. | Ref Drawing. | Date Opened | Document Set | Review Comment  | Action by | Comment Response | Status |
|----------|--------------|-------------|--------------|---|-----------|------------------|--------|
| 10.0.42  | P1-1-1A      | 8/19/2022   | DD           | Storm Drain line coming out of Media Center is going outdoors. BALA to confirm intent of Storm drain pipe outdoors on Level 1.  | BALA      |                  | Open   |
| 10.0.43  | P1-1-1A      | 8/19/2022   | DD           | TLT 655 only has vent plumbing going into bathroom, all other water and drain requirements should be included. Same for adjacent bathroom TLT 656   | BALA      |                  | Open   |
| 10.0.44  | P1-1-1A      | 8/19/2022   | DD           | No plumbing lines shown to ceiling hung water heater in TLT 656, as well as connecting that water heater to PX-1 in Duplicating   | BALA      |                  | Open   |
| 10.0.45  | P1-1-1A      | 8/19/2022   | DD           | TLT 518 only has one plumbing line designated to this room  | BALA      |                  | Open   |
| 10.0.46  | P1-1-1A      | 8/19/2022   | DD           | TLT 492 showns "8" ST" but is not pointing to a plumbing line   | BALA      |                  | Open   |
| 10.0.47  | P1-1-1A      | 8/19/2022   | DD           | Carpentry shop - P-3b, P-5, and P-8 do not show any plumbing lines to it  | BALA      |                  | Open   |
| 10.0.48  | P1-1-1A      | 8/19/2022   | DD           | Grease Trap actual fixtures are not established or indicated in Dishwashing 584. There should be identifiable fixtures that it is pointing to   | BALA      |                  | Open   |
| 10.0.49  | P1-1-1A      | 8/19/2022   | DD           | Water lines to be shown to EWH 2's in Plumbing shop   | BALA      |                  | Open   |
| 10.0.50  | P1-1-1A      | 8/19/2022   | DD           | Water lines to be shown to P-3B in plumbing shop  | BALA      |                  | Open   |
| 10.0.51  | P1-1-1A      | 8/19/2022   | DD           | No plumbing lines shown to Dishwasher Room 530 or the sinks outside of the room.  | BALA      |                  | Open   |
| 10.0.52  | P1-1-1A      | 8/19/2022   | DD           | No plumbing lines shown to Culinary Arts equipment  | BALA      |                  | Open   |
| 10.0.53  | P1-1-1B      | 8/19/2022   | DD           | EWH 3's outside of TLT 507 are in the middle of the hallway and one of them is inside a wall.   | BALA      |                  | Open   |
| 10.0.54  | P1-1-1B      | 8/19/2022   | DD           | Dashed line that leads to TLT593 and comes from TLT 641 (branches off headed towards HVAC Tech) is not labeled, sized or tied back to anything, just floating.  | BALA      |                  | Open   |
| 10.0.55  | P1-1-1B      | 8/19/2022   | DD           | In the middle of Electrical Tech it notes "3" vent to extend to nearby fixtures".<br>It doesn't seem like there are any fixtures nearby. BALA to confirm intent.  | BALA      |                  | Open   |
| 10.0.56  | P1-1-1B      | 8/19/2022   | DD           | No floor drains shown in Plumbing shop, besides outside of Sink P-3B. BALA to confirm that is correct.  | BALA      |                  | Open   |
| 10.0.57  | P1-1-1B      | 8/19/2022   | DD           | In HVAC Tech, there is "8" vent for radon mitigation" inside the Office 508.<br>Please confirm that these should be located in column enclosures and not in<br>middle of office space                   | BALA      |                  | Open   |
| 10.0.58  | P1-1-1B      | 8/19/2022   | DD           | Floor Drain to be labeled in Plumb Water Service Room 214   | BALA      |                  | Open   |
| 10.0.59  | P1-1-1B      | 8/19/2022   | DD           | Floor drain to be labeled in Fire Pump Room 205   | BALA      |                  | Open   |
| 10.0.60  | P1-1-1B      | 8/19/2022   | DD           | Item P-7 in the electrical shop has no plumbing lines roughed to it   | BALA      |                  | Open   |
| 10.0.61  | P1-1-1B      | 8/19/2022   | DD           | Item P-7 in the plumbing shop has no plumbing lines roughed to it   | BALA      |                  | Open   |
| 10.0.62  | P1-1-1C      | 8/19/2022   | DD           | There is a dashed line that leads from TLT 600 to the chase of both TLT 606<br>and 607. This line is not labeled or sized and open-ended. This line also<br>branches out to the doorway of Kitchen 605. | BALA      |                  | Open   |
| 10.0.63  | P1-1-1C      | 8/19/2022   | DD           | PX-1's in Kitchen 605, Dressing Room 123, Dressing Room 127, Creative Play 597 do not have all the plumbing lines run to them.  | BALA      |                  | Open   |



| ltem No. | Ref Drawing. | Date Opened | Document Set | Review Comment  | Action by | Comment Response | Status |
|----------|--------------|-------------|--------------|---|-----------|------------------|--------|
| 10.0.64  | P1-1-1C      | 8/19/2022   | DD           | TLT 646 and 647 do not have all plumbing lines run to them. There is a pipe that is coming up through the chases but it seems that it is only 1 pipe - whether vent, HW, CW, or drain. Others are missing                                   | BALA      |                  | Open   |
| 10.0.65  | P1-1-1D      | 8/19/2022   | DD           | Dashed line through Corridor 426 and it's associated branches are not labeled or sized.   | BALA      |                  | Open   |
| 10.0.66  | P1-1-1D      | 8/19/2022   | DD           | Floor drain is not labeled in Shower 564  | BALA      |                  | Open   |
| 10.0.67  | P1-1-1D      | 8/19/2022   | DD           | TLT 576, 89, 566, 572, 567, 565, 564, 553 and 552 do not have all plumbing lines run to them. There is a pipe that is coming up through the chases but it seems that it is only 1 pipe - whether vent, HW, CW, or drain. Others are missing | BALA      |                  | Open   |
| 10.0.68  | P1-1-1D      | 8/19/2022   | DD           | Exam Room 92, Exam Room 574, and Resting Room 90 has sinks in rooms, but no plumbing lines run to them.   | BALA      |                  | Open   |
| 10.0.69  | P1-1-1D      | 8/19/2022   | DD           | TLT/Shower 566 does not have any floor drains. Typically rooms with showers have a floor drain. BALA to confirm this is correct.  | BALA      |                  | Open   |
| 10.0.70  | P1-1-2A      | 8/19/2022   | DD           | Floor drains in Mechanical 281 are not labeled.   | BALA      |                  | Open   |
| 10.0.71  | P1-1-2A      | 8/19/2022   | DD           | All PX-4 sinks in Science Labs/Prep Room's should have all plumbing lines designated to the fixtures  | BALA      |                  | Open   |
| 10.0.72  | P1-1-2A      | 8/19/2022   | DD           | In the Mechanical Room - Besides the RD line and the CA line, the other two<br>plumbing lines (for the biotech compressor and the line leading towards the<br>north side of the room) are not sized or labeled                              | BALA      |                  | Open   |
| 10.0.73  | P1-1-2A      | 8/19/2022   | DD           | In Mechanical Room, there is no piping going to the Biotech vacuum pump<br>and the biotech compressor tank.   | BALA      |                  | Open   |
| 10.0.74  | P1-1-3A      | 8/19/2022   | DD           | Hosebib for TLT 477 is located inside a wall. Should be relocated to show inside bathroom.  | BALA      |                  | Open   |
| 10.0.75  | P1-1-4A      | 8/19/2022   | DD           | TLT 253 has no sinks designated for this bathroom. BALA to confirm this is correct.   | BALA      |                  | Open   |
| 10.0.76  | P1-1-4A      | 8/19/2022   | DD           | TLT 632 does not have the toilet or the sink labeled.   | BALA      |                  | Open   |
| 10.0.77  | P1-1-4A      | 8/19/2022   | DD           | There is a dental seat that does not have PX-6 associated with it, like the others. While the PX-6 is there, it is in the middle of the room and over a normal desk. Should be relocated over the dental seat                               | BALA      |                  | Open   |
| 10.0.78  | P1-1-4A      | 8/19/2022   | DD           | Where it notes that "each dental seat shall receive" those plumbing lines should have sizes associated  | BALA      |                  | Open   |
| 10.0.79  | P1-1-4B      | 8/19/2022   | DD           | Two plumbing fixtures in Storage 459 should be labeled.   | BALA      |                  | Open   |
| 10.0.80  | P1-1-4C      | 8/19/2022   | DD           | One of the roof drains is located on a skylight.  | BALA      |                  | Open   |
| 10.0.81  | P1-0-0A      | 1/17/2023   | 60% CD       | Many floor clean out symbols and labels are missing from ST piping on document  | BALA      |                  | Open   |
| 10.0.82  | P1-0-0A      | 1/17/2023   | 60% CD       | Floor drains not labeled  | BALA      |                  | Open   |
| 10.0.83  | P1-0-0A      | 1/17/2023   | 60% CD       | Grease Traps not labeled or sized (in Culinary Arts A148 and Dish A148K)  | BALA      |                  | Open   |
| 10.0.84  | P1-0-0A      | 1/17/2023   | 60% CD       | "Matchline Area-A/Marchline Area-B" to be relocated so it is not in way of description of gas/oil interceptor   | BALA      |                  | Open   |



| ltem No. | Ref Drawing. | Date Opened | Document Set | Review Comment  | Action by | Comment Response | Status |
|----------|--------------|-------------|--------------|---|-----------|------------------|--------|
| 10.0.85  | P1-0-0A      | 1/17/2023   | 60% CD       | Sanitary line in carpentry is not labeled or sized. Sanitary line in carpentry is missing piping to (2) floor drains who's symbols are present, just no piping  | BALA      |                  | Open   |
| 10.0.86  | P1-0-0A      | 1/17/2023   | 60% CD       | Floor drains in TLT A142 and TLT A143 do not have sanitary piping to them.  | BALA      |                  | Open   |
| 10.0.87  | P1-0-0A      | 1/17/2023   | 60% CD       | There is a sudden break in the piping run to TLT A141H, right in front of entrance to tool crib of Carpentry  | BALA      |                  | Open   |
| 10.0.88  | P1-0-0B      | 1/17/2023   | 60% CD       | No sanitary drain line shown to floor drains in Plumbing Shop (2), TLT B104E,<br>TLT B103C, (unlabeled) bathroom next to Locker B101B, Fire Pump Room,<br>Plumb Water Service and Plumb Water Heater. | BALA      |                  | Open   |
| 10.0.89  | P1-0-0B      | 1/17/2023   | 60% CD       | No floor drains shown in the HVAC Shop  | BALA      |                  | Open   |
| 10.0.90  | P1-0-0B      | 1/17/2023   | 60% CD       | Only (1) floor drain shown in Electrical at the southern most point of the shop. Is that sufficient?  | BALA      |                  | Open   |
| 10.0.91  | P1-0-0B      | 1/17/2023   | 60% CD       | Equipment to be labeled (big circle) in Plumb Comp Air Room   | BALA      |                  | Open   |
| 10.0.92  | P1-0-0C      | 1/18/2023   | 60% CD       | Bold circle in Plumbing Room C008 is not labeled or sized   | BALA      |                  | Open   |
| 10.0.93  | P1-0-0C      | 1/18/2023   | 60% CD       | There is a floor drain in the Plumbing Room CO08 that does not have sanitary line branch shown to it.   | BALA      |                  | Open   |
| 10.0.94  | P1-0-0C      | 1/18/2023   | 60% CD       | There is a floor drain in TLT C022C that does not have sanitary line shown to it  | BALA      |                  | Open   |
| 10.0.95  | P1-0-0C      | 1/18/2023   | 60% CD       | All 4 floor drains in the Metal Fab Shop C004 do not have sanitary lines shown to it  | BALA      |                  | Open   |
| 10.0.96  | P1-0-0D      | 1/18/2023   | 60% CD       | "Matchline Area-C/Marchline Area-D" to be relocated so it is not in way of description of Sanitary Exit out of the Auto Tech Shop D003  | BALA      |                  | Open   |
| 10.0.97  | P1-0-0D      | 1/18/2023   | 60% CD       | Floor Drain by Water Bubbler in Auto Tech, as well as the Floor Drain in (unlabeled) TLT Room to have sanitary lines shown to it  | BALA      |                  | Open   |
| 10.0.98  | P1-1-0C      | 1/18/2023   | 60% CD       | Electric Water Heater's are located in Plumbing Room C008, but call out for it<br>is in the "Generator Panels C007" room. To be relocated. This is in Room<br>C007 right now.                         | BALA      |                  | Open   |
| 10.0.99  | P1-1-0C      | 1/18/2023   | 60% CD       | Air Dryer (in Plumbing Room C008) should be sized or specified in some sort.  | BALA      |                  | Open   |
| 10.1.01  | P1-1-0C      | 1/18/2023   | 60% CD       | Plumbing Line from Metal Fab Related CR C018 to Tool Crib C022B is not labeled or sized   | BALA      |                  | Open   |
| 10.1.02  | P1-1-0C      | 1/18/2023   | 60% CD       | What size compressed air line to the Paint Booths?  | BALA      |                  | Open   |
| 10.1.03  | P1-1-0C      | 1/18/2023   | 60% CD       | What size compressed air line to AC18 and AC20?   | BALA      |                  | Open   |
| 10.1.04  | P1-1-0C      | 1/18/2023   | 60% CD       | What size compressed air line to AC07, AC08, and AC05? AC05 and AC08 should have valves?  | BALA      |                  | Open   |
| 10.1.05  | P1-1-0C      | 1/18/2023   | 60% CD       | 10" storm line shown in Auto Collision Shop C022 diagramatically shows it connecting to the Compressed Air Loop.  | BALA      |                  | Open   |
| 10.1.06  | P1-1-0C      | 1/18/2023   | 60% CD       | No water lines shown to Wall Hydrant in Service C022A.  | BALA      |                  | Open   |
| 10.1.07  | P1-1-0C      | 1/18/2023   | 60% CD       | In Metal Fab shop - "Shutoff Valves at as required", should be more specific to note "shutoff valves readily accessible per welding booth"  | BALA      |                  | Open   |
| 10.1.08  | P1-1-0C      | 1/18/2023   | 60% CD       | Gas to paint booths show one line going to paint booth and the other just stops after the valve symbol.   | BALA      |                  | Open   |
| 10.1.09  | P1-1-0D      | 1/18/2023   | 60% CD       | Auto Tech Shop at eastern most side of shop - "interior hose bibb" and<br>"provide wall hydrant" do not show those symbols at those locations, nor<br>does it have any water piping shown to it       | BALA      |                  | Open   |



| ltem No. | Ref Drawing. | Date Opened | Document Set | Review Comment  | Action by    | Comment Response | Status |
|----------|--------------|-------------|--------------|---|--------------|------------------|--------|
| 10.1.10  | P3-0-1       | 1/19/2023   | 60% CD       | Detail 1 - "concrete thrust block see detail" needs to be specific as to what detail your referring them to. "Undisturbed earth" is also noted twice  | BALA         |                  | Open   |
| 10.1.11  | P3-0-1       | 1/20/2023   | 60% CD       | Detail 4 - not enough detail. Items are not specifiied or labeled to refer<br>contractor to the specifications of that piece of equipment. Thermometer on<br>each EWH is not labeled. None of the plumbing lines are sized  | BALA         |                  | Open   |
| 10.1.12  | PC-1-1       | 1/18/2023   | 60% CD       | It looks like there is two water heaters in space (where the cold water line<br>runs through Maintenance Room. Are those meant to be there? Not<br>mentioned in notes associated with room  | BALA         |                  | Open   |
| 10.1.13  | PC-1-1       | 1/18/2023   | 60% CD       | No water lines shown to P-4, exterior water hydrant, and Water Cooler in CB105.   | BALA         |                  | Open   |
| 10.1.14  | PC-1-1       | 1/18/2023   | 60% CD       | For concessions room - all equipment (triple sink, hand sink, grease trap, and<br>floor drain should ALL be shown and labeled/specified in this room. It should<br>also show the plumbing lines to each of these equipment for estimating<br>purposes. If there is a grease trap, we should have location and associated<br>piping with it to show where it's going and where it's leaving. | BALA         |                  | Open   |
| 10.1.15  | PL-1-1       | 1/18/2023   | 60% CD       | There are dotted lines (presumably vents) that are not sized or labeled, and also floating in space   | BALA         |                  | Open   |
| 10.1.16  | PL-1-1       | 1/18/2023   | 60% CD       | Sump pump is pointed to on drawing but no symbol or size for this sump pump, which would be consistent with the rest of the drawings.   | BALA         |                  | Open   |
| 10.1.17  | PM-1-1       | 1/18/2023   | 60% CD       | Why is undercounter water heater shown on the underslab plan?   | BALA         |                  | Open   |
| 10.1.18  | PM-1-1       | 1/18/2023   | 60% CD       | Vent lines are not labeled or sized in the underslab plan   | BALA         |                  | Open   |
| 10.1.19  | GENERAL      | 1/18/2023   | 60% CD       | More often labeling of lines to follow them through the pages would be helpful for anyone reviewing.  | BALA         |                  | Open   |
| 10.1.20  | GENERAL      | 1/18/2023   | 60% CD       | Why are some floor drains labeled and some are not?   | BALA         |                  | Open   |
| 10.1.21  | GENERAL      | 1/18/2023   | 60% CD       | Electric Trap Primers should be utilized on all floor drains.   | BALA         |                  | Open   |
| 10.1.22  | GENERAL      | 1/18/2023   | 60% CD       | All vocational shops that have use of Gas should have an Emergency Power<br>Off that is readily accessible. Each shop should have the ability to shut down<br>the gas at any time with the press of a button for safety of students.  | BALA         |                  | Open   |
| 10.1.23  | P-1-1-3B     | 1/20/2023   | 60% CD       | Per Medical Assisting Programming Meeting on 10/5/22, a seperate sink for<br>disposal of urine was indicated to be required in addition to a standard<br>handwashing sink within the "Dirty" room. The Plumbing and Equipment<br>drawings only show 1 sink in this room. Please update drawings to reflect<br>added sink.   | BALA/DRA/PLS |                  | Open   |
| 10.1.24  | P-1-1-1C     | 1/20/2023   | 60% CD       | Per Early Childhood Programming Meeting on 10/5/22, PMA believes one<br>sink in the "shop space" should be ADA. PMA believes one sink may be used<br>to cleaning art supplies, should a plaster trap be specified for one of these<br>sinks? Please advise if DRA/BALA/PLS do not have the same understanding.  | BALA/DRA/PLS |                  | Open   |
| 10.1.25  | P1-1-1-0D    | 1/20/2023   | 60% CD       | Per the Auto Tech Programming Meeting on 10/3/22, PMA believes overhead compressed air drops should be provided in the Small Engine room per department leader request, this does not appear to be reflected in the drawing. Please confirm if these need to be added.  | BALA         |                  | Open   |



| ltem No.             | Ref Drawing. | Date Opened | Document Set | Review Comment  | Action by | Comment Response | Status |
|----------------------|--------------|-------------|--------------|---|-----------|------------------|--------|
| 11.0 Fire Protection |              |             |              |   |           |                  |        |
| 11.0.1               | GENERAL      | 8/19/2022   | DD           | PMA notes Wakefield Fire Department Chief was happy with the progress of the drawings   | BALA      |                  | Open   |
| 11.0.2               | GENERAL      | 8/19/2022   | DD           | Sprinkler coverage shown under stairs is suggested  | BALA      |                  | Open   |
| 11.0.3               | GENERAL      | 8/19/2022   | DD           | If the "Collab" spaces that are off the main corridors have ceiling above that is<br>at a lower elevation than Corridor ceiling, then sprinkler heads should be<br>shown/considered | BALA      |                  | Open   |
| 11.0.4               | GENERAL      | 8/19/2022   | DD           | Any exterior "overhangs" should show concealed dry system sprinkler heads.  | BALA      |                  | Open   |
| 11.0.5               | GENERAL      | 8/19/2022   | DD           | Any vestibules should be reviewed to see if sprinkler heads are required.   | BALA      |                  | Open   |
| 11.0.6               | FP1-1-3A     | 8/19/2022   | DD           | To the right of the Collab Space 47, there is a sprinkler head shown, but only 1 and no others in this area. BALA to confirm intent.  | BALA      |                  | Open   |
| 11.0.7               | FP1-1-3A     | 8/19/2022   | DD           | No Sprinkler heads shown in Stairwells  | BALA      |                  | Open   |
| 11.0.8               | FP1-1-3A     | 8/19/2022   | DD           | Valves to be labeled on this drawing where FD valves are indicated  | BALA      |                  | Open   |
| 11.0.9               | FP1-1-3B     | 8/19/2022   | DD           | There is a sprinkler head shown in a chase, to the right of the Sped Tutorial room 82. BALA to confirm this is intent   | BALA      |                  | Open   |
| 11.0.10              | FP1-1-3B     | 8/19/2022   | DD           | Valves to be labeled on this drawing where FD valves are indicated  | BALA      |                  | Open   |
| 11.0.11              | FP1-1-3C     | 8/19/2022   | DD           | Valves to be labeled on this drawing where FD valves are indicated  | BALA      |                  | Open   |
| 11.0.12              | FP1-1-3D     | 8/19/2022   | DD           | Valves to be labeled on this drawing where FD valves are indicated  | BALA      |                  | Open   |
| 11.0.13              | FP1-1-4A     | 8/19/2022   | DD           | Valves to be labeled on this drawing where FD valves are indicated  | BALA      |                  | Open   |
| 11.0.14              | FP1-1-4B     | 8/19/2022   | DD           | Valves to be labeled on this drawing where FD valves are indicated  | BALA      |                  | Open   |
| 11.0.15              | FP1-1-4B     | 8/19/2022   | DD           | Sprinkler lay out shown in PLTW/Engineering room, but not in outher adjacent rooms or any of the classrooms, offices, and utility rooms.  | BALA      |                  | Open   |
| 11.0.16              | FP1-1-4C     | 8/19/2022   | DD           | Valves to be labeled on this drawing where FD valves are indicated  | BALA      |                  | Open   |
| 11.0.17              | FP1-1-4D     | 8/19/2022   | DD           | Valves to be labeled in Stairway and northeast corner of this drawing   | BALA      |                  | Open   |
| 11.0.18              | FP1-1-MC     | 8/19/2022   | DD           | Seems like there may be Fire Department valves in the corners of the east side of the drawings, should these be labeled?  | BALA      |                  | Open   |
| 11.0.19              | FP1-2-1A     | 8/19/2022   | DD           | (2) Fire Department valves on the A Roof that are not labeled or called out on the eastern side of the drawings. BALA to confirm what these items are.                              | BALA      |                  | Open   |
| 11.0.20              | FP1-2-1A     | 8/19/2022   | DD           | (2) Fire Department valves called out on the A Roof. Is this feasible? BALA to confirm this is correct.   | BALA      |                  | Open   |
| 11.0.21              | FP1-2-1B     | 8/19/2022   | DD           | (2) Fire Department valves located on the roof? Is this feasible? BALA to confirm this is correct.  | BALA      |                  | Open   |
| 11.0.22              | FP1-2-1C     | 8/19/2022   | DD           | (3) Fire Department valves located on the roof? is this feasible? BALA to confirm that is correct.  | BALA      |                  | Open   |
| 11.0.23              | FP6-0-1      | 8/19/2022   | DD           | Fire pump piping detail with bypass does not show pipe sizes  | BALA      |                  | Open   |
| 11.0.24              | GENERAL      | 1/20/2023   | 60% CD       | Fire protection drawings require piping to be shown to sprinkler heads on all drawings/levels   | BALA      |                  | Open   |
| 11.0.25              | GENERAL      | 1/20/2023   | 60% CD       | Hacthing needs to be adjusted to limit background confusion, suggest cleaner hatching or the background to be overall floor plans.  | BALA      |                  | Open   |
| 11.0.26              | GENERAL      | 1/20/2023   | 60% CD       | Accessories/valves/equipment need to be incorporated onto all drawings.   | BALA      |                  | Open   |
| 11.0.27              | GENERAL      | 1/20/2023   | 60% CD       | Confirm recycling room A109 receives wet line vs dry.   | BALA      |                  | Open   |
| 11.0.28              | GENERAL      | 1/20/2023   | 60% CD       | Media Center area is missing all heads/pipe runs/equipment etc.   | BALA      |                  | Open   |



| ltem No.  | Ref Drawing. | Date Opened | Document Set | Review Comment   | Action by | Comment Response | Status |
|-----------|--------------|-------------|--------------|--|-----------|------------------|--------|
| 11.0.29   | GENERAL      | 1/20/2023   | 60% CD       | Specific locations require detail callouts on riser diagram, typ.  | BALA      |                  | Open   |
| 12.0 HVAC |              |             |              |  |           |                  |        |
| 12.0.1    | GENERAL      | 8/19/2022   | DD           | Registers/diffusers are not located on any plans. Per MSBA guide, ceiling diffusers/registers to be shown  | BALA      |                  | Open   |
| 12.0.2    | GENERAL      | 8/19/2022   | DD           | Process piping is not shown on plan view, only on riser view. BALA to confirm that is correct  | BALA      |                  | Open   |
| 12.0.3    | GENERAL      | 8/19/2022   | DD           | No ceiiling height's shown on any plan views   | BALA      |                  | Open   |
| 12.0.4    | GENERAL      | 8/19/2022   | DD           | All toilet rooms should have exhaust duct. BALA to confirm.  | BALA      |                  | Open   |
| 12.0.5    | M1-1-0D      | 8/19/2022   | DD           | EUH in stair 3 and stair 6 are not labeled or called out   | BALA      |                  | Open   |
| 12.0.6    | M1-1-0D      | 8/19/2022   | DD           | Welding booths (2) shown, but only 1 of them calls for exhaust ductwork.   | BALA      |                  | Open   |
| 12.0.7    | M1-1-0D      | 8/19/2022   | DD           | Carbon Monoxide detectors to be labeled in the Auto Tech shop as it is a high risk for Carbon monoxide   | BALA      |                  | Open   |
| 12.0.8    | M1-1-1A      | 8/19/2022   | DD           | EUH in Dry Storage is not labeled or called out  | BALA      |                  | Open   |
| 12.0.9    | M1-1-1A      | 8/19/2022   | DD           | EUH in Receiving is not labeled or called out  | BALA      |                  | Open   |
| 12.0.10   | M1-1-1A      | 8/19/2022   | DD           | Carbon Monoxide detectors to be installed in Receiving area?   | BALA      |                  | Open   |
| 12.0.11   | M1-1-1A      | 8/19/2022   | DD           | Duct intersections around AHU-7 should show minimum ceiling height   | BALA      |                  | Open   |
| 12.0.12   | M1-1-1A      | 8/19/2022   | DD           | There is an EUH in the Recycling Room that is not labeled.   | BALA      |                  | Open   |
| 12.0.13   | M1-1-1B      | 8/19/2022   | DD           | There are "reducers/increasers" for changing ductwork size coming from AHU-<br>4 to the 50" diameter and 60" diameter ductowrk that span through the<br>Electrical shop. However, the largest size of ductwork is shown, however<br>what it reduces from is not sized. | BALA      |                  | Open   |
| 12.0.14   | M1-1-1B      | 8/19/2022   | DD           | Cosmetology and Theory CR have paragraphs pointing to them that are related to the Cafeteria. Please edit text for appropriate space   | BALA      |                  | Open   |
| 12.0.15   | M1-1-1B      | 8/19/2022   | DD           | Ductowrk in southwestern most portion of drawing (coming from Dry Storage) is not sized  | BALA      |                  | Open   |
| 12.0.16   | M1-1-1B      | 8/19/2022   | DD           | EUH's to be labeled on this drawing  | BALA      |                  | Open   |
| 12.0.17   | M1-1-1B      | 8/19/2022   | DD           | Are the two 72x72 intake lovers too close to the condensors?   | BALA      |                  | Open   |
| 12.0.18   | M1-1-1C      | 8/19/2022   | DD           | EUH's to be labeled on this drawing  | BALA      |                  | Open   |
| 12.0.19   | M1-1-1C      | 8/19/2022   | DD           | Mechanical item (rectangle) in Stair 4 is not labeled or sized   | BALA      |                  | Open   |
| 12.0.20   | M1-1-1D      | 8/19/2022   | DD           | Ductwork is not sized in Corridor 661 (at the intersection of 16 column line and DD line)  | BALA      |                  | Open   |
| 12.0.21   | M1-1-1D      | 8/19/2022   | DD           | In Stair 6 "provide wall mounted indoor VRF unit and connec to CU-2" there is not figure there to point to, should there be a symbol there?  | BALA      |                  | Open   |
| 12.0.22   | M1-1-1D      | 8/19/2022   | DD           | Two mechanical units in Corridor 424 on western most portion of drawing is not labeled or sized.   | BALA      |                  | Open   |
| 12.0.23   | M1-1-1D      | 8/19/2022   | DD           | Should EUH be in the Shower 552 (girls locker room) since it is in the Boys<br>Locker Room Shower Room?  | BALA      |                  | Open   |
| 12.0.24   | M1-1-1D      | 8/19/2022   | DD           | EUH's not labeled on the southern most portion of this drawing.  | BALA      |                  | Open   |
| 12.0.25   | M1-1-2A      | 8/19/2022   | DD           | Ceiling height to be called out at Mechanical 281 where lots of ductwork intersect   | BALA      |                  | Open   |
| 12.0.26   | M1-1-2A      | 8/19/2022   | DD           | Ceiling height to be called out at intersection of ductwork - for example: the 24x10 and the 36x14 intersenct in Corridor 440  | BALA      |                  | Open   |
| 12.0.27   | M1-1-2A      | 8/19/2022   | DD           | Duct work in MC Office 118 is not labeled, besides the FCU. What are intentions of the two ductwork items in this room?  | BALA      |                  | Open   |
| 12.0.28   | M1-1-2A      | 8/19/2022   | DD           | Mechanical units (linear diffusers?) in media center are not labeled.  | BALA      |                  | Open   |
| 12.0.29   | M1-1-2A      | 8/19/2022   | DD           | Mechanical unit in Stair 2 to be labeled.  | BALA      |                  | Open   |
| 12.0.30   | M1-1-2A      | 8/19/2022   | DD           | Mechanical unit to the east side of the KEF's is to be labeled.  | BALA      |                  | Open   |



| ltem No. | Ref Drawing. | Date Opened | Document Set | Review Comment   | Action by | Comment Response | Status |
|----------|--------------|-------------|--------------|--|-----------|------------------|--------|
| 12.0.31  | M1-1-2C      | 8/19/2022   | DD           | if the round items in the northeastern portion of this drawing (Auditorium) are mechanical, they should be labeled and sized.                                    | BALA      |                  | Open   |
| 12.0.32  | M1-1-2C      | 8/19/2022   | DD           | FCU's on west side of drawing are not labeled in the Depart Head Rooms or Conference Room 256  | BALA      |                  | Open   |
| 12.0.33  | M1-1-2C      | 8/19/2022   | DD           | The ductwork inside the chase at the west side of the Upper Auditorium is not sized or deciphered if going up or down.   | BALA      |                  | Open   |
| 12.0.34  | M1-1-2D      | 8/19/2022   | DD           | The ductwork inside the chase at the northern most part of this drawing is not sized or deciphered if going up or down.  | BALA      |                  | Open   |
| 12.0.35  | M1-1-2D      | 8/19/2022   | DD           | The ductwork located in Corridor 622 is not sized.   | BALA      |                  | Open   |
| 12.0.36  | M1-1-2D      | 8/19/2022   | DD           | BALA to confirm that the intent is to have 2 EUH's in the Gym Storage Room.<br>Excessive for a storage room?   | BALA      |                  | Open   |
| 12.0.37  | M1-1-3A      | 8/19/2022   | DD           | In the chase of the Science Lab, there are 3 ductwork risers that do not show the sizes and if they are going up or down.  | BALA      |                  | Open   |
| 12.0.38  | M1-1-3A      | 8/19/2022   | DD           | The ductwork that serves the "Size 6 VAV's are not sized.  | BALA      |                  | Open   |
| 12.0.39  | M1-1-3B      | 8/19/2022   | DD           | Where do 44x16 ductwork's end/where are they going? Intended to end in Storage Room 490 and CR 483?  | BALA      |                  | Open   |
| 12.0.40  | M1-1-3C      | 8/19/2022   | DD           | Ceiling height to be called out in Mechanical 639 for an understanding of worst case what the ceiling may need to be at ductwork intersections                   | BALA      |                  | Open   |
| 12.0.41  | M1-1-3D      | 8/19/2022   | DD           | Mechanical unit in Corridor 425 (outside of Stair 3) is not labeled or designated.   | BALA      |                  | Open   |
| 12.0.42  | M1-1-3D      | 8/19/2022   | DD           | None of the ductwork or mechanical equipment are labeled or sized. This is at the north portion of the drawings in the Mechanical Room 639 (outside of Stair 5). | BALA      |                  | Open   |
| 12.0.43  | M1-1-CB      | 8/19/2022   | DD           | ACCU and AC should be labeled with # designations in the Mechanical<br>Stadium Elevator  | BALA      |                  | Open   |
| 12.0.44  | M1-1-CB      | 8/19/2022   | DD           | Concession's building should have mechanical equipment labeled with # designations - EUH's, AC unit, and ACCU unit.  | BALA      |                  | Open   |
| 12.0.45  | M1-1-CB      | 8/19/2022   | DD           | Concession's building should have show ductwork connections to ERV units as scheduled.   | BALA      |                  | Open   |
| 12.0.46  | M1-1-CB      | 8/19/2022   | DD           | Ductowrk sizes are not specified that are intended for connection to ERV-5   | BALA      |                  | Open   |
| 12.0.47  | M1-1-LB      | 8/19/2022   | DD           | Locker Room 1st floor units do not have # associated with it, mechanical units should be labeled and designated - all EUH's, one ACCU, and one AC unit.          | BALA      |                  | Open   |
| 12.0.48  | M1-1-LB      | 8/19/2022   | DD           | Locker Room 2nd floor units should all be labeled - EUH's  | BALA      |                  | Open   |
| 12.0.49  | M1-1-LB      | 8/19/2022   | DD           | FCU 18-1 and 18-6 are located on top of lockers. Should be relocated   | BALA      |                  | Open   |
| 12.0.50  | M1-1-LB      | 8/19/2022   | DD           | Locker Room 1st floor - ductwork should make connections to the ERV or at minimum in the same room as unit.  | BALA      |                  | Open   |
| 12.0.51  | M1-1-MB      | 8/19/2022   | DD           | There is a box that is east of a louver on the west side of the Garage, and that box is not labeled or designated  | BALA      |                  | Open   |
| 12.0.52  | M1-1-MB      | 8/19/2022   | DD           | Fan is not labeled with a # designation.   | BALA      |                  | Open   |
| 12.0.53  | M1-1-MB      | 8/19/2022   | DD           | Grille's to be shown (and associated ductwork & sizes) in the bay's  | BALA      |                  | Open   |
| 12.0.54  | M2-0-4       | 8/19/2022   | DD           | Ductwork sizes shown on HRU 1 and 2, however not shown for HRU 3 and HRU 4   | BALA      |                  | Open   |
| 12.0.55  | M2-0-4       | 8/19/2022   | DD           | Ductwork size shown on one of the branches of ductwork to RTU-1, however it is not shown on the other branch line.   | BALA      |                  | Open   |



| Item No.        | Ref Drawing. | Date Opened | Document Set | Review Comment   | Action by  | Comment Response | Status |
|-----------------|--------------|-------------|--------------|--|------------|------------------|--------|
| 12.0.56         | M2-0-4       | 8/19/2022   | DD           | Ductwork supply/return to be clarified for RTU-1, as the arrows are conflicting as to what exactly is supply and what exactly is return  | BALA       |                  | Open   |
| 12.0.57         | M2-0-4       | 8/19/2022   | DD           | There is a "SD" that is not assigned to anything to the left of the riser on RTU-<br>1, that should be deleted as Smoke detectors are already captured.  | BALA       |                  | Open   |
| 12.0.58         | M2-0-4       | 8/19/2022   | DD           | Ductwork sizes for RTU-2 and RTU-3 are not shown.  | BALA       |                  | Open   |
| 12.0.59         | M2-0-4       | 8/19/2022   | DD           | For RTU-3, there is no duct smoke detector on the supply side of the ductwork. This is not typical compared to the other systems. BALA to confirm this is correct.   | BALA       |                  | Open   |
| 12.0.60         | GENERAL      | 1/20/2023   | 60% CD       | Large scale plans containing AHU's need to be dimensioned to show equipment to scale.  | BALA       |                  | Open   |
| 12.0.61         | GENERAL      | 1/20/2023   | 60% CD       | Duct riser diagrams need to indicte sizing   | BALA       |                  | Open   |
| 12.0.62         | GENERAL      | 1/20/2023   | 60% CD       | Some small ductwork needs final sizing indicated on ductwork drawings (I.E. Classroom A430), typ. comment.   | BALA       |                  | Open   |
| 13.0 Lighting   |              |             |              |  |            |                  |        |
| 14.0.1          | GENERAL      | 8/19/2022   | DD           | Drawings/Specs to be updated to show local fire alarm systems for outbuildings per meeting with Wakefield Fire Department on 7/29/22.  | BALA       |                  | Open   |
| 15.0 Electrical |              |             |              |  |            |                  |        |
| 15.0.1          | GENERAL      | 8/19/2022   | DD           | If there are automatic flushers or faucets in bathrooms, they will require direct power and/or an outlet.  | BALA       |                  | Open   |
| 15.0.2          | GENERAL      | 8/19/2022   | DD           | Label EUH's specific #'s   | BALA       |                  | Open   |
| 15.0.3          | GENERAL      | 8/19/2022   | DD           | EUH's shown on E1-1-0C but not on E1-1-MD, specifically in Stairwells and Boiler Room  | BALA       |                  | Open   |
| 15.0.4          | GENERAL      | 8/19/2022   | DD           | Power to all the hand dryers   | BALA       |                  | Open   |
| 15.0.5          | General      | 8/19/2022   | DD           | Design team to review all overhang areas and determine with if gutter/heat<br>trace is required to avoid potential impalment situation in winter with icicles<br>forming on roof edge  | BALA / DRA |                  | Open   |
| 15.0.10         | E0-1-2       | 8/19/2022   | DD           | Digital Message board notes wiring to "Maintenance Building", suggest to be<br>more specific in the Maintenance Building   | BALA       |                  | Open   |
| 15.0.11         | E0-1-3       | 8/19/2022   | DD           | To the east side of the tennis courts, there is a handicap ramp that may need illumination for ADA   | BALA       |                  | Open   |
| 15.0.12         | E1-1-0C      | 8/19/2022   | DD           | There is an outlet in Stairwell 7, but none in Stairwell 6. Confirm intent.  | BALA       |                  | Open   |
| 15.0.13         | E1-1-0C      | 8/19/2022   | DD           | In Weight Room 0, there is no outlets on the western wall.   | BALA       |                  | Open   |
| 15.0.14         | E1-1-0C      | 8/19/2022   | DD           | In Cust Workshop 147, there is no outlets in the room.   | BALA       |                  | Open   |
| 15.0.15         | E1-1-0C      | 8/19/2022   | DD           | In General Supply 275, there is only two outlets at entrance. Being a long room, should there be an outlet at the far end wall?  | BALA       |                  | Open   |
| 15.0.16         | E1-1-0C      | 8/19/2022   | DD           | One outlet in: IDF Room 216, Plumb Comp Air 211, Elev Mach 548, Elect Main Standby 277, Main Electric Room 279, Cust Storage 146 and Elect Voc 193. Confirm intent.  | BALA       |                  | Open   |
| 15.0.17         | E1-1-0C      | 8/19/2022   | DD           | In Metal Fab Shop, there are only 2 outlets on knee wall in middle of room, seems like 5 pieces of equipment along this wall. Do they all not require outlets? If not, should there be any outlets on that other side of the wall? | BALA       |                  | Open   |
| 15.0.18         | E1-1-0C      | 8/19/2022   | DD           | In Metal Fab Shop, the two walls on the eastern side of the room (north and south walls) have a minimum length of 28' between the outlets. Southern most wall is longer. Confirm intent.   | BALA       |                  | Open   |



| ltem No. | Ref Drawing. | Date Opened | Document Set | Review Comment  | Action by | Comment Response | Status |
|----------|--------------|-------------|--------------|---|-----------|------------------|--------|
| 15.0.19  | E1-1-0C      | 8/19/2022   | DD           | In Metal Fab Shop, there is an alcove south of the Argon Stor 608, that has no outlets.                                   | BALA      |                  | Open   |
| 15.0.20  | E1-1-0C      | 8/19/2022   | DD           | Outlet in Stor 613 is located on a wall, can be mistaken later. Suggest rotating outlet or moving south a little.         | BALA      |                  | Open   |
| 15.0.21  | E1-1-0C      | 8/19/2022   | DD           | In Office 578, there are only two duplex receptacles scheduled for an office scheduled for 4 people.                      | BALA      |                  | Open   |
| 15.0.22  | E1-1-0C      | 8/19/2022   | DD           | No Outlets on the wall that divides the Main Electric Room and the Boiler Room.   | BALA      |                  | Open   |
| 15.0.23  | E1-1-0C      | 8/19/2022   | DD           | Conflict of doorway/wall where there are two outlets landing on a wall or door at the Tool Crib 611.                      | BALA      |                  | Open   |
| 15.0.24  | E1-1-0D      | 8/19/2022   | DD           | There is an EPO located outside of the Weights Room 0 and in Corridor 57.<br>Not required in a corridor?                  | BALA      |                  | Open   |
| 15.0.25  | E1-1-0D      | 8/19/2022   | DD           | No Outlets shown in Office 615 of Auto Shop.  | BALA      |                  | Open   |
| 15.0.26  | E1-1-MC      | 8/19/2022   | DD           | AC Units 2, 3, 4, 5 and 6 not shown.  | BALA      |                  | Open   |
| 15.0.27  | E1-1-MC      | 8/19/2022   | DD           | EWH's now shown in Boiler Room  | BALA      |                  | Open   |
| 15.0.28  | E1-1-1A      | 8/19/2022   | DD           | Principal's Office 172 has a meeting table with no outlets nearby. Sped Director Room 132 has one by their meeting table. | BALA      |                  | Open   |
| 15.0.29  | E1-1-1A      | 8/19/2022   | DD           | Sped Conference Room 133 has no outlets in Room.  | BALA      |                  | Open   |
| 15.0.30  | E1-1-1A      | 8/19/2022   | DD           | Mail Room 173 has no outlets in Room or any outlets outside of Mail Room along the bathroom walls.                        | BALA      |                  | Open   |
| 15.0.31  | E1-1-1A      | 8/19/2022   | DD           | Conference Room 180 has no outlets in Room  | BALA      |                  | Open   |
| 15.0.32  | E1-1-1A      | 8/19/2022   | DD           | Stair 1 has no outlets. Confirm that is intent.   | BALA      |                  | Open   |
| 15.0.33  | E1-1-1A      | 8/19/2022   | DD           | Locker Room 525 has no outlets.   | BALA      |                  | Open   |
| 15.0.34  | E1-1-1A      | 8/19/2022   | DD           | No outlets along the sink wall, just south of the Dry Storage Room 528. GFI?  | BALA      |                  | Open   |
| 15.0.35  | E1-1-1A      | 8/19/2022   | DD           | No Outlets in Dishwash Room 530   | BALA      |                  | Open   |
| 15.0.36  | E1-1-1A      | 8/19/2022   | DD           | There is an outlet in Vestibule 420, but no outlets in Vestibule of Main<br>Entrance/Corridor 577                         | BALA      |                  | Open   |
| 15.0.37  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Disposal Room 535. Confirm that is intent.  | BALA      |                  | Open   |
| 15.0.38  | E1-1-1A      | 8/19/2022   | DD           | The two outlets in Locker 501 are located in lockers. To be relocated?<br>Lockers 498 and 505 have no outlets.            | BALA      |                  | Open   |
| 15.0.39  | E1-1-1A      | 8/19/2022   | DD           | Label electrical equipment south of Tool Crib 494   | BALA      |                  | Open   |
| 15.0.40  | E1-1-1A      | 8/19/2022   | DD           | Office 491 - 3 quad outlets for 5 person Office. One of those outlets is a GFI, which is not required in dry space?       | BALA      |                  | Open   |
| 15.0.41  | E1-1-1A      | 8/19/2022   | DD           | 2 AC's in Plumb Comp Air 212, please confirm that is intent.  | BALA      |                  | Open   |
| 15.0.42  | E1-1-1A      | 8/19/2022   | DD           | No outlets along back wall of Related CR 503. All outlets are mostly at front of room.                                    | BALA      |                  | Open   |
| 15.0.43  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Cafeteria   | BALA      |                  | Open   |
| 15.0.44  | E1-1-1A      | 8/19/2022   | DD           | No power outlets at Cash Registers of Servery   | BALA      |                  | Open   |
| 15.0.45  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Servery at all  | BALA      |                  | Open   |
| 15.0.46  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Kitchen at all  | BALA      |                  | Open   |
| 15.0.47  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Dish Washing 584  | BALA      |                  | Open   |
| 15.0.48  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Receiving 66  | BALA      |                  | Open   |
| 15.0.49  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Recycling Room 145.   | BALA      |                  | Open   |
| 15.0.50  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Dry Storage 583   | BALA      |                  | Open   |
| 15.0.51  | E1-1-1A      | 8/19/2022   | DD           | No outlets in Tool Crib 511   | BALA      |                  | Open   |
| 15.0.52  | E1-1-1B      | 8/19/2022   | DD           | No GFI outlet at Electrical Shop sink in Locker Area 590  | BALA      |                  | Open   |



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|----------|--------------|-------------|--------------|--|-----------|------------------|--------|
| 15.0.53  | E1-1-1B      | 8/19/2022   | DD           | No outlets in Locker Area 590  | BALA      |                  | Open   |
| 15.0.54  | E1-1-1B      | 8/19/2022   | DD           | Box that is south of LPH-1F and LP-1F should be lableled.  | BALA      |                  | Open   |
| 15.0.55  | E1-1-1B      | 8/19/2022   | DD           | Both tool cribs for Electrical Shop have no outlets.   | BALA      |                  | Open   |
| 15.0.56  | E1-1-1C      | 8/19/2022   | DD           | Corridor 621 - lack of outlets? Only one outlet on east side of hallway. An outlet on the southern portion of the decorative bench, but no outlets on northern side of bench   | BALA      |                  | Open   |
| 15.0.57  | E1-1-1C      | 8/19/2022   | DD           | TLT 647 and TLT 646 should have GFI by the sink, currently on opposite wall  | BALA      |                  | Open   |
| 15.0.58  | E1-1-1C      | 8/19/2022   | DD           | No outlets in Aud Storage 126  | BALA      |                  | Open   |
| 15.0.59  | E1-1-1C      | 8/19/2022   | DD           | No outlets in Referee Room 707   | BALA      |                  | Open   |
| 15.0.60  | E1-1-1C      | 8/19/2022   | DD           | No outlets in Auditorium 124 at all  | BALA      |                  | Open   |
| 15.0.61  | E1-1-1C      | 8/19/2022   | DD           | No outlets on Stage 125 at all   | BALA      |                  | Open   |
| 15.0.62  |              | 8/19/2022   | DD           | Outlet needed for dishwasher in Kitchen 605  | BALA      |                  | Open   |
| 15.0.63  | E1-1-1C      | 8/19/2022   | DD           | Creative Play 597 - duplex shown at sink, should be GFI. Another sink in this room with no outlet, should be GFI.  | BALA      |                  | Open   |
| 15.0.64  | E1-1-1D      | 8/19/2022   | DD           | No outlets in Fitness Room's 0, 568 and 569.   | BALA      |                  | Open   |
| 15.0.65  | E1-1-1D      | 8/19/2022   | DD           | EUH is not called out/indicated in Stair 3.  | BALA      |                  | Open   |
| 15.0.66  | E1-1-1D      | 8/19/2022   | DD           | No outlets in Girls Locker 0, Boys Locker 0, Team Locker's 554, 559, 560, 561, 562 and 563   | BALA      |                  | Open   |
| 15.0.67  | E1-1-1D      | 8/19/2022   | DD           | There is an EUH in Boys Locker Room Shower 564, but there is no EUH in Girls<br>Locker Room Shower 552   | BALA      |                  | Open   |
| 15.0.68  | E1-1-1D      | 8/19/2022   | DD           | There is a callout of a EUH in TLT 565, however there is no other EUH's in these sorts of bathrooms, as well as it seems to be pointing to a symbol that doesn't look like an EUH. To be confirmed   | BALA      |                  | Open   |
| 15.0.69  | E1-1-1MA     | 8/19/2022   | DD           | The room to the north of the Cafeteria does not have any mechanical units?   | BALA      |                  | Open   |
| 15.0.70  | E1-1-1MA     | 8/19/2022   | DD           | The southern most portion of the drawings, to the east of the Media Center, shows no indication of Mechanical units. To be completed.  | BALA      |                  | Open   |
| 15.0.71  | E1-1-2A      | 8/19/2022   | DD           | No outlets in MC Office 118  | BALA      |                  | Open   |
| 15.0.72  | E1-1-2A      | 8/19/2022   | DD           | There is (3) pieces of equipment (mechanical) that are not labeled/indicated in Science Prep Room  | BALA      |                  | Open   |
| 15.0.73  | E1-1-2B      | 8/19/2022   | DD           | On the southeastern most portion of the drawing, there is an EUH that is<br>located on the exterior of the building. Right next to that is an outlet that is<br>on the exterior of the building. To confirm that is the intent. Not sure it<br>would belong in Classroom either, as adjacent classrooms do not have an<br>EUH. | BALA      |                  | Open   |
| 15.0.74  | E1-1-2B      | 8/19/2022   | DD           | No outlets in Conference Room 256  | BALA      |                  | Open   |
| 15.0.75  | E1-1-2B      | 8/19/2022   | DD           | Should there be a second GFI outlet in TLT 650 if there is 2 sinks?  | BALA      |                  | Open   |
| 15.0.76  | E1-1-2B      | 8/19/2022   | DD           | No outlets in Telcom 142   | BALA      |                  | Open   |
| 15.0.77  | E1-1-2B      | 8/19/2022   | DD           | There is no pull down outlets in Computer Lab's 398 and 399, and the other computer labs have them. Please confirm this is correct. Also, no outlets on east wall of Room 399.   | BALA      |                  | Open   |
| 15.0.78  | E1-1-2B      | 8/19/2022   | DD           | TLT 521 shows an outlet in a wall chase, to be relocated to sink and inside the room.  | BALA      |                  | Open   |



| ltem No.        | Ref Drawing. | Date Opened | Document Set | Review Comment   | Action by | Comment Response | Status |
|-----------------|--------------|-------------|--------------|--|-----------|------------------|--------|
| 15.0.79         | E1-1-2B      | 8/19/2022   | DD           | No outlet at Teacher's Desk in Classroom 400   | BALA      |                  | Open   |
| 15.0.80         | E1-1-2B      | 8/19/2022   | DD           | No outlets in Office 401 and Marketing 441.  | BALA      |                  | Open   |
| 15.0.81         | E1-1-2C      | 8/19/2022   | DD           | No outlets in Auditorium Controls Room   | BALA      |                  | Open   |
| 15.0.82         | E1-1-2D      | 8/19/2022   | DD           | There are (2) EUH's serving the same room (Gym Storage 189) please confirm that is the intent. Does storage room need heat at all?   | BALA      |                  | Open   |
| 15.0.83         | E1-1-2D      | 8/19/2022   | DD           | No mechanical units or outlets shown in the Gymnasium.   | BALA      |                  | Open   |
| 15.0.84         | E1-1-0C      | 1/19/2023   | 60% CD       | Tool Crib C022B shows desks and chairs. Is this going to be a tool crib or a work office? If so, door is opening to a desk with outlet in doorway                          | BALA      |                  | Open   |
| 15.0.85         | E1-1-0C      | 1/19/2023   | 60% CD       | No outlets in Cust Workshop C020   | BALA      |                  | Open   |
| 15.0.86         | E1-1-0C      | 1/19/2023   | 60% CD       | EPO in Office C022E is not labeled   | BALA      |                  | Open   |
| 15.0.87         | E1-1-0C      | 1/19/2023   | 60% CD       | Two offices with no outlets (rooms are not labeled) and those rooms are<br>to the east of General Supply C015, across the hallway where desks are<br>shown.                | BALA      |                  | Open   |
| 15.0.88         | E1-1-0C      | 1/19/2023   | 60% CD       | Cust Office C013 only shows 1 outlet and it's a GFI. Does it need to be GFI? And should there be more outlets in office?   | BALA      |                  | Open   |
| 15.0.89         | E1-1-0C      | 1/19/2023   | 60% CD       | Plumbing Room C008 is a "wet room" does this mean GFI's are required?<br>If so, what is currently shown is just a typical outlet.  | BALA      |                  | Open   |
| 15.0.90         | E1-1-0D      | 1/19/2023   | 60% CD       | Small Engine D003H - if the square in the center is a "working table" then<br>there should be a ceiling hung pull down outlet to be able to utilize for<br>that table.     | BALA      |                  | Open   |
| 15.0.91         | E1-1-0D      | 1/19/2023   | 60% CD       | EPO is not labeled to the east of Locker D003B   | BALA      |                  | Open   |
| 15.0.92         | E1-1-0D      | 1/19/2023   | 60% CD       | There is a floating EPO in the corridor North of the Auto Collission Shop. I believe this is incorrectly placed.   | BALA      |                  | Open   |
| 15.0.93         | E1-1-1A      | 1/19/2023   | 60% CD       | There is no outlet at the Attendance A122 station  | BALA      |                  | Open   |
| 15.0.94         | E1-1-1A      | 1/19/2023   | 60% CD       | There is no outlets in Conference Room A140.   | BALA      |                  | Open   |
| 15.0.95         | E1-1-1A      | 1/19/2023   | 60% CD       | There is no GFI outlet in Duplicating Room. If this has printer, it will need regular outlet. Shouldn't there be a GFI on countertop backsplash as well as for the fridge? | BALA      |                  | Open   |
| 15.0.96         | E1-1-1A      | 1/19/2023   | 60% CD       | No outlets in Mail Room A139   | BALA      |                  | Open   |
| 15.0.97         | E1-1-1A      | 1/19/2023   | 60% CD       | No outlets in Sped Conf A138   | BALA      |                  | Open   |
| 15.0.98         | E1-1-1A      | 1/19/2023   | 60% CD       | No outlets in Dish A148K   | BALA      |                  | Open   |
| 15.0.99         | E1-1-1A      | 1/19/2023   | 60% CD       | TLT A143 has a water heater shown in the middle of bathroom path?  | BALA      |                  | Open   |
| 15.1.01         | E1-1-1A      | 1/19/2023   | 60% CD       | Carpentry Shop A141 - EPO's are not labeled  | BALA      |                  | Open   |
| 15.1.02         | E1-1-1A      | 1/19/2023   | 60% CD       | No outlets in Cafeteria  | BALA      |                  | Open   |
| 15.1.03         | E1-1-1A      | 1/19/2023   | 60% CD       | No outlets in Main Kitchen A108  | BALA      |                  | Open   |
| 15.1.04         | E1-1-1A      | 1/19/2023   | 60% CD       | GFI Outlets needed in TLT A106 and TLT A107  | BALA      |                  | Open   |
| 15.1.05         | E1-1-1A      | 1/19/2023   | 60% CD       | GFI Outlet needed on countertop backsplash for kitchenette in Staff Lunch<br>Room  | BALA      |                  | Open   |
| 15.1.06         | E1-1-1A      | 1/19/2023   | 60% CD       | GFI Outlet needed in Dish Washing A108A  | BALA      |                  | Open   |
| 16.0 Technology |              |             |              |  |           |                  |        |



| Item No.                | Ref Drawing.                       | Date Opened | Document Set | Review Comment  | Action by      | Comment Response | Status   |
|-------------------------|------------------------------------|-------------|--------------|---|----------------|------------------|----------|
| 16.0.1                  | T-1-1-0D                           | 1/20/2023   | 60% CD       | The 75" IFP is currently shown mounted over student work counters in the<br>Small Engine Room within the Auto Tech Shop. The current mounting location<br>may create visibility issues for other students. Please confirm if this screen<br>should be mounted on the East wall of the room or a mobile screen on<br>casters may be considered. Data/power to be adjusted accordingly.                       | 3SI/BALA       |                  | Open     |
| 17.0 Programming Sheets |                                    |             |              |   |                |                  |          |
| 17.0.1                  | GENERAL                            | 8/19/2022   | DD           | Confirm additional lockers should not be included in case needed in future.   | DRA            |                  | Open     |
| 17.0.2                  | GENERAL                            | 8/19/2022   | DD           | Verify all mounted compressed air is at least 48" AFF   | DRA            |                  | Open     |
| 17.0.3                  | VOC-02<br>Automotive<br>Collision  | 8/19/2022   | DD           | Design of shop appears to have shifted appropriately in accordance with discussions held at $6/1/22$ meeting with staff. Noting for record. At next meeting we should review: Storage access & blasting cabinet size.   | No Action Reqd |                  | Record   |
| 17.0.4                  | VOC-03<br>Auto Tech                | 8/19/2022   | DD           | Design of shop appears to have shifted appropriately in accordance with discussions held at 6/2/22 meeting with staff (Provisions for EV, Diesel, exhaust for small engines, 2 tire changers). Noting for record  | No Action Reqd |                  | Record   |
| 17.0.5                  | VOC-04<br>Business Office<br>Tech. | 8/19/2022   | DD           | Bank - NEMT to confirm with Bank that the project may just provide a shell for them to fit out.   | NEMT           |                  | Open     |
| 17.0.6                  | VOC-05<br>Carpentry                | 8/19/2022   | DD           | It appears that the design of the shop has shifted significantly as a result of the 6/1/22 meeting with staff. Most changes appear to be in line with discussions (including space for 16-ft cuts, re-arranging equipment, and eliminating floor sweeps); however, can you please clarify why there are now 2 portable planers by the OH door? (Appear to be adding 1?) Also have we lost a row of storage? | DRA            |                  | Open     |
| 17.0.7                  | VOC-05<br>Carpentry                | 8/19/2022   | DD           | Has NEMT confirmed that 11'-4" OH door is acceptable?   | DRA/NEMT(?)    |                  | Open     |
| 17.0.8                  | VOC-05<br>Carpentry                | 8/19/2022   | DD           | Has DRA contacted Dustpipe to discuss dust collection system design?  | DRA            |                  | Open     |
| 17.0.9                  | VOC-06<br>Cosmetology              | 8/19/2022   | DD           | Need to meet with Staff to review June plans  | NEMT           |                  | Tracking |
| 17.0.10                 | VOC-07<br>Culinary Arts            | 8/19/2022   | DD           | NEMT staff pleased with layouts as of June 2022; next steps were for NEMT to review internally and get back to the team. Tracking here.   | NEMT           |                  | Tracking |
| 17.0.11                 | VOC-08<br>Dental Asstg             | 8/19/2022   | DD           | Has NEMT followed up regarding the size, quantity, and number of A-dec chairs to be purchased outside of the project?   | ??             |                  | Open     |
| 17.0.12                 | VOC-08<br>Dental Asstg             | 8/19/2022   | DD           | Please revise note directly above storage room to only point to chairs on<br>Upper Classmen side for medical grade. School will only use Upper Classmen<br>side in the future   | DRA            |                  | Open     |
| 17.0.13                 | VOC-08<br>Dental Asstg             | 8/19/2022   | DD           | Has NEMT followed up regarding the Ultrasonic setup?  | DRA            |                  | Open     |
| 17.0.14                 | VOC-08<br>Dental Asstg             | 8/19/2022   | DD           | Can you verify how many students can witness demonstrations from X-ray room for next staff meeting? (We should also verify they are happy with flip of X ray and Storage rooms)   | DRA            |                  | Open     |
| 17.0.15                 | VOC-09 Design &<br>Visual Comm.    | 8/19/2022   | DD           | It appears the existing 5,800lb HP Indigo digital press is now reflected as being brought to the new school. NEMT to follow up regarding viability of relocation / potential to trade-in.   | NEMT           |                  | Tracking |
| 17.0.16                 | VOC-09 Design &<br>Visual Comm.    | 8/19/2022   | DD           | PMA would like to request that DRA take another look at the reception counter / desk. NEMT staff provided "rendering" showing a curved reception counter at 6/1/22 design meeting.  | DRA            |                  | Open     |



| Item No. | Ref Drawing.                            | Date Opened | Document Set | Review Comment  | Action by   | Comment Response | Status   |
|----------|---|-------------|--------------|---|-------------|------------------|----------|
| 17.0.17  | VOC-11: Early<br>Childhood<br>Education | 8/19/2022   | DD           | PMA would like to continue discussions regarding emergency egress from rooftop playground in event of emergency.  | DRA         |                  | Open     |
| 17.0.18  | VOC-12:<br>Electrical                   | 8/19/2022   | DD           | Please verify that power for all electrical booths need to be on a separate panel in next meeting with staff. Also PMA noted at the 6/2/22 meeting that the shunt trip breakers were not required if the EPOs can shut down the whole shop. | DRA         |                  | Open     |
| 17.0.19  | VOC-13:<br>Health Asstg                 | 8/19/2022   | DD           | Has NEMT confirmed details of 4 long term care beds they plan to bring as discussed at 6/2/22 staff meeting?  | DRA/NEMT(?) |                  | Open     |
| 17.0.20  | VOC-13:<br>Health Asstg                 | 8/19/2022   | DD           | Has NEMT sent Sim Man spec info as discussed at 6/2/22 staff meeting?   | DRA/NEMT(?) |                  | Tracking |
| 17.0.21  | VOC-13:<br>Health Asstg                 | 8/19/2022   | DD           | Has NEMT followed up regarding grant for EKG machine? NEMT noted at 6/2/22 staff meeting that if grant is accepted, 2 EKG machines will be coming over.   | DRA/NEMT(?) |                  | Open     |
| 17.0.22  | VOC-14:<br>HVAC Tech.                   | 8/19/2022   | DD           | Team discussed maximizing unfinished scope at 6/1/22 design meeting, for students to finish. Can DRA clarify what is left "unfinished" for next design meeting?   | DRA         |                  | Open     |
| 17.0.23  | VOC-16:<br>Plumbing &<br>Pipefitting    | 8/19/2022   | DD           | Soldering tables appear to have been removed?   | DRA         |                  | Open     |
| 17.0.24  | VOC-19<br>Marketing                     | 8/19/2022   | DD           | Lab - Can you confirm if sublimation machine is carried per staff request at 6/1/22 meeting?  | DRA         |                  | Open     |

# OPM SUBMITTAL REVIEW & COORDINATION COMMISSIONING CONSULTANTS REVIEW

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|-----------------|-------------------------------------|--------------------------------------|------------------|--|---|---|--------------------|-------------------|------------|--|
| Consu<br>Servic | tung ⊨ngineering<br>es 2022604.00 G |                                      |                  | Northeast Met  | letropolitan Regional Vocational High School      |   |                    |                   |            |  |
| Project N       | lame:                               | Northeast Metropo                    | litan Regional V | Vocational High School   | Reviewing Agency: Consulting Engineering Services |   |                    |                   |            |  |
| Project N       | lo.:                                | 2022604.00 G                         |                  |  | Reviewed By:                                      | Jeanine Palmieri  |                    |                   |            |  |
| Mileston        | e:<br>Drawing/Space                 |                                      |                  |  |   | 12/4/2022   |                    | Boviowor Bosponso |            |  |
| NO.             | Section                             | Detail/ Room<br>Number               | DISCIPLINE       | Cx Review Comments   | COMMENT BY:                                       | Designer Response   | Follow Up Comments | (Open/Closed)     | Review Set |  |
| CES<br>1.01     | 230993.11 and M<br>Drawings         | Split System A/C<br>Units (Typical)  | М                | 230993.11, 1.15, C for split A/C units it indicates Spaces served<br>by these systems shall be instrumented with temperature sensors<br>for monitoring by the BMS, alarming temperatures out of range.<br>Montoring sensors now shown on drawings.   | CES   | Will be indicated in a future submission.   |                    | Open              | 60%CD      |  |
| CES<br>1.02     | 230993.11 and M<br>Drawings         | EUH/ECUH<br>(Typical)                | М                | 230993.11, 1.13, B for electric cabinet unit heaters indicates that<br>the shall be provided with manufacturers thermostsats for field<br>installation but also shall be instrumented with temperature<br>sensors for monitoring by the BMS and alarming when 5°F below<br>the temp setpoint (adj.) Montoring sensors not yet shown on | CES   | This will be clarified in a future submission.  |                    | Open              | 60%CD      |  |
| CES<br>1.03     | M Drawings                          | General Comment<br>- Control Sensors | М                | Control sensor placement on drawings not yet complete  | CES   | This will be indicated in a future submission.  |                    | In Progress       | 60%CD      |  |
| CES<br>1.04     | M1-1-1A                             | TIT A107                             | М                | No exhaust Shown to this toilet room   | qqw   | Exhaust to this toilet room will be indicted in a future submission.  |                    | Open              | 60%CD      |  |
| CES<br>1.05     | M1-1-1A and<br>M5-0-1               | F-18 (Kitchen<br>Area)               | М                | Review schedule to ensure location and "serving" for F-18 are<br>accurate. Appears to be located in the kitchen A108 and serve<br>Recycling Room A109, custodial A113, Office A104, Tlt A106 and<br>should serve A107 (no grille shown in there currently)   | CES   | Will review and revised.  |                    | Open              | 60%CD      |  |
| CES<br>1.06     | M1-1-1A                             | Elevator Machine<br>Room             | М                | What is this room (Elev Machine Room?) and how is it accessed?<br>No door shown. Split A/C in space missing Tag - Assumed 2-4<br>based on M1-3-1A  | CES   | The location of this AC will be revised in a future submission.   |                    | Open              | 60%CD      |  |
| CES<br>1.07     | M1.1-0D                             | General Comment                      | М                | Ductwork Sizing in progress. To be reviewed for completeness during next review.   | CES   | Noted.  |                    | In Progress       | 60%CD      |  |
| CES<br>1.08     | M1.1-0D                             | Auto Technology<br>D003              | М                | CO/NO2 System - Is this being monitored by the BMS or is this 100% Standalone? If monitored, this should be written into the spec.   | CES   | It will be monitored by the BMS and<br>will be included in the specification in<br>a future submission  |                    | Open              | 60%CD      |  |
| CES<br>1.09     | M1.1-0D                             | VAV Schedules<br>(Typical)           | М                | Sound Data appears to be incomplete  | CES   | Will be completed in a future submission.   |                    | Open              | 60%CD      |  |
| CES<br>1.10     | M1.1-0D                             | Receiving A110                       | М                | Confirm sufficient heat near this exterior door.   | CES   | Confirmed. EUH to be provided in Receiving A110.  |                    | Open              | 60%CD      |  |
| CES<br>1.11     | M1.1-0D                             | Carpentry A141                       | М                | Confirm necessary controls will be provided with relocated dust collector.   | CES   | Confirmed.  |                    | Open              | 60%CD      |  |
| CES<br>1.12     | M1-1-2A                             | CR A224, 225,<br>226, 227            | М                | Suggest moving room name indication for clarity.   | CES   | Noted.  |                    | Open              | 60%CD      |  |
| CES<br>1.13     | M1-1-2B                             | Records B227                         | М                | Does this records area require any ventilation?  | CES   | Ventilation will be added in a future submission.   |                    | Open              | 60%CD      |  |
| CES<br>1.14     | M1-1-2B                             | CR B212 Typical                      | М                | Sensors in progress. To be reviewed on next set. Suggest drawing whips to each piece of equipment controlled for clarity.  | CES   | Controls and sensors will be clarified<br>in a future submission.   |                    | Open              | 60%CD      |  |
| CES<br>1.15     | M1-1-2B                             | TLT 217?                             | М                | Exhaust not shown in space   | CES   | Exhaust will be indicated in future submission.   |                    | Open              | 60%CD      |  |
| CES<br>1.16     | M1-1-3A                             | Elev Machine EE                      | М                | Is split A/C needed in here?   | CES   | AC noted in item number CES 1.06 is<br>to be relocated to this elevator<br>machine room in a future submission.   |                    | Open              | 60%CD      |  |
| CES<br>1.17     | M1-1-3A                             | Digital Learning<br>A308 (typical)   | М                | Similar locations on other pages show T and TC2 serving similar<br>areas. Is this shown correctly here? If the Thermostat controls the<br>VRF. What is controlling the electric reheat on the VAV?   | CES   | This is shown correctly. The<br>thermostat is controlling the VRF FCU<br>and the CO2 sensor is controlling the<br>VAV. The HRU discharge air<br>temperature will be reset based on<br>outdoor air temperature. VAVs<br>connected to HRU-1, 2, 3 will not be |                    | Open              | 60%CD      |  |



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| - (             | <b>CFS</b>                          |                                  |                  | CxA DESIGN REVI   | EW COMMENTS - M                       | echanical and Controls (ATC) Specifics                                       |                    |                                    |            |
|-----------------|-------------------------------------|----------------------------------|------------------|---|---------------------------------------|--|--------------------|------------------------------------|------------|
| Consu<br>Servic | ting ⊨ngineering<br>es 2022604.00 G |                                  |                  | Northeast Met   | ropolitan Reg                         | ional Vocational High Schoo  | I                  |                                    |            |
| Project N       | lame:                               | Northeast Metropo                | litan Regional ` | Vocational High School  | Reviewing Agency:                     | Consulting Engineering Services  |                    |                                    |            |
| Project N       | lo.:                                | 2022604.00 G                     |                  |   | Reviewed By:                          | Jeanine Palmieri   |                    |                                    |            |
| NO.             | Drawing/ Spec<br>Section            | Detail/ Room<br>Number           | DISCIPLINE       | Cx Review Comments  | REVIEW Date.<br>REVIEW<br>COMMENT BY: | Designer Response  | Follow Up Comments | Reviewer Response<br>(Open/Closed) | Review Set |
| CES<br>1.18     | HVAC Drawing<br>Notes               | General Comment                  | М                | Update detail and drawing number for reference.   | CES                                   | Noted.   |                    | Open                               | 60%CD      |
| CES<br>1.19     | M1-1-LB                             | Detail 2                         | М                | Room names not identified on plan.  | CES                                   | Will update in a future submission.  |                    | Open                               | 60%CD      |
| CES<br>1.20     | M1-3-0C                             | Near Coach OFF<br>C024           | М                | What is this space. Is there a FCU that serves Coaches office C024 also? FCUS should be tagged. | CES                                   | Will be revised in a future submission.                                      |                    | Open                               | 60%CD      |
| CES<br>1.21     | M1-3-1D                             | Elec Rm                          | М                | Split A/C not tagged  | CES                                   | Will be tagged in a future submission.                                       |                    | Open                               | 60%CD      |
| CES<br>1.22     | M5-0-3                              | Sound Attenuator<br>Schedule     | М                | Schedule not yet filled in.   | CES                                   | Will be completed in a future submission.                                    |                    | Open                               | 60%CD      |
| CES<br>1.23     | 230993.11                           | Air<br>Handling/Rooftop<br>Units | М                | Suggest identifying sequences with associated unit numbers for clarity.                         | CES                                   | Sequences of operation will be revised and clarified in a future submission. |                    | Open                               | 60%CD      |
| CES<br>1.24     | 230993 and M<br>Dwgs                | Control Diagrams                 | М                | Will control diagrams be provided?  | CES                                   | No.  |                    | Open                               | 60%CD      |

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**CxA DESIGN REVIEW COMMENTS - Electrical** 

#### North at Matu litan Pagional Vacatio nal High School

| Consul<br>Servic | ting Engineering<br>es 2022604.00 G |                                   |                   | Northeast Met  | tropolitan Reg    | jional Vocational High Schoo  | 01                 |                   |            |
|------------------|-------------------------------------|-----------------------------------|-------------------|--|-------------------|---|--------------------|-------------------|------------|
| Project N        | ame:                                | Northeast Metropo                 | olitan Regional V | Vocational High School   | Reviewing Agency: | Consulting Engineering Services   |                    |                   |            |
| Project N        | lo.:                                | 2022604.00 G                      |                   |  | Reviewed By:      | Scott Sullivan  |                    |                   |            |
| Milestone        | 9:                                  | 60% CD                            |                   |  | Review Date:      | 12/5/2022   |                    |                   |            |
|                  | Drawing/ Spec                       | Detail/ Room                      |                   | Cx Poviow Commonts   | REVIEW            |   |                    | Reviewer Response |            |
| NO.              | Section                             | Number                            | DISCIPLINE        | CX Review Comments   | COMMENT BY:       | Designer Response   | Follow Up Comments | (Open/Closed)     | Review Set |
| CES<br>2.01      | E1-1-0                              | MSB-1A - Main<br>Elec C001        | E                 | PLEASE REVIEW INSTALLTION METHODS/FUTURE<br>REPLACEMENT OF LARGER EQUIPMENT SUCH AS THE<br>MAIN SWITCHBOARD, TRANSFORMERS, ETC. DOUBLE<br>DOORS INTO ELECTRICAL ROOM WILL ACCOMMODATE,<br>HOWEVER, THIS LEADS INTO A CORRIDOR WITH<br>STANDARD WITH DOORS AT STAIRS. | CES               | Accommodation for replacement of larger equipment will be reviewed.   |                    | Open              | 60% CD     |
| CES<br>2.02      | E1-1-0                              | PV Panelbaord -<br>Main Elec C001 | E                 | PLEASE INDICATE LOCATION OF PV DISCONNECT SWITCH.<br>NORMALLY REQUIRED AT EXTERIOR ADJACENT TO<br>UTILITY METER/UTILITY TRANSFORMER.   | CES               | Location of PV switch will be included in future submission.  |                    | Open              | 60% CD     |
| CES<br>2.03      | E1-1-0                              | Elev Mach C012                    | E                 | DISCONNECTS ARE REQUIRED AT DOOR STRIKE SIDE OF DOOR.  | CES               | Disconnect location will be revised.  |                    | Open              | 60% CD     |
| CES<br>2.04      | E1-1-0C                             | Key Plan<br>(Typical)             | E                 | PLEASE EDIT KEYPLAN TO MATCH   | CES               | Key plans will be revised to match.   |                    | Open              | 60% CD     |
| CES<br>2.05      | E1-1-0D                             | General<br>Comment                | E                 | PLEASE REVIEW ARTICLE 511 REQUIREMENTS FOR<br>WIRING AND DEVICES AS DESIGN PROGRESSES.   | CES               | Any area classifications and<br>requirements for wiring devices will be<br>coordinated as design progresses.  |                    | Open              | 60% CD     |
| CES<br>2.06      | E1-1-MC/MD and<br>On                | General<br>Comment                | E                 | DRAWING INCOMPLETE, CANNOT BE REVIEWED. Not ready for a 60% CD review.   | CES               | The scope indicated on the drawings<br>is sufficient for a 60%CD pricing set.<br>Drawings issued for the 60%CD<br>MSBA submission will meeting MSBA<br>60%CD requirements with the<br>exception of all circuiting being<br>completed. |                    | Open              | 60% CD     |

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| Consulti<br>Service | ing Engineering<br>s 2022604.00 G | Northeast Metroj                                    |                  |   |                       | tropolitan Regional Vocational High School  |                    |                                    |            |  |  |
|---------------------|-----------------------------------|---|------------------|---|-----------------------|---|--------------------|------------------------------------|------------|--|--|
| Project Na          | ame:                              | Northeast Metropo                                   | litan Regional V | ocational High School   | Reviewing Agency:     | Consulting Engineering Services   |                    |                                    |            |  |  |
| Project No          | ).:                               | 2022604.00 G  | <u> </u>         | 5   | Reviewed By:          | Del Smith   |                    |                                    |            |  |  |
| Milestone           |                                   | 60% CD  |                  |   | Review Date:          | 12/5/2022   |                    |                                    |            |  |  |
| NO.                 | Drawing/ Spec<br>Section          | Detail/ Room<br>Number                              | DISCIPLINE       | Cx Review Comments  | REVIEW<br>COMMENT BY: | Designer Response   | Follow Up Comments | Reviewer Response<br>(Open/Closed) | Review Set |  |  |
| CES<br>3.01         | FP1-1-0.5CD                       | Detail 2  | FP               | Sprinklers are shown too close together   | CES                   | Sprinkler graphics/layout to be revised accordingly.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.02         | FP1-1-0.5CD                       | Detail 3  | FP               | It appears some of this work is also shown on the full plans.   | CES                   | Sprinkler graphics/layout to be revised accordingly.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.03         | FP1-1-0C<br>(Typical)             | Key Plan  | FP               | Correct hatching on key plan to indicate area shown. typical for all sheets   | CES                   | Noted, will address for future submission.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.04         | FP1-1-0C                          | Hatched Area<br>above Corridor<br>C010              | FP               | Light Hazard Area label shown in Ordinary Hazard Area   | CES                   | Light Hazard Area, is noted for toilet<br>room. Will be addressed for clarity on<br>partial plans.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.05         | FP1-1-0C                          | Generator Panels<br>C007 and Elec<br>Main Elec C001 | FP               | Should these areas be shown as Ordinary Hazard?   | CES                   | Areas will be noted as Ordinary<br>Hazard.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.06         | FP1-1-0C                          | Plumbing Room<br>C008                               | FP               | Where does the drain piping for the floor control valves terminate?   | CES                   | Drain piping termination point shall be indicated in future submission.   |                    | Open                               | 60% CD     |  |  |
| CES<br>3.07         | FP1-1-0C                          | Elev #2 E2  | FP               | Is coverage required for the elevator pit and for Elevator Machine Room   | CES                   | These areas do not require sprinkler coverage.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.08         | FP1-1-0C                          | Paint Booth   | FP               | Sprinkler heads shown on the wall. Should these be relocated?   | CES                   | Sprinklers are above paint booth at the shop ceiling.   |                    | Open                               | 60% CD     |  |  |
| CES<br>3.09         | FP1-1-0C                          | Paint Booth   | FP               | The two sets of sprinklers appear to be too close together. is there<br>a separation not readily visible on the plans? Typical for both<br>spray booths | CES                   | One set of sprinkler heads are shown<br>within the booth. Other set is intended<br>to provide coverage at the shop ceiling<br>outside the paint booth. Plans shall be<br>updated for clarity. |                    | Open                               | 60% CD     |  |  |
| CES<br>3.10         | FP1-1-0C                          | Off C022E   | FP               | Sprinkler heads shown too close together and conflicting hazard classifications shown in the is area.   | CES                   | Hazard classifications are for rooms<br>under mezzanine. Classifications to be<br>modified as needed for clarity.<br>Sprinkler layout to be modified.   |                    | Open                               | 60% CD     |  |  |
| CES<br>3.11         | FP1-1-0C                          | TLT C022C   | FP               | Heads shown too close together.   | CES                   | Sprinkler below mezzanine and at<br>shop ceiling appearing on same plan.<br>Graphics to be modified.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.12         | FP1-1-0C                          | Auto Collision<br>C022                              | FP               | Heads shown too close together.   | CES                   | Sprinkler layout to be modified accordingly.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.13         | FP1-1-0C                          | Stair 7   | FP               | Is this a drain riser? Where does it terminate? Also the symbol is not in the legend. Is this a fire department hose valve?                             | CES                   | Symbol is a fire department hose<br>valve. Drain riser to terminate through<br>exterior wall underside of stair.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.14         | FP1-1-0C                          | Auto Collision<br>C022                              | FP               | Missing sprinkler head on the far right side of the plan.   | CES                   | Sprinkler layout to be modified accordingly.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.15         | FP1-1-0C                          | Stair 6   | FP               | There appears to be something missing in this location. Also, the various pipes/risers are not labeled  | CES                   | 6" fire standpipe riser, 3" sprinkler drain riser to be labeled.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.16         | FP1-1-0C/D                        | Stair 6   | FP               | Sprinkler coverage in the stair looks deficient. Typical  | CES                   | Sprinklers will be shown at underside<br>of bottom landing and at top of the<br>stairways. Typical for all stairways.   |                    | Open                               | 60% CD     |  |  |
| CES<br>3.17         | FP1-1-0D                          | Related C022D<br>and TLT C022C                      | FP               | Sprinklers shown too close together   | CES                   | Sprinkler below mezzanine and at<br>shop ceiling appearing on same plan.<br>Graphics to be modified.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.18         | FP1-1-0D                          | Stair 6   | FP               | Where does the drain piping terminate?  | CES                   | Drain riser to terminate through exterior wall underside of stair.  |                    | Open                               | 60% CD     |  |  |
| CES<br>3.19         | FP1-1-0D                          | Just above Stair<br>6                               | FP               | What does the riser serve?  | CES                   | Riser serves auditorium fire department valve connection.   |                    | Open                               | 60% CD     |  |  |
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**CxA DESIGN REVIEW COMMENTS - Fire Protection** 

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|----------|------|---------|---|
| Services | 2022 | 2604.00 | G |

| Consul<br>Servic | ting Engineering<br>es 2022604.00 G | ng<br>G                           |                  |  |                       |   |                    |                                    |            |
|------------------|-------------------------------------|-----------------------------------|------------------|--|-----------------------|---|--------------------|------------------------------------|------------|
| Project N        | lame:                               | Northeast Metropo                 | litan Regional V | ocational High School  | Reviewing Agency:     | Consulting Engineering Services   |                    |                                    |            |
| Project N        | lo.:                                | 2022604.00 G                      | 5                | 5  | Reviewed By:          | Del Smith   |                    |                                    |            |
| Mileston         | 9:                                  | 60% CD                            |                  |  | Review Date:          | 12/5/2022   |                    |                                    |            |
| NO.              | Drawing/ Spec<br>Section            | Detail/ Room<br>Number            | DISCIPLINE       | Cx Review Comments   | REVIEW<br>COMMENT BY: | Designer Response   | Follow Up Comments | Reviewer Response<br>(Open/Closed) | Review Set |
| CES<br>3.20      | FP1-1-0D                            | Area outlined in detail 3 callout | FP               | Conflicting hazard classification  | CES                   | Hazard classifications are for rooms<br>under mezzanine. Classifications to be<br>modified as needed for clarity.<br>Sprinkler layout to be modified. |                    | Open                               | 60% CD     |
| CES<br>3.21      | FP1-1-0D                            | Area outlined in detail 3 callout | FP               | Sprinkler heads shown too close together. Are they at different elevations?            | CES                   | Sprinkler below mezzanine and at<br>shop ceiling appearing on same plan.<br>Graphics to be modified.  |                    | Open                               | 60% CD     |
| CES<br>3.22      | FP1-1-1A                            | Stair 1 S1                        | FP               | Will sprinkler coverage be provided in this area?                                      | CES                   | Sprinkler coverage will be provided in this area as required.   |                    | Open                               | 60% CD     |
| CES<br>3.23      | FP1-1-1A                            | Kitchen A108                      | FP               | Has full coverage been provided?   | CES                   | Full sprinkler coverage to be provided<br>except for areas under hoods, covered<br>under separate ANSUL system.                                       |                    | Open                               | 60% CD     |
| CES<br>3.24      | FP1-1-1A                            | Stair 2 S2                        | FP               | Is a fire department hose valve provided here?   | CES                   | Fire department hose valve to be noted at Stair 2.  |                    | Open                               | 60% CD     |
| CES<br>3.25      | FP1-1-1A                            | Area below Tool<br>Crib B101H     | FP               | This space appears to have no doors. Is sprinkler coverage required?                   | CES                   | Sprinkler coverage is required, this area is accessible from a ladder to the mezzanine level.   |                    | Open                               | 60% CD     |
| CES<br>3.26      | FP1-1-1B                            | Fire Pump Room<br>B105            | FP               | Where is fire pump test header shown?  | CES                   | Fire pump test header shown on north exterior wall outside fire pump room.  |                    | Open                               | 60% CD     |
| CES<br>3.27      | FP1-1-1B                            | Fire Pump Room<br>B105            | FP               | 10" service shown on riser diagram   | CES                   | Riser diagram shall be updated to show 8" service.  |                    | Open                               | 60% CD     |
| CES<br>3.28      | FP1-1-1B                            | Fire Pump Room<br>B105            | FP               | Pump shown backwards   | CES                   | Pump layout to be revised.  |                    | Open                               | 60% CD     |
| CES<br>3.29      | FP1-1-1B                            | Fire Pump Room<br>B105            | FP               | Piping doesn't match riser   | CES                   | Piping to be coordinated accordingly.   |                    | Open                               | 60% CD     |
| CES<br>3.30      | FP1-1-1B/C                          | General<br>Comment                | FP               | piping not visible in multiple areas   | CES                   | Drawings to be revised for clarity.   |                    | Open                               | 60% CD     |
| CES<br>3.31      | FP1-1-1B                            | Plumbing and<br>Pipe Fitting B101 | FP               | FHVC tag shown. What is this associated with?  | CES                   | Fire hose valve connection for<br>standpipe system.   |                    | Open                               | 60% CD     |
| CES<br>3.32      | FP1-1-1B                            | Tool Crib                         | FP               | Confirm sprinkler heads are shown properly.  | CES                   | Heads above and below mezzanine level appearing. Graphics to be modified accordingly.   |                    | Open                               | 60% CD     |
| CES<br>3.33      | FP1-1-1B                            | General<br>Comment                | FP               | Should LH tags be on the part plan on P1-1-1.5AB?                                      | CES                   | Correct. Tag locations to be modified.  |                    | Open                               | 60% CD     |
| CES<br>3.34      | FP1-1-1C                            | Stair 4 S4                        | FP               | Where does the drain terminate   | CES                   | Drain terminates through exterior wall<br>at Lower Level.   |                    | Open                               | 60% CD     |
| CES<br>3.35      | FP1-1-1C                            | Cust A205                         | FP               | Identify symbols shown in space.   | CES                   | Graphical error. Should not appear on FP drawings.  |                    | Open                               | 60% CD     |
| CES<br>3.36      | FP1-1-2C                            | Near Corridor<br>C201             | FP               | 6" FSP and 3" SDR not pointing to anything outside Corridor                            | CES                   | To be deleted.  |                    | Open                               | 60% CD     |
| CES<br>3.37      | FP1-1-2C                            | Corridor C206                     | FP               | Clarify why two types of sprinklers are provided in such close proximity to each other | CES                   | Sprinkler layout to be modified accordingly.  |                    | Open                               | 60% CD     |
| CES<br>3.38      | FP1-1-2C                            | Proscenium<br>opening             | FP               | Are any special fire protection measures necessary at the proscenium opening?          | CES                   | Sprinklers required at underside of<br>walkway. Window sprinklers are<br>required at glass separation at upper<br>levels.                             |                    | Open                               | 60% CD     |
| CES<br>3.39      | FP1-1-3A                            | STOR A314                         | FP               | Sprinkler coverage in this area does not seem to match the background                  | CES                   | Sprinkler layout to be modified accordingly.  |                    | Open                               | 60% CD     |

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| -                 | <b>FS</b>                           | CXA DESIGN REVIEW COMMENTS - FIre Protection           |                   |  |                   |   |                    |               |            |
|-------------------|-------------------------------------|--|-------------------|--|-------------------|---|--------------------|---------------|------------|
| Consul<br>Service | ting Engineering<br>es 2022604.00 G | Northeast Metropolitan Regional Vocational High School |                   |  |                   |   |                    |               |            |
| Project N         | ame:                                | Northeast Metropo                                      | olitan Regional V | ocational High School  | Reviewing Agency: | Consulting Engineering Services                               |                    |               |            |
| Project N         | 0.:                                 | 2022604.00 G   |                   |  | Reviewed By:      | Del Smith   |                    |               |            |
| Milestone         | C. Drowing/Space                    | 60% CD   |                   |  | Review Date:      | 12/5/2022   |                    |               |            |
| NO.               | Section                             | Detail/ Room<br>Number                                 | DISCIPLINE        | Cx Review Comments   | COMMENT BY:       | Designer Response   | Follow Up Comments | (Open/Closed) | Review Set |
| CES<br>3.40       | FP1-1-4D                            | General<br>Comment                                     | FP                | The entire 4th floor appears to be fed off of a single riser. Verify<br>the floor area doesn't exceed that allowed by NFPA 13. Check for<br>other floors as well | CES               | Noted and will be reviewed.                                   |                    | Open          | 60% CD     |
| CES<br>3.41       | FP1-2-1A                            | General<br>Comment                                     | FP                | Is more than one standpipe connection required for the roof?   | CES               | Roof area standpipe coverage shall be reviewed and confirmed. |                    | Open          | 60% CD     |
| CES<br>3.42       | FP5-0-1                             | Detail 1   | FP                | It seems redundant to have check valves on the inlet and outlet of the fire pump   | CES               | FP riser diagram to be revised to<br>reflect piping layout.   |                    | Open          | 60% CD     |
| CES<br>3.43       | FP5-0-1                             | Detail 1   | FP                | Four ZCV-A shown on the floor plan but three shown on this detail.   | CES               | FP riser diagram to be revised to<br>reflect piping layout.   |                    | Open          | 60% CD     |
| CES<br>3.44       | FP6-0-1                             | Detail 7   | FP                | Fire Pump Tag incomplete   | CES               | Noted. Will address.  |                    | Open          | 60% CD     |
| CES<br>3.45       | FP6-0-1                             | Detail 8   | FP                | Where is the combination standpipe with PRV required. PRV not found on plans.  | CES               | PRV requirements to be reviewed and addressed accordingly.    |                    | Open          | 60% CD     |

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**CxA DESIGN REVIEW COMMENTS - Plumbing** 

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| Consu<br>Service | un॑g ⊏ngmeering<br>es 2022604.00 G | Northeast Metropolitan Regional Vocational High School |            |   |                        |   |                    |                   |            |
|------------------|------------------------------------|--|------------|---|------------------------|---|--------------------|-------------------|------------|
| Project Name:    |                                    | Northeast Metropolitan Regional Vocational High School |            |   | Reviewing Agency: C    | Consulting Engineering Services   |                    |                   |            |
| Project N        | lo.:                               | 2022604.00 G   |            |   | Reviewed By: Del Smith |   |                    |                   |            |
| Milestone        | 9:                                 | 60% CD   |            |   | Review Date: 1         | 2/5/2022  |                    |                   |            |
|                  | Drawing/ Spec                      | Detail/ Room   |            | Ou Bruisse Original to  | REVIEW COMMENT         |   |                    | Reviewer Response |            |
| NO.              | Section                            | Number   | DISCIPLINE | CX Review Comments  | BY:                    | Designer Response   | Follow Up Comments | (Open/Closed)     | Review Set |
| CES<br>4.01      | P0-0-1 (applicable to all sheets)  | General<br>Comment                                     | Р          | Show locations of cleanouts   | CES                    | Cleanout locations will be added in future submission                                 |                    | Open              | 60% CD     |
| CES<br>4.02      | P0-0-1 (applicable to all sheets)  | General<br>Comment                                     | Р          | Many pipes are shown rising in locations where they will not be<br>concealed. Confirm intent.   | CES                    | Piping to be coordinated with architect accordingly.                                  |                    | Open              | 60% CD     |
| CES<br>4.03      | P0-0-1 (applicable to all sheets)  | General<br>Comment                                     | Р          | Floor drains in many areas do not appear to be vented. Clarify<br>intent.   | CES                    | Floor drain venting to be added in future submission.                                 |                    | Open              | 60% CD     |
| CES<br>4.04      | P1-0-0A                            | Kitchen A108   | Р          | Sanitary connection to floor grate?   | CES                    | Drain connection to be added in future submission                                     |                    | Open              | 60% CD     |
| CES<br>4.05      | P1-0-0A                            | Recycling A109   | Р          | Location shown to grease waste. Should it go to sanitary instead?   | CES                    | FD waste shall go to sanitary.  |                    | Open              | 60% CD     |
| CES<br>4.06      | P1-0-0A                            | Servery A112   | Р          | Several of the storm pipe risers do no appear to be in enclosures.<br>Verify exposed piping is acceptable   | CES                    | Final location to be confirmed with architect.  |                    | Open              | 60% CD     |
| CES<br>4.07      | P1-0-0A                            | Carpentry A141   | Р          | Is the intent to have floor drains in carpentry?  | CES                    | Yes.  |                    | Open              | 60% CD     |
| CES<br>4.08      | P1-0-0A                            | Carpentry A141   | Р          | Why do the other floor drain in this area go through an oil separator but this one does not? Confirm intent. Refer to location on redline markup. | CES                    | Emergency shower/eyewash discharge to sanitary system.                                |                    | Open              | 60% CD     |
| CES<br>4.09      | P1-0-0B                            | Cosmetology<br>B120                                    | Р          | How are these fixtures vented?  | CES                    | Venting to be added below slab in future submission.                                  |                    | Open              | 60% CD     |
| CES<br>4.10      | P1-0-0C                            | Elev #2 E2   | Р          | Where does the pump discharge to?   | CES                    | Pump will discharge and drain to sanitary system.                                     |                    | Open              | 60% CD     |
| CES<br>4.11      | P1-0-0C                            | Shower   | Р          | Sanitary connection to fixtures missing. Also relocate room name/<br>number to proper location.   | CES                    | Noted. Will be revised in future submission.  |                    | Open              | 60% CD     |
| CES<br>4.12      | P1-0-0C                            | TLT C022C  | Р          | Floor drain not connected to sanitary   | CES                    | Noted. Connection to be added in future submission                                    |                    | Open              | 60% CD     |
| CES<br>4.13      | P1-0-0C                            | Auto Collision<br>C022                                 | Р          | 10" Storm - Appears to be an excessively convoluted route. Clarify<br>intent  | CES                    | Routing to be simplified.   |                    | Open              | 60% CD     |
| CES<br>4.14      | P1-0-0C                            | Metal Fabrication<br>C004                              | Р          | 8" Storm - Riser appears to go through a piece of equipment.<br>Clarify intent  | CES                    | Riser shall drop against column.<br>Location will be revised in future<br>submission. |                    | Open              | 60% CD     |
| CES<br>4.15      | P1-0-0C                            | Metal Fabrication<br>C004                              | Р          | Floor cleanout is located under a piece of equipment and may not be readily accessible. Clarify intent/review location                            | CES                    | Location shall be revised in future submission.                                       |                    | Open              | 60% CD     |
| CES<br>4.16      | P1-1-1A                            | Dry Storage A103                                       | Р          | Piping to fixture not shown   | CES                    | Piping to be indicated in future submission.  |                    | Open              | 60% CD     |
| CES<br>4.17      | P1-1-1A                            | Cooler A102  | Р          | Exposed Piping? Confirm intent.   | CES                    | Final location to be coordinated with architect.                                      |                    | Open              | 60% CD     |
| CES<br>4.18      | P1-1-1A                            | OFF A104   | Р          | 8" vent for radon mitigation - exposed piping rising in the middle of the room? Verify intent.  | CES                    | Final location to be coordinated with architect.                                      |                    | Open              | 60% CD     |
| CES<br>4.19      | P1-1-1A                            | Receiving A110   | Р          | Piping shown in space but where is it going?  | CES                    | Piping layout to be completed and intent clarified in future submission.              |                    | Open              | 60% CD     |

| CxA DESIGN REVIEW | COMMENTS - A | Architectural |
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|                            | +                                 |   | CxA DESIGN REVIEW COMMENTS - Architectural             |  |                       |  |                    |                           |               |  |  |  |  |
|----------------------------|-----------------------------------|---|--|--|-----------------------|--|--------------------|---------------------------|---------------|--|--|--|--|
| - (- )<br>Consul<br>Servic | Iting Engineering<br>2022604.00 G |   | Northeast Metropolitan Regional Vocational High School |  |                       |  |                    |                           |               |  |  |  |  |
| Project N                  | Name:                             | Northeast Metro                         | opolitan Regiona                                       | l Vocational High School   | Reviewing Agency:     | Consulting Engineering Services  |                    |                           |               |  |  |  |  |
| Project N                  | No.:                              | 2022604.00 G                            |  |  | Reviewed By:          | Chris Walczak  |                    |                           |               |  |  |  |  |
| Mileston                   | e:                                | 60% CD                                  |  |  | Review Date:          | 12/4/2022  |                    |                           |               |  |  |  |  |
| NO.                        | Drawing/ Spec<br>Section          | Detail/ Room<br>Number                  | DISCIPLINE   | Cx Review Comments   | REVIEW<br>COMMENT BY: | Designer Response  | Follow Up Comments | Response<br>(Open/Closed) | Review<br>Set |  |  |  |  |
| CES<br>6.01                | A2-1-1                            | Detail 3                                | A  | Recommend adding CW27 to "Curtain Wall Types" drawings.  | CES                   | These curtain walls were labeled incorrectly, they should be CW25's. We have corrected the labeling. |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.02                | A2-1-6                            | Detail 3                                | A  | This section of curtain wall, tagged CW23, does not appear to graphically match the CW23 detail shown on Drawing A6-3-4.       | CES                   | Curtain wall was tagged incorrectly. It has now been fixed.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.03                | A2-1-6                            | Detail 3                                | A  | This section of curtain wall, tagged CW24, does not<br>appear to graphically match the CW24 detail shown on<br>Drawing A6-3-4. | CES                   | Curtain wall was tagged incorrectly. It has now been fixed.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.04                | A5-3-1                            | Detail M                                | A  | Roof vapor barrier not shown in detail. Recommend maintaining continuity of the vapor barrier at all equipment curb locations. | CES                   | Vapor barrier will be added to the detail.   |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.05                | A5-3-1                            | Detail N, Q, O,<br>K, H, G, F, E &<br>D | A  | Recommend adding a tag to identify the roof vapor barrier in this detail. (Typical)  | CES                   | Will add appropriate notations.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.06                | A5-3-1                            | Detail F & E                            | А  | Should the sealant bead located beneath the stainless steel rain hood be tagged? (Typical)                                     | CES                   | Will add appropriate notations.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.07                | A6-3-2                            | Detail 1                                | А  | Recommend moving the dimension label for graphical clarity.  | CES                   | Will clean up dimensioning for better clarity.   |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.08                | A6-3-2                            | Detail 1                                | А  | Recommend reviewing conflicting labels. (Typical)  | CES                   | Will review and resolve conflicting labels.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.09                | A6-3-3                            | Detail 1                                | А  | Recommend reviewing conflicting labels.  | CES                   | Will review and resolve conflicting labels.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.10                | A6-3-4                            | Detail 1                                | А  | Recommend reviewing conflicting labels. (Typical)  | CES                   | Will review and resolve conflicting labels.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.11                | A6-3-4                            | Detail 1                                | А  | Both curtain wall types are identified as CW25. Please clarify design intent.  | CES                   | We have fixed the labeling conflict.   |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.12                | A6-3-4                            | Detail 1                                | A  | Both curtain wall types are identified as CW26. Please clarify design intent.  | CES                   | We have fixed the labeling conflict.   |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.13                | A6-3-6                            | Detail 1 & 2                            | A  | Recommend reviewing conflicting labels. (Typical)  | CES                   | Will review and resolve conflicting labels.  |                    | Open                      | CD            |  |  |  |  |
| CES<br>6.14                | A6-3-8                            | Detail 1                                | А  | Recommend identifying component on graphical detail.   | CES                   | Will indentify all components in detailing.  |                    | Open                      | CD            |  |  |  |  |



# OPM SUBMITTAL REVIEW & COORDINATION MSBA DESIGN DEVELOPMENT REVIEW

MSBA Design Dev. Review

DD REVIEW W/ DESIGNER COMMENTS

68.2.1 – **04**a

# APPENDIX 6A MODULE 6 – DESIGN DEVELOPMENT REVIEW COMMENTS

District: Northeast Metro Regional District School: Northeast Metro Regional Vocational Technical High School Owner's Project Manager: PMA Consultants Designer Firm: DRA Architects Submittal Received Date: August 19, 2022 Review Date: August 29 – September 6, 2022 Reviewed by: Gienapp Architects, K. Brown, L. Deveau

Received: September 12, 2022

**DRA Response:** 9/23/2022

## **MSBA REVIEW COMMENTS**

The following comments<sup>1</sup> on the Design Development submittal are issued pursuant to a project submittal review document for the proposed project and presented as a Design Development submission in accordance with the MSBA Module 6 Guidelines.

The items listed below are to be included in each project submittal by the design team (OPM and Designer) to the extent that each item applies to the project, or the design team should include an explanation why an item doesn't apply. The project submittal may be rejected by MSBA if all items below are not fully addressed by the project team. Unless specifically stated otherwise in the review comments below, the OPM and Designer deliverables are included in the submission with no further comment from MSBA required.

## 6A.1 Summary Comments

|   |  | Comments                               |
|---|--|--|
| • | Basic Project Information  |  |
|   | <ul> <li>Enrollment (describe grade configuration, design<br/>enrollment and number of PK students if applicable)</li> </ul> | 1,600 students grades 9-12             |
|   | <ul> <li>GSF area (describe approved GSF in the Project<br/>Funding Agreement and as currently proposed)</li> </ul>          | PFA: 386,630 GSF, Current: 386,630 GSF |
|   | <ul> <li>Project Type (all new, add/reno, reno)</li> </ul>   | New Construction                       |
|   | <ul> <li>Delivery method (DBB, CMR). If CMR, describe<br/>contract status</li> </ul>   | CMR, Gilbane                           |

• Project Budget Compliance:

• The Project Funding Agreement ("PFA") has total project budget of \$317,422,620. The submittal notes that the current total project budget is \$317,422,620, and is within budget.

- The PFA has an estimated construction cost of \$243,591,092. The submittal notes that the OPM's current reconciled estimated construction cost is \$244,203,870, and exceeds the PFA budget by \$612,778.
  - The submission indicates that this overage is being addressed through redistribution of Design & Pricing, Owner's and Construction Contingencies as well as potential value management items.

Massachusetts School Building Authority

# Module 6 Detailed Design – DD

<sup>&</sup>lt;sup>1</sup> The written comments provided by the MSBA are solely for purposes of determining whether the submittal documents, analysis process, proposed planning concept and any other design documents submitted for MSBA review appear consistent with the MSBA's guidelines and requirements, and are not for the purpose of determining whether the proposed design and its process may meet any legal requirements imposed by federal, state or local law, including, but not limited to, zoning ordinances and by-laws, environmental regulations, building codes, sanitary codes, safety codes and public procurement laws or for the purpose of determining whether the proposed design and process meet any applicable professional standard of care or any other standard of care. Project Designers are obligated to implement detailed planning and technical review procedures to effect design criteria coordination, buildability, and technical adequacy of project concepts. Each city, town and regional school district shall be solely responsible for ensuring that its project development concepts comply with all applicable federal, state, and local law provisions. The MSBA recommends that each city, town and regional school district have its legal counsel review its development process and subsequent bid documents to ensure that it is in compliance with all provisions of federal, state and local law, prior to bidding. The MSBA shall not be responsible for any legal fees or costs of any kind that may be incurred by a city, town or regional school district in relation to MSBA requirements or the preparation and review of the project's planning process or plans and specifications.

• The CMR's current construction cost estimate is \$278,095,795 by (Gilbane). The Designer's current construction cost estimate is \$277,970,850 by (Rider Levitt Bucknall). These amounts are prior to value engineering, the result of which is listed in the previous bulleted item.

# 6A.2 OPM Deliverables:

|   | 6A.2.1 OPM Submittal Review & Coordination  | Comments  |
|---|---|---|
| • | OPM's written Designer submission review, with<br>recommendations to the Owner for one of the<br>following (choose one):  |   |
|   | <ul> <li>☑ OPM approves the submission</li> <li>□ OPM approves the submission partially; reject<br/>remainder</li> <li>□ OPM rejects the submission</li> </ul>            |   |
|   | □ OPM requires additional supporting information  |   |
| • | Coordinate design; include written recommendations to<br>the Owner. Address each of the following items<br>individually, and describe how the OPM evaluated each<br>item. |   |
|   | <ul> <li>Technical accuracy, coordination, &amp; clarity</li> </ul>   |   |
|   | <ul> <li>Efficiency &amp; cost effectiveness</li> </ul>   |   |
|   | <ul> <li>○ Operability</li> </ul>   |   |
|   | <ul> <li>○ Constructability</li> </ul>  |   |
|   | ◦ Phasing   | Not explicitly addressed. Please include this in the next submission.<br>OPM Response: Acknowledged, the CM is currently working to develop/refine project phasing. |
|   | ◦ Bid ability   |   |
|   | <ul> <li>Site access during construction</li> </ul>   |   |
| • | Coordinate Commissioning consultant's review.   |   |
|   | <ul> <li>Describe the commissioning consultant's review<br/>status.</li> </ul>  |   |
|   | <ul> <li>Include a copy of the commissioning consultant's<br/>review &amp; project team's response to each item.</li> </ul>   |   |
|   | <ul> <li>Describe the consideration and incorporation of<br/>commissioning consultant's recommendations into<br/>the current submittal.</li> </ul>                        |   |
| • | Coordinate the District response to the MSBA comments of previous submittals.   |   |
|   | <ul> <li>Include a copy of the previous MSBA review &amp;<br/>District response, including any supplemental<br/>submittals and reviews.</li> </ul>                        |   |
|   | • Provide documentation of comments addressed and comment resolution outstanding.   |   |

|   | 6A.2.2 Project Schedule   | Comments |
|---|---|----------|
| • | The OPM is responsible to submit a project schedule<br>that conforms to the following requirements, whether<br>the schedule is produced by the OPM or the CMR (if |          |

# **Massachusetts School Building Authority**

| Upd | odated January 2021  |  |  |  |  |  |
|-----|--|--|--|--|--|--|
|     | applicable). <i>A schedule that is limited to construction tasks is not acceptable and will be rejected</i> . All schedules should be presented in calendar days.  |  |  |  |  |  |
| •   | Update project schedule: At a minimum, the schedule<br>update should provide the same level of detail as was<br>included in Exhibit C of the Project Funding Agreement,<br>expanded and updated to include milestones for<br>Design Development, Bidding, Construction, and<br>Closeout. The updated schedule should include<br>proposed critical path and construction milestone<br>information. In addition to the construction milestones,<br>the schedule must also include the following<br>information as listed in MSBA Module 7, Schedule<br>Activities: |  |  |  |  |  |
|     | $\circ$ Punch list start and end dates   |  |  |  |  |  |
|     | <ul> <li>Project Registration date with the US Green Building<br/>Council ("USGBC") or Collaboration for High<br/>Performance Schools ("CHPS")</li> </ul>  |  |  |  |  |  |
|     | <ul> <li>Provisional/Design package submittal date to USGBC<br/>or CHPS</li> </ul>   |  |  |  |  |  |
|     | <ul> <li>MSBA 50% DCAMM Notification submittal date and<br/>MSBA 100% DCAMM Standard Contractor Evaluation<br/>Form notification date</li> </ul>   |  |  |  |  |  |
|     | <ul> <li>General Contractor/Construction Manager request for<br/>final payment</li> </ul>  |  |  |  |  |  |
|     | <ul> <li>Commissioning Consultant inspection (substantial<br/>completion plus approximately 10 months)</li> </ul>  |  |  |  |  |  |
|     | • Final Commissioning report to MSBA submittal date  |  |  |  |  |  |
|     | <ul> <li>Final Construction package to USGBC/CHPS including<br/>the Final Commissioning Report submittal date</li> </ul>   |  |  |  |  |  |
|     | <ul> <li>Anticipated final Green School Program Certification<br/>letter from USGBC/CHPS issuance date</li> </ul>  |  |  |  |  |  |
|     | <ul> <li>Commissioning Certificate of Completion submittal<br/>date to MSBA</li> </ul>   |  |  |  |  |  |
|     | <ul> <li>Final reimbursement request submittal date to MSBA</li> </ul>   |  |  |  |  |  |
| •   | Include application submission and approval dates in<br>the project schedule for the following approvals,<br>coordinated with the Designer's submittal information.<br>In addition, provide dates for any other state or federal<br>approval not listed below (the following list is not a<br>comprehensive itemization of required state approvals;<br>other requirements may apply, and some items listed<br>below might not be applicable to this project) Indicate<br>"Non-Applicable" on the project schedule where<br>appropriate.                         |  |  |  |  |  |
|     | <ul> <li>DESE - Special Education approval by Department of<br/>Elementary and Secondary Education</li> </ul>  |  |  |  |  |  |
|     | • MHC – Project Notification Form and approvals by MA<br>Historical Commission   |  |  |  |  |  |
|     | <ul> <li>OIG - Construction Manager at Risk approval by the<br/>Office of Inspector General</li> </ul>   |  |  |  |  |  |

| U | pdate | d January 2021  |  |
|---|-------|---|--|
|   |       | <ul> <li>Executive Office of Energy and Environmental Affairs</li> <li>/ EEA:</li> </ul>  |  |
|   |       | <ul> <li>MEPA - MA Environmental Policy Act by Energy<br/>&amp; Environmental Affairs:</li> </ul>   |  |
|   |       | ENF - Environmental Notification Form   |  |
|   |       | EIR - Environmental Impact Report   |  |
|   |       | <ul> <li>Article 97 Land Disposition Policy approval by</li> </ul>  |  |
|   |       | Energy & Environmental Affairs  |  |
|   |       | $_{\odot}$ MA DEP - Massachusetts Department of   |  |
|   |       | Environmental Protection  |  |
|   |       | <ul> <li>MA DOT - Massachusetts Department of<br/>Transportation</li> </ul>   |  |
|   |       | $_{\odot}$ MA DPH - Massachusetts Department of Public Health   |  |
|   |       | <ul> <li>EPA –NPDES National Pollutant Discharge Elimination<br/>System Notice of Intent approval by the US<br/>Environmental Protection Agency</li> </ul>  |  |
|   |       | <ul> <li>MAAB - Accessibility variances by MA Architectural<br/>Access Board</li> </ul>   |  |
|   | •     | Indicate all required state reviews or permits on the<br>milestone schedule including actual or planned<br>approval dates which are required in order to maintain<br>the planned bidding and construction schedule and<br>milestones indicated therein. For required state reviews<br>or permits which have not been obtained on schedule,<br>provide a separate (subnetwork) schedule depicting<br>recovery actions to obtain required approvals in order<br>to maintain the bidding and construction schedule.  |  |
|   | •     | The schedule is to be updated and submitted to the MSBA with each OPM monthly report and as often as it is required to reflect any changes, including any changes to milestone dates, but must be submitted with each design submittal (DD, 60% CD, 90% CD). The schedule shall reflect any variances in the updated schedule relative to the baseline project schedule include with the Project Scope and Budget Agreement.  |  |
|   | •     | Indicate the Design Development submission date to<br>the MSBA and proposed 60% and 90% Construction<br>Documents submittals submission dates. The schedule<br>is to incorporate 21 calendar day required duration for<br>the MSBA review of each submission, and a minimum<br>14 calendar days for the project team incorporation of<br>the MSBA review comments as well as all others into<br>the project documents prior to the next submission or<br>finalizing project documents to make available to<br>bidders. 35 calendar days between each MSBA design<br>submission (DD, 60%, 90%) is the minimum<br>acceptable duration; if the project team believes<br>additional time is required for any or all the<br>submissions the durations for these activities are to be<br>increased accordingly. |  |

|   | 6A.2.3 Project Scope and Budget   | Comments  |
|---|---|---|
| • | Develop project scope and budget, cost estimates and reconciliation:  |   |
|   | <ul> <li>OPM construction cost estimate using the Uniformat<br/>II Classification to Level 3, Showing unit rates and<br/>quantities; with escalation projected to the mid-point<br/>of construction; AND</li> </ul>   |   |
|   | <ul> <li>OPM construction cost estimate using CSI<br/>MasterFormat 6-digit format to Level 3 and MGL<br/>c.149 s 44F (filed sub-bid) format showing unit rates<br/>and quantities; with escalation projected to the mid-<br/>point of construction.</li> </ul>  |   |
|   | <ul> <li>OPM reconciliation of the OPM/CMR and Designer<br/>construction cost estimates including a description of<br/>the method to derive this reconciliation. Refer to this<br/>link for an example of the Cost Estimate<br/>Reconciliation Form.</li> </ul> |   |
|   | <ul> <li>Updated Cost Estimate Comparison Form. Refer to<br/>this link for an example of the Cost Estimate<br/>Comparison Form.</li> </ul>  |   |
| • | CMR (if applicable)   |   |
|   | <ul> <li>If the Owner has not yet contracted with a<br/>Construction Manager (CM), the OPM must develop a<br/>construction cost estimate as described above for<br/>comparison with the Designer's cost estimate.</li> </ul>                                    |   |
|   | <ul> <li>If the Owner has given the CM a Notice to Proceed,<br/>the OPM must review cost estimates provided by the<br/>Designer and CM and provide a Designer's and CM's<br/>construction cost estimates reconciliation as<br/>described above.</li> </ul>      |   |
| • | Updated project budget in the total project budget<br>format, based on the reconciled construction cost<br>estimate. If the reconciled estimate is not used for the<br>updated project budget, provide an explanation.  | A total project budget form is included. However, it is not<br>on MSBA's template. Please include this on the MSBA's<br>template for the next submission.<br><b>OPM Response:</b> Acknowledged.   |
| • | Describe any early-bid packages anticipated scope and<br>schedule. Include any early-bid packages (if applicable)<br>in the submittal to show a complete project. Provide<br>bid tables for a completed sub-bid package.  |   |
| • | Value Engineering Recommendations (if any)  |   |
|   | <ul> <li>Provide the list of potential and accepted Value<br/>Engineering recommendations, and associated<br/>costs of each item.</li> </ul>  | The submission indicates that the construction overage is<br>being addressed through redistribution of Design &<br>Pricing, Owner's and Construction Contingencies as well<br>as potential value management items. At this early stage<br>of design, it would appear premature to reduce<br>contingencies before all value management options have<br>been exhausted. The MSBA will continue to monitor the<br>construction budget for conformance to the PFA<br>throughout the design phase.<br><b>Team Response:</b> Please see the DD package for a detailed<br>description and justification of the budget shifts that were |
|   |   | agreed upon by the entire project team including the Owner,   |

| Updat | ed January 2021  |   |
|-------|--|---|
| Updat | ed January 2021  | both estimators, and the FFE/Technology consultants.<br>Regarding design/pricing contingency: robust cost estimate<br>reconciliation and value management processes involved a<br>heavy level of scrutinization/understanding of the plans,<br>providing the estimators with a greater sense of confidence in<br>the development of the plans, and thus confidence in the |
|       |  | design/pricing contingencies carried. Also please note the<br>designer has provided additional value management options<br>that have not yet been taken per Owner's direction; but their<br>cost is quantified for future phases if needed.   |
|       | <ul> <li>Provide a copy of the Committee vote for any<br/>accepted Value Engineering recommendations.</li> </ul> |   |

# 6A.3 Designer Deliverables

| 6A.3.1 General Requirements |  | Comments  |
|-----------------------------|--|---|
| •                           | Submit an updated work plan.   |   |
| •                           | Basis of Design narrative description for each of the following disciplines:   |   |
|                             |  |   |
|                             | <ul> <li>Structural: narrative must include lateral bracing<br/>methods and how earthquake code requirements will<br/>be met</li> </ul>  |   |
|                             | ◦ Civil  |   |
|                             | ○ MEP + FP   |   |
|                             | <ul> <li>Data/Comms./Security</li> </ul>   |   |
| •                           | Building Code Analysis   |   |
| •                           | Provide a list of proprietary items under consideration.   |   |
| •                           | An interior color theory statement describing proposed<br>paint and material selections and colors for typical and<br>special spaces, why they have been selected and how<br>these selections relate to exterior materials and colors.<br>Confirm that color and material selections have been<br>presented to and approved by the District. | Included. The submission does not confirm if color and<br>material selections have been presented to or approved<br>by the District. Please confirm this in the next<br>submission.<br>Design Team Response: Material selections and color<br>concepts have been reviewed with the District. Further<br>meetings expected at next phase of the project. |
| •                           | Confirm project registration with CHPS/USGBC.  |   |
| •                           | Structural calculations and required floor loads   |   |
| •                           | Energy model calculations  |   |
| •                           | Life Cycle cost analysis for energy and water<br>consuming devices   |   |
| •                           | Heat gain and loss calculations for Heating, Ventilating and Air Conditioning systems  |   |
| •                           | Calculations showing total electrical load   |   |
| •                           | Security and Visual access requirements:   |   |
|                             | <ul> <li>Confirmation that the persons responsible for<br/>District's emergency procedures implementation, and<br/>responding emergency medical, fire protection, and<br/>police agency representatives have been consulted in</li> </ul>  | The submission does not confirm if emergency medical personnel have been consulted. Please address this in the next submission.<br>Design Team Response: The project has been reviewed by first responders.   |

| Update | ed January 2021  |  |
|--------|--|--|
|        | the planning process and any associated  |  |
|        | requirements have been included in this project.   |  |
|        | $\circ$ Identify any other security related items particular to  |  |
|        | the District and/or the proposed project.  |  |
|        | <ul> <li>Verification that the following safety and security<br/>related issues have been reviewed and are in</li> </ul> |  |
|        | accordance with the Districts procedures as noted  |  |
|        | above:   |  |
|        | <ul> <li>Main entrance design – describe District</li> </ul>   |  |
|        | protocol for visitor entry and check-in related  |  |
|        | to the current design for visitors to remain in  |  |
|        | the vestibule versus a side sub-vestibule.   |  |
|        | <ul> <li>Classroom lockset hardware - committee<br/>bardware functions are compatible with the</li> </ul>                |  |
|        | District's protocols related to lockdown.  |  |
|        | <ul> <li>Classroom / Instructional spaces visibility -</li> </ul>  |  |
|        | confirm that the inclusion of sidelights at  |  |
|        | entrance locations is compatible with the  |  |
|        | District's current standards related to visibility<br>from corridors and whether any related vision                      |  |
|        | control option measures are to be  |  |
|        | incorporated.  |  |
|        | <ul> <li>Alternative entry locations - confirm project</li> </ul>  |  |
|        | includes site and building signage, as may be  |  |
|        | identify locations where first responders may  |  |
|        | more directly reach a person needing medical   |  |
|        | attention; Knox Boxes; Fire Alarm Control  |  |
|        | Panels, and provisions for building plans to be  |  |
|        | delivered to local fire and response agencies.   |  |
| •      | Facility and Maintenance requirements:   |  |
|        | <ul> <li>Confirmation that the persons responsible for<br/>maintenance have been consulted in the planning</li> </ul>    |  |
|        | process and any associated requirements have been  |  |
|        | considered for this project. Describe maintenance  |  |
|        | related items particular to the District and/or the  |  |
|        | proposed project.  |  |
|        | <ul> <li>Verification that at a minimum the following issues</li> </ul>  |  |
|        | Training hours and scheduling  |  |
|        | <ul> <li>HVAC systems</li> </ul>   |  |
|        | Building Management Systems  |  |
|        | Lighting fixtures and controls   |  |
|        | Closning procedures and materials  |  |
|        |  |  |
|        | Mochanical room access   |  |
|        | Mechanical room access   |  |
| •      | Quality Control narratives, supporting plans and documents demonstrating:  |  |
|        | ∘ Ceiling clearances   |  |
|        | <ul> <li>Mechanical room and shaft sizes</li> </ul>  |  |
|        | o heendhical room and share sizes  |  |

| Up | date | ed January 2021                                   |
|----|------|---|
|    |      | $_{\odot}$ Coordinate specifications and drawings |
|    |      | ○ Filed sub-bid work                              |
|    |      | ◦ Scheduling                                      |
|    |      | <ul> <li>Equipment and power</li> </ul>           |
|    |      | • Existing and new construction                   |
|    |      | ○ Phasing   |

| 6A.3.2 Space Summary      |                      |                     |  |                            |                      |  |
|---------------------------|----------------------|---------------------|--|----------------------------|----------------------|--|
| Spaces                    | PFA Space<br>Summary | DD Space<br>Summary | <u>60% CD</u><br><u>Space</u><br>Summary | 90% CD<br>Space<br>Summary | Difference<br>to PFA | <u>Comments</u>  |
| Core Academic<br>Spaces   | 51,990               | 52,020              |  |                            | 30                   | General classrooms<br>reduced 90 sf; Teacher<br>Planning/Workrooms<br>added 30 sf; Science<br>Classrooms/Labs added<br>115 sf; Prep Room<br>reduced 15 sf.   |
| Special Education         | 7,070                | 7,070               |  |                            | -                    | No proposed changes  |
| Art and Music             | -                    | -                   |  |                            | -                    |  |
| Vocations &<br>Technology | 127,755              | 127,510             |  |                            | (245)                | Tech./Engineering<br>Rooms increased 10 sf;<br>Automotive Collision Rpr<br>reduced 65 sf; Business<br>Office Tech. reduced 5<br>sf; Carpentry reduced<br>100 sf; Cosmetology<br>reduced 5 sf; Culinary<br>Arts increased 60 sf;<br>Design & Visual<br>Communications reduced<br>50 sf; Early Childhood<br>Ed. increased 15 sf;<br>Electrical Tech. reduced<br>40 sf; Health Assisting<br>reduced 40 sf; HVAC<br>Tech. increased 5 sf;<br>Metal Fab. reduced 30<br>sf; Plumbing &<br>Pipefitting reduced 5 sf;<br>Biotech. reduced 30 sf;<br>Marketing increased 15<br>sf; Medical Assisting<br>increased 20 sf |

| Health and Physical<br>Education                                      | 25,750  | 25,535  |   | (215)      | Gym reduced 365 sf; PE<br>Alternatives increased 60<br>sf; Gym Storeroom<br>increased 5 sf; Locker<br>Rooms w/Toilets<br>reduced 325 sf; Phys Ed<br>Storage & Closets<br>increased 420 sf; Athletic<br>Director's Office<br>increased 15 sf. |
|---|---------|---------|---|------------|--|
| Media Center  | 5,455   | 5,460   |   | 5          | Media Center/Reading<br>Room increased 5 sf  |
| Auditorium / Drama  | 10,505  | 10,540  |   | 35         | Auditorium increased 30  |
| Dining and Food<br>Service  | 13,180  | 13,180  |   | -          | Cafeteria/Student<br>Lounge/Break-out<br>increased 20 sf;<br>Chair/Table Storage<br>increased 5 sf; Scramble<br>Serving Area increased<br>90 sf; Kitchen reduced<br>115 sf.  |
| Medical   | 1,340   | 1,325   |   | (15)       | Medical Suite Toilet<br>reduced 5 sf; Nurses'<br>Office reduced 15 sf.   |
| Administration and<br>Guidance  | 8,655   | 8,630   |   | (25)       | Conference Room<br>reduced 15 sf; Teacher<br>Work Room reduced 10<br>sf.   |
| Custodial and<br>Maintenance  | 4,150   | 4,175   |   | 25         | Receiving & General<br>Supply increased 14 sf;<br>Storeroom increased 11<br>sf.  |
| Other   | 1,900   | 1,870   |   | (30)       | Adult Ed Offices &<br>Storage reduced 5 sf;<br>Superintendent's Office<br>reduced 5 sf; Business<br>Office Suite, HR reduced<br>20 sf.   |
| Total Building<br>Net   | 257,750 | 257,315 |   | (435)      |  |
| Non-  |         |         | I | 1          | 1  |
| Vocational Officer  | 2 560   | 2 026   |   | 270        |  |
|   | 2,000   | 2,930   |   | 3/0<br>202 |  |
| Unoccupied MEP/FP<br>Unoccupied Closets,<br>Supply Rooms &<br>Storage | 725     | 774     |   | 49         |  |
| Toilet Rooms  | 4,375   | 4,359   |   | (16)       |  |
| Circulation   | 77,430  | 69,739  |   | (7,691)    |  |
| Remaining   | 33,510  | 40,945  |   | 7,435      |  |
| Total Gross   | 386,630 | 386,630 |   | -          |  |
| Grossing Factor   | 1.50    | 1.50    |   | 0          |  |

Massachusetts School Building Authority

| Updat | ed January 2021  |   |
|-------|--|---|
| •     | Updated space summary and signed certification that reflects the current design  |   |
| •     | Comparison of the current design with the final<br>educational program, and confirmation that there are<br>no variations. If there are variations, the written<br>summary must address the following:  |   |
|       | <ul> <li>Explanation of deviations within the space summary from the Project Funding Agreement. MSBA will either:</li> <li>MSBA accepts this variation to the approved project with no further action.</li> <li>Prior to the MSBA accepting this variation to the project, the Designer must describe in detail the reason for the change.</li> </ul>  | The submission indicates minor deviations of square<br>footages were made to accommodate program layouts<br>and general coordination of MEP/FP and Structural<br>systems. In the response to these review comments,<br>please confirm that all spaces will conform to MSBA's<br>minimum/maximum space guidelines. The MSBA will<br>continue to monitor any areas in excess of the agreed<br>upon GSF at PFA and may consider deviations over<br>guidelines as ineligible at PFA Bid Amendment.<br>Design Team Response: Confirmed & Acknowledged. |
|       | <ul> <li>The MSBA considers that deviations included changes<br/>in the size of a specific space, program area total nsf,<br/>space location, surrounding adjacencies of a space<br/>and/or the intended room purpose:         <ul> <li>The submittal must clearly call out deviations to<br/>location and surrounding adjacencies using<br/>redlines or "clouding".</li> <li>The explanation should clearly identify the basis<br/>of the change identifying both architectural<br/>and/or programmatic reasons.</li> </ul> </li> </ul>   |   |
|       | <ul> <li>If the basis of the change is programmatic, the<br/>submittal should include a red-lined version of<br/>the educational plan included in the Project<br/>Funding Agreement.</li> </ul>  |   |
| •     | Regarding DESE approved SPED Spaces:   |   |
|       | <ul> <li>Include a copy of the most recent letter from DESE<br/>approving the current proposed SPED spaces</li> </ul>  |   |
|       | <ul> <li>Confirm that the DESE approved SPED spaces have<br/>not deviated, using the definition above; or,</li> <li>If the District wishes to submit a change to its<br/>DESE approved submittal, it must a) confirm<br/>that all changes to SPED spaces are final; b)<br/>provide a new SPED submittal in the original<br/>submittal format (described in Module 4<br/>Schematic Design Section 4.1.1 and Mod 4<br/>Appendix 4B) clearly noting any changes with<br/>clouded floor plans and red-lined narratives and<br/>tables; and c) indicate how the project<br/>schedule can accommodate a potential DESE<br/>resubmittal and approval. Please provide a<br/>separate package for changes to DESE<br/>approved SPED spaces.</li> <li>If the District chooses not to change from the<br/>DESE approved submittal it should explain<br/>when and how the spaces will be returned to<br/>the approved size, configuration and location.</li> </ul> |   |

| • | Regarding DESE Approved Public Day Education  |   |
|---|---|---|
|   | <ul> <li>Indicate "Not Applicable" if the project does not<br/>include DESE approved Public Day Education spaces.</li> </ul>  |   |
|   | <ul> <li>If applicable, confirm that the DESE approved Public<br/>Day Education spaces have not deviated, using the<br/>definition above; or,</li> <li>If the District wishes to submit a change to its</li> </ul>  |   |
|   | DESE approved submittal, it must a) confirm<br>that all changes to Public Day Education spaces<br>are final; b) provide a new submittal in the<br>original submittal format, noting any changes<br>with clouded floor plans and red-lined<br>narratives and tables; and c) indicate how the<br>project schedule can accommodate a potential<br>DESE resubmittal and approval. Please provide<br>a separate package for changes to Public Day<br>Education Spaces.   |   |
|   | <ul> <li>If the District chooses not to change from the<br/>DESE approved submittal it should confirm that<br/>the spaces are the same or explain when and<br/>how the spaces will be returned to the<br/>approved size, configuration and location.</li> </ul>   |   |
| • | Regarding DESE approved Chapter 74 Program Spaces:  |   |
|   | <ul> <li>Indicate "Not Applicable" if the project does not<br/>include DESE approved Chapter 74 Spaces</li> </ul>   |   |
|   | <ul> <li>If applicable, confirm that the proposed Chapter 74<br/>spaces conform to the current DESE Chapter 74<br/>manual for Vocational Technical Education Programs.</li> </ul>   |   |
|   | <ul> <li>Include a copy of the most recent letter from DESE<br/>approving the current proposed Chapter 74 Program<br/>spaces.</li> </ul>  |   |
|   | <ul> <li>If applicable, confirm that the DESE approved<br/>Chapter 74 Program spaces have not deviated, using<br/>the definition above, or;</li> </ul>  | <i>In the response to these review comments, please confirm that all vocational Chapter 74 spaces are within Chapter 74 guidelines.</i> |
|   | <ul> <li>If the District wishes to submit a change to its<br/>DESE approved submittal, it must a) confirm<br/>that all changes to Chapter 74 Program spaces<br/>are final; b) provide a new submittal in the<br/>original submittal format, noting any changes<br/>with clouded floor plans and red-lined<br/>narratives and tables; and c) indicate how the<br/>project schedule can accommodate a potential<br/>DESE resubmittal and approval. Please provide<br/>a separate package for changes to the Chapter<br/>74 Program Space</li> </ul> | Design Team Response: Confirmed.  |
|   | <ul> <li>If the District chooses not to change from the<br/>DESE approved submittal it should explain<br/>when and how the spaces will be returned to<br/>the approved size, configuration and location.</li> </ul>   |   |

Massachusetts School Building Authority

6A.3.3 Project Approvals

Comments

| • | Describe the status of the following approvals. In<br>addition, provide the status of any other state or<br>federal approval not listed below (the following list is<br>not a comprehensive itemization of required state<br>approvals; other requirements may apply, and some<br>items listed below may not be applicable to this<br>project). Provide a copy of the appropriate application<br>forms and/or approval letters where applicable.<br>Indicate "Not Applicable" where appropriate and<br>describe why each item is not applicable. For each<br>agency approval required for this project, indicate the<br>date when approval was received. All required<br>approvals should have an associated approval date<br>indicated in the 90% CD submission and prior to<br>advertising for bids. Confirm that the required<br>approvals are coordinated with the OPM's project<br>schedule. |  |
|---|---|--|
|   | <ul> <li>DESE – Special Education approval by Department of<br/>Elementary and Secondary Education</li> <li>MHC – Project Notification Form and approvals by MA</li> </ul>  |  |
|   | Historical Commission   |  |
|   | <ul> <li>OIG - Construction Manager at Risk approval by the<br/>Office of Inspector General</li> </ul>  |  |
|   | <ul> <li>Executive Office of Energy and Environmental Affairs</li> <li>/ EEA:</li> </ul>  |  |
|   | <ul> <li>MEPA - MA Environmental Policy Act by Energy<br/>&amp; Environmental Affairs:</li> </ul>   |  |
|   | ENF - Environmental Notification Form   |  |
|   | EIR - Environmental Impact Report   |  |
|   | <ul> <li>Article 97 Land Disposition Policy approval by<br/>Energy &amp; Environmental Affairs</li> </ul>   |  |
|   | <ul> <li>MA DEP - Massachusetts Department of<br/>Environmental Protection</li> </ul>   |  |
|   | <ul> <li>MA DOT - Massachusetts Department of<br/>Transportation</li> </ul>   |  |
|   | $_{\odot}$ MA DPH - Massachusetts Department of Public Health   |  |
|   | • EPA – NPDES National Pollutant Discharge Elimination  |  |
|   | Environmental Protection Agency (or indicate as "by GC/CMR")  |  |
|   | <ul> <li>MAAB - Accessibility variances by MA Architectural<br/>Access Board</li> </ul>   |  |
| • | Confirmation that the Project has undergone review  |  |
|   | and obtained all necessary approvals by any   |  |
|   | law to review the Project, including but not limited to   |  |
|   | the approvals listed above. Attached such   |  |
|   | documentation letters evidencing such reviews and   |  |
|   | approvals. In accordance with the Project Funding<br>Agreement ("PEA") Section 4.12 the District must   |  |
|   | obtain such reviews or approvals prior to construction  |  |
|   | bids solicitation.  |  |

| _ |   |  |
|---|---|--|
| • | For any required state reviews or permits for which<br>approval has not been obtained as of the Design<br>Development submission date, provide a status update<br>including actions taken to date and actions planned to<br>obtain the required state reviews and permit<br>approval(s) in order to comply with the PFA Section<br>4.12 and maintain the projected schedule milestones<br>listed in the OPM Deliverables. |  |
| • | List all target dates for all local zoning approvals, testing and permits.  |  |
| • | Provide a certification that all applicable utility officials<br>have been contacted by the Designer regarding each<br>basic utility connection.  |  |

| 6A.3.4 Cost Estimates |  | Comments |
|-----------------------|--|----------|
| •                     | Designer's construction cost estimate using the<br>Uniformat II Classification to Level 3, Showing unit<br>rates and quantities; with escalation projected to the<br>mid-point of construction AND;  |          |
| •                     | Designer's construction cost estimate using CSI<br>MasterFormat 6-digit format to Level 3 and MGL c.149<br>s 44F (filed sub-bid) format showing unit rates and<br>quantities; with escalation projected to the mid-point of<br>construction. |          |

|   | 6A.3.5 Drawings (developed to Design Development progress level)  | Comments  |
|---|---|---|
| • | Half-size drawings only. Confirm that text, symbols, shading and all drawings content are legible.                              | Due to the current COVID-19 situation, hard copies were<br>not provided. MSBA may request hard copies, at a later<br>date, for record.<br>Design Team Response: Acknowledged  |
| • | If applicable, include early bid package contract<br>documents in the submittal to show a complete<br>project.                  | Although there are two early bid packages, it appears<br>that copies of them were not included in the submission.<br>Copies of early bid packages should be included in future<br>submissions.<br>Design Team Response: The early bid packages are schedule<br>to be issued following 60% CD submission. When available<br>copies will be provided. |
| • | Cover Sheet showing a drawing list and a locations<br>map (the project title should be visible when the<br>drawings are rolled) |   |
| • | Sheets containing all symbols, abbreviations and notes applicable to each discipline  |   |
| • | Site and Utility drawings should show the following:  |   |
|   | ○ Proposed work layout  | A proposed work layout is not included. This should be<br>included in future submissions.<br>Design Team Response: Acknowledged   |
|   | <ul> <li>Existing and proposed contours</li> </ul>  |   |
|   | <ul> <li>Building locations fixed and referenced from main<br/>survey baseline</li> </ul>                                       | It appears that the building is not located from a main<br>survey baseline. Suggest including a location reference<br>for clarity.  |

|   |   | Design Team Response: Acknowledged   |
|---|---|--|
|   | <ul> <li>Floor elevations at each entrance/exit and key<br/>exterior grades at perimeter showing drainage away<br/>from the building</li> </ul>                       |  |
|   | $\circ$ Site Benchmarks   |  |
|   | ◦ Boring locations  |  |
|   | <ul> <li>Retaining walls</li> </ul>   |  |
|   | <ul> <li>All utilities existing and proposed, indicating location,<br/>elevation, composition and size e.g., gas and electric<br/>utility providers</li> </ul>        |  |
|   | <ul> <li>Roads, laid out parking areas, walks, recreation<br/>areas, terraces and other site improvements</li> </ul>  |  |
|   | $_{\odot}$ Plant materials with preliminary schedule  |  |
| • | Architectural drawings showing the following:   |  |
|   | <ul> <li>Demolition drawings</li> </ul>   | Demolition drawings are not included. It is not clear if<br>this is part of the early bid package. Demolition drawings<br>should be included in future submissions.Design Team Response:<br>The existing school will be demolished in its entirety. The<br>Design Team will not be providing any selective demolition<br>drawings.For bidding purposes Construction Manager's demolition<br>package will include existing blueprints of the building in<br>addition to the following specification sections:Section 022400, Hazardous Materials Report<br>Section 024113.23, Utility Demolition<br>Section 028213, Asbestos AbatementThe demolition and abatement sub-contractors shall be<br>required to attend a walkthrough of the existing building prior<br>to bidding.Landscape Demo and Site Preparation Plans, which were<br>include in the Design Development Submission, indicate<br>building removal. The Geotechnical Report indicates |
|   | <ul> <li>Mobilization and enabling works</li> </ul>   | Not included. It is not clear if this is part of the early bid<br>package. This should be included in future submissions.  |
|   | $\circ$ Floor Plans (minimum $1/8'' = 1'-0''$ before reduction)   | orm Response. Acknowledged.  |
|   | <ul> <li>Internal partitions; appropriate thickness and<br/>dimensions to fix basic organizations; indicate fire<br/>rated partitions and smoke partitions</li> </ul> |  |
|   | $_{\odot}$ Key plans/overall plans where required   |  |
|   | <ul> <li>Building perimeter with exterior wall thicknesses and<br/>overall dimensions</li> </ul>  |  |
|   | ○ Structural grid   |  |
|   | $_{\odot}$ Mechanical and electrical systems plan requirements  |  |

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|-----------------|---|---|
|                 | <ul> <li>Building core; elevators, stairs, shafts, public toilets,<br/>with dimensions</li> </ul>   |   |
|                 | <ul> <li>○ Door swings</li> </ul>   |   |
|                 | <ul> <li>Finish floor elevations coordinated with exterior<br/>grade elevations at all interior to exterior transitions</li> </ul>              | Not included. This should be reviewed and coordinated<br>for future submissions.<br>Design Team Response: Landscape's Site Grading Plans,<br>provided in the Design Development Submission, indicate spot<br>grade elevations at each exterior door which are set to<br>provide accessibility to finish floor at grade levels. To reduce<br>potential mathematics errors during construction,<br>Architectural drawings set the first floor at elevation 100'-0".<br>A note will be added to Architectural floor plans indicating |
|                 |   | that the 100'-0" elevation is equal to elevation 164'-0" as shown on Landscape drawings.  |
|                 | o Built-in furniture  |   |
|                 | <ul> <li>Kitchen equipment</li> </ul>   |   |
|                 | <ul> <li>Furniture layout concept drawings</li> </ul>   |   |
| •               | Large scale plans showing key areas e.g., lobby, special spaces. Indicate floor surface materials (minimum $1/4'' = 1'-0''$ before reduction)   | Not included. This should be reviewed and included in future submissions.<br>Design Team Response: Large scale plans will be added, as needed, for areas requiring additional detailing.  |
| •               | Roof plans showing the following:   |   |
|                 | <ul> <li>Proposed systems type</li> </ul>   |   |
|                 | $\circ$ Pitch and drainage pattern  |   |
|                 | $_{\odot}$ Roof drains, gutters and scuppers  |   |
|                 | <ul> <li>Skylights, penthouses, major equipment, chimneys</li> </ul>  |   |
|                 | ○ Roof access and ladders   |   |
|                 | ○ Walk pads   |   |
|                 | <ul> <li>Rooftop Solar Readiness area, PV support and<br/>interconnection pathways</li> </ul>   |   |
| •               | Building sections: One transverse and one longitudinal section. Indicate floor to ceiling heights and floor-to-floor heights. Label all spaces. | Building sections are included. However, floor to ceiling<br>heights are not indicated. This should be updated for the<br>next submission.<br>Design Team Response: Ceiling height elevations are<br>indicated on the Architectural Reflected Ceiling Plans.  |
| •               | Building sections updated and coordinated with plans<br>and elevations  |   |
| •               | Building elevations showing the following:  |   |
|                 | <ul> <li>Full height elevations including roof structures, e.g.,<br/>mechanical equipment, chimneys, and penthouses</li> </ul>                  | Rooftop mechanical equipment is not shown on the<br>exterior elevations. Please revise and include in the next<br>submission.<br>Design Team Response: Acknowledged.  |
|                 | <ul> <li>Floor elevations, floor-to-floor height, and overall<br/>height related to benchmarks on site plans</li> </ul>                         | <ul> <li>Floor elevations are included. However, they are not coordinated with site grading. Please revise and include in the next submission.</li> <li>Design Team Response: To reduce mathematical errors while constructing the building, Architectural drawings set the first floor at elevation 100'-0".</li> </ul>  |

| puate |   |   |
|-------|---|---|
|       |   | A note will be added to Architectural floor plans indicating that the 100'-0" elevation is equal to elevation 164'-0" as shown on Landscape drawings.   |
|       | $_{\odot}$ Windows, storefront, and curtain wall systems  |   |
|       | <ul> <li>All columns located on a centerline and coordinated<br/>with the structural drawings</li> </ul>  |   |
|       | <ul> <li>Materials indicating major control and expansion<br/>joints, and divisions of materials where required</li> </ul>  | <ul> <li>Expansion joints, if required, are not included on the elevations. Please revise and include in the next submission.</li> <li>Design Team Response: There is one expansion joint that runs through the building. It is located between column lines Y.9 and AA. Structural Steel and Architectural walls, shown on the Design Development Set, respect this joint. We will add a note to the exterior elevations.</li> </ul> |
|       | $_{\odot}$ Exterior grades and topographical features in context  |   |
| •     | Full height wall sections for main elevations and at<br>special conditions. Show foundation and perimeter<br>treatment, wall construction including insulation and<br>supporting structure, fenestration and mechanical<br>penetrations, and floor construction | Full height wall sections are included. However, the<br>foundation conditions are not shown in the sections.<br>Please revise and include in the next submission.<br><b>Design Team Response:</b> This is intentional. For foundation<br>wall and footing information, the Contractor is to refer to the<br>Structural Drawings.  |
| •     | Interior elevations: Show at all spaces, e.g. library,<br>lobby, and all typical spaces, e.g. classroom   |   |
| •     | Reflected ceiling plans: Show prototypical structural,<br>fire protection, mechanical and electrical information<br>for classrooms and major spaces, including lighting<br>layouts with ceiling height and material changes.                                    |   |
| •     | Schedules:  |   |
|       | ◦ Finishes  |   |
|       | ○ Doors   |   |
|       | ∘ Windows   |   |
|       | <ul> <li>Equipment schedules; e.g., food service, instructional<br/>media</li> </ul>  |   |
|       | o Partitions  |   |
| •     | Structural concepts   |   |
|       | <ul> <li>Framing plans; typical floor framing, roof framing,<br/>special framing, show framing at major openings and<br/>member sizes</li> </ul>  |   |
|       | $_{\odot}$ Floor and roof framing design loads  |   |
|       | <ul> <li>Foundation plan showing sizes and typical<br/>component locations</li> </ul>   |   |
|       | <ul> <li>All columns and beams are identified (with typical<br/>sizes shown) on column and beam schedules or on<br/>drawings</li> </ul>   |   |
|       | $_{\odot}$ Preliminary details including floor and roof deck  |   |
|       | <ul> <li>Details and locations for special and/or incidental<br/>structure features; e.g., tunnels, connecting bridges<br/>and unique architectural features</li> </ul>   |   |
|       | <ul> <li>Connection to existing buildings at foundation and at<br/>key points at existing structure if applicable</li> </ul>  |   |

| Update | ed January 2021  |  |
|--------|--|--|
|        | <ul> <li>All construction joint and expansion joint locations<br/>coordinated with structural drawings</li> </ul>  | <ul> <li>Expansion joints, if required, do not appear to be included. Please review and, if applicable, include in the next submission.</li> <li>Design Team Response: There is one expansion joint that runs through the building. It is located between column lines Y.9 and AA. Structural Steel and Architectural walls, shown on the Design Development Set, respect this joint. We will add notes to future drawings.</li> </ul> |
|        | <ul> <li>Schedules (with dimensions) for all lintels, beams,<br/>joists, and columns. Coordinate dimensions of all<br/>elements listed in the schedules with dimensions<br/>depicted on the plans</li> </ul> |  |
| •      | Fire Protection floor plans indicating wet or dry type systems, hose racks or cabinets and fire department tie-ins, including:   |  |
|        | <ul> <li>Typical sprinkler head layout</li> </ul>  |  |
|        | <ul> <li>Sprinkler piping mains and size</li> </ul>  |  |
|        | <ul> <li>Sprinkler service location</li> </ul>   |  |
|        | ○ Fire pump where required   |  |
| •      | Plumbing and sanitary systems:   |  |
|        | <ul> <li>Floor plans indicating plumbing fixtures and special<br/>features rough-in locations, piping systems and<br/>principal items equipment approximate locations and<br/>sizes</li> </ul>               |  |
| •      | Heating, Ventilating and Air Conditioning Systems:   |  |
|        | <ul> <li>Piping systems locations and approximate sizes, air<br/>handling systems and principal equipment items such<br/>as compressors or cooling towers</li> </ul>   |  |
|        | <ul> <li>Mechanical rooms and fan rooms space requirements<br/>and locations. Indicate shaft requirements</li> </ul>   |  |
|        | <ul> <li>Adequate ceiling heights exists at worst-case duct<br/>intersection</li> </ul>  |  |
|        | <ul> <li>Ceiling diffusers/registers generally consistent with<br/>architectural reflected ceiling plan</li> </ul>   | <i>Ceiling diffusers are not shown on the plans. This should be reviewed and included in the next submission.</i><br><b>Design Team Response:</b> Acknowledged.  |
| •      | Electrical Systems:  |  |
|        | <ul> <li>All services including those for special purposes shall<br/>be located and indicated</li> </ul>   |  |
|        | <ul> <li>Light fixtures on electrical drawings generally<br/>consistent with architectural reflected ceiling plans</li> </ul>  |  |
|        | <ul> <li>Switchgear and emergency generator</li> </ul>   |  |
|        | <ul> <li>Electrical equipment locations are coordinated with<br/>site paving and grading</li> </ul>  |  |
|        | <ul> <li>All motorized equipment is generally consistent with<br/>electrical drawings</li> </ul>   |  |
|        | • All power equipment has electrical connections   |  |
|        | <ul> <li>Fire alarm system drawings showing all initiation and<br/>signaling devices, control panels, annunciator panels,<br/>etc.</li> </ul>  |  |
|        | <ul> <li>Security and system drawings</li> </ul>   |  |

| <ul> <li>Communications drawings showing chases, major<br/>equipment locations and any special distribution</li> </ul> |  |
|--|--|
| requirements   |  |

| 64 | A.3.6 Project Manual (developed to Design Development progress level)  | Comments   |
|----|--|--|
| •  | If applicable, include early bid package contract<br>documents in the submittal to show a complete<br>project.   | No early bid packages were included in this submission.<br>It appears that early packages will be issued for Early<br>Site Blasting and Foundation & Steel. Please provide this<br>information in the next submission.<br>Design Team Response: Acknowledged.  |
| •  | Outline Specifications (Short-Form / Preliminary Project<br>Description; not full-length format) in the current CSI<br>Master spec divisions.  | Specifications were provided in Uniformat, and thus do<br>not follow the CSI MasterFormat specification divisions.<br>For future DD submissions, please provide specifications<br>in outline specification format using CSI MasterFormat<br>divisions.<br>Design Team Response: Acknowledged. Prior to the Design<br>Development Submission, the project team reviewed the<br>specification format requirements with MSBA. |
| •  | Geotechnical report including test boring hole locations<br>and dates, soil investigation results including water<br>levels, allowable solid bearing pressure, foundation<br>type and footing and slabs bottom grades. |  |
| •  | Site work: clearing, drives, walks, parking areas,<br>fences, excavation, backfill, planting, footings on earth,<br>rock, piles, caissons, proposed bearing pressures,<br>boring logs                                  |  |
|    | <ul> <li>Foundation walls; concrete types, reinforcing,<br/>waterproofing type and extent</li> </ul>   | Below-grade waterproofing types are not specified in the<br>Project Manual. Please provide this information in the<br>next submission.<br>Design Team Response: Acknowledged.  |
|    | $_{\odot}$ Footing drains; type, drainage disposal   | Information on footing drains is not included in the<br>Project Manual. This should be reviewed and, if<br>necessary, updated for the next submission.<br>Design Team Response: Acknowledged.  |
|    | <ul> <li>Exterior Walls: superstructure, type, materials, brick<br/>type, alternate cladding, back-up materials, damp<br/>proofing material and extent, special features</li> </ul>                                    |  |
|    | <ul> <li>Roof types, vapor barrier, insulation, flashings, all<br/>materials</li> </ul>  | Information on roof type is included. However, types of<br>supplementary components (types of insulation,<br>flashings, etc.) are not specified. Please provide this<br>information in the next submission.<br>Design Team Response: Acknowledged.   |
|    | <ul> <li>Flashings; general types, all materials, weights,<br/>where each type is to be used</li> </ul>  | <i>Flashing materials, weights and locations are not included in the Project Manual. Please provide this information in the next submission.</i><br>Design Team Response: Acknowledged.  |
|    | <ul> <li>Sheet metal; gutters, leaders, other uses, except<br/>flashing</li> </ul>   |  |
|    | <ul> <li>Windows; general types, materials, sub-frames,<br/>finish, glazing, screens</li> </ul>  |  |
|    | <ul> <li>Rough openings for all doors and windows<br/>coordinated</li> </ul>   |  |

| d January 2021   |   |
|--|---|
| <ul> <li>Doors, exterior and interior; types and thicknesses<br/>and fire rating identified if applicable</li> </ul>   |   |
| <ul> <li>Steps, exterior; including platforms and landings'<br/>materials</li> </ul>   |   |
| <ul> <li>Stairs, interior; including platforms, landings, walls,<br/>materials and finishes</li> </ul>   |   |
| <ul> <li>Framing; wood, concrete or metal systems in<br/>accordance with general design</li> </ul>   |   |
| $_{\odot}$ Partitions; materials, thicknesses, finishes  |   |
| $_{\odot}$ Cabinet and casework; types and materials   |   |
| $_{\odot}$ Food Service Equipment; provided equipment list   |   |
| $_{\odot}$ Furring; lathing, plastering, materials and locations   | Information on furring materials and locations is not<br>included in the Project Manual. Please provide this<br>information in the next submission.<br>Design Team Response: Plaster is not anticipated as a<br>material that will be used on the project.  |
| <ul> <li>Insulation thermal; types, thicknesses, application<br/>methods and locations</li> </ul>  |   |
| <ul> <li>Acoustical treatments; types, thicknesses, application<br/>methods and locations</li> </ul>   | Acoustical treatment thickness and application metho<br>were not included in the Project Manual. Please inclu<br>this information in the next submission.<br>Design Team Response: Acknowledged.  |
| <ul> <li>Interior finishes; materials for floors, walls, bases,<br/>wainscots, trim, ceilings, ceiling heights</li> </ul>  |   |
| <ul> <li>Fire protection; standpipe systems, sprinkler systems,<br/>fire pumps and accessories</li> </ul>  |   |
| <ul> <li>Water supply; source; main connection location will<br/>be made; type of pipe for service main; load<br/>requirements; load factors and pressures</li> </ul>  | Information on the water supply is not included in the<br>Project Manual. Please provide this information in the<br>next submission.<br>Design Team Response: Pressures and flows are determine<br>by a flow test and connections are identified on the civil p<br>Loads will be included in future submission. |
| <ul> <li>Sanitary sewers; sewage disposal system, pipe and<br/>other materials.</li> </ul>   | Information on the sanitary sewer system is not incluin the Project Manual. Please provide this information the next submission.<br>Design Team Response: Acknowledged.   |
| <ul> <li>Storm sewers; storm drainage disposal system<br/>(institution or local facility), pipe and other materials</li> </ul>   | Information on the storm drainage system is not incluin the Project Manual. Please provide this information the next submission. Design Team Response: Acknowledged.  |
| <ul> <li>Gas main; material, size, location. Interface with<br/>utility company.</li> </ul>  | Information on the gas main is not included in the<br>Project Manual. Please provide this information in the<br>next submission.<br>Design Team Response: Gas Main will be furnished and<br>installed by Wakefield Gas and Light.   |
| <ul> <li>Plumbing; systems such as wastes, vents, hot water,<br/>cold water, gas, air, oxygen, vacuum, main supply<br/>source, materials for each, water heaters, pumps,<br/>thermal insulation fixture quality, all special features</li> </ul> |   |
| <ul> <li>Heating, ventilating and air conditioning; heating<br/>type and refrigeration plants, boilers and cooling<br/>equipment types and capacities, fuel, burner type,<br/>fuel storage, heaters, feed water pumps and heaters.</li> </ul>    |   |

# Massachusetts School Building Authority

| Updated January 2021   |  |
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| thermal insulation, heating medium type, supply and<br>return piping, radiation, unit heaters, radiant heating,<br>principal air conditioning equipment types, special<br>features, supply, return and exhaust ductwork  |  |
| <ul> <li>Electrical work; service connection, location,<br/>institution or public utility, overhead or underground,<br/>transformers including type and location, conduit and<br/>wiring types, fixtures types, main switchboard<br/>location, radio, fire alarm, telephone, public address,<br/>emergency lighting and wiring, emergency or other<br/>generators, special features, including Master TV,<br/>information retrieval and/or data processing system</li> </ul> |  |
| <ul> <li>Elevators, dumbwaiters and platform lifts; capacities,<br/>speed, travel in feet, landings, operation, controls,<br/>platform sizes, machine type and location, car and<br/>entrance finishes, signals</li> </ul>   | <i>Elevator speed, operation, controls, platform size,</i><br><i>machine type, car and entrance finishes and signals are</i><br><i>not included in the Project Manual. Please include this</i><br><i>information in the next submission.</i><br><b>Design Team Response:</b> Acknowledged. |
| $_{\odot}$ Other built-in equipment, types and materials   |  |
| ○ All "Work by others" specifications coordinated  | The specification submitted is in Uniformat, and thus<br>contained no "work by others" references. For future DD<br>submissions, please provide an outline specification using<br>CSI MasterFormat divisions.<br>Design Team Response: Acknowledged.                                       |
| ○ Special features   |  |

|   | 6A.3.7 Project Coordination   | Comments   |
|---|---|--|
| • | All room names and numbers are coordinated between all disciplines.   |  |
| • | The structural, mechanical, or other disciplines, do not conflict with architectural plans or specifications. |  |
| • | The finish grade elevations coordinated between all disciplines.  |  |
| • | Civil earthwork grading and excavation plans are coordinated with architectural and landscape plans.          |  |
| • | Structural dimensions match Architectural drawings.   |  |
| • | Column orientation matches Architectural drawings.  |  |
| • | Column grid lines match Architectural drawings.   |  |
| • | Column and bearing wall locations match Architectural drawings.   |  |
| • | Column locations coordinated with all other disciplines.  |  |
| • | Seismic detailing coordinates with Architectural drawings.  | Seismic bracing locations are shown on architectural floor<br>plans but do not appear to be coordinated. Please review<br>and coordinate for the next submission.<br>Design Team Response: Acknowledged.   |
| • | Beams and columns are not protruding horizontally and vertically into stairwells, and other interior spaces.  | It appears that an open shaft is not indicated for<br>stairwells shown on S1-1-3C and S1-1-3D. The structural<br>beam layout at all stairwells should be reviewed and<br>coordinated for the next submission.<br>Design Team Response: Acknowledged. |

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|-------|--|--|
| •     | Beams and columns are not protruding horizontally and vertically into stairwells, and other interior spaces.   | It appears that an open shaft is not indicated for<br>stairwells shown on S1-1-3C and S1-1-3D. The structural<br>beam layout at all stairwells should be reviewed and<br>coordinated for the next submission.<br>Design Team Response: Acknowledged. |
| •     | Verify modular dimensions at vertical masonry construction.  |  |
| •     | Room wall/floor/ceiling construction coordinated with architectural finishes.  |  |
| •     | Mechanical equipment power requirements and<br>physical locations, including special information as to<br>who mounts, connects, tests, etc.  |  |
| •     | Verify potential spatial conflicts in mechanical equipment.  |  |
| •     | Equipment plan coordinates with architectural plans.   |  |
| •     | All kitchen equipment with utility systems indicated.  |  |
| •     | The Designer confirms that the project continues to<br>comply with the MSBA High School Science Lab<br>Guidelines and/or Recommendations of Best Practices<br>for K-12 STEM learning Spaces. |  |

MSBA Design Dev. Review

COMMENTS ADDRESSED SINCE DD REVIEW

6B.2.1 – 04b

# 6B.2.1-04b MSBA COMMENTS ADDRESSED SINCE DD REVIEW

The following describes items addressed from MSBA's Review Comments from the previous Design Development Submission. Refer to Section 6B.2.1-04a, within this submittal, for a copy of MSBA's Design Development Review which follow up is addressed below.

# 6A.2 OPM Deliverables

|         | MSBA's DD Review Comment   | Current Status   |
|---------|--|--|
| Phasing | Not explicitly addressed. Please include<br>this in the next submission. | OPM Response: Acknowledged, the CM is currently working to develop/refine project phasing. |

## 6A.2.2 Project Schedule

| MSBA's DD Review Comment | Current Status |
|--------------------------|----------------|
| No MSBA Comments         |                |

# 6A.2.3 Project Scope and Budget

|                              | MSBA's DD Review Comment  | Current Status   |
|------------------------------|---|--|
| Updated<br>Project<br>Budget | A total project budget form is included.<br>However, it is not on MSBA's template.<br>Please include this on the MSBA's<br>template for the next submission.  | OPM Response: Acknowledged   |
| Value<br>Engineering         | The submission indicates that the<br>construction overage is being addressed<br>through redistribution of Design &<br>Pricing, Owner's and Construction<br>Contingencies as well as potential value<br>management items. At this early stage<br>of design, it would appear premature to<br>reduce contingencies before all value<br>management options have been<br>exhausted. The MSBA will continue to<br>monitor the construction budget for<br>conformance to the PFA throughout the<br>design phase. | Team Response: Please see the DD package for a<br>detailed description/justification of the budget<br>shifts that were agreed upon by the entire project<br>team including the Owner, both estimators, and<br>the FFE/Technology consultants. Regarding<br>design/pricing contingency: robust cost estimate<br>reconciliation and value management processes<br>involved a heavy level of<br>scrutinization/understanding of the plans,<br>providing the estimators with a greater sense of<br>confidence in the development of the plans, and<br>thus confidence in the design/pricing contingencies<br>carried. Also please note the designer has provided |

|  | additional value management options that have not <u>yet</u> been taken per Owner's direction, but their |
|--|--|
|  | cost is quantified for future phases if needed.  |

# 6A.3 Designer Deliverables

|  | MSBA's DD Review Comment   | Current Status   |
|--|--|--|
| Interior<br>Color<br>Theory<br>Statement | Included. The submission does not<br>confirm if color and material<br>selections have been presented to or<br>approved by the District. Please<br>confirm this in the next submission. | Interior Color Theory Statement provided in the 60% documents provides a sampling of the color selections that were made during made during an October 25, 2022 meeting with the district. |
| Security &<br>Visual<br>Access           | The submission does not confirm if<br>emergency medical personnel have<br>been consulted. Please address this<br>in the next submission.   | The project has been reviewed by first responders.<br>It is expected that additional meetings will be held<br>in the next phase to review and finalize hardware.                           |

# 6A.3.2 Space Summary

|   | MSBA's DD Review Comment   | Current Status  |
|---|--|---|
| Explanation<br>of<br>Deviations<br>within<br>Space<br>Summary | The submission indicates minor<br>deviations of square footages were<br>made to accommodate program<br>layouts and general coordination of<br>MEP/FP and Structural systems. In<br>the response to these review<br>comments, please confirm that all<br>spaces will conform to MSBA's<br>minimum/maximum space<br>guidelines. The MSBA will continue<br>to monitor any areas in excess of<br>the agreed upon GSF at PFA and<br>may consider deviations over<br>guidelines as ineligible at PFA Bid<br>Amendment. | Confirmed and acknowledged.                                     |
| DESE<br>Approved<br>Chapter 74<br>Programs                    | In the response to these review<br>comments, please confirm that all<br>vocational Chapter 74 spaces are<br>within Chapter 74 guidelines.  | Our spaces remain in conformance with Chapter<br>74 Guidelines. |

# 6A.3.3 Project Approvals

| MSBA's DD Review Comment | Current Status |
|--------------------------|----------------|
| No MSBA Comments         |                |

# 6A.3.4 Cost Estimates

| MSBA's DD Review Comment | Current Status |
|--------------------------|----------------|
| No MSBA Comments         |                |

# 6A.3.5 Drawings

|   | MSBA's DD Review Comment   | Current Status   |
|---|--|--|
| Half-Size<br>Drawings                             | Due to the current COVID-19 situation,<br>hard copies were not provided. MSBA<br>may request hard copies, at a later<br>date, for record.  | Understood.  |
| Early Bid<br>Packages                             | Although there are two early bid<br>packages, it appears that copies of<br>them were not included in the<br>submission. Copies of early bid<br>packages should be included in<br>future submissions. | The first early bid package "Early Site Preparation"<br>has not yet been released for bidding and is<br>currently being reviewed.<br>The second early bid package "Early Structure and<br>Foundations" is still in production.<br>Copies of both will be provided once the packages<br>are complete.                 |
| Site & Utility<br>– Proposed<br>Work Layout       | A proposed work layout is not<br>included. This should be included in<br>future submissions.   | Limit of work lines are shown on both Civil and Landscape drawings   |
| Site & Utility<br>– Building<br>Location<br>Fixed | It appears that the building is not<br>located from a main survey baseline.<br>Suggest including a location<br>reference for clarity.  | Notes (General Note #1 on Architectural Plans) are<br>included on both the Structural and Architectural<br>drawings clarifying the relationship between civil sea<br>level elevations and building elevations.   |
| Architectural<br>–<br>Demolition<br>Drawings      | Demolition drawings are not<br>included. It is not clear if this is part<br>of the early bid package. Demolition<br>drawings should be included in future<br>submissions.                            | There is no selective demolition scope for this<br>project. The existing building will be demolished in<br>its entirety. As such no building demolition drawings<br>will be issued.  |
|   |  | the Construction Manager's demolition package will<br>include existing blueprints of the building in addition<br>to the following specification sections:<br>Section 022400, Hazardous Materials Report<br>Section 024100, Demolition<br>Section 024113.23, Utility Demolition<br>Section 028213, Asbestos Abatement |
|   |  | The demolition and abatement sub-<br>contractors shall be required to attend a   |

|                                    |   | walkthrough of the existing building prior to bidding.  |
|------------------------------------|---|---|
|                                    |   | Landscape Demo and Site Preparation Plans indicate the  |
|                                    |   | building removal. The Geotechnical Report indicates     |
|                                    |   | requirements for below grade existing construction      |
|                                    |   | removal.  |
| Architectural<br>–<br>Mobilization | Not included. It is not clear if this is<br>part of the early bid package. This<br>should be included in future<br>submissions. | OPM Response: Acknowledged.                             |
| Architectural                      | Not included. This should be  | Landscape's Site Grading Plans indicate spot grade      |
| – Finished<br>Floor                | submissions.  | elevations at each exterior door, which are set to      |
| Elevation                          |   | provide accessibility to finish floor at grade levels.  |
| Coordination                       |   | ruction. Architectural drawings set the first floor at  |
| with Site                          |   | elevation 100'-0".                                      |
|                                    |   |   |
|                                    |   | General Note #1 on                                      |
|                                    |   | the Architectural floor plans indicate that the 100'-   |
|                                    |   | 0" elevation is equal to elevation 163.5' mean sea      |
|                                    |   | level which coordinates with the                        |
| 0                                  | National This should be   | Landscape drawings.                                     |
|                                    | reviewed and included in future   | Large scale plans of tollet rooms, stairs, and          |
| Plans                              | submissions.  | large scale plans of the shop classrooms are included   |
|                                    |   | for equipment layouts.                                  |
| Architectural                      | Building sections are included.   | Ceiling height elevations are noted on the              |
| – Building                         | However, floor to ceiling heights are   | Architectural Reflected Ceiling Plans.                  |
| Sections                           | for the next submission.  |   |
| Architectural                      | Rooftop mechanical equipment is not   | The Building Elevations have been updated to show       |
| – Building                         | shown on the exterior elevations.<br>Please revise and include in the next  | Mechanical Equipment.                                   |
| Elevations                         | submission.   |   |
|                                    | Floor elevations are included.  | Architectural drawings set the first floor at elevation |
|                                    | However, they are not coordinated<br>with site grading. Please revise and   | 100'-0" to reduce potential mathematical errors         |
|                                    | include in the next submission.   | during construction.                                    |
|                                    |   | General Note #1 on the Architectural floor plans        |
|                                    |   | (and Structural floor plans) indicate that the          |
|                                    |   | 100'-0" elevation is equal to elevation 163.5' mean     |
|                                    |   | sea level which coordinates with the                    |
|                                    |   | Landscape drawings.                                     |
|                                    | Expansion joints, if required, are not  | Elevations 1/A.2.1.5 and 1/A2.13 denote the 4"          |
|                                    | included on the elevations. Please<br>revise and include in the next  | expansion joint which runs between column lines         |
|                                    | submission.   | Y.9 and AA.   |
| Architectural                      | Full height wall sections are included.   | Wall Section intentionally do not show foundation       |
| – Full Height                      |   | wall and footing conditions. All foundation wall and    |

| Wall<br>Sections                   | revise and include in the next submission.  | footing information is found on the Structural drawings.  |
|------------------------------------|---|---|
| Structural –<br>Expansion<br>Joint | Expansion joints, if required, do not<br>appear to be included. Please review<br>and, if applicable, include in the next<br>submission. | There is only one 4" expansion joint which runs<br>between column lines Y.9 and AA. This can be seen<br>in the floor plans. |
| HVAC –<br>Ceiling<br>Diffusers     | Ceiling diffusers are not shown on<br>the plans. This should be reviewed<br>and included in the next submission.                        | Reflected Ceiling Plans have been further developed to include ceiling diffusers.   |

# 6A.3.6 Project Manual

|   | MSBA's DD Review  | Current Status   |
|---|---|--|
|   | Comment   |  |
| Early Bid<br>Package<br>Contract<br>Documents | No early bid packages were included<br>in this submission. It appears that<br>early packages will be issued for<br>Early Site Blasting and Foundation &<br>Steel. Please provide this information<br>in the next submission.                                    | The first early bid package "Early Site Preparation"<br>has not yet been released for bidding and is<br>currently being reviewed.<br>The second early bid package "Early Structure and<br>Foundations" is still in production.<br>Copies of both will be provided once the packages<br>are complete. |
| Outline<br>Specifications                     | Specifications were provided in<br>Uniformat, and thus do not follow<br>the CSI MasterFormat specification<br>divisions. For future DD<br>submissions, please provide<br>specifications in outline specification<br>format using CSI MasterFormat<br>divisions. | Acknowledged, current specifications are in the CSI<br>MasterFormat.   |
| Foundation<br>Walls                           | Below-grade waterproofing types are<br>not specified in the Project Manual.<br>Please provide this information in<br>the next submission.   | Refer to Specification Section 070001-<br>Waterproofing, Dampproofing, and Caulking.   |
| Footing<br>Drains                             | Information on footing drains is not<br>included in the Project Manual. This<br>should be reviewed and, if<br>necessary, updated for the next<br>submission.  | While the PVC piping is specified in the Civil sections,<br>it will be duplicated in the plumbing specification for<br>clarity in the next phase.  |
| Roof Types                                    | Information on roof type is included.<br>However, types of supplementary<br>components (types of insulation,<br>flashings, etc.) are not specified.<br>Please provide this information in<br>the next submission.   | Refer to Specification Sections 070002, 075400, 076100, 076200, and 077100 for roof related materials.   |
| Flashing                                      | Flashing materials, weights and<br>locations are not included in the<br>Project Manual. Please provide this<br>information in the next submission.  | Refer to Specification Section 076200-Sheet Metal Flashings and trim.  |
| Furring                                       | Information on furring materials and<br>locations is not included in the<br>Project Manual. Please provide this<br>information in the next submission.  | There is no plastering scope on this project. Refer to Specification Section 092110-Gypsum Board Assemblies for interior wallboard materials.  |

| Acoustical<br>Treatment | Acoustical treatment thickness and<br>application methods were not<br>included in the Project Manual.<br>Please include this information in the<br>next submission.  | Refer to Specification Sections 098120-Sprayed<br>Acoustic Insulation and 098430-Sound Absorbing<br>Panels.   |
|-------------------------|--|---|
| Water Supply            | Information on the water supply is<br>not included in the Project Manual.<br>Please provide this information in<br>the next submission.  | Refer to Specification Section 331000-Water Utilities   |
| Sanitary<br>Sewer       | Information on the sanitary sewer<br>system is not included in the Project<br>Manual. Please provide this<br>information in the next submission.   | Refer to Specification Section 333000-Sanitary<br>Sewerage Utilities.   |
| Storm Sewer             | Information on the storm drainage<br>system is not included in the Project<br>Manual. Please provide this<br>information in the next submission.   | Refer to Specification Section 334000-Storm Drainage Utilities.   |
| Gas Main                | Information on the gas main is not<br>included in the Project Manual.<br>Please provide this information in<br>the next submission.  | The Gas Main will be furnished and installed by<br>Wakefield Gas and Light. Refer to Specification<br>Section 221123-Natrual Gas Piping for any other gas<br>related materials. |
| Elevators               | Elevator speed, operation, controls,<br>platform size, machine type, car and<br>entrance finishes and signals are not<br>included in the Project Manual.<br>Please include this information in the<br>next submission. | Refer to Specification Section 140001-Elevators.  |
| Work by<br>Others       | The specification submitted is in<br>Uniformat, and thus contained no<br>"work by others" references. For<br>future DD submissions, please<br>provide an outline specification using<br>CSI MasterFormat divisions.    | 60% Specifications are formatted using CSI<br>MasterFormat divisions.   |

# 6A.3.7 Project Coordination

|   | MSBA's DD Review Comment   | Current Status  |
|---|--|---|
| Seismic                                       | Seismic bracing locations are shown<br>on architectural floor plans but do<br>not appear to be coordinated.<br>Please review and coordinate for<br>the next submission.  | Seismic bracing locations have been coordinated<br>and can be seen on Architectural and Structural<br>drawings. |
| Beams &<br>Columns<br>Protruding<br>at Stairs | It appears that an open shaft is not<br>indicated for stairwells shown on<br>S1-1-3C and S1-1-3D. The<br>structural beam layout at all<br>stairwells should be reviewed and<br>coordinated for the next<br>submission. | Structural drawings have been coordinated with the Architectural stair construction.                            |

Project Schedule **01** 

# **6B.2.2** PROJECT SCHEDULE

# PROJECT SCHEDULE PROJECT SCHEDULE

68.2.2 - **01**
| Metro - Master | Project Schedule   | PMA MSB         | A Project Layout | Total            | <del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del> |
|----------------|--|-----------------|------------------|------------------|--|
|                | Activity Name  | Duration        | FINIST           | Float            |  |
| IE Metro       | - Master Project Schedule  |                 |                  |                  |  |
| OPM Sele       | ection   |                 |                  |                  |  |
| A1000          | PMA Interview  | 1 27-Jun-19A    | 27-Jun-19 A      |                  | PMA Interview                                    |
| A1010          | OPM Selection Period   | 27 27-Jun-19A   | 05-Aug-19A       |                  | OPM Selection Period                             |
| A1380          | MSBA OPM Review Panel  | 1 05-Aug-19A    | 05-Aug-19A       |                  | MSBA OPM Review Panel                            |
| A1020          | Contract Negotiation   | 3 05-Aug-19 A   | 08-Aug-19A       |                  | Contract Negotiation                             |
| A1390          | PMA Contract Executed  | 1 08-Aug-19A    | 08-Aug-19A       |                  | PMA Contract Executed                            |
| Designer       | Selection  |                 |                  |                  |  |
| A1030          | OPM Draft Designer RFS & Send DRAFT to District                      | 10 05-Aug-19 A  | 16-Aug-19A       |                  | OPM Draft Designer RFS & Send                    |
| A1430          | District Approve Designer RFS  | 5 28-Aug-19A    | 03-Sep-19A       |                  | I District Approve Designer RFS                  |
| A1040          | MSBA Approve Designer RFS  | 8 04-Sep-19A    | 13-Sep-19A       |                  | I MSBA Approve Designer RFS                      |
| A1060          | Designer RFS Advertisements  | 5 03-Oct-19A    | 09-Oct-19A       |                  | I Designer RFS Advertisements                    |
| A1470          | Designer Site Visit  | 1 16-Oct-19A    | 16-Oct-19A       |                  | I Designer Site Visit                            |
| A1050          | Designer RFS Response Period   | 21 09-Oct-19A   | 06-Nov-19A       | 1<br>1<br>1<br>1 | Designer RFS Response Period                     |
| A1070          | Evaluate Responses & Submit to MSBA                                  | 6 07-Nov-19A    | 14-Nov-19A       |                  | I Evaluate Responses & Submi                     |
| A1080          | Designer Selection Panel Mtg #1                                      | 0               | 06-Dec-19A       | 1                | ◆ Designer Selection Panel Mtc                   |
| A1090          | Designer Selection Panel Mtg #2                                      | 0               | 17-Dec-19A       | 1                | <ul> <li>Designer Selection Panel Mtc</li> </ul> |
| A1100          | Negotiate & Execute Contract   | 17 18-Dec-19A   | 09-Jan-20 A      |                  | Negotiate & Execute Contra                       |
| Prelimina      | ry Design Program  |                 |                  |                  |  |
| A1110          | School Dept Develop DRAFT Education Program                          | 126 09-Aug-19 A | 31-Jan-20 A      |                  | School Dept Develop DRAI                         |
| A1130          | Evaluation of Existing Conditions                                    | 31 10-Jan-20 A  | 21-Feb-20 A      | 1<br>1<br>1      | Evaluation of Existing Conc                      |
| A1190          | Education Program Refined with Designer Input                        | 21 03-Feb-20 A  | 02-Mar-20 A      |                  | Education Program Refine                         |
| A1120          | Draft Initial Space Summary  | 10 24-Mar-20 A  | 06-Apr-20 A      |                  | Draft Initial Space Summa                        |
| A1140          | Establish Site Development Requirements                              | 5 31-Mar-20 A   | 29-May-20 A      |                  | 🔲 Establish Site Developn                        |
| A1150          | Preliminary Evaluation of Alternatives                               | 20 07-Apr-20 A  | 23-Jul-20 A      |                  | Preliminary Evaluation                           |
| A1160          | Compile & Submit PDP to MSBA (target Aug 14, 2020)                   | 3 11-Aug-20 A   | 13-Aug-20 A      | 1<br>1<br>1      | I Compile & Submit PE                            |
| A1200          | Final Review & Acceptance of Education Program                       | 15 03-Mar-20 A  | 13-Aug-20 A      |                  | Final Review & Accep                             |
| A1220          | SBC Approval of PDP Alternatives (target Aug 13, 2020)               | 1 13-Aug-20 A   | 13-Aug-20 A      | 1                | I SBC Approval of PDF                            |
| A1210          | Cost & Schedule Analysis of PDP Alternatives                         | 31 01-Jul-20 A  | 14-Aug-20 A      | 1                | Cost & Schedule Ana                              |
| A1170          | MSBA Review Period   | 21 14-Aug-20 A  | 16-Oct-20A       | 1                | MSBA Review Peri                                 |
| A1180          | Respond to MSBA Review Comments                                      | 12 19-Oct-20 A  | 30-Oct-20 A      |                  | I Respond to MSBA                                |
| Preferred      | Schematic Report   |                 |                  |                  |  |
| A1230          | Evaluation of Existing Conditions (Phase II Exploration)             | 30 17-Aug-20 A  | 09-Dec-20 A      | 1                | Evaluation of Exis                               |
| A1240          | Final Evaluation of Alternatives                                     | 40 17-Aug-20 A  | 09-Dec-20 A      |                  | Final Evaluation of                              |
| A1250          | Identification and Development of Preferred Solution                 | 23 09-Nov-20 A  | 09-Dec-20 A      | 1                | Identification and                               |
| A1260          | Local Actions and Approvals (Dec 10, 2020 SBC Mtg)                   | 1 10-Dec-20 A   | 10-Dec-20 A      |                  | I Local Actions and                              |
| A1310          | Compile and Submit PSR [Dec 29, 2020 Deadline]                       | 13 11-Dec-20 A  | 23-Dec-20 A      |                  | Compile and Sul                                  |
| A1200          | MSBA Facilities Assessment Subcommittee Lan 13, 2021 or Jan 20, 2021 | 1 13-Jan-21 A   | 13-Jan-21 A      |                  | I MSBA Facilities                                |

|   |   |   | 19-Jan-23 ( | 08:54   |
|---|---|---|-------------|---|
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| I DRAFT to District                     | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   |             | 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1<br>1 1 1 1 1 1   |
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|   |   |   |             |   |
| H                                       |   |   |             |   |
| th:MSBA                                 |   |   |             |   |
| #1                                      |   |   |             |   |
| )#2                                     |   |   |             |   |
| ct                                      | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   | I     I     I     I     I     I     I       I     I     I     I     I     I     I       I     I     I     I     I     I     I       I     I     I     I     I     I     I   |             |   |
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| -T Education Program                    | 1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1   | 1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1   |             |   |
| litions                                 |   |   |             |   |
| d with Designer Input                   | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   |   |             |   |
| ary                                     |   |   |             |   |
| of Alternatives                         |   |   |             | 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1<br>1 1 1 1 1 1   |
| P to MSBA (target Aug 14, 2020)         |   |   |             | · · · · · · · · · · · · · · · · · · ·   |
| otance of Education Program             | 1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1   | 1         1         1         1         1         1           1         1         1         1         1         1         1           1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1   |             |   |
| PAlternatives (target Aug 13, 2020)     |   |   |             |   |
| lysis of PDP Alternatives               | 1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1 | I         I |             |   |
| oʻd                                     |   |   |             | 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1<br>1 1 1 1 1 1   |
| Review Comments                         |   |   |             |   |
|   |   |   |             |   |
| sting Conditions (Phase II Exploration) |   |   |             |   |
| Davelopment of Desforred Solution       |   |   |             |   |
| Approvals (Dec 10 · 2020 SRC: Mta)      |   |   |             | + + + + + + + + + + + + + + + + + + +   |
| mit PSR [Dec 29, 2020 Deadline]         |   |   |             | 1     1     1     1     1       1     1     1     1     1     1       1     1     1     1     1     1       1     1     1     1     1     1       1     1     1     1     1     1       1     1     1     1     1     1 |
| Assessment Subcommittee [Jan 13, 2      | 021 or  | Jan 20  | ), 2021]    |   |
| ·····                                   |   |   |             |   |
|   |   |   |             |   |

| NE Metro - Master P | aster Project Schedule PMA MSBA Project Layout                           |                      |             |             |                  |   |                                       |
|---------------------|--|----------------------|-------------|-------------|------------------|---|---------------------------------------|
| ctivity ID          | Activity Name  | Original<br>Duration | Start       | Finish      | Total<br>Float   |   |                                       |
| A1280               | MSBAPSR Review Period  | 21                   | 24-Dec-20 A | 28-Jan-21 A |                  |   | MSBAPSR Rev                           |
| A1300               | Response to MSBA PSR Review Comments Due                                 | 13                   | 29-Jan-21 A | 10-Feb-21 A |                  |   | Response to M                         |
| A1270               | MSBA Board of Directors Approval of PSR [Feb 11, 2020 estimated]         | 0                    |             | 11-Feb-21 A |                  |   | MSBA Board of                         |
| Schematic           | : Design   |                      |             |             | 1                |   |                                       |
| A1400               | Schematic Estimate Set Due   | 0                    |             | 19-May-21 A |                  |   | ♦ Schematic E                         |
| A1320               | Schematic Design Period (early start @ risk after FAS)                   | 99                   | 04-Jan-21 A | 09-Jun-21 A |                  |   | Schematic                             |
| A1410               | Schematic Estimating Period  | 16                   | 20-May-21 A | 11-Jun-21 A |                  |   | Schematic                             |
| A1420               | Estimate Reconcilation & Value Engineering                               | 11                   | 14-Jun-21 A | 28-Jun-21 A |                  |   | Estimate R                            |
| A1480               | SBC Meeting for VE & Approval of SD (7/1/21)                             | 1                    | 01-Jul-21 A | 01-Jul-21 A |                  |   | I SBC Meet                            |
| A1330               | Compile and Submit SD to MSBA [July 7, 2021 deadline]                    | 4                    | 02-Jul-21 A | 07-Jul-21 A |                  |   | l Compile a                           |
| A1340               | MSBA Review Period   | 21                   | 07-Jul-21 A | 27-Jul-21 A |                  |   | I MSBA Re                             |
| A1350               | Respond to MSBA Review Comments  | 14                   | 28-Jul-21 A | 10-Aug-21 A |                  |   | l Respond                             |
| A1370               | Negotiate PS&B / Project Funding Agreement                               | 15                   | 27-Jul-21 A | 17-Aug-21 A |                  |   | Negotiate                             |
| A1360               | MSBA Board Approval of Project Scope and Budget [Aug 25, 2021 estimated] | 0                    |             | 25-Aug-21 A |                  |   | ♦ MSBA Bo                             |
| A1490               | Execute MSBA PS&B  | 10                   | 25-Aug-21 A | 15-Dec-21 A |                  |   | Exec                                  |
| A1500               | Execute Final MSBA PFA   | 10                   | 11-Mar-22 A | 24-Mar-22 A |                  |   | • • • • • • • • • • • • • • • • • • • |
| DESE Sul            | omittal  | ;                    |             |             |                  |   |                                       |
| A2620               | Schematic Design DESE Submittal (July 7 deadline)                        | 23                   | 07-Jun-21 A | 07-Jul-21 A | 1<br>1<br>1<br>1 |   | Schematic                             |
| A2630               | DESE Review Period (21 calendar days)                                    | 21                   | 07-Jul-21 A | 27-Jul-21 A |                  | 1       1 | DESE Re                               |
| A2640               | DESE Supplement - Provide add'l info if requested                        | 10                   | 27-Jul-21 A | 10-Aug-21 A |                  |   | I DESE SU                             |
| OIG CMA             | R Approval   | 1.                   |             |             |                  |   |                                       |
| A2940               | PMA Submit Application to OIG  | 39                   | 04-Jan-21 A | 25-Feb-21 A |                  |   | 🗖 PMA Submit Aj                       |
| A2950               | OIG Review & Approval Period   | 20                   | 26-Feb-21 A | 23-Mar-21 A |                  |   | OIG Review 8                          |
| Project Fu          | nding  |                      |             |             |                  | 1     1 <td></td>   |                                       |
| A1450               | Appropriation of Funds - Special Town Meeting (60 day window)            | 10                   | 09-Sep-21A  | 08-Nov-21 A |                  |   | 🗖 Appro                               |
| A1440               | Critical Community Outreach Period                                       | 47                   | 25-Aug-21 A | 24-Jan-22 A |                  |   | Crit                                  |
| A1460               | Authorization of Borrowing - Ballot Vote                                 | 1                    | 25-Jan-22 A | 25-Jan-22 A |                  |   | I Aut                                 |
| A3040               | DRA Proceeds into DD   | 5                    | 26-Jan-22 A | 14-Feb-22 A |                  |   | I Dr                                  |
| Detailed D          | esian  |                      |             |             |                  |   |                                       |
| A2570               | LEED/CHPS Registration (After DD Estimate Set)                           | 5                    | 24-Jun-22 A | 30-Jun-22 A |                  | 1     1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1   |                                       |
| A2580               | LEED/CHPS Provisional Design Pkg Submittal (After 60% Estimate Set)      | 10                   | 20-Jan-23   | 02-Feb-23   | 64               | 1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1   |                                       |
| Design De           | evelopment   |                      | 1           |             |                  |   |                                       |
| A1630               | DD Estimate Set  | 109                  | 15-Feb-22 A | 24-Jun-22 A |                  |   |                                       |
| A1870               | DD Cx Review   | 10                   | 27-Jun-22 A | 15-Jul-22 A |                  |   |                                       |
| A1640               | DD Estimating  | 20                   | 27-Jun-22A  | 22-Jul-22 A |                  |   |                                       |
| A1660               | DD Design & Constructibility Reviews                                     | 20                   | 27-Jun-22A  | 29-Jul-22 A |                  |   |                                       |
| A1650               | DD VE & Reconciliation   | 15                   | 22-Jul-22 A | 18-Aug-22 A |                  |   |                                       |
| A1670               | DD Submission to MSBA  | 5                    | 08-Aug-22 A | 19-Aug-22 A |                  |   |                                       |

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|---|----------|--------------------------------------|----------|
|   |          |                                      |          |
| <i>i</i> ew.Period                                  |          |                                      |          |
| ISBA PSR Review Comments Due                        |          |                                      |          |
| f Directors Approval of PSR [Feb 11, 2020 estimated | j        |                                      |          |
|   |          |                                      |          |
| Estimate Set Due                                    |          |                                      |          |
| Design Period (early start @ risk after FAS)        |          |                                      |          |
| Estimating Period                                   |          |                                      |          |
| econcilation & Value Engineering                    |          |                                      |          |
| ng for ME & Approval of SU (7/1/21)                 |          |                                      |          |
| view Period   |          |                                      |          |
| to MSBA Review Comments                             |          |                                      |          |
| e PS&B / Project Funding Agreement                  |          |                                      |          |
| oard Approval of Project Scope and Budget [Aug 2!   | 5, 202   | 1 est                                | imat     |
| ute MSBA PS&B                                       |          |                                      |          |
| xecute Final MSBAPFA                                |          |                                      |          |
|   |          |                                      | <br><br> |
| : Design DESE Submittal (July 7 deadline)           |          |                                      |          |
| view Period (21 calendar days)                      |          |                                      |          |
| ipplement - Provide add i mo il requested           |          |                                      |          |
|   |          |                                      |          |
|   |          | <br>           <br>             <br> |          |
|   |          |                                      |          |
| priation of Funds - Special Town Meeting (60 day w  | indow    | n                                    |          |
| ical Community Outreach Period                      |          |                                      |          |
| horization of Borrowing - Ballot Vote               |          |                                      |          |
| RA Proceeds into DD                                 |          | F F T T T T                          |          |
|   |          |                                      |          |
| LEED/CHPS Registration (After DD Estimate Set)      |          |                                      |          |
| LEED/CHPS Provisional Design Pkg Subr               | nittal ( | After                                | 60%      |
|   |          |                                      |          |
| DD Estimate Set                                     |          |                                      |          |
|   |          |                                      |          |
| DD Design & Constructibility Reviews                |          |                                      |          |
| DD VE & Reconciliation                              |          |                                      |          |
| I DD Submission to MSBA                             |          |                                      |          |
|   |          |                                      |          |
|   |          |                                      |          |

| E Metro - Master | tro - Master Project Schedule PMA MSBA Project Layout            |                        |             |              |                    |   |   |   |
|------------------|--|------------------------|-------------|--------------|--------------------|---|---|---|
| ivity ID         | Activity Name  | Original S<br>Duration | tart        | Finish       | Total<br>Float     |   |   |   |
| A1680            | DD MSBA Review Period  | 21 2                   | 0-Aug-22 A  | 09-Sep-22A   |                    |   |   |   |
| A1690            | DD District Response to MSBA Review Comments                     | 14 1                   | 0-Sep-22A   | 23-Sep-22A   |                    |   | 1       1 | 1 1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1  |
| 60% Des          | ign (Early Site Blasting)  |                        |             |              |                    |   | 1       1 |   |
| A1770            | 60% Estimate Set (EARLY SITE BLASTING)                           | 66 2                   | 2-Aug-22 A  | 21-Nov-22 A  |                    |   |   |   |
| A1850            | 60% Cx Review  | 10 2                   | 2-Nov-22 A  | 05-Dec-22 A  |                    |   |   |   |
| A1780            | 60% Estimating   | 19 2                   | 2-Nov-22 A  | 16-Dec-22 A  |                    |   |   |   |
| A1800            | 60% Design & Constructibility Reviews                            | 20 2                   | 2-Nov-22 A  | 19-Dec-22 A  |                    |   |   |   |
| A1790            | 60% VE & Reconciliation (SBC Mtg 1/12/23)                        | 19 1                   | 9-Dec-22 A  | 19-Jan-23 A  |                    |   |   |   |
| A1810            | 60% Submission to MSBA   | 12 2                   | 0-Jan-23 A  | 06-Feb-23    | 0                  |   |   |   |
| A1820            | 60% MSBA Review Period   | 21 0                   | 7-Feb-23    | 27-Feb-23    | 51                 |   |   |   |
| A1830            | 60% District Response to MSBA Review Comments (in working days)  | 14 2                   | 8-Feb-23    | 13-Mar-23    | 51                 |   |   |   |
| 90% Des          | ign (100% Foundation & Steel)                                    |                        |             |              |                    |   | 1     1 <td></td>   |   |
| A2030            | 75% Steel (EARLY BID PACKAGE)                                    | 12 1                   | 6-Jan-23 A  | 07-Feb-23    | 0                  | 1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1 | 1       1 |   |
| A1700            | 90% Estimate Set (EARLY FOUNDATION BID DOCUMENTS)                | 55 1                   | 6-Jan-23 A  | 31-Mar-23    | 23                 |   |   |   |
| A1860            | 90% Cx Review  | 10 0                   | 3-Apr-23    | 14-Apr-23    | 93                 |   |   |   |
| A1710            | 90% Estimating   | 15 0                   | 3-Apr-23    | 21-Apr-23    | 23                 |   |   |   |
| A1730            | 90% Design & Constructibility Reviews                            | 20 0                   | 3-Apr-23    | 28-Apr-23    | 28                 |   | 1       1 | 1 1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1<br>1 1 1 1   |
| A1720            | 90% VE & Reconciliation (SBC Mtg 5/11/23)                        | 14 2                   | 4-Apr-23    | 11-May-23    | 23                 |   | 1     1 <td></td>   |   |
| A1740            | 90% Submission to MSBA   | 5 0                    | 8-May-23    | 12-May-23    | 23                 |   | 1       1 | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1 |
| A1750            | 90% MSBA Review Period   | 21 1                   | 3-May-23    | 02-Jun-23    | 116                |   |   | .1 I I I I I I.<br>1 1 1 1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1   |
| A1760            | 90% District Response to MSBA Review Comments (in working days)  | 14 0                   | 3-Jun-23    | 16-Jun-23    | 116                |   | 1       1 | 1 1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1   |
| 100% De          | sign   |                        |             |              |                    |   | 1       1 |   |
| A1840            | 100% Bid Package   | 50 1                   | 5-May-23    | 21-Jul-23    | 23                 |   |   |   |
| A1880            | 100% Submission to MSBA  | 5 1                    | 7-Jul-23    | 21-Jul-23    | 62                 |   |   |   |
| Permittin        | a  |                        |             |              | +                  |   |   |   |
| MHC - M          | A Historical Commission  |                        |             |              |                    | 1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1   | 1     1 <td>1 1 1 1 1 1 1 1<br/>1 1 1 1 1 1 1<br/>1 1 1 1 1</td>  | 1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1<br>1 1 1 1 1   |
| A1610            | Compile & Submit PNE to MHC @ PSR                                | 10 1                   | 2- lun-20 Δ | 25- lup-20 A |                    |   | Compile & Sub   | mit PNI   |
| A1620            | MHC Review Period  | 20.2                   | 6- lun-20 A | 20-001-20 A  |                    |   | MHC Review !  | Period  |
|                  |  | 20 2                   |             |              |                    |   |   | onou  |
| Δ2030            |  | 1 2                    | 3-Mar-21 Δ  | 23-Mar-21 Δ  | <br>   <br>   <br> |   |   | nnrova  |
|                  |  | I Z                    |             |              |                    |   |   | ppiore  |
|                  | NotApplicable  | 1 0                    | 7 Jul 21 A  |              |                    |   | 1 Nic   | st Annlic   |
|                  |  |                        | 7-JUEZTA    | 07-JUE2TA    |                    |   | 1   | νημριι  |
| EEA Arti         | cie 97 Land Disposition Policy                                   |                        | 7 1 1 0 4 4 |              |                    |   |   | A   |
| A2650            | NotApplicable  | 1 0                    | 7-Jul-21 A  | 07-Jul-21 A  |                    |   |   | st Applic   |
| MADEP            | BWP Air Quality Program  |                        |             |              |                    |   |   |   |
| A2840            | Gilbane to Submit Notification 10 Days Prior to Excavation Start | 1 2                    | 7-Mar-23    | 27-Mar-23    | 166                |   | 1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1     1   |   |
| MADOT            | Permitting   |                        |             |              |                    |   |   |   |
| Actual W         | ork Critical Remaining Work                                      |                        | Pa          | are 3 of 5   |                    |   |   |   |
| Remainir         | ng Work   Milestone  |                        | 1 4         | <u> </u>     |                    |   |   |   |

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| DD MSBA Review Period   |
| I DD District Response to MSBA Review Comments  |
|   |
| 60% Estimate Set (EARLY SITE BLASTING)  |
| ■ 60% Cx Review   |
| <ul> <li>60% Esumating</li> <li>60% Design &amp; Constructibility Reviews</li> </ul>  |
| ■ 60% VE & Reconciliation (SBC Mtg 1/12/23)   |
| 0 60% Submission to MSBA  |
| II 60% MSBA Review Period   |
| 60% District Response to MSBA Review Comments (in the second s |
|   |
| II 75% STEEL (EARLY BID PACKAGE)  |
| I 90% Cx Review   |
| 0 90% Estimating  |
| 90% Design & Constructibility Reviews   |
| 90% VE & Reconciliation (SBC Mtg 5/11/23)   |
| 1 90% Submission to MSBA  |
| 90% District Response to MSBA Review Comments   |
|   |
| 🔲 100% Bid Package  |
| I 100% Submission to MSBA   |
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| to MHC @ PSR  |
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| of CMAR   |
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| 1)<br>19  |
|   |
| I Gilbane to Submit Notification 10 Days Prior to Excavation  |
|   |
|   |

| NE Metro - Master Pro | ject Schedule  | PMA MSBA Project Layout |                      |             |             |                |   |  |                 |   |   |
|-----------------------|--|-------------------------|----------------------|-------------|-------------|----------------|---|--|-----------------|---|---|
| Activity ID           | Activity Name  | [                       | Original<br>Duration | Start       | Finish      | Total<br>Float |   |  |                 |   |   |
| A2660                 | Determination of Applicability @ 60% (3 month process per Nitsch | 7/2/21)                 | 5                    | 20-Jan-23   | 26-Jan-23   | 188            |   |  |                 |   |   |
| MA DPH Pe             | ermitting  |                         |                      |             |             |                |   |  |                 |   |   |
| A2670                 | Not required per DRA 8/4 email                                   |                         | 1                    | 04-Aug-22 A | 04-Aug-22 A |                |   |  |                 |   |   |
| MAAB Acco             | essibility Variances   |                         |                      |             |             |                |   |  |                 |   |   |
| A2680                 | Determination of Applicability @ 60%                             |                         | 5                    | 20-Jan-23   | 26-Jan-23   | 88             |   |  |                 |   |   |
| Wetlands F            | Protection Act NOI (310 CMR 10.00)                               |                         |                      |             |             |                |   |  |                 |   |   |
| A2870                 | Submit NOI @ DD Completion (BRP WPA Form 3) to Con Com an        | nd MA DEP               | 20                   | 12-Aug-22 A | 22-Sep-22 A |                |   |  |                 |   |   |
| A2880                 | MADEP Assignment of File Number                                  |                         | 10                   | 18-Oct-22 A | 31-Oct-22 A |                | + -  -  -  -  -  -   -   -   -   -   -  |  |                 |   |   |
| A3020                 | Peer Review (if required by ConCom)                              |                         | 53                   | 23-Sep-22 A | 20-Jan-23   | 143            |   |  |                 |   |   |
| A2890                 | Public Hearings to Solicit Public Comments                       |                         | 5                    | 04-Oct-22 A | 21-Feb-23   | 143            |   |  |                 |   |   |
| A2900                 | Public Comment Period (21 CDs)                                   |                         | 21                   | 22-Feb-23   | 14-Mar-23   | 201            |   |  |                 | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   |
| A2910                 | Order of Conditions Issued                                       |                         | 1                    | 14-Mar-23   | 15-Mar-23   | 143            |   |  |                 |   |   |
| A3060                 | Appeal Period (10 CDs)   |                         | 10                   | 16-Mar-23   | 25-Mar-23   | 201            | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1 |  |                 | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   |   |
| MAOffice              | of Coastal Zone Mgmt (CZMA)                                      |                         |                      |             |             |                |   |  |                 |   |   |
| A2920                 | Not Applicable (confirmed by Nitsch on 7/2/21)                   |                         | 1                    | 02-Jul-21 A | 02-Jul-21 A |                |   |  |                 | ΙΝα   | ot Applica  |
| Planning &            | Zoning   |                         |                      |             |             |                |   |  |                 |   |   |
| A2820                 | Site Plan Review @ 60% Phase (see DRA 7/2/21 email)              |                         | 34                   | 20-Jan-23   | 08-Mar-23   | 59             |   |  |                 |   |   |
| MADEP M               | ass Contingency Plan (MCP)                                       |                         |                      |             |             |                |   |  |                 |   |   |
| A2210                 | Not required per DRA 8/4 email                                   |                         | 1                    | 04-Aug-22 A | 04-Aug-22 A |                |   |  |                 |   |   |
| National H            | eritage Endangered Species Program                               |                         |                      |             |             |                |   |  |                 |   |   |
| A2220                 | Not required per MEPA advisory opinion dated 5/26/22             |                         | 1                    | 26-May-22 A | 26-May-22 A |                |   |  |                 |   |   |
| Board of H            | ealth Review   |                         |                      |             |             |                |   |  |                 |   |   |
| A2230                 | To be completed at 90% (see DRA 8/4/22 email)                    |                         | 20                   | 03-Apr-23   | 28-Apr-23   | 112            |   |  |                 |   |   |
| Bidding               |  |                         |                      |             |             |                |   |  |                 |   | I         I |
| CMAR                  |  |                         |                      |             |             |                |   |  |                 |   |   |
| A1910                 | CMAR RFQ Period  |                         | 20                   | 12-Mar-21 A | 08-Apr-21 A |                |   |  |                 | CMA   | r rfq f   |
| A1920                 | CMAR Shortlist & Interviews                                      |                         | 20                   | 09-Apr-21 A | 11-May-21 A |                |   |  |                 | CM/   | AR Shor   |
| A1980                 | CMAR Selected  |                         | 10                   | 11-May-21 A | 11-May-21 A |                |   |  | -i-i-i-i-i-<br> | I CM/   | AR Seleo  |
| PH1A Early            | / Site   |                         |                      |             |             |                |   |  |                 | 1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1   | 1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1   |
| A3000                 | Procurement of Early Site (60% Estimate Package) - May incl FSE  | Belect and FF           | 44                   | 24-Jan-23   | 27-Mar-23   | 144            |   |  |                 |   |   |
| PH1B Early            | / Foundations/Steel  |                         |                      |             |             |                |   |  |                 | 1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1 |   |
| A3010                 | Procurement of Early Foundation (90% Package) - Need Waterpi     | roofing FSB             | 62                   | 03-Apr-23   | 27-Jun-23   | 168            |   |  |                 |   |   |
| A3080                 | Procurement/Lead Time of Early Steel (75% Package)               |                         | 201                  | 07-Feb-23   | 14-Nov-23   | 0              |   |  |                 |   |   |
| PH2 New E             | Bldg (incl FSBs)   |                         |                      |             | ·           |                |   |  |                 |   |   |
| A1890                 | RFQ Advertisement and Trade Prequal (Submit to CR by 1/12/23     | )                       | 20                   | 09-Mar-23   | 05-Apr-23   | 59             |   |  |                 | 1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1   | I         I |
| Actual Work           | Critical Remaining Work  | 1                       | I                    | Pag         | e 4 of 5    | <b>L</b>       | 11  |  |                 |   |   |

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|---|--------------------------|---|----------------------------------|------------------------|-------|
|   |                          |   |                                  |                        |       |
| Determination of Applicability @ 60% (3 mo        | nth                      |   |                                  | ės                     | S De  |
|   |                          |   |                                  |                        |       |
| I Not required per DRA 8/4 email                  |                          |   |                                  | +                      |       |
|   |                          |   |                                  |                        |       |
| Determination of Applicability @ 60%              |                          |   |                                  |                        |       |
|   |                          |   |                                  |                        |       |
| Submit NOI @ DD Completion (BRP WPA Forn          | h3`                      | ) to  | С                                | on                     | Col   |
| I MA DEP Assignment of File Number                |                          | <b>1</b>      <br> -  -  -<br>       <br>           | T  <br> -++<br>       <br>       | + + -                  |       |
| Peer Review (if required by ConCom)               |                          |   |                                  |                        |       |
| Public Hearings to Solicit Public Comments        |                          | 1 1 1<br>1 1 1<br>1 1 1                             |                                  |                        |       |
| Public Comment Period (21 CDs)                    |                          |   |                                  |                        |       |
| I Order of Conditions Issued                      | <br>       <br>  -  -  - |   | 1 1 1<br>1 1 1<br>1 1 1<br>1 1 1 | 1 1<br>1 1<br>1 1<br>+ |       |
| I Appeal Period (10 CDs)                          |                          |   |                                  |                        |       |
|   |                          |   |                                  |                        |       |
| ble (confirmed by Nitsch on 7/2/21)               |                          |   |                                  |                        |       |
|   |                          |   |                                  |                        |       |
| 🔲 Site Plan Review @ 60% Phase (see DR            | Α7                       | 121   | 21                               | ė'n                    | nail) |
|   |                          |   |                                  |                        |       |
| I Not required per DRA 8/4 email                  |                          |   |                                  |                        |       |
|   |                          | 1 1 1<br>1 1 1<br>1 1 1                             |                                  |                        |       |
| Not required per MEPA advisory opinion dated 5/26 | /22                      | 2   |                                  |                        |       |
|   |                          |   |                                  |                        |       |
| □ To be completed at 90% (see DRA 8/4/2           | 22 (                     | em  | ail)                             | +                      |       |
|   |                          |   |                                  |                        |       |
|   |                          |   |                                  |                        |       |
| Daviad  |                          |   |                                  |                        |       |
|   |                          |   |                                  |                        |       |
| list & interviews<br>ted                          |                          |   |                                  | ++                     |       |
|   |                          |   |                                  |                        |       |
|   | Ъс                       | ماد   |                                  | 1                      | ٨/-   |
|   | га                       |   | ayı                              | 3)-                    | IVIC  |
|   |                          |   |                                  |                        |       |
| Procurement of Early Foundation (909              | ⁄6 F                     | ac  | жa                               | ge                     | ) - N |
| Procurement/Lead Time of Early                    | Ste                      | el  | (75                              | 5%                     | Pa    |
|   |                          | , , , ,<br>, , , ,<br>, , , ,<br>, , , ,<br>, , , , |                                  |                        |       |
| RFQAdvertisement and Trade Prequal (              | Su                       | bn  | nit te                           | o C                    | R t   |
|   |                          |   |                                  |                        |       |

| o - Master F | Project Schedule  | PMA MSBA Project Layout |           |            | PM             |   | <del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del> |
|--------------|---|-------------------------|-----------|------------|----------------|---|--|
| ID           | Activity Name   | Original<br>Duration    | Start     | Finish     | Total<br>Float |   |  |
| 2360         | Complete Prequal & Notify Prequalified Firms                    | 20                      | 06-Apr-23 | 03-May-23  | 59             |   |  |
| A2140        | Trade Prequal Bid Protest Schedule Contingency                  | 20                      | 04-May-23 | 31-May-23  | 59             |   |  |
| A1900        | Trade Bidding   | 40                      | 21-Jul-23 | 14-Sep-23  | 23             |   |  |
| A1990        | Execute GMP Contract  | 58                      | 15-Sep-23 | 05-Dec-23  | 91             |   |  |
| Construct    | ion   |                         |           |            |                | 1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1   |  |
| A3030        | Issue Notice to Proceed   | 1                       | 24-Mar-23 | 27-Mar-23  | 154            |   |  |
| Phase 1A     | Early Site Prep   |                         | 1         |            |                |   |  |
| A2710        | EPANPDES National Pollutant Discharge Elimination System NOI    | 10                      | 27-Mar-23 | 07-Apr-23  | 144            |   |  |
| A2740        | SWPPP   | 10                      | 27-Mar-23 | 07-Apr-23  | 144            |   |  |
| A2960        | Phase 1A Early Site Prep  | 123                     | 10-Apr-23 | 27-Sep-23  | 144            |   |  |
| Phase 1B     | Early Foundations/Steel   |                         |           | ,          |                |   |  |
| A2970        | Phase 1B Excavation & Foundations                               | 74                      | 01-Aug-23 | 10-Nov-23  | 144            |   |  |
| A2990        | Phase 1B Steel  | 142                     | 15-Nov-23 | 30-May-24  | 0              |   |  |
| Phase 2 M    | New Building  |                         |           |            |                |   |  |
| A2000        | Phase 2 Contracts/Submittals/Mobilization                       | 20                      | 15-Sep-23 | 12-Oct-23  | 23             | 1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1   |  |
| A1930        | Phase 2 New Building  | 506                     | 15-Nov-23 | 22-Oct-25  | 0              |   |  |
| A2010        | Phase 2 Substantial Completion                                  | 1                       | 22-Oct-25 | 22-Oct-25  | 0              |   |  |
| A2410        | Phase 2 Commissioning   | 60                      | 11-Sep-25 | 03-Dec-25  | 22             |   |  |
| A2350        | Phase 2 Punchlist   | 45                      | 23-Oct-25 | 24-Dec-25  | 7              |   |  |
| A2020        | Phase 2 FFE / IT / Move   | 52                      | 23-Oct-25 | 02-Jan-26  | 0              | 1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1   |  |
| A1940        | Phase 2 Ready for Occupancy (1/5/26 Target)                     | 1                       | 05-Jan-26 | 05-Jan-26* | 0              | 1       1 |  |
| Phase 3 A    | Abate/Demo/Site   | ,                       |           | ,          |                |   |  |
| A2760        | Phase 3 Owner Vacate Existing Building                          | 10                      | 06-Jan-26 | 19-Jan-26  | 1              |   |  |
| A2750        | Phase 3 Abatement & Demolition                                  | 95                      | 20-Jan-26 | 01-Jun-26  | 1              |   |  |
| A2790        | Phase 3 Final Site Improvements                                 | 122                     | 02-Jun-26 | 18-Nov-26  | 1              |   |  |
| A2800        | Phase 3 Substantially Complete (Target 11/20/26)                | 1                       | 18-Nov-26 | 18-Nov-26* | 1              |   |  |
| A2810        | Phase 3 Punchlist   | 30                      | 19-Nov-26 | 30-Dec-26  | 81             |   |  |
| Closeout     |   |                         |           |            |                |   |  |
| A2720        | Complete 50% DCAM Evals   | 30                      | 11-Dec-24 | 21-Jan-25  | 657            |   |  |
| A2730        | Complete 100% DCAM Evals  | 30                      | 19-Nov-26 | 30-Dec-26  | 181            |   |  |
| A1950        | 10 Month Warranty Walkthrough & Cx Inspection                   | 5                       | 31-Dec-26 | 06-Jan-27  | 161            | 1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1       1     1     1     1     1     1     1     1     1   |  |
| A2560        | GC Submits Request for Final Payment                            | 15                      | 07-Jan-27 | 27-Jan-27  | 161            | 1       1 |  |
| A2590        | Final Cx Report Submission to MSBA w/ Certificate of Completion | 20                      | 07-Jan-27 | 03-Feb-27  | 176            |   |  |
| A2600        | Submission of Final Reimbursement Request                       | 20                      | 28-Jan-27 | 24-Feb-27  | 161            |   |  |
| A1960        | LEED Final Construction Package Submitted / Approved            | 120                     | 31-Dec-26 | 16-Jun-27  | 81             |   |  |
| A1070        | MSBA Financial Closeout   | 60                      | 17-Jun-27 | 08-Sep-27  | 81             |   |  |

Remaining Work 🔶

Milestone

|  | 19- Jan-23 08:54                                      |
|--|---|
|  |   |
|  |   |
|  | Complete Prequal & Notify Prequalified Firms          |
|  | Trade Prequal Bid Protest Schedule Contingency        |
|  | 🗖 : Trade Bidding                                     |
|  | Execute GMP Contract                                  |
|  |   |
|  | I Issue Notice to Proceed                             |
| 1 1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1 1<br>1 1 1 1 1 1 1 1 1 |   |
| <br>   |   |
|  | I EPANPDES National Pollutant Discharge Elimination S |
|  | I SWPPP   |
|  | Phase 1A Early Site Prep                              |
|  |   |
|  | Phase 1B Excavation & Foundations                     |
|  |   |
|  |   |
|  |   |
|  | Phase 2 Contracts/Submittals/Mobilization             |
|  | Phase 2 New Building                                  |
|  | I Phase 2 Substantial Co                              |
|  | Phase 2 Commissionin                                  |
|  | Phase 2 Punchlist                                     |
|  | 🔲 Phase 2 FFE / IT / Mo                               |
|  | Ⅰ Phase 2 Ready for O                                 |
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|  | Complete 50% DCAM Evals                               |
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Cost Estimate Reconciliation 01 Cost Estimate Comparison 02 Cost Estimate – CM-R 03 Cost Estimate - Designer 04 Updated Project Budget 05 Description of Early-Bid Package 06 Value Engineering 07

# **6B.2.3** PROJECT SCOPE & BUDGET

# PROJECT SCOPE & BUDGET COST ESTIMATE RECONCILIATION

#### **RECONCILED CONSTRUCTION COST ESTIMATE**

| District:             | Northeast Metropolitan Regional Vocational H | igh School District |
|-----------------------|--|---------------------|
| Project:              | Northeast Metropolitan Regional Vocational H | igh School Project  |
| OPM:                  | PMA Consultants                              |                     |
| Designer:             | DRA Architects                               |                     |
| CM (if applicable):   | Gilbane                                      |                     |
| Project Type:         | New Construction                             |                     |
| Submittal (DD/60/90): | 60% CD                                       |                     |
| Proposed Gross SqFt:  | 382,610                                      |                     |

| CSI DIVISION | DESCRIPTION                              | DESIGNER COST ESTIMATE | CM Cost Estimate | Delta (\$)   |
|--------------|--|------------------------|------------------|--------------|
| n/a          | GMP Fee                                  | \$4,205,160            | \$4,205,160      | \$0          |
| n/a          | GMP Insurance                            | \$4,214,052            | \$4,216,484      | -\$2,432     |
| n/a          | GMP Contingency                          | \$5,583,215            | \$5,467,336      | \$115,879    |
| n/a          | Design & Estimating Contingency          | \$5,099,564            | \$5,104,293      | -\$4,729     |
| n/a          | Escalation                               | \$9,408,691            | \$9,417,421      | -\$8,730     |
| 1000         | General Requirements                     | \$18,206,565           | \$18,070,586     | \$135,979    |
| 2000         | Existing Conditions                      | \$5,298,953            | \$4,236,404      | \$1,062,549  |
| 3000         | Concrete                                 | \$11,349,286           | \$12,187,851     | -\$838,565   |
| 4000         | Masonry                                  | \$8,048,893            | \$6,869,970      | \$1,178,923  |
| 5000         | Metals                                   | \$21,340,676           | \$20,932,119     | \$408,557    |
| 6000         | Woods, Plastics, Composites              | \$3,108,888            | \$3,373,506      | -\$264,618   |
| 7000         | Thermal and Moisture Protection          | \$16,212,191           | \$13,863,450     | \$2,348,741  |
| 8000         | Openings                                 | \$10,211,161           | \$11,064,731     | -\$853,570   |
| 9000         | Finishes                                 | \$21,198,957           | \$21,015,196     | \$183,761    |
| 10000        | Specialties                              | \$1,766,029            | \$1,710,917      | \$55,112     |
| 11000        | Equipment                                | \$4,222,900            | \$4,406,709      | -\$183,809   |
| 12000        | Furnishings                              | \$710,668              | \$1,746,176      | -\$1,035,508 |
| 13000        | Special Construction                     | \$153,150              | \$150,300        | \$2,850      |
| 14000        | Conveying Equipment                      | \$885,000              | \$885,000        | \$0          |
| 21000        | Fire Suppression                         | \$2,972,079            | \$3,029,692      | -\$57,613    |
| 22000        | Plumbing                                 | \$7,929,280            | \$8,029,914      | -\$100,634   |
| 23000        | Heating Ventilating and Air Conditioning | \$28,027,560           | \$27,811,853     | \$215,707    |
| 26000        | Electrical                               | \$18,511,138           | \$17,723,184     | \$787,954    |
| 27000        | Communications                           | \$3,727,249            | \$3,536,294      | \$190,955    |
| 28000        | Electronic Safety and Security           | \$2,346,508            | \$2,529,353      | -\$182,845   |
| 31000        | Earthwork                                | \$18,706,035           | \$20,233,664     | -\$1,527,629 |
| 32000        | Exterior Improvements                    | \$9,050,609            | \$9,482,656      | -\$432,047   |
| 33000        | Utilities                                | \$6,730,279            | \$8,014,421      | -\$1,284,142 |
| 5            | Subtotal Base Contract Amount            | \$249,224,736          | \$249,314,640    | -\$89,904    |
| E            | Bid Alternates (If applicable)           | \$0                    | \$0              |              |
| T            | OTAL AMOUNT                              | \$249,224,736          | \$249,314,640    |              |
| ٦            | TOTAL \$/SF                              | 651.3806121            | 651.6155877      |              |

# PROJECT SCOPE & BUDGET COST ESTIMATE COMPARISON

# COST ESTIMATE COMPARISON SPREADSHEET (CSI FORMAT)

|                                    | (Northeas   | t Metropolit | an Regional          | Vocation        | al High S | School) (New C | onstruct  | ion)     |              |           |
|------------------------------------|---|--------------|----------------------|-----------------|-----------|----------------|-----------|----------|--------------|-----------|
| Estimated Construction Start Date: |   |              | 2/27/2023            |                 | XXXX      |                |           | XXXX     |              |           |
|                                    |   | 60% CD       |                      |                 | 100% CD   |                |           | Bid Data |              |           |
|                                    | Description   | GSF          | Total Cost           | Unit Cost       | GSF       | Total Cost     | Unit Cost | GSF      | Total Cost   | Unit Cost |
| Genera                             | I Requirements Subgroup   |              |                      |                 |           |                |           |          |              |           |
| 1                                  | General Requirements  | 382610       | 8,519,059            | \$22.27         |           |                |           |          |              |           |
|                                    | Insurance   | 382610       | 1,592,163            | \$4.16          |           |                | #DIV/0!   |          |              | #DIV/0!   |
|                                    | Subcontractor Bonds   | 382610       | 2,621,889            | \$6.85          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
|                                    | GC Bonds  | 382610       | 0                    | \$0.00          | 0         |                |           |          |              | #DIV/0!   |
|                                    | Design & Pricing Contingency<br>PMA Note: Incl. GMP Contingency | 382610       | 10,682,779           | \$27.92         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
|                                    | General Conditions  | 382610       | 9,687,506            | \$25.32         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
|                                    | Overhead & Profit   | 382610       | 4,205,160            | \$10.99         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| Faciliti                           | es Construction Subgroup  |              |                      |                 |           |                |           |          |              |           |
| 2                                  | Existing Conditions   | 382610       | 5,298,953            | \$13.85         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 3                                  | Concrete  | 382610       | 11,349,286           | \$29.66         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 4                                  | Masonry   | 382610       | 8,048,893            | \$21.04         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 5                                  | Metals  | 382610       | 21,340,676           | \$55.78         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 6                                  | Wood, Plastics and Composites                                   | 382610       | 3,108,888            | \$8.13          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 7                                  | Thermal & Moisture Protection                                   | 382610       | 16,212,191           | \$42.37         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 8                                  | Openings  | 382610       | 10,211,161           | \$26.69         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 9                                  | Finishes  | 382610       | 21,198,957           | \$55.41         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 10                                 | Specialties   | 382610       | 1,766,029            | \$4.62          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 11                                 | Equipment   | 382610       | 4,222,900            | \$11.04         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 12                                 | Furnishings   | 382610       | 710,668              | \$1.86          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 13                                 | Special Construction  | 382610       | 153,150              | \$0.40          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 14                                 | Conveying   | 382610       | 885,000              | \$2.31          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| Faciliti                           | es Services Subgroup  |              |                      |                 |           |                |           |          |              |           |
| 21                                 | Fire Suppression  | 382610       | 2,972,079            | \$7.77          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 22                                 | Plumbing  | 382610       | 7,929,280            | \$20.72         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 23                                 | HVAC  | 382610       | 28,027,560           | \$73.25         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 25                                 | Integrated Automation   | 382610       | 0                    | \$0.00          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 26                                 | Electrical  | 382610       | 18,511,138           | \$48.38         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 27                                 | Communications  | 382610       | 3,727,249            | \$9.74          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 28                                 | Electrionic Safety and Security                                 | 382610       | 2,346,508            | \$6.13          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| Site an                            | d Infrastructure Subgroup                                       |              |                      |                 |           |                |           | -        |              |           |
| 31                                 | Earthwork   | 382610       | 18,706,035           | \$48.89         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 32                                 | Exterior Improvements   | 382610       | 9,050,609            | \$23.65         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 33                                 | Utilities   | 382610       | 6,730,279            | 1759.0%         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 34                                 | Transportation  | 382610       | 0                    | 0.0%            | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
| 35                                 | Waterway and Marine Construction                                | 382610       | 0                    | \$0.00          | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
|                                    | Construction Subtotal   | 382610       | 239,816,045          | <u>\$626.79</u> | 0         | (              | ) #DIV/0! | 0        | C            | #DIV/0!   |
|                                    | Escalation to Construction Mid-Point                            | 382610       | 9,408,691            | \$24.59         | 0         |                | #DIV/0!   | 0        |              | #DIV/0!   |
|                                    | Total Cost<br>\$/GSF  | 382610       | 249,224,736<br>\$651 |                 | 0         | #DIV/0!        | )         | 0        | 0<br>#DIV/0! |           |
|                                    |   |              |                      |                 |           |                |           |          |              |           |
|                                    | Alternates  |              |                      |                 |           |                |           |          |              |           |

|   | Alternates |  |  |  |  |  |  |  |
|---|------------|--|--|--|--|--|--|--|
| 1 |            |  |  |  |  |  |  |  |
| 2 |            |  |  |  |  |  |  |  |
| 3 |            |  |  |  |  |  |  |  |
| 4 |            |  |  |  |  |  |  |  |

# PROJECT SCOPE & BUDGET COST ESTIMATE – CM-R

68.2.3 - 03

COST ESTIMATE CM-R

# UNIFORMAT

6B.2.3 – **03** 

#### 60% CD Estimate - Reconciled incl VE

| bane       |
|------------|
| 01/20/2023 |
| Rev.3      |

| Uniformat Sort                      | Quantity    | Unit Cost            | Total Cost    |
|-------------------------------------|-------------|----------------------|---------------|
| MAIN BUILDING                       | 380,570 GSF | \$417.02 / GSF       | \$158,705,642 |
| A SUBSTRUCTURE                      |             | \$26.58 / GSF        | \$10,115,661  |
| B SHELL                             |             | \$133.46 / GSF       | \$50,792,402  |
| C INTERIORS                         |             | \$82.38 / GSF        | \$31,352,662  |
| D SERVICES                          |             | \$158.84 / GSF       | \$60,450,925  |
| E EQUIPMENT & FURNISHINGS           |             | \$15.75 / GSF        | \$5,993,992   |
| CONCESSIONS / TOILET BLDG           | 0 GSF       | \$0.00 / GSF         | \$0           |
| A SUBSTRUCTURE                      |             | \$0.00 / GSF         | \$0           |
| B SHELL                             |             | \$0.00 / GSF         | \$0           |
| C INTERIORS                         |             | \$0.00 / GSF         | \$0           |
| D SERVICES                          |             | \$0.00 / GSF         | \$0           |
| E EQUIPMENT & FURNISHINGS           |             | \$0.00 / GSF         | \$0           |
| LOCKER BLDG                         | 0 GSF       | \$0.00 / GSF         | \$0           |
| A SUBSTRUCTURE                      |             | \$0.00 / GSF         | \$0           |
| B SHELL                             |             | \$0.00 / GSF         | \$0           |
| C INTERIORS                         |             | \$0.00 / GSF         | \$0           |
| D SERVICES                          |             | \$0.00 / GSF         | \$0           |
| MAINTENANCE BLDG                    | 2,040 GSF   | \$254.40 / GSF       | \$518,969     |
| A SUBSTRUCTURE                      |             | \$70.94 / GSF        | \$144,715     |
| B SHELL                             |             | \$24.09 / GSF        | \$49,147      |
| C INTERIORS                         |             | \$31.56 / GSF        | \$64,381      |
| D SERVICES                          |             | \$54.13 / GSF        | \$110,425     |
| F SPECIAL CONSTRUCTION & DEMOLITION |             | \$73.68 / GSF        | \$150,300     |
| SITEWORK                            | 382,610 GSF | \$108.34 / GSF       | \$41,453,440  |
| G SITEWORK                          |             | \$103.82 / GSF       | \$39,723,065  |
| Z GENERAL                           |             | \$4.52 / GSF         | \$1,730,375   |
| DEMO & ABATEMENT                    | 0 GSF       | \$3,493,683.00 / GSF | \$3,493,683   |
| F SPECIAL CONSTRUCTION & DEMOLITION |             | \$0.00 / GSF         | \$3,493,683   |
| Subtotal Direct Cost                |             | \$533.63 /SF         | \$204,171,734 |

#### 60% CD Estimate - Reconciled incl VE



| Indirect Costs                            | Amount | Total Cost    |
|---|--------|---------------|
| Design and Estimating Contingency         | 2.50%  | \$5,104,293   |
| Subtotal 1                                |        | \$209,276,027 |
| Escalation                                | 4.50%  | \$9,417,421   |
| Projected Cost of Work                    |        | \$218,693,449 |
| Subcontractor Bonds                       | 1.20%  | \$2,624,321   |
| Insurance - CCIP (Changed from GL)        |        | \$6,198,303   |
| Cost of Traditional Insurance (trade +GL) |        | (\$6,822,122) |
| Builders Risk                             |        | \$365,272     |
| Payment and Performance Bond              |        | \$1,850,710   |
| Subtotal Insurances                       |        | \$222,909,933 |
| CM General Conditions                     |        | \$9,687,591   |
| Field Office Support                      |        | \$1,010,430   |
| CM General Requirements                   |        | \$5,034,190   |
| Cost of Work / Site Services              |        | \$1,000,000   |
| CM Contingency                            | 2.50%  | \$5,467,336   |
| Subtotal 2                                |        | \$245,109,480 |
| CM Fee                                    |        | \$4,205,160   |
| Total Construction Costs                  |        | \$249,314,640 |

Total Construction Cost

\$651.62 /SF

\$249,314,640

#### 60% CD Estimate - Reconciled incl VE



#### MAIN BUILDING

| DESCRIPTION  | QUAN      | ΓΙΤΥ | UNIT COST        | TOTAL COST   |
|--|-----------|------|------------------|--------------|
| A SUBSTRUCTURE   | 380,570 0 | SSF  | \$26.58 / GSF    | \$10,115,661 |
| A10 FOUNDATIONS  |           |      | \$6.95 / GSF     | \$2,645,494  |
| A1010 STANDARD FOUNDATIONS   |           |      | \$5.66 / GSF     | \$2,155,469  |
| A1010 Standard Foundations   |           |      | \$0.74 / GSF     | \$281,990    |
| Formwork - Continuous Footings   | 3,302     | sfca | \$20.00 /sfca    | \$66,040     |
| Rebar - Continuous Footings (F&I) - ADJUST PER RECON <\$200> /<br>TON <1 TON>                                  | 14        | ton  | \$3,600.00 /ton  | \$50,400     |
| Concrete - Continuous Footings (material and placed, typ)<br><adjust <\$50="" cy="" per="" recon,=""></adjust> | 202       | су   | \$325.00 /cy     | \$65,650     |
| CIP Concrete - Interior Footings @ CMU - ADJUSTED PER RECON <\$650 / CY>                                       | 116       | су   | \$650.00 /cy     | \$75,400     |
| Concrete - Footing Steps   | 22        | су   | \$2,250.00 /cy   | \$49,500     |
| VE C01 - Raise Dropped Footings  | -1.00     | ls   | \$25,000.00 /ls  | (\$25,000)   |
| A1013 Column Foundations   |           |      | \$4.66 / GSF     | \$1,773,479  |
| Formwork - Column Footings   | 23,036    | sfca | \$22.00 /sfca    | \$506,792    |
| Formwork - Piers / Pilasters   | 1,304     | sfca | \$28.00 /sfca    | \$36,512     |
| Rebar - Piers / Pilasters (F&I) - ADJUST PER RECON <\$200> / TON   | 6.00      | ton  | \$3,600.00 /ton  | \$21,600     |
| Rebar - Column Footings (F&I) - ADJUST PER RECON <\$200> /<br>TON <4 TONS>                                     | 133       | ton  | \$3,600.00 /ton  | \$478,800    |
| Concrete Isolated Piers - Complete F&I   | 55        | су   | \$425.00 /cy     | \$23,375     |
| Concrete - Column Footings - Complete Complete F&I   | 1,834     | су   | \$350.00 /cy     | \$641,900    |
| Column Diamonds, Grout - Isolated Footings ADJUST PER RECON <\$25 PER TON>                                     | 258       | ea   | \$250.00 /ea     | \$64,500     |
| A1019 Standard Foundation Supplementary Components   |           |      | \$0.26 / GSF     | \$100,000    |
| ADD THICKENED SLAB HAUNCH @NON-SHEAR WALL CMU<br>WALLS   | 1.00      | ls   | \$100,000.00 /ls | \$100,000    |
| A2020 BASEMENT WALL CONSTRUCTION   |           |      | \$1.17 / GSF     | \$443,525    |
| A1011 Wall Foundations   |           |      | \$1.17 / GSF     | \$443,525    |
| Formwork - Retaining Wall Footings   | 2,329     | sfca | \$25.00 /sfca    | \$58,225     |
| Rebar - Retaining Wall Footings @ Wall (F&I) - ADJUST PER<br>RECON <\$200> / TON, <5 TONS>                     | 46        | ton  | \$3,600.00 /ton  | \$165,600    |
| F&I Concrete - Retaining Wall Footings   | 676       | су   | \$325.00 /cy     | \$219,700    |
| A4040 PITS & BASES   |           |      | \$0.12 / GSF     | \$46,500     |
| A4040 Pits & Bases   |           |      | \$0.12 / GSF     | \$46,500     |
| Elevator Pit Walls / Mat Slab - complete   | 16        | су   | \$1,500.00 /cy   | \$24,000     |
| Other Pit Walls / Mat Slab - Leveling & Equipment - ADJUST PER<br>RECON TO JUST DEPRESSIONS <\$75K>            | 1.00      | ls   | \$22,500.00 /ls  | \$22,500     |
| A20 SUBGRADE ENCLOSURES  |           |      | \$7.67 / GSF     | \$2,917,140  |
| A1010 STANDARD FOUNDATIONS   |           |      | \$2.64 / GSF     | \$1,003,850  |
| A1011 Wall Foundations   |           |      | \$2.64 / GSF     | \$1,003,850  |
| Formwork - @ Foundation Wall - Exterior Frost Wall   | 16,387    | sfca | \$25.00 /sfca    | \$409,675    |
| Formwork - @ Foundation Wall - Exterior Radial Frost Wall  | 1,525     | sfca | \$45.00 /sfca    | \$68,625     |
| Formwork - @ Foundation Wall - Interior Wall   | 5,727     | sfca | \$25.00 /sfca    | \$143,175    |
| Rebar - Frost Wall (F&I)   | 47        | ton  | \$3,800.00 /ton  | \$178,600    |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST        | TOTAL COST  |
|--|-------------|------------------|-------------|
| Concrete - Foundation Walls  | 627 cy      | \$325.00 /cy     | \$203,775   |
| A2020 BASEMENT WALL CONSTRUCTION   |             | \$5.03 / GSF     | \$1,913,290 |
| A2020 Basement Wall Construction   |             | \$3.88 / GSF     | \$1,476,825 |
| Formwork - @ Basement Retaining Wall   | 31,385 sfca | \$25.00 /sfca    | \$784,625   |
| Rebar - Basement Wall (F&I)  | 85 ton      | \$3,800.00 /ton  | \$323,000   |
| F&I Concrete - Basement Wall   | 1,136 cy    | \$325.00 /cy     | \$369,200   |
| A2022 Moisture Protection  |             | \$1.15 / GSF     | \$436,465   |
| Insulation / damproofing - Foundation Walls  | 8,193 sf    | \$10.00 /sf      | \$81,930    |
| Insulation / Fluid-Applied Waterproofing - Basement Walls & top of ftgs                              | 18,969 sf   | \$15.00 /sf      | \$284,535   |
| Waterproof Pits - 2 ea - Elev  | 400 sf      | \$25.00 /sf      | \$10,000    |
| Waterproof Pits -6 ea - Other  | 2,400 sf    | \$25.00 /sf      | \$60,000    |
| A40 SLABS-ON-GRADE   |             | \$5.62 / GSF     | \$2,137,402 |
| A1010 STANDARD FOUNDATIONS   |             | \$0.55 / GSF     | \$210,000   |
| A1019 Standard Foundation Supplementary Components   |             | \$0.55 / GSF     | \$210,000   |
| Weather Protection - Foundations   | 1.00 ls     | \$100,000.00 /ls | \$100,000   |
| Housekeeping Pads - allow  | 1,200 sf    | \$50.00 /sf      | \$60,000    |
| Misc Curbs, Embeds   | 1.00 ls     | \$50,000.00 /ls  | \$50,000    |
| Thickened Slab @CMU Walls - dwgs show footings & walls - VE<br>for haunched slab                     | 0.00 nic    |                  | \$0         |
| A4010 STANDARD SLABS-ON-GRADE  |             | \$3.71 / GSF     | \$1,411,554 |
| A4010 Standard Slabs-on-Grade  |             | \$3.71 / GSF     | \$1,411,554 |
| Formwork - Slab Edge   | 5,423 lf    | \$20.00 /lf      | \$108,460   |
| Formwork - Slab Construction Joints  | 2,575 lf    | \$20.00 /lf      | \$51,500    |
| Welded Wire Mesh - Slab on Grade (Incl. Overlap) F&I   | 147,327 sf  | \$1.75 /sf       | \$257,822   |
| Welded Wire Mesh - Slab on Grade (Incl. Overlap) F&I - VE to go<br>with fibermesh - not incorporated | 0.00 ls     |                  | \$0         |
| Concrete Material - (SOG)  | 1,987 cy    | \$150.00 /cy     | \$298,050   |
| Place & Finish Slab on Grade Concrete (6" @shops + 4"<br>elsewhere)                                  | 128,111 sf  | \$3.45 /sf       | \$441,983   |
| Sawcut Slab on Grade Control Joints  | 7,800 lf    | \$12.00 /lf      | \$93,600    |
| Cure / Protect Slab on Grade - ADJUST PER RECON <\$.25>  | 128,111 sf  | \$1.25 /sf       | \$160,139   |
| A4040 PITS & BASES   |             | \$0.06 / GSF     | \$23,400    |
| A4040 Pits & Bases   |             | \$0.06 / GSF     | \$23,400    |
| Support Steel - Elev. Sill Angles  | 9.00 ea     | \$1,500.00 /ea   | \$13,500    |
| Elev. Sump Pit Covers-Galv.  | 2.00 ea     | \$950.00 /ea     | \$1,900     |
| Elev. Pit Ladders  | 2.00 ea     | \$4,000.00 /ea   | \$8,000     |
| A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS   |             | \$1.29 / GSF     | \$492,448   |
| A4096 Slab-On-Grade Supplementary Components   |             | \$1.29 / GSF     | \$492,448   |
| Rigid Insulation @ S.O.G 2' @ Perimeter  | 10,846 sf   | \$2.85 /sf       | \$30,911    |
| Vapor Barrier @ S.O.G.   | 128,111 sf  | \$0.90 /sf       | \$115,300   |
| Compacted Base   Under - ONSITE PROCESSED, REDUCED PER<br>RECON @ 12" - Place & Compact              | 5,295 cy    | \$17.00 /cy      | \$90,015    |
| Fine Grade Base  | 128,111 sf  | \$1.50 /sf       | \$192,167   |





| DESCRIPTION   | QUANTITY    | UNIT COST        | TOTAL COST   |
|---|-------------|------------------|--------------|
| Rough Grade Base  | 128,111 sf  | \$0.50 /sf       | \$64,056     |
| A60 WATER & GAS MITIGATION  |             | \$2.26 / GSF     | \$860,650    |
| A6010 BUILDING SUBDRAINAGE  |             | \$2.26 / GSF     | \$860,650    |
| A6011 Foundation Drainage   |             | \$2.26 / GSF     | \$860,650    |
| Building Foundation Drainage - Perforated PVC (F&I) - Perimeter                   | 3,400 lf    | \$41.50 /lf      | \$141,100    |
| Building Foundation Drainage - Perforated PVC (F&I) - underslab                   | 10,000 lf   | \$41.50 /lf      | \$415,000    |
| E&B for Electrical within footprint   | 1.00 ls     | \$50,000.00 /ls  | \$50,000     |
| E&B for Plumbing within footprint   | 3,150 lf    | \$57.00 /lf      | \$179,550    |
| Radon Mitigation - 20 drops / 60' each  | 1.00 ls     | \$75,000.00 /ls  | \$75,000     |
| A90 SUBSTRUCTURE RELATED ACTIVITIES   |             | \$4.09 / GSF     | \$1,554,975  |
| A1010 STANDARD FOUNDATIONS  |             | \$4.09 / GSF     | \$1,554,975  |
| A9011 Backfill & Compaction   |             | \$4.09 / GSF     | \$1,554,975  |
| Excav. Column Footings  | 7,763 cy    | \$25.00 /cy      | \$194,075    |
| Excav. Continuous & Retaining Wall Footings                                       | 16,675 cy   | \$25.00 /cy      | \$416,875    |
| Excav. Pits   | 150 cy      | \$25.00 /cy      | \$3,750      |
| Backfill & Compact Column Footings  | 5,655 cy    | \$45.00 /cy      | \$254,475    |
| Backfill Pits   | 125 cy      | \$45.00 /cy      | \$5,625      |
| Backfill Wall / Footings  | 15,115 cy   | \$45.00 /cy      | \$680,175    |
| B SHELL   | 380,570 GSF | \$133.46 / GSF   | \$50,792,402 |
| B10 SUPERSTRUCTURE  |             | \$68.07 / GSF    | \$25,905,165 |
| B1010 FLOOR CONSTRUCTION  |             | \$43.82 / GSF    | \$16,676,969 |
| B1010 Floor Construction  |             | \$7.27 / GSF     | \$2,768,174  |
| Welded Wire Mesh - Structural Slabs (Incl. Overlap) F&I                           | 281,722 sf  | \$1.75 /sf       | \$493,014    |
| Buy & Place Slab on Deck Concrete 5.25" - ADJUST PER RECON<br>FOR LIGHTWT, +50/CY | 3,780 cy    | \$425.00 /cy     | \$1,606,500  |
| Finish Concrete - Metal Deck  | 244,976 sf  | \$3.75 /sf       | \$918,660    |
| VE S01A - Reduce based on sub budget  | -1.00 ls    | \$250,000.00 /ls | (\$250,000)  |
| B1011 Floor Structural Frame  |             | \$31.51 / GSF    | \$11,992,658 |
| Structural Steel Beams - HSS  | 50 ton      | \$5,700.00 /ton  | \$283,062    |
| Structural Steel Beams - MC   | 459 lb      | \$10.00 /lb      | \$4,590      |
| Structural Steel Beams - WF   | 1,260 ton   | \$5,500.00 /ton  | \$6,930,000  |
| Structural Steel Connections  | 243 ton     | \$5,500.00 /ton  | \$1,336,775  |
| VE S03 - reduce per sub budgets   | -1.00 ls    | \$500,000.00 /ls | (\$500,000)  |
| Structural Steel Bracing Bays - HSS   | 107 ton     | \$5,700.00 /ton  | \$607,905    |
| Structural Steel Columns - HSS - Square / Rectangular                             | 283 ton     | \$5,700.00 /ton  | \$1,615,494  |
| Metal Decking - Floor, 2"   | 244,976 sf  | \$7.00 /sf       | \$1,714,832  |
| B1012 Floor Decks, Slabs, & Toppings  |             | \$0.42 / GSF     | \$159,364    |
| Concrete Topping @ Precast Plank  | 17,357 sf   | \$7.25 /sf       | \$125,838    |
| Concrete Topping @ Precast Plank - updated per VE S04                             | -893.00 sf  | \$7.25 /sf       | (\$6,474)    |
| Housekeeping Pads Complete  | 1,000 sf    | \$40.00 /sf      | \$40,000     |
| Geofoam - Stage Floor & Raised Platform - deleted                                 | 0.00 excl   |                  | \$0          |
| B1014 Mezzanine Floor Construction  |             | \$2.26 / GSF     | \$858,352    |
| Floor Precast - Plank - Hollow Core 8" Thick - Mezzanine                          | 17,357 sf   | \$48.00 /sf      | \$833,136    |

#### 60% CD Estimate - Reconciled incl VE



| SCRIPTION  | QUANT   | TITY | UNIT CC      | )ST   | TOTAL COST         |
|--|---------|------|--------------|-------|--------------------|
| Floor Precast - Plank - Hollow Core 8" Thick - Mezzanine -<br>reduced per VE S04                   | -893.00 | sf   | \$48.00      | /sf   | (\$42,864)         |
| Wood Decking - 3/4" @ Mezzanine Complete \$/sf - ADJUST PER<br>RECON +40/CY                        | 1,702   | sf   | \$40.00      | /sf   | \$68,080           |
| B1019 Floor Construction Supplementary Components  |         |      | \$2.36       | / GSF | \$898,421          |
| Applied Fireproofing Complete \$/sf  | 244,976 | sf   | \$3.30       | /sf   | \$808,421          |
| Intumescent Fireproofing @ exposed framing / bracing - allow                                       | 1.00    | allw | \$40,000.00  | /allw | \$40,000           |
| Misc. Patching of Fireproofing   | 1.00    | ls   | \$50,000.00  | /ls   | \$50,000           |
| B1020 ROOF CONSTRUCTION  |         |      | \$20.19      | / GSF | \$7,682,096        |
| B1021 Roof Structural Frame  |         |      | \$17.37      | / GSF | \$6,609,237        |
| Structural Steel Connections   | 140     | ton  | \$5,500.00   | /ton  | \$772,145          |
| Structural Steel Beams - HSS   | 1,691   | lb   | \$10.00      | /lb   | \$16,910           |
| Structural Steel Beams - MC  | 261     | lb   | \$10.00      | /lb   | \$2,610            |
| Structural Steel Beams - WF  | 446     | ton  | \$5,500.00   | /ton  | \$2,454,815        |
| Structural Steel Bracing Bays - HSS  | 62      | ton  | \$5,700.00   | /ton  | \$351,177          |
| Structural Steel Columns - HSS - Round   | 26      | ton  | \$6,000.00   | /ton  | \$156,240          |
| Structural Steel Columns - HSS - Square / Rectangular  | 164     | ton  | \$5,700.00   | /ton  | \$933,147          |
| Steel Dunnage - Galvanized   | 43      | ton  | \$6,250.00   | /ton  | \$268,125          |
| Steel Joist - DLH  | 115     | ton. | \$5,350.00   | /ton. | \$614,126          |
| Metal Decking - Roof Cornice, 1"   | 5,915   | sf   | \$6.00       | /sf   | \$35 <i>,</i> 490  |
| Metal Decking - Roof, 1-1/2"   | 291     | sf   | \$6.00       | /sf   | \$1,746            |
| Metal Decking - Roof, 2" - ADJUST PER RECON, ADDED   | 20,118  | sf   | \$6.00       | /sf   | \$120,708          |
| Metal Decking - Roof, 3"   | 102,555 | sf   | \$7.00       | /sf   | \$717,885          |
| Metal Roof Deck - Acoustic   | 12,624  | sf   | \$13.00      | /sf   | \$164,112          |
| B1022 Roof Decks, Slabs, & Sheathing   |         |      | \$1.08       | / GSF | \$409,599          |
| Welded Wire Mesh - Roof Deck (Incl. Overlap) F&I   | 23,135  | sf   | \$1.75       | /sf   | \$40,486           |
| Concrete Material & Place -@ Roof Deck - ADJUST PER RECON<br>FOR LIGHTWT, +50/CY                   | 310     | су   | \$425.00     | /cy   | \$131,750          |
| Finish Concrete - Roof Roof Deck   | 20,118  | sf   | \$3.75       | /sf   | \$75,443           |
| Roof Equipment Pads, CIP Concrete - complete   | 4,048   | sf   | \$40.00      | /sf   | \$161,920          |
| B1029 Roof Construction Supplementary Components   |         |      | \$1.74       | / GSF | \$663,261          |
| Rough Carpentry - Roof Blocking  | 5,925   | lf   | \$12.00      | /lf   | \$71,100           |
| Rough Carpentry @ Curbs  | 37      | ea   | \$750.00     | /ea   | \$27,750           |
| Temporary Roof Perimeter Protection  | 1.00    | allw | \$20,000.00  | /allw | \$20,000           |
| Temporary Roof Protection  | 1.00    | allw | \$15,000.00  | /allw | \$15,000           |
| Applied Fireproofing Complete \$/sf - ADJUST PER RECON<br>+\$.40/SF                                | 141,503 | sf   | \$3.60       | /sf   | \$509,411          |
| Intumescent Fireproofing @ exposed framing / bracing - allow                                       | 1.00    | allw | \$10,000.00  | /allw | \$10,000           |
| Misc. Patching of Fireproofing   | 1.00    | ls   | \$10,000.00  | /ls   | \$10,000           |
| B1080 STAIRS   |         |      | \$4.06       | / GSF | \$1,546,100        |
| B1081 Stair Construction   |         |      | \$3.90       | / GSF | \$1,482,500        |
| Ext. Stairs - Exterior Stair to second floor deck, incl. rail, 28 risers and 1 landing, 1 location | 1.00    | flgt | \$30,000.00  | /flgt | \$30,000           |
| Stairs - Concrete In Steel Pan Stairs  | 16      | flgt | \$12,500.00  | /flgt | \$202 <i>,</i> 500 |
| Stairs - Concrete risers @ Aud   | 1.00    | ls   | \$125,000.00 | /ls   | \$125,000          |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUAN      | ΓΙΤΥ | UNIT CO      | ST    | TOTAL COST   |
|---|-----------|------|--------------|-------|--------------|
| Stairs - Monument / Feature w/ Rails - Open Ornamental Stair, 1 location                                      | 3.00      | flgt | \$135,000.00 | /flgt | \$405,000    |
| Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 1 locations  | 1.00      | flgt | \$45,000.00  | /flgt | \$45,000     |
| Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 6 locations  | 15        | flgt | \$45,000.00  | /flgt | \$675,000    |
| B2017 Balcony Walls & Railings  |           |      | \$0.17       | / GSF | \$63,600     |
| Railing   Ballasted Guardrail at High Roof  | 65        | lf   | \$160.00     | /lf   | \$10,400     |
| Railing   Exterior Guardrail at Rotunda Porch - INCREASED PER<br>RECON  | 195       | lf   | \$272.82     | /lf   | \$53,200     |
| Railing   Playground Fencing w/ Privacy Screen - DELETED PER<br>RECON, CARRIED IN LANDSCAPE                   | 0.00      | lf   |              |       | \$0          |
| B20 EXTERIOR VERTICAL ENCLOSURES  |           |      | \$50.37      | / GSF | \$19,169,952 |
| B2010 EXTERIOR WALLS  |           |      | \$32.19      | / GSF | \$12,251,841 |
| B2011 Exterior Wall Veneer  |           |      | \$21.57      | / GSF | \$8,210,750  |
| Staging and Scaffolding - Exterior CMU - All exterior Masonry   | 1.00      | ls   | \$185,000.00 | /ls   | \$185,000    |
| Exterior Face Brick Veneer - ADJUST PER RECON, +\$2/SF  | 23,043    | sf   | \$45.00      | /sf   | \$1,036,935  |
| Exterior CMU - CMU Veneer - ADJUST PER RECON, +\$2/SF   | 33,536    | sf   | \$37.00      | /sf   | \$1,240,832  |
| Exterior Stone - 2" Granite Veneer Panels   | 2,385     | sf   | \$175.00     | /sf   | \$417,375    |
| Exterior Stone - 2" Granite Veneer Panels VE TO CHANGE TO<br>ARRISCRAFT                                       | -2385.00  | sf   | \$125.00     | /sf   | (\$298,125)  |
| Exterior Cast Stone Veneer - Arriscraft   | 7,310     | sf   | \$50.00      | /sf   | \$365,500    |
| Cast Stone Column Wraps at South Entrance   | 2.00      | ea   | \$15,000.00  | /ea   | \$30,000     |
| Screen Wall   RTU Screen @ mech. equip none shown, excluded   | 0.00      | excl |              |       | \$0          |
| Metal Panel   Insulated Metal Panels w/ 4" LGMF Backup  | 14,863    | sf   | \$90.00      | /sf   | \$1,337,670  |
| Metal Panel   Flat-Lock Metal Tiles over 9/16" Galvanized Utility<br>Deck                                     | 4,976     | sf   | \$145.00     | /sf   | \$721,520    |
| Metal Panel   Corrugated Insulated Metal Panels on Aluminum<br>Clip System                                    | 4,978     | sf   | \$76.00      | /sf   | \$378,328    |
| ACM   ACM Cornice - Tapered Roof Edge, Low Roofs (~6-8'<br>Surface Area) - ADJUST PER RECON <\$35/LF>         | 1,931     | lf   | \$1,015.00   | /lf   | \$1,959,965  |
| ACM   ACM Panels on Metal Clip System   | 4,040     | sf   | \$95.00      | /sf   | \$383,800    |
| ACM   ACM Column Wraps/Fin Projections at 4th Floor Canopy -<br>South Elevation +\$370/LF                     | 150       | lf   | \$580.00     | /lf   | \$87,000     |
| ACM   ACM Column Wraps/Fin Projections at Rotunda - 27' Tall -<br>ADJUST PER RECON +250/LF                    | 515       | lf   | \$435.00     | /lf   | \$224,025    |
| ACM   ACM Decorative Accent Bandings - ADJUST PER RECON,<br>+\$25/LF)   | 525       | lf   | \$145.00     | /lf   | \$76,125     |
| Exterior Enclosure Painting, Staining & Transparent Finishing   | 720       | mhr  | \$90.00      | /mhr  | \$64,800     |
| B2012 Exterior Wall Construction  |           |      | \$9.41       | / GSF | \$3,579,798  |
| Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU,<br>Insul, AVB, NO INT GWB) - ADJUSTED PER RECON | 35,909    | sf   | \$46.00      | /sf   | \$1,651,814  |
| PER RECON, RE-ALLOCATED 10K SF TO LGMF  | -10000.00 | sf   | \$46.00      | /sf   | (\$460,000)  |
| PER VE-A02 - change 12" Back-up to 8"   | -1.00     | ls   | \$45,500.00  | /ls   | (\$45,500)   |
| Stabilizer Clips-Galv. @ Perimeter Masonry Walls  | 70,145    | sf   | \$1.00       | /sf   | \$70,145     |
| Blocking @ Exterior Wall Mounted Railing \$/If  | 355       | lf   | \$10.00      | /lf   | \$3,550      |
| Blocking @ Exterior Louver \$/If  | 715       | lf   | \$10.00      | /lf   | \$7,150      |

#### 60% CD Estimate - Reconciled incl VE



| ESCRIPTION  | QUANTITY     | UNIT COST      | TOTAL COST  |
|---|--------------|----------------|-------------|
| Exterior Air and Vapor Barrier System (AVB) - Total enclosure SF  | 130,946 sfwa | \$0.00 /sfwa   | \$0         |
| Caulking and Sealants, Exterior - Total enclosure SF  | 130,946 sfwa | \$0.75 /sfwa   | \$98,210    |
| Exterior Wall Backup GWB Stud Wall - 6" MS, AVB, Dens Glass,<br>Insul., 5/8 GWB                                       | 42,213 sf    | \$22.00 /sf    | \$928,686   |
| Exterior Wall Backup GWB Stud Wall - 4" MS at Insulated MWP   | 10,584 sf    | \$14.00 /sf    | \$148,176   |
| Exterior Framing for Decorative Cornices - 3 5/8" MS, AVB, Dens<br>Glass, Insul.                                      | 11,323 sf    | \$28.00 /sf    | \$317,044   |
| Exterior Framing for Soffits - 3 5/8" MS, AVB, Dens Glass, Insul.   | 4,441 sf     | \$32.00 /sf    | \$142,112   |
| Exterior Framing, As Required, for ACM Column Wraps/Fins at Rotunda   | 1,760 sf     | \$40.00 /sf    | \$70,400    |
| Exterior Framing, INCREASE PER RECONCILIATION   | 72,231 sf    | \$4.57 /sf     | \$329,811   |
| Exterior Framing, PER RECONCILIATION, RE-ALLOCATE 10K SF<br>FROM CMU  | 10,000 sf    | \$28.00 /sf    | \$280,000   |
| Exterior Framing w/ AVB and Insulation at Low Roof Parapets   | 1,910 sf     | \$20.00 /sf    | \$38,200    |
| B2013 Exterior Wall Interior Skin   |              | \$0.70 / GSF   | \$264,790   |
| 2" Closed Cell Spray Foam Insulation - ADJUSTED PER RECON -<br>+\$2/SF  | 43,905 sf    | \$5.50 /sf     | \$241,478   |
| 6" Closed Cell Spray Foam Insulation- ADJUSTED PER RECON -<br>+\$2/SF   | 2,914 sf     | \$8.00 /sf     | \$23,312    |
| B2018 Exterior Wall Supplementary Components  |              | \$0.50 / GSF   | \$190,504   |
| Sheet Metal Flashing & Trim Complete \$/sf  | 152,403 sfwa | \$1.25 /sfwa   | \$190,504   |
| B2019 Exterior Wall Opening Supplementary Components  |              | \$0.02 / GSF   | \$6,000     |
| Exterior Signage   Name and logo sign attached to enclosure,<br>Aluminum  | 1.00 ls      | \$6,000.00 /ls | \$6,000     |
| B2020 EXTERIOR WINDOWS  |              | \$16.53 / GSF  | \$6,290,896 |
| B2021 Exterior Operating Windows  |              | \$0.21 / GSF   | \$81,750    |
| Blocking @ Window Perimeter \$/If   | 5,450 lf     | \$15.00 /lf    | \$81,750    |
| B2022 Exterior Fixed Windows  |              | \$1.21 / GSF   | \$460,250   |
| Window   Insulated Translucent Wall Panel System w/ Integral<br>Louvers   | 2,630 sf     | \$175.00 /sf   | \$460,250   |
| B2023 Exterior Window Wall Storefronts  |              | \$4.69 / GSF   | \$1,784,040 |
| Exterior Windows   Insulating Glass in Aluminum System -<br>ADJUST PER RECON, +\$10/SF                                | 10,209 sf    | \$120.00 /sf   | \$1,225,080 |
| Storefront   Insulating Glass in Aluminum Storefront System-<br>ADJUST PER RECON, +\$10/SF                            | 4,658 sf     | \$120.00 /sf   | \$558,960   |
| Premium for Operable Vents at Storefront/Windows/Translucent<br>Panels  | 0.00 ea      |                | \$0         |
| B2029 Curtain Walls   |              | \$10.42 / GSF  | \$3,964,856 |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>6" System- ADJUST PER RECON, +\$10/SF            | 60 sf        | \$145.00 /sf   | \$8,700     |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>7" System- ADJUST PER RECON, +\$10/SF            | 18,131 sf    | \$148.00 /sf   | \$2,683,388 |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>7" System - Radiused- ADJUST PER RECON, +\$10/SF | 5,481 sf     | \$148.00 /sf   | \$811,188   |
| Curtain Wall - Premium for Bullet Resistant Glazing   | 1,235 sf     | \$100.00 /sf   | \$123,500   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY  | UNIT COST         | TOTAL COST  |
|---|-----------|-------------------|-------------|
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>10" System- ADJUST PER RECON, +\$10/SF | 2,113 sf  | \$160.00 /sf      | \$338,080   |
| B2050 EXTERIOR DOORS & GRILLES  |           | \$1.37 / GSF      | \$523,215   |
| B2051 Exterior Entrance Doors   |           | \$0.75 / GSF      | \$284,900   |
| Door   HM Double Exterior - Incl. Door, Frame, and Hardware   | 3.00 ea   | \$7,000.00 /ea    | \$21,000    |
| Door   HM Single Exterior - Incl. Door, Frame, and Hardware   | 5.00 ea   | \$3,500.00 /ea    | \$17,500    |
| Glass & Alum Doors - Double Exterior - Incl. Door, Frame, and<br>Hardware                                   | 24 ea     | \$8,800.00 /ea    | \$211,200   |
| Glass & Alum Doors - Single Exterior - Incl. Door, Frame, and Hardware                                      | 8.00 ea   | \$4,400.00 /ea    | \$35,200    |
| B2053.4 Overhead & Roll Up Doors  |           | \$0.63 / GSF      | \$238,315   |
| Door   Insulated Overhead Coiling Door, Motor Operated, 1 each  | 115 sf    | \$55.00 /sf       | \$6,325     |
| Door   Motor Operated Overhead Door w/ Insulating Glass -<br>Typ., 13 ea                                    | 2,442 sf  | \$95.00 /sf       | \$231,990   |
| <b>B2070 EXTERIOR LOUVERS &amp; VENTS</b>   |           | \$0.27 / GSF      | \$104,000   |
| B2071 Exterior Louvers  |           | \$0.27 / GSF      | \$104,000   |
| Louver   Exterior Louvers   | 1,040 sf  | \$100.00 /sf      | \$104,000   |
| B30 EXTERIOR HORIZONTAL ENCLOSURES  |           | \$15.02 / GSF     | \$5,717,285 |
| B3010 ROOFING   |           | \$13.48 / GSF     | \$5,128,490 |
| B3012 Low Slope Membrane Systems  |           | \$12.98 / GSF     | \$4,941,385 |
| Green Roof System - Planter / Plantings Allowance   | 1.00 allw | \$50,000.00 /allw | \$50,000    |
| Pre-Vegetated Roof Garden System  | 4,820 sf  | \$50.00 /sf       | \$241,000   |
| Roof System Type A - TPO Membrane, 1/2" Cover Board, 6-1/2"<br>Insul.                                       | 67,401 sf | \$30.00 /sf       | \$2,022,030 |
| Roof System Type B- TPO Membrane, 1/2" Cover Board, 6-1/2"<br>Tapered Insul.                                | 67,660 sf | \$33.00 /sf       | \$2,232,780 |
| Concrete Paver Roof System over Membrane Roof - ADJUST PER<br>RECON, QTY & uNIT \$                          | 3,860 sf  | \$45.00 /sf       | \$173,700   |
| Rubber Paver Roof System over Membrane Roof   | 2,365 sf  | \$55.00 /sf       | \$130,075   |
| Premium for Tapered Cricket Areas   | 18,360 sf | \$5.00 /sf        | \$91,800    |
| Slip sheet @ PV Arra areas - Not Included per DD VE   | 0.00 sf   |                   | \$0         |
| B3014.2 Flashings & Trim  |           | \$0.41 / GSF      | \$155,105   |
| Patch and Seal Roof Penetrations  | 1.00 ls   | \$35,000.00 /ls   | \$35,000    |
| Metal Coping at Granite Wall  | 95 lf     | \$135.00 /lf      | \$12,825    |
| Roof Edge Fascia  | 5,364 lf  | \$20.00 /lf       | \$107,280   |
| B3019 Roofing Supplementary Components  |           | \$0.08 / GSF      | \$32,000    |
| Elevator Roof Vent  | 2.00 ea   | \$2,500.00 /ea    | \$5,000     |
| Expansion Joints - 4" Bellows Joint   | 180 lf    | \$150.00 /lf      | \$27,000    |
| B3020 ROOF APPURTENANCES  |           | \$0.57 / GSF      | \$218,800   |
| B3020 Roof Appurtenances  |           | \$0.32 / GSF      | \$122,300   |
| Smoke Hatches - Bilco Automatic Fire/Smoke Vent (4'6"x6'6")<br>DELETED @ RECON                              | 0.00 nic  |                   | \$0         |
| Roofing Pavers/Walkways - ADJUST PER RECON - RUBBER VS<br>PRECAST   | 11,615 sf | \$10.53 /sf       | \$122,300   |
| G2061.4 Site Furnishings  |           | \$0.25 / GSF      | \$96,500    |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANTITY    | UNIT COST     | TOTAL COST   |
|---|-------------|---------------|--------------|
| Roof Deck - Fiberglass Planters - deleted per VE  | 0.00 nic    |               | \$0          |
| Roof Deck - Raised Stacked 4x4 Wood Platers w Semi-intensive<br>green rf - deleted per VE                       | 0.00 nic    |               | \$0          |
| Roof Deck - Roof Pavers not on pedestals - pavers cut to follow roof pitches                                    | 3,860 sf    | \$25.00 /sf   | \$96,500     |
| Roof Deck - Synthetic Turf - deleted per VE   | 0.00 nic    |               | \$0          |
| Roof Deck - Wood Bench - surface mounted wood / metal link<br>bench   | 0.00 nic    |               | \$0          |
| Roof Deck - Wood Deck   | 0.00 nic    |               | \$0          |
| Roof Deck - Wood Pergola - deleted per VE   | 0.00 nic    |               | \$0          |
| Roof Deck - Wood Seatwalls, stacked   | 0.00 nic    |               | \$0          |
| B3080 OVERHEAD EXTERIOR ENCLOSURES  |             | \$0.97 / GSF  | \$369,995    |
| B3081 Exterior Ceilings   |             | \$0.97 / GSF  | \$369,995    |
| Soffits - ACM   | 1,771 sf    | \$120.00 /sf  | \$212,520    |
| Soffits - Exterior Rated Gyp  | 1,715 sf    | \$25.00 /sf   | \$42,875     |
| Soffits - Linear Metal Ceilings   | 955 sf      | \$120.00 /sf  | \$114,600    |
| Exterior Ceiling   Plaster Soffit - Exterior- ADJUST PER RECON, DELETED DOUBLE UP                               | 0.00 sf     |               | \$0          |
| Exterior Ceiling Finishes   Paint, Stain, and Finish Exterior Ceilings<br>- ADJUST PER RECON, DELETED DOUBLE UP | 0.00 sf     |               | \$0          |
| C INTERIORS   | 380,570 GSF | \$82.38 / GSF | \$31,352,662 |
| C10 INTERIOR CONSTRUCTION   |             | \$49.96 / GSF | \$19,015,138 |
| C1010 INTERIOR PARTITIONS   |             | \$35.85 / GSF | \$13,644,658 |
| C1011 Interior Fixed Partitions   |             | \$28.83 / GSF | \$10,971,078 |
| Interior CMU 4.0 - 4"   | 2,226 sf    | \$22.00 /sf   | \$48,972     |
| Interior CMU 8.0 - 8"   | 54,681 sf   | \$26.00 /sf   | \$1,421,706  |
| Interior CMU 8.1 - 8"   | 913 sf      | \$26.00 /sf   | \$23,738     |
| Interior CMU 8.2 - 8" (2hr RATED)   | 12,434 sf   | \$30.00 /sf   | \$373,020    |
| Interior CMU 12.0 - 12"   | 10,667 sf   | \$35.00 /sf   | \$373,345    |
| Interior CMU 12.2 - 12"   | 4,824 sf    | \$35.00 /sf   | \$168,840    |
| Interior CMU ADJUST PER RECON - INCREASE QTY FOR HIGHER<br>HT (LOWER AT MEZZ)                                   | 12,831 sf   | \$28.00 /sf   | \$359,268    |
| Interior CMU ADJUST PER VE S04  | -65.00 sf   | \$350.00 /sf  | (\$22,750)   |
| Interior Rough Carpentry  | 382,610 sf  | \$2.04 /sf    | \$780,800    |
| Wall Type (F1.0) GWB on 7/8" Metal Furring  | 813 sf      | \$13.00 /sf   | \$10,569     |
| Wall Type (F2.0) GWB on 1-5/8" Metal Stud   | 1,724 sf    | \$13.00 /sf   | \$22,412     |
| Wall Type (F4.0) 3-5/8" MS, 1lyr 5/8" GWB OS  | 14,311 sf   | \$13.00 /sf   | \$186,043    |
| Wall Type (F6) 6" MS, 1lyr 5/8" GWB OS  | 32,075 sf   | \$18.00 /sf   | \$577,350    |
| Wall Type (F6.0A) 6" MS, 2lyrs 5/8" GWB OS  | 38,024 sf   | \$18.00 /sf   | \$684,432    |
| Wall Type - ADJUST PARTITION UNIT \$ PER SUB QUOTES   | 66,429 sf   | \$18.40 /sf   | \$1,222,286  |
| Wall Type - PER RECON, INCREASE PARTITION QTY   | 376,000 sf  | \$1.00 /sf    | \$376,000    |
| Wall Type (F4.0A) 3-5/8" MS, 2lyrs 5/8" GWB OS  | 10,279 sf   | \$19.00 /sf   | \$195,301    |
| Wall Type (G4.0) 3-5/8" MS, 1lyr 5/8" GWB ES, 3-1/2" Acoustic<br>Batt   | 125 sf      | \$16.50 /sf   | \$2,063      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY  | UNIT COST         | TOTAL COST  |
|---|-----------|-------------------|-------------|
| Wall Type (G6.0) 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt                      | 52,111 sf | \$18.00 /sf       | \$937,998   |
| Wall Type (G6.0A) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt                    | 57,319 sf | \$19.00 /sf       | \$1,089,061 |
| Wall Type (G6.0B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt                    | 56,657 sf | \$19.50 /sf       | \$1,104,812 |
| Wall Type (G6.0C) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt                    | 1,063 sf  | \$19.50 /sf       | \$20,729    |
| Wall Type (G6.1) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt                     | 5,196 sf  | \$19.50 /sf       | \$101,322   |
| Wall Type (G6.1B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt                    | 2,490 sf  | \$19.50 /sf       | \$48,555    |
| Wall Type (G6.2) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt, 2hr<br>RATED       | 13,907 sf | \$23.00 /sf       | \$319,861   |
| Wall Type (S6.1) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB,<br>2hr RATED | 890 sf    | \$22.00 /sf       | \$19,580    |
| Wall Type (S6.2) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB,<br>2hr RATED | 23,883 sf | \$22.00 /sf       | \$525,426   |
| Partition - change from CMU to GWB per VE S04                                   | 65 sf     | \$5.25 /sf        | \$341       |
| Partition - Premium Abuse Resistant Drywall                                     | 0.00 lf   |                   | \$0         |
| C1016 Glazed Partitions & Storefronts   |           | \$6.78 / GSF      | \$2,579,915 |
| Borrowed lights- BL1-BL5  | 865 sf    | \$70.00 /sf       | \$60,550    |
| CW Interior   | 4,805 sf  | \$140.00 /sf      | \$672,700   |
| Storefront - Interior   | 11,175 sf | \$105.00 /sf      | \$1,173,375 |
| Storefront - Interior, FIRE RATED   | 2,857 sf  | \$225.00 /sf      | \$642,825   |
| Art Glass Panels @ Cafeteria (PREMIUM)  | 219 sf    | \$25.00 /sf       | \$5,465     |
| Glazing - Interior Ballistic, not shown Allowance                               | 1.00 allw | \$25,000.00 /allw | \$25,000    |
| C1017 Interior Guardrails & Screens   |           | \$0.25 / GSF      | \$93,665    |
| Gym   Flexible Stainless Steel Safety Netting By Metal<br>Fabrications          | 2,370 sf  | \$39.52 /sf       | \$93,665    |
| C1020 INTERIOR WINDOWS  |           | \$0.00 / GSF      | \$1,500     |
| C1020 Interior Windows  |           | \$0.00 / GSF      | \$1,500     |
| Transaction Window - Interior   | 1.00 ea   | \$1,500.00 /ea    | \$1,500     |
| C1030 INTERIOR DOORS  |           | \$5.18 / GSF      | \$1,972,013 |
| C1031.4 Standard Interior Doors   |           | \$3.48 / GSF      | \$1,325,780 |
| Door type Al 2- 24" x $2'-9$ " & 23" x 24" Vision Panel                         | 33 ea     | \$800.00 /ea      | \$26,400    |
| Door type C- Stainless coiling door at counter 4'-6-3/8 x 3'-9-1/8"             | 17 sf     | \$175.00 /sf      | \$2.975     |
| Door type F   | 568 ea    | \$385.00 /ea      | \$218.680   |
| Door type FW1- 24" x 31" Vision Panel   | 10 ea     | \$475.00 /ea      | \$4,750     |
| Door type FW2- 12" x 12" Vision Panel   | 1.00 ea   | \$455.00 /ea      | \$455       |
| Door type RG- Overhead Rolling Security Grille 6'x 10'- 4 each                  | 240 sf    | \$100.00 /sf      | \$24,000    |
| Door type W1- 24" x 5'-4"" Vision Panel   | 1.00 ea   | \$515.00 /ea      | \$515       |
| Door type W2- 24" x 2'-9" & 23" x 24" Vision Panel                              | 4.00 ea   | \$550.00 /ea      | \$2,200     |
| Door type WM- Wire Mesh panel   | 28 ea     | \$350.00 /ea      | \$9,800     |
| Frame- Type 1   | 287 ea    | \$300.00 /ea      | \$86,100    |
| Frame- Type 2   | 126 ea    | \$425.00 /ea      | \$53,550    |
| Frame- Type 4   | 13 ea     | \$450.00 /ea      | \$5,850     |
| Frame- Type 4A  | 23 ea     | \$475.00 /ea      | \$10,925    |
| Frame- Type 5   | 7.00 ea   | \$400.00 /ea      | \$2,800     |
| Frame- Type 6 &6A   | 4.00 ea   | \$400.00 /ea      | \$1,600     |
| Frame- Type 9   | 2.00 ea   | \$9,100.00 /ea    | \$18,200    |





| DESCRIPTION  | QUANT   | TITY  | UNIT CO      | DST      | TOTAL COST       |
|--|---------|-------|--------------|----------|------------------|
| Glazing   Interior doors and sidelights  | 2,793   | sf    | \$35.00      | /sf      | \$97,755         |
| Hardware   Interior Door Hardware Per Leaf   | 645     | leaf  | \$600.00     | /leaf    | \$387,000        |
| Install doors and hardware   | 3,225   | hr    | \$90.00      | /hr      | \$290,250        |
| Paint Interior - Door & Frames   | 1,093   | ea    | \$75.00      | /ea      | \$81,975         |
| C1035 Interior Panel Doors   |         |       | \$0.94       | / GSF    | \$357,000        |
| Support Steel - Interior Rolling Door/Grille Supports  | 1.00    | ls    | \$42,000.00  | /ls      | \$42,000         |
| Overhead Coiling Doors - Stainless Steel   | 1.00    | ea    | \$10,000.00  | /ea      | \$10,000         |
| Overhead Coiling Doors - Standard  | 3.00    | ea    | \$20,000.00  | /ea      | \$60,000         |
| Overhead Rolling Doors - 2 hr Fire Rated, 4 ea, various sizes, 575<br>sf total   | 1.00    | ls    | \$245,000.00 | /Is      | \$245,000        |
| C1039 Interior Door Supplementary Components   |         |       | \$0.76       | / GSF    | \$289,233        |
| Misc. Interior Caulking - General  | 380,570 | sf    | \$0.76       | /sf      | \$289,233        |
| C1090 INTERIOR SPECIALTIES   |         |       | \$8.93       | / GSF    | \$3,396,966      |
| C1091.4 Interior Railings & Handrails  |         |       | \$1.48       | / GSF    | \$562,075        |
| Guard Rail - Interior - Steel Railings (non - stair)   | 430     | lf    | \$90.00      | /lf      | \$38,700         |
| Guard Rail - Interior - Auditorium   | 700     | lf    | \$300.00     | /lf      | \$210.000        |
| Guard Rail - Interior - Glass Guardrail System   | 275     | lf    | \$525.00     | ,<br>/If | \$144.375        |
| Guard Rail - Interior - Glass Guardrail System - VE change some to cable guardrail   | -1.00   | ls    | \$35,000.00  | /Is      | (\$35,000)       |
| Guard Rail - Interior - Guard Rail at Mezzanine  | 1,425   | lf    | \$150.00     | /lf      | \$213,750        |
| Guard Rail - Interior - Guard Rail at Mezzanine - reduced per VE<br>S04  | -65.00  | lf    | \$150.00     | /lf      | (\$9,750)        |
| C1092.2 Compartments & Cubicles  |         |       | \$0.30       | / GSF    | \$112,586        |
| Cubicles   Cubicle Curtains and Track at Nurse's Area.   | 1.00    | ls    | \$7,000.00   | /ls      | \$7,000          |
| Toilet Compartment - Plastic Laminate - Standard   | 45      | stall | \$1,200.00   | /stall   | \$54,000         |
| Toilet Compartment - Plastic Laminate - Handicapped  | 17.00   | stall | \$1,500.00   | /stall   | \$25,500         |
| Urinal Screen - Plastic Laminate   | 37.00   | ea    | \$425.00     | /ea      | \$15,725         |
| Wire Mesh Partition (assume 8' high) - Interior  | 1,151   | sf    | \$9.00       | /sf      | \$10,361         |
| C1092.4 Toilet, Bath, & Laundry Accessories  |         |       | \$0.61       | / GSF    | \$232,085        |
| Toilet Accessories - Unload / Store / Categorize   | 635.00  | mhr   | \$90.00      | /mhr     | \$57,150         |
| Toilet Accessories - Distribute / Install  | 635.00  | mhr   | \$90.00      | /mhr     | \$57,150         |
| Non Restroom   Soap: Soap Dispenser, Wall Mtd.   | 143     | ea    | \$80.00      | /ea      | \$11,440         |
| Restroom   Soap: Soap Dispenser, Wall Mtd.   | 83.00   | ea    | \$80.00      | /ea      | \$6,640          |
| Restroom   Paper Towel Dispenser & Trash, Semi Recessed  | 71.00   | ea    | \$205.00     | /ea      | \$14,555         |
| Restroom   Toilet Paper Dispenser, Wall Mtd.   | 105.00  | ea    | \$100.00     | /ea      | \$10,500         |
| Restroom   Sanitary Napkin Disposal, Recessed  | 105     | ea    | \$75.00      | /ea      | \$7 <i>,</i> 875 |
| Restroom   Soap: Shampoo Dispenser, Shower Wall Mtd.   | 10.00   | ea    | \$90.00      | /ea      | \$900            |
| Restroom   Grab Bar: 36" Peened Grip, Wall Mtd.  | 60.00   | ea    | \$43.00      | /ea      | \$2,580          |
| Restroom   Grab Bar: 42" Peened Grip, Wall Mtd.  | 150.00  | ea    | \$45.00      | /ea      | \$6,750          |
| Non Restroom   Lit Mirror: Single Mirror: Light in Framed Mirror<br>Unit   | 10      | еа    | \$520.00     | /ea      | \$5,200          |
| Non Restroom   Mirror: Full Height Frameless Mirror Allowance -<br>Weight room, Fitness Room, Locker Rooms, Changing Rooms,<br>Misc. | 1.00    | allw  | \$10,500.00  | /allw    | \$10,500         |
| Restroom   Grab Bar: 60" "L" Shaped, Shower, Curved, Wall Mtd.   | 10.00   | ea    | \$115.00     | /ea      | \$1,150          |



#### 60% CD Estimate - Reconciled incl VE

| ESCRIPTION  | QUAN    | ΓΙΤΥ | UNIT CO     | ST    | TOTAL COST  |
|---|---------|------|-------------|-------|-------------|
| Restroom   Baby Changing Station; Wall Mtd.   | 6.00    | ea   | \$220.00    | /ea   | \$1,320     |
| Non Restroom   Hook: Multiple Coat Hook, Coat Rack, Wall Mtd.   | 16      | ea   | \$70.00     | /ea   | \$1,120     |
| Restroom   Mirror: Single Mirror: Framed Mirror Unit  | 85      | ea   | \$165.00    | /ea   | \$14,025    |
| Restroom   Shower curtain and rod, typ. shower unit   | 10.00   | ea   | \$80.00     | /ea   | \$800       |
| Restroom   Shower Seat @ ADA shower units   | 10.00   | ea   | \$230.00    | /ea   | \$2,300     |
| Janitor   Shelf: S.S. Utility Shelf w/ Mop and Broom Holders  | 10.00   | ea   | \$155.00    | /ea   | \$1,550     |
| Janitor   Shelf: SS Shelf 8" D x 24" W  | 10.00   | ea   | \$65.00     | /ea   | \$650       |
| Non Restroom   Hook: Coat Hook, Door / Wall Mtd.  | 43      | ea   | \$20.00     | /ea   | \$860       |
| Restroom   Hook: Coat Hook, Stall Wall Mtd.   | 67.00   | ea   | \$20.00     | /ea   | \$1,340     |
| Non Restroom   Paper Towel Dispenser, Wall Mtd.   | 143     | ea   | \$110.00    | /ea   | \$15,730    |
| C1093 Wall & Door Protection  |         |      | \$0.12      | / GSF | \$45,456    |
| Wall & Door Protection Complete \$/sf, including corner guards  | 403,504 | gsf  | \$0.10      | /gsf  | \$45,456    |
| C1093.2 Information Specialties   |         |      | \$1.43      | / GSF | \$542,850   |
| White / Marker Boards - Small 4' x 4'   | 100     | ea   | \$500.00    | /ea   | \$50,000    |
| White / Marker Boards - Medium 4' x 6'  | 272.00  | ea   | \$750.00    | /ea   | \$204,000   |
| Corkboards / Tack Boards - Large 4' x 8'  | 124     | ea   | \$450.00    | /ea   | \$55,800    |
| Corkboards / Tack Boards - Small 4' x 4'  | 117     | ea   | \$900.00    | /ea   | \$105,300   |
| Signage   Dedication Plaques Allowance - Interior   | 3.00    | allw | \$2,000.00  | /allw | \$9,000     |
| Signage   Egress, Waydinding, and Regulatory - Interior   | 4.00    | ls   | \$5,000.00  | /ls   | \$18,000    |
| Signage   Room Identification Signs - Interior  | 405     | ea   | \$150.00    | /ea   | \$60,750    |
| Signage   Additional Signage Allowance - Interior   | 1.00    | allw | \$10,000.00 | /allw | \$10,000    |
| Signage   Branding and Graphics Allowance - Interior, including<br>large format wall murals and panels. | 3.00    | allw | \$5,000.00  | /allw | \$30,000    |
| C1097 Storage Specialties   |         |      | \$1.64      | / GSF | \$625,426   |
| Lockers   Locker Room: Single and multi-tier lockers on conc, base, 15" x 15"                           | 428     | еа   | \$500.00    | /ea   | \$214,000   |
| Lockers   Shop Lockers 2 Tier, 15" Wide x 15" Deep  | 204     | ea   | \$500.00    | /ea   | \$102,000   |
| Lockers   Corridor Lockers 2 Tier, 15" Wide x 15" Deep on wood base                                     | 1,226   | еа   | \$500.00    | /ea   | \$613,000   |
| Lockers   Corridor Lockers 2 Tier, 15" Wide x 15" Deep on wood base - VE                                | -826.00 | еа   | \$500.00    | /ea   | (\$413,000) |
| Lockers   Cosmetology Lockers: Single &/or double tier, 2' w x<br>2.5' d                                | 22      | ea   | \$625.00    | /ea   | \$13,750    |
| Lockers   Team Lockers: Single tier 2' w x 18" d welded locker on conc. base                            | 142     | ea   | \$575.00    | /ea   | \$81,650    |
| Locker Benches  | 216     | lf   | \$65.00     | /lf   | \$14,026    |
| Storage Wall Shelving - Metal (In F&E Estimate)   | 768     | lf   | \$0.00      | /lf   | \$0         |
| C1099 Other Interior Specialties  |         |      | \$3.01      | / GSF | \$1,145,948 |
| Misc. Metals and Supports   | 403,504 | gsf  | \$1.00      | /gsf  | \$403,504   |
| 2x4 Stud Wall with Plywood - assume 8' high   | 3,134   | sf   | \$10.00     | /sf   | \$31,336    |
| Plywood Sheathing with 2x8 Wood Joists  | 740     | sf   | \$15.00     | /sf   | \$11,107    |
| Safety Related Carpentry - Safety Rails / Opening Protection  | 393,000 | sf   | \$2.00      | /sf   | \$786,000   |
| Safety Related Carpentry - Safety Rails / Opening Protection -<br>adjust per VE                         | -1.00   | ls   | \$86,000.00 | /ls   | (\$86,000)  |
| D4031 Fire Protection Equipment   |         |      | \$0.34      | / GSF | \$130,540   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANT   | TITY | UNIT COST         | TOTAL COST         |
|--|---------|------|-------------------|--------------------|
| Fire Extinguisher Cabinets - Semi-Recessed                               | 262.00  | ea   | \$405.00 /ea      | \$106,110          |
| AED Cabinets, units, and accessories                                     | 14.00   | ea   | \$1,745.00 /ea    | \$24,430           |
| C20 INTERIOR FINISHES  |         |      | \$32.42 / GSF     | \$12,337,525       |
| C2010 WALL FINISHES  |         |      | \$9.03 / GSF      | \$3,436,357        |
| C2012 Wall Paneling  |         |      | \$2.11 / GSF      | \$802,005          |
| Wood Veneer Premium for Paneling at columns                              | 2,304   | sf   | \$85.00 /sf       | \$195,840          |
| Fabric Wrapped Acoustical Wall Panels @ Auditorium                       | 1,540   | sf.  | \$50.00 /sf.      | \$77,000           |
| Wood fiber Acoustical Panels   | 3,475   | sf.  | \$45.00 /sf.      | \$156,375          |
| Cafeteria Column Enclosure - Fiberglass Reinforced (12' high)            | 8.00    | ea   | \$2,750.00 /ea    | \$22,000           |
| Fiber Reinforced Panel (FRP) @ 4' high                                   | 1,292   | sf.  | \$25.00 /sf.      | \$32,292           |
| Fiber Reinforced Panel (FRP) @ Full Height                               | 7,354   | sf.  | \$25.00 /sf.      | \$183,858          |
| Phenolic Resin Wall Panels - Interior                                    | 1,530   | sf.  | \$88.00 /sf.      | \$134,640          |
| C2013.4 Wall Coverings   |         |      | \$0.23 / GSF      | \$89,323           |
| Interior Misc. Millwork not shown or within F&E Estimate                 | 0.00    | nic  |                   | \$0                |
| Vinyl Wall Covering (Auditorium - IWP)                                   | 1,985   | sf.  | \$45.00 /sf.      | \$89,323           |
| C2014 Tile & Terrazzo Wall Finishes                                      |         |      | \$2.31 / GSF      | \$877 <i>,</i> 873 |
| Ceramic Wall Tile - ADJUST PER RECON - REDUCE FROM 42K SF<br>TO 25K SF   | 17,577  | sf   | \$20.00 /sf       | \$351,533          |
| 2" Granite Veneer Panels - ADJUST UNIT PRICE PER RECON                   | 400     | sf.  | \$175.00 /sf.     | \$70,000           |
| Porcelain Wall Tile  | 1,445   | sf.  | \$24.00 /sf.      | \$34,685           |
| Thin Porcelain Wall Tile   | 18,462  | sf.  | \$24.00 /sf.      | \$443,091          |
| VE A04 - CHANGE FLATLOCK TILE TO Thin Porcelain Wall Tile                | 1,963   | sf.  | \$30.00 /sf.      | \$58,890           |
| VE A15 - REDUCE Wall Tile  | -1.00   | ls   | \$80,326.00 /ls   | (\$80,326)         |
| C2015 Stone Facing   |         |      | \$0.00 / GSF      | \$0                |
| Interior Stone - Travertine, not show on drawings EXCLUDED               | 0.00    | sf   |                   | \$0                |
| C2016 Special Wall Surfacing   |         |      | \$0.35 / GSF      | \$132,000          |
| Flat Lock Metal Tile @ Lobby - PER VE A04 - CHANGE TO TILE<br>(597 SQFT) | 0.00    | sf.  |                   | \$0                |
| Flexible Stainless Steel Safety Netting                                  | 2,400   | sf   | \$55.00 /sf       | \$132,000          |
| C2017 Wall Painting & Coating  |         |      | \$2.91 / GSF      | \$1,107,145        |
| Paint Interior GWB Walls   | 220,299 | sf.  | \$1.00 /sf.       | \$220,299          |
| Paint Interior GWB Walls - Soffits                                       | 1,732   | sf.  | \$1.00 /sf.       | \$1,732            |
| Paint Interior GWB Walls - Soffits - not shown                           | 1.00    | allw | \$5,000.00 /allw  | \$5,000            |
| Paint Interior Walls - Epoxy   | 234,495 | sf.  | \$3.50 /sf.       | \$820,731          |
| Paint Interior CMU Walls   | 7,507   | sf   | \$1.25 /sf        | \$9,383            |
| Misc. Interior Painting  | 1.00    | allw | \$50,000.00 /allw | \$50,000           |
| C2018 Acoustical Wall Treatment  |         |      | \$0.68 / GSF      | \$259,053          |
| Fabric Wrapped Acoustical Panels @ Auditorium                            | 696     | sf.  | \$65.00 /sf.      | \$45,222           |
| Wood Fiber Acoustical Panels @ Gymnasium                                 | 3,290   | sf.  | \$65.00 /sf.      | \$213,831          |
| C2019 Wall Finish Supplementary Components                               |         |      | \$0.44 / GSF      | \$168,958          |
| Interior Window Sills @ Exterior - Solid Surface                         | 3,379   | lf   | \$50.00 /lf       | \$168,958          |
| C2030 FLOORING   |         |      | \$10.20 / GSF     | \$3,881,021        |
| C2031 Flooring Treatment   |         |      | \$0.28 / GSF      | \$105,000          |
| Floor Patching Allowance   | 1.00    | allw | \$85,000.00 /allw | \$85,000           |





| DESCRIPTION   | QUANTITY   | UNIT COST         | TOTAL COST  |
|---|------------|-------------------|-------------|
| Floor Prep / Leveling Allowance   | 1.00 allw  | \$20,000.00 /allw | \$20,000    |
| C2032.2 Tile Flooring   |            | \$1.75 / GSF      | \$667,136   |
| Ceramic Floor Tile - Mosaic   | 5,367 sf   | \$24.00 /sf       | \$128,808   |
| Porcelain Tile Floor  | 19,226 sf  | \$28.00 /sf       | \$538,328   |
| C2032.4 Wood Flooring   |            | \$0.70 / GSF      | \$265,188   |
| Wood Flooring - Premium for Markings on Athletic Wood Floor                               | 12,054 sf  | \$1.00 /sf        | \$12,054    |
| Athletic Sports Wood Flooring - Gym   | 12,054 sf  | \$21.00 /sf       | \$253,134   |
| C2032.6 Carpeting   |            | \$0.40 / GSF      | \$153,019   |
| Carpet - 1  | 2,359 sf   | \$6.50 /sf        | \$15,334    |
| Carpet - 2  | 6,364 sf   | \$6.50 /sf        | \$41,366    |
| Carpet - 4  | 1,358 sf   | \$6.50 /sf        | \$8,827     |
| Carpet - 5  | 4,479 sf   | \$6.50 /sf        | \$29,114    |
| Carpet - 6  | 3,889 sf   | \$6.50 /sf        | \$25,279    |
| Carpet - 7  | 872 sf     | \$6.50 /sf        | \$5,668     |
| Carpet - Walk Off Carpet  | 314 sf     | \$12.00 /sf       | \$3,768     |
| Resilient Carpet  | 3,944 sf   | \$6.00 /sf        | \$23,664    |
| C2032.8 Wall Base Finishes  |            | \$0.65 / GSF      | \$246,245   |
| Ceramic Tile Base   | 2,470 lf   | \$19.25 /lf       | \$47,548    |
| Rubber Base   | 38,410 lf  | \$3.00 /lf        | \$115,230   |
| Terrazzo Base   | 2,790 lf   | \$14.00 /lf       | \$39,060    |
| Decorative Fabric Metal Panel - Interior  | 493 sf     | \$90.00 /sf       | \$44,408    |
| Flat Lock Metal Tiles - Interior - PER VE A04 - CHANGE TO TILE<br>(1,366 SQFT)            | 0.00 sf    |                   | \$0         |
| C2033 Specialty Flooring  |            | \$0.21 / GSF      | \$78,050    |
| Foot Grille Carpet  | 1,561 sf   | \$50.00 /sf       | \$78,050    |
| C2035 Resilient Flooring  |            | \$5.71 / GSF      | \$2,171,555 |
| ATH Athletic Sports Flooring  | 3,034 sf   | \$20.00 /sf       | \$60,680    |
| Linoleum LIN1   | 123,045 sf | \$8.50 /sf        | \$1,045,883 |
| Linoleum LIN2   | 164 sf     | \$8.50 /sf        | \$1,394     |
| Linoleum LIN3   | 315 sf     | \$8.50 /sf        | \$2,678     |
| Linoleum LIN4   | 3,298 sf   | \$8.50 /sf        | \$28,033    |
| Sheet Vinyl - Multipurpose  | 9,784 sf   | \$13.00 /sf       | \$127,192   |
| Sheet Vinyl - Slip Resistant  | 1,463 sf   | \$12.00 /sf       | \$17,556    |
| Luxury Viyl Tile LVT  | 3,032 sf   | \$6.50 /sf        | \$19,708    |
| Sheet Vinyl Flooring - SV1  | 35,442 sf  | \$11.00 /sf       | \$389,862   |
| Sheet Vinyl Flooring - SV2  | 197 sf     | \$11.00 /sf       | \$2,167     |
| Sheet Vinyl Flooring - SV3  | 507 sf     | \$11.00 /sf       | \$5,577     |
| Photoluminesent Rubber Stair Treads & Risers - CHANGED TO<br>STANDARD AT RECON - <\$7/SF> | 9,313 sf   | \$28.00 /sf       | \$260,764   |
| Rubber Flooring at Stair Treads and Risers - RR - INCLUDED<br>ABOVE PER RECON             | 0.00 sf    |                   | \$0         |
| Rubber Tile Flooring - RT   | 267 sf     | \$15.00 /sf       | \$4,005     |
| Epoxy Flooring EF-1   | 12,121 sf  | \$17.00 /sf       | \$206,057   |
| C2036.2 Terrazzo Flooring   |            | \$0.00 / GSF      | \$0         |
| Precast Terrazzo risers & treads - DELETED PER RECON                                      | 0.00 sf    |                   | \$0         |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY UNIT COST TOTAL COS |      | IPTION QUANTITY   |              | TOTAL COST |
|---|------------------------------|------|-------------------|--------------|------------|
| C2036.4 Masonry & Stone Flooring  |                              |      | \$0.37 / GSF      | \$140,365    |            |
| Stone Thresholds at wet rooms   | 68                           | sf   | \$100.00 /sf      | \$6,800      |            |
| Sealed Concrete   | 89,043                       | sf   | \$1.50 /sf        | \$133,565    |            |
| C2037 Fluid-Applied Flooring  |                              |      | \$0.14 / GSF      | \$54,464     |            |
| Moisture Mitigation @ Tile  | 6,705                        | sf   | \$2.53 /sf        | \$16,964     |            |
| Paint Interior Metal Pan Stairs   | 25                           | flgt | \$1,500.00 /flgt  | \$37,500     |            |
| C2050 CEILING FINISHES  |                              |      | \$13.19 / GSF     | \$5,020,147  |            |
| C2051 Plaster & Gypsum Board Finish   |                              |      | \$6.27 / GSF      | \$2,384,740  |            |
| Ceiling - GWB Soffit - Interior   | 7,116                        | sf   | \$18.00 /sf       | \$128,092    |            |
| Ceiling - GWB Soffit - Interior, not shown  | 1.00                         | allw | \$50,000.00 /allw | \$50,000     |            |
| GWB   GWB Ceiling, Moisture Resistant GWB Ceiling   | 5,390                        | sf   | \$25.00 /sf       | \$134,750    |            |
| GWB   GWB Ceiling, Typical  | 46,712                       | sf   | \$20.00 /sf       | \$934,240    |            |
| Ceiling - GWB Soffit - Interior @ Curved Media Center   | 426                          | sf   | \$25.00 /sf       | \$10,658     |            |
| Ceiling - GWB SOUND ISOLATION - ADDED @ RECON   | 54,000                       | sf   | \$25.50 /sf       | \$1,377,000  |            |
| Ceiling - GWB SOUND ISOLATION - VE A03 - Change Spec  | -1.00                        | ls   | \$250,000.00 /ls  | (\$250,000)  |            |
| C2054 Acoustical Ceiling Tiles & Panels   |                              |      | \$6.02 / GSF      | \$2,289,573  |            |
| ACT-1   Acoustical Ceiling Tiles - 2 X 2 HIGH NRC ACOUSTICAL<br>CEILING TILE                        | 166,850                      | sf   | \$7.50 /sf        | \$1,251,375  |            |
| ACT-2   Acoustical Ceiling Tiles - 2 X 2 WASHABLE ACOUSTICAL<br>CEILING TILE FOR KITCHEN LOCATIONS  | 6,967                        | sf   | \$8.50 /sf        | \$59,220     |            |
| ACT-4   Acoustical Ceiling Tiles - 2 X 6 HIGH NRC TEGULAR<br>ACOUSTICAL CEILING TILE                | 2,746                        | sf   | \$11.50 /sf       | \$31,579     |            |
| ACT-5   | 4,440                        | sf   | \$12.00 /sf       | \$53,280     |            |
| ACT-3   Acoustical Ceiling Tiles - 2 X 2 HIGH NRC TEGULAR<br>ACOUSTICAL CEILING TILE AT ADMIN AREAS | 12,351                       | sf   | \$6.75 /sf        | \$83,369     |            |
| Interior Ceiling   Linear Metal Ceiling W/ Woodlook, 4" Wide<br>Plank                               | 11,750                       | sf   | \$50.00 /sf       | \$587,500    |            |
| Hung Ceiling   Mesh Metal Ceiling   | 750                          | sf   | \$50.00 /sf       | \$37,500     |            |
| Acoustical Reflector @ Stage  | 350                          | sf   | \$100.00 /sf      | \$35,000     |            |
| ACPCP   Acoustical Preformed Ceiling Panels   | 2,100                        | sf   | \$65.00 /sf       | \$136,500    |            |
| EAVB   Aluminum Vertical Blade Ceiling System   | 0.00                         | excl |                   | \$0          |            |
| Phenolic / IWP Wd Ceiling Ceiling Panels  | 150                          | sf   | \$95.00 /sf       | \$14,250     |            |
| ACM   Aluminum Composite Material Ceiling - Interior - DELETE<br>DOUBLE UP PER VE A18               | 0.00                         | sf   |                   | \$0          |            |
| Hung Ceiling   Mesh Metal Ceiling With Acrylic Panel Backing -<br>DELETED PER RECON                 | 0.00                         | nic  |                   | \$0          |            |
| C2056 Painting & Staining Ceilings  |                              |      | \$0.71 / GSF      | \$271,120    |            |
| Paint   Painted Interior GWB - Moisture Resistant GWB Ceiling                                       | 5,390                        | sf   | \$1.00 /sf        | \$5,390      |            |
| Paint   Painted Interior GWB - Typical Ceilings - Latex   | 46,712                       | sf   | \$1.00 /sf        | \$46,712     |            |
| Paint   Exposed Painted Structural Steel & Metal Deck   | 87,607                       | sf   | \$2.50 /sf        | \$219,018    |            |
| C2059 Ceiling Finish Supplementary Components   |                              |      | \$0.20 / GSF      | \$74,715     |            |
| Paint Sound Barrier   Painted GWB Ceiling - CEILING OCCURING<br>BETWEEN STEEL GIRDERS               | 74,715                       | sf   | \$1.00 /sf        | \$74,715     |            |
| D SERVICES  | 380,570 G                    | SF   | \$158.84 / GSF    | \$60,450,925 |            |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST         | TOTAL COST  |
|--|-----------|-------------------|-------------|
| D10 CONVEYING  |           | \$2.33 / GSF      | \$885,000   |
| D1010 ELEVATORS & LIFTS  |           | \$2.33 / GSF      | \$885,000   |
| D1010 Elevators & Lifts  |           | \$2.14 / GSF      | \$815,000   |
| Elevator #1, Passenger (Otis Gen2, 3,500 capacity) - REDUCED<br>PER RECON <\$100K TOTAL> | 4.00 stop | \$93,750.00 /stop | \$375,000   |
| Elevator #2, Passenger (Otis Gen2, 3,500 capacity)                                       | 5.00 stop | \$88,000.00 /stop | \$440,000   |
| D1017 Cab Finishes   |           | \$0.18 / GSF      | \$70,000    |
| Cab Finish Premium Allowance   | 2.00 ea   | \$35,000.00 /ea   | \$70,000    |
| D20 PLUMBING   |           | \$20.97 / GSF     | \$7,981,609 |
| D2000 PLUMBING EQUIPMENT   |           | \$4.72 / GSF      | \$1,795,343 |
| D2000 Plumbing Equipment   |           | \$4.72 / GSF      | \$1,795,343 |
| Sub-Meters   | 1.00 ls   | \$10.000.00 /ls   | \$10.000    |
| Circulating Pump   | 10 ea     | \$1,650.00 /ea    | \$16,500    |
| Thermostatic Mixing Valve - EHW-4  | 3.00 ea   | \$5,000.00 /ea    | \$15,000    |
| Thermostatic Mixing Valve - Dual - EHW-1 & EHW-2   | 2.00 ea   | \$15,000.00 /ea   | \$30,000    |
| Thermostatic Mixing Valve - P-7 Fixtures (EW)  | 7.00 ea   | \$500.00 /ea      | \$3,500     |
| Thermostatic Mixing Valve - P-8 Fixtures (EW/ES)   | 23 ea     | \$2,500.00 /ea    | \$57,500    |
| Thermostatic Mixing Valve - Triple - EHW-3   | 1.00 ea   | \$20,000.00 /ea   | \$20,000    |
| Domestic Water Booster Pump  | 1.00 ea   | \$45,000.00 /ea   | \$45,000    |
| Backflow Preventers  | 1.00 ls   | \$35,000.00 /ls   | \$35,000    |
| Kitchen Equipment Connections  | 1.00 ls   | \$75,000.00 /ls   | \$75,000    |
| Science Classroom / Bio-Tech Equipment Connections                                       | 1.00 ls   | \$10,000.00 /ls   | \$10,000    |
| Shop Equipment Connections   | 1.00 ls   | \$50,000.00 /ls   | \$50,000    |
| Water Meters   | 1.00 ls   | \$5,500.00 /ls    | \$5,500     |
| Trap Primers & Associated Piping   | 127 ea    | \$1,000.00 /ea    | \$127,000   |
| Floor Drain W/Trap   | 127 ea    | \$950.00 /ea      | \$120,650   |
| Roof Drains  | 94 ea     | \$1,365.00 /ea    | \$128,310   |
| Exterior Grease Interceptor  | 2.00 ea   | \$41,711.68 /ea   | \$83,423    |
| Local Grease Interceptor 35 GPM  | 3.00 ea   | \$1,027.92 /ea    | \$3,084     |
| Local Grease Interceptor 50 GPM  | 2.00 ea   | \$1,192.92 /ea    | \$2,386     |
| Local Grease Interceptor 75 GPM  | 2.00 ea   | \$2,441.88 /ea    | \$4,884     |
| Ceiling UTL Panels   | 17 ea     | \$500.00 /ea      | \$8,500     |
| Elevator Sump Pumps  | 3.00 ea   | \$5,500.00 /ea    | \$16,500    |
| Gas / Oil Interceptor - Shops  | 4.00 ea   | \$15,000.00 /ea   | \$60,000    |
| AC-1 - Auto Collision / Metal Fab  | 2.00 ea   | \$48,321.36 /ea   | \$96,643    |
| AC-2 - VOC Tech Shops  | 1.00 ea   | \$31,821.36 /ea   | \$31,821    |
| AC-3 - Bio Tech Lab  | 1.00 ea   | \$28,821.36 /ea   | \$28,821    |
| AC-4 - Drafting & Design   | 1.00 ea   | \$35,821.36 /ea   | \$35,821    |
| AC-5 - Dental - Compressed Air System  | 1.00 ea   | \$36,821.36 /ea   | \$36,821    |
| AC-6 - Dental - Robotics - Compressed Air System   | 1.00 ea   | \$35,821.36 /ea   | \$35,821    |
| Compressed Air Filter, PI, & PRV   | 72 ea     | \$500.00 /ea      | \$36,000    |
| Compressed Air Hose Reels  | 36 ea     | \$800.00 /ea      | \$28,800    |
| VAC-1 - Bio Tech Lab - Vacuum System   | 1.00 ea   | \$21,821.36 /ea   | \$21,821    |
| VAC-2 - Dental - Vacuum System   | 1.00 ea   | \$53,821.36 /ea   | \$53,821    |
|  |           |                   |             |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION  | QUANTITY  | Y UNIT CO            | )ST   | TOTAL COST  |
|--|-----------|----------------------|-------|-------------|
| EWH-1 & EWH-2 - Elec Water Heater - PVI Durawatt - 466         | 4.00 ea   | \$51,069.80          | /ea   | \$204,279   |
| EWH-3 - Elec Water Heater - AO Smith DES-100                   | 3.00 ea   | \$12,855.84          | /ea   | \$38,568    |
| EWH-4 - Elec Water Heater - PVI Durawatt - 550                 | 2.00 ea   | \$61,069.80          | /ea   | \$122,140   |
| EWH-5 - Elec Water Heater - AO Smith DES-10                    | 1.00 ea   | \$1,427.92           | /ea   | \$1,428     |
| Argon / Oxygen / Acetylene Manifolds                           | 3.00 ea   | \$8,000.00           | /ea   | \$24,000    |
| Natural Gas Control at Kitchen - Kitchen                       | 4.00 ea   | \$1,000.00           | /ea   | \$4,000     |
| Natural Gas Shut off Valve & Cabinet - HVAC Tech & Paint Booth | 2.00 ea   | \$1,000.00           | /ea   | \$2,000     |
| pH Neutralization System                                       | 1.00 ea   | \$50,000.00          | /ea   | \$50,000    |
| Expansion Tanks  | 10 ea     | \$1,500.00           | /ea   | \$15,000    |
| D2010 DOMESTIC WATER DISTRIBUTION                              |           | \$4.30               | / GSF | \$1,638,300 |
| D2012 Domestic Water Piping                                    |           | \$4.30               | / GSF | \$1,638,300 |
| Domestic Hot & Cold Water Piping - 2" & Less                   | 21,000 lf | \$35.00              | /lf   | \$735,000   |
| Domestic Water Piping - 3"                                     | 2,200 lf  | \$86.00              | /If   | \$189,200   |
| Domestic Water Piping - 4"                                     | 1,000 lf  | \$104.00             | /lf   | \$104,000   |
| Domestic Water Piping - 6"                                     | 300 lf    | \$207.00             | /lf   | \$62,100    |
| ADJUST PER RECON   | 1.00 ls   | \$200,000.00         | /ls   | \$200,000   |
| Insulation   | 24,500 lf | \$12.00              | /If   | \$294,000   |
| Valves & Accessories   | 1.00 ls   | \$54,000.00          | /ls   | \$54,000    |
| D2020 SANITARY DRAINAGE  |           | \$4.55               | / GSF | \$1,733,025 |
| D2025 Sanitary Drain Piping - UG                               |           | \$0.76               | / GSF | \$291,025   |
| Sanitary Waste & Vent Piping - 2"- 3"                          | 800 lf    | \$50.00              | /If   | \$40,000    |
| Sanitary Waste & Vent Piping - 4"- 6"                          | 1,755 lf  | \$80.00              | /lf   | \$140,400   |
| Sanitary Waste & Vent Piping - 8"                              | 885 lf    | \$125.00             | /lf   | \$110,625   |
| D2026 Sanitary Drain Piping - AG                               |           | \$3.07               | / GSF | \$1,170,000 |
| Sanitary Waste & Vent Piping - 2" - 4"                         | 9,000 lf  | \$50.00              | /lf   | \$450,000   |
| Sanitary Waste & Vent Piping - 4" - 6"                         | 7,000 lf  | \$80.00              | /lf   | \$560,000   |
| Sanitary Waste & Vent Piping - ADJUST PER RECON                | 1.00 ls   | \$160,000.00         | /ls   | \$160,000   |
| D2028 Kitchen Drain Piping - AG                                |           | \$0.32               | / GSF | \$120,000   |
| Kitchen Waste & Vent Piping - UG & AG                          | 2,000 lf  | \$60.00              | /lf   | \$120,000   |
| D2029 Laboratory / Industrial Drain Piping - UG                |           | \$0.40               | / GSF | \$152,000   |
| Acid Waste & Vent Piping - UG & AG                             | 1,600 lf  | \$95.00              | /If   | \$152,000   |
| D2040 PLUMBING FIXTURES  |           | \$2.17               | / GSF | \$826,288   |
| D2043 Plumbing Fixtures  |           | \$2.17               | / GSF | \$826,288   |
| P-1 & P-1A - Water Closet - Wall Hung                          | 88 ea     | \$2,965.00           | /ea   | \$260,920   |
| P-2 & P-2A - Urinal  | 33 ea     | \$2,115.00           | /ea   | \$69,795    |
| VE P01 DELETE URINALS IN SINGLE OCC TOILET RMS                 | -1.00 ls  | \$85 <i>,</i> 000.00 | /ls   | (\$85,000)  |
| VE P02 DELETE TOILET RM @MAINTENANCE BLDG                      | -1.00 ls  | \$20,000.00          | /ls   | (\$20,000)  |
| P-3A - Lavatory - Wall Hung                                    | 51 ea     | \$1,890.00           | /ea   | \$96,390    |
| PX-4 - Science Classroom Sinks                                 | 45 ea     | \$927.92             | /ea   | \$41,756    |
| PX-5 - Lab Sinks   | 45 ea     | \$1,441.88           | /ea   | \$64,885    |
| PX-1 Sink - Casework - Installation & Hook-Up                  | 53 ea     | \$784.90             | /ea   | \$41,600    |
| PX-2 - Sink w/Eyewash - Casework - Installation & Hook-Up      | 7.00 ea   | \$998.86             | /ea   | \$6,992     |
| PX-3 - Sink - Cosmetology w/Hair Trap                          | 15 ea     | \$1,541.88           | /ea   | \$23,128    |
| PX-6 - Dental Station  | 16 ea     | \$927.92             | /ea   | \$14,847    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION                                       | QUANTITY   | UNIT COST       | TOTAL COST |
|---|------------|-----------------|------------|
| P-4 - Mop Sink                                    | 8.00 ea    | \$2,180.00 /ea  | \$17,440   |
| Cosmetology - Pedicure Station - Hook-ups         | 0.00 ea    |                 | \$0        |
| P-3C - Solid Surface Sink, 2 Station - Bradley    | 9.00 ea    | \$4,500.00 /ea  | \$40,500   |
| P-5 & P-5A - Drinking Foutain - Bi-Level Electric | 17 ea      | \$4,500.00 /ea  | \$76,500   |
| Washing Machine Box                               | 0.00 ea    |                 | \$0        |
| P-6A - Shower - HC (no enclosure)                 | 4.00 ea    | \$883.92 /ea    | \$3,536    |
| P-6 - Shower - (Trim & Drain)                     | 8.00 ea    | \$2,100.00 /ea  | \$16,800   |
| P-7 - Emergenc Eyewash                            | 7.00 ea    | \$550.00 /ea    | \$3,850    |
| P-8 - Emergency Shower/Eyewash                    | 22 ea      | \$2,800.00 /ea  | \$61,600   |
| P-3B - Wash Fountain - Circular - Bradley         | 2.00 ea    | \$6,976.78 /ea  | \$13,954   |
| P-3B - Wash Fountain - Semi-Circular - Bradley    | 12 ea      | \$5,976.78 /ea  | \$71,721   |
| Hose Bibb   | 25 ea      | \$190.00 /ea    | \$4,750    |
| Wall Hydrant                                      | 1.00 ea    | \$325.00 /ea    | \$325      |
| D2050 GENERAL SERVICE COMPRESSED - AIR            |            | \$0.92 / GSF    | \$350,000  |
| D2051 Compressed-Air Systems                      |            | \$0.92 / GSF    | \$350,000  |
| Valves & Accessories                              | 1.00 ls    | \$16,000.00 /ls | \$16,000   |
| 2" & Less CA Piping - Copper                      | 6,200 lf   | \$50.00 /lf     | \$310,000  |
| CA Piping Intake - Copper                         | 300 lf     | \$80.00 /lf     | \$24,000   |
| D2070 RAIN WATER DRAINAGE                         |            | \$2.56 / GSF    | \$973,450  |
| D2071 Storm Drain Piping - UG                     |            | \$0.44 / GSF    | \$167,850  |
| Storm Piping - 10"                                | 370 lf     | \$165.00 /lf    | \$61,050   |
| Storm Piping - 4"                                 | 50 lf      | \$60.00 /lf     | \$3,000    |
| Storm Piping - 6"                                 | 585 lf     | \$80.00 /lf     | \$46,800   |
| Storm Piping - 8"                                 | 475 lf     | \$120.00 /lf    | \$57,000   |
| D2072 Storm Drain Piping - AG                     |            | \$2.12 / GSF    | \$805,600  |
| Insulation - Storm                                | 1,260 lf   | \$20.00 /lf     | \$25,200   |
| Storm Piping - 10"                                | 40 lf      | \$170.00 /lf    | \$6,800    |
| Storm Piping - 4"                                 | 2,080 lf   | \$160.00 /lf    | \$332,800  |
| Storm Piping - 6"                                 | 3,475 lf   | \$90.00 /lf     | \$312,750  |
| Storm Piping - 8"                                 | 985 lf     | \$130.00 /lf    | \$128,050  |
| D2080 OTHER PLUMBING SYSTEMS                      |            | \$0.37 / GSF    | \$141,500  |
| D2085 Medical Gas Piping                          |            | \$0.18 / GSF    | \$67,000   |
| Vacuum - Exhaust                                  | 100 lf     | \$80.00 /lf     | \$8,000    |
| Vacuum Piping - 1" & Less                         | 1,200 lf   | \$45.00 /lf     | \$54,000   |
| Valves & Accessories                              | 1.00 ls    | \$5,000.00 /ls  | \$5,000    |
| D2088 Process / Industrial Gas Piping             |            | \$0.20 / GSF    | \$74,500   |
| Argon / Oxygen / Acetylene Piping - 1" & Less     | 1,500 lf   | \$45.00 /lf     | \$67,500   |
| Valves & Accessories                              | 1.00 ls    | \$7,000.00 /ls  | \$7,000    |
| D2090 MISC. PLUMBING SYSTEMS                      |            | \$0.97 / GSF    | \$369,153  |
| D2090 Plumbing Misc Items                         |            | \$0.97 / GSF    | \$369,153  |
| Admin & Expenses                                  | 380.570 sf | \$0.97 /sf      | \$369,153  |
| D3010 FACILITY FUEL SYSTEMS                       | ,          | \$0.41 / GSF    | \$154.550  |
| D2080 Natural Gas Pining                          |            | \$0.41 / GSF    | \$154.550  |
| Natural Gas Pining - 2" & Less                    | 1 800 lf   | \$60.00 /If     | \$108 000  |
| Matural Gast iping 2 of LESS                      | 1,000 11   | 900.00 / II     | J100,000   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTI     | ΤY   | UNIT CC        | ST    | TOTAL COST        |
|--|------------|------|----------------|-------|-------------------|
| Natural Gas Piping - 4"                                    | 355 li     | f    | \$110.00       | /lf   | \$39,050          |
| Valves & Accessories                                       | 1.00 1     | S    | \$7,500.00     | /ls   | \$7,500           |
| D30 HEATING, VENTILATION, & AIR CONDITIONING (HVAC)        |            |      | \$73.08        | / GSF | \$27,811,853      |
| D3040 HVAC MAJOR EQUIPMENT                                 |            |      | \$28.88        | / GSF | \$10,989,306      |
| D3040 HVAC Major Equipment                                 |            |      | \$28.72        | / GSF | \$10,928,384      |
| AHU 1-10, HRU 1-5, RTU 1-2, MUA-1&2                        | 1.00 k     | s    | \$6,135,000.00 | /ls   | \$6,135,000       |
| AHU 1-10, Labor & Conns                                    | 10 e       | ea   | \$9,276.00     | /ea   | \$92,760          |
| HRU 1-5 Labor & Conns                                      | 5.00 e     | ea   | \$8,308.00     | /ea   | \$41,540          |
| MUA 1-2 Labor & Conns                                      | 2.00 e     | ea   | \$6,340.00     | /ea   | \$12,680          |
| RTU 1-2 Labor & Conns                                      | 2.00 e     | ea   | \$8,308.00     | /ea   | \$16,616          |
| Exhaust Fans - Scheduled                                   | 1.00 1     | s    | \$153,711.91   | /ls   | \$153,712         |
| Vehicle Exhaust fans and reels                             | 1.00 1     | s    | \$69,076.05    | /ls   | \$69,076          |
| ERU 1-4 & ERU-7  | 5.00 e     | ea   | \$20,436.00    | /ea   | \$102,180         |
| Dust Collection Platform - DELETED PER RECON               | 0.00 n     | nic  |                |       | \$0               |
| Dust Collector - Owner To Relocate Existing                | 0.00 a     | allw |                |       | \$0               |
| Dust Collector -RIGGING, ADDED PER RECON                   | 1.00 ls    | s    | \$15,000.00    | /ls   | \$15,000          |
| Split Systems Labor & Connect                              | 49 e       | ea   | \$4,872.00     | /ea   | \$238,728         |
| VRF/VCU/Splits Equipment                                   | 1.00 ls    | S    | \$3,100,000.00 | /ls   | \$3,100,000       |
| VRF Selector Boxes Install                                 | 46 e       | ea   | \$976.00       | /ea   | \$44,896          |
| VRF -CU Install  | 75 e       | ea   | \$2,436.00     | /ea   | \$182,700         |
| VRF Fan Coil Units Install                                 | 269 e      | ea   | \$1,952.00     | /ea   | \$525,088         |
| VRF-VCU Condenser Install                                  | 88 e       | ea   | \$1,318.00     | /ea   | \$115,984         |
| Gravity Vent   | 4.00 e     | ea   | \$6,436.00     | /ea   | \$25,744          |
| Gravity Vent- GV 1 & 2                                     | 2.00 e     | ea   | \$12,404.00    | /ea   | \$24,808          |
| VFD Fans   | 8.00 e     | ea   | \$3,984.00     | /ea   | \$31,872          |
| D3041 Terminal & Package Units                             |            |      | \$0.16         | / GSF | \$60,922          |
| Unit Heater - Elec   | 29 e       | ea   | \$1,434.00     | /ea   | \$41,586          |
| Cabinet Unit Heater (ceiling)                              | 7.00 e     | ea   | \$2,762.30     | /ea   | \$19,336          |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS                   |            |      | \$24.31        | / GSF | \$9,251,464       |
| D3053 HVAC Air Distribution                                |            |      | \$24.31        | / GSF | \$9,251,464       |
| SM Coordination & Material Handling                        | 1.00 k     | S    | \$240,000.00   | /ls   | \$240,000         |
| Weld Exhaust Extraction arms (FBO) Instalation             | 23 e       | ea   | \$1,476.00     | /ea   | \$33,948          |
| Insulation - Fire Wrap                                     | 6,500 s    | sf   | \$22.31        | /sf   | \$144,998         |
| Insulation - FRK Blanket Insulation, 2"                    | 150,000 s  | sf   | \$4.60         | /sf   | \$689,829         |
| Ductwork - Galvanized                                      | 440,000 ll | b    | \$13.62        | /lb   | \$5,991,252       |
| Ductwork - Galvanized - ADDED PER RECON (INCL ACCESSORIES) | 15,000 ll  | b    | \$15.00        | /lb   | \$225,000         |
| Ductwork - DBL Wall Premium                                | 1.00 ls    | s    | \$50,000.00    | /ls   | \$50 <i>,</i> 000 |
| Ductwork - Stainless Steel Kitchen                         | 2,750 ll   | b    | \$24.69        | /lb   | \$67,903          |
| Ductwork - Black Iron - Kitchen Exhaust                    | 10,500 ll  | b    | \$20.46        | /lb   | \$214,873         |
| Ductwork - HVAC & Plbg Tech Flues                          | 1.00 a     | allw | \$75,000.00    | /allw | \$75,000          |
| Air Duct Accessories                                       | 1.00 k     | S    | \$600,000.00   | /ls   | \$600,000         |
| Sound Attenuator (HRU, RTU, & AHU 360kcfm total)           | 1.00 !     | S    | \$140,912.00   | /ls   | \$140,912         |
| VAV OA & Exhaust w/o RHC                                   | 111 e      | ea   | \$998.41       | /ea   | \$110,823         |
| VAV Box - PER VE M02 REDUCE BY GROUPING                    | -1.00 ls   | S    | \$116,510.00   | /ls   | (\$116,510)       |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTI    | ITY  | UNIT CO      | ST    | TOTAL COST  |
|---|-----------|------|--------------|-------|-------------|
| VAV Box w/ERHC  | 182 e     | ea   | \$1,469.04   | /ea   | \$267,365   |
| VAV FPTU w/ ERHC  | 9.00 e    | ea   | \$3,139.95   | /ea   | \$28,260    |
| Duct Collection Duct - Fabricated                               | 0.00 l    | lf   |              |       | \$0         |
| Plenums   | 3,170 s   | sf   | \$69.00      | /sf   | \$218,730   |
| Register, Diffusers, & Grilles                                  | 850 e     | ea   | \$216.00     | /ea   | \$183,600   |
| Register, Diffusers, & Grilles - 3ft                            | 49 6      | ea   | \$301.25     | /ea   | \$14,761    |
| Register, Diffusers, & Grilles - LD                             | 160 e     | ea   | \$442.00     | /ea   | \$70,720    |
| D3060 CONTROLS & INSTRUMENTATION                                |           |      | \$5.95       | / GSF | \$2,264,800 |
| D3061 Automatic Temperature Controls                            |           |      | \$5.95       | / GSF | \$2,264,800 |
| ATC - BMS   | 380,570 s | sf   | \$5.75       | /sf   | \$2,189,800 |
| Dashboard Allowance   | 1.00 a    | allw | \$50,000.00  | /allw | \$50,000    |
| Lighting Control  | 1.00 a    | allw | \$25,000.00  | /allw | \$25,000    |
| D3070 SPECIAL PURPOSE HVAC SYSTEMS                              |           |      | \$10.05      | / GSF | \$3,824,308 |
| D3075 Refrigerant Piping  |           |      | \$8.53       | / GSF | \$3,244,721 |
| Split System Piping - Line Sets                                 | 49 6      | ea   | \$5,500.00   | /ea   | \$269,500   |
| VRF Piping  | 194,275 s | sf   | \$9.35       | /sf   | \$1,816,471 |
| Roof Pipe Jacketing   | 3,000 I   | lf   | \$15.00      | /lf   | \$45,000    |
| RTU/AHU/HRU Condensers-2 Pipe Circuit                           | 6,750 l   | lf   | \$165.00     | /lf   | \$1,113,750 |
| D3076 Condensate Drain Piping                                   |           |      | \$1.52       | / GSF | \$579,587   |
| Condensate Drain Piping & Insulation                            | 11,000 l  | lf   | \$51.75      | /lf   | \$569,250   |
| Condensate Drain Pumps  | 25 e      | ea   | \$413.47     | /ea   | \$10,337    |
| D3080 SYSTEMS TESTING & BALANCING                               |           |      | \$0.75       | / GSF | \$284,476   |
| D3080 Air & Water Balance                                       |           |      | \$0.75       | / GSF | \$284,476   |
| Testing & Balancing   | 380,570 s | sf   | \$0.75       | /sf   | \$284,476   |
| D3090 OTHER HVAC SYSTEMS & EQUIP                                |           |      | \$3.15       | / GSF | \$1,197,500 |
| D3091 HVAC Misc Items   |           |      | \$3.15       | / GSF | \$1,197,500 |
| Rigging and Hoisting  | 1.00 l    | ls   | \$172,500.00 | /ls   | \$172,500   |
| Project Expenses and Commissioning                              | 1.00 l    | ls   | \$775,000.00 | /ls   | \$775,000   |
| Project Management  | 1.00 l    | ls   | \$250,000.00 | /ls   | \$250,000   |
| VE Items M1 through M7, M9, M11                                 | 0.00 l    | ls   |              |       | \$0         |
| D40 FIRE PROTECTION   |           |      | \$7.96       | / GSF | \$3,029,692 |
| D4010 SPRINKLERS  |           |      | \$4.73       | / GSF | \$1,799,342 |
| D4011 Wet Sprinkler System                                      |           |      | \$4.73       | / GSF | \$1,799,342 |
| Distribution Piping w/Fittings & Hangers                        | 26,755 l  | lf   | \$30.00      | /lf   | \$802,650   |
| Sprinkler System - Paint Spray Booths                           | 1.00 l    | ls   | \$20,000.00  | /ls   | \$20,000    |
| Head - Pendant, concealed                                       | 2,055 e   | ea   | \$147.06     | /ea   | \$302,208   |
| Head - Upright  | 1,285 e   | ea   | \$108.55     | /ea   | \$139,484   |
| SPRINKLER SYSTEM - ADJUST PER RECON                             | 380,000 s | sf   | \$2.00       | /sf   | \$760,000   |
| SPRINKLER SYSTEM - PER VE FP01 - SCHEDULE 10 FOR LARGER<br>PIPE | -1.00 l   | ls   | \$225,000.00 | /ls   | (\$225,000) |
| D4020 STANDPIPES  |           |      | \$2.25       | / GSF | \$857,979   |
| D4022 Standpipe & Fire Mains                                    |           |      | \$2.25       | / GSF | \$857,979   |
| Standpipes & Fire Mains - 6"                                    | 13,365 l  | lf   | \$50.00      | /lf   | \$668,250   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTI  | ITY | UNIT CO         | ST    | TOTAL COST   |
|---|---------|-----|-----------------|-------|--------------|
| Double Check Valve 8"   | 1.00    | ea  | \$16,582.59     | /ea   | \$16,583     |
| Hose Valve, 2-1/2"  | 31      | ea  | \$475.12        | /ea   | \$14,729     |
| Zone Control Valve Assembly   | 21      | ea  | \$6,125.60      | /ea   | \$128,638    |
| Wet Check Valve Assembly - 8"   | 3.00    | ea  | \$5,350.72      | /ea   | \$16,052     |
| Fire Department Connection  | 0.00    | ea  |                 |       | \$0          |
| Roof Manifold   | 9.00    | ea  | \$1,525.36      | /ea   | \$13,728     |
| D4030 FIRE PROTECTION SPECIALTIES   |         |     | \$0.33          | / GSF | \$125,000    |
| D4031 Fire Protection Equipment   |         |     | \$0.33 <i>j</i> | / GSF | \$125,000    |
| Electric Fire Pump, 1000 GPM  | 1.00    | ea  | \$120,000.00    | /ea   | \$120,000    |
| Jockey Pump   | 1.00    | ea  | \$5,000.00      | /ea   | \$5,000      |
| D4090 OTHER FIRE PROTECTION SYSTEMS   |         |     | \$0.65          | / GSF | \$247,371    |
| D4096 Fire Protection Misc Items  |         |     | \$0.65          | / GSF | \$247,371    |
| Coordination & Expenses   | 380,570 | sf  | \$0.65          | /sf   | \$247,371    |
| D50 ELECTRICAL  | ,       |     | \$39.83         | / GSF | \$15,157,937 |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION   |         |     | \$23.39         | / GSF | \$8.900.128  |
| D5023 Large Power & Distribution  |         |     | \$4.27          | / GSF | \$1,624,365  |
| 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit                       | 12      | еа  | \$727.02        | /ea   | \$8,724      |
| 100 AMP 3 POLEN1 fused disconnect 600 volt composite unit                       | 4.00    | ea  | \$936.66        | /ea   | \$3,747      |
| 200 AMP 3 POLE N1 fused disconnect 600 volt composite unit                      | 10      | ea  | \$1.421.32      | /ea   | \$14.213     |
| 400 AMP 3 POLE N1 fused disconnect 600 volt composite unit                      | 10      | ea  | \$3.608.00      | /ea   | \$36.080     |
| 600 AMP 3 POLE N1 fused disconnect 600 volt composite unit                      | 1.00    | ea  | \$5,033.50      | /ea   | \$5,033      |
| 30 KVA NEMA 1 Transformer composite unit  | 20      | ea  | \$4,998.21      | /ea   | \$99.964     |
| 75 KVA NEMA 1 Transformer composite unit  | 2.00    | ea  | \$10,211.93     | /ea   | \$20,424     |
| 75 KVA NEMA 1 Transformer composite unit for EV charging                        | 3.00    | ea  | \$10,211.93     | /ea   | \$30,636     |
| 112.5 KVA NEMA 1 Transformer composite unit                                     | 19      | ea  | \$12,322.96     | /ea   | \$234,136    |
| 225 KVA NEMA 1 Transformer composite unit                                       | 2.00    | ea  | \$19,528.70     | /ea   | \$39,057     |
| 4000 Amp Main Switchboard MCB   | 2.00    | ea  | \$201,000.00    | /ea   | \$402,000    |
| 2000 Amp 277/480 Switchboard MCB  | 1.00    | ea  | \$85,000.00     | /ea   | \$85,000     |
| 1600 Amp 277/480 Switchboard MCB  | 1.00    | ea  | \$50,000.00     | /ea   | \$50,000     |
| 100 AMP 120/208 panel board surface mounted composite                           | 20      | ea  | \$3,106.84      | /ea   | \$62,137     |
| 225 AMP 120/208 Panel board surface mounted composite unit                      | 1.00    | ea  | \$4,189.84      | /ea   | \$4,190      |
| 225 AMP 120/208 Panel board surface mounted composite unit                      | 3.00    | ea  | \$4,107.12      | /ea   | \$12,321     |
| for charging Stations   |         |     |                 |       |              |
| Nema 3r Enclosure for EV Chaging Gear   | 3.00    | ea  | \$4,107.12      | /ea   | \$12,321     |
| 400 AMP 120/208 Panel board surface mounted composite unit                      | 24 (    | ea  | \$6,062.34      | /ea   | \$145,496    |
| 100 AMP 277/480 Panel board surface mounted composite unit                      | 8.00    | ea  | \$3,200.84      | /ea   | \$25,607     |
| 200 AMP 277/480 Panel board surface mounted composite unit                      | 8.00    | ea  | \$4,106.20      | /ea   | \$32,850     |
| 225 AMP 277/480 Panel board surface mounted composite unit                      | 19      | ea  | \$4,734.34      | /ea   | \$89,952     |
| 250 AMP 277/480 Panel board surface mounted composite unit charging             | 3.00    | ea  | \$4,868.03      | /ea   | \$14,604     |
| 400 AMP 277/480 Fusable Distribution Panel board surface mounted composite unit | 1.00    | ea  | \$8,558.61      | /ea   | \$8,559      |
| 400 AMP 277/480 Panel board surface mounted composite unit                      | 3.00    | ea  | \$7,051.34      | /ea   | \$21,154     |
| 800 AMP 277/480 Distribution Panel board surface mounted composite unit         | 1.00    | ea  | \$12,411.87     | /ea   | \$12,412     |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST        | TOTAL COST    |
|---|----------|------------------|---------------|
| 1200 AMP 277/480 Distribution Panel board surface mounted composite unit  | 4.00 ea  | \$17,035.84 /ea  | \$68,143      |
| 1200 AMP 277/480 Mechanical Panel board surface mounted composite unit  | 2.00 ea  | \$17,035.84 /ea  | \$34,072      |
| Metering Allowance based on 83 distribution panels and 16<br>Location for Cicurit meter cand Cat 6 Data Link recon 11-28-2022   | 1.00 ls  | \$400,000.01 /ls | \$400,000     |
| Metering Allowance based on 83 distribution panels and 16<br>Location for Cicurit meter cand Cat 6 Data Link recon 11-28-2022<br>Remove all and left generator and primary metering | -1.00 ls | \$350,000.00 /ls | (\$350,000)   |
| Utility Meter Sockets composite unit  | 3.00 ea  | \$510.69 /ea     | \$1,532       |
| D5024 Large Power Feeder Conduit  |          | \$10.61 / GSF    | \$4,037,987   |
| #136 20 AMP EMT Composite feeders copper - Large Power  | 721 lf   | \$16.96 /lf      | \$12,231      |
| #137 20 AMP EMT Composite feeders copper - Large Power  | 712 lf   | \$16.96 /lf      | \$12,078      |
| #138 20 AMP EMT Composite feeders copper - Large Power  | 706 lf   | \$16.96 /lf      | \$11,977      |
| #139 45 AMP EMT Composite feeders copper - Large Power  | 759 lf   | \$29.71 /lf      | \$22,550      |
| #140 20 AMP EMT Composite feeders copper - Large Power  | 556 lf   | \$16.96 /lf      | \$9,432       |
| #141 20 AMP EMT Composite feeders copper - Large Power  | 554 lf   | \$16.96 /lf      | \$9,398       |
| #150 35 AMP EMT Composite feeders copper - Large Power  | 552 lf   | \$18.69 /lf      | \$10,317      |
| #151 35 AMP EMT Composite feeders copper - Large Power  | 658 lf   | \$18.69 /lf      | \$12,298      |
| #152 30 AMP EMT Composite feeders copper - Large Power  | 658 lf   | \$18.69 /lf      | \$12,298      |
| #156 35 AMP EMT Composite feeders copper - Large Power  | 577 lf   | \$18.69 /lf      | \$10,784      |
| #158 35 AMP EMT Composite feeders copper - Large Power  | 586 lf   | \$18.69 /lf      | \$10,952      |
| #168 35 AMP EMT Composite feeders copper - Large Power  | 635 lf   | \$18.69 /lf      | \$11,868      |
| #170 35 AMP EMT Composite feeders copper - Large Power  | 639 lf   | \$18.69 /lf      | \$11,943      |
| #172 35 AMP EMT Composite feeders copper - Large Power  | 712 lf   | \$18.69 /lf      | \$13,307      |
| #176 35 AMP EMT Composite feeders copper - Large Power  | 733 lf   | \$18.69 /lf      | \$13,700      |
| #178 35 AMP EMT Composite feeders copper - Large Power  | 736 lf   | \$18.69 /lf      | \$13,756      |
| #180 35 AMP EMT Composite feeders copper - Large Power  | 742 lf   | \$18.69 /lf      | \$13,868      |
| #181 35 AMP EMT Composite feeders copper - Large Power  | 347 lf   | \$18.69 /lf      | \$6,485       |
| #231 20 AMP EMT Composite feeders copper - Large Power  | 313 lf   | \$16.96 /lf      | \$5.310       |
| #236 20 AMP EMT Composite feeders copper - Large Power  | 1.108 lf | \$16.96 /lf      | \$18.796      |
| #237 20 AMP EMT Composite feeders copper - Large Power  | 501 lf   | \$16.96 /lf      | \$8.499       |
| #238 20 AMP EMT Composite feeders copper - Large Power  | 382 If   | \$16.96 /lf      | \$6.480       |
| #239 20 AMP EMT Composite feeders copper - Large Power  | 497 lf   | \$16.96 /lf      | \$8.431       |
| #250 20 AMP EMT Composite feeders copper - Large Power  | 321 lf   | \$16.96 /lf      | \$5.445       |
| #254 20 AMP EMT Composite feeders copper - Large Power  | 429 If   | \$16.96 /lf      | \$7.278       |
| #255 20 AMP EMT Composite feeders copper - Large Power  | 437 lf   | \$17.04 /lf      | \$7.447       |
| #257 20 AMP EMT Composite feeders copper - Large Power  | 333 lf   | \$17.04 /lf      | \$5.675       |
| #258 20 AMP FMT Composite feeders copper - Large Power  | 358 lf   | \$17.04 /lf      | \$6,101       |
| #260 20 AMP FMT Composite feeders copper - Large Power  | 289 If   | \$16.96 /lf      | \$4,903       |
| #262 20 AMP FMT Composite feeders copper - Large Power  | 295 lf   | \$16.96 /lf      | \$5,004       |
| #268 20 AMP EMT Composite feeders copper - Large Power  | 364 If   | \$16.96 /lf      | \$6.175       |
| #269 20 AMP EMT Composite feeders copper - Large Power  | 235 lf   | \$16.96 /lf      | \$3.987       |
| #270 20 AMP EMT Composite feeders copper - Large Power  | 236 lf   | \$16.96 /lf      | \$4.004       |
| #272 20 AMP EMT Composite feeders copper - Large Power  | 228 lf   | \$16.96 /lf      | \$3.868       |
| #274 20 AMP EMT Composite feeders copper - Large Power  | 223 lf   | \$17.04 /lf      | \$3,800       |
|   |          | <i>+-,</i>       | <i>+2,200</i> |

60% CD Estimate - Reconciled incl VE



| #276 20 AMP EMT Composite feeders copper - Large Power         541. If         517.04 //I         59.218           #278 20 AMP EMT Composite feeders copper - Large Power         489. If         517.04 //I         58.333           #282 20 AMP EMT Composite feeders copper - Large Power         481. If         517.04 //I         55.163           #282 20 AMP EMT Composite feeders copper - Large Power         481. If         517.04 //I         57.844           #282 20 AMP EMT Composite feeders copper - Large Power         481. If         517.04 //I         57.844           #282 20 AMP EMT Composite feeders copper - Large Power         432. If         517.04 //I         57.844           #282 20 AMP EMT Composite feeders copper - Large Power         120. If         516.93 //I         52.032           #296 15 AMP EMT Composite feeders copper - Large Power         120. If         516.93 //I         52.032           #297 15 AMP EMT Composite feeders copper - Large Power         120. If         516.93 //I         52.032           #37 20 AMP EMT Composite feeders copper - Large Power         658. If         53.382. //I         522.243           #144 80 AMP EMT Composite feeders copper - Large Power         663. If         53.382. //I         522.423           #143 80 AMP EMT Composite feeders copper - Large Power         663. If         53.382. //I         522.423           #1  | DESCRIPTION  | QUANTITY | UNIT COST   | TOTAL COST |
|--|--|----------|-------------|------------|
| #278 20 AMP EMT Composite feeders copper - Large Power       482 If       \$17.04 /If       \$8,313         #288 20 AMP EMT Composite feeders copper - Large Power       481 If       \$17.04 /If       \$8,136         #288 20 AMP EMT Composite feeders copper - Large Power       445 If       \$17.04 /If       \$7,464         #288 20 AMP EMT Composite feeders copper - Large Power       432 If       \$17.04 /If       \$7,464         #288 20 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #294 15 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #293 15 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #293 15 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #294 15 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #327 20 AMP EMT Composite feeders copper - Large Power       653 If       \$3382 /If       \$22,243         #144 80 AMP EMT Composite feeders copper - Large Power       651 If       \$3382 /If       \$22,423         #147 80 AMP EMT Composite feeders copper - Large Power       651 If       \$3382 /If       \$22,424         #149 80 AMP EMT Composite feeders copper - Large Power       651 If       \$3382 /If   | #276 20 AMP EMT Composite feeders copper - Large Power | 541 lf   | \$17.04 /lf | \$9,218    |
| #280 20 AMP EMT Composite feeders copper - Large Power       481       If       \$17.04       /If       \$8,196         #282 20 AMP EMT Composite feeders copper - Large Power       481       If       \$17.04       /If       \$7,583         #286 20 AMP EMT Composite feeders copper - Large Power       438       If       \$17.04       /If       \$7,361         #286 20 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2,032         #294 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2,032         #295 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2,032         #293 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2,032         #237 20 AMP EMT Composite feeders copper - Large Power       663       If       \$33.82       /If       \$2,22,49         #144 80 AMP EMT Composite feeders copper - Large Power       661       If       \$33.82       /If       \$2,22,49         #148 80 AMP EMT Composite feeders copper - Large Power       671       If       \$38.82       /If       \$2,44       \$1,58         #149 80 AMP EMT Composite feeders copper - Large Power       671       If  | #278 20 AMP EMT Composite feeders copper - Large Power | 489 lf   | \$17.04 /lf | \$8,333    |
| #7282 20 AMP EMT Composite feeders copper - Large Power       441       if       \$17.04       /if       \$57.83         #7286 20 AMP EMT Composite feeders copper - Large Power       438       If       \$17.04       /if       \$57.464         #7286 20 AMP EMT Composite feeders copper - Large Power       432       If       \$17.04       /if       \$57.302         #7296 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /if       \$2.032         #7297 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /if       \$2.032         #2397 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /if       \$2.032         #327 20 AMP EMT Composite feeders copper - Large Power       658       If       \$33.82       /if       \$2.22,234         #146 80 AMP EMT Composite feeders copper - Large Power       661       If       \$33.82       /if       \$22.423         #147 80 AMP EMT Composite feeders copper - Large Power       661       If       \$33.82       /if       \$22.423         #147 80 AMP EMT Composite feeders copper - Large Power       661       If       \$33.82       /if       \$22.423         #147 80 AMP EMT Composite feeders copper - Large Power       706       If       \$33.  | #280 20 AMP EMT Composite feeders copper - Large Power | 482 If   | \$17.04 /lf | \$8,213    |
| #284 20 AMP EMT Composite feeders copper - Large Power       438       If       \$17.04       /ff       \$7,464         #286 20 AMP EMT Composite feeders copper - Large Power       432       If       \$17.04       /ff       \$5,7361         #294 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /ff       \$22.032         #297 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /ff       \$22.032         #297 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /ff       \$22.032         #328 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /ff       \$22.032         #328 20 AMP EMT Composite feeders copper - Large Power       658       If       \$33.82       /ff       \$22.032         #144 80 AMP EMT Composite feeders copper - Large Power       671       If       \$33.82       /ff       \$22.433         #144 80 AMP EMT Composite feeders copper - Large Power       761       If       \$23.84       /ff       \$18.88         #145 80 AMP EMT Composite feeders copper - Large Power       761       If       \$23.82       /ff       \$22.490         #144 80 AMP EMT Composite feeders copper - Large Power       761       If       \$28.14 <td>#282 20 AMP EMT Composite feeders copper - Large Power</td> <td>481 lf</td> <td>\$17.04 /lf</td> <td>\$8,196</td>  | #282 20 AMP EMT Composite feeders copper - Large Power | 481 lf   | \$17.04 /lf | \$8,196    |
| #286 20 AMP EMT Composite feeders copper - Large Power       432 If       \$17.04 /If       \$7,361         #288 20 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #297 15 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #297 15 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #328 20 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #327 20 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,232         #144 80 AMP EMT Composite feeders copper - Large Power       663 If       \$33.82 /If       \$22,243         #144 80 AMP EMT Composite feeders copper - Large Power       665 If       \$33.82 /If       \$22,423         #144 80 AMP EMT Composite feeders copper - Large Power       667 If       \$33.82 /If       \$22,423         #144 80 AMP EMT Composite feeders copper - Large Power       761 If       \$33.82 /If       \$21,822         #145 80 AMP EMT Composite feeders copper - Large Power       765 If       \$33.82 /If       \$24,215         #145 80 AMP EMT Composite feeders copper - Large Power       765 If       \$33.82 /If       \$24,215         #145 80 AMP EMT Composite feeders copper - Large Power       761 If       \$28.14 /I   | #284 20 AMP EMT Composite feeders copper - Large Power | 445 lf   | \$17.04 /lf | \$7,583    |
| #288 20 AMP ENT Composite feeders copper - Large Power       422 If       \$17.04 /If       \$2,032         #294 15 AMP ENT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #297 15 AMP ENT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #297 15 AMP ENT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #298 15 AMP ENT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,232         #327 20 AMP ENT Composite feeders copper - Large Power       658 If       \$33.82 /If       \$22,243         #1445 80 AMP ENT Composite feeders copper - Large Power       661 If       \$33.82 /If       \$22,433         #1445 80 AMP ENT Composite feeders copper - Large Power       671 If       \$33.82 /If       \$22,430         #1445 80 AMP ENT Composite feeders copper - Large Power       671 If       \$33.82 /If       \$21,882         #1445 80 AMP ENT Composite feeders copper - Large Power       706 If       \$33.82 /If       \$21,882         #1445 80 AMP ENT Composite feeders copper - Large Power       716 If       \$33.82 /If       \$24,215         #145 80 AMP ENT Composite feeders copper - Large Power       716 If       \$28.14 /If       \$16,631         #155 60 AMP ENT Composite feeders copper - Large Power       593 If       \$28   | #286 20 AMP EMT Composite feeders copper - Large Power | 438 lf   | \$17.04 /lf | \$7,464    |
| #294 15 AMP EMT Composite feeders copper - Large Power       120       If       \$15.93       /If       \$2.032         #296 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2.032         #292 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2.032         #327 20 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2.032         #1445 80 AMP EMT Composite feeders copper - Large Power       663       If       \$33.82       /If       \$22.243         #144 80 AMP EMT Composite feeders copper - Large Power       661       If       \$33.82       /If       \$22.449         #144 80 AMP EMT Composite feeders copper - Large Power       671       If       \$28.14       /If       \$18.88         #144 80 AMP EMT Composite feeders copper - Large Power       706       If       \$28.14       /If       \$18.967         #154 50 AMP EMT Composite feeders copper - Large Power       716       If       \$28.14       /If       \$24.82         #153 60 AMP EMT Composite feeders copper - Large Power       581       If       \$28.14       /If       \$16.637         #155 60 AMP EMT Composite feeders copper - Large Power       501       If       \$28.14   | #288 20 AMP EMT Composite feeders copper - Large Power | 432 lf   | \$17.04 /lf | \$7,361    |
| #296 15 AMP EMT Composite feeders copper - Large Power       120       If       \$15.93       /If       \$2,032         #297 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2,032         #327 20 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2,032         #437 20 AMP EMT Composite feeders copper - Large Power       663       If       \$33.82       /If       \$22,254         #1445 80 AMP EMT Composite feeders copper - Large Power       665       If       \$33.82       /If       \$22,430         #144 80 AMP EMT Composite feeders copper - Large Power       671       If       \$33.82       /If       \$22,440         #144 80 AMP EMT Composite feeders copper - Large Power       671       If       \$33.82       /If       \$22,430         #144 80 AMP EMT Composite feeders copper - Large Power       706       If       \$33.82       /If       \$24,400         #153 50 AMP EMT Composite feeders copper - Large Power       716       If       \$33.82       /If       \$24,215         #155 60 AMP EMT Composite feeders copper - Large Power       751       If       \$28.14       /If       \$16,687         #155 00 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14 <td>#294 15 AMP EMT Composite feeders copper - Large Power</td> <td>120 lf</td> <td>\$16.93 /lf</td> <td>\$2,032</td>  | #294 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #297 15 AMP EMT Composite feeders copper - Large Power       120       If       \$15.93       /If       \$2,032         #298 15 AMP EMT Composite feeders copper - Large Power       120       If       \$16.93       /If       \$2,032         #1415 80 AMP EMT Composite feeders copper - Large Power       668       If       \$33.82       /If       \$22,254         #144 80 AMP EMT Composite feeders copper - Large Power       663       If       \$33.82       /If       \$22,423         #144 80 AMP EMT Composite feeders copper - Large Power       671       If       \$28.14       /If       \$18.882         #144 80 AMP EMT Composite feeders copper - Large Power       671       If       \$28.14       /If       \$19.887         #154 50 AMP EMT Composite feeders copper - Large Power       706       If       \$28.14       /If       \$19.867         #155 60 AMP EMT Composite feeders copper - Large Power       716       If       \$28.14       /If       \$16.621         #155 60 AMP EMT Composite feeders copper - Large Power       593       If       \$28.14       /If       \$16.631         #156 60 AMP EMT Composite feeders copper - Large Power       501       If       \$28.14       /If       \$16.631         #156 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14 <td>#296 15 AMP EMT Composite feeders copper - Large Power</td> <td>120 lf</td> <td>\$16.93 /lf</td> <td>\$2,032</td>   | #296 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #298 15 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$2,032         #145 80 AMP EMT Composite feeders copper - Large Power       658 If       \$33.82 /If       \$22,254         #146 80 AMP EMT Composite feeders copper - Large Power       663 If       \$33.82 /If       \$22,423         #147 80 AMP EMT Composite feeders copper - Large Power       661 If       \$33.82 /If       \$22,423         #147 80 AMP EMT Composite feeders copper - Large Power       671 If       \$33.82 /If       \$22,423         #148 80 AMP EMT Composite feeders copper - Large Power       671 If       \$33.82 /If       \$21,882         #153 50 AMP EMT Composite feeders copper - Large Power       706 If       \$28.14 /If       \$19,862         #155 60 AMP EMT Composite feeders copper - Large Power       716 If       \$28.14 /If       \$16,661         #159 60 AMP EMT Composite feeders copper - Large Power       593 If       \$28.14 /If       \$16,631         #159 60 AMP EMT Composite feeders copper - Large Power       591 If       \$28.14 /If       \$16,631         #160 60 AMP EMT Composite feeders copper - Large Power       591 If       \$28.14 /If       \$16,631         #161 60 AMP EMT Composite feeders copper - Large Power       601 If       \$28.14 /If       \$16,631         #161 60 AMP EMT Composite feeders copper - Large Power       600 If       \$28.   | #297 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #327 20 AMP EMT Composite feeders copper - Large Power       120 If       \$16.93 /If       \$22,032         #145 80 AMP EMT Composite feeders copper - Large Power       668 If       \$33.82 /If       \$22,243         #146 80 AMP EMT Composite feeders copper - Large Power       665 If       \$33.82 /If       \$22,434         #148 80 AMP EMT Composite feeders copper - Large Power       665 If       \$33.82 /If       \$22,430         #148 80 AMP EMT Composite feeders copper - Large Power       667 If       \$28.14 /If       \$18,882         #149 80 AMP EMT Composite feeders copper - Large Power       706 If       \$28.14 /If       \$19,867         #155 00 AMP EMT Composite feeders copper - Large Power       716 If       \$33.82 /If       \$24,215         #155 00 AMP EMT Composite feeders copper - Large Power       593 If       \$28.14 /If       \$16,687         #157 60 AMP EMT Composite feeders copper - Large Power       593 If       \$28.14 /If       \$16,687         #150 60 AMP EMT Composite feeders copper - Large Power       601 If       \$28.14 /If       \$16,687         #160 60 AMP EMT Composite feeders copper - Large Power       601 If       \$28.14 /If       \$16,687         #161 60 AMP EMT Composite feeders copper - Large Power       601 If       \$28.14 /If       \$17,7081         #162 60 AMP EMT Composite feeders copper - Large Power       601 If       \$2   | #298 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #145 80 AMP EMT Composite feeders copper - Large Power       658       If       \$33.82       //If       \$22,243         #147 80 AMP EMT Composite feeders copper - Large Power       663       If       \$33.82       //If       \$22,443         #147 80 AMP EMT Composite feeders copper - Large Power       661       If       \$33.82       //If       \$22,443         #148 60 AMP EMT Composite feeders copper - Large Power       671       If       \$23.82       //If       \$21,882         #143 80 AMP EMT Composite feeders copper - Large Power       706       If       \$33.82       //If       \$21,886         #155 50 AMP EMT Composite feeders copper - Large Power       716       If       \$28.14       //If       \$16,687         #155 60 AMP EMT Composite feeders copper - Large Power       593       If       \$28.14       //If       \$16,687         #155 60 AMP EMT Composite feeders copper - Large Power       607       If       \$28.14       //If       \$16,687         #160 60 AMP EMT Composite feeders copper - Large Power       607       If       \$28.14       //If       \$16,687         #161 60 AMP EMT Composite feeders copper - Large Power       607       If       \$28.14       //If       \$17,081         #162 60 AMP EMT Composite feeders copper - Large Power       632       If <t< td=""><td>#327 20 AMP EMT Composite feeders copper - Large Power</td><td>120 lf</td><td>\$16.93 /lf</td><td>\$2,032</td></t<>                                    | #327 20 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #144 80 AMP EMT Composite feeders copper - Large Power       663       If       \$33.82       //f       \$22,423         #147 80 AMP EMT Composite feeders copper - Large Power       661       If       \$33.82       //f       \$22,443         #148 80 AMP EMT Composite feeders copper - Large Power       671       If       \$23.82       //f       \$21,882         #135 80 AMP EMT Composite feeders copper - Large Power       676       If       \$28.14       //f       \$19,882         #153 50 AMP EMT Composite feeders copper - Large Power       716       If       \$28.14       //f       \$19,642         #155 60 AMP EMT Composite feeders copper - Large Power       585       If       \$28.14       //f       \$16,642         #157 60 AMP EMT Composite feeders copper - Large Power       593       If       \$28.14       //f       \$16,631         #161 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       //f       \$16,631         #162 60 AMP EMT Composite feeders copper - Large Power       600       If       \$28.14       //f       \$16,631         #163 70 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       //f       \$17,784         #165 70 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14 </td <td>#145 80 AMP EMT Composite feeders copper - Large Power</td> <td>658 lf</td> <td>\$33.82 /lf</td> <td>\$22,254</td>                                      | #145 80 AMP EMT Composite feeders copper - Large Power | 658 lf   | \$33.82 /lf | \$22,254   |
| #147 80 AMP EMT Composite feeders copper - Large Power       665       If       \$33.82       /If       \$22,490         #148 60 AMP EMT Composite feeders copper - Large Power       671       If       \$23.82       /If       \$21,882         #143 80 AMP EMT Composite feeders copper - Large Power       667       If       \$28.14       /If       \$21,882         #153 50 AMP EMT Composite feeders copper - Large Power       766       If       \$28.14       /If       \$24,215         #154 80 AMP EMT Composite feeders copper - Large Power       785       If       \$28.14       /If       \$16,662         #157 60 AMP EMT Composite feeders copper - Large Power       593       If       \$28.14       /If       \$16,662         #159 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,661         #160 60 AMP EMT Composite feeders copper - Large Power       600       If       \$28.14       /If       \$17,784         #161 60 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       /If       \$17,897         #163 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14       /If       \$17,897         #163 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14 </td <td>#146 80 AMP EMT Composite feeders copper - Large Power</td> <td>663 lf</td> <td>\$33.82 /lf</td> <td>\$22,423</td>                                      | #146 80 AMP EMT Composite feeders copper - Large Power | 663 lf   | \$33.82 /lf | \$22,423   |
| #148 60 AMP EMT Composite feeders copper - Large Power       671       If       \$28.14       /If       \$218,82         #133 50 AMP EMT Composite feeders copper - Large Power       766       If       \$23.82       /If       \$21,832         #153 50 AMP EMT Composite feeders copper - Large Power       706       If       \$23.82       /If       \$24,215         #154 80 AMP EMT Composite feeders copper - Large Power       593       If       \$28.14       /If       \$16,687         #155 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,687         #155 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,631         #160 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,631         #162 60 AMP EMT Composite feeders copper - Large Power       600       If       \$28.14       /If       \$17,781         #162 60 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       /If       \$17,784         #164 70 AMP EMT Composite feeders copper - Large Power       636       If       \$28.14       /If       \$17,787         #166 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14 </td <td>#147 80 AMP EMT Composite feeders copper - Large Power</td> <td>665 lf</td> <td>\$33.82 /lf</td> <td>\$22,490</td>                                      | #147 80 AMP EMT Composite feeders copper - Large Power | 665 lf   | \$33.82 /lf | \$22,490   |
| #149 80 AMP EMT Composite feeders copper - Large Power       647 If       \$33.82 /If       \$21,882         #153 50 AMP EMT Composite feeders copper - Large Power       706 If       \$28.14 /If       \$19,867         #154 80 AMP EMT Composite feeders copper - Large Power       716 If       \$33.82 /If       \$24,215         #155 60 AMP EMT Composite feeders copper - Large Power       593 If       \$28.14 /If       \$16,642         #155 60 AMP EMT Composite feeders copper - Large Power       593 If       \$28.14 /If       \$16,637         #155 60 AMP EMT Composite feeders copper - Large Power       601 If       \$28.14 /If       \$16,631         #166 00 AMP EMT Composite feeders copper - Large Power       600 If       \$28.14 /If       \$16,631         #162 60 AMP EMT Composite feeders copper - Large Power       600 If       \$28.14 /If       \$17,081         #162 60 AMP EMT Composite feeders copper - Large Power       632 If       \$28.14 /If       \$17,784         #163 70 AMP EMT Composite feeders copper - Large Power       634 If       \$28.14 /If       \$17,897         #166 70 AMP EMT Composite feeders copper - Large Power       631 If       \$28.14 /If       \$17,897         #166 70 AMP EMT Composite feeders copper - Large Power       642 If       \$28.14 /If       \$18,806         #177 70 AMP EMT Composite feeders copper - Large Power       641 If       \$28   | #148 60 AMP EMT Composite feeders copper - Large Power | 671 lf   | \$28.14 /lf | \$18,882   |
| #153 50 AMP EMT Composite feeders copper - Large Power       706 If       \$28.14 /If       \$19,867         #154 80 AMP EMT Composite feeders copper - Large Power       716 If       \$33.82 /If       \$24,215         #155 60 AMP EMT Composite feeders copper - Large Power       585 If       \$28.14 /If       \$16,687         #155 60 AMP EMT Composite feeders copper - Large Power       591 If       \$28.14 /If       \$16,687         #155 60 AMP EMT Composite feeders copper - Large Power       601 If       \$28.14 /If       \$16,631         #156 60 AMP EMT Composite feeders copper - Large Power       607 If       \$28.14 /If       \$16,631         #166 60 AMP EMT Composite feeders copper - Large Power       600 If       \$28.14 /If       \$17,781         #162 60 AMP EMT Composite feeders copper - Large Power       600 If       \$28.14 /If       \$17,781         #162 60 AMP EMT Composite feeders copper - Large Power       632 If       \$28.14 /If       \$17,784         #164 70 AMP EMT Composite feeders copper - Large Power       636 If       \$28.14 /If       \$17,785         #165 70 AMP EMT Composite feeders copper - Large Power       631 If       \$28.14 /If       \$18,806         #166 70 AMP EMT Composite feeders copper - Large Power       631 If       \$28.14 /If       \$18,825         #166 70 AMP EMT Composite feeders copper - Large Power       643 If       \$28   | #149 80 AMP EMT Composite feeders copper - Large Power | 647 lf   | \$33.82 /lf | \$21,882   |
| #154 80 AMP EMT Composite feeders copper - Large Power       716       If       \$33.82       /If       \$24,215         #155 60 AMP EMT Composite feeders copper - Large Power       585       If       \$28.14       /If       \$16,627         #155 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,631         #159 60 AMP EMT Composite feeders copper - Large Power       607       If       \$28.14       /If       \$16,631         #160 60 AMP EMT Composite feeders copper - Large Power       607       If       \$28.14       /If       \$17,784         #161 60 AMP EMT Composite feeders copper - Large Power       600       If       \$28.14       /If       \$17,784         #162 60 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       /If       \$17,784         #164 70 AMP EMT Composite feeders copper - Large Power       636       If       \$28.14       /If       \$17,789         #166 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14       /If       \$17,759         #166 70 AMP EMT Composite feeders copper - Large Power       641       If       \$28.14       /If       \$18,235         #171 70 AMP EMT Composite feeders copper - Large Power       648       If       \$28.14 </td <td>#153 50 AMP EMT Composite feeders copper - Large Power</td> <td>706 lf</td> <td>\$28.14 /lf</td> <td>\$19,867</td>                                      | #153 50 AMP EMT Composite feeders copper - Large Power | 706 lf   | \$28.14 /lf | \$19,867   |
| #155 60 AMP EMT Composite feeders copper - Large Power       585       If       \$28.14       /If       \$16,627         #157 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,637         #159 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,631         #161 60 AMP EMT Composite feeders copper - Large Power       607       If       \$28.14       /If       \$16,631         #161 60 AMP EMT Composite feeders copper - Large Power       600       If       \$28.14       /If       \$16,884         #163 70 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       /If       \$17,784         #164 70 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       /If       \$17,784         #164 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14       /If       \$17,897         #166 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14       /If       \$17,897         #166 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14       /If       \$18,806         #167 70 AMP EMT Composite feeders copper - Large Power       648       If       \$28.14 </td <td>#154 80 AMP EMT Composite feeders copper - Large Power</td> <td>716 lf</td> <td>\$33.82 /lf</td> <td>\$24,215</td>                                      | #154 80 AMP EMT Composite feeders copper - Large Power | 716 lf   | \$33.82 /lf | \$24,215   |
| #157 60 AMP EMT Composite feeders copper - Large Power       593       If       \$28.14       /If       \$16,687         #159 60 AMP EMT Composite feeders copper - Large Power       601       If       \$28.14       /If       \$16,631         #160 60 AMP EMT Composite feeders copper - Large Power       607       If       \$28.14       /If       \$16,631         #161 60 AMP EMT Composite feeders copper - Large Power       600       If       \$28.14       /If       \$17,801         #162 60 AMP EMT Composite feeders copper - Large Power       600       If       \$28.14       /If       \$17,801         #162 70 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       /If       \$17,784         #164 70 AMP EMT Composite feeders copper - Large Power       632       If       \$28.14       /If       \$17,789         #165 70 AMP EMT Composite feeders copper - Large Power       631       If       \$28.14       /If       \$17,756         #167 70 AMP EMT Composite feeders copper - Large Power       642       If       \$28.14       /If       \$18,8061         #169 70 AMP EMT Composite feeders copper - Large Power       648       If       \$28.14       /If       \$18,8061         #173 40 AMP EMT Composite feeders copper - Large Power       738       If       \$28.14  | #155 60 AMP EMT Composite feeders copper - Large Power | 585 lf   | \$28.14 /lf | \$16,462   |
| #159 60 AMP EMT Composite feeders copper - Large Power601If\$28.14//f\$16,912#160 60 AMP EMT Composite feeders copper - Large Power607If\$28.14//f\$17,081#161 60 AMP EMT Composite feeders copper - Large Power600If\$28.14//f\$17,081#162 60 AMP EMT Composite feeders copper - Large Power600If\$28.14//f\$17,081#162 70 AMP EMT Composite feeders copper - Large Power622If\$28.14//f\$17,784#164 70 AMP EMT Composite feeders copper - Large Power624If\$28.14//f\$17,789#165 70 AMP EMT Composite feeders copper - Large Power631If\$28.14//f\$17,750#165 70 AMP EMT Composite feeders copper - Large Power631If\$28.14//f\$18,035#176 70 AMP EMT Composite feeders copper - Large Power642If\$28.14//f\$18,066#169 70 AMP EMT Composite feeders copper - Large Power618If\$28.14//f\$18,020#173 40 AMP EMT Composite feeders copper - Large Power618If\$28.14//f\$18,601#174 40 AMP EMT Composite feeders copper - Large Power739If\$33.82//f\$28,128#173 80 AMP EMT Composite feeders copper - Large Power739If\$33.82//f\$28,138#174 40 AMP EMT Composite feeders copper - Large Power739If\$33.82//f\$22,933#177 80 AMP EMT Composite feeders copper - Large Power739If\$33.82<  | #157 60 AMP EMT Composite feeders copper - Large Power | 593 lf   | \$28.14 /lf | \$16,687   |
| #160 60 AMP EMT Composite feeders copper - Large Power       591 If       \$28.14 /lf       \$16,631         #161 60 AMP EMT Composite feeders copper - Large Power       607 If       \$28.14 /lf       \$17,081         #162 60 AMP EMT Composite feeders copper - Large Power       600 If       \$28.14 /lf       \$16,884         #163 70 AMP EMT Composite feeders copper - Large Power       632 If       \$28.14 /lf       \$17,784         #164 70 AMP EMT Composite feeders copper - Large Power       632 If       \$28.14 /lf       \$17,789         #165 70 AMP EMT Composite feeders copper - Large Power       631 If       \$28.14 /lf       \$17,897         #165 70 AMP EMT Composite feeders copper - Large Power       631 If       \$28.14 /lf       \$17,756         #167 70 AMP EMT Composite feeders copper - Large Power       642 If       \$28.14 /lf       \$18,066         #169 70 AMP EMT Composite feeders copper - Large Power       648 If       \$28.14 /lf       \$18,235         #171 70 AMP EMT Composite feeders copper - Large Power       656 If       \$28.14 /lf       \$18,601         #174 40 AMP EMT Composite feeders copper - Large Power       739 If       \$33.82 /lf       \$24,993         #177 80 AMP EMT Composite feeders copper - Large Power       752 If       \$33.82 /lf       \$25,128         #179 80 AMP EMT Composite feeders copper - Large Power       752 If       \$33   | #159 60 AMP EMT Composite feeders copper - Large Power | 601 lf   | \$28.14 /lf | \$16,912   |
| #161 60 AMP EMT Composite feeders copper - Large Power607If\$28.14//f\$17,081#162 60 AMP EMT Composite feeders copper - Large Power600If\$28.14//f\$16,884#163 70 AMP EMT Composite feeders copper - Large Power632If\$28.14//f\$17,584#164 70 AMP EMT Composite feeders copper - Large Power634If\$28.14//f\$17,597#165 70 AMP EMT Composite feeders copper - Large Power636If\$28.14//f\$17,798#166 70 AMP EMT Composite feeders copper - Large Power631If\$28.14//f\$18,066#165 70 AMP EMT Composite feeders copper - Large Power642If\$28.14//f\$18,066#165 70 AMP EMT Composite feeders copper - Large Power648If\$28.14//f\$18,205#171 70 AMP EMT Composite feeders copper - Large Power718If\$28.14//f\$18,601#173 40 AMP EMT Composite feeders copper - Large Power651If\$28.14//f\$18,601#174 40 AMP EMT Composite feeders copper - Large Power739If\$33.82/lf\$24,993#177 80 AMP EMT Composite feeders copper - Large Power739If\$33.82/lf\$25,128#177 80 AMP EMT Composite feeders copper - Large Power732If\$33.82/lf\$25,333#177 80 AMP EMT Composite feeders copper - Large Power732If\$28.14/lf\$20,317#178 04 AMP EMT Composite feeders copper - Large Power722If\$28.14<  | #160 60 AMP EMT Composite feeders copper - Large Power | 591 lf   | \$28.14 /lf | \$16,631   |
| #162 60 AMP EMT Composite feeders copper - Large Power600 If\$28.14 //f\$16,884#163 70 AMP EMT Composite feeders copper - Large Power632 If\$28.14 //f\$17,784#164 70 AMP EMT Composite feeders copper - Large Power624 If\$28.14 //f\$17,599#165 70 AMP EMT Composite feeders copper - Large Power636 If\$28.14 //f\$17,756#166 70 AMP EMT Composite feeders copper - Large Power631 If\$28.14 //f\$17,756#167 70 AMP EMT Composite feeders copper - Large Power642 If\$28.14 //f\$18,066#169 70 AMP EMT Composite feeders copper - Large Power648 If\$28.14 //f\$18,020#171 70 AMP EMT Composite feeders copper - Large Power611 If\$28.14 //f\$18,066#173 40 AMP EMT Composite feeders copper - Large Power616 If\$28.14 //f\$18,600#174 40 AMP EMT Composite feeders copper - Large Power739 If\$28.14 //f\$18,400#175 80 AMP EMT Composite feeders copper - Large Power739 If\$33.82 //f\$24,993#177 80 AMP EMT Composite feeders copper - Large Power739 If\$33.82 //f\$24,993#177 80 AMP EMT Composite feeders copper - Large Power721 If\$33.82 //f\$25,128#179 80 AMP EMT Composite feeders copper - Large Power721 If\$33.82 //f\$25,133#182 60 AMP EMT Composite feeders copper - Large Power721 If\$28.14 //f\$20,317#187 40 AMP EMT Composite feeders copper - Large Power721 If\$28.14 //f\$21,0317#187 40 AMP EMT Composite feeders copper - Large Power341 If <td< td=""><td>#161 60 AMP EMT Composite feeders copper - Large Power</td><td>607 lf</td><td>\$28.14 /lf</td><td>\$17,081</td></td<> | #161 60 AMP EMT Composite feeders copper - Large Power | 607 lf   | \$28.14 /lf | \$17,081   |
| #163 70 AMP EMT Composite feeders copper - Large Power632If\$28.14//f\$17,784#164 70 AMP EMT Composite feeders copper - Large Power624If\$28.14/If\$17,559#165 70 AMP EMT Composite feeders copper - Large Power636If\$28.14/If\$17,897#166 70 AMP EMT Composite feeders copper - Large Power631If\$28.14/If\$17,756#167 70 AMP EMT Composite feeders copper - Large Power642If\$28.14/If\$18,066#169 70 AMP EMT Composite feeders copper - Large Power648If\$28.14/If\$18,235#171 70 AMP EMT Composite feeders copper - Large Power641If\$28.14/If\$18,235#171 70 AMP EMT Composite feeders copper - Large Power661If\$28.14/If\$18,601#174 40 AMP EMT Composite feeders copper - Large Power656If\$28.14/If\$18,601#177 80 AMP EMT Composite feeders copper - Large Power739If\$33.82/If\$24,993#177 80 AMP EMT Composite feeders copper - Large Power752If\$33.82/If\$25,128#179 80 AMP EMT Composite feeders copper - Large Power722If\$28.14/If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power738If\$21.13/If\$9,254#179 80 AMP EMT Composite feeders copper - Large Power743If\$21.00/If\$7,287#187 40 AMP EMT Composite feeders copper - Large Power722If\$28.14 <td< td=""><td>#162 60 AMP EMT Composite feeders copper - Large Power</td><td>600 lf</td><td>\$28.14 /lf</td><td>\$16,884</td></td<>  | #162 60 AMP EMT Composite feeders copper - Large Power | 600 lf   | \$28.14 /lf | \$16,884   |
| #164 70 AMP EMT Composite feeders copper - Large Power624If\$28.14//f\$17,559#165 70 AMP EMT Composite feeders copper - Large Power636If\$28.14//f\$17,897#166 70 AMP EMT Composite feeders copper - Large Power631If\$28.14//f\$17,756#167 70 AMP EMT Composite feeders copper - Large Power642If\$28.14//f\$18,066#169 70 AMP EMT Composite feeders copper - Large Power648If\$28.14//f\$18,235#171 70 AMP EMT Composite feeders copper - Large Power661If\$28.14//f\$18,601#173 40 AMP EMT Composite feeders copper - Large Power656If\$28.14//f\$18,601#174 40 AMP EMT Composite feeders copper - Large Power739If\$33.82//f\$24,993#177 80 AMP EMT Composite feeders copper - Large Power739If\$33.82//f\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752If\$33.82//f\$22,031#182 60 AMP EMT Composite feeders copper - Large Power752If\$33.82//f\$20,317#187 40 AMP EMT Composite feeders copper - Large Power722If\$23.14//f\$20,317#177 80 AMP EMT Composite feeders copper - Large Power722If\$23.42//f\$20,317#187 40 AMP EMT Composite feeders copper - Large Power722If\$23.42//f\$20,317#187 40 AMP EMT Composite feeders copper - Large Power341If\$21.10<  | #163 70 AMP EMT Composite feeders copper - Large Power | 632 lf   | \$28.14 /lf | \$17,784   |
| #165 70 AMP EMT Composite feeders copper - Large Power636If\$28.14/If\$17,897#166 70 AMP EMT Composite feeders copper - Large Power631If\$28.14/If\$17,756#167 70 AMP EMT Composite feeders copper - Large Power642If\$28.14/If\$18,066#169 70 AMP EMT Composite feeders copper - Large Power648If\$28.14/If\$18,235#171 70 AMP EMT Composite feeders copper - Large Power648If\$28.14/If\$18,020#173 40 AMP EMT Composite feeders copper - Large Power661If\$28.14/If\$18,601#174 40 AMP EMT Composite feeders copper - Large Power656If\$28.14/If\$18,460#175 80 AMP EMT Composite feeders copper - Large Power739If\$33.82/If\$24,993#177 80 AMP EMT Composite feeders copper - Large Power772If\$33.82/If\$25,128#179 80 AMP EMT Composite feeders copper - Large Power772If\$33.82/If\$22,0317#182 60 AMP EMT Composite feeders copper - Large Power722If\$28.14/If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power341If\$21.00/If\$7,287#132 40 AMP EMT Composite feeders copper - Large Power342If\$21.00/If\$7,287#142 40 AMP EMT Composite feeders copper - Large Power343If\$21.00/If\$7,287#133 40 AMP EMT Composite feeders copper - Large Power341If\$21.00 <td< td=""><td>#164 70 AMP EMT Composite feeders copper - Large Power</td><td>624 lf</td><td>\$28.14 /lf</td><td>\$17,559</td></td<>  | #164 70 AMP EMT Composite feeders copper - Large Power | 624 lf   | \$28.14 /lf | \$17,559   |
| #166 70 AMP EMT Composite feeders copper - Large Power631 lf\$28.14 /lf\$17,756#167 70 AMP EMT Composite feeders copper - Large Power642 lf\$28.14 /lf\$18,066#169 70 AMP EMT Composite feeders copper - Large Power648 lf\$28.14 /lf\$18,235#171 70 AMP EMT Composite feeders copper - Large Power718 lf\$28.14 /lf\$18,001#173 40 AMP EMT Composite feeders copper - Large Power661 lf\$28.14 /lf\$18,601#174 40 AMP EMT Composite feeders copper - Large Power656 lf\$28.14 /lf\$18,400#175 80 AMP EMT Composite feeders copper - Large Power739 lf\$33.82 /lf\$24,993#177 80 AMP EMT Composite feeders copper - Large Power743 lf\$33.82 /lf\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752 lf\$33.82 /lf\$20,017#187 40 AMP EMT Composite feeders copper - Large Power722 lf\$28.14 /lf\$20,317#187 40 AMP EMT Composite feeders copper - Large Power743 lf\$21.13 /lf\$9,254#232 40 AMP EMT Composite feeders copper - Large Power341 lf\$21.00 /lf\$7,287#233 40 AMP EMT Composite feeders copper - Large Power347 lf\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power399 lf\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 lf\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00  | #165 70 AMP EMT Composite feeders copper - Large Power | 636 lf   | \$28.14 /lf | \$17,897   |
| #167 70 AMP EMT Composite feeders copper - Large Power       642       If       \$28.14       /If       \$18,066         #169 70 AMP EMT Composite feeders copper - Large Power       648       If       \$28.14       /If       \$18,235         #171 70 AMP EMT Composite feeders copper - Large Power       718       If       \$28.14       /If       \$18,001         #173 40 AMP EMT Composite feeders copper - Large Power       661       If       \$28.14       /If       \$18,601         #174 40 AMP EMT Composite feeders copper - Large Power       656       If       \$28.14       /If       \$18,601         #175 80 AMP EMT Composite feeders copper - Large Power       739       If       \$33.82       /If       \$24,993         #177 80 AMP EMT Composite feeders copper - Large Power       743       If       \$33.82       /If       \$25,128         #179 80 AMP EMT Composite feeders copper - Large Power       752       If       \$33.82       /If       \$25,433         #182 60 AMP EMT Composite feeders copper - Large Power       722       If       \$28.14       /If       \$20,317         #187 40 AMP EMT Composite feeders copper - Large Power       341       If       \$21.00       /If       \$7,287         #233 40 AMP EMT Composite feeders copper - Large Power       341       If       \$21.00 <td>#166 70 AMP EMT Composite feeders copper - Large Power</td> <td>631 lf</td> <td>\$28.14 /lf</td> <td>\$17,756</td>  | #166 70 AMP EMT Composite feeders copper - Large Power | 631 lf   | \$28.14 /lf | \$17,756   |
| #169 70 AMP EMT Composite feeders copper - Large Power648If\$28.14/If\$18,235#171 70 AMP EMT Composite feeders copper - Large Power718If\$28.14/If\$20,205#173 40 AMP EMT Composite feeders copper - Large Power661If\$28.14/If\$18,601#174 40 AMP EMT Composite feeders copper - Large Power656If\$28.14/If\$18,460#175 80 AMP EMT Composite feeders copper - Large Power739If\$33.82/If\$24,993#177 80 AMP EMT Composite feeders copper - Large Power743If\$33.82/If\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752If\$33.82/If\$22,317#182 60 AMP EMT Composite feeders copper - Large Power722If\$28.14/If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power722If\$21.13/If\$9,254#182 60 AMP EMT Composite feeders copper - Large Power341If\$21.00/If\$7,161#187 40 AMP EMT Composite feeders copper - Large Power341If\$21.00/If\$7,287#232 40 AMP EMT Composite feeders copper - Large Power347If\$21.00/If\$8,379#233 40 AMP EMT Composite feeders copper - Large Power399If\$21.00/If\$8,379#243 40 AMP EMT Composite feeders copper - Large Power399If\$21.00/If\$8,463#245 30 AMP EMT Composite feeders copper - Large Power403If\$21.00/If  | #167 70 AMP EMT Composite feeders copper - Large Power | 642 lf   | \$28.14 /lf | \$18,066   |
| #171 70 AMP EMT Composite feeders copper - Large Power718If\$28.14//If\$20,205#173 40 AMP EMT Composite feeders copper - Large Power661If\$28.14//If\$18,601#174 40 AMP EMT Composite feeders copper - Large Power656If\$28.14//If\$18,460#175 80 AMP EMT Composite feeders copper - Large Power739If\$33.82//If\$24,993#177 80 AMP EMT Composite feeders copper - Large Power743If\$33.82//If\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752If\$33.82//If\$25,433#182 60 AMP EMT Composite feeders copper - Large Power722If\$28.14//If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power722If\$28.14//If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power738If\$21.00//If\$7,161#232 40 AMP EMT Composite feeders copper - Large Power341If\$21.00//If\$7,287#233 40 AMP EMT Composite feeders copper - Large Power347If\$21.00//If\$8,379#243 40 AMP EMT Composite feeders copper - Large Power399If\$21.00//If\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403If\$21.00//If\$8,463#245 30 AMP EMT Composite feeders copper - Large Power403If\$21.00//If\$8,035#246 40 AMP EMT Composite feeders copper - Large Power411If\$19.   | #169 70 AMP EMT Composite feeders copper - Large Power | 648 lf   | \$28.14 /lf | \$18,235   |
| #173 40 AMP EMT Composite feeders copper - Large Power661If\$28.14/If\$18,601#174 40 AMP EMT Composite feeders copper - Large Power656If\$28.14/If\$18,460#175 80 AMP EMT Composite feeders copper - Large Power739If\$33.82/If\$24,993#177 80 AMP EMT Composite feeders copper - Large Power743If\$33.82/If\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752If\$33.82/If\$20,317#182 60 AMP EMT Composite feeders copper - Large Power722If\$28.14/If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power722If\$21.13/If\$9,254#233 40 AMP EMT Composite feeders copper - Large Power341If\$21.00/If\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399If\$21.00/If\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403If\$21.00/If\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411If\$19.55/If\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312If\$21.00/If\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312If\$21.00/If\$6,552   | #171 70 AMP EMT Composite feeders copper - Large Power | 718 lf   | \$28.14 /lf | \$20,205   |
| #174 40 AMP EMT Composite feeders copper - Large Power656If\$28.14/If\$18,460#175 80 AMP EMT Composite feeders copper - Large Power739If\$33.82/If\$24,993#177 80 AMP EMT Composite feeders copper - Large Power743If\$33.82/If\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752If\$33.82/If\$25,433#182 60 AMP EMT Composite feeders copper - Large Power722If\$28.14/If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power722If\$21.13/If\$9,254#232 40 AMP EMT Composite feeders copper - Large Power341If\$21.00/If\$7,161#233 40 AMP EMT Composite feeders copper - Large Power347If\$21.00/If\$8,379#243 40 AMP EMT Composite feeders copper - Large Power399If\$21.00/If\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403If\$21.00/If\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411If\$19.55/If\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312If\$21.00/If\$6,552  | #173 40 AMP EMT Composite feeders copper - Large Power | 661 lf   | \$28.14 /lf | \$18,601   |
| #175 80 AMP EMT Composite feeders copper - Large Power739 If\$33.82 /lf\$24,993#177 80 AMP EMT Composite feeders copper - Large Power743 If\$33.82 /lf\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752 If\$33.82 /lf\$25,433#182 60 AMP EMT Composite feeders copper - Large Power722 If\$28.14 /lf\$20,317#187 40 AMP EMT Composite feeders copper - Large Power438 If\$21.13 /lf\$9,254#232 40 AMP EMT Composite feeders copper - Large Power341 If\$21.00 /lf\$7,161#233 40 AMP EMT Composite feeders copper - Large Power347 If\$21.00 /lf\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399 If\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 If\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 If\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 If\$21.00 /lf\$6,552   | #174 40 AMP EMT Composite feeders copper - Large Power | 656 lf   | \$28.14 /lf | \$18,460   |
| #177 80 AMP EMT Composite feeders copper - Large Power743 If\$33.82 /If\$25,128#179 80 AMP EMT Composite feeders copper - Large Power752 If\$33.82 /If\$25,433#182 60 AMP EMT Composite feeders copper - Large Power722 If\$28.14 /If\$20,317#187 40 AMP EMT Composite feeders copper - Large Power438 If\$21.13 /If\$9,254#232 40 AMP EMT Composite feeders copper - Large Power341 If\$21.00 /If\$7,161#233 40 AMP EMT Composite feeders copper - Large Power347 If\$21.00 /If\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399 If\$21.00 /If\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 If\$21.00 /If\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 If\$19.55 /If\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 If\$21.00 /If\$6,552  | #175 80 AMP EMT Composite feeders copper - Large Power | 739 lf   | \$33.82 /lf | \$24,993   |
| #179 80 AMP EMT Composite feeders copper - Large Power752 lf\$33.82 /lf\$25,433#182 60 AMP EMT Composite feeders copper - Large Power722 lf\$28.14 /lf\$20,317#187 40 AMP EMT Composite feeders copper - Large Power438 lf\$21.13 /lf\$9,254#232 40 AMP EMT Composite feeders copper - Large Power341 lf\$21.00 /lf\$7,161#233 40 AMP EMT Composite feeders copper - Large Power347 lf\$21.00 /lf\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399 lf\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 lf\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00 /lf\$6,552   | #177 80 AMP EMT Composite feeders copper - Large Power | 743 lf   | \$33.82 /lf | \$25,128   |
| #182 60 AMP EMT Composite feeders copper - Large Power722 If\$28.14 /lf\$20,317#187 40 AMP EMT Composite feeders copper - Large Power438 If\$21.13 /lf\$9,254#232 40 AMP EMT Composite feeders copper - Large Power341 If\$21.00 /lf\$7,161#233 40 AMP EMT Composite feeders copper - Large Power347 If\$21.00 /lf\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399 If\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 If\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 If\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 If\$21.00 /lf\$6,552  | #179 80 AMP EMT Composite feeders copper - Large Power | 752 lf   | \$33.82 /lf | \$25,433   |
| #187 40 AMP EMT Composite feeders copper - Large Power438 lf\$21.13 /lf\$9,254#232 40 AMP EMT Composite feeders copper - Large Power341 lf\$21.00 /lf\$7,161#233 40 AMP EMT Composite feeders copper - Large Power347 lf\$21.00 /lf\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399 lf\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 lf\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00 /lf\$6,552   | #182 60 AMP EMT Composite feeders copper - Large Power | 722 lf   | \$28.14 /lf | \$20,317   |
| #232 40 AMP EMT Composite feeders copper - Large Power341 lf\$21.00 /lf\$7,161#233 40 AMP EMT Composite feeders copper - Large Power347 lf\$21.00 /lf\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399 lf\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 lf\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00 /lf\$6,552   | #187 40 AMP EMT Composite feeders copper - Large Power | 438 lf   | \$21.13 /lf | \$9,254    |
| #233 40 AMP EMT Composite feeders copper - Large Power347 lf\$21.00 /lf\$7,287#243 40 AMP EMT Composite feeders copper - Large Power399 lf\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 lf\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00 /lf\$6,552   | #232 40 AMP EMT Composite feeders copper - Large Power | 341 lf   | \$21.00 /lf | \$7,161    |
| #243 40 AMP EMT Composite feeders copper - Large Power399 lf\$21.00 /lf\$8,379#244 40 AMP EMT Composite feeders copper - Large Power403 lf\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00 /lf\$6,552   | #233 40 AMP EMT Composite feeders copper - Large Power | 347 lf   | \$21.00 /lf | \$7,287    |
| #244 40 AMP EMT Composite feeders copper - Large Power403 lf\$21.00 /lf\$8,463#245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00 /lf\$6,552   | #243 40 AMP EMT Composite feeders copper - Large Power | 399 If   | \$21.00 /lf | \$8,379    |
| #245 30 AMP EMT Composite feeders copper - Large Power411 lf\$19.55 /lf\$8,035#246 40 AMP EMT Composite feeders copper - Large Power312 lf\$21.00 /lf\$6,552   | #244 40 AMP EMT Composite feeders copper - Large Power | 403 lf   | \$21.00 /lf | \$8,463    |
| #246 40 AMP EMT Composite feeders copper - Large Power 312 If \$21.00 /lf \$6,552  | #245 30 AMP EMT Composite feeders copper - Large Power | 411 lf   | \$19.55 /lf | \$8,035    |
|  | #246 40 AMP EMT Composite feeders copper - Large Power | 312 lf   | \$21.00 /lf | \$6,552    |


60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST   | TOTAL COST       |
|--|----------|-------------|------------------|
| #247 35 AMP EMT Composite feeders copper - Large Power | 319 lf   | \$20.31 /lf | \$6,479          |
| #248 40 AMP EMT Composite feeders copper - Large Power | 303 lf   | \$21.00 /lf | \$6,363          |
| #249 30 AMP EMT Composite feeders copper - Large Power | 314 lf   | \$19.55 /lf | \$6,138          |
| #251 40 AMP EMT Composite feeders copper - Large Power | 327 lf   | \$21.00 /lf | \$6,867          |
| #252 30 AMP EMT Composite feeders copper - Large Power | 337 lf   | \$19.55 /lf | \$6,588          |
| #253 40 AMP EMT Composite feeders copper - Large Power | 421 lf   | \$21.00 /lf | \$8,841          |
| #256 40 AMP EMT Composite feeders copper - Large Power | 328 lf   | \$21.00 /lf | \$6 <i>,</i> 888 |
| #259 40 AMP EMT Composite feeders copper - Large Power | 294 If   | \$21.00 /lf | \$6,174          |
| #261 40 AMP EMT Composite feeders copper - Large Power | 304 If   | \$21.00 /lf | \$6,384          |
| #263 40 AMP EMT Composite feeders copper - Large Power | 218 lf   | \$21.00 /lf | \$4,578          |
| #264 35 AMP EMT Composite feeders copper - Large Power | 216 lf   | \$20.31 /lf | \$4,387          |
| #265 40 AMP EMT Composite feeders copper - Large Power | 209 If   | \$21.00 /lf | \$4,389          |
| #266 35 AMP EMT Composite feeders copper - Large Power | 210 lf   | \$20.31 /lf | \$4,265          |
| #271 40 AMP EMT Composite feeders copper - Large Power | 228 lf   | \$21.00 /lf | \$4,788          |
| #273 40 AMP EMT Composite feeders copper - Large Power | 222 If   | \$21.00 /lf | \$4,662          |
| #275 40 AMP EMT Composite feeders copper - Large Power | 550 lf   | \$21.00 /lf | \$11,550         |
| #277 40 AMP EMT Composite feeders copper - Large Power | 493 If   | \$21.00 /lf | \$10,353         |
| #279 40 AMP EMT Composite feeders copper - Large Power | 490 lf   | \$21.00 /lf | \$10,290         |
| #281 40 AMP EMT Composite feeders copper - Large Power | 483 lf   | \$23.60 /lf | \$11,401         |
| #283 40 AMP EMT Composite feeders copper - Large Power | 452 lf   | \$23.60 /lf | \$10,669         |
| #285 40 AMP EMT Composite feeders copper - Large Power | 447 lf   | \$21.00 /lf | \$9,387          |
| #287 40 AMP EMT Composite feeders copper - Large Power | 443 If   | \$21.00 /lf | \$9,303          |
| #291 30 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243          |
| #292 30 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243          |
| #300 35 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243          |
| #302 35 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243          |
| #044 50 AMP EMT Composite feeders copper - Large Power | 35 lf    | \$29.71 /lf | \$1,040          |
| #047 50 AMP EMT Composite feeders copper - Large Power | 362 lf   | \$29.71 /lf | \$10,753         |
| #050 50 AMP EMT Composite feeders copper - Large Power | 482 lf   | \$29.71 /lf | \$14,318         |
| #053 50 AMP EMT Composite feeders copper - Large Power | 307 lf   | \$29.71 /lf | \$9,120          |
| #056 50 AMP EMT Composite feeders copper - Large Power | 447 lf   | \$29.71 /lf | \$13,278         |
| #059 50 AMP EMT Composite feeders copper - Large Power | 291 lf   | \$29.71 /lf | \$8,644          |
| #062 50 AMP EMT Composite feeders copper - Large Power | 474 lf   | \$29.71 /lf | \$14,080         |
| #065 50 AMP EMT Composite feeders copper - Large Power | 280 lf   | \$29.71 /lf | \$8,318          |
| #125 50 AMP EMT Composite feeders copper - Large Power | 548 lf   | \$29.71 /lf | \$16,279         |
| #130 50 AMP EMT Composite feeders copper - Large Power | 571 lf   | \$29.71 /lf | \$16,962         |
| #134 50 AMP EMT Composite feeders copper - Large Power | 342 lf   | \$29.71 /lf | \$10,159         |
| #234 60 AMP EMT Composite feeders copper - Large Power | 356 lf   | \$26.58 /lf | \$9,462          |
| #235 60 AMP EMT Composite feeders copper - Large Power | 366 lf   | \$26.58 /lf | \$9,727          |
| #290 45 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$28.14 /lf | \$3,376          |
| #299 50 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$28.14 /lf | \$3,376          |
| #301 50 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$28.14 /lf | \$3,376          |
| #303 50 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$28.14 /lf | \$3,376          |
| #305 50 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$28.14 /lf | \$3,376          |
| #306 50 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$28.14 /lf | \$3,376          |



60% CD Estimate - Reconciled incl VE



| #307 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #308 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #310 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #311 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #313 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #313 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #315 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #315 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #315 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #315 50 AMP EMT Composite feeders copper - Large Power         120         if         \$28.14         /if         \$53.376           #31  | DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|--|----------|--------------|------------|
| #308 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #309 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #311 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #313 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #313 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #314 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #316 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14 </td <td>#307 50 AMP EMT Composite feeders copper - Large Power</td> <td>120 lf</td> <td>\$28.14 /lf</td> <td>\$3,376</td>   | #307 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #309 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #310 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #312 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #313 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #320 53 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14 </td <td>#308 50 AMP EMT Composite feeders copper - Large Power</td> <td>120 lf</td> <td>\$28.14 /lf</td> <td>\$3,376</td>   | #308 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #310 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #311 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #313 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #313 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #315 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #319 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #324 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #324 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$53.376         #324 S0 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14 </td <td>#309 50 AMP EMT Composite feeders copper - Large Power</td> <td>120 lf</td> <td>\$28.14 /lf</td> <td>\$3,376</td>   | #309 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #311 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #312 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #313 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #312 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #320 35 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #323 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #324 35 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #324 35 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #324 35 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f  | #310 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #312 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #313 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #315 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #315 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #315 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #315 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #315 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #315 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #312 50 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #324 35 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #324 35 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #324 35 AMP ENT Composite feeders copper - Large Power       120 If       528.14 //f       53.376         #325 35 AMP ENT Composite feeders copper - Large Power       120 If       528.61 //f   | #311 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #313 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #314 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #315 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #320 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #321 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #323 50 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 //f       \$3,376         #323 50 AMP EMT Composite feeders copper - Large Power       120 If       \$18.69 //f       \$2,243         #324 50 AMP EMT Composite feeders copper - Large Power       120 If       \$18.69 //f       \$2,243         #325 50 AMP EMT Composite feeders Copper - Large Power       120 If       \$18.69 //f       \$2,243         #325 50 AMP EMT Composite feeders Copper - Large Power       120 If       \$36.01 //f  | #312 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #314 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #315 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #320 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #322 53 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #325 54 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #325 53 AMP EMT Composite feeders Copper - Large Power       120       If       \$28.14       /If       \$3.376         #326 50 AMP EMT Composite feeders Copper - Large Power       120       If       \$3.60       <   | #313 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #315 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #316 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #318 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #318 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #320 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #321 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #322 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #325 35 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #326 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #326 50 AMP EMT Composite feeders copper - Large Power       120       if       \$28.14       /if       \$3,376         #326 10 AMP MT Composite feeders Copper - Large Power       372       if       \$36.01       <   | #314 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #316 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #317 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #319 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$5.3376         #319 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$5.3376         #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$5.3376         #323 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$5.3376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$5.3376         #325 51 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$5.3376         #326 45 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$5.3376         #326 100 AMP IMT Composite feeders copper - Large Power       120       If       \$5.601       /If       \$5.3378         #031 100 AMP EMT Composite feeders Copper - Large Power       324       If       \$6.601 </td <td>#315 50 AMP EMT Composite feeders copper - Large Power</td> <td>120 lf</td> <td>\$28.14 /lf</td> <td>\$3,376</td>   | #315 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #317 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #318 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #320 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #323 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.43       /If       \$2.243         #326 45 AMP EMT Composite feeders copper - Large Power       120       If       \$28.69       /If       \$2.243         #326 100 AMP EMT Composite feeders copper - Large Power       120       If       \$28.60       /If       \$3.376         #031 100 AMP EMT Composite feeders Copper - Large Power       120       If       \$28.41       /If       \$3.378         #038 100 AMP EMT Composite feeders Copper - Large Power       35       If       \$36.01       /If       \$13.95         #038 100 AMP EMT Composite feeders Copper - Large Power       248       If       \$36.01   | #316 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #318 S0 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #319 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #326 45 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #036 100 AMP EMT Composite feeders Copper - Large Power       37       If       \$36.01       /If       \$3.395         #038 100 AMP EMT Composite feeders Copper - Large Power       243       If       \$36.01   | #317 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #319 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       //f       \$3,376         #320 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       //f       \$3,376         #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       //f       \$3,376         #323 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       //f       \$3,376         #325 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       //f       \$3,376         #036 100 AMP EMT Composite feeders copper - Large Power       35       If       \$10.869       //f       \$3,376         #037 100 AMP EMT Composite feeders Copper - Large Power       372       If       \$36.01       /f       \$13,395         #038 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /f       \$13,395         #039 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /f       \$13,95         #031 100 AMP EMT Composite feeders Copper - Large Power       283       If       \$36.01       /f       \$13,95         #041 100 AMP EMT Composite feeders Copper - Large Power       281       If       \$36.01  | #318 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #320 35 AMP EMT Composite feeders copper - Large Power       120       If       \$18.69       /If       \$22.13         #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #325 45 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #326 45 AMP EMT Composite feeders Copper - Large Power       35       If       \$10.08.05       /If       \$3.372         #037 100 AMP EMT Composite feeders Copper - Large Power       372       If       \$3.601       /If       \$13.395         #038 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$3.601       /If       \$13.506         #041 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$3.601       /If       \$15.516         #042 100 AMP EMT Composite feeders Copper - Large Power       281       If       \$3.601       /If       \$15.952         #121 100 AMP EMT Composite feeders Copper - Large Power       1005       If       \$3.601  | #319 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #321 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$33,376         #323 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$33,376         #325 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.69       /If       \$22,243         #325 35 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$33,376         #036 100 AMP MI Composite feeders copper - Large Power       35       If       \$108.05       /If       \$33,3782         #037 100 AMP EMT Composite feeders Copper - Large Power       372       If       \$36.01       /If       \$31,3782         #038 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /If       \$31,376         #038 100 AMP EMT Composite feeders Copper - Large Power       243       If       \$36.01       /If       \$31,996         #044 100 AMP EMT Composite feeders Copper - Large Power       243       If       \$36.01       /If       \$31,994         #041 100 AMP EMT Composite feeders Copper - Large Power       240       If       \$36.01       /If       \$31,992         #142 100 AMP EMT Composite feeders Copper - Large Power       250       If  | #320 35 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$18.69 /lf  | \$2,243    |
| #323 50 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #324 35 AMP EMT Composite feeders copper - Large Power       120       If       \$18.69       /If       \$2.243         #325 45 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3.376         #036 100 AMP EMT Composite feeders Copper - Large Power       35       If       \$108.05       /If       \$3.376         #038 100 AMP EMT Composite feeders Copper - Large Power       372       If       \$36.01       /If       \$3.378         #039 100 AMP EMT Composite feeders Copper - Large Power       474       If       \$36.01       /If       \$3.996         #040 100 AMP EMT Composite feeders Copper - Large Power       283       If       \$36.01       /If       \$3.996         #041 100 AMP EMT Composite feeders Copper - Large Power       420       If       \$36.01       /If       \$3.996         #042 100 AMP EMT Composite feeders Copper - Large Power       420       If       \$36.01       /If       \$3.996         #041 100 AMP EMT Composite feeders Copper - Large Power       265       If       \$36.01       /If       \$3.972         #141 100 AMP EMT Composite feeders Copper - Large Power       1,025       If       \$36.01 </td <td>#321 50 AMP EMT Composite feeders copper - Large Power</td> <td>120 lf</td> <td>\$28.14 /lf</td> <td>\$3,376</td>   | #321 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #324 35 AMP EMT Composite feeders copper - Large Power       120 If       \$18.69 /If       \$2,243         #325 35 AMP EMT Composite feeders copper - Large Power       120 If       \$18.69 /If       \$2,243         #326 45 AMP EMT Composite feeders copper - Large Power       120 If       \$28.14 /If       \$3,376         #036 100 AMP MI Composite feeders Copper - Large Power       37 If       \$36.01 /If       \$13,395         #037 100 AMP EMT Composite feeders Copper - Large Power       474 If       \$36.01 /If       \$15,106         #039 100 AMP EMT Composite feeders Copper - Large Power       249 If       \$36.01 /If       \$15,916         #041 100 AMP EMT Composite feeders Copper - Large Power       442 If       \$36.01 /If       \$16,924         #041 100 AMP EMT Composite feeders Copper - Large Power       470 If       \$36.01 /If       \$16,924         #041 100 AMP EMT Composite feeders Copper - Large Power       265 If       \$36.01 /If       \$13,972         #132 125 AMP EMT Composite feeders Copper - Large Power       288 If       \$36.01 /If       \$13,972         #132 125 AMP EMT Composite feeders Copper - Large Power       528 If       \$36.01 /If       \$13,972         #132 100 AMP EMT Composite feeders Copper - Large Power       528 If       \$36.01 /If       \$13,972         #132 100 AMP EMT Composite feeders Copper - Large Power       525 If <t< td=""><td>#323 50 AMP EMT Composite feeders copper - Large Power</td><td>120 lf</td><td>\$28.14 /lf</td><td>\$3,376</td></t<> | #323 50 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #325 35 AMP EMT Composite feeders copper - Large Power       120       If       \$18.69       /If       \$22,43         #326 45 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$33,762         #036 100 AMP EMT Composite feeders copper - Large Power       35       If       \$108.05       //If       \$53,782         #037 100 AMP EMT Composite feeders Copper - Large Power       372       If       \$36.01       /If       \$51,3355         #038 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /If       \$51,916         #041 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /If       \$51,916         #042 100 AMP EMT Composite feeders Copper - Large Power       243       If       \$36.01       /If       \$51,924         #041 100 AMP EMT Composite feeders Copper - Large Power       420       If       \$36.01       /If       \$51,924         #041 100 AMP EMT Composite feeders Copper - Large Power       251       If       \$36.01       /If       \$51,924         #132 125 AMP EMT Composite feeders Copper - Large Power       1025       If       \$36.01       /If       \$51,901         #132 125 AMP EMT Composite feeders Copper - Large Power       252       If       <   | #324 35 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$18.69 /lf  | \$2,243    |
| #326 45 AMP EMT Composite feeders copper - Large Power       120       If       \$28.14       /If       \$3,376         #036 100 AMP MI Composite feeders Copper - Large Power       37       If       \$100 AMP EMT Composite feeders Copper - Large Power       372       If       \$36.01       /If       \$13,395         #037 100 AMP EMT Composite feeders Copper - Large Power       474       If       \$36.01       /If       \$13,395         #038 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /If       \$100,190         #040 100 AMP EMT Composite feeders Copper - Large Power       422       If       \$36.01       /If       \$10,924         #041 100 AMP EMT Composite feeders Copper - Large Power       422       If       \$36.01       /If       \$10,924         #041 100 AMP EMT Composite feeders Copper - Large Power       420       If       \$36.01       /If       \$10,924         #041 100 AMP EMT Composite feeders Copper - Large Power       265       If       \$36.01       /If       \$1,924         #041 100 AMP EMT Composite feeders Copper - Large Power       288       If       \$36.01       /If       \$1,924         #132 125 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$1,914         #144 10  | #325 35 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$18.69 /lf  | \$2,243    |
| #036 100 AMP MI Composite feeders Copper - Large Power       35       If       \$108.05       /If       \$3,782         #037 100 AMP EMT Composite feeders Copper - Large Power       372       If       \$36.01       /If       \$13,395         #038 100 AMP EMT Composite feeders Copper - Large Power       274       If       \$36.01       /If       \$13,395         #039 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /If       \$10,068         #040 100 AMP EMT Composite feeders Copper - Large Power       283       If       \$36.01       /If       \$10,924         #041 100 AMP EMT Composite feeders Copper - Large Power       442       If       \$36.01       /If       \$15,916         #042 100 AMP EMT Composite feeders Copper - Large Power       265       If       \$36.01       /If       \$16,924         #043 100 AMP EMT Composite feeders Copper - Large Power       288       If       \$36.01       /If       \$19,924         #132 125 AMP EMT Composite feeders Copper - Large Power       528       If       \$36.01       /If       \$19,014         #184 100 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$19,014         #281 00 AMP EMT Composite feeders Copper - Large Power       525       If  | #326 45 AMP EMT Composite feeders copper - Large Power   | 120 lf   | \$28.14 /lf  | \$3,376    |
| #037 100 AMP EMT Composite feeders Copper - Large Power       372       If       \$36.01       /If       \$13,395         #038 100 AMP EMT Composite feeders Copper - Large Power       474       If       \$36.01       /If       \$17,068         #039 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /If       \$17,068         #040 100 AMP EMT Composite feeders Copper - Large Power       283       If       \$36.01       /If       \$10,90         #041 100 AMP EMT Composite feeders Copper - Large Power       442       If       \$36.01       /If       \$15,916         #042 100 AMP EMT Composite feeders Copper - Large Power       265       If       \$36.01       /If       \$16,924         #043 100 AMP EMT Composite feeders Copper - Large Power       288       If       \$36.01       /If       \$16,924         #122 125 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$16,977         #144 100 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$18,977         #228 100 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$18,905         #228 100 AMP EMT Composite feeders Copper - Large Power       525       If <t< td=""><td>#036 100 AMP MI Composite feeders Copper - Large Power</td><td>35 lf</td><td>\$108.05 /lf</td><td>\$3,782</td></t<>  | #036 100 AMP MI Composite feeders Copper - Large Power   | 35 lf    | \$108.05 /lf | \$3,782    |
| #038 100 AMP EMT Composite feeders Copper - Large Power       474       If       \$36.01       /If       \$17,068         #039 100 AMP EMT Composite feeders Copper - Large Power       283       If       \$36.01       /If       \$10,090         #040 100 AMP EMT Composite feeders Copper - Large Power       283       If       \$36.01       /If       \$10,190         #041 100 AMP EMT Composite feeders Copper - Large Power       442       If       \$36.01       /If       \$15,916         #042 100 AMP EMT Composite feeders Copper - Large Power       470       If       \$36.01       /If       \$16,924         #043 100 AMP EMT Composite feeders Copper - Large Power       265       If       \$36.01       /If       \$16,924         #132 125 AMP EMT Composite feeders Copper - Large Power       328       If       \$36.01       /If       \$13,972         #144 100 AMP EMT Composite feeders Copper - Large Power       528       If       \$36.01       /If       \$13,972         #144 100 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$19,914         #184 100 AMP EMT Composite feeders Copper - Large Power       525       If       \$36.01       /If       \$18,077         #228 100 AMP EMT Composite feeders Copper - Large Power       525       If       <   | #037 100 AMP EMT Composite feeders Copper - Large Power  | 372 lf   | \$36.01 /lf  | \$13,395   |
| #039 100 AMP EMT Composite feeders Copper - Large Power       249       If       \$36.01       /If       \$8,966         #040 100 AMP EMT Composite feeders Copper - Large Power       283       If       \$36.01       /If       \$10,190         #041 100 AMP EMT Composite feeders Copper - Large Power       442       If       \$36.01       /If       \$15,916         #042 100 AMP EMT Composite feeders Copper - Large Power       442       If       \$36.01       /If       \$16,924         #043 100 AMP EMT Composite feeders Copper - Large Power       470       If       \$36.01       /If       \$13,972         #132 125 AMP EMT Composite feeders Copper - Large Power       328       If       \$36.01       /If       \$13,972         #144 100 AMP EMT Composite feeders Copper - Large Power       528       If       \$36.01       /If       \$13,972         #144 100 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$18,907         #228 100 AMP EMT Composite feeders Copper - Large Power       525       If       \$36.01       /If       \$18,907         #224 100 AMP EMT Composite feeders Copper - Large Power       525       If       \$36.01       /If       \$18,905         #241 100 AMP EMT Composite feeders Copper - Large Power       120       If <t< td=""><td>#038 100 AMP EMT Composite feeders Copper - Large Power</td><td>474 lf</td><td>\$36.01 /lf</td><td>\$17,068</td></t<>  | #038 100 AMP EMT Composite feeders Copper - Large Power  | 474 lf   | \$36.01 /lf  | \$17,068   |
| #040 100 AMP EMT Composite feeders Copper - Large Power283 If\$36.01 //f\$10,190#041 100 AMP EMT Composite feeders Copper - Large Power442 If\$36.01 //f\$15,916#042 100 AMP EMT Composite feeders Copper - Large Power470 If\$36.01 //f\$16,924#043 100 AMP EMT Composite feeders Copper - Large Power265 If\$36.01 //f\$13,972#132 125 AMP EMT Composite feeders Copper - Large Power388 If\$36.01 //f\$13,972#144 100 AMP EMT Composite feeders Copper - Large Power528 If\$36.01 //f\$19,014#184 100 AMP EMT Composite feeders Copper - Large Power1,025 If\$36.01 //f\$18,077#230 100 AMP EMT Composite feeders Copper - Large Power502 If\$36.01 //f\$18,077#230 100 AMP EMT Composite feeders Copper - Large Power525 If\$36.01 //f\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power525 If\$36.01 //f\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //f\$4,059#242 80 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //f\$4,059#242 80 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //f\$4,059#243 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //f\$4,059#242 80 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //f\$4,059#243 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //f\$4,059#255 90 AMP EMT Composite feeders Copper - Large Power120 If <td>#039 100 AMP EMT Composite feeders Copper - Large Power</td> <td>249 lf</td> <td>\$36.01 /lf</td> <td>\$8,966</td>   | #039 100 AMP EMT Composite feeders Copper - Large Power  | 249 lf   | \$36.01 /lf  | \$8,966    |
| #041 100 AMP EMT Composite feeders Copper - Large Power442If\$36.01//f\$15,916#042 100 AMP EMT Composite feeders Copper - Large Power470If\$36.01/If\$16,924#043 100 AMP EMT Composite feeders Copper - Large Power265If\$36.01/If\$13,972#132 125 AMP EMT Composite feeders Copper - Large Power388If\$36.01/If\$13,972#144 100 AMP EMT Composite feeders Copper - Large Power528If\$36.01/If\$13,972#144 100 AMP EMT Composite feeders Copper - Large Power502If\$36.01/If\$19,014#184 100 AMP EMT Composite feeders Copper - Large Power502If\$36.01/If\$18,077#228 100 AMP EMT Composite feeders Copper - Large Power502If\$36.01/If\$18,095#241 100 AMP EMT Composite feeders Copper - Large Power255If\$36.01/If\$18,905#241 100 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#239 00 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120If\$33.8   | #040 100 AMP EMT Composite feeders Copper - Large Power  | 283 lf   | \$36.01 /lf  | \$10,190   |
| #042 100 AMP EMT Composite feeders Copper - Large Power       470       If       \$36.01       /If       \$16,924         #043 100 AMP EMT Composite feeders Copper - Large Power       265       If       \$36.01       /If       \$9,542         #132 125 AMP EMT Composite feeders Copper - Large Power       388       If       \$36.01       /If       \$13,972         #144 100 AMP EMT Composite feeders Copper - Large Power       528       If       \$36.01       /If       \$19,014         #184 100 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$19,014         #184 100 AMP EMT Composite feeders Copper - Large Power       502       If       \$36.01       /If       \$18,077         #228 100 AMP EMT Composite feeders Copper - Large Power       525       If       \$36.01       /If       \$18,077         #230 100 AMP EMT Composite feeders Copper - Large Power       525       If       \$36.01       /If       \$18,005         #241 100 AMP EMT Composite feeders Copper - Large Power       120       If       \$33.82       /If       \$4,059         #242 80 AMP EMT Composite feeders Copper - Large Power       120       If       \$33.82       /If       \$4,059         #295 90 AMP EMT Composite feeders Copper - Large Power       120       If       \$3  | #041 100 AMP EMT Composite feeders Copper - Large Power  | 442 lf   | \$36.01 /lf  | \$15,916   |
| #043 100 AMP EMT Composite feeders Copper - Large Power265If\$36.01//f\$9,542#132 125 AMP EMT Composite feeders Copper - Large Power388If\$36.01//f\$13,972#144 100 AMP EMT Composite feeders Copper - Large Power528If\$36.01//f\$19,014#184 100 AMP EMT Composite feeders Copper - Large Power502If\$36.01//f\$36,911#228 100 AMP EMT Composite feeders Copper - Large Power502If\$36.01//f\$18,077#230 100 AMP EMT Composite feeders Copper - Large Power525If\$36.01//f\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power525If\$31.60//f\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#293 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82 <td< td=""><td>#042 100 AMP EMT Composite feeders Copper - Large Power</td><td>470 lf</td><td>\$36.01 /lf</td><td>\$16,924</td></td<>   | #042 100 AMP EMT Composite feeders Copper - Large Power  | 470 lf   | \$36.01 /lf  | \$16,924   |
| #132 125 AMP EMT Composite feeders Copper - Large Power388 If\$36.01 //If\$13,972#144 100 AMP EMT Composite feeders Copper - Large Power528 If\$36.01 //If\$19,014#184 100 AMP EMT Composite feeders Copper - Large Power1,025 If\$36.01 //If\$36,911#228 100 AMP EMT Composite feeders Copper - Large Power502 If\$36.01 //If\$18,077#230 100 AMP EMT Composite feeders Copper - Large Power525 If\$36.01 //If\$9,183#241 100 AMP EMT Composite feeders Copper - Large Power525 If\$36.01 //If\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power165 If\$31.60 //If\$5,214#293 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //If\$4,059#242 80 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //If\$4,059#293 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //If\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //If\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 //If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 //If\$34,70#001 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 //If\$34,90#005 2000 AMP EMT Composite feeders Copper - Large Power32 If\$102.06 //If\$34,90#005 2000 AMP EMT Composite feeders Copper - Large Power <td>#043 100 AMP EMT Composite feeders Copper - Large Power</td> <td>265 lf</td> <td>\$36.01 /lf</td> <td>\$9,542</td>   | #043 100 AMP EMT Composite feeders Copper - Large Power  | 265 lf   | \$36.01 /lf  | \$9,542    |
| #144 100 AMP EMT Composite feeders Copper - Large Power528If\$36.01//f\$19,014#184 100 AMP EMT Composite feeders Copper - Large Power1,025If\$36.01//f\$36,911#228 100 AMP EMT Composite feeders Copper - Large Power502If\$36.01//f\$18,077#230 100 AMP EMT Composite feeders Copper - Large Power255If\$36.01//f\$18,077#241 100 AMP EMT Composite feeders Copper - Large Power525If\$36.01//f\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power165If\$31.60//f\$5,214#293 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#242 80 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#293 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149If\$102.06//f\$3,470#001 1200 AMP EMT Composite feeders Copper - Large Power382If\$102.06//f\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power382If\$102.06//f\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power278If\$1   | #132 125 AMP EMT Composite feeders Copper - Large Power  | 388 lf   | \$36.01 /lf  | \$13,972   |
| #184 100 AMP EMT Composite feeders Copper - Large Power1,025If\$36.01/If\$36,911#228 100 AMP EMT Composite feeders Copper - Large Power502If\$36.01/If\$18,077#230 100 AMP EMT Composite feeders Copper - Large Power255If\$36.01/If\$9,183#241 100 AMP EMT Composite feeders Copper - Large Power525If\$36.01/If\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power165If\$31.60/If\$5,214#293 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149If\$821.92/If\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34If\$102.06/If\$38,987#011 200 AMP EMT Composite feeders Copper - Large Power382If\$102.06/If\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06/If\$28,373#012 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06/If\$28,373#012 200 AMP EMT Composite feeders Copper - Large Power278If <td< td=""><td>#144 100 AMP EMT Composite feeders Copper - Large Power</td><td>528 lf</td><td>\$36.01 /lf</td><td>\$19,014</td></td<>   | #144 100 AMP EMT Composite feeders Copper - Large Power  | 528 lf   | \$36.01 /lf  | \$19,014   |
| #228 100 AMP EMT Composite feeders Copper - Large Power502 lf\$36.01 /lf\$18,077#230 100 AMP EMT Composite feeders Copper - Large Power255 lf\$36.01 /lf\$9,183#241 100 AMP EMT Composite feeders Copper - Large Power525 lf\$36.01 /lf\$18,005#242 80 AMP EMT Composite feeders Copper - Large Power165 lf\$31.60 /lf\$5,214#293 90 AMP EMT Composite feeders Copper - Large Power120 lf\$33.82 /lf\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120 lf\$33.82 /lf\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120 lf\$33.82 /lf\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120 lf\$33.82 /lf\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120 lf\$33.82 /lf\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149 lf\$821.92 /lf\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power382 lf\$102.06 /lf\$38,987#011 200 AMP EMT Composite feeders Copper - Large Power382 lf\$102.06 /lf\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481 lf\$102.06 /lf\$28,373#012 200 AMP EMT Composite feeders Copper - Large Power278 lf\$102.06 /lf\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278 lf\$102.06 /lf\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278 lf\$102.06 /lf\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power  | #184 100 AMP EMT Composite feeders Copper - Large Power  | 1,025 lf | \$36.01 /lf  | \$36,911   |
| #230 100 AMP EMT Composite feeders Copper - Large Power255If\$36.01//f\$9,183#241 100 AMP EMT Composite feeders Copper - Large Power525If\$36.01/If\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power165If\$31.60/If\$5,214#293 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120If\$33.82/If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149If\$33.82/If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149If\$12.06/If\$12,466#008 200 AMP EMT Composite feeders Copper - Large Power34If\$102.06/If\$34,70#011 200 AMP EMT Composite feeders Copper - Large Power382If\$102.06/If\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481If\$102.06/If\$28,373#012 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06/If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06/If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278If\$10   | #228 100 AMP EMT Composite feeders Copper - Large Power  | 502 lf   | \$36.01 /lf  | \$18,077   |
| #241 100 AMP EMT Composite feeders Copper - Large Power525 If\$36.01 /If\$18,905#242 80 AMP EMT Composite feeders Copper - Large Power165 If\$31.60 /If\$5,214#293 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149 If\$821.92 /If\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 /If\$38,987#011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /If\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#021 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#022 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /If\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /If\$45,723  | #230 100 AMP EMT Composite feeders Copper - Large Power  | 255 lf   | \$36.01 /lf  | \$9,183    |
| #242 80 AMP EMT Composite feeders Copper - Large Power165If\$31.60//f\$5,214#293 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power120If\$33.82//f\$4,059#008 200 AMP EMT Composite feeders Copper - Large Power149If\$821.92//f\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34If\$102.06//f\$38,987#011 200 AMP EMT Composite feeders Copper - Large Power382If\$102.06//f\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06//f\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06//f\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06//f\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06//f\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278If\$102.06//f\$45,723#020 200 AMP EMT Composite feeders Copper - Large Power278If <t< td=""><td>#241 100 AMP EMT Composite feeders Copper - Large Power</td><td>525 lf</td><td>\$36.01 /lf</td><td>\$18,905</td></t<>  | #241 100 AMP EMT Composite feeders Copper - Large Power  | 525 lf   | \$36.01 /lf  | \$18,905   |
| #293 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#295 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149 If\$821.92 /If\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 /If\$38,987#011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /If\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /If\$45,723   | #242 80 AMP EMT Composite feeders Copper - Large Power   | 165 lf   | \$31.60 /lf  | \$5,214    |
| #295 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#328 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149 If\$821.92 /If\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 /If\$38,987#011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /If\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481 If\$102.06 /If\$28,373#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power448 If\$102.06 /If\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power488 If\$102.06 /If\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /If\$20,087   | #293 90 AMP EMT Composite feeders Copper - Large Power   | 120 lf   | \$33.82 /lf  | \$4,059    |
| #328 90 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /lf\$4,059#329 110 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /lf\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149 If\$821.92 /lf\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 /lf\$3,470#011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /lf\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481 If\$102.06 /lf\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /lf\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power448 If\$102.06 /lf\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /lf\$20,087   | #295 90 AMP EMT Composite feeders Copper - Large Power   | 120 lf   | \$33.82 /lf  | \$4,059    |
| #329 110 AMP EMT Composite feeders Copper - Large Power120 If\$33.82 /If\$4,059#005 2000 AMP EMT Composite feeders Copper - Large Power149 If\$821.92 /If\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 /If\$3,470#011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /If\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481 If\$102.06 /If\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power448 If\$102.06 /If\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /If\$20,087   | #328 90 AMP EMT Composite feeders Copper - Large Power   | 120 lf   | \$33.82 /lf  | \$4,059    |
| #005 2000 AMP EMT Composite feeders Copper - Large Power149 If\$821.92 /If\$122,466#008 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 /If\$3,470#011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /If\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481 If\$102.06 /If\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /If\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power448 If\$102.06 /If\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /If\$20,087  | #329 110 AMP EMT Composite feeders Copper - Large Power  | 120 lf   | \$33.82 /lf  | \$4,059    |
| #008 200 AMP EMT Composite feeders Copper - Large Power34 If\$102.06 /lf\$3,470#011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /lf\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481 If\$102.06 /lf\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /lf\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power448 If\$102.06 /lf\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /lf\$20,087   | #005 2000 AMP EMT Composite feeders Copper - Large Power | 149 lf   | \$821.92 /lf | \$122,466  |
| #011 200 AMP EMT Composite feeders Copper - Large Power382 If\$102.06 /lf\$38,987#014 200 AMP EMT Composite feeders Copper - Large Power481 If\$102.06 /lf\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 If\$102.06 /lf\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power448 If\$102.06 /lf\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 If\$102.06 /lf\$20,087  | #008 200 AMP EMT Composite feeders Copper - Large Power  | 34 lf    | \$102.06 /lf | \$3,470    |
| #014 200 AMP EMT Composite feeders Copper - Large Power481 lf\$102.06 /lf\$49,092#017 200 AMP EMT Composite feeders Copper - Large Power278 lf\$102.06 /lf\$28,373#020 200 AMP EMT Composite feeders Copper - Large Power448 lf\$102.06 /lf\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 lf\$102.06 /lf\$20,087   | #011 200 AMP EMT Composite feeders Copper - Large Power  | 382 lf   | \$102.06 /lf | \$38,987   |
| #017 200 AMP EMT Composite feeders Copper - Large Power       278 If       \$102.06 /lf       \$28,373         #020 200 AMP EMT Composite feeders Copper - Large Power       448 If       \$102.06 /lf       \$45,723         #023 200 AMP EMT Composite feeders Copper - Large Power       285 If       \$102.06 /lf       \$20,087   | #014 200 AMP EMT Composite feeders Copper - Large Power  | 481 lf   | \$102.06 /lf | \$49,092   |
| #020 200 AMP EMT Composite feeders Copper - Large Power448 lf\$102.06 /lf\$45,723#023 200 AMP EMT Composite feeders Copper - Large Power285 lf\$102.06 /lf\$20.087   | #017 200 AMP EMT Composite feeders Copper - Large Power  | 278 lf   | \$102.06 /lf | \$28,373   |
| #023 200 AMP FMT Composite feeders Copper - Large Dower 285 If \$102.05 /If \$20.097   | #020 200 AMP EMT Composite feeders Copper - Large Power  | 448 lf   | \$102.06 /lf | \$45,723   |
| $\frac{1}{1023} 200 \text{ Aivir Livir Composite reducts Copper - Large Fower 203 II \frac{1}{20200}$  | #023 200 AMP EMT Composite feeders Copper - Large Power  | 285 lf   | \$102.06 /lf | \$29,087   |



#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST        |
|---|----------|--------------|-------------------|
| #026 200 AMP EMT Composite feeders Copper - Large Power                 | 478 lf   | \$102.06 /lf | \$48,785          |
| #029 200 AMP EMT Composite feeders Copper - Large Power                 | 274 lf   | \$102.06 /lf | \$27,965          |
| #071 200 AMP EMT Composite feeders Copper - Large Power                 | 76 lf    | \$102.06 /lf | \$7,757           |
| #083 Fire Pump Assume 200 AMP MI Composite feeders Copper - Large Power | 87 lf    | \$243.86 /lf | \$21,215          |
| #106 200 AMP EMT Composite feeders Copper - Large Power                 | 329 lf   | \$102.06 /lf | \$33,578          |
| #107 200 AMP EMT Composite feeders Copper - Large Power                 | 83 lf    | \$102.06 /lf | \$8,471           |
| #183 150 AMP EMT Composite feeders Copper - Large Power                 | 347 lf   | \$65.49 /lf  | \$22,726          |
| #185 200 AMP EMT Composite feeders Copper - Large Power                 | 627 lf   | \$95.38 /lf  | \$59,803          |
| #211 150 AMP EMT Composite feeders Copper - Large Power                 | 84 If    | \$65.49 /lf  | \$5,501           |
| #212 175 AMP EMT Composite feeders Copper - Large Power                 | 316 lf   | \$89.47 /lf  | \$28,272          |
| #224 150 AMP EMT Composite feeders Copper - Large Power                 | 336 lf   | \$65.49 /lf  | \$22,006          |
| #225 150 AMP EMT Composite feeders Copper - Large Power                 | 379 lf   | \$65.49 /lf  | \$24,822          |
| #087 225 AMP EMT Composite feeders Copper - Large Power                 | 35 lf    | \$102.06 /lf | \$3,572           |
| #090 225 AMP EMT Composite feeders Copper - Large Power                 | 490 lf   | \$102.06 /lf | \$50,010          |
| #094 225 AMP EMT Composite feeders Copper - Large Power                 | 391 lf   | \$102.06 /lf | \$39,906          |
| #097 225 AMP EMT Composite feeders Copper - Large Power                 | 499 lf   | \$102.06 /lf | \$50,929          |
| #100 225 AMP EMT Composite feeders Copper - Large Power                 | 463 lf   | \$102.06 /lf | \$47,254          |
| #103 225 AMP EMT Composite feeders Copper - Large Power                 | 495 lf   | \$102.06 /lf | \$50,520          |
| #108 225 AMP EMT Composite feeders Copper - Large Power                 | 407 lf   | \$102.06 /lf | \$41,539          |
| #113 225 AMP EMT Composite feeders Copper - Large Power                 | 386 lf   | \$102.06 /lf | \$39,396          |
| #118 225 AMP EMT Composite feeders Copper - Large Power                 | 438 lf   | \$102.06 /lf | \$44,703          |
| #121 225 AMP EMT Composite feeders Copper - Large Power                 | 335 lf   | \$102.06 /lf | \$34,191          |
| #127 225 AMP EMT Composite feeders Copper - Large Power                 | 329 lf   | \$102.06 /lf | \$33,578          |
| #186 225 AMP EMT Composite feeders Copper - Large Power                 | 680 lf   | \$102.06 /lf | \$69 <i>,</i> 402 |
| #189 225 AMP EMT Composite feeders Copper - Large Power                 | 178 lf   | \$102.06 /lf | \$18,167          |
| #192 225 AMP EMT Composite feeders Copper - Large Power                 | 245 lf   | \$102.06 /lf | \$25,005          |
| #199 225 AMP EMT Composite feeders Copper - Large Power                 | 249 lf   | \$102.06 /lf | \$25,413          |
| #202 225 AMP EMT Composite feeders Copper - Large Power                 | 73 lf    | \$102.06 /lf | \$7,450           |
| #205 225 AMP EMT Composite feeders Copper - Large Power                 | 245 lf   | \$102.06 /lf | \$25,005          |
| #208 225 AMP EMT Composite feeders Copper - Large Power                 | 301 lf   | \$102.06 /lf | \$30,720          |
| #213 225 AMP EMT Composite feeders Copper - Large Power                 | 501 lf   | \$102.06 /lf | \$51,133          |
| #215 225 AMP EMT Composite feeders Copper - Large Power                 | 278 lf   | \$102.06 /lf | \$28,373          |
| #218 225 AMP EMT Composite feeders Copper - Large Power                 | 305 lf   | \$102.06 /lf | \$31,129          |
| #221 225 AMP EMT Composite feeders Copper - Large Power                 | 304 lf   | \$102.06 /lf | \$31,027          |
| #229 225 AMP EMT Composite feeders Copper - Large Power                 | 255 lf   | \$102.06 /lf | \$26,026          |
| #304 225 AMP EMT Composite feeders Copper - Large Power                 | 120 lf   | \$91.95 /lf  | \$11,034          |
| #084 250 AMP EMT Composite feeders Copper - Large Power                 | 55 lf    | \$101.96 /lf | \$5,608           |
| #142 300 AMP EMT Composite feeders Copper - Large Power                 | 685 lf   | \$134.44 /lf | \$92,094          |
| #143 300 AMP EMT Composite feeders Copper - Large Power                 | 624 lf   | \$134.44 /lf | \$83,893          |
| #226 300 AMP EMT Composite feeders Copper - Large Power                 | 428 lf   | \$134.44 /lf | \$57,542          |
| #227 300 AMP EMT Composite feeders Copper - Large Power                 | 466 lf   | \$134.44 /lf | \$62,651          |
| #240 300 AMP EMT Composite feeders Copper - Large Power                 | 259 lf   | \$134.44 /lf | \$34,821          |
| #033 600 AMP EMT Composite feeders Copper - Large Power                 | 36 lf    | \$266.49 /lf | \$9,594           |
| #034 400 AMP MI Composite feeders Copper - Large Power                  | 73 lf    | \$451.98 /lf | \$32,995          |
|   |          |              |                   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST       | TOTAL COST         |
|---|----------|-----------------|--------------------|
| #068 400 AMP MI Composite feeders Copper - Large Power  | 68 lf    | \$451.98 /lf    | \$30,735           |
| #069 400 AMP MI Composite feeders Copper - Large Power  | 72 lf    | \$451.98 /lf    | \$32,543           |
| #075 400 AMP MI Composite feeders Copper - Large Power  | 62 If    | \$451.98 /lf    | \$28,023           |
| #081 600 AMP EMT Composite feeders Copper - Large Power   | 76 lf    | \$266.49 /lf    | \$20,253           |
| #195 400 AMP EMT Composite feeders Copper - Large Power   | 336 If   | \$181.45 /lf    | \$60,968           |
| #006 400 AMP EMT Composite feeders Copper - Large Power   | 82 If    | \$165.36 /lf    | \$13,560           |
| #032 800 AMP EMT Composite feeders Copper - Large Power   | 70 lf    | \$362.17 /lf    | \$25,352           |
| #076 800 AMP EMT Composite feeders Copper - Large Power   | 275 lf   | \$362.17 /lf    | \$99 <i>,</i> 596  |
| #003 1200 AMP EMT Composite feeders Copper - Large Power  | 372 lf   | \$544.21 /lf    | \$202 <i>,</i> 445 |
| #004 1200 AMP EMT Composite feeders Copper - Large Power  | 31 lf    | \$544.21 /lf    | \$16,870           |
| #077 1200 AMP EMT Composite feeders Copper - Large Power  | 31 lf    | \$544.21 /lf    | \$16,870           |
| #078 1200 AMP EMT Composite feeders Copper - Large Power  | 32 If    | \$544.21 /lf    | \$17,415           |
| #289 1200 AMP EMT Composite feeders Copper - Large Power  | 120 lf   | \$493.53 /lf    | \$59,223           |
| D5025 Emergency Gen Set W/ATS   |          | \$0.11 / GSF    | \$43,169           |
| Auto Transfer Switch 3P - 250a  | 1.00 ea  | \$8,894.58 /ea  | \$8,895            |
| Auto Transfer Switch 3P - 400a  | 3.00 ea  | \$11,424.75 /ea | \$34,274           |
| D5027 Mechanical Equipment Connections  |          | \$4.13 / GSF    | \$1,572,259        |
| E3EQ   AC - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                        | 53 ea    | \$655.72 /ea    | \$34,753           |
| E3EQ   30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                                | 6.00 ea  | \$655.72 /ea    | \$3,934            |
| E3EQ   30A Disconnect - Unassigned 30 AMP 3 POLE N1 fused<br>disconnect 600 volt composite unit | 112 ea   | \$655.72 /ea    | \$73,441           |
| E3EQ   AC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                           | 2.00 ea  | \$655.72 /ea    | \$1,311            |
| E3EQ   BS - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                           | 11 ea    | \$655.72 /ea    | \$7,213            |
| E3EQ   CU-1 with VFD 35A composite unit connection only off riser                               | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-10A with VFD 40A composite unit connection only off<br>riser                          | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-10B with VFD 30A composite unit connection only off riser                             | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-11A with VFD 80A composite unit connection only off<br>riser                          | 1.00 ea  | \$936.66 /ea    | \$937              |
| E3EQ   CU-11B with VFD 35A composite unit connection only off<br>riser                          | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-11C with VFD 35A composite unit connection only off<br>riser                          | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-12 with VFD 30A composite unit connection only off<br>riser                           | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-13A with VFD 40A composite unit connection only off<br>riser                          | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-13B with VFD 20A composite unit connection only off riser                             | 1.00 ea  | \$448.22 /ea    | \$448              |
| E3EQ   CU-13C with VFD 20A composite unit connection only off riser                             | 1.00 ea  | \$448.22 /ea    | \$448              |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| E3EQ   CU-14A with VFD 40A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-14B with VFD 20A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-15 with VFD 50A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-16 with VFD 20A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-17 with VFD 80A composite unit connection only off riser                   | 1.00 ea  | \$936.66 /ea | \$937      |
| E3EQ   CU-19A with VFD 40A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-19B with VFD 20A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-2A with VFD 45A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-2B with VFD 20A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-3 with VFD 40A composite unit connection only off riser                    | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-4A with VFD 80A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-4B with VFD 80A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-5A with VFD 40A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-5B with VFD 30A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-6A with VFD 40A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-6B with VFD 35 A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-7 with VFD 15 A composite unit connection only off riser                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-8A with VFD 80 A composite unit connection only off riser                  | 1.00 ea  | \$936.66 /ea | \$937      |
| E3EQ   CU-8B with VFD 60 A composite unit connection only off riser                  | 1.00 ea  | \$727.02 /ea | \$727      |
| E3EQ   CU-9A with VFD 40 A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-9B with VFD 30 A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-9C with VFD 20 A composite unit connection only off riser                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   DCU1 30 A composite unit connection on mechanical<br>schedule includes feeder | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   DF - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit             | 2.00 ea  | \$655.72 /ea | \$1,311    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| E3EQ   DWP - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit  | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   ERV - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit   | 4.00 ea  | \$655.72 /ea | \$2,623    |
| E3EQ   ERV-1 with VFD 45 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-2 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-3 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-4 with VFD 45 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-5 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-6 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-7 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   EUH - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit  | 34 ea    | \$655.72 /ea | \$22,295   |
| E3EQ   F with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder removed during recon 12-20-<br>2022 | 0.00 ea  |              | \$0        |
| E3EQ   F1 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder                                    | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F10 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder                                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F11 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F12 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F13 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F14 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F15 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F16 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F17 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder                                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F18 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder                                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F2 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder                                    | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F3 with VFD 15 A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F4 with VFD 90 A composite unit connection only off riser   | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   F5 with VFD 15 A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F6 with VFD 15 A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |





| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| E3EQ   F7 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F8 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder               | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F9 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder               | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   Fire Pump Controler FBO composite unit connection only off riser                                     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   FTU - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 9.00 ea  | \$655.72 /ea | \$5,902    |
| E3EQ   GV - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                    | 2.00 ea  | \$655.72 /ea | \$1,311    |
| E3EQ   GVI - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                                      | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   GVR - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                                      | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   KEF - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                                      | 5.00 ea  | \$655.72 /ea | \$3,279    |
| E3EQ   MAU1 with VFD 35 A composite unit connection only on drawing not on riser includeds feeder           | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   MAU2 with VFD 60A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   PE-1 with Cntrl composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   PE-2 with Cntrl composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   PH - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                                       | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   SA - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                                       | 2.00 ea  | \$655.72 /ea | \$1,311    |
| E3EQ   VAC - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   VAV - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 62 ea    | \$655.72 /ea | \$40,655   |
| E3EQ   VCU with VFD 20 A composite unit connection only off riser removed during Recon double up 12-20-2022 | 0.00 ea  |              | \$0        |
| E3EQ   VCU-5B with VFD 20 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-5D with VFD 20 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-6B with VFD 35 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-6D with VFD 35 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H1B with VFD 20 A composite unit connection only off riser                                       | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H1D with VFD 20 A composite unit connection only off riser                                       | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H1F with VFD 20 A composite unit connection only off riser                                       | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H2B with VFD 20 A composite unit connection only off riser                                       | 1.00 ea  | \$448.22 /ea | \$448      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST      | TOTAL COST |
|---|----------|----------------|------------|
| E3EQ   VCU-H2D with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-H2F with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-H3A with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-H3B with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-H3D with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-H3F with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-M2B with VFD 35 A composite unit connection only<br>off riser  | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-M2C with VFD 80 A composite unit connection only<br>off riser  | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-M2D with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-M2F with VFD 35 A composite unit connection only<br>off riser  | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-R1B with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-R1D with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-R2B with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-R2C,E with VFD 50 A composite unit connection only off riser   | 2.00 ea  | \$448.22 /ea   | \$896      |
| E3EQ   VCU-R3B with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea   | \$448      |
| E3EQ   VCU-R4B,D,F with VFD 35 A composite unit connection only off riser | 3.00 ea  | \$448.22 /ea   | \$1,345    |
| E3EQ   ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit   | 55 ea    | \$727.02 /ea   | \$39,986   |
| E3EQ   H1A with VFD 40 A composite unit connection only off riser         | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   RTU - 60 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit | 3.00 ea  | \$727.02 /ea   | \$2,181    |
| E3EQ   VAV Connection for electric Rehated coil - not shown on electrical | 162 ea   | \$1,149.02 /ea | \$186,141  |
| E3EQ   VCU-1A with VFD 40 A composite unit connection only off riser      | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-1B with VFD 40 A composite unit connection only off riser      | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-2A with VFD 50 A composite unit connection only off riser      | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-2B with VFD 50 A composite unit connection only off riser      | 1.00 ea  | \$516.82 /ea   | \$517      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| E3EQ   VCU-3A,C with VFD 50 A composite unit connection only off riser   | 2.00 ea  | \$516.82 /ea | \$1,034    |
| E3EQ   VCU-3B,D with VFD 35 A composite unit connection only off riser   | 2.00 ea  | \$516.82 /ea | \$1,034    |
| E3EQ   VCU-4A with VFD 40 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-4B with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-4C with VFD 40 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-4D with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-5A with VFD 40 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-5C with VFD 40 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-6A with VFD 60 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-6C with VFD 60 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-7A with VFD 60 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-7B with VFD 60 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-7C with VFD 60 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-7D with VFD 60 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-8A with VFD 70 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-8B with VFD 70 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-8C with VFD 70 A composite unit connection only off<br>riser  | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-8D with VFD 70 A composite unit connection only off riser     | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-9A,C,D with VFD 50 A composite unit connection only off riser | 3.00 ea  | \$516.82 /ea | \$1,550    |
| E3EQ   VCU-9B with VFD 225 A composite unit connection only off riser    | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   VCU-H1A with VFD 40 A composite unit connection only off riser    | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-H1C with VFD 40 A composite unit connection only off riser    | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-H1E with VFD 40 A composite unit connection only off riser    | 1.00 ea  | \$516.82 /ea | \$517      |
| E3EQ   VCU-H2A with VFD 40 A composite unit connection only off riser    | 1.00 ea  | \$516.82 /ea | \$517      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST      | TOTAL COST |
|---|----------|----------------|------------|
| E3EQ   VCU-H2C with VFD 40 A composite unit connection only off riser                                 | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H2E with VFD 40 A composite unit connection only off riser                                 | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H3C with VFD 40 A composite unit connection only off riser                                 | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H3E with VFD 40 A composite unit connection only off riser                                 | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M1A with VFD 40 A composite unit connection only off riser                                 | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M1B with VFD 40 A composite unit connection only off riser                                 | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M2A with VFD 80 A composite unit connection only off riser                                 | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M2E with VFD 80 A composite unit connection only<br>off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R1A with VFD 70 A composite unit connection only<br>off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R1C with VFD 70 A composite unit connection only<br>off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R2A with VFD 70 A composite unit connection only<br>off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R3A with VFD 35 A composite unit connection only<br>off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VRF branch selector 208 composite unit connection off<br>mechanical schedule and feeder        | 47 ea    | \$516.82 /ea   | \$24,290   |
| E3EQ   AHU1 with VFD 150 A composite unit connection on<br>drawing not on riser includeds feeder      | 1.00 ea  | \$1,250.00 /ea | \$1,250    |
| E3EQ   AHU10 with VFD 300 A composite unit connection on<br>mechanical schedule includeds feeder      | 1.00 ea  | \$2,500.00 /ea | \$2,500    |
| E3EQ   AHU2 with VFD 150 A composite unit connection only on<br>drawing not on riser includeds feeder | 1.00 ea  | \$1,250.00 /ea | \$1,250    |
| E3EQ   AHU3 with VFD 100 A composite unit connection on<br>mechanical schedule includeds feeder       | 1.00 ea  | \$920.18 /ea   | \$920      |
| E3EQ   AHU4 with VFD 100 A composite unit connection on<br>mechanical schedule includeds feeder       | 1.00 ea  | \$920.18 /ea   | \$920      |
| E3EQ   AHU5 with VFD 100 A composite unit connection on<br>mechanical schedule includeds feeder       | 1.00 ea  | \$920.18 /ea   | \$920      |
| E3EQ   AHU6 with VFD 200 A composite unit connection on<br>mechanical schedule includeds feeder       | 1.00 ea  | \$1,421.00 /ea | \$1,421    |
| E3EQ   AHU7 with VFD 225 A composite unit connection on riser<br>not on drawings includeds feeder     | 1.00 ea  | \$1,421.00 /ea | \$1,421    |
| E3EQ   AHU8 with VFD 150 A composite unit connection on riser<br>not on drawings includeds feeder     | 1.00 ea  | \$1,250.00 /ea | \$1,250    |
| E3EQ   AHU9 with VFD 300 A composite unit connection on mechanical schedule includeds feeder          | 1.00 ea  | \$2,500.00 /ea | \$2,500    |
| E3EQ   DC-1 ith VFD 100 A composite unit connection only off riser                                    | 1.00 ea  | \$920.18 /ea   | \$920      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST      | TOTAL COST  |
|--|-----------|----------------|-------------|
| E3EQ   HRU4 with VFD 100 A composite unit connection only off riser                                      | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   HRU5 with VFD 100 A composite unit connection only off riser                                      | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   HV8 with VFD 80 A composite unit connection only off riser  | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   HRU1 with VFD 300 A composite unit connection only off riser                                      | 1.00 ea   | \$4,785.56 /ea | \$4,786     |
| E3EQ   HRU2 with VFD 300 A composite unit connection only off riser                                      | 1.00 ea   | \$4,785.56 /ea | \$4,786     |
| E3EQ   HRU3 with VFD 300 A composite unit connection only off riser                                      | 1.00 ea   | \$4,785.56 /ea | \$4,786     |
| E3EQ   EWH w/ junction box Composite Unit  | 11 ea     | \$655.72 /ea   | \$7,213     |
| E3EQ   FCU w/ junction box - Composite Unit  | 235 ea    | \$655.72 /ea   | \$154,094   |
| 20 AMP EMT Composite feeders copper - Mechanical   | 6,450 lf  | \$16.93 /lf    | \$109,199   |
| 30 AMP EMT Composite feeders copper - Mechanical   | 35,700 lf | \$18.69 /lf    | \$667,233   |
| 100 AMP EMT Composite feeders Copper - Mechanical  | 2,250 lf  | \$36.01 /lf    | \$81,019    |
| Small VFD on electrical, VFD's included with mechanical as shown on mechanical Drawings recon 11-28-2022 | 0.00 ls   |                | \$0         |
| D5029 Small Power Devices & Wiring   |           | \$4.26 / GSF   | \$1,622,348 |
| Small Power \$/sf - Cafeteria  | 8,135 sf  | \$1.50 /sf     | \$12,202    |
| Wiremold Dual Channel Empty Raceway with wiring - no devices<br>included - Composite Unit                | 31 lf     | \$60.36 /lf    | \$1,894     |
| Wiremold Duplex Receptacle Only Composite Unit   | 15 ea     | \$45.60 /ea    | \$684       |
| Small Power \$/sf - Conference Rooms   | 719 sf    | \$5.00 /sf     | \$3,595     |
| Small Power \$/sf - Gym  | 11,959 sf | \$1.50 /sf     | \$17,939    |
| Small Power \$/sf - Kitchen / Servery  | 3,883 sf  | \$1.00 /sf     | \$3,883     |
| Small Power \$/sf - Media Center   | 2,460 sf  | \$4.00 /sf     | \$9,840     |
| Small Power \$/sf - Storage  | 1,622 sf  | \$0.50 /sf     | \$811       |
| Small Power \$/sf - Circulation  | 4,619 sf  | \$1.50 /sf     | \$6,929     |
| E3EQ   Auto 120 volt connetions - Assume Power is covered on<br>Electrical Power plans                   | 0.00 ea   |                | \$0         |
| E3EQ   Auto 208 volt connetions - Assume Power is covered on<br>Electrical Power plans                   | 0.00 ea   |                | \$0         |
| E3EQ   Auto Technology 120 volt connections - Assume Power is<br>covered on Electrical Power plans       | 0.00 ea   |                | \$0         |
| E3EQ   Auto Technology 208 volt connetions - Assume Power is<br>covered on Electrical Power plans        | 0.00 ea   |                | \$0         |
| E3EQ   Biotech 120 volt connetions - Assume Power is covered<br>on Electrical Power plans                | 0.00 ea   |                | \$0         |
| E3EQ   Carpentry 120 volt connetions - Assume Power is covered<br>on Electrical Power plans              | 0.00 ea   |                | \$0         |
| E3EQ   Carpentry 208 volt connetions Mechanical schedule with feeder                                     | 0.00 ea   |                | \$0         |
| E3EQ   Carpentry 480 volt connetions Mechanical schedule with feeder                                     | 0.00 ea   |                | \$0         |
| E3EQ   Cosmo 120 volt connetions - Assume Power is covered on<br>Electrical Power plans                  | 0.00 ea   |                | \$0         |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| E3EQ   Cosmo 208 volt connetions - Assume Power is covered on<br>Electrical Power plans            | 0.00 ea  |              | \$0        |
| E3EQ   Dental 120 volt connetions - Assume Power is covered on<br>Electrical Power plans           | 0.00 ea  |              | \$0        |
| E3EQ   Dental 208 volt connetions - Assume Power is covered on<br>Electrical Power plans           | 0.00 ea  |              | \$0        |
| E3EQ   Drafting and Design 120 volt connetions - Assume Power is covered on Electrical Power plans | 0.00 ea  |              | \$0        |
| E3EQ   Drafting and Design 208 volt connetions - Assume Power is covered on Electrical Power plans | 0.00 ea  |              | \$0        |
| E3EQ   DVC Comp. Lab 120 volt connetions - Assume Power is covered on Electrical Power plans       | 0.00 ea  |              | \$0        |
| E3EQ   DVC Comp. Lab 208 volt connetions - Assume Power is covered on Electrical Power plans       | 0.00 ea  |              | \$0        |
| E3EQ   Electrical 120 volt connetions - Assume Power is covered<br>on Electrical Power plans       | 0.00 ea  |              | \$0        |
| E3EQ   Health Assist 120 volt connetions - Assume Power is covered on Electrical Power plans       | 0.00 ea  |              | \$0        |
| E3EQ   Health Assist 208 volt connetions - Assume Power is covered on Electrical Power plans       | 0.00 ea  |              | \$0        |
| E3EQ   HVAC 120 volt connetions - Assume Power is covered on<br>Electrical Power plans             | 0.00 ea  |              | \$0        |
| E3EQ   HVAC 208 volt connetions - Assume Power is covered on<br>Electrical Power plans             | 0.00 ea  |              | \$0        |
| E3EQ   Kitchen: Culinary Arts Equipment 120 volt connetions<br>Mechanical schedule with feeder     | 96 ea    | \$448.22 /ea | \$43,029   |
| E3EQ   Kitchen: Culinary Arts Equipment 208 volt connetions<br>Mechanical schedule with feeder     | 22 ea    | \$448.22 /ea | \$9,861    |
| E3EQ   Kitchen: Culinary Arts Equipment 480 volt connetions<br>Mechanical schedule with feeder     | 2.00 ea  | \$448.22 /ea | \$896      |
| E3EQ   Kitchen: Main Equipment 120 volt connetions Mechanical<br>schedule with feeder              | 64 ea    | \$448.22 /ea | \$28,686   |
| E3EQ   Kitchen: Main Equipment 208 volt connetions Mechanical<br>schedule with feeder              | 18 ea    | \$448.22 /ea | \$8,068    |
| E3EQ   Kitchen: Main Equipment 480 volt connetions Mechanical<br>schedule with feeder              | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   Medical 120 volt connetions - Assume Power is covered<br>on Electrical Power plans          | 0.00 ea  |              | \$0        |
| E3EQ   Medical 208 volt connetions - Assume Power is covered<br>on Electrical Power plans          | 0.00 ea  |              | \$0        |
| E3EQ   MF 120 volt connetions - Assume Power is covered on<br>Electrical Power plans               | 0.00 ea  |              | \$0        |
| E3EQ   MF 208 volt connetions - Assume Power is covered on<br>Electrical Power plans               | 0.00 ea  |              | \$0        |
| E3EQ   MF 480 volt connetions - Assume Power is covered on<br>Electrical Power plans               | 0.00 ea  |              | \$0        |
| E3EQ   Plumbing 120 volt connetions - Assume Power is covered<br>on Electrical Power plans         | 0.00 ea  |              | \$0        |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST      | TOTAL COST  |
|--|-----------|----------------|-------------|
| E3EQ   Robotics 120 volt connetions - Assume Power is covered<br>on Electrical Power plans | 0.00 ea   |                | \$0         |
| E3EQ   Robotics 208 volt connetions - Assume Power is covered<br>on Electrical Power plans | 0.00 ea   |                | \$0         |
| Switch: Tamper Resistant - S (1) Single pole Switch Composite unit                         | 103 ea    | \$78.72 /ea    | \$8,108     |
| FB: Floor box (type 2) Quad recep and Telcom provisions                                    | 1.00 ea   | \$558.85 /ea   | \$559       |
| FB: Quad Floor Box - Composite Unit  | 54 ea     | \$875.00 /ea   | \$47,250    |
| Transformer: 24 V XFMR Low Voltage transformer   | 24 ea     | \$217.48 /ea   | \$5,220     |
| Recep: Range receptacle Composite unit   | 1.00 ea   | \$115.23 /ea   | \$115       |
| Recep: 20 Amp Straight Blade 250V (Type 6-20R) Receptacle<br>Composite unit                | 1.00 ea   | \$131.58 /ea   | \$132       |
| Recep: 20A Twist lock (Type 4) 250V Receptacle Composite unit                              | 1.00 ea   | \$131.58 /ea   | \$132       |
| Recep: 30 Amp Straight Blade, 125V (Note 2) Nema Receptacle                                | 2.00 ea   | \$165.17 /ea   | \$330       |
| Recep: 30A Straight Blade (type 5) Nema Receptacle Composite unit                          | 4.00 ea   | \$165.17 /ea   | \$661       |
| Recep: 50 Amp Twist Lock Receptacle Composite unit   | 45 ea     | \$199.56 /ea   | \$8,980     |
| JB: Power Junction Box - FF, Furniture Flush mtd. Composite Unit                           | 6.00 ea   | \$105.00 /ea   | \$630       |
| JB: Power Junction Box - Typ. Composite Unit   | 151 ea    | \$85.04 /ea    | \$12,842    |
| JB: Power Junction Box - XP Composite Unit   | 2.00 ea   | \$125.00 /ea   | \$250       |
| Switch: EPO Switch at Shops  | 33 ea     | \$85.04 /ea    | \$2,806     |
| Recep: 12V Receptacle Composite unit   | 24 ea     | \$83.40 /ea    | \$2,002     |
| Recep: Duplex receptacle Composite unit  | 1,398 ea  | \$83.40 /ea    | \$116,589   |
| Recep: Duplex receptacle XP Composite unit   | 17 ea     | \$135.00 /ea   | \$2,295     |
| Recep: VPO - Duplex receptacle Composite unit  | 2.00 ea   | \$83.40 /ea    | \$167       |
| Recep: Duplex GFI receptacle Composite unit  | 360 ea    | \$116.68 /ea   | \$42,005    |
| Switch: EPO Switch at Shops XP   | 1.00 ea   | \$116.68 /ea   | \$117       |
| Recep: Quad receptacle Composite unit  | 436 ea    | \$119.92 /ea   | \$52,286    |
| Recep: Quad GFI receptacle Composite unit  | 40 ea     | \$186.35 /ea   | \$7,454     |
| 20 AMP EMT Composite feeders copper - Large Power  | 32,088 lf | \$16.93 /lf    | \$543,292   |
| 30 AMP EMT Composite feeders copper - Large Power  | 7,770 lf  | \$18.69 /lf    | \$145,228   |
| 50 AMP EMT Composite feeders copper - Large Power  | 1,350 lf  | \$26.14 /lf    | \$35,289    |
| CR: Cord Reel Power Only 30A Twistlock Composite Unit                                      | 253 ea    | \$905.53 /ea   | \$229,099   |
| EV Charging Station - Single Composite Unit  | 4.00 ea   | \$7,932.85 /ea | \$31,731    |
| 12/2 MC Cable Composite Unit   | 48,132 lf | \$3.70 /lf     | \$178,016   |
| D5040 LIGHTING   |           | \$14.18 / GSF  | \$5,396,888 |
| D5042 Light Fixtures   |           | \$11.92 / GSF  | \$4,536,083 |
| 20 AMP EMT Composite feeders copper - Large Power  | 48,000 lf | \$16.93 /lf    | \$812,704   |
| PB Gym Light Composite Unit  | 36 ea     | \$661.71 /ea   | \$23,822    |
| RLH Composite Unit   | 8.00 ea   | \$561.71 /ea   | \$4,494     |
| RN2 Lighting Fixture   | 51 ea     | \$391.71 /ea   | \$19,977    |
| DPB2 Composite Unit  | 30 ea     | \$661.71 /ea   | \$19,851    |
| GSB Light Fixture  | 20 ea     | \$461.71 /ea   | \$9,234     |
| GSD Lighting Fixture   | 24 ea     | \$411.71 /ea   | \$9,881     |
| Light Fixture Recessed Can Composite Unit  | 15 ea     | \$411.71 /ea   | \$6,176     |
|  |           |                |             |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| LSE Light Fixture   | 7.00 ea  | \$561.71 /ea | \$3,932    |
| RC1 Recessed Can lighting Fixture                                       | 297 ea   | \$391.71 /ea | \$116,338  |
| RE Lighting   | 80 ea    | \$391.71 /ea | \$31,337   |
| RF Recessed Can light Fixture   | 63 ea    | \$391.71 /ea | \$24,678   |
| RJ Square Recess Can Light Fixture                                      | 36 ea    | \$391.71 /ea | \$14,102   |
| RK Lighting Fixturet  | 8.00 ea  | \$391.71 /ea | \$3,134    |
| RN1 Light Fixture   | 8.00 ea  | \$391.71 /ea | \$3,134    |
| RQ Lighting Fixture   | 25 ea    | \$391.71 /ea | \$9,793    |
| RB2 2x4 Lighting Fixture  | 6.00 ea  | \$382.99 /ea | \$2,298    |
| RDA 2x4   | 31 ea    | \$382.99 /ea | \$11,873   |
| RL1 2X4 Lighting Fixture  | 201 ea   | \$382.99 /ea | \$76,981   |
| RL2 2x4 Led Recessed Troffer Composite Unit                             | 62 ea    | \$382.99 /ea | \$23,745   |
| RLE Lighting Fixture  | 32 ea    | \$761.71 /ea | \$24,375   |
| RA2 Light Fixture   | 6.00 ea  | \$391.71 /ea | \$2,350    |
| RDB 2x2   | 13 ea    | \$391.71 /ea | \$5,092    |
| RA1 2X2 Lighting Fixture  | 179 ea   | \$391.71 /ea | \$70,116   |
| RA3 Lighting Fixture  | 19 ea    | \$391.71 /ea | \$7,443    |
| RB1 Lighting Fixture  | 150 ea   | \$391.71 /ea | \$58,757   |
| RLC Lighting Fixture Composite Unit                                     | 1,871 ea | \$179.96 /ea | \$336,732  |
| GSC 8 foot  | 12 ea    | \$817.96 /ea | \$9,816    |
| GSE Lighting Fixture  | 34 If    | \$190.99 /lf | \$6,402    |
| Light Fixture Recessed Slot Fixture Per Linear Foot Composite<br>Unit   | 18 lf    | \$190.99 /lf | \$3,437    |
| LPJ Recessed Slot Fixture Per Linear Foot Composite Unit                | 462 If   | \$135.99 /lf | \$62,874   |
| LSA linear Fixture per foot   | 743 lf   | \$135.99 /lf | \$101,048  |
| LSB Per Linear Foot Composite Unit                                      | 197 lf   | \$135.99 /lf | \$26,804   |
| RLA1 Light Fixture  | 763 lf   | \$135.99 /lf | \$103,719  |
| RLA2 Lighting Fixture per Linear Foot                                   | 41 lf    | \$160.99 /lf | \$6,677    |
| RLB-1 Linear fixtuire per foot  | 224 If   | \$135.99 /lf | \$30,415   |
| RLD1 Light fixture per foot   | 59 lf    | \$135.99 /lf | \$8,034    |
| RLD3 Light Fixture per Linear foot                                      | 273 lf   | \$135.99 /lf | \$37,135   |
| GPL2 4 foot   | 17 ea    | \$508.96 /ea | \$8,652    |
| LPB Light Fixture   | 46 ea    | \$608.96 /ea | \$28,012   |
| LPE Lighting Fixture  | 18 ea    | \$608.96 /ea | \$10,961   |
| GPL1 8 foot   | 20 ea    | \$817.96 /ea | \$16,359   |
| Light Fixture 8 Foot Pendant Mounted Fixture Composite Unit             | 133 ea   | \$627.96 /ea | \$83,519   |
| LPA1 Light Fixture  | 3,653 ea | \$234.96 /ea | \$858,293  |
| GPE Light Fixture   | 82 If    | \$210.99 /lf | \$17,210   |
| Light Fixture Pendant Mounted Fixture per linear foot Composite<br>Unit | 146 lf   | \$135.99 /lf | \$19,894   |
| LPA2 per linear foott   | 17 lf    | \$190.99 /lf | \$3,287    |
| LPC Lighting Fixture per Linear foot                                    | 1,452 lf | \$135.99 /lf | \$197,468  |
| LPD Lighting Fixture per Linear foot                                    | 284 lf   | \$135.99 /lf | \$38,653   |
| LPG Light Fixture per Linear Foot                                       | 73 lf    | \$135.99 /lf | \$9,973    |
| LPK per Linear Foot   | 293 lf   | \$135.99 /lf | \$39,839   |





| DESCRIPTION  | QUANTITY  | UNIT CO    | ST    | TOTAL COST |
|--|-----------|------------|-------|------------|
| LPL Pendand per Linear Foot  | 299 lf    | \$135.99   | /lf   | \$40,684   |
| LPM1 Lighting Fixture  | 80 If     | \$135.99   | /lf   | \$10,869   |
| GWD Wall Mounted Fixture   | 32 ea     | \$391.71   | /ea   | \$12,535   |
| GWE1 Light Fxiture   | 39 ea     | \$561.71   | /ea   | \$21,907   |
| GWE2 Light Fixture   | 28 ea     | \$561.71   | /ea   | \$15,728   |
| LSG1 Lighting Fixture  | 74 ea     | \$561.71   | /ea   | \$41,567   |
| LSH 4 Foot   | 24 ea     | \$561.71   | /ea   | \$13,481   |
| LSH 8 foot   | 43 ea     | \$676.21   | /ea   | \$29,077   |
| LSG2 Light Fixture   | 55 ea     | \$706.21   | /ea   | \$38,842   |
| Light Fixture Wall Mounted Fixture Per Linear Foot Composite<br>Unit | 60 lf     | \$190.99   | /lf   | \$11,482   |
| LSH per linear foot  | 99 lf     | \$135.99   | /lf   | \$13,402   |
| LSJ Light Fixture  | 75 lf     | \$135.99   | /lf   | \$10,164   |
| RBL3 per Linear foot   | 55 lf     | \$135.99   | /lf   | \$7,483    |
| RLB2 Lighting Fixture per Linear foot                                | 556 lf    | \$135.99   | /lf   | \$75,561   |
| RLB4 Lighting Fixture  | 75 lf     | \$135.99   | /lf   | \$10,237   |
| RLD2 Light Fixture   | 76 lf     | \$135.99   | /lf   | \$10,297   |
| GWB Light Fixture  | 11 ea     | \$618.96   | /ea   | \$6,809    |
| GWC Exterior Wall mounted Light                                      | 15 ea     | \$668.96   | /ea   | \$10,034   |
| RLF Lighti Fixture   | 10 ea     | \$818.96   | /ea   | \$8,190    |
| RM Light Fixture   | 2.00 ea   | \$448.96   | /ea   | \$898      |
| SWA Lighting Fixture   | 10 ea     | \$618.96   | /ea   | \$6,190    |
| DPA Light Fixutre  | 10 ea     | \$618.96   | /ea   | \$6,190    |
| DPB Lighting Fixture   | 12 ea     | \$718.96   | /ea   | \$8,628    |
| GPB Fixture  | 126 ea    | \$818.96   | /ea   | \$103,189  |
| GPK Light Fixture  | 20 ea     | \$1,240.98 | /ea   | \$24,820   |
| GSA Light Fixture  | 54 ea     | \$718.96   | /ea   | \$38,824   |
| PD Lighti Fixture  | 76 ea     | \$618.96   | /ea   | \$47,041   |
| PD1 Lighting Fixture   | 27 ea     | \$618.96   | /ea   | \$16,712   |
| PF Lighting Fixture  | 60 ea     | \$618.96   | /ea   | \$37,138   |
| PF1 Lighting Fixture   | 24 ea     | \$618.96   | /ea   | \$14,855   |
| RP Lighting Fixturet   | 11 ea     | \$448.96   | /ea   | \$4,939    |
| SA Light Fisxture  | 34 ea     | \$818.96   | /ea   | \$27,845   |
| TA Lighting Track per Linear foot                                    | 68 lf     | \$97.37    | /lf   | \$6,610    |
| TA Track Head  | 25 ea     | \$207.21   | /ea   | \$5,180    |
| Exit Sign  | 150 ea    | \$391.71   | /ea   | \$58,757   |
| F1 Lighting Fixture  | 64 ea     | \$200.00   | /ea   | \$12,800   |
| 12/2 MC Cable Composite Unit   | 72,000 lf | \$3.70     | /lf   | \$266,292  |
| D5044 Lighting Controls & Wiring                                     |           | \$1.93     | / GSF | \$735,805  |
| S (1) Single pole Switch Composite unit                              | 13 ea     | \$78.72    | /ea   | \$1,023    |
| SOR (1) Single pole Switch Composite unit                            | 5.00 ea   | \$78.72    | /ea   | \$394      |
| ST Single Pole Switch  | 37 ea     | \$78.72    | /ea   | \$2,913    |
| SS (2) Single pole Switches Composite unit                           | 2.00 ea   | \$110.42   | /ea   | \$221      |
| SD (1) Dimmer Switch composite unit                                  | 249 ea    | \$155.59   | /ea   | \$38,741   |
| S3 (1) 3 way switch composite unit                                   | 20 ea     | \$85.00    | /ea   | \$1,700    |





| DESCRIPTION  | QUANT   | TITY | UNIT CC      | ST    | TOTAL COST |
|--|---------|------|--------------|-------|------------|
| St3 (1) 3 way switch composite unit  | 2.00    | ea   | \$85.00      | /ea   | \$170      |
| S3S3 (2) 3 way Switches Composite unit   | 11      | ea   | \$123.12     | /ea   | \$1,354    |
| SLV (1) Low voltage Switch Composite unit  | 58      | ea   | \$92.22      | /ea   | \$5,349    |
| Occupancy sensor Wall mounted Composite unit   | 43      | ea   | \$255.70     | /ea   | \$10,995   |
| SVSD Vacancy Senor Dimmer  | 75      | ea   | \$286.76     | /ea   | \$21,507   |
| Vacancy sensor Wall mounted Composite unit   | 62      | ea   | \$286.76     | /ea   | \$17,779   |
| OS! Occupancy sensor Ceiling mounted Composite unit  | 246     | ea   | \$289.42     | /ea   | \$71,198   |
| Lighting Control Panel composite unit  | 5.00    | ea   | \$4,964.04   | /ea   | \$24,820   |
| Recptacle Control Panel composite unit   | 9.00    | ea   | \$4,964.04   | /ea   | \$44,676   |
| VS1 Vacancy sensor Ceiling mounted Composite unit  | 183     | ea   | \$250.32     | /ea   | \$45,809   |
| Daylight Sensor Ceiling Mounted Composite unit   | 124     | ea   | \$278.70     | /ea   | \$34,558   |
| 20 AMP EMT Composite feeders copper - Large Power  | 20,000  | lf   | \$16.93      | /lf   | \$338,627  |
| 12/2 MC Cable Composite Unit   | 20,000  | lf   | \$3.70       | /lf   | \$73,970   |
| D5046 Theatrical Lighting  |         |      | \$0.33       | / GSF | \$125,000  |
| recon 11-28-2022   | 1.00    | ls   | \$100,000.00 | /ls   | \$100,000  |
| Theatrical Lighting and Dimming Equipment Recon 11-28-2022   | 1.00    | ls   | \$100,000.00 | /ls   | \$100,000  |
| Theatrical Lighting and other Equipment excluded 11-28-2022  | 0.00    | excl |              |       | \$0        |
| VE G09 Aud   | -1.00   | ls   | \$75,000.00  | /ls   | (\$75,000) |
| D5090 OTHER ELECTRICAL SYSTEMS   |         |      | \$2.26       | / GSF | \$860,922  |
| D5094 Grounding & Lightning Protection Sys.  |         |      | \$0.68       | / GSF | \$257,418  |
| Ground Rod - Copperclad 3/4" x 10'   | 28      | ea   | \$126.99     | /ea   | \$3,556    |
| Lightening Protection Air Terminal   | 258     | ea   | \$465.25     | /ea   | \$120,035  |
| LP Bonding Plate   | 46      | ea   | \$150.00     | /ea   | \$6,900    |
| Copper Ground Bus Bar .25"x 2" x 3 foot  | 10      | ea   | \$546.75     | /ea   | \$5,467    |
| Copper Ground Bus Bar .25"x 2" x 4 foot  | 1.00    | ea   | \$729.00     | /ea   | \$729      |
| Ground Test Well - Terra Cotta with Steel Lid  | 4.00    | ea   | \$489.00     | /ea   | \$1,956    |
| Misc Grounding Requirements  | 39,203  | gsf  | \$0.40       | /gsf  | \$15,681   |
| Cadweld Cable to Steel - 250 Max   | 67      | ea   | \$74.99      | /ea   | \$5,024    |
| Lp Cadweld   | 44      | ea   | \$96.26      | /ea   | \$4,235    |
| Grouunding Cable Copper Bare Stranded # 4/0  | 3,158   | lf   | \$7.41       | /lf   | \$23,411   |
| Lightening Protection Cable Copper Bare Stranded # 4/0   | 9,500   | lf   | \$7.41       | /lf   | \$70,424   |
| D5095 Miscellaneous Electrical Systems   |         |      | \$1.59       | / GSF | \$603,503  |
| Electrical Permit asuumed to be waived by town   | 0.00    | ea   |              |       | \$0        |
| Full time Saftey Coordinator   | 1.00    | ea   | \$108,000.00 | /ea   | \$108,000  |
| General Foreman Non Working  | 1.00    | ea   | \$54,000.00  | /ea   | \$54,000   |
| Misc Expenses  | 392,032 | gsf  | \$1.51       | /gsf  | \$592,752  |
| Temp Lighting and Power  | 392,032 | gsf  | \$0.70       | /gsf  | \$275,206  |
| Utility Company Backcharges by owner   | 1.00    | excl | \$0.00       | /excl | \$0        |
| Trailers   | 1.00    | ea   | \$26,999.71  | /ea   | \$27,000   |
| BIM Modeling / As Builts   | 1.00    | ea   | \$157,544.55 | /ea   | \$157,545  |
| Relcoated Existing Overhead feed to other school due to new roadway recon 11-28-2022                                 | 1.00    | ea   | \$25,000.00  | /ea   | \$25,000   |
| VE Items E01 through E11, E14 through E21, E24 trough E26  | 0.00    | ls   |              |       | \$0        |
| VE01 In each classroom, reduce lighting control zones from four<br>zones per classroom to three zones per classroom. | 0.00    | ls   |              |       | \$0        |





| DESCRIPTION  | QUANTITY | UNIT COST        | TOTAL COST  |
|--|----------|------------------|-------------|
| VE02 For site lighting, control lighting with integral photocells at each light pole, in lieu of using the lighting control system on top of photocells to turn on/off fixtures. | 0.00 ls  |                  | \$0         |
| VE03 Provide aluminum feeders for those within the main building 200Amps and larger. This does not include feeders run to the satellite buildings                                | -1.00 ls | \$150,000.00 /ls | (\$150,000) |
| VE04 Remove duct banks from main fire alarm control panel to all satellite/out buildings.  | 0.00 ls  |                  | \$0         |
| VE05 Change the site lighting fixtures to the following: Beacon<br>Viper - https://hubbellcdn.com/specsheet/BEA_VIPERSPEC.pdf  | 0.00 ls  |                  | \$0         |
| VE06 Shorten Duct Bank Primary, Telcom and Generator to more<br>in the range of to in the range of 500 lf  | 0.00 ls  |                  | \$0         |
| VE07 Move All Transformer closer to their prospective<br>Switchboards in the range of 50 linear feet per run currently<br>200+ feet away   | 0.00 ls  |                  | \$0         |
| VE08 Utilize Aluminum Feeders 100 amps can be added to above   | -1.00 ls | \$150,000.00 /ls | (\$150,000) |
| VE09 Utilize Aluminum MC Feeders for feeds 100 amps to 225 amps can be added to above  | 0.00 ls  |                  | \$0         |
| VE10 Eliminate Vehicle Charging Stations in Auto Shop quantity of 4  | 0.00 ls  |                  | \$0         |
| VE11 Reduce Cord Reel Quantity in shops reduce by 10 overall<br>NOW VE07 ACCEPTED - TARGET REDUCTION VIA COORDINATION  | -1.00 ls | \$16,000.00 /ls  | (\$16,000)  |
| VE14 Utilize Lightning Preventor System in lieu of Lightening<br>Protection cannot be take with E12 - NOW VE E02 ACCEPTED  | -1.00 ls | \$100,000.00 /ls | (\$100,000) |
| VE15 Move Class Speech Reinforcement to tech Budget Wireless<br>Ceiling Panel  | 0.00 ls  |                  | \$0         |
| VE16 Remove Draw-out Breakers from Main Switchboard  | 0.00 ls  |                  | \$0         |
| VE17 Have Single ended Switchboard would remove set of<br>Secondaries and remove Secondary Duct Bank reduces<br>redundancy NOW VE EO4 ACCEPTED                                   | -1.00 ls | \$175,000.00 /ls | (\$175,000) |
| VE18 Eliminate panels and transformers for Parking EV charging<br>Stations conduit, wire ,panels transformer and charging station  | 0.00 ls  |                  | \$0         |
| VE19 Re-evaluate conduit and Service going from Maintenance<br>Building to Main Building(reduce spares and shorter conduits)   | 0.00 ls  |                  | \$0         |
| VE20 Eliminate Theatrical Dimming and rough in(eliminates all<br>Electrical Scope associated with Theater) - NOW VE E03A<br>ACCEPTED   | -1.00 ls | \$25,000.00 /ls  | (\$25,000)  |
| VE21 Revaluate Conduit and how site Lighting is powered for<br>entrance near School Sign and power and communication for<br>sign potentially wirless NOW VE E11 ACCEPTED         | -1.00 ls | \$20,000.00 /ls  | (\$20,000)  |
| VE24 Reduce Security Camera counts(target)   | 0.00 ls  |                  | \$0         |
| VE25 Delete Sub Metering   | 0.00 ls  |                  | \$0         |
| VE26 Target Reduction in Lighting - \$1 / sqft   | 0.00 ls  |                  | \$0         |
| D60 COMMUNICATIONS   |          | \$8.20 / GSF     | \$3,121,467 |
| D5090 OTHER ELECTRICAL SYSTEMS   |          | \$0.46 / GSF     | \$176,726   |
| D5092 Clock Systems  |          | \$0.46 / GSF     | \$176,726   |
| Clock Single Face Battery or 110 clock   | 235 ea   | \$547.40 /ea     | \$128,639   |
| Clock Rough in and Backboxes   | 1.00 ls  | \$29,999.97 /ls  | \$30,000    |





| DESCRIPTION   | QUANT | ΊΤΥ  | UNIT CC      | ST    | TOTAL COST        |
|---|-------|------|--------------|-------|-------------------|
| LV Cabling (included in overall)  | 7,020 | lf   | \$2.58       | /lf   | \$18,087          |
| D6010 COMMUNICATIONS & SECURITY   |       |      | \$4.30       | / GSF | \$1,634,899       |
| D6013 Tel/Data System   |       |      | \$4.30       | / GSF | \$1,634,899       |
| Wiremold D2 Data Jack Only Composite Unit                                       | 6.00  | ea   | \$306.97     | /ea   | \$1,842           |
| Poke Thru D3 data con Composite Unit  | 4.00  | ea   | \$1,259.53   | /ea   | \$5,038           |
| Poke Thru D2 data con Composite Unit  | 75    | ea   | \$1,084.65   | /ea   | \$81,349          |
| Poke Thru D4 data con Composite Unit  | 12    | ea   | \$1,284.65   | /ea   | \$15,416          |
| IDF Room Fit-Out composite unit   | 8.00  | ea   | \$15,000.00  | /ea   | \$120,000         |
| MDF Room Fit-Out composite unit   | 1.00  | ea   | \$30,000.00  | /ea   | \$30,000          |
| Tel/data Backbone Cabling , additional Devices and Testing                      | 1.00  | ea   | \$400,000.00 | /ea   | \$400,000         |
| Poke Thru D1 data con Composite Unit  | 24    | ea   | \$876.00     | /ea   | \$21,024          |
| D1 Telephone jack with 3/4" Stub to accessible ceiling composite unit 30 feet   | 3.00  | ea   | \$613.10     | /ea   | \$1,839           |
| DPI - D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet  | 1.00  | ea   | \$613.10     | /ea   | \$613             |
| Vape D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet   | 69    | ea   | \$613.10     | /ea   | \$42,304          |
| VH - D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet   | 11    | ea   | \$613.10     | /ea   | \$6,744           |
| VH - D1 Data jack at additional TVs and Displays not labeled                    | 76    | ea   | \$613.10     | /ea   | \$46,595          |
| WP - "VOIP" Wall Telephone Outlet   | 73    | ea   | \$613.10     | /ea   | \$44,756          |
| D2 Data jack with 3/4" Stub up to accessible ceiling composite unit 10 feet     | 2.00  | ea   | \$503.30     | /ea   | \$1,007           |
| EMP - Empty back box for Simman Cabling by Owner                                | 3.00  | ea   | \$421.70     | /ea   | \$1,265           |
| S2 Data jack with 3/4" Stub up to accessible ceiling composite unit 30 feet     | 8.00  | ea   | \$740.40     | /ea   | \$5,923           |
| TD2 TelData jack with 3/4" Stub up to accessible ceiling composite unit 30 feet | 10    | ea   | \$740.40     | /ea   | \$7,404           |
| D2 Data jack with 1/2" Stub to accessible ceiling composite unit 30 feet _2_    | 552   | ea   | \$698.17     | /ea   | \$385,387         |
| VPL - Low Video Presentation Outlet composite unit 10 feet _1_                  | 105   | ea   | \$603.76     | /ea   | \$63 <i>,</i> 395 |
| VPH - High Video Presentation Outlet composite unit 10 feet                     | 105   | ea   | \$756.47     | /ea   | \$79,429          |
| D4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet     | 1.00  | ea   | \$995.00     | /ea   | \$995             |
| S4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet     | 2.00  | ea   | \$995.00     | /ea   | \$1,990           |
| Audio Visual Cabling Overall Value  | 1.00  | ea   | \$102,404.62 | /ea   | \$102,405         |
| IPTV and Video on Demand(overal IPTV and Video Demand) - shift to Tech Budget   | 0.00  | excl |              |       | \$0               |
| WAP jack ceiling mounted composite unit   | 208   | ea   | \$491.78     | /ea   | \$102,290         |
| Telcom not Defined in Media Center  | 2,648 | gsf  | \$6.00       | /gsf  | \$15,888          |
| 65" Signage - Wall Mtd Display - Composite Assembly                             | 15    | excl | \$0.00       | /excl | \$0               |
| 75" Wall Mtd Display - Composite Assembly                                       | 103   | excl | \$0.00       | /excl | \$0               |
| Telcom Adjustment during recon 12-20-2022                                       | 1.00  | excl | \$50,000.00  | /excl | \$50,000          |
| D6030 SOUND AND A/V   |       |      | \$3.44       | / GSF | \$1,309,843       |
| D6031 Audio-Video Systems   |       |      | \$2.80       | / GSF | \$1,067,380       |





| DESCRIPTION  | QUANT  | TITY | UNIT CO             | ST    | TOTAL COST  |
|--|--------|------|---------------------|-------|-------------|
| AV Rack, Floor Mtd.  | 0.00   | ea   |                     |       | \$0         |
| AV Eq Rack Wall Mounted Rack   | 0.00   | ea   |                     |       | \$0         |
| Local Audio System Suspended Speaker w/ 1" con to av rack                                | 8.00   | ea   | \$315.00            | /ea   | \$2,520     |
| Speech Reinforcement System  | 101    | ea   | \$2,342.00          | /ea   | \$236,542   |
| Fitness Center Audio Visual System   | 1.00   | ea   | \$16,613.77         | /ea   | \$16,614    |
| IC - Intercom Wall Plate, backbox w/ 1" Conduit to AV Rack                               | 1.00   | ea   | \$247.48            | /ea   | \$247       |
| Weight Audio Visual System   | 1.00   | ea   | \$17,500.00         | /ea   | \$17,500    |
| Gym Audio Visual System RACK   | 1.00   | ea   | \$25,357.14         | /ea   | \$25,357    |
| Studen Commons Audio Visual System   | 1.00   | ea   | \$94,918.89         | /ea   | \$94,919    |
| TP - AV Sys. Control Touch Plate, backbox w/ 1" Conduit to AV<br>Rack                    | 1.00   | ea   | \$220.88            | /ea   | \$221       |
| Auditorium ALS Assisted Listening System Antenna   | 1.00   | ea   | \$3,500.00          | /ea   | \$3,500     |
| Auditorium VPO Video Projector with 1" to AV rack  | 1.00   | ea   | \$2,500.00          | /ea   | \$2,500     |
| Auditorium AV Rack   | 2.00   | ea   | \$25,000.00         | /ea   | \$50,000    |
| Auditorium Dante Input Plate with 1" to AV rack  | 4.00   | ea   | \$1,500.00          | /ea   | \$6,000     |
| Auditorium Fill Speaker  | 2.00   | ea   | \$2,500.00          | /ea   | \$5,000     |
| Auditorium Intercom Wall Plate with 1" to AV rack  | 4.00   | ea   | \$1,500.00          | /ea   | \$6,000     |
| Auditorium Local Speakr in Hall Way  | 3.00   | ea   | \$500.00            | /ea   | \$1,500     |
| Auditorium LSS Loud Speaker  | 2.00   | ea   | \$2,500.00          | /ea   | \$5,000     |
| Auditorium Mon with Wall Plate with 1" to AV rack  | 2.00   | ea   | \$2 <i>,</i> 500.00 | /ea   | \$5,000     |
| Auditorium Motorized Projection Screen   | 1.00   | ea   | \$15,000.00         | /ea   | \$15,000    |
| Auditorium Projector   | 1.00   | ea   | \$50,000.00         | /ea   | \$50,000    |
| Auditorium Sub Woofer  | 2.00   | ea   | \$2,500.00          | /ea   | \$5,000     |
| Auditorium TP Touch Control Plate with 1" to AV rack                                     | 5.00   | ea   | \$3 <i>,</i> 500.00 | /ea   | \$17,500    |
| Auditorium/Stage Video   | 1.00   | ea   | \$62,247.71         | /ea   | \$62,248    |
| Cafeteria Local Speaker  | 16     | ea   | \$500.00            | /ea   | \$8,000     |
| Class Room and Conference Room Interactive Flat Panel excluded<br>shifted to tech Budget | 0.00   | excl |                     |       | \$0         |
| Gym Local Speaker  | 24     | ea   | \$1,507.35          | /ea   | \$36,176    |
| DAN - Dante Input Wall Panel, backbox w/ 1" Conduit to AV Rack                           | 1.00   | ea   | \$505.61            | /ea   | \$506       |
| Video Projector  | 1.00   | ea   | \$145.12            | /ea   | \$145       |
| Instructional AV Excluded part of tech budget  | 1.00   | ea   | \$0.00              | /ea   | \$0         |
| Large AV Allowance   | 1.00   | ea   | \$557,760.00        | /ea   | \$557,760   |
| Scoreboards Exterior Connection  | 1.00   | ea   | \$1,625.41          | /ea   | \$1,625     |
| VE E01 - ADJUST BASED ON TECH / SECURITY FEEDBACK  | -1.00  | ea   | \$165,000.00        | /ea   | (\$165,000) |
| D6032 Sound/PA Systems   |        |      | \$0.64              | / GSF | \$242,462   |
| Public Address Speaker   | 653    | ea   | \$200.00            | /ea   | \$130,600   |
| PA Horn Speaker  | 62     | ea   | \$400.00            | /ea   | \$24,800    |
| VC - PA Speaker Volume Control   | 75     | ea   | \$150.00            | /ea   | \$11,250    |
| LV Cabling for Speaker   | 44,950 | lf   | \$2.58              | /lf   | \$115,812   |
| REduce PA During Recon   | -1.00  | lf   | \$40,000.00         | /lf   | (\$40,000)  |
| D70 ELECTRONIC SAFETY & SECURITY   |        |      | \$6.47              | / GSF | \$2,463,365 |
| D6010 COMMUNICATIONS & SECURITY  |        |      | \$4.19              | / GSF | \$1,593,763 |
| D6011 Fire Alarm System  |        |      | \$1.27              | / GSF | \$485,202   |
| Fire Alarm Manual pull station composite unit  | 54     | ea   | \$271.61            | /ea   | \$14,667    |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANT  | ΊΤΥ | UNIT CC             | ST    | TOTAL COST        |
|---|--------|-----|---------------------|-------|-------------------|
| Fire Alarm Bell Exterior - WP composite unit  | 2.00   | ea  | \$278.99            | /ea   | \$558             |
| Fire Alarm Smoke detector composite unit  | 102    | ea  | \$338.62            | /ea   | \$34,539          |
| Fire Alarm Duct smoke detector with relay base composite unit   | 24     | ea  | \$707.94            | /ea   | \$16,990          |
| Fire Alarm Flow switch composite unit   | 7.00   | ea  | \$242.39            | /ea   | \$1,697           |
| Fire Alarm Tamper switch composite unit   | 16     | ea  | \$242.39            | /ea   | \$3 <i>,</i> 878  |
| Fire Alarm Sounder composite unit   | 44     | ea  | \$274.64            | /ea   | \$12,084          |
| Fire Alarm Strobe Wall composite unit   | 73     | ea  | \$268.00            | /ea   | \$19,564          |
| Fire Alarm BDA  | 2.00   | ea  | \$509.44            | /ea   | \$1,019           |
| Fire Alarm Remote indicating light composite unit   | 29     | ea  | \$203.70            | /ea   | \$5,907           |
| Fire Alarm Speaker strobe composite unit  | 427    | ea  | \$327.46            | /ea   | \$139,823         |
| FACP  | 2.00   | ea  | \$23,643.21         | /ea   | \$47,286          |
| Fire Alarm Terminal cabinet composite unit  | 9.00   | ea  | \$1,395.43          | /ea   | \$12,559          |
| Control Relay   | 35     | ea  | \$335.17            | /ea   | \$11,731          |
| Fire Alarm Monitor module composite unit  | 58     | ea  | \$335.17            | /ea   | \$19,440          |
| FDS Fire Alarm  | 25     | ea  | \$2,377.21          | /ea   | \$59 <i>,</i> 430 |
| AR Two Way Fire Dept Communcation Station   | 0.00   | ea  |                     |       | \$0               |
| BP Fire Booster Panel   | 8.00   | ea  | \$3 <i>,</i> 436.21 | /ea   | \$27,490          |
| Fire Alarm Annunciator medium composite unit  | 1.00   | ea  | \$3 <i>,</i> 436.21 | /ea   | \$3,436           |
| Fire Alarm Annunciator large composite unit   | 12     | ea  | \$4,425.21          | /ea   | \$53,102          |
| D6016 Surveillance CCTV System  |        |     | \$2.28              | / GSF | \$869,364         |
| Vape System Allowance 07-28-2022 Jacks are with Telcom, Device and install only                       | 1.00   | ls  | \$37,400.00         | /ls   | \$37,400          |
| 2" PVC with Fiber Optic Cable for Exiterior Cameras   | 8,100  | lf  | \$29.31             | /lf   | \$237,411         |
| Cat 6 Cable   | 15,700 | lf  | \$0.79              | /If   | \$12,442          |
| Media Converters for Exterior Cameras   | 54     | ea  | \$330.99            | /ea   | \$17,873          |
| CCTV Camera D1 Data jack with 1/2" Stub to accessible ceiling composite unit 10 feet 1                | 210    | ea  | \$356.76            | /ea   | \$74,920          |
| Security CCTV Head End - Medium Composite Unit  | 1.00   | ea  | \$36,689.00         | /ea   | \$36,689          |
| CCTV Video Camera - Fixed Bullet Camera, Exterior WP Assembly<br>Composite Unit Exterior Pole Mounted | 54     | ea  | \$1,576.00          | /ea   | \$85,104          |
| CCTV Video Camera - PTZ Dome Camera, Interior Assembly<br>Composite Unit                              | 130    | ea  | \$1,893.00          | /ea   | \$246,090         |
| Added 50,000 to Security/CCTv to align with LV Cosnultants<br>Budget                                  | 1.00   | ea  | \$50,000.00         | /ea   | \$50,000          |
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit                           | 34     | ea  | \$2,101.00          | /ea   | \$71,434          |
| D6017 Security Access Control   |        |     | \$0.63              | / GSF | \$239,197         |
| (1) 2" Empty PVC Conduit with pull string composite unit - Large<br>Power at lift Gate                | 350    | lf  | \$27.27             | /lf   | \$9,545           |
| Security Composite Cable Per Foot   | 33,150 | lf  | \$1.25              | /lf   | \$41,438          |
| Security Composite Cable Per Foot at lift Gate  | 1,050  | lf  | \$1.25              | /lf   | \$1,313           |
| Security SOS - Siren Operating System at lift gate  | 1.00   | ea  | \$186.75            | /ea   | \$187             |
| Security Chime Composite Unit   | 9.00   | ea  | \$203.75            | /ea   | \$1,834           |
| Security Motion Sensor Composite Unit   | 69     | ea  | \$179.28            | /ea   | \$12,370          |
| Security Card Reader Composite Unit   | 62     | ea  | \$259.29            | /ea   | \$16,076          |
| Security Card Reader Exterior WP Composite Unit   | 1.00   | ea  | \$299.66            | /ea   | \$300             |
|   |        |     |                     |       |                   |





| DESCRIPTION  | QUANTITY    | UNIT COST          | TOTAL COST  |
|--|-------------|--------------------|-------------|
| Security Key Pad Composite Unit  | 2.00 ea     | \$475.28 /ea       | \$951       |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit                           | 63 ea       | \$198.77 /ea       | \$12,523    |
| Security WC - Door Contact / Roof Hatch Contact Composite Unit                           | 9.00 ea     | \$198.77 /ea       | \$1,789     |
| Security Intercom Station Interior / Exterior WP Composite Unit                          | 1.00 ea     | \$522.81 /ea       | \$523       |
| Security Intercom Unit With Video Master Station Composite<br>Unit                       | 8.00 ea     | \$1,319.70 /ea     | \$10,558    |
| Security Intercom Station With Video Interior / Exterior WP<br>Composite Unit            | 6.00 ea     | \$684.76 /ea       | \$4,109     |
| Security VES - Security Stantion with airphone intercom                                  | 1.00 ea     | \$684.76 /ea       | \$685       |
| Security Head End and Testing  | 1.00 ea     | \$125,000.00 /ea   | \$125,000   |
| D7050 DETECTION & ALARM  |             | \$2.29 / GSF       | \$869,602   |
| D6011 Fire Alarm System  |             | \$2.29 / GSF       | \$869,602   |
| Radio Master box   | 1.00 ea     | \$9,007.46 /ea     | \$9,007     |
| BDA  | 385,651 gsf | \$0.53 /gsf        | \$203,440   |
| Testing - Fire Alarm   | 1.00 ea     | \$6,655.28 /ea     | \$6,655     |
| Area of Refuge   | 1.00 ls     | \$12,000.00 /ls    | \$12,000    |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit                                   | 50,000 lf   | \$12.77 /lf        | \$638,500   |
| E EQUIPMENT & FURNISHINGS  | 380,570 GSF | \$15.75 / GSF      | \$5,993,992 |
| E10 EQUIPMENT  |             | \$14.82 / GSF      | \$5,641,773 |
| E1030 COMMERCIAL EQUIPMENT   |             | \$6.17 / GSF       | \$2,348,714 |
| E1038 Foodservice Equipment  |             | \$6.17 / GSF       | \$2,348,714 |
| Food Service Equipment (Sub quote)   | 1.00 ls     | \$2,348,714.00 /ls | \$2,348,714 |
| E1040 INSTITUTIONAL EQUIPMENT  |             | \$1.20 / GSF       | \$457,874   |
| E1044.2 Laboratory Equipment   |             | \$0.25 / GSF       | \$93,750    |
| Equipment - Fume Hood (FH-1) - Ductless, ADA Base - REDUCED<br>PER RECON                 | 6.00 ea     | \$15,625.00 /ea    | \$93,750    |
| E1044.4 Educational & Scientific Equipment   |             | \$0.96 / GSF       | \$364,124   |
| Equipment - (DW-1) F&I Dishwasher  | 0.00 ea     |                    | \$0         |
| Equipment - (REF-1) F&I Refrigerator   | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC01) F&I Full Down Draft Paint<br>Booth                     | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC02) F&I Paint Mixing Booth                                 | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC03) F&I Power Coating Booth                                | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC04) F&I Power Coating Oven                                 | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC05) F&I Frame Strighener                                   | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC07) Install ONLY Dual Exhaust<br>Collection Arms - Welding | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC08) Install ONLY Blasting Cabinet                          | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AC08A) Install ONLY Power Module                             | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AT01) F&I 10,000 lb 2 Post Lifts                             | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AT02) F&I 16,000 lb 2 Post Lifts                             | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AT03) F&I MSDS   | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AT04) F&I EV Charging Station                                | 0.00 ea     |                    | \$0         |
| Equipment - Auto Collision (AT05) Install ONLY Tire Charger                              | 0.00 ea     |                    | \$0         |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION  | QUANTITY | UNIT COST      | TOTAL COST |
|--|----------|----------------|------------|
| Equipment - Auto Collision (AT06) Install ONLY Wheel Balancer                            | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT07) Install ONLY Alignment Rack                            | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT08) Install ONLY Alignment Console<br>/ Sensors            | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT09) Install ONLY Blasting Cabinet                          | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT09A) Install ONLY Power Module                             | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT10) Install ONLY Dual Exhaust<br>Collection Arms - Welding | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT11) Install ONLY Vehicle Exhaust<br>Collection             | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT12) F&I 1 Ton Chain Fall                                   | 0.00 ea  |                | \$0        |
| Equipment - Auto Collision (AT25) F&I Hoist Crane  | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP01) F&I Dust Collection - Full Shop, see<br>HVAC                | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP02) Install ONLY Large CNC                                      | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP03) Install ONLY Cabinet Saw                                    | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP04) Install ONLY Panel Saw                                      | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP05) Install ONLY Table Saw                                      | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP07) Install ONLY Inverted Router                                | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP08) Install ONLY Planer   | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP09) Install ONLY Jointer  | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP10) Install ONLY Oscillating Universal<br>Edge Sander           | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP11) Install ONLY Planer   | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP12) Install ONLY Drum Sander                                    | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP13) Install ONLY Vertical Band Saw                              | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP14) Install ONLY Table Saw                                      | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP15) Install ONLY Plywood Rack                                   | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP16) Install ONLY Linear Stock Rack                              | 0.00 ea  |                | \$0        |
| Equipment - Cosmetology (CM03) F&I Double Sided Syling<br>Stations                       | 24 ea    | \$5,039.92 /ea | \$120,958  |
| Equipment - Cosmetology (CM04) F&I Shampoo Stations                                      | 12 ea    | \$2,164.92 /ea | \$25,979   |
| Equipment - Cosmetology (CM05) F&I Double Manicure Tables                                | 10 ea    | \$3,314.92 /ea | \$33,149   |
| Equipment - Cosmetology (CM06) F&I Pedicure Station                                      | 3.00 ea  | \$6,764.92 /ea | \$20,295   |
| Equipment - Cosmetology (CM26) F&I Triple Lockers  | 22 ea    | \$2,739.92 /ea | \$60,278   |
| Equipment - Cosmetology (D-1) F&I Dryer  | 1.00 ea  | \$2,232.46 /ea | \$2,232    |
| Equipment - Cosmetology (W-1) F&I Washer   | 1.00 ea  | \$2,232.46 /ea | \$2,232    |
| Equipment - Dental Assist (DT01) F&I MSDS  | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT02) F&I Washer  | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT03) F&I Dryer   | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT04) Install ONLY X Ray Chair                                | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT05) Install ONLY Air Compressor                             | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT06) Install ONLY Amalgam<br>Seperator                       | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT07) Install ONLY Vacuum Pump                                | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT08) Install ONLY Instrument Washer                          | 0.00 ea  |                | \$0        |

#### 60% CD Estimate - Reconciled incl VE

## Gilbane 01/20/2023 Rev.3

| DESCRIPTION  | QUANTITY | UNIT COST | TOTAL COST |
|--|----------|-----------|------------|
| Equipment - Dental Assist (DT09) Install ONLY Dental Chair w/Full<br>Package | 0.00 ea  |           | \$0        |
| Equipment - Design and Visual (DV01) Install ONLY Large Digital<br>Press     | 0.00 ea  |           | \$0        |
| Equipment - Design and Visual (DV01A) Install ONLY 3PH<br>Transformer        | 0.00 ea  |           | \$0        |
| Equipment - Design and Visual (DV02) Install ONLY Chiller                    | 0.00 ea  |           | \$0        |
| Equipment - Design and Visual (DV03) Install ONLY Large<br>Compressor        | 0.00 ea  |           | \$0        |
| Equipment - Design and Visual (DV04) Install ONLY Parts Washer               | 0.00 ea  |           | \$0        |
| Equipment - Design and Visual (DV05) Install ONLY Paper Cutter               | 0.00 ea  |           | \$0        |
| Equipment - Early Childhood (D-1) F&I Dryer                                  | 0.00 ea  |           | \$0        |
| Equipment - Early Childhood (W-1) F&I Washer                                 | 0.00 ea  |           | \$0        |
| Equipment - Electrical (ET01) F&I Student Booths                             | 0.00 ea  |           | \$0        |
| Equipment - Electrical (ET17) F&I Cooktop                                    | 0.00 ea  |           | \$0        |
| Equipment - Electrical (ET18) F&I Exhaust Hood w/ Light                      | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (D-1) F&I Dryer                                 | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (DW-1) F&I Dishwasher                           | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (HA06) Install ONLY Sim Man                     | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (HA07) Install ONLY Mock Headwall               | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (HA08) Install ONLY X-Ray Viewbox               | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (HA09) Install ONLY BP Cuff - Wall<br>Mt        | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (MW-1) F&I Microwave                            | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (REF-1) F&I Refrigerator                        | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (W-1) F&I Washer                                | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV01) Install ONLY Lowerclass Booths                  | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV02) Install ONLY 96% Boilers                        | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV03) Install ONLY Walk In Freezer                    | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV04) Install ONLY Lowerclass Booths                  | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV05) Install ONLY Oil Furnaces                       | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV06) Install ONLY 80% Furnaces                       | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV07) Install ONLY Mini Split Units                   | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV08) Install ONLY 1.5 Ton Condensers                 | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV09) Install ONLY AC / Heating Units                 | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV10) Install ONLY On Demand HW Unit                  | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV11) Install ONLY Upperclass Booths                  | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV12) Install ONLY VRF Ceiling                        | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV12A) Install ONLY VRF Ducted                        | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV12B) Install ONLY VRF Wall                          | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (D-1) F&I Dryer                                | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA03) Install ONLY Sim Man                    | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA10) Install ONLY Xray Box                   | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA14) Install ONLY Otoscope                   | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA18) Install ONLY Blood<br>Pressure Unit     | 0.00 ea  |           | \$0        |

#### 60% CD Estimate - Reconciled incl VE



| SCRIPTION   | QUAN    | ΓΙΤΥ   | UNIT COS             | т    | TOTAL COST        |  |
|---|---------|--------|----------------------|------|-------------------|--|
| Equipment - Medical Assisting (W-1) F&I Washer                                      | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Metal Fabrication (MF01) Install ONLY Exhaust<br>Collection Arms        | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Metal Fabrication (MF01A) Install ONLY Exhaust<br>Collection Arms w/Fan | 0.00    | еа     |                      |      | \$0               |  |
| Equipment - Metal Fabrication (MF02) Install ONLY Hydraulic<br>Squaring Shear       | 0.00    | еа     |                      |      | \$0               |  |
| Equipment - Metal Fabrication (MF02A) Install ONLY Hydraulic<br>Squaring Shear      | 0.00    | еа     |                      |      | \$0               |  |
| Equipment - Metal Fabrication (MF03) Install ONLY CNC Hydraulic<br>Press Brake      | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Metal Fabrication (MF61) Install ONLY Overhead<br>Hoist - 2 Ton         | 0.00    | еа     |                      |      | \$0               |  |
| Equipment - Plumbing (PL01) F&I 8' UC Student Booth                                 | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Plumbing (PL02) F&I LC Student Booth                                    | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Plumbing (PL03) F&I Electric Hot Water (OD)                             | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Plumbing (PL04) F&I Gas Boiler w/tankless                               | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Plumbing (PL05) F&I Gas Water Heater                                    | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - RINSTALLATION ALLOWANCE - PER RECON                                     | 0.00    | ea     |                      |      | \$0               |  |
| Equipment - Robotics (RB01) F&I Air Compressor                                      | 900     | mhr    | \$110.00 /           | /mhr | \$99 <i>,</i> 000 |  |
| E1070 ENTERTAINMENT & RECREATIONAL EQUIPMENT  |         |        | \$1.35 /             | GSF  | \$514,600         |  |
| E1071 Theater & Stage Equipment   |         |        | \$1.35 /             | GSF  | \$514,600         |  |
| Stage Curtains and Rigging - Powered rigging  | 1.00    | ls     | \$200,000.00         | /ls  | \$200,000         |  |
| Theater - Auditorium Fixed Seating - QTO - ADJUST PER RECON                         | 572     | ea     | \$550.00             | /ea  | \$314,600         |  |
| E1090 OTHER EQUIPMENT   |         |        | \$0.94 /             | GSF  | \$356,281         |  |
| E1097 Athletic, Recreational, & Therapeutic Equipment                               |         |        | \$0.94 /             | GSF  | \$356,281         |  |
| Basketball Backstops  | 6.00    | ea     | \$15,000.00          | /ea  | \$90,000          |  |
| Divider Curtains  | 1.00    | ea     | \$32,000.00          | /ea  | \$32,000          |  |
| Gym Wall Padding  | 964     | sf     | \$20.00              | /sf  | \$19,281          |  |
| Telescoping Bleachers   | 4.00    | ea     | \$53,750.00 <i>j</i> | /ea  | \$215,000         |  |
| E1098 Residential Equipment   |         |        | \$0.00 /             | GSF  | \$0               |  |
| Rooftop Play Equipment - not shown, exclude   | 0.00    | nic    |                      |      | \$0               |  |
| E2010 FIXED FURNISHINGS   |         |        | \$5.16 /             | GSF  | \$1,964,304       |  |
| F2013 Casework  |         |        | \$5.16 /             | GSF  | \$1.964.304       |  |
| Counterton-Casework Enory   | 1 1 2 8 | lf     | \$120.00             | /If  | \$136 610         |  |
| Countertop-Casework, Epoxy  | 68      | lf     | \$150.00             | /lf  | \$10 147          |  |
| Countertop-Casework PLAM  | 726     | <br>If | \$60.00              | /lf  | \$43 587          |  |
| Casework - PLAM Counter (1' deep) w/ Brackets                                       | 79      | lf     | \$60.00              | /lf  | \$4.711           |  |
| Casework - PLAM Counter w/ Brackets   | 1.247   | lf     | \$60.00              | /lf  | \$74.838          |  |
| Custom Millwork - Bench with Solid Surface Top                                      | 247     | lf     | \$600.00             | /lf  | \$148.255         |  |
| Custom Millwork - Cafe Counter with Quartz Countertop                               | 27      | lf     | \$1,100.00           | /If  | \$29,995          |  |
| Custom Millwork - Display Case (8' High)  | 22      | lf     | \$2,500.00           | /lf  | \$54,206          |  |
| Custom Millwork - Media Center Desk   | 41      | lf     | \$482.59             | /lf  | \$20,000          |  |
| Custom Millwork - Reception Desk with Solid Surface Top                             | 28      | lf     | ,<br>\$1,082.20      | /If  | \$30,000          |  |
| Custom Millwork - TV Studio, not shown - EXCLUDED                                   | 1 00    | nic    | \$0.00               | /nic | \$0               |  |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANT     | ITY | UNIT CO      | ST    | TOTAL COST    |
|---|-----------|-----|--------------|-------|---------------|
| Custom Millwork - School Store, not shown - EXCLUDED  | 1.00      | nic | \$0.00       | /nic  | \$0           |
| Custom Millwork - Collab Spaces, not shown - EXCLUDED   | 1.00      | nic | \$0.00       | /nic  | \$0           |
| Custom Millwork - Career Center, not shown - EXCLUDED   | 1.00      | nic | \$0.00       | /nic  | \$0           |
| Custom Millwork - Bank, not shown - EXCLUDED  | 1.00      | nic | \$0.00       | /nic  | \$0           |
| Custom Millwork - Wood Cubbie - 4' high   | 24        | ea  | \$750.00     | /ea   | \$18,000      |
| Casework - Base Cabinets  | 754       | lf  | \$325.00     | /lf   | \$244,914     |
| Casework - Base Cabinets - Design Visual Flat File  | 14        | lf  | \$500.00     | /lf   | \$6,775       |
| Casework - Cosmetology Base Cabinets  | 56        | lf  | \$325.00     | /lf   | \$18,176      |
| Casework - Cosmetology Wall Cabinets  | 49        | lf  | \$200.00     | /lf   | \$9,742       |
| Casework - Wall Cabinets  | 468       | lf  | \$200.00     | /lf   | \$93,585      |
| Casework - Mailroom   | 12        | lf  | \$350.00     | /lf   | \$4,242       |
| Casework - Tall Storage 7' high   | 384       | lf  | \$600.00     | /lf   | \$230,643     |
| Casework - Cabinet - Cubbies (2'-3"x2'8")   | 5.00      | ea  | \$500.00     | /ea   | \$2,500       |
| Lab Casework - Base Cabinets  | 981       | lf  | \$350.00     | /lf   | \$343,294     |
| Lab Casework - Wall Cabinets  | 193       | lf  | \$250.00     | /lf   | \$48,232      |
| Lab Casework - Wall Cabinets w/ Pegboards   | 415       | lf  | \$300.00     | /lf   | \$124,554     |
| Lab Casework - Island Demonstration Desk  | 44        | lf  | \$561.96     | /lf   | \$25,000      |
| Lab Casework - Goggle Storage Cabinet   | 4.00      | ea  | \$1,250.00   | /ea   | \$5,000       |
| Lab Casework - Flammables and Corrosives Storage Cabinet  | 8.00      | ea  | \$3,125.00   | /ea   | \$25,000      |
| Lab Casework - PX-1 (Casework Sink)   | 53        | ea  | \$800.00     | /ea   | \$42,400      |
| Lab Casework - PREMIUM FOR DENTAL CASEWORK  | 1.00      | ls  | \$45,000.00  | /ls   | \$45,000      |
| Lab Casework - PX-2 (Casework Sink w/ Eyewash)  | 7.00      | ea  | \$800.00     | /ea   | \$5,600       |
| Lab Casework - PX-3 (Cosmetology Sink)  | 15        | ea  | \$800.00     | /ea   | \$12,000      |
| Lab Casework - PX-4 (Science Room Sink)   | 45        | ea  | \$1,050.00   | /ea   | \$47,250      |
| Lab Casework - PX-5 (Lab Sink)  | 45        | ea  | \$1,050.00   | /ea   | \$47,250      |
| Lab Casework - PX-6 (Dental Station Sink)   | 16        | ea  | \$800.00     | /ea   | \$12,800      |
| E20 FURNISHINGS   |           |     | \$0.93       | / GSF | \$352,219     |
| E2010 FIXED FURNISHINGS   |           |     | \$0.93       | / GSF | \$352,219     |
| E2012 Window Treatments   |           |     | \$0.93       | / GSF | \$352.219     |
| Window Shades - Manual Operated - Interior  | 174       | еа  | \$150.00     | /ea   | \$26,100      |
| Roller Shades - Manual Operated - Translucent Wall Panel<br>System, assume not required                   | 2,630     | sf  | \$0.00       | /sf   | \$0           |
| Roller Shades - Manual Operated - Exterior Windows Aluminum<br>System                                     | 10,209    | sf  | \$10.00      | /sf   | \$102,090     |
| Roller Shades - Manual Operated - Exterior Storefront System  | 4.658     | sf  | \$10.00      | /sf   | \$46.580      |
| Roller Shades - Manual Operated - Exterior Curtain Wall System  | 23.026    | sf  | \$10.00      | /sf   | \$230,260     |
| Roller Shades - Manual Operated - REDUCE PER RECON  | -10000.00 | sf  | \$10.00      | /sf   | (\$100.000)   |
| Roller Shades - Electrically Operated - Exterior Curtain Wall<br>System @ Rotunda - REDUCE UNIT PER RECON | 2,759     | sf  | \$20.00      | /sf   | \$55,189      |
| Roller Shades - Electrically Operated - REDUCE QTY PER RECON  | -400.00   | sf  | \$20.00      | /sf   | (\$8,000)     |
| TOTAL MAIN BUILDING   |           | \$4 | 417.02 / GSF | :     | \$158,705,642 |

Wakefield, MA

60% CD Estimate - Reconciled incl VE



### CONCESSIONS / TOILET BLDG

| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| A SUBSTRUCTURE  | 0 GSF    | \$0.00 / GSF | \$0        |
| A10 FOUNDATIONS   |          | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS                                  |          | \$0.00 / GSF | \$0        |
| A1010 Standard Foundations                                  |          | \$0.00 / GSF | \$0        |
| Continuous Strip Ftg - 150' x 2' x 1'                       | 0.00 cy  |              | \$0        |
| F&I Building Foundation Drainage - excl                     | 0.00 ls  |              | \$0        |
| A1019 Standard Foundation Supplementary Components          |          | \$0.00 / GSF | \$0        |
| Damproofing - Foundation Walls                              | 0.00 sf  |              | \$0        |
| Rigid Insulation @ Fndn. Walls                              | 0.00 sf  |              | \$0        |
| A9011 Backfill & Compaction                                 |          | \$0.00 / GSF | \$0        |
| Excavate, Backfill & Compact                                | 0.00 ls  |              | \$0        |
| A20 SUBGRADE ENCLOSURES                                     |          | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS                                  |          | \$0.00 / GSF | \$0        |
| A1010 Standard Foundations                                  |          | \$0.00 / GSF | \$0        |
| Foundation Wall - 150' x 3' x 1'                            | 0.00 cy  |              | \$0        |
| A40 SLABS-ON-GRADE  |          | \$0.00 / GSF | \$0        |
| A4010 STANDARD SLABS-ON-GRADE                               |          | \$0.00 / GSF | \$0        |
| A4010 Standard Slabs-on-Grade                               |          | \$0.00 / GSF | \$0        |
| SOG Complete \$/sf - 5", WWF Reinforcing                    | 0.00 sf  |              | \$0        |
| A4096 Slab-On-Grade Supplementary Components                |          | \$0.00 / GSF | \$0        |
| Vapor Barrier @ SOG   | 0.00 sf  |              | \$0        |
| Rigid Insulation @ S.O.G.                                   | 0.00 sf  |              | \$0        |
| B SHELL   | 0 GSF    | \$0.00 / GSF | \$0        |
| B10 SUPERSTRUCTURE  |          | \$0.00 / GSF | \$0        |
| B1020 ROOF CONSTRUCTION                                     |          | \$0.00 / GSF | \$0        |
| B1021 Roof Structural Frame                                 |          | \$0.00 / GSF | \$0        |
| Delete per VM   | 0.00 sf  |              | \$0        |
| Wood Framing, Roof Truss \$/sf                              | 0.00 sf  |              | \$0        |
| B20 EXTERIOR VERTICAL ENCLOSURES                            |          | \$0.00 / GSF | \$0        |
| B2010 EXTERIOR WALLS  |          | \$0.00 / GSF | \$0        |
| B2012 Exterior Wall Construction                            |          | \$0.00 / GSF | \$0        |
| Exterior CMU Veneer - large scale                           | 0.00 sf  |              | \$0        |
| Exterior Backup Wall CMU - 8"                               | 0.00 sf  |              | \$0        |
| Delete per VM   | 0.00 ls  |              | \$0        |
| Fiber Cement Panels - Exterior Wall                         | 0.00 sf  |              | \$0        |
| B2050 EXTERIOR DOORS & GRILLES                              |          | \$0.00 / GSF | \$0        |
| B2051 Exterior Entrance Doors                               |          | \$0.00 / GSF | \$0        |
| Door   SS Pair Exterior - Incl. Door, Frame, and Hardware   | 0.00 ea  |              | \$0        |
| Door   SS Single Exterior - Incl. Door, Frame, and Hardware | 0.00 ea  |              | \$0        |
| Paint Exterior - Door Frms                                  | 0.00 ea  | 4            | \$0        |
| B2053.4 Overhead & Roll Up Doors                            |          | \$0.00 / GSF | \$0        |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION  | QUANTITY   | UNIT COST    | TOTAL COST |
|--|------------|--------------|------------|
| Roll-up concession window counter door, SS         | 0.00 ls    |              | \$0        |
| <b>B2070 EXTERIOR LOUVERS &amp; VENTS</b>          |            | \$0.00 / GSF | \$0        |
| B2071 Exterior Louvers                             |            | \$0.00 / GSF | \$0        |
| Louver - Exterior Aluminum                         | 0.00 sf    |              | \$0        |
| B30 EXTERIOR HORIZONTAL ENCLOSURES                 |            | \$0.00 / GSF | \$0        |
| B3010 ROOFING                                      |            | \$0.00 / GSF | \$0        |
| B3012 Low Slope Membrane Systems                   |            | \$0.00 / GSF | \$0        |
| Delete per VM                                      | 0.00 sf    |              | \$0        |
| Standing Seam Metal Roof System                    | 0.00 sf    |              | \$0        |
| B3014.2 Flashings & Trim                           |            | \$0.00 / GSF | \$0        |
| SS Snow Fence                                      | 0.00 ls    |              | \$0        |
| Metal Coping/Roof Edge                             | 0.00 lf    |              | \$0        |
| B3014.4 Gutters & Downspouts                       |            | \$0.00 / GSF | \$0        |
| Gutters  | 0.00 lf    |              | \$0        |
| Downspouts   | 0.00 nic   |              | \$0        |
| C INTERIORS  | 0 GSF      | \$0.00 / GSF | \$0        |
| C10 INTERIOR CONSTRUCTION                          |            | \$0.00 / GSF | \$0        |
| C1010 INTERIOR PARTITIONS                          |            | \$0.00 / GSF | \$0        |
| C1011 Interior Fixed Partitions                    |            | \$0.00 / GSF | \$0        |
| Interior CMU - 8"                                  | 0.00 sf    | ,            | \$0        |
| Interior Rough Carpentry                           | 0.00 sf    |              | \$0        |
| C1030 INTERIOR DOORS                               |            | \$0.00 / GSF | \$0        |
| C1031.4 Standard Interior Doors                    |            | \$0.00 / GSF | \$0        |
| Door type F- SS                                    | 0.00 ea    |              | \$0        |
| Door type R-Over head coiling                      | 0.00 ea    |              | \$0        |
| Frame- Type 1- SS                                  | 0.00 ea    |              | \$0        |
| Hardware   Interior Door Hardware Per Leaf         | 0.00 leaf  |              | \$0        |
| Install doors and hardware                         | 0.00 hr    |              | \$0        |
| Paint Interior - Door & Frames                     | 0.00 ea    |              | \$0        |
| C1039 Interior Door Supplementary Components       |            | \$0.00 / GSF | \$0        |
| Misc. Interior Caulking - General                  | 0.00 sf    |              | \$0        |
| C1090 INTERIOR SPECIALTIES                         |            | \$0.00 / GSF | \$0        |
| C1092.2 Compartments & Cubicles                    |            | \$0.00 / GSF | \$0        |
| Toilet Compartment - Stainless Steel - Standard    | 0.00 stall |              | \$0        |
| Toilet Compartment - Stainless Steel - Handicapped | 0.00 stall |              | \$0        |
| Urinal Screen - Stainless Steel                    | 0.00 ea    |              | \$0        |
| C1092.4 Toilet, Bath, & Laundry Accessories        |            | \$0.00 / GSF | \$0        |
| Toilet Accessories - Men's Room                    | 0.00 ea    |              | \$0        |
| Toilet Accessories - Women's Room                  | 0.00 ea    |              | \$0        |
| C1099 Other Interior Specialties                   |            | \$0.00 / GSF | \$0        |
| Interior Misc.Metals Item -                        | 0.00 sf    |              | \$0        |
| C20 INTERIOR FINISHES                              |            | \$0.00 / GSF | \$0        |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANTITY  | UNIT COST    | TOTAL COST |
|---|-----------|--------------|------------|
| C2010 WALL FINISHES   |           | \$0.00 / GSF | \$0        |
| C2017 Wall Painting & Coating                               |           | \$0.00 / GSF | \$0        |
| Paint Interior Walls - Epoxy                                | 0.00 sf.  |              | \$0        |
| Misc. Interior Painting                                     | 0.00 allw |              | \$0        |
| C2030 FLOORING  |           | \$0.00 / GSF | \$0        |
| C2035 Resilient Flooring                                    |           | \$0.00 / GSF | \$0        |
| Epoxy Flooring - Poured                                     | 0.00 sf   |              | \$0        |
| Sealed Concrete   | 0.00 sf   |              | \$0        |
| C2050 CEILING FINISHES                                      |           | \$0.00 / GSF | \$0        |
| C2051 Plaster & Gypsum Board Finish                         |           | \$0.00 / GSF | \$0        |
| GWB   GWB Ceiling, Typical                                  | 0.00 sf   |              | \$0        |
| VE - Delete   | 0.00 ls   |              | \$0        |
| C2056 Painting & Staining Ceilings                          |           | \$0.00 / GSF | \$0        |
| Paint   Painted Interior GWB - Typical Ceilings - Epoxy Pnt | 0.00 sf   |              | \$0        |
| D SERVICES  | 0 GSF     | \$0.00 / GSF | \$0        |
| D20 PLUMBING  |           | \$0.00 / GSF | \$0        |
| D2000 PLUMBING EQUIPMENT                                    |           | \$0.00 / GSF | \$0        |
| D2000 Plumbing Equipment                                    |           | \$0.00 / GSF | \$0        |
| Water Meter 4"  | 0.00 ea   |              | \$0        |
| Circulating Pump - DHWH                                     | 0.00 ea   |              | \$0        |
| Thermostatic Mixing Valve, 2"                               | 0.00 ea   |              | \$0        |
| Backflow Preventer (RP) 4"                                  | 0.00 ea   |              | \$0        |
| Kitchen Equipment Connections                               | 0.00 ls   |              | \$0        |
| Trap Primers & Associated Piping                            | 0.00 ea   |              | \$0        |
| Floor Drain W/Trap  | 0.00 ea   |              | \$0        |
| Local Grease Interceptor 35 GPM                             | 0.00 ea   |              | \$0        |
| Elevator Sump Pump  | 0.00 ea   |              | \$0        |
| Oil Interceptor Elevator                                    | 0.00 ea   |              | \$0        |
| Electric Water Heater - 30 Gallon 15 KW                     | 0.00 ea   |              | \$0        |
| Expansion Tank  | 0.00 ea   |              | \$0        |
| D2010 DOMESTIC WATER DISTRIBUTION                           |           | \$0.00 / GSF | \$0        |
| D2012 Domestic Water Piping                                 |           | \$0.00 / GSF | \$0        |
| Domestic Hot & Cold Water Piping                            | 0.00 lf   |              | \$0        |
| Insulation  | 0.00 If   |              | \$0        |
| Valves & Accessories  | 0.00 ls   |              | \$0        |
| D2020 SANITARY DRAINAGE                                     |           | \$0.00 / GSF | \$0        |
| D2026 Sanitary Drain Piping - AG                            |           | \$0.00 / GSF | \$0        |
| Sanitary Waste & Vent Piping - UG & AG                      | 0.00 If   |              | \$0        |
| D2040 PLUMBING FIXTURES                                     |           | \$0.00 / GSF | \$0        |
| D2043 Plumbing Fixtures                                     |           | \$0.00 / GSF | \$0        |
| Drinking Fountain - Exterior                                | 0.00 ea   |              | \$0        |
| Water Closet - Wall Hung                                    | 0.00 ea   |              | \$0        |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| Lavatory - Wall                                     | 0.00 ea  |              | \$0        |
| Mop Sink  | 0.00 ea  |              | \$0        |
| Urinal  | 0.00 ea  |              | \$0        |
| Hose Bibb   | 0.00 ea  |              | \$0        |
| Wall Hydrant  | 0.00 ea  |              | \$0        |
| D2090 MISC. PLUMBING SYSTEMS                        |          | \$0.00 / GSF | \$0        |
| D2090 Plumbing Misc Items                           |          | \$0.00 / GSF | \$0        |
| Admin & Expenses                                    | 0.00 ls  |              | \$0        |
| Delete Concessions Building - Add Alternate         | 0.00 ls  |              | \$0        |
| D30 HEATING, VENTILATION, & AIR CONDITIONING (HVAC) |          | \$0.00 / GSF | \$0        |
| D3040 HVAC MAJOR EQUIPMENT                          |          | \$0.00 / GSF | \$0        |
| D3040 HVAC Major Equipment                          |          | \$0.00 / GSF | \$0        |
| ERU-5   | 0.00 ea  |              | \$0        |
| Split Systems - 3T Heat Pump                        | 0.00 ea  |              | \$0        |
| D3041 Terminal & Package Units                      |          | \$0.00 / GSF | \$0        |
| Unit Heater - Elec                                  | 0.00 ea  |              | \$0        |
| Cabinet Unit Heater (ceiling)                       | 0.00 ea  |              | \$0        |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS            |          | \$0.00 / GSF | \$0        |
| D3053 HVAC Air Distribution                         |          | \$0.00 / GSF | \$0        |
| SM Coordination & Material Handling                 | 0.00 ls  |              | \$0        |
| Ductwork - Galvanized                               | 0.00 lb  |              | \$0        |
| Air Duct Accessories                                | 0.00 ls  |              | \$0        |
| RGDs and Vents                                      | 0.00 ea  |              | \$0        |
| D3060 CONTROLS & INSTRUMENTATION                    |          | \$0.00 / GSF | \$0        |
| D3061 Automatic Temperature Controls                |          | \$0.00 / GSF | \$0        |
| ATC - BMS - Split & ERV                             | 0.00 ls  |              | \$0        |
| D3070 SPECIAL PURPOSE HVAC SYSTEMS                  |          | \$0.00 / GSF | \$0        |
| D3075 Refrigerant Piping                            |          | \$0.00 / GSF | \$0        |
| Split System Piping - Line Sets                     | 0.00 ea  |              | \$0        |
| D3076 Condensate Drain Piping                       |          | \$0.00 / GSF | \$0        |
| Condensate Drain Piping & Insulation                | 0.00 lf  |              | \$0        |
| Condensate Drain Pumps                              | 0.00 ea  |              | \$0        |
| D3080 SYSTEMS TESTING & BALANCING                   |          | \$0.00 / GSF | \$0        |
| D3080 Air & Water Balance                           |          | \$0.00 / GSF | \$0        |
| Testing & Balancing                                 | 0.00 sf  |              | \$0        |
| D3090 OTHER HVAC SYSTEMS & EQUIP                    |          | \$0.00 / GSF | \$0        |
| D3091 HVAC Misc Items                               |          | \$0.00 / GSF | \$0        |
| Rigging and Hoisting                                | 0.00 ls  |              | \$0        |
| DElete per VE                                       | 0.00 ls  |              | \$0        |
| Project Expenses and Commissioning                  | 0.00 ls  |              | \$0        |
| D50 ELECTRICAL                                      |          | \$0.00 / GSF | \$0        |
| <b>D5020 ELECTRICAL SERVICE &amp; DISTRIBUTION</b>  |          | \$0.00 / GSF | \$0        |
| D5021 Medium Voltage Conduit and Cabling            |          | \$0.00 / GSF | \$0        |



60% CD Estimate - Reconciled incl VE

| SCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| (1) 4" Empty PVC Conduit with pull string composite unit Spares<br>tel     | 0.00 lf  |              | \$0        |
| (2) 4" Empty PVC Conduit with pull string composite unit Spares            | 0.00 lf  |              | \$0        |
| D5023 Large Power & Distribution   |          | \$0.00 / GSF | \$0        |
| 30 KVA NEMA 1 Transformer composite unit                                   | 0.00 ea  |              | \$0        |
| 100 AMP 120/208 panel board surface mounted composite                      | 0.00 ea  |              | \$0        |
| 250 AMP 277/480 Panel board surface mounted composite unit                 | 0.00 ea  |              | \$0        |
| D5024 Large Power Feeder Conduit   |          | \$0.00 / GSF | \$0        |
| 250 AMP PVC Composite feeder copper - Large Power                          | 0.00 lf  |              | \$C        |
| D5027 Mechanical Equipment Connections                                     |          | \$0.00 / GSF | \$0        |
| AC 30A Con Assembly  | 0.00 ea  |              | \$0        |
| ERV - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit            | 0.00 ea  |              | \$C        |
| EUH 1 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite<br>unit       | 0.00 ea  |              | \$0        |
| E3EQ   ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit | 0.00 ea  |              | \$0        |
| EWH w/ JB 30 A composite unit connection and Feeder                        | 0.00 ea  |              | \$0        |
| 30 AMP EMT Composite feeders copper - Mechanical                           | 0.00 lf  |              | \$0        |
| D5029 Small Power Devices & Wiring   |          | \$0.00 / GSF | ŞI         |
| Duplex GFI WP Receptacle Composite Unit                                    | 0.00 ea  |              | \$C        |
| Power Junction Box - Typ. Composite Unit                                   | 0.00 ea  |              | \$0        |
| Recep: Duplex receptacle Composite unit                                    | 0.00 ea  |              | \$0        |
| Duplex GFI receptacle Composite unit                                       | 0.00 ea  |              | \$C        |
| 20 AMP EMT Composite feeders copper - Large Power                          | 0.00 lf  |              | \$C        |
| 12/2 MC Cable Composite Unit   | 0.00 lf  |              | \$0        |
| D5040 LIGHTING   |          | \$0.00 / GSF | Ş          |
| D5042 Light Fixtures   |          | \$0.00 / GSF | \$0        |
| 20 AMP EMT Composite feeders copper - Lighting Branch                      | 0.00 lf  |              | \$0        |
| F1 Lighting Fixture  | 0.00 ea  |              | \$0        |
| D5044 Lighting Controls & Wiring   |          | \$0.00 / GSF | Ş          |
| S (1) Single pole Switch Composite unit                                    | 0.00 ea  |              | \$C        |
| SLV (1) Low voltage Switch Composite unit                                  | 0.00 ea  |              | \$C        |
| OS! Occupancy sensor Ceiling mounted Composite unit                        | 0.00 ea  |              | \$0        |
| 20 AMP EMT Composite feeders copper - Lighting Control Branch              | 0.00 lt  |              | \$0        |
| D5090 OTHER ELECTRICAL SYSTEMS   |          | \$0.00 / GSF | \$C        |
| D5092 Clock Systems  |          | \$0.00 / GSF | \$C        |
| Clock Single Face Battery or 110 clock                                     | 0.00 ea  |              | \$0        |
| D5094 Grounding & Lightning Protection Sys.                                |          | \$0.00 / GSF | \$0        |
| Grounding  | 0.00 gsf |              | \$0        |
| D5095 Miscellaneous Electrical Systems                                     |          | \$0.00 / GSF | \$0        |
| Mis Expenses   | 0.00 gsf |              | \$0        |
| Delete per VE as alternate elec,comm, sec                                  | 0.00 ls  |              | \$0        |
| Temp Lighting and Power  | 0.00 gsf |              | \$0        |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| D60 COMMUNICATIONS   |          | \$0.00 / GSF | \$0        |
| D6010 COMMUNICATIONS & SECURITY  |          | \$0.00 / GSF | \$0        |
| D6011 Fire Alarm System  |          | \$0.00 / GSF | \$0        |
| Fire Alarm Manual pull station composite unit  | 0.00 ea  |              | \$0        |
| Fire Alarm Smoke detector composite unit   | 0.00 ea  |              | \$0        |
| Fire Alarm Heat detector composite unit  | 0.00 ea  |              | \$0        |
| D6011 FACP   | 0.00 ea  |              | \$0        |
| Control Relay  | 0.00 ea  |              | \$0        |
| Fire Alarm Annunciator medium composite unit   | 0.00 ea  |              | \$0        |
| D6013 Tel/Data System  |          | \$0.00 / GSF | \$0        |
| Fit-Out Telcom Equipment composite unit  | 0.00 ea  |              | \$0        |
| WP - "VOIP" Wall Telephone Outlet  | 0.00 ea  |              | \$0        |
| D2 Data jack with 1/2" Stub to accessible ceiling composite unit 30 feet _2_                 | 0.00 ea  |              | \$0        |
| D6016 Surveillance CCTV System   |          | \$0.00 / GSF | \$0        |
| Cat 6 Cable  | 0.00 lf  |              | \$0        |
| CCTV D1 Data Jacks   | 0.00 ea  |              | \$0        |
| CCTV Head End  | 0.00 ea  |              | \$0        |
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit                  | 0.00 ea  |              | \$0        |
| D6017 Security Access Control  |          | \$0.00 / GSF | \$0        |
| Security Composite Cable Per Foot  | 0.00 lf  |              | \$0        |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit                               | 0.00 ea  |              | \$0        |
| Delete per VE  | 0.00 ls  |              | \$0        |
| Security Control Unit - Small Composite Unit   | 0.00 ea  |              | \$0        |
| D6030 SOUND AND A/V  |          | \$0.00 / GSF | \$0        |
| D6032 Sound/PA Systems   |          | \$0.00 / GSF | \$0        |
| Public Address Speaker   | 0.00 ea  |              | \$0        |
| LV Cabling for Speaker   | 0.00 lf  |              | \$0        |
| Sound/PA Head end at Concessions   | 0.00 ls  |              | \$0        |
| D70 ELECTRONIC SAFETY & SECURITY   |          | \$0.00 / GSF | \$0        |
| D7050 DETECTION & ALARM  |          | \$0.00 / GSF | \$0        |
| D6011 Fire Alarm System  |          | \$0.00 / GSF | \$0        |
| Delete per VE  | 0.00 ea  |              | \$0        |
| <ul><li>(1) 4" Empty PVC Conduit with pull string composite unit Spares</li><li>FA</li></ul> | 0.00 lf  |              | \$0        |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit                                       | 0.00 lf  |              | \$0        |
| E EQUIPMENT & FURNISHINGS  | 0 GSF    | \$0.00 / GSF | \$0        |
| E10 EQUIPMENT  |          | \$0.00 / GSF | \$0        |
| E1090 OTHER EQUIPMENT  |          | \$0.00 / GSF | \$0        |
| E1092 Food Service Equipment   |          | \$0.00 / GSF | \$0        |
| Food Service Equipment   | 0.00 nic |              | \$0        |



| DESCRIPTION                     | QUANTITY | UNIT COST  | TOTAL COST |
|---------------------------------|----------|------------|------------|
| TOTAL CONCESSIONS / TOILET BLDG | \$(      | 0.00 / GSF | \$0        |

60% CD Estimate - Reconciled incl VE



### LOCKER BLDG

| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| A SUBSTRUCTURE   | 0 GSF    | \$0.00 / GSF | \$0        |
| A10 FOUNDATIONS  |          | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS   |          | \$0.00 / GSF | \$0        |
| A1010 Standard Foundations   |          | \$0.00 / GSF | \$0        |
| Standard Concrete Foundation - Complete \$/sf - Locker Building -<br>strip & clmn ftgs | 0.00 sf  |              | \$0        |
| F&I Building Foundation Drainage - Perforated PVC                                      | 0.00 sf  |              | \$0        |
| A20 SUBGRADE ENCLOSURES  |          | \$0.00 / GSF | \$0        |
| A2010 WALLS FOR SUBGRADE ENCLOSURES  |          | \$0.00 / GSF | \$0        |
| A2011 Subgrade Enclosure Wall Construction   |          | \$0.00 / GSF | \$0        |
| Standard Concrete Foundation - Complete \$/sf - Locker Building -<br>walls             | 0.00 cy  |              | \$0        |
| A2020 BASEMENT WALL CONSTRUCTION   |          | \$0.00 / GSF | \$0        |
| A2020 Basement Wall Construction   |          | \$0.00 / GSF | \$0        |
| Rigid Insulation @ Fndn. Walls   | 0.00 sf  |              | \$0        |
| A2022 Moisture Protection  |          | \$0.00 / GSF | \$0        |
| Damproofing - Foundation Walls   | 0.00 sf  |              | \$0        |
| Waterproofing - Foundation Walls @ Elevator Pit  | 0.00 sf  |              | \$0        |
| A40 SLABS-ON-GRADE   |          | \$0.00 / GSF | \$0        |
| A4010 STANDARD SLABS-ON-GRADE  |          | \$0.00 / GSF | \$0        |
| A4010 Standard Slabs-on-Grade  |          | \$0.00 / GSF | \$0        |
| Standard Concrete Foundation - Complete \$/sf - Locker Building                        | 0.00 sf  |              | \$0        |
| A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS   |          | \$0.00 / GSF | \$0        |
| A4096 Slab-on-Grade Supplementary Components   |          | \$0.00 / GSF | \$0        |
| Rigid Insulation @ S.O.G.  | 0.00 sf  |              | \$0        |
| B SHELL  | 0 GSF    | \$0.00 / GSF | \$0        |
| B10 SUPERSTRUCTURE   |          | \$0.00 / GSF | \$0        |
| B1010 FLOOR CONSTRUCTION   |          | \$0.00 / GSF | \$0        |
| B1011 Floor Structural Frame   |          | \$0.00 / GSF | \$0        |
| Structural Steel Floor Framing - Col, Beams, Connections                               | 0.00 ton |              | \$0        |
| Metal Decking - Floor, 2"  | 0.00 sf  |              | \$0        |
| B1012 Floor Decks, Slabs, & Toppings   |          | \$0.00 / GSF | \$0        |
| Welded Wire Mesh - Structural Slabs (Incl. Overlap) F&I                                | 0.00 sf  |              | \$0        |
| Buy & Place Slab on Deck Concrete 5.25"  | 0.00 cy  |              | \$0        |
| Finish Concrete - Metal Deck   | 0.00 sf  |              | \$0        |
| B1019 Floor Construction Supplementary Components                                      |          | \$0.00 / GSF | \$0        |
| Cementitious Spray Fireproofing (Beams & Columns)                                      | 0.00 sf  |              | \$0        |
| Misc. Patching of Fireproofing   | 0.00 ls  |              | \$0        |
| Firestopping / Safing @ Building Perimeter \$/If                                       | 0.00 lf  |              | \$0        |
| B1020 ROOF CONSTRUCTION  |          | \$0.00 / GSF | \$0        |
| B1021 Roof Structural Frame  |          | \$0.00 / GSF | \$0        |





## LOCKER BLDG [ CONTINUED ]

| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| Structural Steel Roof Framing - Col, Beams, Connections                                  | 0.00 ton |              | \$0        |
| B1020 ROOF CONSTRUCTION  |          | \$0.00 / GSF | \$0        |
| B1029 Roof Construction Supplementary Components   |          | \$0.00 / GSF | \$0        |
| Rough Carpentry Roofing  | 0.00 sf  |              | \$0        |
| B1080 STAIRS   |          | \$0.00 / GSF | \$0        |
| B2017 Balcony Walls & Railings   |          | \$0.00 / GSF | \$0        |
| Railing   Exterior Guardrail at Locker Building Ramp/Steps                               | 0.00 lf  |              | \$0        |
| B20 EXTERIOR VERTICAL ENCLOSURES   |          | \$0.00 / GSF | \$0        |
| B2010 EXTERIOR WALLS   |          | \$0.00 / GSF | \$0        |
| B2011 Exterior Wall Veneer   |          | \$0.00 / GSF | \$0        |
| Exterior CMU - CMU Veneer  | 0.00 sf  |              | \$0        |
| Soffits  | 0.00 sf  |              | \$0        |
| B2012 Exterior Wall Construction   |          | \$0.00 / GSF | \$0        |
| Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU,<br>Insul, AVB, NO INT GWB) | 0.00 sf  |              | \$0        |
| B2020 EXTERIOR WINDOWS   |          | \$0.00 / GSF | \$0        |
| B2023 Exterior Window Wall Storefronts   |          | \$0.00 / GSF | \$0        |
| Storefront   Insulating Glass in Aluminum Storefront System                              | 0.00 sf  |              | \$0        |
| B2029 Curtain Walls  |          | \$0.00 / GSF | \$0        |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>7" System           | 0.00 sf  |              | \$0        |
| B2050 EXTERIOR DOORS & GRILLES   |          | \$0.00 / GSF | \$0        |
| B2051 Exterior Entrance Doors  |          | \$0.00 / GSF | \$0        |
| Glass & Alum Doors - Double Exterior - Incl. Door, Frame, and<br>Hardware                | 0.00 ea  |              | \$0        |
| Glass & Alum Doors - Single Exterior - Incl. Door, Frame, and Hardware                   | 0.00 ea  |              | \$0        |
| Paint Exterior - Doors   | 0.00 ea  |              | \$0        |
| B2053.4 Overhead & Roll Up Doors   |          | \$0.00 / GSF | \$0        |
| Door   Insulated Overhead Coiling Door, Motor Operated, 3 each                           | 0.00 sf  |              | \$0        |
| B30 EXTERIOR HORIZONTAL ENCLOSURES   |          | \$0.00 / GSF | \$0        |
| B3010 ROOFING  |          | \$0.00 / GSF | \$0        |
| B3011 Steep Slope Roofing  |          | \$0.00 / GSF | \$0        |
| Sheet Metal Roofing System Over Elevator Shaft   | 0.00 sf  |              | \$0        |
| B3012 Low Slope Membrane Systems   |          | \$0.00 / GSF | \$0        |
| Pre-Vegetated Roof Garden System   | 0.00 sf  |              | \$0        |
| Standing Seam Metal Roof   | 0.00 sf  |              | \$0        |
| B3013 Roof Insulation & Fill   |          | \$0.00 / GSF | \$0        |
| Tapered Roof Insulation - Premium, assume not required                                   | 0.00 nic |              | \$0        |
| B3014.2 Flashings & Trim   |          | \$0.00 / GSF | \$0        |
| Patch and Seal Roof Penetrations   | 0.00 ls  |              | \$0        |
| Metal Coping/Roof Edge   | 0.00 lf  |              | \$0        |
| B3014.4 Gutters & Downspouts   |          | \$0.00 / GSF | \$0        |

#### 60% CD Estimate - Reconciled incl VE



LOCKER BLDG [ CONTINUED ]

| DESCRIPTION  | QUANTITY  | UNIT COST    | TOTAL COST |
|--|-----------|--------------|------------|
| Gutters, not shown assume required                                     | 0.00 lf   |              | \$0        |
| Downspouts, not shown assume required                                  | 0.00 lf   |              | \$0        |
| B3020 ROOF APPURTENANCES   |           | \$0.00 / GSF | \$0        |
| B3020 Roof Appurtenances   |           | \$0.00 / GSF | \$0        |
| Roof Access Hatch, assume required                                     | 0.00 ea   |              | \$0        |
| Roofing Pavers/Walkways - Membrane, not shown                          | 0.00 allw |              | \$0        |
| C INTERIORS  | 0 GSF     | \$0.00 / GSF | \$0        |
| C10 INTERIOR CONSTRUCTION  |           | \$0.00 / GSF | \$0        |
| C1010 INTERIOR PARTITIONS  |           | \$0.00 / GSF | \$0        |
| C1011 Interior Fixed Partitions  |           | \$0.00 / GSF | \$0        |
| Interior CMU - 8"  | 0.00 sf   |              | \$0        |
| Interior CMU - 8" (Elevator Shaft)                                     | 0.00 sf   |              | \$0        |
| Interior Rough Carpentry   | 0.00 sf   |              | \$0        |
| C1030 INTERIOR DOORS   |           | \$0.00 / GSF | \$0        |
| C1031.4 Standard Interior Doors  |           | \$0.00 / GSF | \$0        |
| Door type AL2- 24" x 2'-9" & 23" x 24" Vision Panel                    | 0.00 ea   |              | \$0        |
| Door type F  | 0.00 ea   |              | \$0        |
| Door type R- Overhead door   | 0.00 ea   |              | \$0        |
| Frame- Alum  | 0.00 ea   |              | \$0        |
| Frame- Type 1  | 0.00 ea   |              | \$0        |
| Glazing   Interior doors and sidelights                                | 0.00 sf   |              | \$0        |
| Hardware   Interior Door Hardware Per Leaf                             | 0.00 leaf |              | \$0        |
| Install doors and hardware   | 0.00 hr   |              | \$0        |
| Paint   Paint Interior Doors   | 0.00 leaf |              | \$0        |
| Paint Interior - Door & Frames   | 0.00 ea   |              | \$0        |
| C1034 Interior Coiling Doors   |           | \$0.00 / GSF | \$0        |
| Support Steel - Interior Rolling Door/Grille Supports                  | 0.00 ls   |              | \$0        |
| Support Steel - Misc Supports  | 0.00 ls   |              | \$0        |
| C1039 Interior Door Supplementary Components                           |           | \$0.00 / GSF | \$0        |
| Misc. Interior Caulking - General                                      | 0.00 sf   |              | \$0        |
| C1090 INTERIOR SPECIALTIES   |           | \$0.00 / GSF | \$0        |
| C1097 Storage Specialties  |           | \$0.00 / GSF | \$0        |
| Locker Benches   | 0.00 lf   |              | \$0        |
| Storage Wall Shelving - Metal (In F&E Estimate)                        | 0.00 lf   |              | \$0        |
| C20 INTERIOR FINISHES  |           | \$0.00 / GSF | \$0        |
| C2010 WALL FINISHES  |           | \$0.00 / GSF | \$0        |
| C2013.4 Wall Coverings   |           | \$0.00 / GSF | \$0        |
| Interior Misc. Millwork not shown                                      | 0.00 sf   |              | \$0        |
| C2014 Tile & Terrazzo Wall Finishes                                    |           | \$0.00 / GSF | \$0        |
| Ceramic Wall Tile  | 0.00 sf   |              | \$0        |
| Ceramic Wall Tile - ADJUST PER RECON - REDUCE FROM 42K SF<br>TO 25K SF | 0.00 sf   |              | \$0        |

60% CD Estimate - Reconciled incl VE



### LOCKER BLDG [ CONTINUED ]

| DESCRIPTION   | QUANTITY  | UNIT COST    | TOTAL COST |
|---|-----------|--------------|------------|
| C2017 Wall Painting & Coating                           |           | \$0.00 / GSF | \$0        |
| Paint Interior Walls - Epoxy                            | 0.00 sf.  |              | \$0        |
| Misc. Interior Painting                                 | 0.00 allw |              | \$0        |
| C2019 Wall Finish Supplementary Components              |           | \$0.00 / GSF | \$0        |
| Interior Window Sills @ Exterior - Solid Surface        | 0.00 lf   |              | \$0        |
| C2030 FLOORING  |           | \$0.00 / GSF | \$0        |
| C2032.2 Tile Flooring                                   |           | \$0.00 / GSF | \$0        |
| Ceramic Floor Tile                                      | 0.00 sf   |              | \$0        |
| C2035 Resilient Flooring                                |           | \$0.00 / GSF | \$0        |
| Epoxy Flooring - Poured                                 | 0.00 sf   |              | \$0        |
| C2036.4 Masonry & Stone Flooring                        |           | \$0.00 / GSF | \$0        |
| Stone Thresholds at wet rooms                           | 0.00 sf   |              | \$0        |
| C2050 CEILING FINISHES                                  |           | \$0.00 / GSF | \$0        |
| C2051 Plaster & Gypsum Board Finish                     |           | \$0.00 / GSF | \$0        |
| GWB   GWB Ceiling, Typical                              | 0.00 sf   |              | \$0        |
| C2056 Painting & Staining Ceilings                      |           | \$0.00 / GSF | \$0        |
| Paint   Painted Interior GWB - Typical Ceilings - Latex | 0.00 sf   |              | \$0        |
| Paint   Exposed Painted Structural Steel & Metal Deck   | 0.00 sf   |              | \$0        |
| D SERVICES  | 0 GSF     | \$0.00 / GSF | \$0        |
| D10 CONVEYING   |           | \$0.00 / GSF | \$0        |
| D1010 ELEVATORS & LIFTS                                 |           | \$0.00 / GSF | \$0        |
| D1010 Elevators & Lifts                                 |           | \$0.00 / GSF | \$0        |
| Elevator incl cab finishes - add alt                    | 0.00 alt  |              | \$0        |
| D20 PLUMBING  |           | \$0.00 / GSF | \$0        |
| D2000 PLUMBING EQUIPMENT                                |           | \$0.00 / GSF | \$0        |
| D2000 Plumbing Equipment                                |           | \$0.00 / GSF | \$0        |
| Water Meter 4"  | 0.00 ea   |              | \$0        |
| Circulating Pump - DHWH                                 | 0.00 ea   |              | \$0        |
| Thermostatic Mixing Valve, 2"                           | 0.00 ea   |              | \$0        |
| Backflow Preventer (RP) 4"                              | 0.00 ea   |              | \$0        |
| Floor Drain W/Trap                                      | 0.00 ea   |              | \$0        |
| Trench Drains   | 0.00 ea   |              | \$0        |
| Roof Drains   | 0.00 ea   |              | \$0        |
| Elevator Sump Pump                                      | 0.00 ea   |              | \$0        |
| Gas / Oil Interceptor                                   | 0.00 ea   |              | \$0        |
| Oil Interceptor   | 0.00 ea   |              | \$0        |
| Electric Water Heater - 60 KW                           | 0.00 ea   |              | \$0        |
| Expansion Tank  | 0.00 ea   |              | \$0        |
| D2010 DOMESTIC WATER DISTRIBUTION                       |           | \$0.00 / GSF | \$0        |
| D2012 Domestic Water Piping                             |           | \$0.00 / GSF | \$0        |
| Domestic Hot & Cold Water Piping                        | 0.00 lf   |              | \$0        |
| Insulation  | 0.00 lf   |              | \$0        |
60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| Valves & Accessories                                | 0.00 ls  |              | \$0        |
| D2020 SANITARY DRAINAGE                             |          | \$0.00 / GSF | \$0        |
| D2026 Sanitary Drain Piping - AG                    |          | \$0.00 / GSF | \$0        |
| Sanitary Waste & Vent Piping - UG & AG              | 0.00 lf  |              | \$0        |
| D2040 PLUMBING FIXTURES                             |          | \$0.00 / GSF | \$0        |
| D2043 Plumbing Fixtures                             |          | \$0.00 / GSF | \$0        |
| Water Closet - Wall Hung                            | 0.00 ea  |              | \$0        |
| Lavatory - Wall                                     | 0.00 ea  |              | \$0        |
| Mop Sink  | 0.00 ea  |              | \$0        |
| Drinking Foutain - Bi-Level Electric                | 0.00 ea  |              | \$0        |
| Shower - (Trim & Drain)                             | 0.00 ea  |              | \$0        |
| Hose Bibb   | 0.00 ea  |              | \$0        |
| Wall Hydrant  | 0.00 ea  |              | \$0        |
| D2070 RAIN WATER DRAINAGE                           |          | \$0.00 / GSF | \$0        |
| D2072 Storm Drain Piping - AG                       |          | \$0.00 / GSF | \$0        |
| Storm Drainage Piping - UG & AG                     | 0.00 lf  |              | \$0        |
| D2090 MISC. PLUMBING SYSTEMS                        |          | \$0.00 / GSF | \$0        |
| D2090 Plumbing Misc Items                           |          | \$0.00 / GSF | \$0        |
| Admin & Expenses                                    | 0.00 sf  |              | \$0        |
| Delete Locker Room Building - Add Alternate         | 0.00 ls  |              | \$0        |
| D30 HEATING, VENTILATION, & AIR CONDITIONING (HVAC) |          | \$0.00 / GSF | \$0        |
| D3040 HVAC MAJOR EQUIPMENT                          |          | \$0.00 / GSF | \$0        |
| D3040 HVAC Major Equipment                          |          | \$0.00 / GSF | \$0        |
| ERU-6   | 0.00 ea  |              | \$0        |
| Split Systems - 3T Heat Pump                        | 0.00 ea  |              | \$0        |
| VRF Equipment -18T                                  | 0.00 ls  |              | \$0        |
| VRF Fan Coil Units Install                          | 0.00 ea  |              | \$0        |
| VRF-VCU Condenser Install                           | 0.00 ea  |              | \$0        |
| D3041 Terminal & Package Units                      |          | \$0.00 / GSF | \$0        |
| Unit Heater - Elec                                  | 0.00 ea  |              | \$0        |
| Cabinet Unit Heater (ceiling)                       | 0.00 ea  |              | \$0        |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS            |          | \$0.00 / GSF | \$0        |
| D3053 HVAC Air Distribution                         |          | \$0.00 / GSF | \$0        |
| SM Coordination & Material Handling                 | 0.00 ls  |              | \$0        |
| Ductwork - Galvanized                               | 0.00 lb  |              | \$0        |
| Air Duct Accessories                                | 0.00 ls  |              | \$0        |
| RGDs and Vents                                      | 0.00 ea  |              | \$0        |
| D3060 CONTROLS & INSTRUMENTATION                    |          | \$0.00 / GSF | \$0        |
| D3061 Automatic Temperature Controls                |          | \$0.00 / GSF | \$0        |
| ATC - BMS   | 0.00 ls  |              | \$0        |
| ATC - BMS CO2 Monitoring                            | 0.00 ls  |              | \$0        |
| D3070 SPECIAL PURPOSE HVAC SYSTEMS                  |          | \$0.00 / GSF | \$0        |
| D3075 Refrigerant Piping                            |          | \$0.00 / GSF | \$0        |

### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| Split System Piping - Line Sets   | 0.00 ea  |              | \$0        |
| VRF Piping  | 0.00 sf  |              | \$0        |
| D3076 Condensate Drain Piping   |          | \$0.00 / GSF | \$0        |
| Condensate Drain Piping & Insulation  | 0.00 lf  |              | \$0        |
| Condensate Drain Pumps  | 0.00 ea  |              | \$0        |
| D3080 SYSTEMS TESTING & BALANCING   |          | \$0.00 / GSF | \$0        |
| D3080 Air & Water Balance   |          | \$0.00 / GSF | \$0        |
| Testing & Balancing   | 0.00 sf  |              | \$0        |
| D3090 OTHER HVAC SYSTEMS & EQUIP  |          | \$0.00 / GSF | \$0        |
| D3091 HVAC Misc Items   |          | \$0.00 / GSF | \$0        |
| Rigging and Hoisting  | 0.00 ls  |              | \$0        |
| Project Expenses and Commissioning  | 0.00 ls  |              | \$0        |
| D40 FIRE PROTECTION   |          | \$0.00 / GSF | \$0        |
| D4010 SPRINKLERS  |          | \$0.00 / GSF | \$0        |
| D4011 Wet Sprinkler System  |          | \$0.00 / GSF | \$0        |
| Wet Sprinkler System - Delete Per Reconcile   | 0.00 sf  |              | \$0        |
| D50 ELECTRICAL  |          | \$0.00 / GSF | \$0        |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION   |          | \$0.00 / GSF | \$0        |
| D5023 Large Power & Distribution  |          | \$0.00 / GSF | \$0        |
| 75 KVA NEMA 1 Transformer composite unit at Locker Building                                 | 0.00 ea  |              | \$0        |
| 225 AMP 120/208 Panel board surface mounted composite unit at Locker Building               | 0.00 ea  |              | \$0        |
| 1200 AMP 277/480 Distribution Panel board surface mounted composite unit at Locker Building | 0.00 ea  |              | \$0        |
| D5024 Large Power Feeder Conduit  |          | \$0.00 / GSF | \$0        |
| 1200 AMP PVC Composite feeder copper - Large Power  | 0.00 lf  |              | \$0        |
| (4) 4" Empty PVC Conduit with pull String composite unit - Large Power                      | 0.00 lf  |              | \$0        |
| D5025 Emergency Gen Set W/ATS   |          | \$0.00 / GSF | \$0        |
| Emergency Feeders   | 0.00 gsf |              | \$0        |
| D5027 Mechanical Equipment Connections  |          | \$0.00 / GSF | \$0        |
| AC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                              | 0.00 ea  |              | \$0        |
| E3EQ   DWP with VFD 30A composite unit on drawings not on<br>riser includes feeder          | 0.00 ea  |              | \$0        |
| E3EQ   ERV-1 with VFD 15 A composite unit connection only off<br>riser                      | 0.00 ea  |              | \$0        |
| E3EQ   F - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                     | 0.00 ea  |              | \$0        |
| EUH 1 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite<br>unit                        | 0.00 ea  |              | \$0        |
| SP - Sump pump at elev pit - 30 AMP 3 POLE N1 fused disconnect<br>600 volt composite unit   | 0.00 ea  |              | \$0        |
| E3EQ   ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit                     | 0.00 ea  |              | \$0        |
| E3EQ   FCU w/ junction box - Composite Unit   | 0.00 ea  |              | \$0        |





| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| 30 AMP EMT Composite feeders copper - Mechanical                              | 0.00 lf  |              | \$0        |
| D5029 Small Power Devices & Wiring  |          | \$0.00 / GSF | \$0        |
| Small Power \$/sf - Locker Building   | 0.00 sf  |              | \$0        |
| Power Junction Box - Typ. Composite Unit includeds branch                     | 0.00 ea  |              | \$0        |
| D5040 LIGHTING  |          | \$0.00 / GSF | \$0        |
| D5042 Light Fixtures  |          | \$0.00 / GSF | \$0        |
| 20 AMP EMT Composite feeders copper - Lighting Branch                         | 0.00 lf  |              | \$0        |
| F1 Lighting Fixture   | 0.00 ea  |              | \$0        |
| D5044 Lighting Controls & Wiring  |          | \$0.00 / GSF | \$0        |
| S (1) Single pole Switch Composite unit                                       | 0.00 ea  |              | \$0        |
| 20 AMP EMT Composite feeders copper - Lighting Control Branch                 | 0.00 lf  |              | \$0        |
| D5090 OTHER ELECTRICAL SYSTEMS  |          | \$0.00 / GSF | \$0        |
| D5092 Clock Systems   |          | \$0.00 / GSF | \$0        |
| Clock Single Face Battery or 110 clock  | 0.00 ea  |              | \$0        |
| D5094 Grounding & Lightning Protection Sys.                                   |          | \$0.00 / GSF | \$0        |
| Grounding   | 0.00 gsf |              | \$0        |
| D5095 Miscellaneous Electrical Systems  |          | \$0.00 / GSF | \$0        |
| Mis Expenses  | 0.00 gsf |              | \$0        |
| Delete per VE as alternate elec,com,sec                                       | 0.00 gsf |              | \$0        |
| Temp Lighting and Power   | 0.00 gsf |              | \$0        |
| D60 COMMUNICATIONS  |          | \$0.00 / GSF | \$0        |
| D6010 COMMUNICATIONS & SECURITY   |          | \$0.00 / GSF | \$0        |
| D6011 Fire Alarm System   |          | \$0.00 / GSF | \$0        |
| Fire Alarm Manual pull station composite unit                                 | 0.00 ea  |              | \$0        |
| Fire Alarm Smoke detector composite unit                                      | 0.00 ea  |              | \$0        |
| Fire Alarm Speaker strobe composite unit                                      | 0.00 ea  |              | \$0        |
| Control Relay   | 0.00 ea  |              | \$0        |
| Fire Alarm Monitor module composite unit                                      | 0.00 ea  |              | \$0        |
| D6013 Tel/Data System   |          | \$0.00 / GSF | \$0        |
| Fit-Out Telcom Equipment composite unit                                       | 0.00 ea  |              | \$0        |
| D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet      | 0.00 ea  |              | \$0        |
| D1 Telephone jack with 3/4" Stub to accessible ceiling composite unit 30 feet | 0.00 ea  |              | \$0        |
| WP - "VOIP" Wall Telephone Outlet   | 0.00 ea  |              | \$0        |
| WAP jack ceiling mounted composite unit                                       | 0.00 ea  |              | \$0        |
| D6016 Surveillance CCTV System  |          | \$0.00 / GSF | \$0        |
| Cat 6 Cable   | 0.00 lf  |              | \$0        |
| CCTV Head End   | 0.00 ea  |              | \$0        |
| CCTV Video Camera - PTZ Dome Camera, Interior Assembly<br>Composite Unit      | 0.00 ea  |              | \$0        |
| CCTV D1 Data Jacks  | 0.00 ea  |              | \$0        |
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit   | 0.00 ea  |              | \$0        |





| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| D6017 Security Access Control                                  |          | \$0.00 / GSF | \$0        |
| Security Composite Cable Per Foot                              | 0.00 lf  |              | \$0        |
| Security Card Reader Composite Unit                            | 0.00 ea  |              | \$0        |
| Security Key Pad Composite Unit                                | 0.00 ea  |              | \$0        |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit | 0.00 ea  |              | \$0        |
| Security Control Unit - Small Composite Unit                   | 0.00 ea  |              | \$0        |
| D6030 SOUND AND A/V  |          | \$0.00 / GSF | \$0        |
| D6032 Sound/PA Systems   |          | \$0.00 / GSF | \$0        |
| Public Address Speaker   | 0.00 ea  |              | \$0        |
| Volume Controls  | 0.00 ea  |              | \$0        |
| LV Cabling for Speaker   | 0.00 lf  |              | \$0        |
| D70 ELECTRONIC SAFETY & SECURITY                               |          | \$0.00 / GSF | \$0        |
| D6010 COMMUNICATIONS & SECURITY                                |          | \$0.00 / GSF | \$0        |
| D6011 Fire Alarm System  |          | \$0.00 / GSF | \$0        |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit         | 0.00 lf  |              | \$0        |
| TOTAL LOCKER BLDG  | \$       | 0.00 / GSF   | \$0        |

60% CD Estimate - Reconciled incl VE



### MAINTENANCE BLDG

| DESCRIPTION  | QUANTITY  | UNIT COST      | TOTAL COST |
|--|-----------|----------------|------------|
| A SUBSTRUCTURE   | 2,040 GSF | \$70.94 / GSF  | \$144,715  |
| A10 FOUNDATIONS  |           | \$20.20 / GSF  | \$41,200   |
| A1010 STANDARD FOUNDATIONS   |           | \$20.20 / GSF  | \$41,200   |
| A1010 Standard Foundations   |           | \$20.20 / GSF  | \$41,200   |
| Standard Concrete Foundation - Complete \$/sf - Maintenance<br>Building ADJUST PER RECON <\$20K> | 2,040 sf  | \$15.20 /sf    | \$31,000   |
| F&I Building Foundation Drainage - Perforated PVC  | 2,040 sf  | \$5.00 /sf     | \$10,200   |
| A20 SUBGRADE ENCLOSURES  |           | \$24.39 / GSF  | \$49,755   |
| A2010 WALLS FOR SUBGRADE ENCLOSURES  |           | \$20.51 / GSF  | \$41,850   |
| A2011 Subgrade Enclosure Wall Construction   |           | \$20.51 / GSF  | \$41,850   |
| Standard Concrete Foundation - Complete \$/sf - walls  | 27 су     | \$1,550.00 /cy | \$41,850   |
| A2020 BASEMENT WALL CONSTRUCTION   |           | \$3.88 / GSF   | \$7,905    |
| A2020 Basement Wall Construction   |           | \$1.67 / GSF   | \$3,405    |
| Rigid Insulation @ Fndn. Walls   | 750 sf    | \$4.54 /sf     | \$3,405    |
| A2022 Moisture Protection  |           | \$2.21 / GSF   | \$4,500    |
| Damproofing - Foundation Walls   | 750 sf    | \$6.00 /sf     | \$4,500    |
| A40 SLABS-ON-GRADE   |           | \$19.00 / GSF  | \$38,760   |
| A4010 STANDARD SLABS-ON-GRADE  |           | \$19.00 / GSF  | \$38,760   |
| A4010 Standard Slabs-on-Grade  |           | \$19.00 / GSF  | \$38,760   |
| Standard Concrete Foundation - Complete \$/sf - Maintenance<br>Building                          | 2,040 sf  | \$18.00 /sf    | \$36,720   |
| Waterproof SOG - Vapor Barrier   | 2,040 sf  | \$1.00 /sf     | \$2,040    |
| A60 WATER & GAS MITIGATION   |           | \$7.35 / GSF   | \$15,000   |
| A6010 BUILDING SUBDRAINAGE   |           | \$7.35 / GSF   | \$15,000   |
| A6011 Foundation Drainage  |           | \$7.35 / GSF   | \$15,000   |
| Building Foundation Drainage - Perforated PVC (F&I) - ADDED<br>PER RECON                         | 332 lf    | \$45.18 /lf    | \$15,000   |
| B SHELL  | 2,040 GSF | \$24.09 / GSF  | \$49,147   |
| B10 SUPERSTRUCTURE   |           | \$1.56 / GSF   | \$3,185    |
| B1010 FLOOR CONSTRUCTION   |           | \$0.00 / GSF   | \$0        |
| B1019 Floor Construction Supplementary Components  |           | \$0.00 / GSF   | \$0        |
| Cementitious Spray Fireproofing (Beams & Columns)  | 0.00 sf   |                | \$0        |
| Firestopping / Safing @ Building Perimeter \$/If   | 0.00 lf   |                | \$0        |
| B1020 ROOF CONSTRUCTION  |           | \$1.56 / GSF   | \$3,185    |
| B1029 Roof Construction Supplementary Components   |           | \$1.56 / GSF   | \$3,185    |
| Rough Carpentry Roofing  | 2,123 sf  | \$1.50 /sf     | \$3,185    |
| B20 EXTERIOR VERTICAL ENCLOSURES   |           | \$21.70 / GSF  | \$44,275   |
| B2050 EXTERIOR DOORS & GRILLES   |           | \$21.70 / GSF  | \$44,275   |
| B2051 Exterior Entrance Doors  |           | \$3.58 / GSF   | \$7,300    |
| Door   HM Single Exterior - Incl. Door, Frame, and Hardware                                      | 2.00 ea   | \$3,500.00 /ea | \$7,000    |
| Paint Exterior - Doors   | 3.00 ea   | \$100.00 /ea   | \$300      |

#### 60% CD Estimate - Reconciled incl VE

Gilbane 01/20/2023 Rev.3

| DESCRIPTION   | QUANTITY  | UNIT COST        | TOTAL COST |
|---|-----------|------------------|------------|
| B2053.4 Overhead & Roll Up Doors  |           | \$18.13 / GSF    | \$36,975   |
| Door   Motor Operated Overhead Door w/ Insulating Glass -<br>Typ., 3 ea | 435 sf    | \$85.00 /sf      | \$36,975   |
| B30 EXTERIOR HORIZONTAL ENCLOSURES                                      |           | \$0.83 / GSF     | \$1,688    |
| B3010 ROOFING   |           | \$0.83 / GSF     | \$1,688    |
| B3012 Low Slope Membrane Systems  |           | \$0.00 / GSF     | \$0        |
| Roof System, assume provided by Pre-Engineered Building                 | 2,123 sf  | \$0.00 /sf       | \$0        |
| B3013 Roof Insulation & Fill  |           | \$0.00 / GSF     | \$0        |
| Tapered Roof Insulation - Premium, assume not required                  | 0.00 nic  |                  | \$0        |
| B3014.4 Gutters & Downspouts  |           | \$0.83 / GSF     | \$1,688    |
| Gutters, not shown assume required                                      | 60 lf     | \$20.00 /lf      | \$1,205    |
| Downspouts, not shown assume required                                   | 32 lf     | \$15.00 /lf      | \$483      |
| C INTERIORS   | 2,040 GSF | \$31.56 / GSF    | \$64,381   |
| C10 INTERIOR CONSTRUCTION   |           | \$27.06 / GSF    | \$55,200   |
| C1010 INTERIOR PARTITIONS   |           | \$0.00 / GSF     | \$0        |
| C1011 Interior Fixed Partitions   |           | \$0.00 / GSF     | \$0        |
| Interior Rough Carpentry  | 0.00 sf   |                  | \$0        |
| C1030 INTERIOR DOORS  |           | \$27.06 / GSF    | \$55,200   |
| C1031.4 Standard Interior Doors   |           | \$21.91 / GSF    | \$44,700   |
| Door type F   | 3.00 ea   | \$385.00 /ea     | \$1,155    |
| Door type R- 12'x 12'   | 3.00 ea   | \$12,960.00 /ea  | \$38,880   |
| Frame- Type 1   | 3.00 ea   | \$300.00 /ea     | \$900      |
| Hardware   Interior Door Hardware Per Leaf                              | 3.00 leaf | \$600.00 /leaf   | \$1,800    |
| Install doors and hardware  | 16 hr     | \$90.00 /hr      | \$1,440    |
| Paint   Paint Interior Doors  | 3.00 leaf | \$100.00 /leaf   | \$300      |
| Paint Interior - Door & Frames  | 3.00 ea   | \$75.00 /ea      | \$225      |
| C1034 Interior Coiling Doors  |           | \$5.15 / GSF     | \$10,500   |
| Support Steel - Interior Rolling Door/Grille Supports                   | 1.00 ls   | \$10,500.00 /ls  | \$10,500   |
| C1039 Interior Door Supplementary Components                            |           | \$0.00 / GSF     | \$0        |
| Misc. Interior Caulking - General                                       | 0.00 sf   |                  | \$0        |
| C20 INTERIOR FINISHES   |           | \$4.50 / GSF     | \$9,181    |
| C2010 WALL FINISHES   |           | \$4.50 / GSF     | \$9,181    |
| C2017 Wall Painting & Coating   |           | \$4.50 / GSF     | \$9,181    |
| Paint Interior Walls - Epoxy  | 1,195 sf. | \$3.50 /sf.      | \$4,181    |
| Misc. Interior Painting   | 1.00 allw | \$5,000.00 /allw | \$5,000    |
| D SERVICES  | 2,040 GSF | \$54.13 / GSF    | \$110,425  |
| D20 PLUMBING  |           | \$23.68 / GSF    | \$48,305   |
| D2000 PLUMBING EQUIPMENT  |           | \$7.62 / GSF     | \$15,550   |
| D2000 Plumbing Equipment  |           | \$7.62 / GSF     | \$15,550   |
| Water Meter - 2"  | 1.00 ea   | \$1,200.00 /ea   | \$1,200    |
| Backflow Preventer (RP) 2"  | 1.00 ea   | \$1,500.00 /ea   | \$1,500    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY     | UNIT COST       | TOTAL COST |
|---|--------------|-----------------|------------|
| Trap Primers & Associated Piping                    | 3.00 ea      | \$1,000.00 /ea  | \$3,000    |
| Gas / Oil Interceptor                               | 1.00 ea      | \$6,000.00 /ea  | \$6,000    |
| Floor Drain W/Trap                                  | 3.00 ea      | \$950.00 /ea    | \$2,850    |
| Point of Use Elec Water Heater                      | 1.00 ea      | \$1,000.00 /ea  | \$1,000    |
| D2010 DOMESTIC WATER DISTRIBUTION                   |              | \$3.43 / GSF    | \$7,000    |
| D2012 Domestic Water Piping                         |              | \$3.43 / GSF    | \$7,000    |
| Domestic Hot & Cold Water Piping                    | 100 lf       | \$48.00 /lf     | \$4,800    |
| Insulation  | 100 lf       | \$12.00 /lf     | \$1,200    |
| Valves & Accessories                                | 1.00 ls      | \$1,000.00 /ls  | \$1,000    |
| D2020 SANITARY DRAINAGE                             |              | \$8.68 / GSF    | \$17,700   |
| D2026 Sanitary Drain Piping - AG                    |              | \$8.68 / GSF    | \$17,700   |
| Sanitary Waste & Vent Piping - UG & AG              | 295 lf       | \$60.00 /lf     | \$17,700   |
| D2040 PLUMBING FIXTURES                             |              | \$2.25 / GSF    | \$4,587    |
| D2043 Plumbing Fixtures                             |              | \$2.25 / GSF    | \$4,587    |
| Water Closet - Wall Hung                            | 1.00 ea      | \$2,469.50 /ea  | \$2,470    |
| Lavatory - Wall                                     | 1.00 ea      | \$1,573.00 /ea  | \$1,573    |
| Hose Bibb   | 1.00 ea      | \$187.00 /ea    | \$187      |
| Wall Hydrant  | 1.00 ea      | \$357.50 /ea    | \$358      |
| D2090 MISC. PLUMBING SYSTEMS                        | \$1.70 / GSF |                 | \$3,468    |
| D2090 Plumbing Misc Items                           |              | \$1.70 / GSF    | \$3,468    |
| Admin & Expenses                                    | 2,040 sf     | \$1.70 /sf      | \$3,468    |
| Delete per VE                                       | 0.00 sf      |                 | \$0        |
| D30 HEATING, VENTILATION, & AIR CONDITIONING (HVAC) |              | \$0.00 / GSF    | \$0        |
| D3040 HVAC MAJOR EQUIPMENT                          |              | \$3.19 / GSF    | \$6,514    |
| D3040 HVAC Major Equipment                          |              | \$0.89 / GSF    | \$1,818    |
| Exhaust Fan   | 1.00 ea      | \$1,818.00 /ea  | \$1,818    |
| D3041 Terminal & Package Units                      |              | \$2.30 / GSF    | \$4,696    |
| Unit Heater - Elec                                  | 1.00 ea      | \$1,434.00 /ea  | \$1,434    |
| Cabinet Unit Heater (ceiling)                       | 1.00 ea      | \$3,262.30 /ea  | \$3,262    |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS            |              | \$6.13 / GSF    | \$12,507   |
| D3053 HVAC Air Distribution                         |              | \$6.13 / GSF    | \$12,507   |
| SM Coordination & Material Handling                 | 1.00 ls      | \$375.00 /ls    | \$375      |
| Ductwork - Galvanized                               | 600 lb       | \$14.88 /lb     | \$8,927    |
| Air Duct Accessories                                | 1.00 ls      | \$1,000.00 /ls  | \$1,000    |
| Plenums   | 2.00 ea      | \$500.00 /ea    | \$1,000    |
| RGDs and Vents                                      | 4.00 ea      | \$301.25 /ea    | \$1,205    |
| D3060 CONTROLS & INSTRUMENTATION                    |              | \$1.23 / GSF    | \$2,500    |
| D3061 Automatic Temperature Controls                |              | \$1.23 / GSF    | \$2,500    |
| ATC - BMS CO2 Monitoring                            | 1.00 ls      | \$2,500.00 /ls  | \$2,500    |
| D3080 SYSTEMS TESTING & BALANCING                   |              | \$0.20 / GSF    | \$400      |
| D3080 Air & Water Balance                           |              | \$0.20 / GSF    | \$400      |
| Testing & Balancing                                 | 1.00 ls      | \$400.00 /ls    | \$400      |
| D3090 OTHER HVAC SYSTEMS & EQUIP                    |              | (\$10.75) / GSF | (\$21,921) |
|   |              |                 |            |

#### 60% CD Estimate - Reconciled incl VE

01/20/2023 Rev.3

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| DESCRIPTION   | QUANT | TITY | UNIT COST        | TOTAL COST |
|---|-------|------|------------------|------------|
| D3091 HVAC Misc Items   |       |      | (\$10.75) / GSF  | (\$21,921) |
| Delete per VE   | -1.00 | ls   | \$24,420.86 /ls  | (\$24,421) |
| Project Expenses and Commissioning                                      | 1.00  | ls   | \$2,500.00 /ls   | \$2,500    |
| D50 ELECTRICAL  |       |      | \$22.94 / GSF    | \$46,800   |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION                                 |       |      | \$16.66 / GSF    | \$33,979   |
| D5023 Large Power & Distribution  |       |      | \$8.69 / GSF     | \$17,720   |
| 75 KVA NEMA 1 Transformer composite unit                                | 1.00  | ea   | \$10,373.93 /ea  | \$10,374   |
| 225 AMP 120/208 Panel board surface mounted composite unit              | 1.00  | ea   | \$4,107.12 /ea   | \$4,107    |
| 400 AMP 277/480 Panel board surface mounted composite unit              | 1.00  | ea   | \$7,078.62 /ea   | \$7,079    |
| Large Power and Distibution   | 2,040 | gsf  | \$4.00 /gsf      | \$8,160    |
| Large Power and Distibution Recon Reduction                             | -1.00 | gsf  | \$12,000.00 /gsf | (\$12,000) |
| D5027 Mechanical Equipment Connections                                  |       |      | \$5.93 / GSF     | \$12,099   |
| E3EQ   ACCU 30A composite unit connection Mechanical Schedule in feeder | 1.00  | ea   | \$448.22 /ea     | \$448      |
| EUH 1 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite<br>unit    | 3.00  | ea   | \$655.72 /ea     | \$1,967    |
| EUH 2 - 30 A composite unit connection and Feeder                       | 1.00  | ea   | \$655.72 /ea     | \$656      |
| EWH 30 A composite unit connection and Feeder                           | 2.00  | ea   | \$448.22 /ea     | \$896      |
| F - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit           | 1.00  | ea   | \$655.72 /ea     | \$656      |
| 30 AMP EMT Composite feeders copper - Mechanical                        | 400   | lf   | \$18.69 /lf      | \$7,476    |
| D5029 Small Power Devices & Wiring                                      |       |      | \$2.04 / GSF     | \$4,160    |
| Small Power \$/sf - Maintenance Building                                | 2,040 | sf   | \$4.00 /sf       | \$8,160    |
| Small Power Reduction per rec   | -1.00 | sf   | \$4,000.00 /sf   | (\$4,000)  |
| D5040 LIGHTING  |       |      | \$4.12 / GSF     | \$8,398    |
| D5042 Light Fixtures  |       |      | \$2.66 / GSF     | \$5,434    |
| 20 AMP EMT Composite feeders copper - Lighting Branch                   | 250   | lf   | \$16.93 /lf      | \$4,233    |
| WP Exterior Wall Mounted Light Fixture                                  | 1.00  | ea   | \$401.76 /ea     | \$402      |
| F1 Lighting Fixture   | 4.00  | ea   | \$200.00 /ea     | \$800      |
| D5044 Lighting Controls & Wiring  |       |      | \$1.45 / GSF     | \$2,964    |
| S3 (1) 3 way switch composite unit                                      | 2.00  | ea   | \$85.00 /ea      | \$170      |
| Ceiling mounted occupancy sensor composite unit                         | 1.00  | ea   | \$254.07 /ea     | \$254      |
| 20 AMP EMT Composite feeders copper - Lighting Control Branch           | 150   | lf   | \$16.93 /lf      | \$2,540    |
| D5090 OTHER ELECTRICAL SYSTEMS  |       |      | \$2.17 / GSF     | \$4,424    |
| D5092 Clock Systems   |       |      | \$0.09 / GSF     | \$174      |
| Clock Single Face Battery or 110 clock                                  | 1.00  | ea   | \$173.54 /ea     | \$174      |
| D5094 Grounding & Lightning Protection Sys.                             |       |      | \$0.25 / GSF     | \$517      |
| Grounding   | 2,040 | gsf  | \$0.25 /gsf      | \$517      |
| D5095 Miscellaneous Electrical Systems                                  | ,     | 0    | \$1.83 / GSF     | \$3,733    |
| Mis Expenses  | 2.040 | gsf  | \$2.00 /gsf      | \$4.081    |
| Mis Expenses Reduction per Recon  | -1.00 | ea   | \$2.000.00 /ea   | (\$2.000)  |
| Temp Lighting and Power   | 2,040 | gsf  | \$0.81 /gsf      | \$1,652    |
| D60 COMMUNICATIONS  | , -   | -    | \$1.66 / GSF     | \$3.393    |
| D6010 COMMUNICATIONS & SECURITY   |       |      | \$1.27 / GSF     | \$2,585    |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANTITY  | UNIT COST      | TOTAL COST |
|---|-----------|----------------|------------|
| D6013 Tel/Data System   |           | \$1.27 / GSF   | \$2,585    |
| Fit-Out Telcom Equipment composite unit                                     | 1.00 ea   | \$1,551.00 /ea | \$1,551    |
| WP - "VOIP" Wall Telephone Outlet   | 1.00 ea   | \$613.10 /ea   | \$613      |
| D2 Data jack with 1" Stub up to accessible ceiling composite unit 10 feet   | 1.00 ea   | \$529.51 /ea   | \$530      |
| Telcom Recon adjusment  | -1.00 ea  | \$600.00 /ea   | (\$600)    |
| WAP jack ceiling mounted composite unit                                     | 1.00 ea   | \$491.78 /ea   | \$492      |
| D6030 SOUND AND A/V   |           | \$0.40 / GSF   | \$808      |
| D6032 Sound/PA Systems  |           | \$0.40 / GSF   | \$808      |
| PA Horn Speaker   | 1.00 ea   | \$400.00 /ea   | \$400      |
| Volume Controls   | 1.00 ea   | \$150.00 /ea   | \$150      |
| LV Cabling for Speaker  | 100 lf    | \$2.58 /lf     | \$258      |
| D70 ELECTRONIC SAFETY & SECURITY  |           | \$5.85 / GSF   | \$11,927   |
| D6010 COMMUNICATIONS & SECURITY   |           | \$4.59 / GSF   | \$9,373    |
| D6011 Fire Alarm System   |           | \$1.52 / GSF   | \$3,110    |
| Fire alarm manual pull station composite unit                               | 2.00 ea   | \$269.35 /ea   | \$539      |
| Fire Alarm Manual pull station composite unit                               | 2.00 ea   | \$271.61 /ea   | \$543      |
| Fire Alarm Heat detector composite unit                                     | 3.00 ea   | \$457.54 /ea   | \$1,373    |
| Fire alarm speaker strobe Ceiling WP composite unit                         | 2.00 ea   | \$327.77 /ea   | \$656      |
| D6016 Surveillance CCTV System  |           | \$1.71 / GSF   | \$3,497    |
| Cat 6 Cable   | 50 lf     | \$0.79 /lf     | \$40       |
| CCTV Head End   | 1.00 ea   | \$1,000.00 /ea | \$1,000    |
| CCTV D1 Data Jacks  | 1.00 ea   | \$356.76 /ea   | \$357      |
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit | 1.00 ea   | \$2,101.00 /ea | \$2,101    |
| D6017 Security Access Control   |           | \$1.36 / GSF   | \$2,766    |
| Security Composite Cable Per Foot   | 350 lf    | \$1.25 /lf     | \$438      |
| Security Card Reader Composite Unit   | 1.00 ea   | \$259.29 /ea   | \$259      |
| Security Key Pad Composite Unit   | 1.00 ea   | \$475.28 /ea   | \$475      |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit              | 5.00 ea   | \$198.77 /ea   | \$994      |
| Security Control Unit - Small Composite Unit                                | 1.00 ea   | \$1,200.00 /ea | \$1,200    |
| Security Reduction per Recon  | -1.00 ea  | \$600.00 /ea   | (\$600)    |
| D7050 DETECTION & ALARM   |           | \$1.25 / GSF   | \$2,554    |
| D6011 Fire Alarm System   |           | \$1.25 / GSF   | \$2,554    |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit                      | 200 lf    | \$12.77 /lf    | \$2,554    |
| F SPECIAL CONSTRUCTION & DEMOLITION   | 2,040 GSF | \$73.68 / GSF  | \$150,300  |
| F10 SPECIAL CONSTRUCTION  |           | \$73.68 / GSF  | \$150,300  |
| F1010 INTEGRATED CONSTRUCTION   |           | \$73.68 / GSF  | \$150,300  |
| F1019 Other Special Construction  |           | \$73.68 / GSF  | \$150,300  |
| Pre Engineered Buildings Complete - ADJUST PER RECON                        | 2,004 sf  | \$75.00 /sf    | \$150,300  |
| TOTAL MAINTENANCE BLDG  | \$        | 5254.40 / GSF  | \$518,969  |

#### 60% CD Estimate - Reconciled incl VE



### SITEWORK

| DESCRIPTION   | QUANTITY  |      | FION QUANTITY      |              | UNIT COST | TOTAL COST |
|---|-----------|------|--------------------|--------------|-----------|------------|
| G SITEWORK  | 382,610 0 | SSF  | \$103.82 / GSF     | \$39,723,065 |           |            |
| G10 SITE PREPARATION  |           |      | \$45.09 / GSF      | \$17,250,456 |           |            |
| G1010 SITE CLEARING   |           |      | \$2.43 / GSF       | \$930,412    |           |            |
| G1011 Clearing & Grubbing   |           |      | \$2.43 / GSF       | \$930,412    |           |            |
| Bulk Site Clearing & Grubbing   | 35        | acre | \$5,600.00 /acre   | \$196,000    |           |            |
| Strip Forest Mat P1 - Offsite Disposal - P1                                     | 10,000    | су   | \$42.00 /cy        | \$420,000    |           |            |
| Strip topsoil & screen & stockpile for re-use P1 - P2                           | 8,274     | су   | \$38.00 /cy        | \$314,412    |           |            |
| G1020 SITE ELEMENTS DEMOLITION  |           |      | \$0.92 / GSF       | \$350,721    |           |            |
| G1023 Infrastructure Demolition   |           |      | \$0.92 / GSF       | \$350,721    |           |            |
| R&D Elec Conduit  | 581       | lf   | \$27.00 /lf        | \$15,687     |           |            |
| R&D Elec DB   | 1,173     | lf   | \$43.00 /lf        | \$50,439     |           |            |
| R&D Gas   | 132       | lf   | \$27.00 /lf        | \$3,564      |           |            |
| R&D Sewer/Drain Pipe  | 4,122     | lf   | \$31.00 /lf        | \$127,782    |           |            |
| R&D Water   | 2,859     | lf   | \$31.00 /lf        | \$88,629     |           |            |
| Cut & Cap Water Service   | 2.00      | ea   | \$16,500.00 /ea    | \$33,000     |           |            |
| R&D Sewer Drain Structure   | 51        | ea   | \$620.00 /ea       | \$31,620     |           |            |
| G1030 SITE ELEMENT RELOCATIONS  |           |      | \$30.63 / GSF      | \$11,720,304 |           |            |
| G1033 Rock Excavation   |           |      | \$26.30 / GSF      | \$10,060,948 |           |            |
| Mass Rock Blasting  | 138,361   | су   | \$20.00 /cy        | \$2,767,220  |           |            |
| Mass Rock Excavation  | 138,361   | су   | \$16.00 /cy        | \$2,213,776  |           |            |
| Mass Rock Processing  | 138,361   | су   | \$14.00 /cy        | \$1,937,054  |           |            |
| Allow for additional material handling due to logistics -<br>ADJUSTED PER RECON | 148,632   | су   | \$5.00 /cy         | \$743,160    |           |            |
| Allow for Rock Scaling  | 1.00      | allw | \$150,000.00 /allw | \$150,000    |           |            |
| PER RECON - ADD ROCK EXCAVATION TO SUBSURFACE SYTEM #2                          | 5,327     | су   | \$55.00 /cy        | \$292,967    |           |            |
| PER RECON - ADJUST TO 5' BELOW SLAB FOR OVERBLAST                               | 16,667    | су   | \$55.00 /cy        | \$916,667    |           |            |
| Trench Rock Blasting  | 10,001    | су   | \$75.00 /cy        | \$750,075    |           |            |
| Trench Rock Excavation  | 10,001    | су   | \$15.00 /cy        | \$150,015    |           |            |
| Trench Rock Processing  | 10,001    | су   | \$14.00 /cy        | \$140,014    |           |            |
| G1034 Fill & Borrow   |           |      | \$3.56 / GSF       | \$1,363,698  |           |            |
| Fill to get to sub grade elev - phase 1 - from onsite processed rock            | 49,222    | су   | \$18.00 /cy        | \$885,996    |           |            |
| Fill to get to sub grade elev - phase 2 - from onsite processed rock            | 26,539    | су   | \$18.00 /cy        | \$477,702    |           |            |
| G1035 Temporary Erosion & Sediment Control                                      |           |      | \$0.77 / GSF       | \$295,659    |           |            |
| Antitracking Pads   | 6.00      | ea   | \$5,500.00 /ea     | \$33,000     |           |            |
| Erosion Control Hay Bales / Silt Fence  | 8,377     | lf   | \$10.50 /lf        | \$87,959     |           |            |
| Erosion Control Blankets & Mats   | 1.00      | ls   | \$40,000.00 /ls    | \$40,000     |           |            |
| Erosion Control - CB Inlet Protection   | 149       | ls   | \$300.00 /ls       | \$44,700     |           |            |
| Erosion Control - Maintain / remove   | 1.00      | ls   | \$90,000.00 /ls    | \$90,000     |           |            |
| G1070 SITE EARTHWORK  |           |      | \$11.11 / GSF      | \$4,249,019  |           |            |
| G1072 Excavation & Fill   |           |      | \$11.11 / GSF      | \$4,249,019  |           |            |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANT    | TITY | UNIT COS    | ST  | TOTAL COST   |
|--|----------|------|-------------|-----|--------------|
| Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 1      | 20,386   | су   | \$42.00     | /cy | \$856,212    |
| Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 2      | 39,376   | су   | \$42.00     | /cy | \$1,653,792  |
| Bulk Excavation Offsite Disposal - processed rock Phase 1 (sell) -<br>ADJUST PER RECON | 62,601   | су   | \$15.00     | /cy | \$939,015    |
| Excavate & Backfill for Site Improvements items (pads / stairs, etc)                   | 20,000   | су   | \$40.00     | /cy | \$800,000    |
| G20 SITE IMPROVEMENTS  |          |      | \$29.36 /   | GSF | \$11,234,448 |
| G1070 SITE EARTHWORK   |          |      | \$1.20 /    | GSF | \$457,380    |
| G1072 Excavation & Fill  |          |      | \$1.20 /    | GSF | \$457,380    |
| Rip Rap Slopes   | 3,267    | су   | \$140.00    | /cv | \$457,380    |
| G2010 ROADWAYS   | ,        | ,    | \$6.85 /    | GSF | \$2,621,104  |
| G2011 Roadway Pavement   |          |      | \$4.57 /    | GSF | \$1,748,099  |
| Fine Grade Pavement Base   | 316.791  | sf   | \$0.50      | /sf | \$158.396    |
| Backfill Pavement Base Mat'l processed material  | 15.650   | cv   | \$15.00     | /cv | \$234.750    |
| - Raised Crosswalks @ Bit Pavement   | 208      | sv   | \$35.00     | /sv | \$7,280      |
| Bituminious Paving - Parking Lot Pavement  | 16,957   | sy   | \$33.00     | /sy | \$559,581    |
| Bituminious Paving - Roadway Pavement  | 17,073   | sy   | \$36.00     | /sy | \$614,628    |
| Concrete Paving - 6" Vehicular   | 6,139    | sf   | \$16.50     | /sf | \$101,294    |
| Concrete Paving - 6" Vehicular @walkway to lower sportsfields                          | 4,374    | sf   | \$16.50     | /sf | \$72,171     |
| G2012 Roadway Curbs & Gutters  |          |      | \$2.06 /    | GSF | \$787,965    |
| Granite Curbing - Vertical (Staight & Radius)  | 10,994   | lf   | \$68.00     | /lf | \$747,592    |
| Bituminous Curbing (Cape Cod Berm)   | 5,383    | lf   | \$7.50      | /If | \$40,373     |
| G2013 Marking & Signage  |          |      | \$0.22 /    | GSF | \$85,040     |
| Accessible Walkway Ramp  | 1,008    | sf   | \$5.00      | /sf | \$5,040      |
| Painted Lines - Misc. Striping - Lane SWL, Stop Lines, etc.                            | 1.00     | ls   | \$50,000.00 | /ls | \$50,000     |
| SITE SIGNAGE - ADDED PER RECON   | 1.00     | ls   | \$30,000.00 | /ls | \$30,000     |
| G2030 PEDESTRIAN PLAZAS & WALKWAYS   |          |      | \$1.67 /    | GSF | \$640,416    |
| G2031 Pedestrian Pavement  |          |      | \$1.67 /    | GSF | \$640,416    |
| Prepare & Compact Subbase  | 78,756   | sf   | \$0.50      | /sf | \$39,378     |
| Backfill Pavement Base Mat'l processed material  | 2,550    | су   | \$81.00     | /cy | \$206,550    |
| Asphalt Walkway Paving   | 5,420    | sy   | \$33.00     | /sy | \$178,860    |
| Concrete Pad - Egress Pinned to Bldg   | 126      | sf   | \$15.00     | /sf | \$1,890      |
| Concrete Paving - Gray Std Finish  | 18,958   | sf   | \$12.00     | /sf | \$227,496    |
| Concrete Paving - Integral Color Exposed Aggregate                                     | 0.00     | sf   |             |     | \$0          |
| Concrete Paving - Integral Color Exposed Aggregate - accent<br>bands                   | 0.00     | sf   |             |     | \$0          |
| Concrete Paving - Integral Color Exposed Aggregate - accent<br>bands - etched          | 0.00     | sf   |             |     | \$0          |
| Concrete Paving - Ramps  | 324      | sf   | \$15.00     | /sf | \$4,860      |
| Concrete Paving -PRE RECON, CORRECT TO CONCRETE VS<br>ASPHALT                          | -2449.00 | sf   | \$8.33      | /sf | (\$20,408)   |
| Stone Dust Walk - stabilized   | 179      | sf   | \$10.00     | /sf | \$1,790      |
| Unit Pavers - Granite / Precast  | 0.00     | excl |             |     | \$0          |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY |      | IPTION QUANTITY      |       | TITY UNIT COST |  | TOTAL COST |  |
|---|----------|------|----------------------|-------|----------------|--|------------|--|
| G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS   |          |      | \$8.49               | / GSF | \$3,248,173    |  |            |  |
| E1097 Athletic, Recreational, & Therapeutic Equipment                                   |          |      | \$1.66               | / GSF | \$635,575      |  |            |  |
| Permanent Bleachers (F&I) including pressbox - ADJUST PER<br>RECON                      | 508      | seat | \$679.13             | /seat | \$345,000      |  |            |  |
| Sportsfield Specialties - Prefabricated Ticket Booth (material only)                    | 0.00     | excl |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Scoreboard - Football   | 1.00     | ea   | \$100,000.00         | /ea   | \$100,000      |  |            |  |
| Sportsfield Specialties - Scoreboard - other  | 2.00     | ea   | \$30,000.00          | /ea   | \$60,000       |  |            |  |
| Sportsfield Specialties - Baseball - Bases, Sleeves (material only)                     | 0.00     | ls   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Softball - Bases, Sleeves (material only)                     | 0.00     | ls   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Pitching Rubber (material only)                               | 0.00     | ea   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Home Plate (material only)                                    | 0.00     | ea   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Stadium Safety Netting System (material only) - add alternate | 0.00     | lf   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Baseball Batting Tunnel (material only)                       | 0.00     | excl |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Softball Batting Tunnel (material only)                       | 0.00     | excl |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Baseball / Softball Foul Pole (material only)                 | 0.00     | ea   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Baseball - Dugouts 8'x34' (material only)                     | 0.00     | ea   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Softball- Dugouts 8'x34' (material only)                      | 0.00     | ea   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Team Benches at Dugouts (material only)                       | 0.00     | ea   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Helmut Caddy / Bat Bin (material only)                        | 0.00     | ea   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Tension Netting Backstop - 32'h - Softball<br>(material only) | 0.00     | lf   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Tension Netting Backstop - 42'h - Baseball<br>(material only) | 0.00     | lf   |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Football - Goal Posts (material only)                         | 2.00     | ea   | \$6,330.00           | /ea   | \$12,660       |  |            |  |
| Sportsfield Specialties - Football - Goal Posts Pads (material only)                    | 2.00     | ea   | \$595.00             | /ea   | \$1,190        |  |            |  |
| Sportsfield Specialties - Soccer Goal Safety System (material only)                     | 0.00     | alt  |                      |       | \$0            |  |            |  |
| Sportsfield Specialties - Shot Put/Hammer Throw Ring (material only)                    | 1.00     | ea   | \$385.00             | /ea   | \$385          |  |            |  |
| Sportsfield Specialties - Shot Put Toe Board (material only)                            | 1.00     | ea   | \$435.00             | /ea   | \$435          |  |            |  |
| Sportsfield Specialties - Shot Put Cage (material only)                                 | 1.00     | ea   | \$2,310.00           | /ea   | \$2,310        |  |            |  |
| Sportsfield Specialties - Shot Put Backup Net (material only)                           | 1.00     | ea   | \$395.00             | /ea   | \$395          |  |            |  |
| Sportsfield Specialties - Pole Vault Box (material only)                                | 1.00     | ea   | \$1,170.00           | /ea   | \$1,170        |  |            |  |
| Sportsfield Specialties - Pole Vault Standard Forming System<br>(material only)         | 1.00     | ea   | \$1,935.00           | /ea   | \$1,935        |  |            |  |
| Sportsfield Specialties - Pole Vault Equipment Set (material only)                      | 1.00     | ea   | \$21 <i>,</i> 970.00 | /ea   | \$21,970       |  |            |  |
| Sportsfield Specialties - Long/Triple Jump Takeoff Boards<br>(material only)            | 1.00     | ea   | \$1,085.00           | /ea   | \$1,085        |  |            |  |
| Sportsfield Specialties - Tennis Court Nets - Net, Posts, Sleeves<br>(material only)    | 0.00     | alt  |                      |       | \$0            |  |            |  |
| Exterior Athletic Equipment - Labor to Unbox, Assemble, & Install                       | 16       | crdy | \$5,440.00           | /crdy | \$87,040       |  |            |  |
| Outdoor Fitness Equipment   | 0.00     | alt  |                      |       | \$0            |  |            |  |
| Backstops   | 0.00     | alt  |                      |       | \$0            |  |            |  |
| Softball - Field Backstops  | 0.00     | alt  |                      |       | \$0            |  |            |  |

60% CD Estimate - Reconciled incl VE



| G2057 Playing Fields     \$6.83 / GSF     \$2,612,593       Prepare & Compact Subbase     130,000 sf     \$1.00 / sf     \$130,000       Subgrade layer @ Nutral Playing surfaces, FB & Track     130,000 sf     \$1.00 / sf     \$5130,000       Subgrade layer @ Nutral Playing surfaces, SB & Track     130,000 sf     \$1.00 / sf     \$50       Asphah Surface vito conting Jstriping @ Tenis Courts     0.00 alt     \$50     \$51       Baseball / Softball / Socter Field-Base Scope, seeded Iawn     65,000 sf     \$1.00 / sf     \$65,000       Baseball Field - Natural Irrigated Baseball -Alt     0.00 alt     \$50     \$61,000 sf     \$1.00 / sf     \$89,427       Bd / Soccer Field - Base Scope - Seeded Lawn     89,427 sf     \$1.00 / sf     \$89,427     \$61,000 sf     \$51,00 / sf     \$91,000 sf     \$51,00 / sf     \$92,000 sf     \$51,00 / sf     \$92,000 sf     \$92,000 sf     \$93,000 sf     \$51,00 / sf     \$93,693,000 sf     \$51,00 / sf     \$93,693,000 sf     \$51,00 / sf     \$93,693,000 sf     \$51,00 / sf     \$95,693,000 sf     \$52,00 / sf     \$95,693,000 sf     \$25,00 / sf     \$95,693,000 sf     \$25,00 / sf     \$95,693,000 sf     \$25,00 / sf     \$95,693,000 sf     <  | DESCRIPTION   | QUANT   | TTY  | UNIT COS     | ST    | TOTAL COST  |
|--|---|---------|------|--------------|-------|-------------|
| Prepare & compact Subbase     130,000     rf     \$1.00     /rf     \$130,000     si     \$14,25     /s125,250       Subgrade layer @ Synthetic Playing surfaces     0.00     sf     \$1000     \$100     \$1000     \$1000     \$1000     \$1000     \$1000     \$10000     \$1100     \$100000     \$1100     \$100000     \$11000     \$11000     \$11000     \$11000     \$11000     \$11000     \$11000     \$11000     \$110000     \$100000     \$10000     \$100   | G2057 Playing Fields  |         |      | \$6.83 /     | ' GSF | \$2,612,598 |
| Subgrade layer @ Natural Playing surfaces, FB & Track     130,000 sf     \$42,5 /sf     \$5252,500       Subgrade layer @ Synthetic Playing surfaces     0.00 sf     \$0       Asphaht Surface w to poating / striping @ Tenis Courts     0.00 at     \$0       Baseball / Sottball / Soccer Fields- Engineered Infield Mix - add     0.00 sf     \$1.00 /sf     \$50       Baseball Field - Base scope, seeded lawn     65,000 sf     \$1.00 /sf     \$89,927       BB / Soccer Field - Base Scope - Seeded lawn     89,427 sf     \$1.00 /sf     \$89,927       BB / Soccer Field - Asternal Irrigated Turf B8 / Soccer Field - alt -     0.00 att     \$0     \$0       CORRECTD PER RECON     78,524 ls     \$4.00 /ls     \$314,096     \$1     \$0       Poured in place Safery Surfaing     0.00 att     \$0     \$0     \$1.00 /sf     \$25.00 /sf     \$256,670       Resilient Track ADUST PER RECON     31,852 sf     \$25.00 /sf     \$256,670     \$0       Resilient Track Dame (Fab Endone) - ADUST PER RECON     31,852 sf     \$25.00 /sf     \$269,705       Coccerte Pad Senders onk (Baseball / Softball = add att)     2,975 f     \$260,00 /sf     \$23,00 /sf     \$23,00 /sf     \$23,320  | Prepare & Compact Subbase   | 130,000 | sf   | \$1.00       | /sf   | \$130,000   |
| Subgrade layer @ Synthetic Playing surfaces     0.00     sf     \$0       Asphalt Surface w top coaling / striping @ Tennis Courts     0.00     ait     \$0       Baseball / Sottball / Soccer Fields - Engineered Infield Mix - add     0.00     sf     \$1.00     /sf     \$56,800       Baseball Field - Natural Irrigated Baseball - Alt     0.00     ait     \$50     \$68     \$51.00     /sf     \$539,427     \$51.00     /sf     \$5314,956     \$539,427     \$51.00     /sf     \$539,427     \$51.00     /sf     \$5314,956     \$559,400     \$531,4296     \$500,718     \$5314,956     \$559,41     \$539,427     \$51.00     /sf     \$5314,956     \$559,41     \$539,427     \$52,500     \$55,600     \$55,600     \$50     \$52,500     \$55,600     \$50     \$52,500     \$51,600,60     \$50     \$52,957,100     \$530,457     \$52,957,100     \$52,957,100     \$52,957,100     \$530,457     \$52,957,100     \$50,600     \$51,200,61  | Subgrade layer @ Natural Playing surfaces, FB & Track                                       | 130,000 | sf   | \$4.25       | /sf   | \$552,500   |
| Asphaft Surface wt top coating / Striping @ Tennis Courts 0.00 alt 50<br>Baseball / Sortball / Soccer Field-s. Engineered Infield Mix - add 0.00 sf 51.00 /sf 565.000<br>Baseball Field - Natural Irrigated Baseball - Alt 0.00 alt 50<br>BB / Soccer Field - Base Scope - Seeded Lawn 89,427 sf 51.00 /sf 589,427<br>BB / Soccer Field - Natural Irrigated Baseball - Alt 0.00 alt 50<br>CORRECTD PER RECON 78,524 is 54.00 /sf 589,427<br>B Field Natural Irrigated Baseball - Alt 0.00 alt 50<br>OC ORRECTD PER RECON 78,524 is 54.00 /sf 5814.096<br>Poured in place Safety Surfacing 0.00 alt 50<br>Resilient Track - ADIUST PER RECON 20,447 sf 525.00 /sf 5796,300<br>Resilient Track - ADIUST PER RECON 20,447 sf 525.00 /sf 5506,675<br>Trench Drain at Inner track perimeter 1,305 if 5120.00 /if 525,600 /sf 526,500<br>Concrete Part - RECON 20,447 sf 520.00 /sf 525,00 /sf 526,600<br>COORC Concrete Part - RECON 20,447 sf 540.00 /sf 525,00 /sf 526,600<br>COORC Strip Step S, Ramps 50,69 / Sf 526,360<br>Concrete Part - Bellexchers only (Baseball / Softball = add alt) 2,976 sf 540.00 /sf 522,320<br>Concrete Part - Generator 733 sf 540.00 /sf 523,320<br>Concrete Part - Generator 733 sf 540.00 /sf 533,170<br>Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF 14 cy 52,000.00 /sf 533,170<br>Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF 14 cy 52,000.00 /sf 533,000<br>Cutots Site / Building Sign Allowance 1.00 allw 530,000.00 /sf 533,000<br>Cutots Site / Building Sign Allowance 50.00 sf 55,000<br>Retaining Wall - Concrete (CIP) | Subgrade layer @ Synthetic Playing surfaces   | 0.00    | sf   |              |       | \$0         |
| Baseball / Softball / Soccer Fields- Engineered Infield Mix - add0.00sf\$0atBaseball Field - Natural Irrigated Baseball - Alt0.00alt\$0Baseball Field - Natural Irrigated Baseball - Alt0.00alt\$0BB / Soccer Field - Natural Irrigated Turl BB / Soccer Field - alt -0.00alt\$0CORRECTED PER RECON78,524Is\$4.00/Is\$314,096FB Field Natural Irrigated Turl BB / Soccer Field - alt -0.00alt\$0\$0Poured in place Safety Surfacing0.00alt\$0\$0\$0Poured in place Safety Surfacing0.00alt\$0\$0\$0Resillent Track - ADJUST PER RECON31,852\$25,00/If\$508,675Trench Drain at Inner track perimeter1,305If\$120,00/If\$156,600G2005 SITE DEVELOPMENT\$7.73\$65\$262,350\$262,350Concrete Base for Site Entry Sign1.00Is\$10,000.00/Is\$10,000Concrete Pad - Engensters only (Baseball / Softball = add alt)2.976\$40,000/If\$22,300Concrete Pad - Generator733\$6\$40,000/If\$23,500Concrete Pad - Generator\$1,397\$5\$5,531,170\$12,000\$1\$0Concrete Pad - Generator\$1,397\$5\$5,531,170\$1,240,000\$1\$20,000Concrete Pad - Generator\$1,397\$5\$5,531,170\$1,240,000\$1\$22,500,00\$22,55,200Retaining W   | Asphalt Surface w top coating / striping @ Tennis Courts                                    | 0.00    | alt  |              |       | \$0         |
| Baseball Field - Base scope, seeded lawn     65,000 sf     \$1.00 /sf     \$60,00 alt       Baseball Field - Natural Irrigated Basebal - Alt     0.00 alt     \$0       BB / Soccer Field - Base Scope - Seeded Lawn     89,427 sf     \$1.00 /sf     \$39,427       BB / Soccer Field - Natural Irrigated Turf BB / Soccer Field - alt -     0.00 alt     \$0     \$0       CORRECTO PER RECON     78,524 ls     \$4.00 /sf     \$314,096     \$1     \$0       Poured in place Safety Surfacing     0.00 alt     \$0     \$0     \$0     \$0       Resilient Track - ADJUST PER RECON     31,852 sf     \$25.00 /sf     \$796,300     \$50       Resilient Track Dzone (FB Endcone) - ADJUST PER RECON     20,347 sf     \$512.00 /sf     \$508,675       G2060 SITE DEVELOPMENT     \$7.73 / 65F     \$2,2957,100     \$510,000 /sf     \$510,000 /sf     \$10,000       Concrete Base for Site Entry Sign     1.00 ls     \$10,000 /sf     \$10,000     \$10,000     \$10,000     \$10,000     \$10,000     \$10,000     \$10,000     \$10,000     \$10,000     \$10,000     \$10,000     \$13,97     \$24,2957,100     \$20,297,100     \$20,597 /s55     \$23,550,01 /   | Baseball / Softball / Soccer Fields- Engineered Infield Mix - add alt                       | 0.00    | sf   |              |       | \$0         |
| Baseball Field - Natural Irrigated Baseball - Alt     0.00 alt     \$0       BB / Soccer Field - Natural Irrigated Baseball - Alt     0.00 alt     \$1.00 /sf     \$89,427       BB / Soccer Field - Natural Irrigated Baseball - Alt     0.00 alt     \$0       CORRECTED PER RECON     78,524 is     \$4.00 /sf     \$314,096       FB Field Natural Turf FB Field - Alternate     0.00 alt     \$0     \$0       Poured in place Safety Surfacing     0.00 alt     \$0     \$0       Resilient Track - ADJUST PER RECON     31,852 sf     \$25.00 /sf     \$508,675       Trench Drain at Inner track perimeter     1,305 lf     \$120.00 /lf     \$1556,600       G2030 Strte DEVELOPMENT     \$7,73 / GSF     \$2,957,100     \$20,660 / GSF     \$2,000 /lf     \$1510,000 /ls     \$10,000       Concrete Base for Site Entry Sign     1.00 is     \$10,000 /sf     \$20,000     \$119,040     \$20,000     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040     \$119,040 </td <td>Baseball Field - Base scope, seeded lawn</td> <td>65,000</td> <td>sf</td> <td>\$1.00 ,</td> <td>/sf</td> <td>\$65,000</td>   | Baseball Field - Base scope, seeded lawn  | 65,000  | sf   | \$1.00 ,     | /sf   | \$65,000    |
| BB / Soccer Field - Base Scope - Seeded Lawn     89,427 sf     \$1.00 /sf     \$89,427       BB / Soccer Field - Natural Iruf BB / Soccer Field - alt -<br>CORRECTED PER RECON     78,524 ls     \$4.00 /ls     \$314,096       FB Field Natural Turf FB Field - ADUUSTED PER RECON     78,524 ls     \$4.00 /ls     \$314,096       Poured in place Safety Surfacing     0.00 alt     \$0     \$0       Resilient Track A DJUST PER RECON     31,852 sf     \$25.00 /sf     \$796,300       Resilient Track D Zone (FB Endone) - ADJUST PER RECON     20,347 sf     \$225.00 /sf     \$506,600 /ff       G2060 SITE DEVELOPMENT     \$0.69 / GSF     \$226,2360     \$10,000.00 /if     \$10,000       G2031 Exterior Steps & Ramps     \$0.69 / GSF     \$226,2360     \$10,000     \$10,0000       Concrete Pad - Base for Site Entry Sign     1.00 ls     \$10,000 /sf     \$29,320       Concrete Pad - Generator     733 sf     \$40,00 /sf     \$29,320       Concrete Pad - Transformer     500 sf     \$88,000 /sf     \$29,320       Concrete Pad - Transformer     \$1.00 sf     \$1.39 / GSF     \$33,170       Retaining Walls Complete \$/lf - segmental     492 lf     \$56,000 /sf     \$29,3  | Baseball Field - Natural Irrigated Baseball - Alt   | 0.00    | alt  |              |       | \$0         |
| BB / Soccer Field - Natural trigated Turf BB / Soccer Field - alt -     0.00 alt     \$0       CORRECTED PER RECON     78,524 ls     \$4.00 /ls     \$314,096       FB Field Natural Turf FB Field - ADJUSTED PER RECON     78,524 ls     \$4.00 /ls     \$314,096       Poured in place Safety Surfacing     0.00 alt     \$0     \$0       Poured in place Safety Surfacing     0.00 alt     \$0     \$0       Resilient Track - ADJUST PER RECON     23,347 sf     \$25,00 /sf     \$50,69 / S55       Trench Drain at Inner track perimeter     1,305 lf     \$12,000 /lf     \$155,600       G2033 Exterior Steps & Ramps     \$0.69 / GSF     \$2,22,301     \$2,23,201       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976 sf     \$40,000 /sf     \$119,040       Concrete Pad - Transformer     500 sf     \$40,000 /sf     \$22,93,20     \$20,000 /sf     \$22,93,20       Concrete Pad - Transformer     500 sf     \$40,000 /sf     \$22,93,20     \$2,000,00 /sf     \$22,000,00 /sf </td <td>BB / Soccer Field - Base Scope - Seeded Lawn</td> <td>89,427</td> <td>sf</td> <td>\$1.00 ,</td> <td>/sf</td> <td>\$89,427</td>  | BB / Soccer Field - Base Scope - Seeded Lawn  | 89,427  | sf   | \$1.00 ,     | /sf   | \$89,427    |
| FB Field Natural Turf FB Field - ADJUSTED PER RECON     78,524 is     \$4.00 /ls     \$314,096       FB Field Synthetic Turf FB Field - Alternate     0.00 alt     \$0       Poured in place Safety Surfacing     0.00 alt     \$0       Resilient Track - ADJUST PER RECON     31,852 sf     \$25.00 /sf     \$796,300       Resilient Track - ADJUST PER RECON     20,347 sf     \$25.00 /sf     \$508,675       Trench Drain at Inner track perimeter     1,305 lf     \$120,00 /lf     \$156,600       62060 STE DEVELOPMENT     \$7.73 / GSF     \$2,297,100     \$262,360       Concrete Pad - Generator     733 sf     \$40,00 /sf     \$210,000       Concrete Pad - Generator     733 sf     \$40,00 /sf     \$29,320       Concrete Pad - Generator     733 sf     \$40,00 /sf     \$29,320       Concrete Pad - Transformer     500 sf     \$40,00 /sf     \$22,320       Concrete Pad - Generator     \$1.39 / GSF     \$531,170     \$84,000     \$51.39 / GSF     \$521,000       Concrete Stairs & Landings, pads @ egress     1,050 sf     \$80,000 /sf     \$22,000,00 /sf     \$22,000,00 /sf     \$22,000,00 /sf     \$22,000,00 /sf     \$22,52,00   | BB / Soccer Field - Natural Irrigated Turf BB / Soccer Field - alt -<br>CORRECTED PER RECON | 0.00    | alt  |              |       | \$0         |
| FB Field Synthetic Turf FB Field - Alternate   0.00 alt   \$0     Poured in place Safety Surfacing   0.00 alt   \$0     Resilient Track - ADUST FER RECON   31,852 sf   \$25.00 /sf   \$796,300     Resilient Track - ADUST FER RECON   20,347 sf   \$25.00 /sf   \$508,675     Trench Drain at Inner track perimeter   1,305 lf   \$120.00 /lf   \$1556,675     G2030 SITE DEVELOPMENT   \$7,73 /GSF   \$225,00 /sf   \$252,397,100     G2031 Exterior Steps & Ramps   \$0.69 / GSF   \$252,300 /sf   \$10,000     Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)   2,975 sf   \$40.00 /sf   \$119,040     Concrete Pad - Generator   733 sf   \$40.00 /sf   \$29,320     Concrete Pad - Transformer   500 sf   \$88.000 /sf   \$28,000     Concrete Pad - Generator   733 sf   \$80.00 /sf   \$28,000     Concrete Pad - Transformer   500 sf   \$80.00 /sf   \$28,000     Concrete Pad - Transformer   500 sf   \$28,000   \$27,5520     Retaining Walls   Concrete fad @ Team Bench W Overhead Shade   0.00 alt   \$30,000 /sf   \$28,000     CONCrete Pad @ Team Bench W Overhead Shade   0.00  | FB Field Natural Turf FB Field - ADJUSTED PER RECON   | 78,524  | ls   | \$4.00 ,     | /ls   | \$314,096   |
| Poured in place Safety Surfacing     0.00 alt     \$0       Resilient Track - ADJUST PER RECON     31,852 sf     \$25.00 /sf     \$508,675       Resilient Track D Zone (FB Endzone) - ADJUST PER RECON     20,347 sf     \$225.00 /sf     \$508,675       Trench Drain at Inner track perimeter     1,305 lf     \$120.00 /lf     \$156,600       G2033 Exterior Steps & Ramps     \$6.69 / GSF     \$226,37,100       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976 sf     \$40.00 /sf     \$119,040       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976 sf     \$40.00 /sf     \$229,320       Concrete Pad - Generator     733 sf     \$40.00 /sf     \$220,000     Concrete Pad - Transformer     \$00 sf     \$40.00 /sf     \$220,000       Concrete Pad - Transformer     \$00 sf     \$80.00 /sf     \$84,000     \$50     \$60.00 /sf     \$220,000     \$50     \$50.00 /sf     \$28,000     \$50     \$50.00 /sf     \$28,000     \$52,520     \$53.1,170     Retaining Walls Concrete (CIP) - complete, footing & wall     116 cy     \$1,490.00 /cy     \$56,250     \$52,520     \$50.80 /cs     \$30,000     \$275,520     \$50.80 /cs <td< td=""><td>FB Field Synthetic Turf FB Field - Alternate</td><td>0.00</td><td>alt</td><td></td><td></td><td>\$0</td></td<>   | FB Field Synthetic Turf FB Field - Alternate  | 0.00    | alt  |              |       | \$0         |
| Resilient Track - ADJUST PER RECON     31,852     sf     \$25.00     /sf     \$796,300       Resilient Track D Zone (FB Endzone) - ADJUST PER RECON     20,347     sf     \$25.00     /sf     \$508,675       Trench Drain at Inner track perimeter     1,305     if     \$120.00     /jf     \$1556,600       G2060 SITE DEVELOPMENT     \$7.73     /sf     \$2,2957,100     \$262,360       Concrete Base for Site Entry Sign     1.00     is     \$10,000.00     /ls     \$10,000       Concrete Pad - FB Beachers only (Baseball / Softball = add alt)     2,976     \$40,000     /sf     \$22,320       Concrete Pad - Fameformer     500     sf     \$40,000     /sf     \$23,320       Concrete Pad @ Team Bench W Overhead Shade     0.00     alt     \$0     \$13,91     \$55     \$531,170       Retaining Walls     Concrete (CIP) - segmental     492     If     \$560.00     /f     \$225,200       Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     14     cy     \$2,000.00     /cy     \$25,520       G2052 Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     14  | Poured in place Safety Surfacing  | 0.00    | alt  |              |       | \$0         |
| Resilient Track D Zone (FB Endzone) - ADJUST PER RECON     20,347     sf     \$25.00     /sf     \$508,675       Trench Drain at Inner track perimeter     1,305     If     \$12.000     /If     \$156,600       G2030 SITE DEVELOPMENT     \$7.73     /GSF     \$22,957,100     \$0.669     /GSF     \$22,957,100       G2033 Exterior Steps & Ramps     \$0.69     /GSF     \$226,360     \$10,000.00     /ls     \$10,000       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976     \$40,000     /sf     \$219,000       Concrete Pad - Transformer     500     \$f     \$40,000     /sf     \$22,000.00     /sf     \$24,000       Concrete Pad @ Team Bench W Overhead Shade     0.00     alt     \$0     \$0     \$0     \$0     \$0     \$0     \$1.339     /GSF     \$531,170     \$28,000     /sf     \$24,000     \$27,52.00     \$28,000     \$1     \$275,52.00     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000     \$28,000 <td< td=""><td>Resilient Track - ADJUST PER RECON</td><td>31,852</td><td>sf</td><td>\$25.00 ,</td><td>/sf</td><td>\$796,300</td></td<>   | Resilient Track - ADJUST PER RECON  | 31,852  | sf   | \$25.00 ,    | /sf   | \$796,300   |
| Trench Drain at Inner track perimeter     1,305     If     \$120.00     /If     \$156,600       G2060 SITE DEVELOPMENT     \$7.73     /GSF     \$2,2957,100       G2033 Exterior Steps & Ramps     \$0.69     /GSF     \$262,330       Concrete Base for Site Entry Sign     1.00     is     \$10,000.00     /is     \$11,0,000       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2.976     \$4,000     /sf     \$22,320       Concrete Pad - Generator     733     sf     \$40.00     /sf     \$22,020       Concrete Pad - Transformer     500     sf     \$80.00     /sf     \$22,000       Concrete Stairs & Landings, pads @ egress     1,050     sf     \$80.00     /sf     \$24,000       G2052 Retaining Walls     \$1.39     /GSF     \$531,170     Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     14     cy     \$2,000.00     /cy     \$28,000       AT CONTAINTERS     \$1.39     /GSF     \$300,000     cy     \$65,550       G2056 Signage     \$0.80     /GSF     \$305,200     Cy     \$636,600     ff  | Resilient Track D Zone (FB Endzone) - ADJUST PER RECON                                      | 20,347  | sf   | \$25.00 ,    | /sf   | \$508,675   |
| G2060 SITE DEVELOPMENT     \$7.73 / GSF     \$2,957,100       G2033 Exterior Steps & Ramps     \$0.69 / GSF     \$262,360       Concrete Base for Site Entry Sign     1.00 ls     \$10,000.0 /ls     \$10,000.0       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976 sf     \$40,00 /sf     \$229,320       Concrete Pad - Generator     733 sf     \$40,00 /sf     \$229,320       Concrete Pad - Transformer     500 sf     \$40.00 /sf     \$220,000       Concrete Pad @ Team Bench W Overhead Shade     0.00 alt     \$0     \$0       Concrete Pad @ Team Bench W Overhead Shade     0.00 alt     \$1.39 / GSF     \$531,170       Retaining Walls     \$1.39 / GSF     \$580.00 /sf     \$84,000       G2052 Retaining Walls     \$1.39 / GSF     \$531,170       Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     14 cy     \$2,000.0 /cy     \$28,000       AT CONTAINTERS     \$0.08 / GSF     \$30,000     \$28,000     \$0     \$30,000     \$28,000       Custom Site / Building Sign Allowance     1.00 allw     \$30,000.0 /cy     \$565,250     \$0.08 / GSF     \$300,000     \$30,000     \$30,000     \$  | Trench Drain at Inner track perimeter   | 1,305   | lf   | \$120.00     | /lf   | \$156,600   |
| G2033 Exterior Steps & Ramps     \$0.69 / GSF     \$262,360       Concrete Base for Site Entry Sign     1.00 ls     \$10,000.0 /ls     \$10,000       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976 sf     \$40.00 /sf     \$29,320       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976 sf     \$40.00 /sf     \$29,320       Concrete Pad - Transformer     500 sf     \$40.00 /sf     \$29,320       Concrete Pad @ Team Bench W Overhead Shade     0.00 alt     \$0     \$0       Concrete Stairs & Landings, pads @ egress     1,050 sf     \$80.00 /sf     \$84,000       G2052 Retaining Walls     \$1.39 / GSF     \$531,170     \$84,000       Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     14     cy     \$2,000.00 /cy     \$28,000       AT CONTAINTERS     725 cy     \$90.00 /cy     \$65,220     \$30,000     \$30,000       Retaining Wall - Concrete (CIP) - complete, footing & wall     116 cy     \$1,400.00 /cy     \$162,400       Retaining Wall - Concrete (CIP) - complete, footing & wall     16 cy     \$30,000.0 /cy     \$65,520       G2056 Signage     \$0.00 allw     \$30,000     \$30,000   | G2060 SITE DEVELOPMENT  |         |      | \$7.73 /     | GSF   | \$2,957,100 |
| Concrete Base for Site Entry Sign     1.00     Is     \$10,000.00     /Is     \$10,000.00       Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)     2,976     sf     \$40.00     /sf     \$29,320       Concrete Pad - Generator     733     sf     \$40.00     /sf     \$29,320       Concrete Pad - Generator     733     sf     \$40.00     /sf     \$29,320       Concrete Pad - Transformer     500     sf     \$40.00     /sf     \$29,0000       Concrete Pad @ Team Bench W Overhead Shade     0.00     alt     \$0     \$5     \$80.00     /sf     \$84,000       G2052 Retaining Walls     Standings, pads @ egress     1,050     sf     \$80.00     /sf     \$84,000       Retaining Walls Complete \$/lf - segmental     492     lf     \$560.00     /lf     \$275,520       Retaining Wall - Concrete (CIP) - complete, footing & wall     116     cy     \$1,400.00     /cy     \$262,400       Retaining Walls - Concrete (CIP) - complete, footing & wall     116     cy     \$9,080     /cy     \$562,520       G2056 Signage     50.08  | G2033 Exterior Steps & Ramps  |         |      | \$0.69 /     | GSF   | \$262,360   |
| Concrete Pad - FB Bleachers only (Baseball / Softball = add alt) $2,976$ sf $$40.00$ $/sf$ $$$119,040$ Concrete Pad - Generator733sf $$40.00$ $/sf$ $$$29,320$ Concrete Pad - Transformer500sf $$40.00$ $/sf$ $$$20,000$ Concrete Pad @ Team Bench W Overhead Shade0.00alt\$0Concrete Stairs & Landings, pads @ egress $1,050$ sf $$$80.00$ $/sf$ $$$84,000$ G2052 Retaining Walls $$$1.39$ GSF $$$531,170$ \$\$1.39/GSF\$\$531,170Retaining Walls Complete \$/lf - segmental492lf\$\$560.00/lf\$\$275,520Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF14cy\$\$2,000.00/cy\$\$28,000AT CONTAINTERS725cy\$90.00/cy\$\$65,250Retaining Walls - Crushed Stone Base725cy\$90.00/cy\$\$65,250G2056 Signage\$0.08/GSF\$30,0000/allw\$30,0000\$\$30,000Custom Site / Building Sign Allowance1.00allw\$30,000.00/allw\$30,000G2059 Other Site Improvements\$0.88/f\$150.00/f\$148,275Guardrail, Integral to CIP Retaining Wall88If\$150.00/f\$63,450Sand Pit w CIP 8" wall / curb89sf\$75.00/s\$66,600Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway423If\$10,000.00/s\$66,600Flagpoles w/ Base <td>Concrete Base for Site Entry Sign</td> <td>1.00</td> <td>ls</td> <td>\$10,000.00</td> <td>/ls</td> <td>\$10,000</td>  | Concrete Base for Site Entry Sign   | 1.00    | ls   | \$10,000.00  | /ls   | \$10,000    |
| Concrete Pad - Generator     733     sf     \$40.00     /sf     \$29,320       Concrete Pad - Transformer     500     sf     \$40.00     /sf     \$20,000       Concrete Pad @ Team Bench W Overhead Shade     0.00     alt     \$0     Concrete Stairs & Landings, pads @ egress     1,050     sf     \$80.00     /sf     \$\$84,000       G2052 Retaining Walls     \$1.39     /GSF     \$\$531,170     Retaining Walls Complete \$/If - segmental     92     If     \$\$560.00     /If     \$\$27,520       Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     412     cy     \$\$2,000.00     /cy     \$\$28,000       AT CONTAINTERS     725     cy     \$\$0,000     /cy     \$\$655,250       G2056 Signage     50.08     /GSF     \$\$30,000     /cy     \$\$65,250       G2059 Other Site I mprovements     \$0.80     /GSF     \$\$30,000     /cy     \$\$65,250       Guardrail, Integral to CIP Retaining Wall     Sa     /f     \$\$10,000     /cy     \$\$65,250       Guardrail, Integral to CIP Retaining Wall     88     If     \$\$150.00     /lf  | Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)                            | 2,976   | sf   | \$40.00      | /sf   | \$119,040   |
| Concrete Pad - Transformer     500 sf     \$40.00 /sf     \$20,000       Concrete Pad @ Team Bench W Overhead Shade     0.00 alt     \$0       Concrete Stairs & Landings, pads @ egress     1,050 sf     \$80.00 /sf     \$84,000       G2052 Retaining Walls     \$1.39 / GSF     \$531,170       Retaining Walls Complete \$/lf - segmental     492 lf     \$560.00 /lf     \$22,000       Action Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     14 cy     \$2,000.00 /cy     \$28,000       AT CONTAINTERS     725 cy     \$90.00 /cy     \$655,200       Retaining Wall - Concrete (CIP) - complete, footing & wall     116 cy     \$1,400.00 /cy     \$65,250       G2056 Signage     \$0.88 / GSF     \$30,000     \$30,000     \$30,000     \$30,000       Custom Site / Building Sign Allowance     1.00 allw     \$30,000.00 /allw     \$30,000       G2059 Other Site Improvements     \$0.80 / GSF     \$305,200     \$45.00 /lf     \$148,275       Guardrail, Integral to CIP Retaining Wall     88 lf     \$150.00 /lf     \$63,450       Sand Pit w CIP 8" wall / curb     89 sf     \$75.00 /sf     \$66,755       Metal Pipe Bollards - Exterior   | Concrete Pad - Generator  | 733     | sf   | \$40.00      | /sf   | \$29,320    |
| Concrete Pad @ Team Bench W Overhead Shade   0.00 alt   \$0     Concrete Stairs & Landings, pads @ egress   1,050 sf   \$80.00 /sf   \$84,000     G2052 Retaining Walls   \$1.39 / GSF   \$531,170     Retaining Walls Complete \$/lf - segmental   492 lf   \$560.00 /lf   \$228,000     AT CONTAINTERS   14 cy   \$2,000.00 /cy   \$28,000     Retaining Wall - Concrete (CIP) - Omplete, footing & wall   116 cy   \$1,400.00 /cy   \$65,250     Retaining Walls - Crushed Stone Base   725 cy   \$90.00 /cy   \$65,250     G2056 Signage   \$0.80 / GSF   \$30,000   \$30,000     Custom Site / Building Sign Allowance   1.00 allw   \$30,000.0 /allw   \$30,000     G2059 Other Site Improvements   \$0.80 / GSF   \$305,200     Metal Guard Railing, Vehicular   3,295 lf   \$45.00 /lf   \$148,275     Guardrail, Integral to CIP Retaining Wall   88 lf   \$150.00 /lf   \$63,600     Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway   423 lf   \$150.00 /lf   \$63,600     Gaofi L Steel Full Railing & Concrete Ramp @ Vehicular Walkway   423 lf   \$10,000.00 /ls   \$63,600     Flagpoles w/ Base   1.00 ls  | Concrete Pad - Transformer  | 500     | sf   | \$40.00      | /sf   | \$20,000    |
| Concrete Stairs & Landings, pads @ egress   1,050 sf   \$80.00 /sf   \$84,000     G2052 Retaining Walls   \$1.39 / GSF   \$531,170     Retaining Walls Complete \$/lf - segmental   492 lf   \$560.00 /lf   \$275,520     Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF   14 cy   \$2,000.00 /cy   \$28,000     AT CONTAINTERS   116 cy   \$1,400.00 /cy   \$162,400     Retaining Wall - Concrete (CIP) - complete, footing & wall   116 cy   \$9,000 /cy   \$65,250     G2056 Signage   \$0.08 / GSF   \$30,000   \$30,000   \$30,000   \$30,000   \$30,000     Custom Site / Building Sign Allowance   1.00 allw   \$30,000.00 /allw   \$30,000   \$30,000   \$30,000   \$30,000     G2059 Other Site Improvements   \$0.81 / S150.00 /lf   \$148,275   \$0.88 / GSF   \$305,200     Metal Guard Railing, Vehicular   3,295 lf   \$450.00 /lf   \$13,200     Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway   423 lf   \$150.00 /lf   \$63,600     Flagpoles w/ Base   1.00 ls   \$10,000.00 /sis   \$10,000   \$10,000.00 /sis   \$10,000     G2061.4 Site Furnishings   \$1.624,870   \$4.25 / GSF<  | Concrete Pad @ Team Bench W Overhead Shade  | 0.00    | alt  |              |       | \$0         |
| G2052 Retaining Walls     \$1.39 / GSF     \$531,170       Retaining Walls Complete \$/lf - segmental     492 lf     \$560.00 /lf     \$275,520       Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF     14 cy     \$2,000.00 /cy     \$28,000       AT CONTAINTERS     725 cy     \$90.00 /cy     \$162,400       Retaining Walls - Crushed Stone Base     725 cy     \$90.00 /cy     \$65,250       G2056 Signage     \$0.08 / GSF     \$30,000       Custom Site / Building Sign Allowance     1.00 allw     \$30,000.00 /allw     \$30,000       G2059 Other Site Improvements     \$0.80 / GSF     \$303,000       Metal Guard Railing, Vehicular     3,295 lf     \$45.00 /lf     \$13,200       Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway     423 lf     \$150.00 /lf     \$13,200       Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway     423 lf     \$150.00 /lf     \$66,675       Metal Pipe Bollards - Exterior     53 ea     \$1,200.00 /ls     \$16,000       Flagpoles w/ Base     1.00 ls     \$10,000 /ls     \$1,620,470       G2061.4 Site Furnishings     \$4.25 / GSF     \$1,624,870       Backless Wood   | Concrete Stairs & Landings, pads @ egress   | 1,050   | sf   | \$80.00      | /sf   | \$84,000    |
| Retaining Walls Complete \$/if - segmental   492   If   \$560.00   \$275,520     Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF   14   cy   \$2,000.00   /cy   \$28,000     AT CONTAINTERS   116   cy   \$1,400.00   /cy   \$162,400     Retaining Wall - Concrete (CIP) - complete, footing & wall   116   cy   \$1,400.00   /cy   \$162,400     Retaining Walls - Crushed Stone Base   725   cy   \$90.00   /cy   \$652,520     G2056 Signage   \$0.08   /GSF   \$30,000   \$30,000   /allw   \$30,000     Custom Site / Building Sign Allowance   1.00   allw   \$30,000.00   /allw   \$30,000     G2059 Other Site Improvements   \$0.80   /GSF   \$305,200     Metal Guard Railing, Vehicular   3,295   If   \$45.00   /If   \$148,275     Guardrail, Integral to CIP Retaining Wall   88   If   \$150.00   /If   \$13,200     Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway   423   If   \$150.00   /If   \$66,75     Metal Pipe Bollards - Exterior   53   ea   \$1,200.00   | G2052 Retaining Walls   |         |      | \$1.39 /     | ' GSF | \$531,170   |
| Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF<br>AT CONTAINTERS14cy\$2,000.0\$28,000Retaining Wall - Concrete (CIP) - complete, footing & wall116cy\$1,400.0/cy\$162,400Retaining Walls - Crushed Stone Base725cy\$90.00/cy\$65,250G2056 Signage\$0.08/ GSF\$30,000/allw\$30,000/allw\$30,000Custom Site / Building Sign Allowance1.00allw\$30,000.0/allw\$30,000\$30,000G2059 Other Site Improvements\$0.80/ GSF\$305,200\$305,200\$425,200\$425,200Metal Guard Railing, Vehicular3,295If\$45.00/lf\$148,275Guardrail, Integral to CIP Retaining Wall88If\$150.00/lf\$13,200Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway423If\$150.00/lf\$66,675Metal Pipe Bollards - Exterior53ea\$1,200.00/ea\$63,600Flagpoles w/ Base1.00Is\$10,000.00/ls\$10,000G2061.4 Site Furnishings\$1If\$2,000.00/lf\$62,000Perforated Metal Panel, 6' x 11 If11If\$2,000.00/lf\$22,000Pre-engineeered Boardwalk Ramp System7,420sf\$150.00/sf\$1,113.000  | Retaining Walls Complete \$/If - segmental  | 492     | lf   | \$560.00     | /lf   | \$275,520   |
| Retaining Wall - Concrete (CIP) - complete, footing & wall   116   cy   \$1,400.00   /cy   \$162,400     Retaining Walls - Crushed Stone Base   725   cy   \$90.00   /cy   \$65,250     G2056 Signage   \$0.08   /GSF   \$30,000   \$30,000   /allw   \$30,000   /allw   \$30,000     Custom Site / Building Sign Allowance   1.00   allw   \$30,000.00   /allw   \$30,000     G2059 Other Site Improvements   \$0.80   /GSF   \$305,200     Metal Guard Railing, Vehicular   3,295   If   \$45.00   /If   \$148,275     Guardrail, Integral to CIP Retaining Wall   88   If   \$150.00   /If   \$13,200     Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway   423   If   \$150.00   /If   \$63,450     Sand Pit w CIP 8" wall / curb   89   sf   \$75.00   /sf   \$66,675     Metal Pipe Bollards - Exterior   53   ea   \$1,200.00   /ls   \$10,000     Flagpoles w/ Base   1.00   Is   \$10,000.00   /ls   \$10,000   \$162,4870     Backless Wood Bench w Perforated Metal Skirting & L   | Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF<br>AT CONTAINTERS              | 14      | су   | \$2,000.00 , | /cy   | \$28,000    |
| Retaining Walls - Crushed Stone Base   725 cy   \$90.00 /cy   \$65,250     G2056 Signage   \$0.08 / GSF   \$30,000     Custom Site / Building Sign Allowance   1.00 allw   \$30,000.0 /allw   \$30,000     G2059 Other Site Improvements   \$0.80 / GSF   \$305,200     Metal Guard Railing, Vehicular   3,295 lf   \$45.00 /lf   \$148,275     Guardrail, Integral to CIP Retaining Wall   88 lf   \$150.00 /lf   \$13,200     Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway   423 lf   \$150.00 /lf   \$63,600     Sand Pit w CIP 8" wall / curb   89 sf   \$75.00 /sf   \$63,600     Flagpoles w/ Base   1.00 ls   \$10,000.0 /ls   \$10,000     G2061.4 Site Furnishings   \$4.25 / GSF   \$1,624,870     Backless Wood Bench w Perforated Metal Skirting & LED Lighitng   31 lf   \$2,000.00 /lf   \$62,000     Perforated Metal Panel, 6' x 11 lf   11 lf   \$2,000.00 /lf   \$22,000     Pre-engineeered Boardwalk Ramp System   7,420 sf   \$150.00 /sf   \$1,113,000   | Retaining Wall - Concrete (CIP) - complete, footing & wall                                  | 116     | су   | \$1,400.00   | /cy   | \$162,400   |
| G2056 Signage   \$0.08 / GSF   \$30,000     Custom Site / Building Sign Allowance   1.00 allw   \$30,000.00 / allw   \$30,000     G2059 Other Site Improvements   \$0.80 / GSF   \$305,200     Metal Guard Railing, Vehicular   3,295 lf   \$45.00 /lf   \$148,275     Guardrail, Integral to CIP Retaining Wall   88 lf   \$150.00 /lf   \$13,200     Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway   423 lf   \$150.00 /lf   \$66,675     Sand Pit w CIP 8" wall / curb   89 sf   \$75.00 /sf   \$66,675     Metal Pipe Bollards - Exterior   53 ea   \$1,200.00 /ls   \$10,000     Flagpoles w/ Base   1.00 ls   \$10,000.00 /ls   \$10,000     G2061.4 Site Furnishings   \$4.25 / GSF   \$1,624,870     Backless Wood Bench w Perforated Metal Skirting & LED Lighitng   31 lf   \$2,000.00 /lf   \$62,000     Perforated Metal Panel, 6' x 11 lf   11 lf   \$2,000.00 /lf   \$22,000     Pre-engineeered Boardwalk Ramp System   7,420 sf   \$150.00 /sf   \$1,113,000  | Retaining Walls - Crushed Stone Base  | 725     | су   | \$90.00      | /cy   | \$65,250    |
| Custom Site / Building Sign Allowance1.00 allw\$30,000.00 /allw\$30,000G2059 Other Site Improvements\$0.80 / GSF\$305,200Metal Guard Railing, Vehicular3,295 lf\$45.00 /lf\$148,275Guardrail, Integral to CIP Retaining Wall88 lf\$150.00 /lf\$13,200Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway423 lf\$150.00 /lf\$63,450Sand Pit w CIP 8" wall / curb89 sf\$75.00 /sf\$66,675Metal Pipe Bollards - Exterior53 ea\$1,200.00 /lea\$63,600Flagpoles w/ Base1.00 ls\$10,000.00 /ls\$10,000G2061.4 Site Furnishings\$4.25 / GSF\$1,624,870Backless Wood Bench w Perforated Metal Skirting & LED Lighitng31 lf\$2,000.00 /lf\$62,000Perforated Metal Panel, 6' x 11 lf11 lf\$2,000.00 /lf\$22,000Pre-engineeered Boardwalk Ramp System7,420 sf\$150.00 /sf\$1,113,000   | G2056 Signage   |         |      | \$0.08 /     | GSF   | \$30,000    |
| G2059 Other Site Improvements\$0.80 / GSF\$305,200Metal Guard Railing, Vehicular3,295 lf\$45.00 /lf\$148,275Guardrail, Integral to CIP Retaining Wall88 lf\$150.00 /lf\$13,200Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway423 lf\$150.00 /lf\$63,450Sand Pit w CIP 8" wall / curb89 sf\$75.00 /sf\$66,675Metal Pipe Bollards - Exterior53 ea\$1,200.00 /ls\$63,600Flagpoles w/ Base1.00 ls\$10,000.00 /ls\$10,000G2061.4 Site Furnishings\$4.25 / GSFBackless Wood Bench w Perforated Metal Skirting & LED Lighitng31 lf\$2,000.00 /lf\$62,000Perforated Metal Panel, 6' x 11 lf11 lf\$2,000.00 /lf\$22,000Pre-engineeered Boardwalk Ramp System7,420 sf\$150.00 /sf\$1,113,000  | Custom Site / Building Sign Allowance   | 1.00    | allw | \$30,000.00  | /allw | \$30,000    |
| Metal Guard Railing, Vehicular3,295If\$45.00/If\$148,275Guardrail, Integral to CIP Retaining Wall88If\$150.00/If\$13,200Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway423If\$150.00/If\$63,450Sand Pit w CIP 8" wall / curb89sf\$75.00/sf\$66,675Metal Pipe Bollards - Exterior53ea\$1,200.00/ea\$63,600Flagpoles w/ Base1.00ls\$10,000.00/ls\$10,000G2061.4 Site Furnishings\$4.25GSF\$1,624,870Backless Wood Bench w Perforated Metal Skirting & LED Lighitng31If\$2,000.00/lf\$22,000Perforated Metal Panel, 6' x 11 If11If\$2,000.00/lf\$22,000Pre-engineeered Boardwalk Ramp System7,420sf\$150.00/sf\$1,113,000  | G2059 Other Site Improvements   |         |      | \$0.80 /     | GSF   | \$305,200   |
| Guardrail, Integral to CIP Retaining Wall88If\$150.00/If\$13,200Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway423If\$150.00/If\$63,450Sand Pit w CIP 8" wall / curb89sf\$75.00/sf\$66,675Metal Pipe Bollards - Exterior53ea\$1,200.00/ea\$63,600Flagpoles w/ Base1.00Is\$10,000.00/Is\$10,000G2061.4 Site Furnishings\$4.25/ GSF\$1,624,870Backless Wood Bench w Perforated Metal Skirting & LED Lighitng31If\$2,000.00/If\$62,000Perforated Metal Panel, 6' x 11 If11If\$2,000.00/If\$22,000Pre-engineeered Boardwalk Ramp System7,420sf\$150.00/sf\$1,113,000  | Metal Guard Railing. Vehicular  | 3.295   | lf   | \$45.00      | /lf   | \$148.275   |
| Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway423 lf\$150.00 /lf\$63,450Sand Pit w CIP 8" wall / curb89 sf\$75.00 /sf\$66,675Metal Pipe Bollards - Exterior53 ea\$1,200.00 /ea\$63,600Flagpoles w/ Base1.00 ls\$10,000.00 /ls\$10,000G2061.4 Site Furnishings\$4.25 / GSF\$1,624,870Backless Wood Bench w Perforated Metal Skirting & LED Lighitng31 lf\$2,000.00 /lf\$62,000Perforated Metal Panel, 6' x 11 lf11 lf\$2,000.00 /lf\$22,000Pre-engineeered Boardwalk Ramp System7,420 sf\$150.00 /sf\$1,113,000   | Guardrail, Integral to CIP Retaining Wall   | 88      | lf   | \$150.00     | /lf   | \$13,200    |
| Sand Pit w CIP 8" wall / curb89 sf\$75.00 /sf\$6,675Metal Pipe Bollards - Exterior53 ea\$1,200.00 /ea\$63,600Flagpoles w/ Base1.00 ls\$10,000.00 /ls\$10,000G2061.4 Site Furnishings\$4.25 / GSF\$1,624,870Backless Wood Bench w Perforated Metal Skirting & LED Lighitng31 lf\$2,000.00 /lf\$62,000Perforated Metal Panel, 6' x 11 lf11 lf\$2,000.00 /lf\$22,000Pre-engineeered Boardwalk Ramp System7,420 sf\$150.00 /sf\$1,113,000  | Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway                              | 423     | lf   | \$150.00     | /lf   | \$63.450    |
| Metal Pipe Bollards - Exterior   53 ea   \$1,200.00 /ea   \$63,600     Flagpoles w/ Base   1.00 ls   \$10,000.00 /ls   \$10,000     G2061.4 Site Furnishings   \$4.25 / GSF   \$1,624,870     Backless Wood Bench w Perforated Metal Skirting & LED Lighitng   31 lf   \$2,000.00 /lf   \$62,000     Perforated Metal Panel, 6' x 11 lf   11 lf   \$2,000.00 /lf   \$22,000     Pre-engineeered Boardwalk Ramp System   7,420 sf   \$150.00 /sf   \$1,113,000  | Sand Pit w CIP 8" wall / curb   | 89      | sf   | \$75.00      | /sf   | \$6,675     |
| Flagpoles w/ Base   1.00 ls   \$10,000.00 /ls   \$10,000     G2061.4 Site Furnishings   \$4.25 / GSF   \$1,624,870     Backless Wood Bench w Perforated Metal Skirting & LED Lighitng   31 lf   \$2,000.00 /lf   \$62,000     Perforated Metal Panel, 6' x 11 lf   11 lf   \$2,000.00 /lf   \$22,000     Pre-engineeered Boardwalk Ramp System   7,420 sf   \$150.00 /sf   \$1,113,000   | Metal Pipe Bollards - Exterior  | 53      | ea   | \$1,200.00   | /ea   | \$63,600    |
| G2061.4 Site Furnishings\$4.25 / GSF\$1,624,870Backless Wood Bench w Perforated Metal Skirting & LED Lighitng31 lf\$2,000.00 /lf\$62,000Perforated Metal Panel, 6' x 11 lf11 lf\$2,000.00 /lf\$22,000Pre-engineeered Boardwalk Ramp System7,420 sf\$150.00 /sf\$1,113,000  | Flagpoles w/ Base   | 1.00    | ls   | \$10,000.00  | /ls   | \$10,000    |
| Backless Wood Bench w Perforated Metal Skirting & LED Lighitng31 lf\$2,000.00 /lf\$62,000Perforated Metal Panel, 6' x 11 lf11 lf\$2,000.00 /lf\$22,000Pre-engineeered Boardwalk Ramp System7,420 sf\$150.00 /sf\$1,113,000   | G2061.4 Site Furnishings  |         |      | \$4.25 /     | ' GSF | \$1,624,870 |
| Perforated Metal Panel, 6' x 11 lf11 lf\$2,000.00 /lf\$22,000Pre-engineeered Boardwalk Ramp System7,420 sf\$150.00 /sf\$1,113,000  | Backless Wood Bench w Perforated Metal Skirting & LED Lighitng                              | 31      | lf   | \$2,000.00   | /lf   | \$62,000    |
| Pre-engineeered Boardwalk Ramp System 7,420 sf \$150.00 /sf \$1,113.000  | Perforated Metal Panel, 6' x 11 lf  | 11      | lf   | \$2,000.00   | /lf   | \$22,000    |
|  | Pre-engineeered Boardwalk Ramp System   | 7,420   | sf   | \$150.00     | /sf   | \$1,113,000 |

60% CD Estimate - Reconciled incl VE



| SCRIPTION  | QUANT   | ΓΙΤΥ | UNIT CC              | ST    | TOTAL COST  |
|--|---------|------|----------------------|-------|-------------|
| Pre-engineeered Boardwalk Stairs System  | 1,811   | sf   | \$170.00             | /sf   | \$307,870   |
| Wood Deck  | 404     | sf   | \$125.00             | /sf   | \$50,500    |
| Cafe Tables & Seats  | 17      | ea   | \$2,500.00           | /ea   | \$42,500    |
| Recycling / Trash Receptacle   | 2.00    | ea   | \$1,500.00           | /ea   | \$3,000     |
| Concession Table & Bench   | 0.00    | alt  |                      |       | \$0         |
| Gabion Fence Wall w Metal Signage  | 24      | lf   | \$1,000.00           | /lf   | \$24,000    |
| Gabion Seat Wall w Wood Top - Curved   | 42      | lf   | \$750.00             | /lf   | \$31,500    |
| Gabion Seat Wall w Wood Top - Straight   | 44      | lf   | \$500.00             | /lf   | \$22,000    |
| Gabion Seat Wall w Wood Top - VE / Make Add Alt  | -1.00   | ls   | \$53 <i>,</i> 500.00 | /ls   | (\$53,500)  |
| Metal Shipping containers - excluded - still shown but previous VE / FFE                                       | 0.00    | ea   |                      |       | \$0         |
| G2062 Fences & Gates   |         |      | \$0.53               | / GSF | \$203,500   |
| Site Fencing - Ornamental - metal stair w integrated guardrail -<br>NW roof                                    | 1.00    | allw | \$5,000.00           | /allw | \$5,000     |
| Site Fencing - perforate metal screen panel - 8' ht (rooftop play area) - PER RECON, ADJUSTED TO STEEL PICKETT | 97      | lf   | \$350.00             | /lf   | \$33,950    |
| Vehicle Access Gates   | 1.00    | ls   | \$25,000.00          | /ls   | \$25,000    |
| Site Fencing - 4'-0" high, Black Vinyl coated  | 2,498   | lf   | \$40.00              | /lf   | \$99,920    |
| Site Fencing - 6'-0" high, Black Vinyl coated  | 183     | lf   | \$50.00              | /lf   | \$9,150     |
| Site Fencing - 8'-0" high, Black Vinyl coated  | 281     | lf   | \$60.00              | /lf   | \$16,860    |
| Site Fencing - Horizontal Wood Slat 8'-0" high   | 27      | lf   | \$150.00             | /lf   | \$4,050     |
| Site Fencing - 10'-0" high, Black Vinyl coated   | 24      | lf   | \$80.00              | /lf   | \$1,920     |
| Site Gate - 4'-0" high   | 10      | ea   | \$250.00             | /ea   | \$2,500     |
| Site Gate - 6'-0" high   | 2.00    | ea   | \$275.00             | /ea   | \$550       |
| Site Gate - 8'-0" high   | 10      | ea   | \$375.00             | /ea   | \$3,750     |
| Site Gate -10'-0" high   | 2.00    | ea   | \$425.00             | /ea   | \$850       |
| G2080 LANDSCAPING  |         |      | \$3.42               | / GSF | \$1,310,276 |
| G2061.4 Site Furnishings   |         |      | \$0.14               | / GSF | \$55,000    |
| Seating Boulder - Furnish and Set, assume imported (ave weight > 2 tons ea)                                    | 11      | еа   | \$5,000.00           | /ea   | \$55,000    |
| G2081 Planting Irrigation  |         |      | \$0.85               | / GSF | \$324,141   |
| Irrigate natural turf baseball field   | 1.00    | ls   | \$65,000.00          | /ls   | \$65,000    |
| Irrigate natural turf football field   | 89,427  | sf   | \$1.50               | /sf   | \$134,141   |
| Planting Irrigation Complete - allow   | 1.00    | ls   | \$125,000.00         | /ls   | \$125,000   |
| G2082 Turf & Grasses   |         |      | \$1.57               | / GSF | \$601,250   |
| Topsoil / Loam - From Stockpile - F&I  | 4,250   | су   | \$15.00              | /cy   | \$63,750    |
| Topsoil / Loam - Off-Site - F&I  | 4,250   | су   | \$38.00              | /cy   | \$161,500   |
| Topsoil / Loam - PER RECONCILIATION - INCREASE QTY OF IMPORTED LOAM  | 2,000   | су   | \$38.00              | /cy   | \$76,000    |
| Topsoil / Loam- PER RECONCILIATION - INCREASE Unit Price OF<br>IMPORTED LOAM                                   | 6,250   | су   | \$19.20              | /cy   | \$120,000   |
| Hydroseeding (Includes Fine Grade)   | 300,000 | sf   | \$0.50               | /sf   | \$150,000   |
| Wetland Replication Allowance  | 2,000   | sf   | \$15.00              | /sf   | \$30,000    |
| G2083 Plants   |         |      | \$0.86               | / GSF | \$329,885   |
| Groundcover - Pennsylvania Sedge - plugs   | 451     | ea   | \$7.50               | /ea   | \$3,383     |

#### 60% CD Estimate - Reconciled incl VE



| Groundcover - Pernoyhania Sedge - plugs - PER RECON - DELETE     -451.00     ea     \$7.50     /ea     \$13,831       PENN SEGE     Ornamental Grasses - Tufted Hair Grass - plugs     2,922     ea     \$7.50     /ea     \$19,440       Shrubs - Gro-Low Fragmant Sumac - 1 gal     300     ea     \$15,500     /ea     \$51,500       01 - October Giory Red Maple - 3* - 3.5" cal     300     ea     \$55,000     /ea     \$56,500       02 - Red Maple - 1" cal     800     ea     \$51,0000     /ea     \$56,000       03 - Dawn Redwood - 3* cal     8.00     ea     \$51,000.00     /ea     \$51,000       05 - Burr Oak - 2.5" cal     29     ea     \$51,000.00     /ea     \$53,000       06 - Redpoint Maple - 2.5" cal     5.00     ea     \$77,000     /ea     \$51,000       07 - Sugar Maple - 2.5" cal     1.00     ea     \$77,000     /ea     \$51,0000       08 - Chump Paper Birch - 10*1' ht     1.00     ea     \$71,000.00     /ea     \$51,0000       10 - Heritage Birch - 10*2' ht     1.00     ea     \$1,000.00     /ea <td< th=""><th>DESCRIPTION</th><th>QUANT</th><th>TITY</th><th>UNIT CC</th><th>DST</th><th>TOTAL COST</th></td<>   | DESCRIPTION   | QUANT   | TITY | UNIT CC     | DST      | TOTAL COST  |
|--|---|---------|------|-------------|----------|-------------|
| Ornamental Grasses - Tufket Hair Grass - plugs     2,592     ea     \$7,500     /ea     \$51,500       O1     October Glory Red Maple - 3"-3.5" cal     300     ea     \$51,500     /ea     \$56,500       O2     Red Maple - 1" cal     10     ea     \$560,000     /ea     \$56,600       O3     Pawn Retwood - 3" cal     800     ea     \$1,200.00     /ea     \$51,1700       O5     Burr Oak - 2.5" cal     29     ea     \$1,100.00     /ea     \$33,350       O7     Sugar Maple - 2.5" cal     5.00     ea     \$1,100.00     /ea     \$33,350       O7     Sugar Maple - 2.5" cal     5.00     ea     \$1,000.00     /ea     \$3,600       O8     Clump Pape Birch - 7.8" ht     22     ea     \$575.00     /ea     \$3,600       O8     Clump Pape Birch - 7.8" ht     1.00     ea     \$51,000.0     /ea     \$56,000       O1     Heritage Birch - 10-12" ht     1.00     ea     \$51,000.0     /ea     \$51,000       11     Whitesprice Birch - 12" cla'     300  | Groundcover - Pennsylvania Sedge - plugs - PER RECON - DELETE<br>PENN SEDGE | -451.00 | еа   | \$7.50      | /ea      | (\$3,383)   |
| Shrubs - Grot.ow Fragrant Sumar - 1 gal     202 ea     \$75,000 /ea     \$15,150       01 - October Glory Red Maple - 3" - 3.5" cal     3.00     ea     \$51,550.00 /ea     \$56,500       03 - Dawn Redwood - 3" cal     8.00     ea     \$51,400.00 /ea     \$56,500       03 - Dawn Redwood - 3" cal     8.00     ea     \$51,400.00 /ea     \$51,000       04 - White Cak - 1.5" cal     29     ea     \$1,1000     \$65,000       05 - Burr Oak - 2.5" cal     29     ea     \$1,0000 /ea     \$53,300       07 - Sugar Maple - 2.5" cal     20     ea     \$51,0000 /ea     \$51,000       08 - Clump Paper Birch - 1.7.8" ht     22     ea     \$75,000 /ea     \$14,450       10 - Heritage Birch - 10-12' ht     1.00     ea     \$1,00000 /ea     \$50,000       12 - Remaissance Urpite Paper Birch - 12' - 14'     9.00     ea     \$1,00000 /ea     \$50,000       13 - American Beach - 2.5" cal     8.00     ea     \$1,00000 /ea     \$54,000       14 - Black Gum - 2.5" cal     10     ea     \$1,00000 /ea     \$22,300       15 - Swamp White Oak - 3" cal     12  | Ornamental Grasses - Tufted Hair Grass - plugs                              | 2,592   | ea   | \$7.50      | /ea      | \$19,440    |
| 01 - October Glory Red Maple - 1" cal   3.00   ea   \$1,550.00   /ea   \$5,650.00     02 - Red Maple - 1" cal   10   ea   \$5,600.00   /ea   \$5,600.00     03 - Dawn Redwood - 3" cal   18   ea   \$5,200.00   /ea   \$5,11,700.00     05 - Burr Oak - 2.2 S" cal   18   ea   \$5,600.00   /ea   \$5,11,700.00   /ea   \$5,11,700.00   /ea   \$5,11,700.00   /ea   \$5,11,700.00   /ea   \$5,11,700.00   /ea   \$5,100.00   /ea   \$5,600   12   Henritagene Birch - 12.4* 1H   1.00   ea   \$1,000.00   /ea   \$5,600   12   Henritagene Birch - 12.4* 1H   1.00   ea   \$1,000.00   /ea   \$5,600   12   Henritagene Birch - 12.4* 1H   1.00   ea   \$1,000.00   /ea   \$2,000   10   \$1,000.00   /ea  | Shrubs - Gro-Low Fragrant Sumac - 1 gal                                     | 202     | ea   | \$75.00     | /ea      | \$15,150    |
| 02 - Red Maple - 1° cal     10 ea     \$650.00 /ea     \$54,000.0       03 - Dawn Redwood - 3° cal     8.00 ea     \$1,200.00 /ea     \$59,600       04 - White Oak - 1.5° cal     18 ea     \$660.00 /ea     \$11,700       05 - Burr Oak - 22.5° cal     8.00 ea     \$1,400.00 /ea     \$33,350       06 - Redpoint Maple - 2.5° cal     29 ea     \$1,500.00 /ea     \$53,000       06 - Redpoint Maple - 2.5° cal     20 ea     \$73,500.0 /ea     \$14,550       07 - Sugar Maple - 2.5° cal     20 ea     \$73,500.0 /ea     \$14,550       08 - Clump Paper Birch - 10-12' ht     1.00 ea     \$75,000 /ea     \$56,000       10 - Heritage Birch - 10-12' ht     6.00 ea     \$1,000.00 /ea     \$56,000       12 - Remaissance Upright Paper Birch - 12' - 14'     9.00 ea     \$1,000.00 /ea     \$84,000       13 - American Beech - 2.5° cal     10 ea     \$1,000.00 /ea     \$84,000       14 - Black Gum - 2.5° cal     10 ea     \$1,000.00 /ea     \$84,000       15 - Swamp White Oak - 3° cal     12 ea     \$1,300.00 /ea     \$24,700       17 - American Eim - 2.5 °a' cal     12 ea     \$775.00 /ea     \$94,200  | 01 - October Glory Red Maple - 3" - 3.5" cal                                | 3.00    | ea   | \$1,550.00  | /ea      | \$4,650     |
| 03 - Dawn Redwood - 3" cal     8.00 ea     \$1,200.00 /ea     \$95,600       04 - White Dak - 1.5" cal     18 ea     \$560.00 /ea     \$11,700       05 - Burr Oak - 2.52" cal     29 ea     \$1,100.00 /ea     \$33,380       07 - Sugar Maple - 2.5" cal     20 ea     \$1,500.00 /ea     \$33,380       07 - Sugar Maple - 2.5" cal     20 ea     \$1,000.00 /ea     \$35,000       08 - Clump Paper Birch - 7.8" ht     22 ea     \$750.00 /ea     \$1,450.00       09 - Dura Heat River Birch - 12" ht     1.00 ea     \$575.00 /ea     \$1,450.00       10 - Heritage Birch - 12" ht     1.00 ea     \$1,100.00 /ea     \$50.00       11 - Whitespire Birch - 12" ht     1.00 ea     \$1,000.00 /ea     \$50.00       13 - American Beech - 2.5" cal     10 ea     \$1,000.00 /ea     \$80.00       14 Biack Gum - 2.5" cal     10 ea     \$1,300.00 /ea     \$27,300       15 - Swamp White Oak - 3" cal     21 ea     \$1,300.00 /ea     \$27,300       16 - Red Codar - 7-8'     12 ea     \$7,300.00 /ea     \$24,700       18 - Eastern Red Cedar - 7-8'     12 ea     \$7,500.0 /ea     \$24,700       19 - Pittc  | 02 - Red Maple - 1" cal   | 10      | ea   | \$650.00    | /ea      | \$6,500     |
| 04 - White Oak - 1.5" cal   18 ea   \$54,000, /ea   \$51,1700     05 - Burr Oak - 2.5" cal   8.00 ea   \$1,400,00 /ea   \$51,000     06 - Redpoint Maple - 2.5" cal   5.00 ea   \$1,150,00 /ea   \$53,000     07 - Sugar Maple - 2.5" cal   5.00 ea   \$1,000,00 /ea   \$53,000     08 - Clump Paper Birch - 7-8' ht   2.0 ea   \$755,00 /ea   \$1,455,00     10 - Heritage Birch - 10-12' ht   1.00 ea   \$755,00 /ea   \$1,455,00     11 - Whitespire Birch - 12-14' ht   6.00 ea   \$1,000,00 /ea   \$50,00     12 - Renaissance Upright Paper Birch - 12' - 14'   9.00 ea   \$1,000,00 /ea   \$50,000     13 - American Beach - 2.5" cal   8.00 ea   \$1,000,00 /ea   \$80,000     14 - Black Gum - 2.5" cal   8.00 ea   \$1,000,00 /ea   \$82,000     15 - Swamp White Oak - 3" cal   7.00 ea   \$1,200,00 /ea   \$82,000     16 - Red Oak - 2.5" -3" cal   12 ea   \$1,300,00 /ea   \$24,700     17 - American Em - 2.5-3" cal   12 ea   \$1,300,00 /ea   \$24,700     19 - Pitch Pine - 6-7' ht   14 ea   \$50,000 /ea   \$24,700     20 - White Pine - 8-10' ht   12 ea   \$755,00 /   | 03 - Dawn Redwood - 3" cal  | 8.00    | ea   | \$1,200.00  | /ea      | \$9,600     |
| 05 - Burr OAk -22.5" cal     8.00     ea     \$1,400.00     /ea     \$11,200       06 - Redpoint Maple -2.5" cal     29     ea     \$1,1000.0     /ea     \$33,350       07 - Sugar Maple - 2.5" cal     2.00     ea     \$1,000.0     /ea     \$51,000.0     /ea <t< td=""><td>04 - White Oak - 1.5" cal</td><td>18</td><td>ea</td><td>\$650.00</td><td>/ea</td><td>\$11,700</td></t<>   | 04 - White Oak - 1.5" cal   | 18      | ea   | \$650.00    | /ea      | \$11,700    |
| 06 - Redpoint Maple - 2.5" al cal     29 ea S1,150.00 /ea S33,350       07 - Sugar Maple - 2.5" cal     5.00 ea     S1,000.00 /ea     S5,000       08 - Clump Paper Birch - 7.8' ht     2.2 ea     S750.00 /ea     S1,450       09 - Dura Heat River Birch - 6.7' ht     2.00 ea     S750.00 /ea     S1,450       10 - Heritage Birch - 10-12' ht     1.00 ea     S750.00 /ea     S720.00     Fa     S720.00     Fa     S720.00     Fa     S720.00     Fa     S820.00     Fa     S21.200.00 /ea     S20.270.00     Fa     S20.270.00     Fa     S20.270.00     Fa     S20.270.00     Fa     S22.700     Fa     S20.270.00     Fa     S22.700.00     Fa     S22.700.0     Fa     S2   | 05 - Burr Oak - 2-2.5" cal  | 8.00    | ea   | \$1,400.00  | /ea      | \$11,200    |
| 07 - Sugar Maple - 2.5" cal 5.00 ea \$1,000.00 /ea \$5,000   08 - Clump Paper Birch - 7.8' ht 22 ea \$750.00 /ea \$16,500   09 - Dura Heat River Birch - 6.7' ht 2.00 ea \$725.00 /ea \$1,450   10 - Heritage Birch - 10-12' ht 1.00 ea \$750.00 /ea \$5,600   11 - Whitespire Birch - 12' + 14' 9.00 ea \$1,000.00 /ea \$5,000   12 - Renaissance Unright Paper Birch - 12' - 14' 9.00 ea \$1,000.00 /ea \$5,000   13 - American Beech - 2.5" cal 10 ea \$1,000.00 /ea \$8,000   15 - Swamp White Oak - 3" cal 7.00 ea \$1,000.00 /ea \$8,000   16 - Red Oak - 2.5" - 3" cal 19 ea \$1,300.00 /ea \$24,700   18 - Eastern Red Cedar - 7-8' 12 ea \$735.00 /ea \$24,700   18 - Eastern Red Cedar - 7-8' 12 ea \$735.00 /ea \$24,700   21 - White Pine - 8-10' ht 14 ea \$900.00 /ea \$24,700   21 - White Pine - 8-10' ht 12 ea \$755.00 /ea \$3,450   23 - Autumn Brilliance Serviceberry - 7-8' ht 10 ea \$575.00 /ea \$3,450   23 - Autumn Brilliance Serviceberry - 7-8' ht 12 ea \$750.00 /ea \$9,000   24 - Donald Wyman Crabapple - 2"-2.5" cal 10 e \$10,000.00 /s \$10,002.00   | 06 - Redpoint Maple - 2.5" - 3" cal   | 29      | ea   | \$1,150.00  | /ea      | \$33,350    |
| 08 - Clump Paper Birch - 7-8' ht     22 ea     \$750.00 /ea     \$115.00       09 - Dura Heat River Birch - 6-7' ht     2.00 ea     \$755.00 /ea     \$14.50       10 - Heritage Birch - 10-12' ht     1.00 ea     \$750.00 /ea     \$51.500       11 - Whitespire Birch - 12'-14'     9.00 ea     \$1.000.00 /ea     \$50.00       12 - Renaissance Upright Paper Birch - 12' - 14'     9.00 ea     \$1.000.00 /ea     \$50.00       13 - American Beach - 2.5" cal     10 ea     \$1.000.00 /ea     \$88.00       15 - Swamp White Oak - 3" cal     7.00 ea     \$1.200.00 /ea     \$84.00       16 - Red Oak - 2.5" - 3" cal     19 ea     \$1.300.00 /ea     \$24.700       18 - Eastern Red Cedar - 7-8'     12 ea     \$785.00 /ea     \$24.700       19 - Pitch Pine - 6-7' ht     14 ea     \$900.00 /ea     \$21.400       20 - White Pine - 8-10' ht     12 ea     \$785.00 /ea     \$3.450       21 - White Pine - 8-10' ht     12 ea     \$750.00 /ea     \$3.450       22 - Downy Serviceberry - 4.55' ht     12 ea     \$750.00 /ea     \$3.450       23 - Autumn Brilliance Serviceberry - 7-8' ht     12 ea     \$750.00 /ea     \$3.450 <td>07 - Sugar Maple - 2.5" cal</td> <td>5.00</td> <td>ea</td> <td>\$1,000.00</td> <td>/ea</td> <td>\$5,000</td>  | 07 - Sugar Maple - 2.5" cal   | 5.00    | ea   | \$1,000.00  | /ea      | \$5,000     |
| 09 - Dura Heat River Birch - 6-7' ht     2.00     ea     \$725.00     /ea     \$51450       10 - Heritage Birch - 10-12' ht     1.00     ea     \$5750.00     /ea     \$5660       11 - Whitespire Birch - 12' 14'     9.00     ea     \$1,000.00     /ea     \$9,000       13 - American Beech - 2.5" cal     10     ea     \$1,000.00     /ea     \$8,000       14 - Black Gum - 2.5" cal     7.00     ea     \$1,200.00     /ea     \$8,800       15 - Swamp White Oak - 3" cal     7.00     ea     \$1,300.00     /ea     \$8,400       16 - Red Oak - 2.5" - 3" cal     19     ea     \$1,300.00     /ea     \$24,700       18 - Eastern Red Cedar - 7-8'     12     ea     \$785.00     /ea     \$9,420       19 - Pitch Pine - 6-7' ht     14     ea     \$900.00     /ea     \$24,700       21 - White Pine - 5-6' ht     11     ea     \$575.00     /ea     \$3,450       23 - Autumn Brilliance Serviceberry - 7-8' ht     100     Is     \$10,000.00     /Is     \$10,000       24 - Donald Wyman Crabapple - 2"-2.5" cal <td>08 - Clump Paper Birch - 7-8' ht</td> <td>22</td> <td>ea</td> <td>\$750.00</td> <td>/ea</td> <td>\$16,500</td>  | 08 - Clump Paper Birch - 7-8' ht  | 22      | ea   | \$750.00    | /ea      | \$16,500    |
| 10 - Heritage Birch - 10 - 12' ht   1.00   ea   \$750.00 /ea   \$5750     11 - Whitespire Birch - 12 - 14' ht   6.00   ea   \$1,000.00 /ea   \$55,000     12 - Renaissance Upright Paper Birch - 12' - 14'   9.00   ea   \$1,000.00 /ea   \$59,000     13 - American Beech - 2.5" cal   10   ea   \$1,000.00 /ea   \$88,000     14 - Black Gum - 2.5" cal   8.00   ea   \$1,000.00 /ea   \$88,400     15 - Swamp White Oak - 3" cal   21   ea   \$1,300.00 /ea   \$27,300     17 - American Elm - 2.5-3" cal   19   ea   \$1,300.00 /ea   \$24,700     18 - Eastern Red Cedar - 7-8'   12   ea   \$785.00 /ea   \$24,700     20 - White Pine - 8-10' ht   26   ea   \$575.00 /ea   \$24,700     21 - White Pine - 5-6' ht   11   ea   \$675.00 /ea   \$34,50     22 - Downy Serviceberry - 4.5's' ht   12   ea   \$755.00 /ea   \$34,50     23 - Auturn Brilliance Serviceberry - 7-8' ht   12   ea   \$750.00 /ea   \$9,000     Muich   1.00   Is   \$1,000.00 /Is   \$151,000   \$51,00,00   \$53,00,00 </td <td>09 - Dura Heat River Birch - 6-7' ht</td> <td>2.00</td> <td>ea</td> <td>\$725.00</td> <td>/ea</td> <td>\$1,450</td>   | 09 - Dura Heat River Birch - 6-7' ht  | 2.00    | ea   | \$725.00    | /ea      | \$1,450     |
| 11 - Whitespire Birch - 12'-14'   6.00   ea   \$1,100.00   /ea   \$5,000.00     12 - Renaissance Upright Paper Birch - 12' - 14'   9.00   ea   \$1,000.00   /ea   \$5,000.00     13 - American Beech - 2.5'' cal   10   ea   \$1,000.00   /ea   \$8,000     14 - Black Gum - 2.5'' cal   8.00   ea   \$1,200.00   /ea   \$8,000     15 - Swamp White Oak - 3'' cal   7.00   ea   \$1,200.00   /ea   \$8,400     16 - Red Oak - 2.5'' - 3'' cal   12   ea   \$1,300.00   /ea   \$24,700     17 - American Elm - 2.5-3'' cal   19   ea   \$1,300.00   /ea   \$24,700     18 - Eastern Red Cedar - 7-8'   12   ea   \$595.00   /ea   \$24,700     20 - White Pine - 6-7' ht   14   ea   \$900.00   /ea   \$24,700     21 - White Pine - 8-10' ht   12   ea   \$575.00   /ea   \$3,450     23 - Autumn Birlilance Serviceberry - 7-8' ht   12   ea   \$575.00   /ea   \$9,000     Much   1.00   Is   \$1,000.00   /is   \$15,000   \$1,42,558 </td <td>10 - Heritage Birch - 10-12' ht</td> <td>1.00</td> <td>ea</td> <td>\$750.00</td> <td>/ea</td> <td>\$750</td>  | 10 - Heritage Birch - 10-12' ht   | 1.00    | ea   | \$750.00    | /ea      | \$750       |
| 12 - Renaissance Upright Paper Birch - 12' - 14'   9.00 ea   \$1,000.00 /ea   \$5,000     13 - American Beech - 2.5'' cal   10 ea   \$1,000.00 /ea   \$5,000     14 - Black Gum - 2.5'' cal   8.00 ea   \$1,200.00 /ea   \$8,400     16 - Red Oak - 2.5'' - 3'' cal   21 ea   \$1,300.00 /ea   \$8,400     16 - Red Oak - 2.5'' - 3'' cal   19 ea   \$1,300.00 /ea   \$24,730     17 - American Elm - 2.5-3'' cal   19 ea   \$1,300.00 /ea   \$24,700     18 - Eastern Red Cedar - 7-8''   12 ea   \$785.00 /ea   \$9,420     19 - Pitch Pine - 6-7' ht   14 ea   \$900.00 /ea   \$21,600     20 - White Pine - 8-10' ht   26 ea   \$950.00 /ea   \$24,700     21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$3,450     23 - Autumn Brilliance Serviceberry - 7.8' ht   12 ea   \$755.00 /ea   \$3,450     23 - Autumn Brilliance Serviceberry - 7.8' ht   12 ea   \$755.00 /ea   \$3,450     24 - Donald Wyman Crabapple - 2''-2.5'' cal   12 ea   \$755.00 /ea   \$3,450     23 - Autumn Brilliance Serviceberry - 7.8' ht   50   \$10,000 /bi   \$10,000     Much   1.00 is   \$10,   | 11 - Whitespire Birch - 12-14' ht   | 6.00    | ea   | \$1,100.00  | /ea      | \$6,600     |
| 13 - American Beech - 2.5" cal   10 ea   \$1,000.00 /ea   \$10,000     14 - Black Gum - 2.5" cal   8.00 ea   \$1,000.00 /ea   \$8,000     15 - Swamp White Oak - 3" cal   7.00 ea   \$1,200.00 /ea   \$8,400     16 - Red Oak - 2.5" - 3" cal   11 ea   \$1,300.00 /ea   \$27,300     17 - American Elm - 2.5-3" cal   19 ea   \$1,300.00 /ea   \$24,700     18 - Eastern Red Cedar - 7-8'   12 ea   \$785.00 /ea   \$9,420     19 - Pitch Pine - 6-7' ht   14 ea   \$900.00 /ea   \$24,700     20 - White Pine - 8-10' ht   26 ea   \$95.00 /ea   \$24,700     21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$3,450     23 - Autumn Brilliance Serviceberry - 7.8' ht   6.00 ea   \$575.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   1.00 is   \$10,000.00 /is   \$10,000     Mulch   1.00 is   \$10,000.00 /is   \$10,000.00 /is   \$10,000.00 /is   \$10,000.00 /is     Stakes & Guying   0.00 incl   \$2.73 / GSF   \$1,042,658     G301 LQUID & GAS SITE UTLITIES   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 6" DI uwater service to bldg   50<  | 12 - Renaissance Upright Paper Birch - 12' - 14'                            | 9.00    | ea   | \$1,000.00  | /ea      | \$9,000     |
| 14 - Black Gum - 2.5" cal   8.00 ea   \$1,000.00 /ea   \$8,000     15 - Swamp White Oak - 3" cal   7.00 ea   \$1,200.00 /ea   \$8,400     16 - Red Oak - 2.5" - 3" cal   21 ea   \$1,300.00 /ea   \$27,300     17 - American Elm - 2.5-3" cal   19 ea   \$1,300.00 /ea   \$24,700     18 - Eastern Red Cedar - 7-8'   12 ea   \$785.00 /ea   \$24,700     20 - White Pine - 6-7' ht   14 ea   \$900.00 /ea   \$24,700     21 - Pitch Pine - 6-7' ht   14 ea   \$900.00 /ea   \$24,700     21 - White Pine - 8-10' ht   16 ea   \$575.00 /ea   \$24,700     21 - White Pine - 8-10' ht   12 ea   \$750.00 /ea   \$3,450     22 - Downy Serviceberry - 4.5-5' ht   12 ea   \$750.00 /ea   \$9,000     23 - Autumn Brilliance Serviceberry - 7-8' ht   12 ea   \$750.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 Is   \$15,000.00 /ls   \$10,000   \$10,000     Warranty / Maint   0.00 is   \$2.73 / GSF   \$1,042,658     G301 LQUID & GAS SITE UTILITIES   \$2.73 / GSF   \$1,042,658   \$2.73 /  | 13 - American Beech - 2.5" cal  | 10      | ea   | \$1,000.00  | /ea      | \$10,000    |
| 15 - Swamp White Oak - 3" cal   7.00   ea   \$1,200.00   /ea   \$8,400     16 - Red Oak - 2.5" - 3" cal   21   ea   \$1,300.00   /ea   \$27,300     17 - American Elm - 2.5-3" cal   19   ea   \$1,300.00   /ea   \$24,700     18 - Eastern Red Cedar - 7-8"   12   ea   \$785.00   /ea   \$9420     19 - Pitch Pine - 6-7' ht   14   ea   \$900.00   /ea   \$24,700     21 - White Pine - 8-10' ht   26   ea   \$950.00   /ea   \$24,700     21 - White Pine - 5-6' ht   11   ea   \$675.00   /ea   \$57,425     22 - Downy Serviceberry - 4.5-5' ht   6.00   ea   \$575.00   /ea   \$9,000     23 - Autumn Brilliance Serviceberry - 7-8' ht   12   ea   \$750.00   /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12   ea   \$750.00   /ea   \$9,000     Mulch   1.00   is   \$15,000.00   /is   \$11,000   /is   \$10,000     G30 LIQUID & GAS SITE UTILITIES   \$2.73 / GSF   \$1,042,658   \$2,73 / GSF   \$1,042,658 <td>14 - Black Gum - 2.5" cal</td> <td>8.00</td> <td>ea</td> <td>\$1,000.00</td> <td>/ea</td> <td>\$8,000</td>  | 14 - Black Gum - 2.5" cal   | 8.00    | ea   | \$1,000.00  | /ea      | \$8,000     |
| 16 - Red Oak - 2.5" - 3" cal   21 ea   \$1,300.00 /ea   \$27,300     17 - American Elm - 2.5-3" cal   19 ea   \$1,300.00 /ea   \$24,700     18 - Eastern Red Cedar - 7-8'   12 ea   \$785.00 /ea   \$59,420     19 - Pitch Pine - 6-7' ht   14 ea   \$900.00 /ea   \$\$12,600     20 - White Pine - 8-10' ht   26 ea   \$9950.00 /ea   \$\$24,700     21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$\$24,700     21 - White Pine - 5-6' ht   11 ea   \$\$675.00 /ea   \$\$3,450     23 - Autumn Brilliance Serviceberry - 7-8' ht   12 ea   \$\$75.00 /ea   \$\$9,000     Autom Crabapple - 2"-2.5" cal   12 ea   \$\$75.00 /ea   \$\$9,000     Mulch   1.00 is   \$\$15,000.00 /is   \$\$10,000     Warranty / Maint   0.00 incl   \$\$0   \$\$0     G30 LIQUID & GAS SITE UTILITIES   \$\$2.73 / GSF   \$\$1,042,658   \$\$2,73 / GSF   \$\$1,042,658     G301 LIQUID & GAS SITE UTILITIES   \$\$2.73 / GSF   \$\$1,042,658   \$\$2.73 / GSF   \$\$1,042,658     G301 LIQUID & GAS SITE UTILITIES   \$\$2.73 / GSF   \$\$1,042,658   \$\$2,73 / GSF   \$\$1,042,658     G301 LIQUID & GAS SITE UTILI  | 15 - Swamp White Oak - 3" cal   | 7.00    | ea   | \$1,200.00  | /ea      | \$8,400     |
| 17 - American Elm - 2.5-3" cal   19 ea   \$1,300.00 /ea   \$24,700     18 - Eastern Red Cedar - 7-8'   12 ea   \$785.00 /ea   \$9,420     19 - Pitch Pine - 6-7' ht   14 ea   \$900.00 /ea   \$12,600     20 - White Pine - 8-10' ht   26 ea   \$955.00 /ea   \$24,700     21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$7,425     22 - Downy Serviceberry - 4.5-5' ht   6.00 ea   \$575.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Autumn Brilliance Serviceberry - 7-8' ht   1.00 is   \$15,000.00 /is   \$10,000     Stakes & Guying   1.00 is   \$15,000.00 /is   \$10,000     Muich   1.00 is   \$10,000.00 /is   \$10,000     Warranty / Maint   0.00 incl   \$0   \$0     G301 LQUID & GAS SITE UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Di Vater Line   72 if   \$96,50 /if   \$6,900     Excav / Bkfl / Install - 4" Di Water Line   236 if   \$11,000 /if   \$22,5960     Excav / Bkfl / Ins   | 16 - Red Oak - 2.5" - 3" cal  | 21      | ea   | \$1,300.00  | /ea      | \$27,300    |
| 18 - Eastern Red Cedar - 7-8'   12 ea   \$785.00 /ea   \$9,420     19 - Pitch Pine - 6-7' ht   14 ea   \$900.00 /ea   \$12,600     20 - White Pine - 8-10' ht   26 ea   \$950.00 /ea   \$24,700     21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$7,425     22 - Downy Serviceberry - 4.5-5' ht   6.00 ea   \$575.00 /ea   \$3,450     23 - Autum Brilliance Serviceberry - 7-8' ht   12 ea   \$750.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 ls   \$12,000.00 /ls   \$15,000   \$15,000     Stakes & Guying   1.00 ls   \$10,000.00 /ls   \$10,000   \$10,000   \$10,000.00 /ls   \$10,000     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / 6SF   \$6,750,824   \$2.03   \$10,042,658     G301 LQUID & GAS SITE UTILITIES   \$2.73 / 6SF   \$1,042,658   \$2.73 / 6SF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / 6SF   \$1,042,658   \$2.73 / 6SF   \$1,042,658     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$110.00 /lf   \$25,960   \$2.73 / 6SF   \$1,042,658   | 17 - American Elm - 2.5-3" cal  | 19      | ea   | \$1,300.00  | /ea      | \$24,700    |
| 19 - Pitch Pine - 6-7' ht   14 ea   \$900.00 /ea   \$12,600     20 - White Pine - 8-10' ht   26 ea   \$950.00 /ea   \$24,700     21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$7,425     22 - Downy Serviceberry - 4.5-5' ht   6.00 ea   \$575.00 /ea   \$3,450     23 - Autum Brilliance Serviceberry - 7-8' ht   12 ea   \$750.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 ls   \$15,000.00 /ls   \$15,000     Stakes & Guying   1.00 ls   \$10,000.00 /ls   \$10,000     Warranty / Maint   0.00 incl   \$0   \$0     G30 LIQUID & GAS SITE UTILITIES   \$27.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 4" DI Water Line   72 lf   \$96.50 /lf   \$6,948     Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$10.00 /lf   \$24,360     Excav / Bkfl / Install - 6" DI water Line - fire service to bldg   52 lf   \$10.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$13.0.00 /   | 18 - Eastern Red Cedar - 7-8'   | 12      | ea   | \$785.00    | /ea      | \$9,420     |
| 20 - White Pine - 8-10' ht   26 ea   \$950.00 /ea   \$24,700     21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$7,425     22 - Downy Serviceberry - 4.5-5' ht   6.00 ea   \$575.00 /ea   \$3,450     23 - Autumn Brilliance Serviceberry - 7-8' ht   12 ea   \$750.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 ls   \$15,000.00 /ls   \$15,000     Stakes & Guying   1.00 ls   \$10,000 /ls   \$10,000     Warranty / Maint   0.00 incl   \$0     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824     G301 LIQUID & GAS SITE UTILITIES   \$2.73 / GSF   \$1,042,658     G301 LIQUID & GAS SITE UTILITIES   \$2.73 / GSF   \$1,042,658     G301 LIQUID & GAS SITE UTILITIES   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96.50 /lf   \$6,548     Excav / Bkfl / Install - 6" DI water Line   72 lf   \$12.000 /lf   \$24,360     Excav / Bkfl / Install - 6" DI water service to bldg   120 lf   \$12.000 /lf   \$6,240     Excav / Bkfl / Install - 6" DI water service to  | 19 - Pitch Pine - 6-7' ht   | 14      | ea   | \$900.00    | /ea      | \$12,600    |
| 21 - White Pine - 5-6' ht   11 ea   \$675.00 /ea   \$7,425     22 - Downy Serviceberry - 4.5-5' ht   6.00 ea   \$575.00 /ea   \$3,450     23 - Autumn Brilliance Serviceberry - 7-8' ht   12 ea   \$750.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 ls   \$11,000 /ls   \$11,000   \$15,000.00 /ls   \$15,000     Stakes & Guying   1.00 ls   \$10,000.00 /ls   \$10,000   \$10,000   Warranty / Maint   \$0   \$0   \$0     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824   \$0   \$0   \$0     G301 NATER UTILITIES   \$2.73 / GSF   \$1,042,658   \$1,042,658   \$1,042,658   \$2,73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658   \$2,73 / GSF   \$1,042,658   \$2,700   \$2,73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96,50 / lf   \$6,948   \$2,700   \$2,73 / GSF   \$1,042,658     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$10,000 /lf   \$22,5960   \$6,240   \$2,4700   <  | 20 - White Pine - 8-10' ht  | 26      | ea   | \$950.00    | /ea      | \$24,700    |
| 22 - Downy Serviceberry - 4.5-5' ht   6.00 ea   \$575.00 /ea   \$3,450     23 - Autumn Brilliance Serviceberry - 7-8' ht   12 ea   \$750.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 ls   \$15,000.00 /ls   \$15,000     Stakes & Guying   1.00 ls   \$10,000.00 /ls   \$10,000     Waranty / Maint   0.00 incl   \$0     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824     G301 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96.50 /lf   \$6,948     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$22,960     Excav / Bkfl / Install - 6" DI vater service to bldg   52 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 6" DI vater Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   \$,954 lf  | 21 - White Pine - 5-6' ht   | 11      | ea   | \$675.00    | /ea      | \$7,425     |
| 23 - Autumn Brilliance Serviceberry - 7-8' ht   12 ea   \$750.00 /ea   \$9,000     24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 ls   \$15,000.00 /ls   \$15,000   \$15,000     Stakes & Guying   1.00 ls   \$10,000.00 /ls   \$10,000   Warranty / Maint   \$000     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824     G3010 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96.50 /lf   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 lf   \$110.00 /lf   \$22,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   \$,954 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   \$,954 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / GAS PIPING - (INSTALL BY UTILITIES   1,500 lf   \$20.000 /lf <td>22 - Downy Serviceberry - 4.5-5' ht</td> <td>6.00</td> <td>ea</td> <td>\$575.00</td> <td>/ea</td> <td>\$3,450</td>  | 22 - Downy Serviceberry - 4.5-5' ht   | 6.00    | ea   | \$575.00    | /ea      | \$3,450     |
| 24 - Donald Wyman Crabapple - 2"-2.5" cal   12 ea   \$750.00 /ea   \$9,000     Mulch   1.00 ls   \$15,000.00 /ls   \$15,000     Stakes & Guying   1.00 ls   \$10,000.00 /ls   \$10,000     Warranty / Maint   0.00 incl   \$0     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824     G3010 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96.50 /lf   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 lf   \$110.00 /lf   \$25,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf<  | 23 - Autumn Brilliance Serviceberry - 7-8' ht                               | 12      | ea   | \$750.00    | /ea      | \$9,000     |
| Mulch   1.00 ls   \$15,000.00 /ls   \$15,000     Stakes & Guying   1.00 ls   \$10,000 ls   \$10,000 /ls   \$10,000     Warranty / Maint   0.00 incl   \$0     G30 LIQUID & GAS SITE UTILITIES   \$17,64 / GSF   \$6,750,824     G3010 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96,50 /lf   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 lf   \$110.00 /lf   \$25,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 6" DI vater service to bldg   52 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$10,000 /lf   \$30,000     Excav / Bkfl / SAS PIPING - (INSTALL BY  | 24 - Donald Wyman Crabapple - 2"-2.5" cal                                   | 12      | ea   | \$750.00    | /ea      | \$9,000     |
| Stakes & Guying   1.00 ls   \$10,000.0 /ls   \$10,000     Warranty / Maint   0.00 incl   \$0     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824     G3010 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96.50 /lf   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 lf   \$110.00 /lf   \$25,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$130.00 /lf   \$6,240     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$10,000.00 /ls   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$10,000.0 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$10,000.0 /lf   \$30,000     Tap Existing Wa   | Mulch   | 1.00    | ls   | \$15,000.00 | /ls      | \$15,000    |
| Warranty / Maint   0.00 incl   \$0     G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824     G3010 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96.50 / lf   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 lf   \$110.00 / lf   \$25,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 / lf   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$130.00 / lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 / lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 / lf   \$774,020     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 / lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$10,000.00 / lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$10,000.00 / lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   \$,954 lf   \$10,000.00 / lf   \$30,000 </td <td>Stakes &amp; Guying</td> <td>1.00</td> <td>ls</td> <td>\$10,000.00</td> <td>/ls</td> <td>\$10,000</td>  | Stakes & Guying   | 1.00    | ls   | \$10,000.00 | /ls      | \$10,000    |
| G30 LIQUID & GAS SITE UTILITIES   \$17.64 / GSF   \$6,750,824     G3010 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 If   \$96.50 / If   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 If   \$110.00 / If   \$22,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 If   \$120.00 / If   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 If   \$120.00 / If   \$42,360     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 If   \$130.00 / If   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 If   \$130.00 / If   \$774,020     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 If   \$130.00 / If   \$30,000     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 If   \$20.00 / If   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 / cond   \$66,000     Test / Flush-out   1.00 Is   \$10,000.00 / Is   \$10,000   \$10,000     Fire Hydrants   11 ea   \$51,30.00 / ea   \$56,430  | Warranty / Maint  | 0.00    | incl |             |          | \$0         |
| G3010 WATER UTILITIES   \$2.73 / GSF   \$1,042,658     G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 If   \$96.50 / If   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 If   \$110.00 / If   \$22,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 If   \$120.00 / If   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 If   \$120.00 / If   \$6,240     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 If   \$130.00 / If   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 If   \$130.00 / If   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 If   \$130.00 / If   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 If   \$130.00 / If   \$30,000     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 If   \$20.00 / If   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 / cond   \$66,000     Test / Flush-out   1.00 Is   \$10,000.00 / Is   \$10,000   \$66,000     Fire Hydrants   11 ea   \$5,130.00 / ea </td <td>G30 LIQUID &amp; GAS SITE UTILITIES</td> <td></td> <td></td> <td>\$17.64</td> <td>/ GSF</td> <td>\$6,750,824</td>   | G30 LIQUID & GAS SITE UTILITIES   |         |      | \$17.64     | / GSF    | \$6,750,824 |
| G3011 Site Domestic Water Distribution   \$2.73 / GSF   \$1,042,658     Excav / Bkfl / Install - 2" Copper Water Line   72 lf   \$96.50 /lf   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 lf   \$110.00 /lf   \$25,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$130.00 /lf   \$42,400     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430   | G3010 WATER UTILITIES   |         |      | \$2.73      | / GSF    | \$1,042,658 |
| Excav / Bkfl / Install - 2" Copper Water Line   72 If   \$96.50 /lf   \$6,948     Excav / Bkfl / Install - 4" DI Water Line   236 If   \$110.00 /lf   \$25,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 If   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 If   \$120.00 /lf   \$6,240     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 If   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 If   \$130.00 /lf   \$774,020     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 If   \$130.00 /lf   \$30,000     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 If   \$20.00 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 Is   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430  | G3011 Site Domestic Water Distribution                                      |         |      | \$2.73      | / GSF    | \$1,042,658 |
| Excav / Bkfl / Install - 4" DI Water Line   236 lf   \$110.00 /lf   \$25,960     Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$774,020     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 lf   \$20,00.00 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430   | Excay / Bkfl / Install - 2" Copper Water Line                               | 72      | lf   | \$96.50     | /lf      | \$6.948     |
| Excav / Bkfl / Install - 6" DI run out to hydrant   353 lf   \$120.00 /lf   \$42,360     Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$120.00 /lf   \$6,240     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$774,020     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 lf   \$20,000 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430  | Excav / Bkfl / Install - 4" DI Water Line                                   | 236     | lf   | \$110.00    | /lf      | \$25,960    |
| Excav / Bkfl / Install - 6" DI water service to bldg   52 lf   \$120.00 /lf   \$6,240     Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$2774,020     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 lf   \$20.00 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430   | Excav / Bkfl / Install - 6" DI run out to hydrant                           | 353     | lf   | \$120.00    | /lf      | \$42.360    |
| Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg   190 lf   \$130.00 /lf   \$24,700     Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$774,020     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 lf   \$20,000 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430   | Excav / Bkfl / Install - 6" DI water service to bldg                        | 52      | lf   | \$120.00    | /lf      | \$6,240     |
| Excav / Bkfl / Install - 8" DICL Water Line - loop   5,954 lf   \$130.00 /lf   \$774,020     Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 lf   \$20,000 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430   | Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg          | 190     | lf   | \$130.00    | /If      | \$24,700    |
| Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES   1,500 lf   \$20.00 /lf   \$30,000     Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430     G3020 SANITARY SEWERAGE UTILITIES   \$231 / GSF   \$882 710   | Excav / Bkfl / Install - 8" DICL Water Line - loop                          | 5.954   | lf   | \$130.00    | /lf      | \$774.020   |
| Tap Existing Water Main   3.00 cond   \$22,000.00 /cond   \$66,000     Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430     G3020 SANITARY SEWERAGE UTILITIES   \$2,31 / GSF   \$882,710  | Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES                             | 1.500   | lf   | \$20.00     | /If      | \$30.000    |
| Test / Flush-out   1.00 ls   \$10,000.00 /ls   \$10,000     Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430     G3020 SANITARY SEWERAGE UTILITIES   \$2,31 / GSF   \$882,710   | Tap Existing Water Main   | 3.00    | cond | \$22.000.00 | /cond    | \$66.000    |
| Fire Hydrants   11 ea   \$5,130.00 /ea   \$56,430     G3020 SANITARY SEWERAGE UTILITIES   \$2,31 / GSF   \$882,710   | Test / Flush-out  | 1.00    | ls   | \$10.000.00 | /ls      | \$10.000    |
| G3020 SANITARY SEWERAGE LITILITIES \$2.31 / GSF \$282 710  | Fire Hydrants   | 11      | ea   | \$5.130.00  | ,<br>/ea | \$56.430    |
| Severe entrum dettelunde enternied Science Sci | G3020 SANITARY SEWERAGE UTILITIES   |         |      | \$2.31      | / GSF    | \$882.710   |

### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY  | UNIT COST          | TOTAL COST  |
|---|-----------|--------------------|-------------|
| G3020 Sanitary Sewerage Utilities   |           | \$2.31 / GSF       | \$882,710   |
| Relining existing sewer (videotape by others to confirm need)                 | 0.00 nic  |                    | \$0         |
| Sanitary Sewerage Piping, PVC, New 4" PVC                                     | 87 lf     | \$110.00 /lf       | \$9,570     |
| Sanitary Sewerage Piping, PVC, New 4" PVC Vent pipe                           | 145 lf    | \$110.00 /lf       | \$15,950    |
| Sanitary Sewerage Piping, PVC, New 6" Cast Iron                               | 174 lf    | \$135.00 /lf       | \$23,490    |
| Sanitary Sewerage Piping, PVC, New 6" PVC                                     | 949 If    | \$120.00 /lf       | \$113,880   |
| Sanitary Sewerage Piping, PVC, New 6" PVC, Forced Main                        | 479 lf    | \$78.00 /lf        | \$37,362    |
| Sanitary Sewerage Piping, PVC, New 8"   | 3,144 lf  | \$130.00 /lf       | \$408,720   |
| Sanitary Sewerage Pump Station  | 1.00 ls   | \$141,200.00 /ls   | \$141,200   |
| VE C04 - Delete Force Main / Pump Station / MH                                | -1.00 ls  | \$234,052.00 /ls   | (\$234,052) |
| OII/ Gas Seperator  | 3.00 ea   | \$10,500.00 /ea    | \$31,500    |
| Sanitary Manhole  | 39 ea     | \$5,810.00 /ea     | \$226,590   |
| Tie-in to Existing Manholes / Pipe  | 1.00 cond | \$10,000.00 /cond  | \$10,000    |
| Grease Trap - Installed - 1,000 gal   | 1.00 ea   | \$8,500.00 /ea     | \$8,500     |
| Grease Trap - Installed - 10,000 gal  | 1.00 ea   | \$90,000.00 /ea    | \$90,000    |
| G3030 STORM DRAINAGE UTILITIES  |           | \$12.61 / GSF      | \$4,825,456 |
| G3032 Storm Drainage Piping   |           | \$3.39 / GSF       | \$1,296,762 |
| Excav / Bkfl / Install - 06" CPP Storm Drainage                               | 345 lf    | \$80.00 /lf        | \$27,600    |
| Excav / Bkfl / Install - 06" CPP Storm Drainage , underdrain                  | 940 If    | \$80.00 /lf        | \$75,200    |
| Excav / Bkfl / Install - 08" CPP Storm Drainage                               | 237 lf    | \$86.00 /lf        | \$20,382    |
| Excav / Bkfl / Install - 10" CPP Storm Drainage                               | 164 lf    | \$89.00 /lf        | \$14,596    |
| Excav / Bkfl / Install - 12" CPP Storm Drainage                               | 7,844 lf  | \$92.00 /lf        | \$721,648   |
| Excav / Bkfl / Install - 12" CPP Storm Drainage, perforated                   | 458 lf    | \$92.00 /lf        | \$42,136    |
| Excav / Bkfl / Install - 15" CPP Storm Drainage                               | 213 lf    | \$110.00 /lf       | \$23,430    |
| Excav / Bkfl / Install - 18" CPP Storm Drainage                               | 971 lf    | \$130.00 /lf       | \$126,230   |
| Excav / Bkfl / Install - 24" CPP Storm Drainage                               | 1,112 lf  | \$170.00 /lf       | \$189,040   |
| Excav / Bkfl / Install - 30" CPP Storm Drainage                               | 75 lf     | \$250.00 /lf       | \$18,750    |
| Excav / Bkfl / Install - 36" CPP Storm Drainage                               | 0.00 nic  |                    | \$0         |
| Trench Drain  | 151 lf    | \$250.00 /lf       | \$37,750    |
| G3033 Storm Sewer Structures  |           | \$3.19 / GSF       | \$1,218,930 |
| Storm Septors Water Quality Unit - Installed (WQS & WQI)                      | 18 ea     | \$13,500.00 /ea    | \$243,000   |
| Precast Storm Manholes 4'- 6" - Installed                                     | 78 ea     | \$5,590.00 /ea     | \$436,020   |
| Precast Culvert - installed   | 1.00 ls   | \$90,000.00 /ls    | \$90,000    |
| Precast Storm Catch Basins - Installed  | 70 ea     | \$4,990.00 /ea     | \$349,300   |
| Storm Structures - Connect new pipe to Existing                               | 2.00 ea   | \$8,270.00 /ea     | \$16,540    |
| Precast Storm Oil/Water Separator Tank - Installed (OCS)                      | 6.00 ea   | \$5,030.00 /ea     | \$30,180    |
| Area Drains - Installed   | 17 ea     | \$3,170.00 /ea     | \$53,890    |
| G3036.4 Site Subdrainage  |           | \$1.31 / GSF       | \$500,000   |
| Maintain Groundwater System Operation through construction (temp swales, etc) | 1.00 allw | \$500,000.00 /allw | \$500,000   |
| G3037 Storm Drainage Ponds & Reservoirs                                       |           | \$4.73 / GSF       | \$1,809,764 |
| Underground Storm Water Retention System - #1                                 | 11,440 sf | \$42.00 /sf        | \$480,480   |
| Underground Storm Water Retention System - #2                                 | 14,063 sf | \$42.00 /sf        | \$590,646   |
| Underground Storm Water Retention System - #3                                 | 12,665 sf | \$42.00 /sf        | \$531,930   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST        | TOTAL COST  |
|--|-----------|------------------|-------------|
| Underground Storm Water Retention System - #4  | 3,921 sf  | \$42.00 /sf      | \$164,682   |
| Underground Storm Water Retention System - #5  | 703 sf    | \$42.00 /sf      | \$29,526    |
| Flared End / Swale   | 4.00 cond | \$2,500.00 /cond | \$10,000    |
| Headwall   | 1.00 ea   | \$2,500.00 /ea   | \$2,500     |
| G3060 SITE FUEL DISTRIBUTION   |           | \$0.00 / GSF     | \$0         |
| G3066.2 Gas Distribution Piping (Natural & Propane)  |           | \$0.00 / GSF     | \$0         |
| Excav / Bkfl / Install - 6" Natural Gas Line   | 0.00 lf   |                  | \$0         |
| G40 ELECTRICAL SITE IMPROVEMENTS   |           | \$11.73 / GSF    | \$4,487,336 |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION  |           | \$3.84 / GSF     | \$1,468,781 |
| D5021 Medium Voltage Conduit and Cabling   |           | \$1.27 / GSF     | \$484,408   |
| Precast Electric Manhole w/Cover 6 x 6 x 10 - 07/01/22<br>Maintenance Building                                       | 5.00 ea   | \$6,856.16 /ea   | \$34,281    |
| Primary Above Ground Enclosures- 07/01/22 Main Distribution  | 12 ea     | \$5,806.14 /ea   | \$69,674    |
| Ground Manholes and above Ground Enclosures  | 17 ea     | \$740.48 /ea     | \$12,588    |
| Ground Transformer Pads - 07/01/22 Locker Building   | 1.00 ea   | \$2,683.37 /ea   | \$2,683     |
| Ground Transformer Pads - 07/01/22 Main Distribution   | 2.00 ea   | \$2,683.37 /ea   | \$5,367     |
| Layout Transformer Pads - 07/01/22 Locker Building   | 1.00 ea   | \$2,683.37 /ea   | \$2,683     |
| Layout Transformer Pads - 07/01/22 Main Distribution   | 2.00 ea   | \$2,683.37 /ea   | \$5,367     |
| Existing overhead Services Removed   | 312 ea    | \$19.84 /ea      | \$6,191     |
| Feeder   #001 (2) 5" Empty PVC Conduit Spares for primary with<br>pull string composite unit - Large Power           | 1,818 lf  | \$37.20 /lf      | \$67,626    |
| Feeder   #079 (4) 5" Empty PVC Conduit Spares for primary with<br>pull string composite unit - Large Power           | 1,838 lf  | \$74.40 /lf      | \$136,747   |
| Feeder   #086 (4) 5" Emergency Empty PVC Conduit Spares for<br>primary with pull string composite unit - Large Power | 1,796 lf  | \$74.40 /lf      | \$133,622   |
| Telcom Cable Overhead  | 99 lf     | \$76.55 /lf      | \$7,579     |
| D5022 Medium Voltage Switchgear and Panelboard   |           | \$0.00 / GSF     | \$0         |
| 13.8KV 480/277 1200A Pad Mntd. Transformer to locker bldg. by Utility Company  | 1.00 ea   | \$0.00 /ea       | \$0         |
| 13.8KV 480/277 Pad Mntd. Transformers to Main bldg. by Utility Company   | 2.00 ea   | \$0.00 /ea       | \$0         |
| Generator by Utility Company   | 1.00 ea   | \$0.00 /ea       | \$0         |
| D5024 Large Power Feeder Conduit   |           | \$2.54 / GSF     | \$970,693   |
| 225 AMP PVC Composite feeders Copper - Large Power EV<br>charging Station  | 401 lf    | \$102.06 /lf     | \$40,927    |
| 250 AMP PVC Composite feeder copper - Large Power to sports field lighting   | 650 lf    | \$98.13 /lf      | \$63,787    |
| 400 AMP PVC Composite feeder copper - Large Power<br>Maintenace Building   | 985 lf    | \$162.63 /lf     | \$160,188   |
| Feeder   #085 600 AMP PVC Composite feeder copper - Large<br>Power   | 295 lf    | \$243.95 /lf     | \$71,965    |
| 600 AMP PVC Composite feeder copper - Large Power Temp   | 600 lf    | \$177.66 /lf     | \$106,594   |
| Feeder   #002 4000 AMP PVC Composite feeder copper - Large<br>Power  | 169 lf    | \$1,464.53 /lf   | \$247,506   |
| Feeder   #080 4000 AMP PVC Composite feeder copper - Large<br>Power  | 191 lf    | \$1,464.53 /lf   | \$279,726   |

60% CD Estimate - Reconciled incl VE



| ESCRIPTION   | QUANTITY | UNIT COST        | TOTAL COST  |
|--|----------|------------------|-------------|
| D5029 Small Power Devices & Wiring   |          | \$0.01 / GSF     | \$3,043     |
| Power to field Scoreboards   | 2.00 gsf | \$1,521.43 /gsf  | \$3,043     |
| D5049 Site Lighting  |          | \$0.03 / GSF     | \$10,637    |
| 100 AMP EMT Composite feeders Copper - Large Power   | 100 lf   | \$106.37 /lf     | \$10,637    |
| D5040 LIGHTING   |          | \$2.73 / GSF     | \$1,042,819 |
| D5048 Sports Lighting  |          | \$1.13 / GSF     | \$431,378   |
| Site Lighting Branch   | 2,000 ea | \$25.69 /ea      | \$51,378    |
| Reduced sports lighting based on RLB quote per recn  | -1.00 ea | \$120,000.00 /ea | (\$120,000) |
| Sport Lighting S1 thru @4 for Football includes base install and rigging   | 4.00 ea  | \$125,000.00 /ea | \$500,000   |
| D5049 Site Lighting  |          | \$1.60 / GSF     | \$611,441   |
| Ground Pole Base   | 112 ea   | \$499.22 /ea     | \$55,913    |
| Power to Digital Sign at entrance  | 1.00 ea  | \$1,466.67 /ea   | \$1,467     |
| Sitel Lighting Pole Base   | 112 ea   | \$993.66 /ea     | \$111,290   |
| Quazite Handhole Enclosure Composite Unit - Cover included   | 137 ea   | \$918.52 /ea     | \$125,837   |
| 2" PVC future  | 100 ea   | \$16.45 /ea      | \$1,645     |
| 2" PVC Gas Storage to building   | 918 ea   | \$16.45 /ea      | \$15,103    |
| 30 AMP PVC Composite feeder  | 64 lf    | \$16.89 /lf      | \$1,081     |
| 30 AMP PVC Composite feeder EV Shargins Station  | 800 lf   | \$16.89 /lf      | \$13,511    |
| Site Branch to Digital Sign 2"   | 918 ea   | \$14.77 /ea      | \$13,556    |
| Site Lighting Branch 2" branch   | 5,139 ea | \$14.77 /ea      | \$75,887    |
| Electrical Vehicle Charging Station Charging Station @ Site VE<br>E09B CHARGING STATIONS FURNISHED BY OTHERS       | 0.00 ea  |                  | \$0         |
| Site Lighting - cantenary Lighting per linear foot 5 rows - VE-E-18 provisions for future only (savings ~\$11,300) | 0.00 ls  |                  | \$0         |
| EXW1 Light Fixture Exterior Wall Mounted Light Composite Unit  | 6.00 ea  | \$649.76 /ea     | \$3,899     |
| EXB1 Light Fixture Site Lit Bollard Composite Unit   | 25 ea    | \$1,886.51 /ea   | \$47,163    |
| 5000 Watt Ground Light Fixture Site Landscape Light Composite<br>Unit  | 6.00 ea  | \$436.26 /ea     | \$2,618     |
| Site Lighting EXP3   | 10 ea    | \$2,612.48 /ea   | \$26,125    |
| EXP1BC Light Fixture Site Pole Single Head Composite Unit  | 3.00 ea  | \$2,017.98 /ea   | \$6,054     |
| Exp4 Light Fixture Site Pole Single Head Composite Unit  | 1.00 ea  | \$2,017.98 /ea   | \$2,018     |
| Site Lighting cost reduction per REcon   | -1.00 ea | \$35,000.00 /ea  | (\$35,000)  |
| Site Lighting EXF1   | 19 ea    | \$2,017.98 /ea   | \$38,342    |
| Site Lighting EXP1   | 37 ea    | \$2,017.98 /ea   | \$74,665    |
| Site Lighting EXP3   | 15 ea    | \$2,017.98 /ea   | \$30,270    |
| D5090 OTHER ELECTRICAL SYSTEMS   |          | \$0.02 / GSF     | \$7,020     |
| D5095 Miscellaneous Electrical Systems   |          | \$0.02 / GSF     | \$7,020     |
| Quad Shak Lighting Power and Teldata   | 1.00 ea  | \$7,020.00 /ea   | \$7,020     |
| D6010 COMMUNICATIONS & SECURITY  |          | \$1.07 / GSF     | \$411,260   |
| D6013 Tel/Data System  |          | \$1.07 / GSF     | \$411,260   |
| 4X6 Telcom Handhole  | 3.00 ea  | \$4,231.33 /ea   | \$12,694    |
| 6x6x10 Telcom Handhole   | 8.00 ea  | \$6,875.90 /ea   | \$55,007    |
| Keep Existing Telcom Service Operation Allowance   | 1.00 ea  | \$3,702.41 /ea   | \$3,702     |
| Telcom Utility Box   | 6.00 ea  | \$7,933.73 /ea   | \$47,602    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST        | TOTAL COST  |
|--|-------------|------------------|-------------|
| (1) 4" Empty PVC Conduit with pull String composite unit Fire<br>Alarm Concessions           | 563 lf      | \$38.47 /lf      | \$21,661    |
| (1) 4" Empty PVC Conduit with pull String composite unit for<br>telcom *                     | 1,675 lf    | \$38.47 /lf      | \$64,437    |
| (1) 4" Empty PVC Conduit with pull String composite unit telcom<br>Concessions               | 563 lf      | \$38.47 /lf      | \$21,661    |
| (2) 4" Empty PVC Conduit with pull String composite unit spare<br>for telcom and Fire Alarm* | 1,670 lf    | \$18.95 /lf      | \$31,642    |
| (4) 4" Empty PVC Conduit with pull String composite unit                                     | 77 lf       | \$37.90 /lf      | \$2,918     |
| (8) 4" Empty PVC Conduit with pull String composite unit                                     | 1,955 lf    | \$76.69 /lf      | \$149,934   |
| D7050 DETECTION & ALARM  |             | \$0.14 / GSF     | \$54,061    |
| D6011 Fire Alarm System  |             | \$0.08 / GSF     | \$29,061    |
| (1) 4" Empty PVC Conduit with pull String composite unit for Fire<br>Alarm*                  | 1,675 lf    | \$17.35 /lf      | \$29,061    |
| D6017 Security Access Control  |             | \$0.07 / GSF     | \$25,000    |
| Security Gate and Power added during Recon 12-20-2022  | 1.00 ea     | \$25,000.00 /ea  | \$25,000    |
| G4020 SITE ELECTRICAL  |             | \$3.28 / GSF     | \$1,253,396 |
| G4025 Ductbanks, Manholes, & Handholes   |             | \$3.28 / GSF     | \$1,253,396 |
| Adjust DB Section J Reduction  | -1.00 ls    | \$52,000.00 /ls  | (\$52,000)  |
| Exavate / Backfill / Install Elec MH   | 14 ea       | \$19,300.00 /ea  | \$270,200   |
| Excavate / Backfill / Concrete Encasement  | 4,271 lf    | \$130.00 /lf     | \$555,230   |
| Excavate / Backfill / Install- Precast Light pole / Bollard Base                             | 107 ea      | \$2,350.00 /ea   | \$251,450   |
| Excavate / Backfill site lighting conduit  | 9,413 lf    | \$41.50 /lf      | \$390,640   |
| Reduction on Excavation and Backfill per recon   | -1.00 ls    | \$100,000.00 /ls | (\$100,000) |
| VE C07 Reduce DB   | -1.00 ls    | \$62,124.00 /ls  | (\$62,124)  |
| G5010 SITE COMMUNICATIONS SYSTEMS  |             | \$0.65 / GSF     | \$250,000   |
| X9770 Conceptual Budget  |             | \$0.65 / GSF     | \$250,000   |
| Traffic Signal Work - allow moved to G40   | 1.00 ls     | \$250,000.00 /ls | \$250,000   |
| G90 MISCELLANEOUS SITE CONSTRUCTION  |             | \$0.00 / GSF     | \$0         |
| G5010 SITE COMMUNICATIONS SYSTEMS  |             | \$0.00 / GSF     | \$0         |
| X9770 Conceptual Budget  |             | \$0.00 / GSF     | \$0         |
| Traffic Signal Work - allow moved to G40   | 0.00 ls     |                  | \$0         |
| Z GENERAL  | 382,610 GSF | \$4.52 / GSF     | \$1,730,375 |
| Z10 GENERAL REQUIREMENTS   |             | \$4.52 / GSF     | \$1,730,375 |
| Z1050 TEMPORARY FACILITIES & CONTROLS  |             | \$4.52 / GSF     | \$1,730,375 |
| Z1055 Temporary Construction   |             | \$4.52 / GSF     | \$1,730,375 |
| Emergency Spill Kit  | 1.00 ea     | \$2,000.00 /ea   | \$2,000     |
| Temporary Water and Electric Service - Hook-up & Maintenance                                 | 1.00 ls     | \$35,000.00 /ls  | \$35,000    |
| Temporary Walkways   | 1.00 ls     | \$50,000.00 /ls  | \$50,000    |
| Water Truck / Dust Control   | 1.00 ls     | \$30,000.00 /ls  | \$30,000    |
| Dewatering - Pumps / Maintenance - Demo/Foundation   | 1.00 ls     | \$400,000.00 /ls | \$400,000   |
| Temporary Access Roads - Farm Rd & Existing Campus Path                                      | 4,600 sy    | \$32.50 /sy      | \$149,500   |
| Temporary Laydown Area - Prep / Maintain   | 14,275 sy   | \$25.00 /sy      | \$356,875   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION                               | QUANTITY | Y UNIT CO      | ST TOTAL COST  |
|---|----------|----------------|----------------|
| Repair Existing Streets, Sidewalks        | 1.00 all | lw \$50,000.00 | /allw \$50,000 |
| Temporary Barriers & Public Safety        | 1.00 ls  | \$40,000.00    | /ls \$40,000   |
| Temporary Bridge Crossing                 | 1.00 ls  | \$150,000.00   | /ls \$150,000  |
| Traffic Control - Install & Maintain      | 1.00 ls  | \$25,000.00    | /ls \$25,000   |
| Snow Removal                              | 1.00 ls  | \$25,000.00    | /ls \$25,000   |
| Street Sweeping                           | 1.00 ls  | \$25,000.00    | /ls \$25,000   |
| Temp Construction Fence w Rock Cores      | 7,000 lf | \$56.00        | /lf \$392,000  |
| Wrap Building to Place Slabs - incl w GRs | 0.00 ls  |                | \$0            |
| TOTAL SITEWORK                            |          | \$108.34 / GSF | \$41,453,440   |

#### Page 80 of 81



#### 60% CD Estimate - Reconciled incl VE



### **DEMO & ABATEMENT**

| DESCRIPTION   | QUANTITY   | UNIT COST            | TOTAL COST  |
|---|------------|----------------------|-------------|
| F SPECIAL CONSTRUCTION & DEMOLITION                 | 0 GSF      | \$3,493,683.00 / GSF | \$3,493,683 |
| F20 FACILITY REMEDIATION                            |            | \$1,819,675.00 / GSF | \$1,819,675 |
| F2010 HAZARDOUS MATERIALS REMEDIATION               |            | \$1,819,675.00 / GSF | \$1,819,675 |
| F2019 Other Hazardous Selective Building Demolition |            | \$1,819,675.00 / GSF | \$1,819,675 |
| Allowance for Hazardous Materials Abatement         | 1.00 ls    | \$1,919,675.00 /ls   | \$1,919,675 |
| VE - adjust   | -1.00 ls   | \$100,000.00 /ls     | (\$100,000) |
| F30 DEMOLITION                                      |            | \$1,674,008.00 / GSF | \$1,674,008 |
| F3010 STRUCTURE DEMOLITION                          |            | \$1,674,008.00 / GSF | \$1,674,008 |
| F3011 Building Demolition                           |            | \$1,674,008.00 / GSF | \$1,674,008 |
| Demolish Existing School Building                   | 239,144 sf | \$7.00 /sf           | \$1,674,008 |
| TOTAL DEMO & ABATEMENT                              | \$3,493    | .683.00 / GSF        | \$3,493,683 |

COST ESTIMATE CM-R

CSI MASTERFORMAT

6B.2.3 – 03

#### 60% CD Estimate - Reconciled incl VE

CKEK BI

| Masterformat Sort                                 | Quantity    | Unit Cost      | Total Cost    |
|---|-------------|----------------|---------------|
| MAIN BUILDING                                     | 380,570 GSF | \$417.02 / GSF | \$158,705,642 |
| 03 CONCRETE                                       |             | \$31.70 / GSF  | \$12,063,281  |
| 04 MASONRY  |             | \$18.05 / GSF  | \$6,869,970   |
| 05 METALS   |             | \$54.97 / GSF  | \$20,921,619  |
| 06 WOOD, PLASTICS, & COMPOSITES                   |             | \$8.86 / GSF   | \$3,370,321   |
| 07 THERMAL & MOISTURE PROTECTION                  |             | \$36.40 / GSF  | \$13,851,817  |
| 08 OPENINGS                                       |             | \$28.84 / GSF  | \$10,976,581  |
| 09 FINISHES                                       |             | \$55.19 / GSF  | \$21,005,190  |
| 10 SPECIALTIES                                    |             | \$4.42 / GSF   | \$1,680,917   |
| 11 EQUIPMENT                                      |             | \$9.91 / GSF   | \$3,771,134   |
| 12 FURNISHINGS                                    |             | \$4.59 / GSF   | \$1,746,176   |
| 14 CONVEYING EQUIPMENT                            |             | \$2.33 / GSF   | \$885,000     |
| 21 FIRE SUPPRESSION                               |             | \$7.96 / GSF   | \$3,029,692   |
| 22 PLUMBING                                       |             | \$20.97 / GSF  | \$7,981,609   |
| 23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC | 2)          | \$73.08 / GSF  | \$27,811,853  |
| 26 ELECTRICAL                                     |             | \$39.83 / GSF  | \$15,157,937  |
| 27 COMMUNICATIONS                                 |             | \$8.20 / GSF   | \$3,121,467   |
| 28 ELECTRONIC SAFETY & SECURITY                   |             | \$6.47 / GSF   | \$2,463,365   |
| 31 EARTHWORK                                      |             | \$4.09 / GSF   | \$1,554,975   |
| 32 EXTERIOR IMPROVEMENTS                          |             | \$1.16 / GSF   | \$442,737     |
| CONCESSIONS / TOILET BLDG                         | 0 GSF       | \$0.00 / GSF   | \$0           |
| 03 CONCRETE                                       |             | \$0.00 / GSF   | \$0           |
| 04 MASONRY  |             | \$0.00 / GSF   | \$0           |
| 05 METALS   |             | \$0.00 / GSF   | \$0           |
| 06 WOOD, PLASTICS, & COMPOSITES                   |             | \$0.00 / GSF   | \$0           |
| 07 THERMAL & MOISTURE PROTECTION                  |             | \$0.00 / GSF   | \$0           |
| 08 OPENINGS                                       |             | \$0.00 / GSF   | \$0           |
| 09 FINISHES                                       |             | \$0.00 / GSF   | \$0           |
| 10 SPECIALTIES                                    |             | \$0.00 / GSF   | \$0           |
| 11 EQUIPMENT                                      |             | \$0.00 / GSF   | \$0           |
| 22 PLUMBING                                       |             | \$0.00 / GSF   | \$0           |
| 23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC | 2)          | \$0.00 / GSF   | \$0           |
| 26 ELECTRICAL                                     |             | \$0.00 / GSF   | \$0           |
| 27 COMMUNICATIONS                                 |             | \$0.00 / GSF   | \$0           |
| 28 ELECTRONIC SAFETY & SECURITY                   |             | \$0.00 / GSF   | \$0           |
| 31 EARTHWORK                                      |             | \$0.00 / GSF   | \$0           |
| 33 UTILITIES                                      |             | \$0.00 / GSF   | \$0           |
| LOCKER BLDG                                       | 0 GSF       | \$0.00 / GSF   | \$0           |



Rev.3

#### 60% CD Estimate - Reconciled incl VE



| 03 CONCRETE  |             | \$0.00 / GSF   | \$0          |
|--|-------------|----------------|--------------|
| 04 MASONRY   |             | \$0.00 / GSF   | \$0          |
| 05 METALS  |             | \$0.00 / GSF   | \$0          |
| 06 WOOD, PLASTICS, & COMPOSITES                    |             | \$0.00 / GSF   | \$0          |
| 07 THERMAL & MOISTURE PROTECTION                   |             | \$0.00 / GSF   | \$0          |
| 08 OPENINGS  |             | \$0.00 / GSF   | \$0          |
| 09 FINISHES  |             | \$0.00 / GSF   | \$0          |
| 10 SPECIALTIES                                     |             | \$0.00 / GSF   | \$0          |
| 14 CONVEYING EQUIPMENT                             |             | \$0.00 / GSF   | \$0          |
| 21 FIRE SUPPRESSION                                |             | \$0.00 / GSF   | \$0          |
| 22 PLUMBING  |             | \$0.00 / GSF   | \$0          |
| 23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC) |             | \$0.00 / GSF   | \$0          |
| 26 ELECTRICAL                                      |             | \$0.00 / GSF   | \$0          |
| 27 COMMUNICATIONS                                  |             | \$0.00 / GSF   | \$0          |
| 28 ELECTRONIC SAFETY & SECURITY                    |             | \$0.00 / GSF   | \$0          |
| 33 UTILITIES                                       |             | \$0.00 / GSF   | \$0          |
| MAINTENANCE BLDG                                   | 2,040 GSF   | \$254.40 / GSF | \$518,969    |
| 03 CONCRETE  |             | \$61.06 / GSF  | \$124,570    |
| 05 METALS  |             | \$5.15 / GSF   | \$10,500     |
| 06 WOOD, PLASTICS, & COMPOSITES                    |             | \$1.56 / GSF   | \$3,185      |
| 07 THERMAL & MOISTURE PROTECTION                   |             | \$5.70 / GSF   | \$11,633     |
| 08 OPENINGS  |             | \$43.21 / GSF  | \$88,150     |
| 09 FINISHES  |             | \$4.91 / GSF   | \$10,006     |
| 13 SPECIAL CONSTRUCTION                            |             | \$73.68 / GSF  | \$150,300    |
| 22 PLUMBING  |             | \$23.68 / GSF  | \$48,305     |
| 23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC) |             | \$0.00 / GSF   | \$0          |
| 26 ELECTRICAL                                      |             | \$22.86 / GSF  | \$46,627     |
| 27 COMMUNICATIONS                                  |             | \$1.75 / GSF   | \$3,567      |
| 28 ELECTRONIC SAFETY & SECURITY                    |             | \$5.85 / GSF   | \$11,927     |
| 33 UTILITIES                                       |             | \$5.00 / GSF   | \$10,200     |
| SITEWORK   | 382,610 GSF | \$108.34 / GSF | \$41,453,440 |
| 01 GENERAL REQUIREMENTS                            |             | \$3.50 / GSF   | \$1,338,375  |
| 02 EXISTING CONDITIONS                             |             | \$1.94 / GSF   | \$742,721    |
| 10 SPECIALTIES                                     |             | \$0.08 / GSF   | \$30,000     |
| 11 EQUIPMENT                                       |             | \$1.66 / GSF   | \$635,575    |
| 26 ELECTRICAL                                      |             | \$6.58 / GSF   | \$2,518,620  |
| 27 COMMUNICATIONS                                  |             | \$1.07 / GSF   | \$411,260    |
| 28 ELECTRONIC SAFETY & SECURITY                    |             | \$0.14 / GSF   | \$54,061     |
| 31 EARTHWORK                                       |             | \$48.82 / GSF  | \$18,678,689 |
| 32 EXTERIOR IMPROVEMENTS                           |             | \$23.63 / GSF  | \$9,039,919  |

#### 60% CD Estimate - Reconciled incl VE

| Gilbane    |
|------------|
| 01/20/2023 |
| Rev.3      |
|            |

| 33 UTILITIES           |       | \$20.92 / GSF        | \$8,004,220   |
|------------------------|-------|----------------------|---------------|
| DEMO & ABATEMENT       | 0 GSF | \$3,493,683.00 / GSF | \$3,493,683   |
| 02 EXISTING CONDITIONS |       | \$0.00 / GSF         | \$3,493,683   |
| Subtotal Direct Cost   |       | \$533.63 /SF         | \$204,171,734 |

#### 60% CD Estimate - Reconciled incl VE



| Indirect Costs                            | Amount | Total Cost    |
|---|--------|---------------|
| Design and Estimating Contingency         | 2.50%  | \$5,104,293   |
| Subtotal 1                                |        | \$209,276,027 |
| Escalation                                | 4.50%  | \$9,417,421   |
| Projected Cost of Work                    |        | \$218,693,449 |
| Subcontractor Bonds                       | 1.20%  | \$2,624,321   |
| Insurance - CCIP (Changed from GL)        |        | \$6,198,303   |
| Cost of Traditional Insurance (trade +GL) |        | (\$6,822,122) |
| Builders Risk                             |        | \$365,272     |
| Payment and Performance Bond              |        | \$1,850,710   |
| Subtotal Insurances                       |        | \$222,909,933 |
| CM General Conditions                     |        | \$9,687,591   |
| Field Office Support                      |        | \$1,010,430   |
| CM General Requirements                   |        | \$5,034,190   |
| Cost of Work / Site Services              |        | \$1,000,000   |
| CM Contingency                            | 2.50%  | \$5,467,336   |
| Subtotal 2                                |        | \$245,109,480 |
| CM Fee                                    |        | \$4,205,160   |
| Total Construction Costs                  |        | \$249,314,640 |

Total Construction Cost

\$651.62 /SF

\$249,314,640

60% CD Estimate - Reconciled incl VE



### MAIN BUILDING

| DESCRIPTION  | QUANTITY    | UNIT COST        | TOTAL COST   |
|--|-------------|------------------|--------------|
| 03 CONCRETE  | 380,570 GSF | \$31.70 / GSF    | \$12,063,281 |
| A1010 STANDARD FOUNDATIONS   |             | \$8.85 / GSF     | \$3,369,319  |
| A1010 STANDARD FOUNDATIONS   |             | \$0.74 / GSF     | \$281,990    |
| Formwork - Continuous Footings   | 3,302 sfca  | \$20.00 /sfca    | \$66,040     |
| Rebar - Continuous Footings (F&I) - ADJUST PER RECON <\$200> /<br>TON <1 TON>                                  | 14 ton      | \$3,600.00 /ton  | \$50,400     |
| Concrete - Continuous Footings (material and placed, typ)<br><adjust <\$50="" cy="" per="" recon,=""></adjust> | 202 cy      | \$325.00 /cy     | \$65,650     |
| CIP Concrete - Interior Footings @ CMU - ADJUSTED PER RECON <\$650 / CY>                                       | 116 cy      | \$650.00 /cy     | \$75,400     |
| Concrete - Footing Steps   | 22 cy       | \$2,250.00 /cy   | \$49,500     |
| VE C01 - Raise Dropped Footings  | -1.00 ls    | \$25,000.00 /ls  | (\$25,000)   |
| A1011 WALL FOUNDATIONS   |             | \$2.64 / GSF     | \$1,003,850  |
| Formwork - @ Foundation Wall - Exterior Frost Wall   | 16,387 sfca | \$25.00 /sfca    | \$409,675    |
| Formwork - @ Foundation Wall - Exterior Radial Frost Wall  | 1,525 sfca  | \$45.00 /sfca    | \$68,625     |
| Formwork - @ Foundation Wall - Interior Wall   | 5,727 sfca  | \$25.00 /sfca    | \$143,175    |
| Rebar - Frost Wall (F&I)   | 47 ton      | \$3,800.00 /ton  | \$178,600    |
| Concrete - Foundation Walls  | 627 cy      | \$325.00 /cy     | \$203,775    |
| A1013 COLUMN FOUNDATIONS   |             | \$4.66 / GSF     | \$1,773,479  |
| Formwork - Column Footings   | 23,036 sfca | \$22.00 /sfca    | \$506,792    |
| Formwork - Piers / Pilasters   | 1,304 sfca  | \$28.00 /sfca    | \$36,512     |
| Rebar - Piers / Pilasters (F&I) - ADJUST PER RECON <\$200> / TON   | 6.00 ton    | \$3,600.00 /ton  | \$21,600     |
| Rebar - Column Footings (F&I) - ADJUST PER RECON <\$200> /<br>TON <4 TONS>                                     | 133 ton     | \$3,600.00 /ton  | \$478,800    |
| Concrete Isolated Piers - Complete F&I   | 55 cy       | \$425.00 /cy     | \$23,375     |
| Concrete - Column Footings - Complete Complete F&I   | 1,834 cy    | \$350.00 /cy     | \$641,900    |
| Column Diamonds, Grout - Isolated Footings ADJUST PER RECON <\$25 PER TON>                                     | 258 ea      | \$250.00 /ea     | \$64,500     |
| A1019 STANDARD FOUNDATION SUPPLEMENTARY COMPONENT  | S           | \$0.81 / GSF     | \$310,000    |
| ADD THICKENED SLAB HAUNCH @NON-SHEAR WALL CMU<br>WALLS   | 1.00 ls     | \$100,000.00 /ls | \$100,000    |
| Weather Protection - Foundations   | 1.00 ls     | \$100,000.00 /ls | \$100,000    |
| Housekeeping Pads - allow  | 1,200 sf    | \$50.00 /sf      | \$60,000     |
| Misc Curbs, Embeds   | 1.00 ls     | \$50,000.00 /ls  | \$50,000     |
| Thickened Slab @CMU Walls - dwgs show footings & walls - VE<br>for haunched slab                               | 0.00 nic    |                  | \$0          |
| A2020 BASEMENT WALL CONSTRUCTION   |             | \$5.05 / GSF     | \$1,920,350  |
| A1011 WALL FOUNDATIONS   |             | \$1.17 / GSF     | \$443,525    |
| Formwork - Retaining Wall Footings   | 2,329 sfca  | \$25.00 /sfca    | \$58,225     |
| Rebar - Retaining Wall Footings @ Wall (F&I) - ADJUST PER<br>RECON <\$200> / TON, <5 TONS>                     | 46 ton      | \$3,600.00 /ton  | \$165,600    |
| F&I Concrete - Retaining Wall Footings   | 676 cy      | \$325.00 /cy     | \$219,700    |
| A2020 BASEMENT WALL CONSTRUCTION   |             | \$3.88 / GSF     | \$1,476,825  |
| Formwork - @ Basement Retaining Wall   | 31,385 sfca | \$25.00 /sfca    | \$784,625    |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANT   | ΊΤΥ  | UNIT COST        | TOTAL COST         |
|--|---------|------|------------------|--------------------|
| Rebar - Basement Wall (F&I)  | 85      | ton  | \$3,800.00 /ton  | \$323,000          |
| F&I Concrete - Basement Wall   | 1,136   | су   | \$325.00 /cy     | \$369,200          |
| A4010 STANDARD SLABS-ON-GRADE  |         |      | \$3.71 / GSF     | \$1,411,554        |
| A4010 STANDARD SLABS-ON-GRADE  |         |      | \$3.71 / GSF     | \$1,411,554        |
| Formwork - Slab Edge   | 5,423   | lf   | \$20.00 /lf      | \$108,460          |
| Formwork - Slab Construction Joints  | 2,575   | lf   | \$20.00 /lf      | \$51,500           |
| Welded Wire Mesh - Slab on Grade (Incl. Overlap) F&I   | 147,327 | sf   | \$1.75 /sf       | \$257,822          |
| Welded Wire Mesh - Slab on Grade (Incl. Overlap) F&I - VE to go<br>with fibermesh - not incorporated | 0.00    | ls   |                  | \$0                |
| Concrete Material - (SOG)  | 1,987   | су   | \$150.00 /cy     | \$298,050          |
| Place & Finish Slab on Grade Concrete (6" @shops + 4"<br>elsewhere)                                  | 128,111 | sf   | \$3.45 /sf       | \$441,983          |
| Sawcut Slab on Grade Control Joints  | 7,800   | lf   | \$12.00 /lf      | \$93,600           |
| Cure / Protect Slab on Grade - ADJUST PER RECON <\$.25>  | 128,111 | sf   | \$1.25 /sf       | \$160,139          |
| A4040 PITS & BASES   |         |      | \$0.12 / GSF     | \$46,500           |
| A4040 PITS & BASES   |         |      | \$0.12 / GSF     | \$46,500           |
| Elevator Pit Walls / Mat Slab - complete   | 16      | су   | \$1,500.00 /cy   | \$24,000           |
| Other Pit Walls / Mat Slab - Leveling & Equipment - ADJUST PER<br>RECON TO JUST DEPRESSIONS <\$75K>  | 1.00    | ls   | \$22,500.00 /ls  | \$22,500           |
| A6010 BUILDING SUBDRAINAGE   |         |      | \$2.26 / GSF     | \$860,650          |
| A6011 FOUNDATION DRAINAGE  |         |      | \$2.26 / GSF     | \$860,650          |
| Building Foundation Drainage - Perforated PVC (F&I) - Perimeter                                      | 3,400   | lf   | \$41.50 /lf      | \$141,100          |
| Building Foundation Drainage - Perforated PVC (F&I) - underslab                                      | 10,000  | lf   | \$41.50 /lf      | \$415,000          |
| E&B for Electrical within footprint  | 1.00    | ls   | \$50,000.00 /ls  | \$50,000           |
| E&B for Plumbing within footprint  | 3,150   | lf   | \$57.00 /lf      | \$179,550          |
| Radon Mitigation - 20 drops / 60' each   | 1.00    | ls   | \$75,000.00 /ls  | \$75,000           |
| B1010 FLOOR CONSTRUCTION   |         |      | \$9.77 / GSF     | \$3,717,810        |
| B1010 FLOOR CONSTRUCTION   |         |      | \$7.27 / GSF     | \$2,768,174        |
| Welded Wire Mesh - Structural Slabs (Incl. Overlap) F&I  | 281,722 | sf   | \$1.75 /sf       | \$493,014          |
| Buy & Place Slab on Deck Concrete 5.25" - ADJUST PER RECON<br>FOR LIGHTWT, +50/CY                    | 3,780   | су   | \$425.00 /cy     | \$1,606,500        |
| Finish Concrete - Metal Deck   | 244,976 | sf   | \$3.75 /sf       | \$918,660          |
| VE S01A - Reduce based on sub budget   | -1.00   | ls   | \$250,000.00 /ls | (\$250,000)        |
| <b>B1012 FLOOR DECKS, SLABS, &amp; TOPPINGS</b>  |         |      | \$0.42 / GSF     | \$159,364          |
| Concrete Topping @ Precast Plank   | 17,357  | sf   | \$7.25 /sf       | \$125,838          |
| Concrete Topping @ Precast Plank - updated per VE S04  | -893.00 | sf   | \$7.25 /sf       | (\$6 <i>,</i> 474) |
| Housekeeping Pads Complete   | 1,000   | sf   | \$40.00 /sf      | \$40,000           |
| Geofoam - Stage Floor & Raised Platform - deleted  | 0.00    | excl |                  | \$0                |
| B1014 MEZZANINE FLOOR CONSTRUCTION   |         |      | \$2.08 / GSF     | \$790,272          |
| Floor Precast - Plank - Hollow Core 8" Thick - Mezzanine   | 17,357  | sf   | \$48.00 /sf      | \$833,136          |
| Floor Precast - Plank - Hollow Core 8" Thick - Mezzanine - reduced per VE S04                        | -893.00 | sf   | \$48.00 /sf      | (\$42,864)         |
| B1020 ROOF CONSTRUCTION  |         |      | \$1.08 / GSF     | \$409,599          |
| B1022 ROOF DECKS, SLABS, & SHEATHING   |         |      | \$1.08 / GSF     | \$409,599          |

### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY     | UNIT COST         | TOTAL COST   |
|---|--------------|-------------------|--------------|
| Welded Wire Mesh - Roof Deck (Incl. Overlap) F&I  | 23,135 sf    | \$1.75 /sf        | \$40,486     |
| Concrete Material & Place -@ Roof Deck - ADJUST PER RECON<br>FOR LIGHTWT, +50/CY                              | 310 cy       | \$425.00 /cy      | \$131,750    |
| Finish Concrete - Roof Roof Deck  | 20,118 sf    | \$3.75 /sf        | \$75,443     |
| Roof Equipment Pads, CIP Concrete - complete  | 4,048 sf     | \$40.00 /sf       | \$161,920    |
| B1080 STAIRS  |              | \$0.86 / GSF      | \$327,500    |
| B1081 STAIR CONSTRUCTION  |              | \$0.86 / GSF      | \$327,500    |
| Stairs - Concrete In Steel Pan Stairs   | 16 flgt      | \$12,500.00 /flgt | \$202,500    |
| Stairs - Concrete risers @ Aud  | 1.00 ls      | \$125,000.00 /ls  | \$125,000    |
| 04 MASONRY  | 380,570 GSF  | \$18.05 / GSF     | \$6,869,970  |
| B2010 EXTERIOR WALLS  |              | \$10.84 / GSF     | \$4,123,831  |
| B2011 EXTERIOR WALL VENEER  |              | \$7.82 / GSF      | \$2,977,517  |
| Staging and Scaffolding - Exterior CMU - All exterior Masonry   | 1.00 ls      | \$185,000.00 /ls  | \$185,000    |
| Exterior Face Brick Veneer - ADJUST PER RECON, +\$2/SF  | 23,043 sf    | \$45.00 /sf       | \$1,036,935  |
| Exterior CMU - CMU Veneer - ADJUST PER RECON, +\$2/SF   | 33,536 sf    | \$37.00 /sf       | \$1,240,832  |
| Exterior Stone - 2" Granite Veneer Panels   | 2,385 sf     | \$175.00 /sf      | \$417,375    |
| Exterior Stone - 2" Granite Veneer Panels VE TO CHANGE TO<br>ARRISCRAFT                                       | -2385.00 sf  | \$125.00 /sf      | (\$298,125)  |
| Exterior Cast Stone Veneer - Arriscraft   | 7,310 sf     | \$50.00 /sf       | \$365,500    |
| Cast Stone Column Wraps at South Entrance   | 2.00 ea      | \$15,000.00 /ea   | \$30,000     |
| B2012 EXTERIOR WALL CONSTRUCTION  |              | \$3.01 / GSF      | \$1,146,314  |
| Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU,<br>Insul, AVB, NO INT GWB) - ADJUSTED PER RECON | 35,909 sf    | \$46.00 /sf       | \$1,651,814  |
| PER RECON, RE-ALLOCATED 10K SF TO LGMF  | -10000.00 sf | \$46.00 /sf       | (\$460,000)  |
| PER VE-A02 - change 12" Back-up to 8"   | -1.00 ls     | \$45,500.00 /ls   | (\$45,500)   |
| C1010 INTERIOR PARTITIONS   |              | \$7.22 / GSF      | \$2,746,139  |
| C1011 INTERIOR FIXED PARTITIONS   |              | \$7.22 / GSF      | \$2,746,139  |
| Interior CMU 4.0 - 4"   | 2,226 sf     | \$22.00 /sf       | \$48,972     |
| Interior CMU 8.0 - 8"   | 54,681 sf    | \$26.00 /sf       | \$1,421,706  |
| Interior CMU 8.1 - 8"   | 913 sf       | \$26.00 /sf       | \$23,738     |
| Interior CMU 8.2 - 8" (2hr RATED)   | 12,434 sf    | \$30.00 /sf       | \$373,020    |
| Interior CMU 12.0 - 12"   | 10,667 sf    | \$35.00 /sf       | \$373,345    |
| Interior CMU 12.2 - 12"   | 4,824 sf     | \$35.00 /sf       | \$168,840    |
| Interior CMU ADJUST PER RECON - INCREASE QTY FOR HIGHER<br>HT (LOWER AT MEZZ)                                 | 12,831 sf    | \$28.00 /sf       | \$359,268    |
| Interior CMU ADJUST PER VE S04  | -65.00 sf    | \$350.00 /sf      | (\$22,750)   |
| C2010 WALL FINISHES   |              | \$0.00 / GSF      | \$0          |
| C2015 STONE FACING  |              | \$0.00 / GSF      | \$0          |
| Interior Stone - Travertine, not show on drawings EXCLUDED  | 0.00 sf      |                   | \$0          |
| 05 METALS   | 380,570 GSF  | \$54.97 / GSF     | \$20,921,619 |
| A4040 PITS & BASES  |              | \$0.06 / GSF      | \$23,400     |
| A4040 PITS & BASES  |              | \$0.06 / GSF      | \$23,400     |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANT   | ΓΙΤΥ | UNIT COST          | TOTAL COST             |
|--|---------|------|--------------------|------------------------|
| Support Steel - Elev. Sill Angles  | 9.00    | ea   | \$1,500.00 /ea     | \$13,500               |
| Elev. Sump Pit Covers-Galv.  | 2.00    | ea   | \$950.00 /ea       | \$1,900                |
| Elev. Pit Ladders  | 2.00    | ea   | \$4,000.00 /ea     | \$8,000                |
| B1010 FLOOR CONSTRUCTION   |         |      | \$31.51 / GSF      | \$11,992,658           |
| B1011 FLOOR STRUCTURAL FRAME   |         |      | \$31.51 / GSF      | \$11,992,658           |
| Structural Steel Beams - HSS   | 50      | ton  | \$5,700.00 /ton    | \$283,062              |
| Structural Steel Beams - MC  | 459     | lb   | \$10.00 /lb        | \$4,590                |
| Structural Steel Beams - WF  | 1,260   | ton  | \$5,500.00 /ton    | \$6,930,000            |
| Structural Steel Connections   | 243     | ton  | \$5,500.00 /ton    | \$1,336,775            |
| VE S03 - reduce per sub budgets  | -1.00   | ls   | \$500,000.00 /ls   | (\$500,000)            |
| Structural Steel Bracing Bays - HSS  | 107     | ton  | \$5,700.00 /ton    | \$607,905              |
| Structural Steel Columns - HSS - Square / Rectangular  | 283     | ton  | \$5,700.00 /ton    | \$1,615,494            |
| Metal Decking - Floor, 2"  | 244,976 | sf   | \$7.00 /sf         | \$1,714,832            |
| B1020 ROOF CONSTRUCTION  |         |      | \$17.37 / GSF      | \$6,609,237            |
| B1021 ROOF STRUCTURAL FRAME  |         |      | \$17.37 / GSF      | \$6,609,237            |
| Structural Steel Connections   | 140     | ton  | \$5,500.00 /ton    | \$772,145              |
| Structural Steel Beams - HSS   | 1,691   | lb   | \$10.00 /lb        | \$16,910               |
| Structural Steel Beams - MC  | 261     | lb   | \$10.00 /lb        | \$2,610                |
| Structural Steel Beams - WF  | 446     | ton  | \$5,500.00 /ton    | \$2,454,815            |
| Structural Steel Bracing Bays - HSS  | 62      | ton  | \$5,700.00 /ton    | \$351,177              |
| Structural Steel Columns - HSS - Round   | 26      | ton  | \$6,000.00 /ton    | \$156,240              |
| Structural Steel Columns - HSS - Square / Rectangular  | 164     | ton  | \$5,700.00 /ton    | \$933,147              |
| Steel Dunnage - Galvanized   | 43      | ton  | \$6,250.00 /ton    | \$268,125              |
| Steel Joist - DLH  | 115     | ton. | \$5,350.00 /ton.   | \$614,126              |
| Metal Decking - Roof Cornice, 1"   | 5,915   | sf   | \$6.00 /sf         | \$35,490               |
| Metal Decking - Roof, 1-1/2"   | 291     | sf   | \$6.00 /sf         | \$1,746                |
| Metal Decking - Roof, 2" - ADJUST PER RECON, ADDED   | 20,118  | sf   | \$6.00 /sf         | \$120,708              |
| Metal Decking - Roof, 3"   | 102,555 | sf   | \$7.00 /sf         | \$717 <i>,</i> 885     |
| Metal Roof Deck - Acoustic   | 12,624  | sf   | \$13.00 /sf        | \$164,112              |
| B1080 STAIRS   |         |      | \$3.20 / GSF       | \$1,218,600            |
| B1081 STAIR CONSTRUCTION   |         |      | \$3.03 / GSF       | \$1,155,000            |
| Ext. Stairs - Exterior Stair to second floor deck, incl. rail, 28 risers and 1 landing, 1 location | 1.00    | flgt | \$30,000.00 /flgt  | \$30,000               |
| Stairs - Monument / Feature w/ Rails - Open Ornamental Stair, 1<br>location                        | 3.00    | flgt | \$135,000.00 /flgt | \$405,000              |
| Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 1 locations                                     | 1.00    | flgt | \$45,000.00 /flgt  | \$45,000               |
| Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 6 locations                                     | 15      | flgt | \$45,000.00 /flgt  | \$675,000              |
| B2017 BALCONY WALLS & RAILINGS   |         |      | \$0.17 / GSF       | \$6 <mark>3,600</mark> |
| Railing   Ballasted Guardrail at High Roof   | 65      | lf   | \$160.00 /lf       | \$10,400               |
| Railing   Exterior Guardrail at Rotunda Porch - INCREASED PER<br>RECON                             | 195     | lf   | \$272.82 /lf       | \$53,200               |
| Railing   Playground Fencing w/ Privacy Screen - DELETED PER<br>RECON, CARRIED IN LANDSCAPE        | 0.00    | lf   |                    | \$0                    |
| B2010 EXTERIOR WALLS   |         |      | \$0.18 / GSF       | \$70,145               |
| B2012 EXTERIOR WALL CONSTRUCTION   |         |      | \$0.18 / GSF       | \$70,145               |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANTITY    | UNIT COST         | TOTAL COST              |
|---|-------------|-------------------|-------------------------|
| Stabilizer Clips-Galv. @ Perimeter Masonry Walls                                      | 70,145 sf   | \$1.00 /sf        | \$70,145                |
| C1030 INTERIOR DOORS  |             | \$0.11 / GSF      | \$42,000                |
| C1035 INTERIOR PANEL DOORS  |             | \$0.11 / GSF      | \$42,000                |
| Support Steel - Interior Rolling Door/Grille Supports                                 | 1.00 ls     | \$42,000.00 /ls   | \$42,000                |
| C1090 INTERIOR SPECIALTIES  |             | \$2.54 / GSF      | \$965,579               |
| C1091.4 INTERIOR RAILINGS & HANDRAILS   |             | \$1.48 / GSF      | \$562,075               |
| Guard Rail - Interior - Steel Railings (non - stair)                                  | 430 lf      | \$90.00 /lf       | \$38,700                |
| Guard Rail - Interior - Auditorium  | 700 lf      | \$300.00 /lf      | \$210,000               |
| Guard Rail - Interior - Glass Guardrail System  | 275 lf      | \$525.00 /lf      | \$144,375               |
| Guard Rail - Interior - Glass Guardrail System - VE change some to<br>cable guardrail | -1.00 ls    | \$35,000.00 /ls   | (\$35,000)              |
| Guard Rail - Interior - Guard Rail at Mezzanine                                       | 1,425 lf    | \$150.00 /lf      | \$213,750               |
| Guard Rail - Interior - Guard Rail at Mezzanine - reduced per VE<br>S04               | -65.00 lf   | \$150.00 /lf      | (\$9,750)               |
| C1099 OTHER INTERIOR SPECIALTIES  |             | \$1.06 / GSF      | \$403,504               |
| Misc. Metals and Supports   | 403,504 gsf | \$1.00 /gsf       | \$403,504               |
| C2010 WALL FINISHES   |             | \$0.00 / GSF      | \$0                     |
| C2016 SPECIAL WALL SURFACING  |             | \$0.00 / GSF      | \$0                     |
| Flat Lock Metal Tile @ Lobby - PER VE A04 - CHANGE TO TILE<br>(597 SQFT)              | 0.00 sf.    |                   | \$0                     |
| 06 WOOD, PLASTICS, & COMPOSITES   | 380,570 GSF | \$8.86 / GSF      | \$3,370,321             |
| B1010 FLOOR CONSTRUCTION  |             | \$0.18 / GSF      | \$68 <b>,080</b>        |
| B1014 MEZZANINE FLOOR CONSTRUCTION  |             | \$0.18 / GSF      | \$68 <b>,080</b>        |
| Wood Decking - 3/4" @ Mezzanine Complete \$/sf - ADJUST PER<br>RECON +40/CY           | 1,702 sf    | \$40.00 /sf       | \$68,080                |
| B1020 ROOF CONSTRUCTION   |             | \$0.35 / GSF      | \$1 <mark>33,850</mark> |
| B1029 ROOF CONSTRUCTION SUPPLEMENTARY COMPONENTS                                      |             | \$0.35 / GSF      | \$133,850               |
| Rough Carpentry - Roof Blocking   | 5,925 lf    | \$12.00 /lf       | \$71,100                |
| Rough Carpentry @ Curbs   | 37 ea       | \$750.00 /ea      | \$27,750                |
| Temporary Roof Perimeter Protection   | 1.00 allw   | \$20,000.00 /allw | \$20,000                |
| Temporary Roof Protection   | 1.00 allw   | \$15,000.00 /allw | \$15,000                |
| B2010 EXTERIOR WALLS  |             | \$0.03 / GSF      | \$10,700                |
| B2012 EXTERIOR WALL CONSTRUCTION  |             | \$0.03 / GSF      | \$10,700                |
| Blocking @ Exterior Wall Mounted Railing \$/If  | 355 lf      | \$10.00 /lf       | \$3,550                 |
| Blocking @ Exterior Louver \$/lf  | 715 lf      | \$10.00 /lf       | \$7,150                 |
| B2020 EXTERIOR WINDOWS  |             | \$0.21 / GSF      | \$81,750                |
| B2021 EXTERIOR OPERATING WINDOWS  |             | \$0.21 / GSF      | \$81,750                |
| Blocking @ Window Perimeter \$/If   | 5,450 lf    | \$15.00 /lf       | \$81,750                |
| C1010 INTERIOR PARTITIONS   |             | \$2.05 / GSF      | \$780,800               |
| C1011 INTERIOR FIXED PARTITIONS   |             | \$2.05 / GSF      | \$780,800               |
| Interior Rough Carpentry  | 382,610 sf  | \$2.04 /sf        | \$780,800               |
| C1090 INTERIOR SPECIALTIES  |             | \$1.99 / GSF      | \$756,470               |

#### 60% CD Estimate - Reconciled incl VE

Gilbane 01/20/2023 Rev.3

| DESCRIPTION   | QUANTITY    | UNIT COST       | TOTAL COST   |
|---|-------------|-----------------|--------------|
| C1097 STORAGE SPECIALTIES   |             | \$0.04 / GSF    | \$14,026     |
| Locker Benches  | 216 lf      | \$65.00 /lf     | \$14,026     |
| C1099 OTHER INTERIOR SPECIALTIES  |             | \$1.95 / GSF    | \$742,444    |
| 2x4 Stud Wall with Plywood - assume 8' high                                     | 3,134 sf    | \$10.00 /sf     | \$31,336     |
| Plywood Sheathing with 2x8 Wood Joists  | 740 sf      | \$15.00 /sf     | \$11,107     |
| Safety Related Carpentry - Safety Rails / Opening Protection                    | 393,000 sf  | \$2.00 /sf      | \$786,000    |
| Safety Related Carpentry - Safety Rails / Opening Protection -<br>adjust per VE | -1.00 ls    | \$86,000.00 /ls | (\$86,000)   |
| C2010 WALL FINISHES   |             | \$2.54 / GSF    | \$968,323    |
| C2012 WALL PANELING   |             | \$1.75 / GSF    | \$667,365    |
| Wood Veneer Premium for Paneling at columns                                     | 2,304 sf    | \$85.00 /sf     | \$195,840    |
| Fabric Wrapped Acoustical Wall Panels @ Auditorium                              | 1,540 sf.   | \$50.00 /sf.    | \$77,000     |
| Wood fiber Acoustical Panels  | 3,475 sf.   | \$45.00 /sf.    | \$156,375    |
| Cafeteria Column Enclosure - Fiberglass Reinforced (12' high)                   | 8.00 ea     | \$2,750.00 /ea  | \$22,000     |
| Fiber Reinforced Panel (FRP) @ 4' high  | 1,292 sf.   | \$25.00 /sf.    | \$32,292     |
| Fiber Reinforced Panel (FRP) @ Full Height                                      | 7,354 sf.   | \$25.00 /sf.    | \$183,858    |
| C2013.4 WALL COVERINGS  |             | \$0.00 / GSF    | \$0          |
| Interior Misc. Millwork not shown or within F&E Estimate                        | 0.00 nic    |                 | \$0          |
| C2016 SPECIAL WALL SURFACING  |             | \$0.35 / GSF    | \$132,000    |
| Flexible Stainless Steel Safety Netting   | 2,400 sf    | \$55.00 /sf     | \$132,000    |
| C2019 WALL FINISH SUPPLEMENTARY COMPONENTS                                      |             | \$0.44 / GSF    | \$168,958    |
| Interior Window Sills @ Exterior - Solid Surface                                | 3,379 lf    | \$50.00 /lf     | \$168,958    |
| E2010 FIXED FURNISHINGS   |             | \$1.50 / GSF    | \$570,348    |
| E2013 CASEWORK  |             | \$1.50 / GSF    | \$570,348    |
| Countertop-Casework, Epoxy  | 1,138 lf    | \$120.00 /lf    | \$136,610    |
| Countertop-Casework, Galvanized Steel Counter w/ Brackets                       | 68 lf       | \$150.00 /lf    | \$10,147     |
| Countertop-Casework, PLAM   | 726 lf      | \$60.00 /lf     | \$43,587     |
| Casework - PLAM Counter (1' deep) w/ Brackets                                   | 79 lf       | \$60.00 /lf     | \$4,711      |
| Casework - PLAM Counter w/ Brackets   | 1,247 lf    | \$60.00 /lf     | \$74,838     |
| Custom Millwork - Bench with Solid Surface Top                                  | 247 lf      | \$600.00 /lf    | \$148,255    |
| Custom Millwork - Cafe Counter with Quartz Countertop                           | 27 lf       | \$1,100.00 /lf  | \$29,995     |
| Custom Millwork - Display Case (8' High)  | 22 lf       | \$2,500.00 /lf  | \$54,206     |
| Custom Millwork - Media Center Desk   | 41 lf       | \$482.59 /lf    | \$20,000     |
| Custom Millwork - Reception Desk with Solid Surface Top                         | 28 lf       | \$1,082.20 /lf  | \$30,000     |
| Custom Millwork - TV Studio, not shown - EXCLUDED                               | 1.00 nic    | \$0.00 /nic     | \$0          |
| Custom Millwork - School Store, not shown - EXCLUDED                            | 1.00 nic    | \$0.00 /nic     | \$0          |
| Custom Millwork - Collab Spaces, not shown - EXCLUDED                           | 1.00 nic    | \$0.00 /nic     | \$0          |
| Custom Millwork - Career Center, not shown - EXCLUDED                           | 1.00 nic    | \$0.00 /nic     | \$0          |
| Custom Millwork - Bank, not shown - EXCLUDED                                    | 1.00 nic    | \$0.00 /nic     | ŞO           |
| Custom Millwork - Wood Cubbie - 4' high   | 24 ea       | \$750.00 /ea    | \$18,000     |
| 07 THERMAL & MOISTURE PROTECTION  | 380,570 GSF | \$36.40 / GSF   | \$13,851,817 |
| A2020 BASEMENT WALL CONSTRUCTION  |             | \$1.15 / GSF    | \$436,465    |
| A2022 MOISTURE PROTECTION   |             | \$1.15 / GSF    | \$436,465    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANT   | TITY | UNIT CC     | )ST   | TOTAL COST  |
|---|---------|------|-------------|-------|-------------|
| Insulation / damproofing - Foundation Walls   | 8,193   | sf   | \$10.00     | /sf   | \$81,930    |
| Insulation / Fluid-Applied Waterproofing - Basement Walls & top<br>of ftgs                            | 18,969  | sf   | \$15.00     | /sf   | \$284,535   |
| Waterproof Pits - 2 ea - Elev   | 400     | sf   | \$25.00     | /sf   | \$10,000    |
| Waterproof Pits -6 ea - Other   | 2,400   | sf   | \$25.00     | /sf   | \$60,000    |
| A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS  |         |      | \$0.38      | / GSF | \$146,211   |
| A4096 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS  |         |      | \$0.38      | / GSF | \$146,211   |
| Rigid Insulation @ S.O.G 2' @ Perimeter   | 10,846  | sf   | \$2.85      | /sf   | \$30,911    |
| Vapor Barrier @ S.O.G.  | 128,111 | sf   | \$0.90      | /sf   | \$115,300   |
| B1010 FLOOR CONSTRUCTION  |         |      | \$2.36      | / GSF | \$898,421   |
| <b>B1019 FLOOR CONSTRUCTION SUPPLEMENTARY COMPONENTS</b>  |         |      | \$2.36      | / GSF | \$898,421   |
| Applied Fireproofing Complete \$/sf   | 244,976 | sf   | \$3.30      | /sf   | \$808,421   |
| Intumescent Fireproofing @ exposed framing / bracing - allow  | 1.00    | allw | \$40,000.00 | /allw | \$40,000    |
| Misc. Patching of Fireproofing  | 1.00    | ls   | \$50,000.00 | /ls   | \$50,000    |
| B1020 ROOF CONSTRUCTION   |         |      | \$1.39      | / GSF | \$529,411   |
| <b>B1029 ROOF CONSTRUCTION SUPPLEMENTARY COMPONENTS</b>   |         |      | \$1.39      | / GSF | \$529,411   |
| Applied Fireproofing Complete \$/sf - ADJUST PER RECON<br>+\$.40/SF                                   | 141,503 | sf   | \$3.60      | /sf   | \$509,411   |
| Intumescent Fireproofing @ exposed framing / bracing - allow  | 1.00    | allw | \$10,000.00 | /allw | \$10,000    |
| Misc. Patching of Fireproofing  | 1.00    | ls   | \$10,000.00 | /ls   | \$10,000    |
| B2010 EXTERIOR WALLS  |         |      | \$15.04     | / GSF | \$5,721,936 |
| B2011 EXTERIOR WALL VENEER  |         |      | \$13.58     | / GSF | \$5,168,433 |
| Metal Panel   Insulated Metal Panels w/ 4" LGMF Backup  | 14,863  | sf   | \$90.00     | /sf   | \$1,337,670 |
| Metal Panel   Flat-Lock Metal Tiles over 9/16" Galvanized Utility<br>Deck                             | 4,976   | sf   | \$145.00    | /sf   | \$721,520   |
| Metal Panel   Corrugated Insulated Metal Panels on Aluminum<br>Clip System                            | 4,978   | sf   | \$76.00     | /sf   | \$378,328   |
| ACM   ACM Cornice - Tapered Roof Edge, Low Roofs (~6-8'<br>Surface Area) - ADJUST PER RECON <\$35/LF> | 1,931   | lf   | \$1,015.00  | /lf   | \$1,959,965 |
| ACM   ACM Panels on Metal Clip System   | 4,040   | sf   | \$95.00     | /sf   | \$383,800   |
| ACM   ACM Column Wraps/Fin Projections at 4th Floor Canopy -<br>South Elevation +\$370/LF             | 150     | lf   | \$580.00    | /If   | \$87,000    |
| ACM   ACM Column Wraps/Fin Projections at Rotunda - 27' Tall -<br>ADJUST PER RECON +250/LF            | 515     | lf   | \$435.00    | /lf   | \$224,025   |
| ACM   ACM Decorative Accent Bandings - ADJUST PER RECON,<br>+\$25/LF)                                 | 525     | lf   | \$145.00    | /lf   | \$76,125    |
| B2012 EXTERIOR WALL CONSTRUCTION  |         |      | \$0.26      | / GSF | \$98,210    |
| Exterior Air and Vapor Barrier System (AVB) - Total enclosure SF                                      | 130,946 | sfwa | \$0.00      | /sfwa | \$0         |
| Caulking and Sealants, Exterior - Total enclosure SF  | 130,946 | sfwa | \$0.75      | /sfwa | \$98,210    |
| <b>B2013 EXTERIOR WALL INTERIOR SKIN</b>  |         |      | \$0.70      | / GSF | \$264,790   |
| 2" Closed Cell Spray Foam Insulation - ADJUSTED PER RECON -<br>+\$2/SF                                | 43,905  | sf   | \$5.50      | /sf   | \$241,478   |
| 6" Closed Cell Spray Foam Insulation- ADJUSTED PER RECON -<br>+\$2/SF                                 | 2,914   | sf   | \$8.00      | /sf   | \$23,312    |
| <b>B2018 EXTERIOR WALL SUPPLEMENTARY COMPONENTS</b>   |         |      | \$0.50      | / GSF | \$190,504   |

### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY     | UNIT COST         | TOTAL COST        |
|---|--------------|-------------------|-------------------|
| Sheet Metal Flashing & Trim Complete \$/sf  | 152,403 sfwa | \$1.25 /sfwa      | \$190,504         |
| B3010 ROOFING   |              | \$13.48 / GSF     | \$5,128,490       |
| B3012 LOW SLOPE MEMBRANE SYSTEMS  |              | \$12.98 / GSF     | \$4,941,385       |
| Green Roof System - Planter / Plantings Allowance                                     | 1.00 allw    | \$50,000.00 /allw | \$50,000          |
| Pre-Vegetated Roof Garden System  | 4,820 sf     | \$50.00 /sf       | \$241,000         |
| Roof System Type A - TPO Membrane, 1/2" Cover Board, 6-1/2"<br>Insul.                 | 67,401 sf    | \$30.00 /sf       | \$2,022,030       |
| Roof System Type B- TPO Membrane, 1/2" Cover Board, 6-1/2"<br>Tapered Insul.          | 67,660 sf    | \$33.00 /sf       | \$2,232,780       |
| Concrete Paver Roof System over Membrane Roof - ADJUST PER<br>RECON, QTY & uNIT \$    | 3,860 sf     | \$45.00 /sf       | \$173,700         |
| Rubber Paver Roof System over Membrane Roof   | 2,365 sf     | \$55.00 /sf       | \$130,075         |
| Premium for Tapered Cricket Areas   | 18,360 sf    | \$5.00 /sf        | \$91,800          |
| Slip sheet @ PV Arra areas - Not Included per DD VE                                   | 0.00 sf      |                   | \$0               |
| B3014.2 FLASHINGS & TRIM  |              | \$0.41 / GSF      | \$155,105         |
| Patch and Seal Roof Penetrations  | 1.00 ls      | \$35,000.00 /ls   | \$35,000          |
| Metal Coping at Granite Wall  | 95 lf        | \$135.00 /lf      | \$12,825          |
| Roof Edge Fascia  | 5,364 lf     | \$20.00 /lf       | \$107,280         |
| B3019 ROOFING SUPPLEMENTARY COMPONENTS  |              | \$0.08 / GSF      | \$32,000          |
| Elevator Roof Vent  | 2.00 ea      | \$2,500.00 /ea    | \$5,000           |
| Expansion Joints - 4" Bellows Joint   | 180 lf       | \$150.00 /lf      | \$27,000          |
| B3020 ROOF APPURTENANCES  |              | \$0.32 / GSF      | \$122,300         |
| B3020 ROOF APPURTENANCES  |              | \$0.32 / GSF      | \$122,300         |
| Smoke Hatches - Bilco Automatic Fire/Smoke Vent (4'6"x6'6")<br>DELETED @ RECON        | 0.00 nic     |                   | \$0               |
| Roofing Pavers/Walkways - ADJUST PER RECON - RUBBER VS<br>PRECAST                     | 11,615 sf    | \$10.53 /sf       | \$122,300         |
| B3080 OVERHEAD EXTERIOR ENCLOSURES  |              | \$0.97 / GSF      | \$369,995         |
| B3081 EXTERIOR CEILINGS   |              | \$0.97 / GSF      | \$369,995         |
| Soffits - ACM   | 1,771 sf     | \$120.00 /sf      | \$212,520         |
| Soffits - Exterior Rated Gyp  | 1,715 sf     | \$25.00 /sf       | \$42 <i>,</i> 875 |
| Soffits - Linear Metal Ceilings   | 955 sf       | \$120.00 /sf      | \$114,600         |
| C1030 INTERIOR DOORS  |              | \$0.76 / GSF      | \$289,233         |
| C1039 INTERIOR DOOR SUPPLEMENTARY COMPONENTS  |              | \$0.76 / GSF      | \$289,233         |
| Misc. Interior Caulking - General   | 380,570 sf   | \$0.76 /sf        | \$289,233         |
| C2010 WALL FINISHES   |              | \$0.35 / GSF      | \$134,640         |
| C2012 WALL PANELING   |              | \$0.35 / GSF      | \$134,640         |
| Phenolic Resin Wall Panels - Interior   | 1,530 sf.    | \$88.00 /sf.      | \$134,640         |
| C2050 CEILING FINISHES  |              | \$0.20 / GSF      | \$74,715          |
| C2059 CEILING FINISH SUPPLEMENTARY COMPONENTS   |              | \$0.20 / GSF      | \$74.715          |
| Paint Sound Barrier   Painted GWB Ceiling - CEILING OCCURING<br>BETWEEN STEEL GIRDERS | 74,715 sf    | \$1.00 /sf        | \$74,715          |
| 08 OPENINGS   | 380,570 GSF  | \$28.84 / GSF     | \$10,976,581      |

Wakefield, MA

### 60% CD Estimate - Reconciled incl VE

Gilbane 01/20/2023 Rev.3

| DESCRIPTION   | QUANTITY  | UNIT COST      | TOTAL COST  |
|---|-----------|----------------|-------------|
| B2010 EXTERIOR WALLS  |           | \$0.00 / GSF   | \$0         |
| B2011 EXTERIOR WALL VENEER  |           | \$0.00 / GSF   | \$0         |
| Screen Wall   RTU Screen @ mech. equip none shown, excluded   | 0.00 excl |                | \$0         |
| B2020 EXTERIOR WINDOWS  |           | \$16.32 / GSF  | \$6,209,146 |
| B2022 EXTERIOR FIXED WINDOWS  |           | \$1.21 / GSF   | \$460,250   |
| Window   Insulated Translucent Wall Panel System w/ Integral<br>Louvers   | 2,630 sf  | \$175.00 /sf   | \$460,250   |
| <b>B2023 EXTERIOR WINDOW WALL STOREFRONTS</b>   |           | \$4.69 / GSF   | \$1,784,040 |
| Exterior Windows   Insulating Glass in Aluminum System -<br>ADJUST PER RECON, +\$10/SF                                | 10,209 sf | \$120.00 /sf   | \$1,225,080 |
| Storefront   Insulating Glass in Aluminum Storefront System-<br>ADJUST PER RECON, +\$10/SF                            | 4,658 sf  | \$120.00 /sf   | \$558,960   |
| Premium for Operable Vents at Storefront/Windows/Translucent<br>Panels  | 0.00 ea   |                | \$0         |
| B2029 CURTAIN WALLS   |           | \$10.42 / GSF  | \$3,964,856 |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>6" System- ADJUST PER RECON, +\$10/SF            | 60 sf     | \$145.00 /sf   | \$8,700     |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>7" System- ADJUST PER RECON, +\$10/SF            | 18,131 sf | \$148.00 /sf   | \$2,683,388 |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>7" System - Radiused- ADJUST PER RECON, +\$10/SF | 5,481 sf  | \$148.00 /sf   | \$811,188   |
| Curtain Wall - Premium for Bullet Resistant Glazing   | 1,235 sf  | \$100.00 /sf   | \$123,500   |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>10" System- ADJUST PER RECON, +\$10/SF           | 2,113 sf  | \$160.00 /sf   | \$338,080   |
| B2050 EXTERIOR DOORS & GRILLES  |           | \$1.37 / GSF   | \$523,215   |
| B2051 EXTERIOR ENTRANCE DOORS   |           | \$0.75 / GSF   | \$284,900   |
| Door   HM Double Exterior - Incl. Door, Frame, and Hardware   | 3.00 ea   | \$7,000.00 /ea | \$21,000    |
| Door   HM Single Exterior - Incl. Door, Frame, and Hardware   | 5.00 ea   | \$3,500.00 /ea | \$17,500    |
| Glass & Alum Doors - Double Exterior - Incl. Door, Frame, and Hardware  | 24 ea     | \$8,800.00 /ea | \$211,200   |
| Glass & Alum Doors - Single Exterior - Incl. Door, Frame, and Hardware  | 8.00 ea   | \$4,400.00 /ea | \$35,200    |
| B2053.4 OVERHEAD & ROLL UP DOORS  |           | \$0.63 / GSF   | \$238,315   |
| Door   Insulated Overhead Coiling Door, Motor Operated, 1 each  | 115 sf    | \$55.00 /sf    | \$6,325     |
| Door   Motor Operated Overhead Door w/ Insulating Glass -<br>Typ., 13 ea  | 2,442 sf  | \$95.00 /sf    | \$231,990   |
| B2070 EXTERIOR LOUVERS & VENTS  |           | \$0.27 / GSF   | \$104,000   |
| B2071 EXTERIOR LOUVERS  |           | \$0.27 / GSF   | \$104,000   |
| Louver   Exterior Louvers   | 1,040 sf  | \$100.00 /sf   | \$104,000   |
| C1010 INTERIOR PARTITIONS   |           | \$6.78 / GSF   | \$2,579,915 |
| C1016 GLAZED PARTITIONS & STOREFRONTS   |           | \$6.78 / GSF   | \$2,579,915 |
| Borrowed lights- BL1-BL5  | 865 sf    | \$70.00 /sf    | \$60,550    |
| CW Interior   | 4,805 sf  | \$140.00 /sf   | \$672,700   |
| Storefront - Interior   | 11,175 sf | \$105.00 /sf   | \$1,173,375 |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST         | TOTAL COST   |
|--|-------------|-------------------|--------------|
| Storefront - Interior, FIRE RATED  | 2,857 sf    | \$225.00 /sf      | \$642,825    |
| Art Glass Panels @ Cafeteria (PREMIUM)   | 219 sf      | \$25.00 /sf       | \$5,465      |
| Glazing - Interior Ballistic, not shown Allowance                                | 1.00 allw   | \$25,000.00 /allw | \$25,000     |
| C1020 INTERIOR WINDOWS   |             | \$0.00 / GSF      | \$1,500      |
| C1020 INTERIOR WINDOWS   |             | \$0.00 / GSF      | \$1,500      |
| Transaction Window - Interior  | 1.00 ea     | \$1,500.00 /ea    | \$1,500      |
| C1030 INTERIOR DOORS   |             | \$4.10 / GSF      | \$1,558,805  |
| C1031.4 STANDARD INTERIOR DOORS  |             | \$3.27 / GSF      | \$1,243,805  |
| Door type AL2- 24" x 2'-9" & 23" x 24" Vision Panel                              | 33 ea       | \$800.00 /ea      | \$26,400     |
| Door type C- Stainless coiling door at counter 4'-6-3/8 x 3'-9-1/8"              | 17 sf       | \$175.00 /sf      | \$2,975      |
| Door type F  | 568 ea      | \$385.00 /ea      | \$218,680    |
| Door type FW1- 24" x 31" Vision Panel  | 10 ea       | \$475.00 /ea      | \$4,750      |
| Door type FW2- 12" x 12" Vision Panel  | 1.00 ea     | \$455.00 /ea      | \$455        |
| Door type RG- Overhead Rolling Security Grille 6'x 10'- 4 each                   | 240 sf      | \$100.00 /sf      | \$24,000     |
| Door type W1- 24" x 5'-4"" Vision Panel  | 1.00 ea     | \$515.00 /ea      | \$515        |
| Door type W2- 24" x 2'-9" & 23" x 24" Vision Panel                               | 4.00 ea     | \$550.00 /ea      | \$2,200      |
| Door type WM- Wire Mesh panel  | 28 ea       | \$350.00 /ea      | \$9,800      |
| Frame- Type 1  | 287 ea      | \$300.00 /ea      | \$86,100     |
| Frame- Type 2  | 126 ea      | \$425.00 /ea      | \$53,550     |
| Frame- Type 4  | 13 ea       | \$450.00 /ea      | \$5,850      |
| Frame- Type 4A   | 23 ea       | \$475.00 /ea      | \$10,925     |
| Frame- Type 5  | 7.00 ea     | \$400.00 /ea      | \$2,800      |
| Frame- Type 6 &6A  | 4.00 ea     | \$400.00 /ea      | \$1,600      |
| Frame- Type 9  | 2.00 ea     | \$9,100.00 /ea    | \$18,200     |
| Glazing   Interior doors and sidelights  | 2,793 sf    | \$35.00 /sf       | \$97,755     |
| Hardware   Interior Door Hardware Per Leaf                                       | 645 leaf    | \$600.00 /leaf    | \$387,000    |
| Install doors and hardware   | 3,225 hr    | \$90.00 /hr       | \$290,250    |
| C1035 INTERIOR PANEL DOORS   |             | \$0.83 / GSF      | \$315,000    |
| Overhead Coiling Doors - Stainless Steel   | 1.00 ea     | \$10,000.00 /ea   | \$10,000     |
| Overhead Coiling Doors - Standard  | 3.00 ea     | \$20,000.00 /ea   | \$60,000     |
| Overhead Rolling Doors - 2 hr Fire Rated, 4 ea, various sizes, 575<br>sf total   | 1.00 ls     | \$245,000.00 /ls  | \$245,000    |
| 09 FINISHES  | 380,570 GSF | \$55.19 / GSF     | \$21,005,190 |
| B2010 EXTERIOR WALLS   |             | \$6.09 / GSF      | \$2,319,229  |
| B2011 EXTERIOR WALL VENEER   |             | \$0.17 / GSF      | \$64,800     |
| Exterior Enclosure Painting, Staining & Transparent Finishing                    | 720 mhr     | \$90.00 /mhr      | \$64,800     |
| B2012 EXTERIOR WALL CONSTRUCTION   |             | \$5.92 / GSF      | \$2,254,429  |
| Exterior Wall Backup GWB Stud Wall - 6" MS, AVB, Dens Glass,<br>Insul., 5/8 GWB  | 42,213 sf   | \$22.00 /sf       | \$928,686    |
| Exterior Wall Backup GWB Stud Wall - 4" MS at Insulated MWP                      | 10,584 sf   | \$14.00 /sf       | \$148,176    |
| Exterior Framing for Decorative Cornices - 3 5/8" MS, AVB, Dens<br>Glass, Insul. | 11,323 sf   | \$28.00 /sf       | \$317,044    |
| Exterior Framing for Soffits - 3 5/8" MS, AVB, Dens Glass, Insul.                | 4,441 sf    | \$32.00 /sf       | \$142,112    |
#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY   | UNIT COST     | TOTAL COST  |
|--|------------|---------------|-------------|
| Exterior Framing, As Required, for ACM Column Wraps/Fins at Rotunda  | 1,760 sf   | \$40.00 /sf   | \$70,400    |
| Exterior Framing, INCREASE PER RECONCILIATION  | 72,231 sf  | \$4.57 /sf    | \$329,811   |
| Exterior Framing, PER RECONCILIATION, RE-ALLOCATE 10K SF<br>FROM CMU   | 10,000 sf  | \$28.00 /sf   | \$280,000   |
| Exterior Framing w/ AVB and Insulation at Low Roof Parapets  | 1,910 sf   | \$20.00 /sf   | \$38,200    |
| B3080 OVERHEAD EXTERIOR ENCLOSURES   |            | \$0.00 / GSF  | \$0         |
| B3081 EXTERIOR CEILINGS  |            | \$0.00 / GSF  | \$0         |
| Exterior Ceiling   Plaster Soffit - Exterior- ADJUST PER RECON,<br>DELETED DOUBLE UP                         | 0.00 sf    |               | \$0         |
| Exterior Ceiling Finishes   Paint, Stain, and Finish Exterior Ceilings - ADJUST PER RECON, DELETED DOUBLE UP | 0.00 sf    |               | \$0         |
| C1010 INTERIOR PARTITIONS  |            | \$19.56 / GSF | \$7,444,139 |
| C1011 INTERIOR FIXED PARTITIONS  |            | \$19.56 / GSF | \$7,444,139 |
| Wall Type (F1.0) GWB on 7/8" Metal Furring   | 813 sf     | \$13.00 /sf   | \$10,569    |
| Wall Type (F2.0) GWB on 1-5/8" Metal Stud  | 1,724 sf   | \$13.00 /sf   | \$22,412    |
| Wall Type (F4.0) 3-5/8" MS, 1lyr 5/8" GWB OS   | 14,311 sf  | \$13.00 /sf   | \$186,043   |
| Wall Type (F6) 6" MS, 1lyr 5/8" GWB OS   | 32,075 sf  | \$18.00 /sf   | \$577,350   |
| Wall Type (F6.0A) 6" MS, 2lyrs 5/8" GWB OS   | 38,024 sf  | \$18.00 /sf   | \$684,432   |
| Wall Type - ADJUST PARTITION UNIT \$ PER SUB QUOTES  | 66,429 sf  | \$18.40 /sf   | \$1,222,286 |
| Wall Type - PER RECON, INCREASE PARTITION QTY  | 376,000 sf | \$1.00 /sf    | \$376,000   |
| Wall Type (F4.0A) 3-5/8" MS, 2lyrs 5/8" GWB OS   | 10,279 sf  | \$19.00 /sf   | \$195,301   |
| Wall Type (G4.0) 3-5/8" MS, 1lyr 5/8" GWB ES, 3-1/2" Acoustic<br>Batt  | 125 sf     | \$16.50 /sf   | \$2,063     |
| Wall Type (G6.0) 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt   | 52,111 sf  | \$18.00 /sf   | \$937,998   |
| Wall Type (G6.0A) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt   | 57,319 sf  | \$19.00 /sf   | \$1,089,061 |
| Wall Type (G6.0B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt   | 56,657 sf  | \$19.50 /sf   | \$1,104,812 |
| Wall Type (G6.0C) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt   | 1,063 sf   | \$19.50 /sf   | \$20,729    |
| Wall Type (G6.1) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt  | 5,196 sf   | \$19.50 /sf   | \$101,322   |
| Wall Type (G6.1B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt   | 2,490 sf   | \$19.50 /sf   | \$48,555    |
| Wall Type (G6.2) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt, 2hr<br>RATED                                    | 13,907 sf  | \$23.00 /sf   | \$319,861   |
| Wall Type (S6.1) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB,<br>2hr RATED                              | 890 sf     | \$22.00 /sf   | \$19,580    |
| Wall Type (S6.2) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB,<br>2hr RATED                              | 23,883 sf  | \$22.00 /sf   | \$525,426   |
| Partition - change from CMU to GWB per VE S04  | 65 sf      | \$5.25 /sf    | \$341       |
| Partition - Premium Abuse Resistant Drywall  | 0.00 lf    |               | \$0         |
| C1030 INTERIOR DOORS   |            | \$0.22 / GSF  | \$81,975    |
| C1031.4 STANDARD INTERIOR DOORS  |            | \$0.22 / GSF  | \$81,975    |
| Paint Interior - Door & Frames   | 1,093 ea   | \$75.00 /ea   | \$81,975    |
| C2010 WALL FINISHES  |            | \$6.13 / GSF  | \$2,333,394 |
| C2013.4 WALL COVERINGS   |            | \$0.23 / GSF  | \$89,323    |
| Vinyl Wall Covering (Auditorium - IWP)   | 1,985 sf.  | \$45.00 /sf.  | \$89,323    |
| C2014 TILE & TERRAZZO WALL FINISHES  |            | \$2.31 / GSF  | \$877,873   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTI    | ΤY   | UNIT COST         | TOTAL COST        |
|--|-----------|------|-------------------|-------------------|
| Ceramic Wall Tile - ADJUST PER RECON - REDUCE FROM 42K SF<br>TO 25K SF         | 17,577 s  | sf   | \$20.00 /sf       | \$351,533         |
| 2" Granite Veneer Panels - ADJUST UNIT PRICE PER RECON                         | 400 s     | sf.  | \$175.00 /sf.     | \$70,000          |
| Porcelain Wall Tile  | 1,445 s   | sf.  | \$24.00 /sf.      | \$34,685          |
| Thin Porcelain Wall Tile   | 18,462 s  | sf.  | \$24.00 /sf.      | \$443,091         |
| VE A04 - CHANGE FLATLOCK TILE TO Thin Porcelain Wall Tile                      | 1,963 s   | sf.  | \$30.00 /sf.      | \$58 <i>,</i> 890 |
| VE A15 - REDUCE Wall Tile  | -1.00 l   | ls   | \$80,326.00 /ls   | (\$80,326)        |
| C2017 WALL PAINTING & COATING  |           |      | \$2.91 / GSF      | \$1,107,145       |
| Paint Interior GWB Walls   | 220,299 s | sf.  | \$1.00 /sf.       | \$220,299         |
| Paint Interior GWB Walls - Soffits   | 1,732 s   | sf.  | \$1.00 /sf.       | \$1,732           |
| Paint Interior GWB Walls - Soffits - not shown                                 | 1.00 a    | allw | \$5,000.00 /allw  | \$5,000           |
| Paint Interior Walls - Epoxy   | 234,495 s | sf.  | \$3.50 /sf.       | \$820,731         |
| Paint Interior CMU Walls   | 7,507 s   | sf   | \$1.25 /sf        | \$9 <i>,</i> 383  |
| Misc. Interior Painting  | 1.00 a    | allw | \$50,000.00 /allw | \$50,000          |
| C2018 ACOUSTICAL WALL TREATMENT  |           |      | \$0.68 / GSF      | \$259,053         |
| Fabric Wrapped Acoustical Panels @ Auditorium                                  | 696 s     | sf.  | \$65.00 /sf.      | \$45,222          |
| Wood Fiber Acoustical Panels @ Gymnasium                                       | 3,290 s   | sf.  | \$65.00 /sf.      | \$213,831         |
| C2030 FLOORING   |           |      | \$10.20 / GSF     | \$3,881,021       |
| C2031 FLOORING TREATMENT   |           |      | \$0.28 / GSF      | \$105,000         |
| Floor Patching Allowance   | 1.00 a    | allw | \$85,000.00 /allw | \$85,000          |
| Floor Prep / Leveling Allowance  | 1.00 a    | allw | \$20,000.00 /allw | \$20,000          |
| C2032.2 TILE FLOORING  |           |      | \$1.75 / GSF      | \$667,136         |
| Ceramic Floor Tile - Mosaic  | 5,367 s   | sf   | \$24.00 /sf       | \$128,808         |
| Porcelain Tile Floor   | 19,226 s  | sf   | \$28.00 /sf       | \$538,328         |
| C2032.4 WOOD FLOORING  |           |      | \$0.70 / GSF      | \$265,188         |
| Wood Flooring - Premium for Markings on Athletic Wood Floor                    | 12,054 s  | sf   | \$1.00 /sf        | \$12,054          |
| Athletic Sports Wood Flooring - Gym  | 12,054 s  | sf   | \$21.00 /sf       | \$253,134         |
| C2032.6 CARPETING  |           |      | \$0.40 / GSF      | \$153,019         |
| Carpet - 1   | 2,359 s   | sf   | \$6.50 /sf        | \$15,334          |
| Carpet - 2   | 6,364 s   | sf   | \$6.50 /sf        | \$41,366          |
| Carpet - 4   | 1,358 s   | sf   | \$6.50 /sf        | \$8,827           |
| Carpet - 5   | 4,479 s   | sf   | \$6.50 /sf        | \$29,114          |
| Carpet - 6   | 3,889 s   | sf   | \$6.50 /sf        | \$25,279          |
| Carpet - 7   | 872 s     | sf   | \$6.50 /sf        | \$5 <i>,</i> 668  |
| Carpet - Walk Off Carpet   | 314 s     | sf   | \$12.00 /sf       | \$3,768           |
| Resilient Carpet   | 3,944 s   | sf   | \$6.00 /sf        | \$23,664          |
| C2032.8 WALL BASE FINISHES   |           |      | \$0.65 / GSF      | \$246,245         |
| Ceramic Tile Base  | 2,470 l   | lf   | \$19.25 /lf       | \$47,548          |
| Rubber Base  | 38,410 l  | lf   | \$3.00 /lf        | \$115,230         |
| Terrazzo Base  | 2,790 l   | lf   | \$14.00 /lf       | \$39,060          |
| Decorative Fabric Metal Panel - Interior                                       | 493 s     | sf   | \$90.00 /sf       | \$44,408          |
| Flat Lock Metal Tiles - Interior - PER VE A04 - CHANGE TO TILE<br>(1,366 SQFT) | 0.00 s    | sf   |                   | \$0               |
| C2033 SPECIALTY FLOORING   |           |      | \$0.21 / GSF      | \$78,050          |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY   | UNIT COST        | TOTAL COST     |
|--|------------|------------------|----------------|
| Foot Grille Carpet   | 1,561 sf   | \$50.00 /sf      | \$78,050       |
| C2035 RESILIENT FLOORING   |            | \$5.71 / G       | SF \$2,171,555 |
| ATH Athletic Sports Flooring   | 3,034 sf   | \$20.00 /sf      | \$60,680       |
| Linoleum LIN1  | 123,045 sf | \$8.50 /sf       | \$1,045,883    |
| Linoleum LIN2  | 164 sf     | \$8.50 /sf       | \$1,394        |
| Linoleum LIN3  | 315 sf     | \$8.50 /sf       | \$2,678        |
| Linoleum LIN4  | 3,298 sf   | \$8.50 /sf       | \$28,033       |
| Sheet Vinyl - Multipurpose   | 9,784 sf   | \$13.00 /sf      | \$127,192      |
| Sheet Vinyl - Slip Resistant   | 1,463 sf   | \$12.00 /sf      | \$17,556       |
| Luxury Viyl Tile LVT   | 3,032 sf   | \$6.50 /sf       | \$19,708       |
| Sheet Vinyl Flooring - SV1   | 35,442 sf  | \$11.00 /sf      | \$389,862      |
| Sheet Vinyl Flooring - SV2   | 197 sf     | \$11.00 /sf      | \$2,167        |
| Sheet Vinyl Flooring - SV3   | 507 sf     | \$11.00 /sf      | \$5,577        |
| Photoluminesent Rubber Stair Treads & Risers - CHANGED TO<br>STANDARD AT RECON - <\$7/SF>          | 9,313 sf   | \$28.00 /sf      | \$260,764      |
| Rubber Flooring at Stair Treads and Risers - RR - INCLUDED<br>ABOVE PER RECON                      | 0.00 sf    |                  | \$0            |
| Rubber Tile Flooring - RT  | 267 sf     | \$15.00 /sf      | \$4,005        |
| Epoxy Flooring EF-1  | 12,121 sf  | \$17.00 /sf      | \$206,057      |
| C2036.2 TERRAZZO FLOORING  |            | \$0.00 / G       | SF \$0         |
| Precast Terrazzo risers & treads - DELETED PER RECON   | 0.00 sf    |                  | \$0            |
| C2036.4 MASONRY & STONE FLOORING   |            | \$0.37 / G       | SF \$140,365   |
| Stone Thresholds at wet rooms  | 68 sf      | \$100.00 /sf     | \$6,800        |
| Sealed Concrete  | 89,043 sf  | \$1.50 /sf       | \$133,565      |
| C2037 FLUID-APPLIED FLOORING   |            | \$0.14 / G       | SF \$54,464    |
| Moisture Mitigation @ Tile   | 6,705 sf   | \$2.53 /sf       | \$16,964       |
| Paint Interior Metal Pan Stairs  | 25 flgt    | \$1,500.00 /fl   | zt \$37,500    |
| C2050 CEILING FINISHES   | -          | \$12.99 / G      | SF \$4,945,432 |
| C2051 PLASTER & GYPSUM BOARD FINISH  |            | \$6.27 / G       | SF \$2.384.740 |
| Ceiling - GWB Soffit - Interior  | 7.116 sf   | \$18.00 /sf      | \$128.092      |
| Ceiling - GWB Soffit - Interior, not shown   | 1.00 allw  | \$50.000.00 /al  | lw \$50.000    |
| GWB   GWB Ceiling, Moisture Resistant GWB Ceiling  | 5,390 sf   | \$25.00 /sf      | \$134,750      |
| GWB   GWB Ceiling, Typical   | 46,712 sf  | \$20.00 /sf      | \$934,240      |
| Ceiling - GWB Soffit - Interior @ Curved Media Center  | 426 sf     | \$25.00 /sf      | \$10,658       |
| Ceiling - GWB SOUND ISOLATION - ADDED @ RECON  | 54,000 sf  | \$25.50 /sf      | \$1,377,000    |
| Ceiling - GWB SOUND ISOLATION - VE A03 - Change Spec   | -1.00 ls   | \$250,000.00 /ls | (\$250,000)    |
| C2054 ACOUSTICAL CEILING TILES & PANELS  |            | \$6.02 / G       | SF \$2,289,573 |
| ACT-1   Acoustical Ceiling Tiles - 2 X 2 HIGH NRC ACOUSTICAL<br>CEILING TILE                       | 166,850 sf | \$7.50 /sf       | \$1,251,375    |
| ACT-2   Acoustical Ceiling Tiles - 2 X 2 WASHABLE ACOUSTICAL<br>CEILING TILE FOR KITCHEN LOCATIONS | 6,967 sf   | \$8.50 /sf       | \$59,220       |
| ACT-4   Acoustical Ceiling Tiles - 2 X 6 HIGH NRC TEGULAR<br>ACOUSTICAL CEILING TILE               | 2,746 sf   | \$11.50 /sf      | \$31,579       |
| ACT-5  | 4,440 sf   | \$12.00 /sf      | \$53,280       |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST         | TOTAL COST       |
|--|-------------|-------------------|------------------|
| ACT-3   Acoustical Ceiling Tiles - 2 X 2 HIGH NRC TEGULAR<br>ACOUSTICAL CEILING TILE AT ADMIN AREAS                                  | 12,351 sf   | \$6.75 /sf        | \$83,369         |
| Interior Ceiling   Linear Metal Ceiling W/ Woodlook, 4" Wide<br>Plank  | 11,750 sf   | \$50.00 /sf       | \$587,500        |
| Hung Ceiling   Mesh Metal Ceiling  | 750 sf      | \$50.00 /sf       | \$37,500         |
| Acoustical Reflector @ Stage   | 350 sf      | \$100.00 /sf      | \$35,000         |
| ACPCP   Acoustical Preformed Ceiling Panels  | 2,100 sf    | \$65.00 /sf       | \$136,500        |
| EAVB   Aluminum Vertical Blade Ceiling System  | 0.00 excl   |                   | \$0              |
| Phenolic / IWP Wd Ceiling Ceiling Panels   | 150 sf      | \$95.00 /sf       | \$14,250         |
| ACM   Aluminum Composite Material Ceiling - Interior - DELETE<br>DOUBLE UP PER VE A18  | 0.00 sf     |                   | \$0              |
| Hung Ceiling   Mesh Metal Ceiling With Acrylic Panel Backing -<br>DELETED PER RECON  | 0.00 nic    |                   | \$0              |
| C2056 PAINTING & STAINING CEILINGS   |             | \$0.71 / GSF      | \$271,120        |
| Paint   Painted Interior GWB - Moisture Resistant GWB Ceiling  | 5,390 sf    | \$1.00 /sf        | \$5,390          |
| Paint   Painted Interior GWB - Typical Ceilings - Latex  | 46,712 sf   | \$1.00 /sf        | \$46,712         |
| Paint   Exposed Painted Structural Steel & Metal Deck  | 87,607 sf   | \$2.50 /sf        | \$219,018        |
| 10 SPECIALTIES   | 380,570 GSF | \$4.42 / GSF      | \$1,680,917      |
| B2010 EXTERIOR WALLS   |             | \$0.02 / GSF      | \$6,000          |
| <b>B2019 EXTERIOR WALL OPENING SUPPLEMENTARY COMPONEN</b>  | TS          | \$0.02 / GSF      | \$6,000          |
| Exterior Signage   Name and logo sign attached to enclosure,<br>Aluminum   | 1.00 ls     | \$6,000.00 /ls    | \$6,000          |
| C1090 INTERIOR SPECIALTIES   |             | \$4.40 / GSF      | \$1,674,917      |
| C1092.2 COMPARTMENTS & CUBICLES  |             | \$0.30 / GSF      | \$112.586        |
| Cubicles   Cubicle Curtains and Track at Nurse's Area.   | 1.00 ls     | \$7.000.00 /ls    | \$7.000          |
| Toilet Compartment - Plastic Laminate - Standard   | 45 stall    | \$1.200.00 /stall | \$54.000         |
| Toilet Compartment - Plastic Laminate - Handicapped  | 17.00 stall | \$1.500.00 /stall | \$25.500         |
| Urinal Screen - Plastic Laminate   | 37.00 ea    | \$425.00 /ea      | \$15,725         |
| Wire Mesh Partition (assume 8' high) - Interior  | 1,151 sf    | \$9.00 /sf        | \$10,361         |
| C1092.4 TOILET, BATH, & LAUNDRY ACCESSORIES  |             | \$0.61 / GSF      | \$232,085        |
| Toilet Accessories - Unload / Store / Categorize   | 635.00 mhr  | \$90.00 /mhr      | \$57,150         |
| Toilet Accessories - Distribute / Install  | 635.00 mhr  | \$90.00 /mhr      | \$57,150         |
| Non Restroom   Soap: Soap Dispenser, Wall Mtd.   | 143 ea      | \$80.00 /ea       | \$11,440         |
| Restroom   Soap: Soap Dispenser, Wall Mtd.   | 83.00 ea    | \$80.00 /ea       | \$6,640          |
| Restroom   Paper Towel Dispenser & Trash, Semi Recessed  | 71.00 ea    | \$205.00 /ea      | \$14,555         |
| Restroom   Toilet Paper Dispenser, Wall Mtd.   | 105.00 ea   | \$100.00 /ea      | \$10,500         |
| Restroom   Sanitary Napkin Disposal, Recessed  | 105 ea      | \$75.00 /ea       | \$7 <i>,</i> 875 |
| Restroom   Soap: Shampoo Dispenser, Shower Wall Mtd.   | 10.00 ea    | \$90.00 /ea       | \$900            |
| Restroom   Grab Bar: 36" Peened Grip, Wall Mtd.  | 60.00 ea    | \$43.00 /ea       | \$2,580          |
| Restroom   Grab Bar: 42" Peened Grip, Wall Mtd.  | 150.00 ea   | \$45.00 /ea       | \$6,750          |
| Non Restroom   Lit Mirror: Single Mirror: Light in Framed Mirror<br>Unit   | 10 ea       | \$520.00 /ea      | \$5,200          |
| Non Restroom   Mirror: Full Height Frameless Mirror Allowance -<br>Weight room, Fitness Room, Locker Rooms, Changing Rooms,<br>Misc. | 1.00 allw   | \$10,500.00 /allw | \$10,500         |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANT     | TITY | UNIT CO     | ST    | TOTAL COST         |
|---|-----------|------|-------------|-------|--------------------|
| Restroom   Grab Bar: 60" "L" Shaped, Shower, Curved, Wall Mtd.  | 10.00     | ea   | \$115.00    | /ea   | \$1,150            |
| Restroom   Baby Changing Station; Wall Mtd.   | 6.00      | ea   | \$220.00    | /ea   | \$1,320            |
| Non Restroom   Hook: Multiple Coat Hook, Coat Rack, Wall Mtd.   | 16        | ea   | \$70.00     | /ea   | \$1,120            |
| Restroom   Mirror: Single Mirror: Framed Mirror Unit  | 85        | ea   | \$165.00    | /ea   | \$14,025           |
| Restroom   Shower curtain and rod, typ. shower unit   | 10.00     | ea   | \$80.00     | /ea   | \$800              |
| Restroom   Shower Seat @ ADA shower units   | 10.00     | ea   | \$230.00    | /ea   | \$2,300            |
| Janitor   Shelf: S.S. Utility Shelf w/ Mop and Broom Holders  | 10.00     | ea   | \$155.00    | /ea   | \$1,550            |
| Janitor   Shelf: SS Shelf 8" D x 24" W  | 10.00     | ea   | \$65.00     | /ea   | \$650              |
| Non Restroom   Hook: Coat Hook, Door / Wall Mtd.  | 43        | ea   | \$20.00     | /ea   | \$860              |
| Restroom   Hook: Coat Hook, Stall Wall Mtd.   | 67.00     | ea   | \$20.00     | /ea   | \$1,340            |
| Non Restroom   Paper Towel Dispenser, Wall Mtd.   | 143       | ea   | \$110.00    | /ea   | \$15,730           |
| C1093 WALL & DOOR PROTECTION  |           |      | \$0.12      | / GSF | \$45,456           |
| Wall & Door Protection Complete \$/sf, including corner guards  | 403,504   | gsf  | \$0.10      | /gsf  | \$45 <i>,</i> 456  |
| C1093.2 INFORMATION SPECIALTIES   |           |      | \$1.43      | / GSF | \$542 <i>,</i> 850 |
| White / Marker Boards - Small 4' x 4'   | 100       | ea   | \$500.00    | /ea   | \$50,000           |
| White / Marker Boards - Medium 4' x 6'  | 272.00    | ea   | \$750.00    | /ea   | \$204,000          |
| Corkboards / Tack Boards - Large 4' x 8'  | 124       | ea   | \$450.00    | /ea   | \$55,800           |
| Corkboards / Tack Boards - Small 4' x 4'  | 117       | ea   | \$900.00    | /ea   | \$105,300          |
| Signage   Dedication Plaques Allowance - Interior   | 3.00      | allw | \$2,000.00  | /allw | \$9,000            |
| Signage   Egress, Waydinding, and Regulatory - Interior   | 4.00      | ls   | \$5,000.00  | /ls   | \$18,000           |
| Signage   Room Identification Signs - Interior  | 405       | ea   | \$150.00    | /ea   | \$60,750           |
| Signage   Additional Signage Allowance - Interior   | 1.00      | allw | \$10,000.00 | /allw | \$10,000           |
| Signage   Branding and Graphics Allowance - Interior, including<br>large format wall murals and panels. | 3.00      | allw | \$5,000.00  | /allw | \$30,000           |
| C1097 STORAGE SPECIALTIES   |           |      | \$1.61      | / GSF | \$611,400          |
| Lockers   Locker Room: Single and multi-tier lockers on conc, base, 15" x 15"                           | 428       | ea   | \$500.00    | /ea   | \$214,000          |
| Lockers   Shop Lockers 2 Tier, 15" Wide x 15" Deep  | 204       | ea   | \$500.00    | /ea   | \$102,000          |
| Lockers   Corridor Lockers 2 Tier, 15" Wide x 15" Deep on wood base                                     | 1,226     | ea   | \$500.00    | /ea   | \$613,000          |
| Lockers   Corridor Lockers 2 Tier, 15" Wide x 15" Deep on wood base - VE                                | -826.00   | ea   | \$500.00    | /ea   | (\$413,000)        |
| Lockers   Cosmetology Lockers: Single &/or double tier, 2' w x 2.5' d                                   | 22        | ea   | \$625.00    | /ea   | \$13,750           |
| Lockers   Team Lockers: Single tier 2' w x 18" d welded locker on conc. base                            | 142       | ea   | \$575.00    | /ea   | \$81,650           |
| Storage Wall Shelving - Metal (In F&E Estimate)   | 768       | lf   | \$0.00      | /lf   | \$0                |
| D4031 FIRE PROTECTION EQUIPMENT   |           |      | \$0.34      | / GSF | \$130,540          |
| Fire Extinguisher Cabinets - Semi-Recessed  | 262.00    | ea   | \$405.00    | /ea   | \$106,110          |
| AED Cabinets, units, and accessories  | 14.00     | ea   | \$1,745.00  | /ea   | \$24,430           |
| 11 EQUIPMENT  | 380,570 G | SF   | \$9.91      | / GSF | \$3,771,134        |
| C1010 INTERIOR PARTITIONS   |           |      | \$0.25      | / GSF | \$93,665           |
| C1017 INTERIOR GUARDRAILS & SCREENS   |           |      | \$0.25      | / GSF | \$9 <b>3,</b> 665  |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST          | TOTAL COST  |
|--|----------|--------------------|-------------|
| Gym   Flexible Stainless Steel Safety Netting By Metal<br>Fabrications                   | 2,370 sf | \$39.52 /sf        | \$93,665    |
| E1030 COMMERCIAL EQUIPMENT   |          | \$6.17 / GSF       | \$2,348,714 |
| E1038 FOODSERVICE EQUIPMENT  |          | \$6.17 / GSF       | \$2,348,714 |
| Food Service Equipment (Sub quote)   | 1.00 ls  | \$2,348,714.00 /ls | \$2,348,714 |
| E1040 INSTITUTIONAL EQUIPMENT  |          | \$1.20 / GSF       | \$457,874   |
| E1044.2 LABORATORY EQUIPMENT   |          | \$0.25 / GSF       | \$93,750    |
| Equipment - Fume Hood (FH-1) - Ductless, ADA Base - REDUCED<br>PER RECON                 | 6.00 ea  | \$15,625.00 /ea    | \$93,750    |
| E1044.4 EDUCATIONAL & SCIENTIFIC EQUIPMENT   |          | \$0.96 / GSF       | \$364,124   |
| Equipment - (DW-1) F&I Dishwasher  | 0.00 ea  |                    | \$0         |
| Equipment - (REF-1) F&I Refrigerator   | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC01) F&I Full Down Draft Paint<br>Booth                     | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC02) F&I Paint Mixing Booth                                 | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC03) F&I Power Coating Booth                                | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC04) F&I Power Coating Oven                                 | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC05) F&I Frame Strighener                                   | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC07) Install ONLY Dual Exhaust<br>Collection Arms - Welding | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC08) Install ONLY Blasting Cabinet                          | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AC08A) Install ONLY Power Module                             | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT01) F&I 10,000 lb 2 Post Lifts                             | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT02) F&I 16,000 lb 2 Post Lifts                             | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT03) F&I MSDS   | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT04) F&I EV Charging Station                                | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT05) Install ONLY Tire Charger                              | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT06) Install ONLY Wheel Balancer                            | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT07) Install ONLY Alignment Rack                            | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT08) Install ONLY Alignment Console<br>/ Sensors            | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT09) Install ONLY Blasting Cabinet                          | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT09A) Install ONLY Power Module                             | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT10) Install ONLY Dual Exhaust<br>Collection Arms - Welding | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT11) Install ONLY Vehicle Exhaust<br>Collection             | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT12) F&I 1 Ton Chain Fall                                   | 0.00 ea  |                    | \$0         |
| Equipment - Auto Collision (AT25) F&I Hoist Crane  | 0.00 ea  |                    | \$0         |
| Equipment - Carpentry (CP01) F&I Dust Collection - Full Shop, see<br>HVAC                | 0.00 ea  |                    | \$0         |
| Equipment - Carpentry (CP02) Install ONLY Large CNC                                      | 0.00 ea  |                    | \$0         |
| Equipment - Carpentry (CP03) Install ONLY Cabinet Saw                                    | 0.00 ea  |                    | \$0         |
| Equipment - Carpentry (CP04) Install ONLY Panel Saw                                      | 0.00 ea  |                    | \$0         |
| Equipment - Carpentry (CP05) Install ONLY Table Saw                                      | 0.00 ea  |                    | \$0         |
| Equipment - Carpentry (CP07) Install ONLY Inverted Router                                | 0.00 ea  |                    | \$0         |





| DESCRIPTION  | QUANTITY | UNIT COST      | TOTAL COST |
|--|----------|----------------|------------|
| Equipment - Carpentry (CP08) Install ONLY Planer                               | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP09) Install ONLY Jointer                              | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP10) Install ONLY Oscillating Universal<br>Edge Sander | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP11) Install ONLY Planer                               | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP12) Install ONLY Drum Sander                          | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP13) Install ONLY Vertical Band Saw                    | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP14) Install ONLY Table Saw                            | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP15) Install ONLY Plywood Rack                         | 0.00 ea  |                | \$0        |
| Equipment - Carpentry (CP16) Install ONLY Linear Stock Rack                    | 0.00 ea  |                | \$0        |
| Equipment - Cosmetology (CM03) F&I Double Sided Syling<br>Stations             | 24 ea    | \$5,039.92 /ea | \$120,958  |
| Equipment - Cosmetology (CM04) F&I Shampoo Stations                            | 12 ea    | \$2,164.92 /ea | \$25,979   |
| Equipment - Cosmetology (CM05) F&I Double Manicure Tables                      | 10 ea    | \$3,314.92 /ea | \$33,149   |
| Equipment - Cosmetology (CM06) F&I Pedicure Station                            | 3.00 ea  | \$6,764.92 /ea | \$20,295   |
| Equipment - Cosmetology (CM26) F&I Triple Lockers                              | 22 ea    | \$2,739.92 /ea | \$60,278   |
| Equipment - Cosmetology (D-1) F&I Dryer  | 1.00 ea  | \$2,232.46 /ea | \$2,232    |
| Equipment - Cosmetology (W-1) F&I Washer                                       | 1.00 ea  | \$2,232.46 /ea | \$2,232    |
| Equipment - Dental Assist (DT01) F&I MSDS                                      | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT02) F&I Washer                                    | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT03) F&I Dryer                                     | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT04) Install ONLY X Ray Chair                      | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT05) Install ONLY Air Compressor                   | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT06) Install ONLY Amalgam<br>Seperator             | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT07) Install ONLY Vacuum Pump                      | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT08) Install ONLY Instrument Washer                | 0.00 ea  |                | \$0        |
| Equipment - Dental Assist (DT09) Install ONLY Dental Chair w/Full<br>Package   | 0.00 ea  |                | \$0        |
| Equipment - Design and Visual (DV01) Install ONLY Large Digital<br>Press       | 0.00 ea  |                | \$0        |
| Equipment - Design and Visual (DV01A) Install ONLY 3PH<br>Transformer          | 0.00 ea  |                | \$0        |
| Equipment - Design and Visual (DV02) Install ONLY Chiller                      | 0.00 ea  |                | \$0        |
| Equipment - Design and Visual (DV03) Install ONLY Large<br>Compressor          | 0.00 ea  |                | \$0        |
| Equipment - Design and Visual (DV04) Install ONLY Parts Washer                 | 0.00 ea  |                | \$0        |
| Equipment - Design and Visual (DV05) Install ONLY Paper Cutter                 | 0.00 ea  |                | \$0        |
| Equipment - Early Childhood (D-1) F&I Dryer                                    | 0.00 ea  |                | \$0        |
| Equipment - Early Childhood (W-1) F&I Washer                                   | 0.00 ea  |                | \$0        |
| Equipment - Electrical (ET01) F&I Student Booths                               | 0.00 ea  |                | \$0        |
| Equipment - Electrical (ET17) F&I Cooktop                                      | 0.00 ea  |                | \$0        |
| Equipment - Electrical (ET18) F&I Exhaust Hood w/ Light                        | 0.00 ea  |                | \$0        |
| Equipment - Health Assisting (D-1) F&I Dryer                                   | 0.00 ea  |                | \$0        |
| Equipment - Health Assisting (DW-1) F&I Dishwasher                             | 0.00 ea  |                | \$0        |
| Equipment - Health Assisting (HA06) Install ONLY Sim Man                       | 0.00 ea  |                | \$0        |





| DESCRIPTION  | QUANTITY | UNIT COST | TOTAL COST |
|--|----------|-----------|------------|
| Equipment - Health Assisting (HA07) Install ONLY Mock Headwall                   | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (HA08) Install ONLY X-Ray Viewbox                   | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (HA09) Install ONLY BP Cuff - Wall<br>Mt            | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (MW-1) F&I Microwave                                | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (REF-1) F&I Refrigerator                            | 0.00 ea  |           | \$0        |
| Equipment - Health Assisting (W-1) F&I Washer                                    | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV01) Install ONLY Lowerclass Booths                      | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV02) Install ONLY 96% Boilers                            | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV03) Install ONLY Walk In Freezer                        | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV04) Install ONLY Lowerclass Booths                      | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV05) Install ONLY Oil Furnaces                           | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV06) Install ONLY 80% Furnaces                           | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV07) Install ONLY Mini Split Units                       | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV08) Install ONLY 1.5 Ton Condensers                     | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV09) Install ONLY AC / Heating Units                     | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV10) Install ONLY On Demand HW Unit                      | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV11) Install ONLY Upperclass Booths                      | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV12) Install ONLY VRF Ceiling                            | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV12A) Install ONLY VRF Ducted                            | 0.00 ea  |           | \$0        |
| Equipment - HVAC Tech (HV12B) Install ONLY VRF Wall                              | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (D-1) F&I Dryer                                    | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA03) Install ONLY Sim Man                        | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA10) Install ONLY Xray Box                       | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA14) Install ONLY Otoscope                       | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (MA18) Install ONLY Blood<br>Pressure Unit         | 0.00 ea  |           | \$0        |
| Equipment - Medical Assisting (W-1) F&I Washer                                   | 0.00 ea  |           | \$0        |
| Equipment - Metal Fabrication (MF01) Install ONLY Exhaust<br>Collection Arms     | 0.00 ea  |           | \$0        |
| Equipment - Metal Fabrication (MF01A) Install ONLY Exhaust Collection Arms w/Fan | 0.00 ea  |           | \$0        |
| Equipment - Metal Fabrication (MF02) Install ONLY Hydraulic<br>Squaring Shear    | 0.00 ea  |           | \$0        |
| Equipment - Metal Fabrication (MF02A) Install ONLY Hydraulic<br>Squaring Shear   | 0.00 ea  |           | \$0        |
| Equipment - Metal Fabrication (MF03) Install ONLY CNC Hydraulic<br>Press Brake   | 0.00 ea  |           | \$0        |
| Equipment - Metal Fabrication (MF61) Install ONLY Overhead<br>Hoist - 2 Ton      | 0.00 ea  |           | \$0        |
| Equipment - Plumbing (PL01) F&I 8' UC Student Booth                              | 0.00 ea  |           | \$0        |
| Equipment - Plumbing (PL02) F&I LC Student Booth                                 | 0.00 ea  |           | \$0        |
| Equipment - Plumbing (PL03) F&I Electric Hot Water (OD)                          | 0.00 ea  |           | \$0        |
| Equipment - Plumbing (PL04) F&I Gas Boiler w/tankless                            | 0.00 ea  |           | \$0        |
| Equipment - Plumbing (PL05) F&I Gas Water Heater                                 | 0.00 ea  |           | \$0        |
| Equipment - RINSTALLATION ALLOWANCE - PER RECON                                  | 0.00 ea  |           | \$0        |





| DESCRIPTION   | QUANTITY     | UNIT COST        | TOTAL COST        |
|---|--------------|------------------|-------------------|
| Equipment - Robotics (RB01) F&I Air Compressor  | 900 mhr      | \$110.00 /mhr    | \$99,000          |
| E1070 ENTERTAINMENT & RECREATIONAL EQUIPMENT  |              | \$1.35 / GSF     | \$514,600         |
| E1071 THEATER & STAGE EQUIPMENT   |              | \$1.35 / GSF     | \$514,600         |
| Stage Curtains and Rigging - Powered rigging  | 1.00 ls      | \$200,000.00 /ls | \$200,000         |
| Theater - Auditorium Fixed Seating - QTO - ADJUST PER RECON   | 572 ea       | \$550.00 /ea     | \$314,600         |
| E1090 OTHER EQUIPMENT   |              | \$0.94 / GSF     | \$356,281         |
| E1097 ATHLETIC, RECREATIONAL, & THERAPEUTIC EQUIPMENT   |              | \$0.94 / GSF     | \$356,281         |
| Basketball Backstops  | 6.00 ea      | \$15,000.00 /ea  | \$90,000          |
| Divider Curtains  | 1.00 ea      | \$32,000.00 /ea  | \$32,000          |
| Gym Wall Padding  | 964 sf       | \$20.00 /sf      | \$19,281          |
| Telescoping Bleachers   | 4.00 ea      | \$53,750.00 /ea  | \$215,000         |
| E1098 RESIDENTIAL EQUIPMENT   |              | \$0.00 / GSF     | \$0               |
| Rooftop Play Equipment - not shown, exclude   | 0.00 nic     |                  | \$0               |
| 12 FURNISHINGS  | 380,570 GSF  | \$4.59 / GSF     | \$1,746,176       |
| E2010 FIXED FURNISHINGS   |              | \$4.59 / GSF     | \$1,746,176       |
| E2012 WINDOW TREATMENTS   |              | \$0.93 / GSF     | \$352,219         |
| Window Shades - Manual Operated - Interior  | 174 ea       | \$150.00 /ea     | \$26,100          |
| Roller Shades - Manual Operated - Translucent Wall Panel<br>System, assume not required                   | 2,630 sf     | \$0.00 /sf       | \$0               |
| Roller Shades - Manual Operated - Exterior Windows Aluminum<br>System                                     | 10,209 sf    | \$10.00 /sf      | \$102,090         |
| Roller Shades - Manual Operated - Exterior Storefront System  | 4,658 sf     | \$10.00 /sf      | \$46,580          |
| Roller Shades - Manual Operated - Exterior Curtain Wall System  | 23,026 sf    | \$10.00 /sf      | \$230,260         |
| Roller Shades - Manual Operated - REDUCE PER RECON  | -10000.00 sf | \$10.00 /sf      | (\$100,000)       |
| Roller Shades - Electrically Operated - Exterior Curtain Wall<br>System @ Rotunda - REDUCE UNIT PER RECON | 2,759 sf     | \$20.00 /sf      | \$55,189          |
| Roller Shades - Electrically Operated - REDUCE QTY PER RECON  | -400.00 sf   | \$20.00 /sf      | (\$8,000)         |
| E2013 CASEWORK  |              | \$3.66 / GSF     | \$1,393,957       |
| Casework - Base Cabinets  | 754 lf       | \$325.00 /lf     | \$244,914         |
| Casework - Base Cabinets - Design Visual Flat File  | 14 lf        | \$500.00 /lf     | \$6,775           |
| Casework - Cosmetology Base Cabinets  | 56 lf        | \$325.00 /lf     | \$18,176          |
| Casework - Cosmetology Wall Cabinets  | 49 lf        | \$200.00 /lf     | \$9,742           |
| Casework - Wall Cabinets  | 468 lf       | \$200.00 /lf     | \$93 <i>,</i> 585 |
| Casework - Mailroom   | 12 lf        | \$350.00 /lf     | \$4,242           |
| Casework - Tall Storage 7' high   | 384 lf       | \$600.00 /lf     | \$230,643         |
| Casework - Cabinet - Cubbies (2'-3"x2'8")   | 5.00 ea      | \$500.00 /ea     | \$2,500           |
| Lab Casework - Base Cabinets  | 981 lf       | \$350.00 /lf     | \$343,294         |
| Lab Casework - Wall Cabinets  | 193 lf       | \$250.00 /lf     | \$48,232          |
| Lab Casework - Wall Cabinets w/ Pegboards   | 415 lf       | \$300.00 /lf     | \$124,554         |
| Lab Casework - Island Demonstration Desk  | 44 lf        | \$561.96 /lf     | \$25,000          |
| Lab Casework - Goggle Storage Cabinet   | 4.00 ea      | \$1,250.00 /ea   | \$5,000           |
| Lab Casework - Flammables and Corrosives Storage Cabinet  | 8.00 ea      | \$3,125.00 /ea   | \$25,000          |
| Lab Casework - PX-1 (Casework Sink)   | 53 ea        | \$800.00 /ea     | \$42,400          |





| DESCRIPTION  | QUANTITY    | UNIT COST         | TOTAL COST  |
|--|-------------|-------------------|-------------|
| Lab Casework - PREMIUM FOR DENTAL CASEWORK   | 1.00 ls     | \$45,000.00 /ls   | \$45,000    |
| Lab Casework - PX-2 (Casework Sink w/ Eyewash)   | 7.00 ea     | \$800.00 /ea      | \$5,600     |
| Lab Casework - PX-3 (Cosmetology Sink)   | 15 ea       | \$800.00 /ea      | \$12,000    |
| Lab Casework - PX-4 (Science Room Sink)  | 45 ea       | \$1,050.00 /ea    | \$47,250    |
| Lab Casework - PX-5 (Lab Sink)   | 45 ea       | \$1,050.00 /ea    | \$47,250    |
| Lab Casework - PX-6 (Dental Station Sink)  | 16 ea       | \$800.00 /ea      | \$12,800    |
| 14 CONVEYING EQUIPMENT   | 380,570 GSF | \$2.33 / GSF      | \$885,000   |
| D1010 ELEVATORS & LIFTS  |             | \$2.33 / GSF      | \$885,000   |
| D1010 ELEVATORS & LIFTS  |             | \$2.14 / GSF      | \$815,000   |
| Elevator #1, Passenger (Otis Gen2, 3,500 capacity) - REDUCED<br>PER RECON <\$100K TOTAL> | 4.00 stop   | \$93,750.00 /stop | \$375,000   |
| Elevator #2, Passenger (Otis Gen2, 3,500 capacity)                                       | 5.00 stop   | \$88,000.00 /stop | \$440,000   |
| D1017 CAB FINISHES   |             | \$0.18 / GSF      | \$70,000    |
| Cab Finish Premium Allowance   | 2.00 ea     | \$35,000.00 /ea   | \$70,000    |
| 21 FIRE SUPPRESSION  | 380,570 GSF | \$7.96 / GSF      | \$3,029,692 |
| D4010 SPRINKLERS   |             | \$4.73 / GSF      | \$1,799,342 |
| D4011 WET SPRINKLER SYSTEM   |             | \$4.73 / GSF      | \$1,799,342 |
| Distribution Piping w/Fittings & Hangers   | 26,755 lf   | \$30.00 /lf       | \$802,650   |
| Sprinkler System - Paint Spray Booths  | 1.00 ls     | \$20,000.00 /ls   | \$20,000    |
| Head - Pendant, concealed  | 2,055 ea    | \$147.06 /ea      | \$302,208   |
| Head - Upright   | 1,285 ea    | \$108.55 /ea      | \$139,484   |
| SPRINKLER SYSTEM - ADJUST PER RECON  | 380,000 sf  | \$2.00 /sf        | \$760,000   |
| SPRINKLER SYSTEM - PER VE FP01 - SCHEDULE 10 FOR LARGER<br>PIPE                          | -1.00 ls    | \$225,000.00 /ls  | (\$225,000) |
| D4020 STANDPIPES   |             | \$2.25 / GSF      | \$857,979   |
| D4022 STANDPIPE & FIRE MAINS   |             | \$2.25 / GSF      | \$857,979   |
| Standpipes & Fire Mains - 6"   | 13,365 lf   | \$50.00 /lf       | \$668,250   |
| Double Check Valve 8"  | 1.00 ea     | \$16,582.59 /ea   | \$16,583    |
| Hose Valve, 2-1/2"   | 31 ea       | \$475.12 /ea      | \$14,729    |
| Zone Control Valve Assembly  | 21 ea       | \$6,125.60 /ea    | \$128,638   |
| Wet Check Valve Assembly - 8"  | 3.00 ea     | \$5,350.72 /ea    | \$16,052    |
| Fire Department Connection   | 0.00 ea     |                   | \$0         |
| Roof Manifold  | 9.00 ea     | \$1,525.36 /ea    | \$13,728    |
| D4030 FIRE PROTECTION SPECIALTIES  |             | \$0.33 / GSF      | \$125,000   |
| D4031 FIRE PROTECTION EQUIPMENT  |             | \$0.33 / GSF      | \$125,000   |
| Electric Fire Pump, 1000 GPM   | 1.00 ea     | \$120,000.00 /ea  | \$120,000   |
| Jockey Pump  | 1.00 ea     | \$5,000.00 /ea    | \$5,000     |
| D4090 OTHER FIRE PROTECTION SYSTEMS  |             | \$0.65 / GSF      | \$247,371   |
| D4096 FIRE PROTECTION MISC ITEMS   |             | \$0.65 / GSF      | \$247,371   |
| Coordination & Expenses  | 380,570 sf  | \$0.65 /sf        | \$247,371   |
| 22 PLUMBING  | 380,570 GSF | \$20.97 / GSF     | \$7,981,609 |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST       | TOTAL COST  |
|--|----------|-----------------|-------------|
| D2000 PLUMBING EQUIPMENT                                       |          | \$4.72 / GSF    | \$1,795,343 |
| D2000 PLUMBING EQUIPMENT                                       |          | \$4.72 / GSF    | \$1,795,343 |
| Sub-Meters   | 1.00 ls  | \$10,000.00 /ls | \$10,000    |
| Circulating Pump   | 10 ea    | \$1,650.00 /ea  | \$16,500    |
| Thermostatic Mixing Valve - EHW-4                              | 3.00 ea  | \$5,000.00 /ea  | \$15,000    |
| Thermostatic Mixing Valve - Dual - EHW-1 & EHW-2               | 2.00 ea  | \$15,000.00 /ea | \$30,000    |
| Thermostatic Mixing Valve - P-7 Fixtures (EW)                  | 7.00 ea  | \$500.00 /ea    | \$3,500     |
| Thermostatic Mixing Valve - P-8 Fixtures (EW/ES)               | 23 ea    | \$2,500.00 /ea  | \$57,500    |
| Thermostatic Mixing Valve - Triple - EHW-3                     | 1.00 ea  | \$20,000.00 /ea | \$20,000    |
| Domestic Water Booster Pump                                    | 1.00 ea  | \$45,000.00 /ea | \$45,000    |
| Backflow Preventers  | 1.00 ls  | \$35,000.00 /ls | \$35,000    |
| Kitchen Equipment Connections                                  | 1.00 ls  | \$75,000.00 /ls | \$75,000    |
| Science Classroom / Bio-Tech Equipment Connections             | 1.00 ls  | \$10,000.00 /ls | \$10,000    |
| Shop Equipment Connections                                     | 1.00 ls  | \$50,000.00 /ls | \$50,000    |
| Water Meters   | 1.00 ls  | \$5,500.00 /ls  | \$5,500     |
| Trap Primers & Associated Piping                               | 127 ea   | \$1,000.00 /ea  | \$127,000   |
| Floor Drain W/Trap   | 127 ea   | \$950.00 /ea    | \$120,650   |
| Roof Drains  | 94 ea    | \$1,365.00 /ea  | \$128,310   |
| Exterior Grease Interceptor                                    | 2.00 ea  | \$41,711.68 /ea | \$83,423    |
| Local Grease Interceptor 35 GPM                                | 3.00 ea  | \$1,027.92 /ea  | \$3,084     |
| Local Grease Interceptor 50 GPM                                | 2.00 ea  | \$1,192.92 /ea  | \$2,386     |
| Local Grease Interceptor 75 GPM                                | 2.00 ea  | \$2,441.88 /ea  | \$4,884     |
| Ceiling UTL Panels   | 17 ea    | \$500.00 /ea    | \$8,500     |
| Elevator Sump Pumps  | 3.00 ea  | \$5,500.00 /ea  | \$16,500    |
| Gas / Oil Interceptor - Shops                                  | 4.00 ea  | \$15,000.00 /ea | \$60,000    |
| AC-1 - Auto Collision / Metal Fab                              | 2.00 ea  | \$48,321.36 /ea | \$96,643    |
| AC-2 - VOC Tech Shops  | 1.00 ea  | \$31,821.36 /ea | \$31,821    |
| AC-3 - Bio Tech Lab  | 1.00 ea  | \$28,821.36 /ea | \$28,821    |
| AC-4 - Drafting & Design                                       | 1.00 ea  | \$35,821.36 /ea | \$35,821    |
| AC-5 - Dental - Compressed Air System                          | 1.00 ea  | \$36,821.36 /ea | \$36,821    |
| AC-6 - Dental - Robotics - Compressed Air System               | 1.00 ea  | \$35,821.36 /ea | \$35,821    |
| Compressed Air Filter, PI, & PRV                               | 72 ea    | \$500.00 /ea    | \$36,000    |
| Compressed Air Hose Reels                                      | 36 ea    | \$800.00 /ea    | \$28,800    |
| VAC-1 - Bio Tech Lab - Vacuum System                           | 1.00 ea  | \$21,821.36 /ea | \$21,821    |
| VAC-2 - Dental - Vacuum System                                 | 1.00 ea  | \$53,821.36 /ea | \$53,821    |
| EWH-1 & EWH-2 - Elec Water Heater - PVI Durawatt - 466         | 4.00 ea  | \$51,069.80 /ea | \$204,279   |
| EWH-3 - Elec Water Heater - AO Smith DES-100                   | 3.00 ea  | \$12,855.84 /ea | \$38,568    |
| EWH-4 - Elec Water Heater - PVI Durawatt - 550                 | 2.00 ea  | \$61,069.80 /ea | \$122,140   |
| EWH-5 - Elec Water Heater - AO Smith DES-10                    | 1.00 ea  | \$1,427.92 /ea  | \$1,428     |
| Argon / Oxygen / Acetylene Manifolds                           | 3.00 ea  | \$8,000.00 /ea  | \$24,000    |
| Natural Gas Control at Kitchen - Kitchen                       | 4.00 ea  | \$1,000.00 /ea  | \$4,000     |
| Natural Gas Shut off Valve & Cabinet - HVAC Tech & Paint Booth | 2.00 ea  | \$1,000.00 /ea  | \$2,000     |
| pH Neutralization System                                       | 1.00 ea  | \$50,000.00 /ea | \$50,000    |
| Expansion Tanks  | 10 ea    | \$1,500.00 /ea  | \$15,000    |
| D2010 DOMESTIC WATER DISTRIBUTION                              |          | \$4.30 / GSF    | \$1,638,300 |

#### 60% CD Estimate - Reconciled incl VE

Gilbane 01/20/2023 Rev.3

| DESCRIPTION   | QUANTIT   | TY UNIT CO     | DST            | TOTAL COST         |
|---|-----------|----------------|----------------|--------------------|
| D2012 DOMESTIC WATER PIPING                               |           | \$4.30         | / GSF          | \$1,638,300        |
| Domestic Hot & Cold Water Piping - 2" & Less              | 21,000 lf | f \$35.00      | /lf            | \$735,000          |
| Domestic Water Piping - 3"                                | 2,200 lf  | f \$86.00      | /lf            | \$189,200          |
| Domestic Water Piping - 4"                                | 1,000 lf  | f \$104.00     | /lf            | \$104,000          |
| Domestic Water Piping - 6"                                | 300 lf    | f \$207.00     | /lf            | \$62,100           |
| ADJUST PER RECON  | 1.00 ls   | s \$200,000.00 | /ls            | \$200,000          |
| Insulation  | 24,500 lf | f \$12.00      | /lf            | \$294,000          |
| Valves & Accessories                                      | 1.00 ls   | s \$54,000.00  | /ls            | \$54,000           |
| D2020 SANITARY DRAINAGE                                   |           | \$4.55         | / GSF          | \$1,733,025        |
| D2025 SANITARY DRAIN PIPING - UG                          |           | \$0.76         | / GSF          | \$291, <b>02</b> 5 |
| Sanitary Waste & Vent Piping - 2"- 3"                     | 800 lf    | f \$50.00      | /lf            | \$40,000           |
| Sanitary Waste & Vent Piping - 4"- 6"                     | 1,755 lf  | f \$80.00      | /lf            | \$140,400          |
| Sanitary Waste & Vent Piping - 8"                         | 885 lf    | f \$125.00     | /lf            | \$110,625          |
| D2026 SANITARY DRAIN PIPING - AG                          |           | \$3.07         | / GSF          | \$1,170,000        |
| Sanitary Waste & Vent Piping - 2" - 4"                    | 9,000 lf  | f \$50.00      | /lf            | \$450,000          |
| Sanitary Waste & Vent Piping - 4" - 6"                    | 7,000 lf  | f \$80.00      | /lf            | \$560,000          |
| Sanitary Waste & Vent Piping - ADJUST PER RECON           | 1.00 ls   | s \$160,000.00 | /ls            | \$160,000          |
| D2028 KITCHEN DRAIN PIPING - AG                           |           | \$0.32         | / GSF          | \$120,000          |
| Kitchen Waste & Vent Piping - UG & AG                     | 2,000 lf  | f \$60.00      | /lf            | \$120,000          |
| D2029 LABORATORY / INDUSTRIAL DRAIN PIPING - UG           |           | \$0.40         | ) <b>/ GSF</b> | \$152,000          |
| Acid Waste & Vent Piping - UG & AG                        | 1,600 lf  | f \$95.00      | /lf            | \$152,000          |
| D2040 PLUMBING FIXTURES                                   |           | \$2.17         | / GSF          | \$826,288          |
| D2043 PLUMBING FIXTURES                                   |           | \$2.17         | / GSF          | \$826,288          |
| P-1 & P-1A - Water Closet - Wall Hung                     | 88 e      | ea \$2,965.00  | /ea            | \$260,920          |
| P-2 & P-2A - Urinal                                       | 33 e      | ea \$2,115.00  | /ea            | \$69,795           |
| VE P01 DELETE URINALS IN SINGLE OCC TOILET RMS            | -1.00 ls  | s \$85,000.00  | /ls            | (\$85,000)         |
| VE P02 DELETE TOILET RM @MAINTENANCE BLDG                 | -1.00 ls  | s \$20,000.00  | /ls            | (\$20,000)         |
| P-3A - Lavatory - Wall Hung                               | 51 e      | ea \$1,890.00  | /ea            | \$96,390           |
| PX-4 - Science Classroom Sinks                            | 45 e      | a \$927.92     | /ea            | \$41,756           |
| PX-5 - Lab Sinks  | 45 e      | a \$1,441.88   | /ea            | \$64,885           |
| PX-1 Sink - Casework - Installation & Hook-Up             | 53 e      | a \$784.90     | /ea            | \$41,600           |
| PX-2 - Sink w/Eyewash - Casework - Installation & Hook-Up | 7.00 e    | a \$998.86     | /ea            | \$6,992            |
| PX-3 - Sink - Cosmetology w/Hair Trap                     | 15 e      | ea \$1,541.88  | /ea            | \$23,128           |
| PX-6 - Dental Station                                     | 16 e      | a \$927.92     | /ea            | \$14,847           |
| P-4 - Mop Sink  | 8.00 e    | ea \$2,180.00  | /ea            | \$17,440           |
| Cosmetology - Pedicure Station - Hook-ups                 | 0.00 e    | a              |                | \$0                |
| P-3C - Solid Surface Sink, 2 Station - Bradley            | 9.00 e    | ea \$4,500.00  | /ea            | \$40,500           |
| P-5 & P-5A - Drinking Foutain - Bi-Level Electric         | 17 e      | ea \$4,500.00  | /ea            | \$76,500           |
| Washing Machine Box                                       | 0.00 e    | a              |                | \$0                |
| P-6A - Shower - HC (no enclosure)                         | 4.00 e    | ea \$883.92    | /ea            | \$3,536            |
| P-6 - Shower - (Trim & Drain)                             | 8.00 e    | ea \$2,100.00  | /ea            | \$16,800           |
| P-7 - Emergenc Eyewash                                    | 7.00 e    | a \$550.00     | /ea            | \$3,850            |
| P-8 - Emergency Shower/Eyewash                            | 22 e      | ea \$2,800.00  | /ea            | \$61,600           |
| P-3B - Wash Fountain - Circular - Bradley                 | 2.00 e    | ea \$6,976.78  | /ea            | \$13,954           |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY    | UNIT COST                      | TOTAL COST              |
|---|-------------|--------------------------------|-------------------------|
| P-3B - Wash Fountain - Semi-Circular - Bradley  | 12 ea       | \$5,976.78 /ea                 | \$71,721                |
| Hose Bibb   | 25 ea       | \$190.00 /ea                   | \$4,750                 |
| Wall Hydrant  | 1.00 ea     | \$325.00 /ea                   | \$325                   |
| D2050 GENERAL SERVICE COMPRESSED - AIR  |             | \$0.92 / GSF                   | \$350,000               |
| D2051 COMPRESSED-AIR SYSTEMS  |             | \$0.92 / GSF                   | \$350,000               |
| Valves & Accessories  | 1.00 ls     | \$16,000.00 /ls                | \$16,000                |
| 2" & Less CA Piping - Copper  | 6,200 lf    | \$50.00 /lf                    | \$310,000               |
| CA Piping Intake - Copper   | 300 lf      | \$80.00 /lf                    | \$24,000                |
| D2070 RAIN WATER DRAINAGE   |             | \$2.56 / GSF                   | \$973,450               |
| D2071 STORM DRAIN PIPING - UG   |             | \$0.44 / GSF                   | \$167,850               |
| Storm Piping - 10"  | 370 lf      | \$165.00 /lf                   | \$61,050                |
| Storm Piping - 4"   | 50 lf       | \$60.00 /lf                    | \$3,000                 |
| Storm Piping - 6"   | 585 lf      | \$80.00 /lf                    | \$46,800                |
| Storm Piping - 8"   | 475 lf      | \$120.00 /lf                   | \$57,000                |
| D2072 STORM DRAIN PIPING - AG   |             | \$2.12 / GSF                   | \$805,600               |
| Insulation - Storm  | 1,260 lf    | \$20.00 /lf                    | \$25,200                |
| Storm Piping - 10"  | 40 lf       | \$170.00 /lf                   | \$6,800                 |
| Storm Piping - 4"   | 2,080 lf    | \$160.00 /lf                   | \$332,800               |
| Storm Piping - 6"   | 3,475 lf    | \$90.00 /lf                    | \$312,750               |
| Storm Piping - 8"   | 985 lf      | \$130.00 /lf                   | \$128,050               |
| D2080 OTHER PLUMBING SYSTEMS  |             | \$0.37 / GSF                   | \$141,500               |
| D2085 MEDICAL GAS PIPING  |             | \$0.18 / GSF                   | \$67,000                |
| Vacuum - Exhaust  | 100 lf      | \$80.00 /lf                    | \$8,000                 |
| Vacuum Piping - 1" & Less   | 1,200 lf    | \$45.00 /lf                    | \$54,000                |
| Valves & Accessories  | 1.00 ls     | \$5,000.00 /ls                 | \$5,000                 |
| D2088 PROCESS / INDUSTRIAL GAS PIPING   |             | \$0.20 / GSF                   | \$74,500                |
| Argon / Oxygen / Acetylene Piping - 1" & Less   | 1,500 lf    | \$45.00 /lf                    | \$67,500                |
| Valves & Accessories  | 1.00 ls     | \$7,000.00 /ls                 | \$7,000                 |
| D2090 MISC. PLUMBING SYSTEMS  |             | \$0.97 / GSF                   | \$369,153               |
| D2090 PLUMBING MISC ITEMS   |             | \$0.97 / GSF                   | \$369,153               |
| Admin & Expenses  | 380,570 sf  | \$0.97 /sf                     | \$369,153               |
| D3010 FACILITY FUEL SYSTEMS   |             | \$0.41 / GSF                   | \$154,550               |
| D2080 NATURAL GAS PIPING  |             | \$0.41 / GSF                   | \$154,550               |
| Natural Gas Piping - 2" & Less  | 1,800 lf    | \$60.00 /lf                    | \$108,000               |
| Natural Gas Piping - 4"   | 355 lf      | \$110.00 /lf                   | \$39,050                |
| Valves & Accessories  | 1.00 ls     | \$7,500.00 /ls                 | \$7,500                 |
| 23 HEATING, VENTILATING, & AIR CONDITIONING<br>(HVAC)   | 380,570 GSF | \$73.08 / GSF                  | \$27,811,853            |
| D3040 HVAC MAJOR EQUIPMENT  |             | \$28.88 / GSF                  | \$10.989.306            |
|   |             | \$28.72 / GSF                  | \$10,928,384            |
|   | 1.00 lc     |                                | \$6 125 000             |
| $\Delta H = 10, H $ | 10 LOU IS   | دم/ 59,000.00<br>دم/ 59,000.00 | \$0,133,000<br>\$02 760 |
|   | TO EQ       | <i>,</i> 2,210.00 /€a          | <i>732,10</i> 0         |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANT   | ΊΤΥ  | UNIT CC        | )ST   | TOTAL COST  |
|--|---------|------|----------------|-------|-------------|
| HRU 1-5 Labor & Conns                                      | 5.00    | ea   | \$8,308.00     | /ea   | \$41,540    |
| MUA 1-2 Labor & Conns                                      | 2.00    | ea   | \$6,340.00     | /ea   | \$12,680    |
| RTU 1-2 Labor & Conns                                      | 2.00    | ea   | \$8,308.00     | /ea   | \$16,616    |
| Exhaust Fans - Scheduled                                   | 1.00    | ls   | \$153,711.91   | /ls   | \$153,712   |
| Vehicle Exhaust fans and reels                             | 1.00    | ls   | \$69,076.05    | /ls   | \$69,076    |
| ERU 1-4 & ERU-7  | 5.00    | ea   | \$20,436.00    | /ea   | \$102,180   |
| Dust Collection Platform - DELETED PER RECON               | 0.00    | nic  |                |       | \$0         |
| Dust Collector - Owner To Relocate Existing                | 0.00    | allw |                |       | \$0         |
| Dust Collector -RIGGING, ADDED PER RECON                   | 1.00    | ls   | \$15,000.00    | /ls   | \$15,000    |
| Split Systems Labor & Connect                              | 49      | ea   | \$4,872.00     | /ea   | \$238,728   |
| VRF/VCU/Splits Equipment                                   | 1.00    | ls   | \$3,100,000.00 | /ls   | \$3,100,000 |
| VRF Selector Boxes Install                                 | 46      | ea   | \$976.00       | /ea   | \$44,896    |
| VRF -CU Install  | 75      | ea   | \$2,436.00     | /ea   | \$182,700   |
| VRF Fan Coil Units Install                                 | 269     | ea   | \$1,952.00     | /ea   | \$525,088   |
| VRF-VCU Condenser Install                                  | 88      | ea   | \$1,318.00     | /ea   | \$115,984   |
| Gravity Vent   | 4.00    | ea   | \$6,436.00     | /ea   | \$25,744    |
| Gravity Vent- GV 1 & 2                                     | 2.00    | ea   | \$12,404.00    | /ea   | \$24,808    |
| VFD Fans   | 8.00    | ea   | \$3,984.00     | /ea   | \$31,872    |
| D3041 TERMINAL & PACKAGE UNITS                             |         |      | \$0.16         | / GSF | \$60,922    |
| Unit Heater - Elec   | 29      | ea   | \$1,434.00     | /ea   | \$41,586    |
| Cabinet Unit Heater (ceiling)                              | 7.00    | ea   | \$2,762.30     | /ea   | \$19,336    |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS                   |         |      | \$24.31        | / GSF | \$9,251,464 |
| D3053 HVAC AIR DISTRIBUTION                                |         |      | \$24.31        | / GSF | \$9,251,464 |
| SM Coordination & Material Handling                        | 1.00    | ls   | \$240,000.00   | /ls   | \$240,000   |
| Weld Exhaust Extraction arms (FBO) Instalation             | 23      | ea   | \$1,476.00     | /ea   | \$33,948    |
| Insulation - Fire Wrap                                     | 6,500   | sf   | \$22.31        | /sf   | \$144,998   |
| Insulation - FRK Blanket Insulation, 2"                    | 150,000 | sf   | \$4.60         | /sf   | \$689,829   |
| Ductwork - Galvanized                                      | 440,000 | lb   | \$13.62        | /lb   | \$5,991,252 |
| Ductwork - Galvanized - ADDED PER RECON (INCL ACCESSORIES) | 15,000  | lb   | \$15.00        | /lb   | \$225,000   |
| Ductwork - DBL Wall Premium                                | 1.00    | ls   | \$50,000.00    | /ls   | \$50,000    |
| Ductwork - Stainless Steel Kitchen                         | 2,750   | lb   | \$24.69        | /lb   | \$67,903    |
| Ductwork - Black Iron - Kitchen Exhaust                    | 10,500  | lb   | \$20.46        | /lb   | \$214,873   |
| Ductwork - HVAC & Plbg Tech Flues                          | 1.00    | allw | \$75,000.00    | /allw | \$75,000    |
| Air Duct Accessories                                       | 1.00    | ls   | \$600,000.00   | /ls   | \$600,000   |
| Sound Attenuator (HRU, RTU, & AHU 360kcfm total)           | 1.00    | ls   | \$140,912.00   | /ls   | \$140,912   |
| VAV OA & Exhaust w/o RHC                                   | 111     | ea   | \$998.41       | /ea   | \$110,823   |
| VAV Box - PER VE M02 REDUCE BY GROUPING                    | -1.00   | ls   | \$116,510.00   | /ls   | (\$116,510) |
| VAV Box w/ERHC   | 182     | ea   | \$1,469.04     | /ea   | \$267,365   |
| VAV FPTU w/ ERHC   | 9.00    | ea   | \$3,139.95     | /ea   | \$28,260    |
| Duct Collection Duct - Fabricated                          | 0.00    | lf   |                |       | \$0         |
| Plenums  | 3,170   | sf   | \$69.00        | /sf   | \$218,730   |
| Register, Diffusers, & Grilles                             | 850     | ea   | \$216.00       | /ea   | \$183,600   |
| Register, Diffusers, & Grilles - 3ft                       | 49      | ea   | \$301.25       | /ea   | \$14,761    |
| Register, Diffusers, & Grilles - LD                        | 160     | ea   | \$442.00       | /ea   | \$70,720    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST         | TOTAL COST        |
|--|-------------|-------------------|-------------------|
| D3060 CONTROLS & INSTRUMENTATION   |             | \$5.95 / GSF      | \$2,264,800       |
| D3061 AUTOMATIC TEMPERATURE CONTROLS   |             | \$5.95 / GSF      | \$2,264,800       |
| ATC - BMS  | 380,570 sf  | \$5.75 /sf        | \$2,189,800       |
| Dashboard Allowance  | 1.00 allw   | \$50,000.00 /allw | \$50,000          |
| Lighting Control   | 1.00 allw   | \$25,000.00 /allw | \$25,000          |
| D3070 SPECIAL PURPOSE HVAC SYSTEMS   |             | \$10.05 / GSF     | \$3,824,308       |
| D3075 REFRIGERANT PIPING   |             | \$8.53 / GSF      | \$3,244,721       |
| Split System Piping - Line Sets  | 49 ea       | \$5,500.00 /ea    | \$269,500         |
| VRF Piping   | 194,275 sf  | \$9.35 /sf        | \$1,816,471       |
| Roof Pipe Jacketing  | 3,000 lf    | \$15.00 /lf       | \$45,000          |
| RTU/AHU/HRU Condensers-2 Pipe Circuit  | 6,750 lf    | \$165.00 /lf      | \$1,113,750       |
| D3076 CONDENSATE DRAIN PIPING  |             | \$1.52 / GSF      | \$579,587         |
| Condensate Drain Piping & Insulation   | 11,000 lf   | \$51.75 /lf       | \$569,250         |
| Condensate Drain Pumps   | 25 ea       | \$413.47 /ea      | \$10,337          |
| D3080 SYSTEMS TESTING & BALANCING  |             | \$0.75 / GSF      | \$284,476         |
| D3080 AIR & WATER BALANCE  |             | \$0.75 / GSF      | \$284,476         |
| Testing & Balancing  | 380.570 sf  | \$0.75 /sf        | \$284,476         |
| D3090 OTHER HVAC SYSTEMS & EQUIP   |             | \$3.15 / GSF      | \$1.197.500       |
|  |             | \$3.15 / GSF      | \$1,197,500       |
| Rigging and Hoisting   | 1.00 ls     | \$172 500 00 /ls  | \$172 500         |
| Project Expenses and Commissioning   | 1.00 ls     | \$775.000.00 /ls  | \$775,000         |
| Project Management   | 1.00 ls     | \$250,000,00 /ls  | \$250,000         |
| VE Items M1 through M7, M9, M11  | 0.00 ls     | <i>\</i>          | \$0               |
| 26 ELECTRICAL  | 380,570 GSF | \$39.83 / GSF     | \$15,157,937      |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION  |             | \$23.39 / GSF     | \$8,900,128       |
| D5023 LARGE POWER & DISTRIBUTION   |             | \$4.27 / GSF      | \$1,624,365       |
| 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit                        | 12 ea       | \$727.02 /ea      | \$8,724           |
| 100 AMP 3 POLE N1 fused disconnect 600 volt composite unit                       | 4.00 ea     | \$936.66 /ea      | \$3,747           |
| 200 AMP 3 POLE N1 fused disconnect 600 volt composite unit                       | 10 ea       | \$1,421.32 /ea    | \$14,213          |
| 400 AMP 3 POLE N1 fused disconnect 600 volt composite unit                       | 10 ea       | \$3,608.00 /ea    | \$36,080          |
| 600 AMP 3 POLE N1 fused disconnect 600 volt composite unit                       | 1.00 ea     | \$5,033.50 /ea    | \$5,033           |
| 30 KVA NEMA 1 Transformer composite unit   | 20 ea       | \$4,998.21 /ea    | \$99,964          |
| 75 KVA NEMA 1 Transformer composite unit   | 2.00 ea     | \$10,211.93 /ea   | \$20,424          |
| 75 KVA NEMA 1 Transformer composite unit for EV charging                         | 3.00 ea     | \$10,211.93 /ea   | \$30,636          |
| 112.5 KVA NEMA 1 Transformer composite unit                                      | 19 ea       | \$12,322.96 /ea   | \$234,136         |
| 225 KVA NEMA 1 Transformer composite unit  | 2.00 ea     | \$19,528.70 /ea   | \$39,057          |
| 4000 Amp Main Switchboard MCB  | 2.00 ea     | \$201,000.00 /ea  | \$402,000         |
| 2000 Amp 277/480 Switchboard MCB   | 1.00 ea     | \$85,000.00 /ea   | \$85,000          |
| 1600 Amp 277/480 Switchboard MCB   | 1.00 ea     | \$50,000.00 /ea   | \$50 <i>,</i> 000 |
| 100 AMP 120/208 panel board surface mounted composite                            | 20 ea       | \$3,106.84 /ea    | \$62,137          |
| 225 AMP 120/208 Panel board surface mounted composite unit                       | 1.00 ea     | \$4,189.84 /ea    | \$4,190           |
| 225 AMP 120/208 Panel board surface mounted composite unit for charging Stations | 3.00 ea     | \$4,107.12 /ea    | \$12,321          |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST        | TOTAL COST       |
|---|----------|------------------|------------------|
| Nema 3r Enclosure for EV Chaging Gear   | 3.00 ea  | \$4,107.12 /ea   | \$12,321         |
| 400 AMP 120/208 Panel board surface mounted composite unit  | 24 ea    | \$6,062.34 /ea   | \$145,496        |
| 100 AMP 277/480 Panel board surface mounted composite unit  | 8.00 ea  | \$3,200.84 /ea   | \$25,607         |
| 200 AMP 277/480 Panel board surface mounted composite unit  | 8.00 ea  | \$4,106.20 /ea   | \$32,850         |
| 225 AMP 277/480 Panel board surface mounted composite unit  | 19 ea    | \$4,734.34 /ea   | \$89,952         |
| 250 AMP 277/480 Panel board surface mounted composite unit  | 3.00 ea  | \$4,868.03 /ea   | \$14,604         |
| charging  |          |                  |                  |
| 400 AMP 277/480 Fusable Distribution Panel board surface mounted composite unit   | 1.00 ea  | \$8,558.61 /ea   | \$8,559          |
| 400 AMP 277/480 Panel board surface mounted composite unit  | 3.00 ea  | \$7,051.34 /ea   | \$21,154         |
| 800 AMP 277/480 Distribution Panel board surface mounted composite unit   | 1.00 ea  | \$12,411.87 /ea  | \$12,412         |
| 1200 AMP 277/480 Distribution Panel board surface mounted composite unit  | 4.00 ea  | \$17,035.84 /ea  | \$68,143         |
| 1200 AMP 277/480 Mechanical Panel board surface mounted composite unit  | 2.00 ea  | \$17,035.84 /ea  | \$34,072         |
| Metering Allowance based on 83 distribution panels and 16<br>Location for Cicurit meter cand Cat 6 Data Link recon 11-28-2022   | 1.00 ls  | \$400,000.01 /ls | \$400,000        |
| Metering Allowance based on 83 distribution panels and 16<br>Location for Cicurit meter cand Cat 6 Data Link recon 11-28-2022<br>Remove all and left generator and primary metering | -1.00 ls | \$350,000.00 /ls | (\$350,000)      |
| Utility Meter Sockets composite unit  | 3.00 ea  | \$510.69 /ea     | \$1,532          |
| D5024 LARGE POWER FEEDER CONDUIT  |          | \$10.61 / GSF    | \$4,037,987      |
| #136 20 AMP EMT Composite feeders copper - Large Power  | 721 lf   | \$16.96 /lf      | \$12,231         |
| #137 20 AMP EMT Composite feeders copper - Large Power  | 712 lf   | \$16.96 /lf      | \$12,078         |
| #138 20 AMP EMT Composite feeders copper - Large Power  | 706 lf   | \$16.96 /lf      | \$11,977         |
| #139 45 AMP EMT Composite feeders copper - Large Power  | 759 lf   | \$29.71 /lf      | \$22,550         |
| #140 20 AMP EMT Composite feeders copper - Large Power  | 556 lf   | \$16.96 /lf      | \$9,432          |
| #141 20 AMP EMT Composite feeders copper - Large Power  | 554 lf   | \$16.96 /lf      | \$9,398          |
| #150 35 AMP EMT Composite feeders copper - Large Power  | 552 lf   | \$18.69 /lf      | \$10,317         |
| #151 35 AMP EMT Composite feeders copper - Large Power  | 658 lf   | \$18.69 /lf      | \$12,298         |
| #152 30 AMP EMT Composite feeders copper - Large Power  | 658 lf   | \$18.69 /lf      | \$12,298         |
| #156 35 AMP EMT Composite feeders copper - Large Power  | 577 lf   | \$18.69 /lf      | \$10,784         |
| #158 35 AMP EMT Composite feeders copper - Large Power  | 586 lf   | \$18.69 /lf      | \$10,952         |
| #168 35 AMP EMT Composite feeders copper - Large Power  | 635 lf   | \$18.69 /lf      | \$11,868         |
| #170 35 AMP EMT Composite feeders copper - Large Power  | 639 lf   | \$18.69 /lf      | \$11,943         |
| #172 35 AMP EMT Composite feeders copper - Large Power  | 712 lf   | \$18.69 /lf      | \$13,307         |
| #176 35 AMP EMT Composite feeders copper - Large Power  | 733 lf   | \$18.69 /lf      | \$13,700         |
| #178 35 AMP EMT Composite feeders copper - Large Power  | 736 lf   | \$18.69 /lf      | \$13,756         |
| #180 35 AMP EMT Composite feeders copper - Large Power  | 742 lf   | \$18.69 /lf      | \$13,868         |
| #181 35 AMP EMT Composite feeders copper - Large Power  | 347 lf   | \$18.69 /lf      | \$6 <i>,</i> 485 |
| #231 20 AMP EMT Composite feeders copper - Large Power  | 313 lf   | \$16.96 /lf      | \$5,310          |
| #236 20 AMP EMT Composite feeders copper - Large Power  | 1,108 lf | \$16.96 /lf      | \$18,796         |
| #237 20 AMP EMT Composite feeders copper - Large Power  | 501 lf   | \$16.96 /lf      | \$8,499          |
| #238 20 AMP EMT Composite feeders copper - Large Power  | 382 lf   | \$16.96 /lf      | \$6,480          |
| #239 20 AMP EMT Composite feeders copper - Large Power  | 497 lf   | \$16.96 /lf      | \$8,431          |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST   | TOTAL COST |
|--|----------|-------------|------------|
| #250 20 AMP EMT Composite feeders copper - Large Power | 321 lf   | \$16.96 /lf | \$5,445    |
| #254 20 AMP EMT Composite feeders copper - Large Power | 429 lf   | \$16.96 /lf | \$7,278    |
| #255 20 AMP EMT Composite feeders copper - Large Power | 437 lf   | \$17.04 /lf | \$7,447    |
| #257 20 AMP EMT Composite feeders copper - Large Power | 333 lf   | \$17.04 /lf | \$5,675    |
| #258 20 AMP EMT Composite feeders copper - Large Power | 358 lf   | \$17.04 /lf | \$6,101    |
| #260 20 AMP EMT Composite feeders copper - Large Power | 289 lf   | \$16.96 /lf | \$4,903    |
| #262 20 AMP EMT Composite feeders copper - Large Power | 295 lf   | \$16.96 /lf | \$5,004    |
| #268 20 AMP EMT Composite feeders copper - Large Power | 364 lf   | \$16.96 /lf | \$6,175    |
| #269 20 AMP EMT Composite feeders copper - Large Power | 235 lf   | \$16.96 /lf | \$3,987    |
| #270 20 AMP EMT Composite feeders copper - Large Power | 236 lf   | \$16.96 /lf | \$4,004    |
| #272 20 AMP EMT Composite feeders copper - Large Power | 228 lf   | \$16.96 /lf | \$3,868    |
| #274 20 AMP EMT Composite feeders copper - Large Power | 223 lf   | \$17.04 /lf | \$3,800    |
| #276 20 AMP EMT Composite feeders copper - Large Power | 541 lf   | \$17.04 /lf | \$9,218    |
| #278 20 AMP EMT Composite feeders copper - Large Power | 489 lf   | \$17.04 /lf | \$8,333    |
| #280 20 AMP EMT Composite feeders copper - Large Power | 482 lf   | \$17.04 /lf | \$8,213    |
| #282 20 AMP EMT Composite feeders copper - Large Power | 481 lf   | \$17.04 /lf | \$8,196    |
| #284 20 AMP EMT Composite feeders copper - Large Power | 445 lf   | \$17.04 /lf | \$7,583    |
| #286 20 AMP EMT Composite feeders copper - Large Power | 438 lf   | \$17.04 /lf | \$7,464    |
| #288 20 AMP EMT Composite feeders copper - Large Power | 432 lf   | \$17.04 /lf | \$7,361    |
| #294 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #296 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #297 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #298 15 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #327 20 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$16.93 /lf | \$2,032    |
| #145 80 AMP EMT Composite feeders copper - Large Power | 658 lf   | \$33.82 /lf | \$22,254   |
| #146 80 AMP EMT Composite feeders copper - Large Power | 663 lf   | \$33.82 /lf | \$22,423   |
| #147 80 AMP EMT Composite feeders copper - Large Power | 665 lf   | \$33.82 /lf | \$22,490   |
| #148 60 AMP EMT Composite feeders copper - Large Power | 671 lf   | \$28.14 /lf | \$18,882   |
| #149 80 AMP EMT Composite feeders copper - Large Power | 647 lf   | \$33.82 /lf | \$21,882   |
| #153 50 AMP EMT Composite feeders copper - Large Power | 706 lf   | \$28.14 /lf | \$19,867   |
| #154 80 AMP EMT Composite feeders copper - Large Power | 716 lf   | \$33.82 /lf | \$24,215   |
| #155 60 AMP EMT Composite feeders copper - Large Power | 585 lf   | \$28.14 /lf | \$16,462   |
| #157 60 AMP EMT Composite feeders copper - Large Power | 593 lf   | \$28.14 /lf | \$16,687   |
| #159 60 AMP EMT Composite feeders copper - Large Power | 601 lf   | \$28.14 /lf | \$16,912   |
| #160 60 AMP EMT Composite feeders copper - Large Power | 591 lf   | \$28.14 /lf | \$16,631   |
| #161 60 AMP EMT Composite feeders copper - Large Power | 607 lf   | \$28.14 /lf | \$17,081   |
| #162 60 AMP EMT Composite feeders copper - Large Power | 600 lf   | \$28.14 /lf | \$16,884   |
| #163 70 AMP EMT Composite feeders copper - Large Power | 632 lf   | \$28.14 /lf | \$17,784   |
| #164 70 AMP EMT Composite feeders copper - Large Power | 624 lf   | \$28.14 /lf | \$17,559   |
| #165 70 AMP EMT Composite feeders copper - Large Power | 636 lf   | \$28.14 /lf | \$17,897   |
| #166 70 AMP EMT Composite feeders copper - Large Power | 631 lf   | \$28.14 /lf | \$17,756   |
| #167 70 AMP EMT Composite feeders copper - Large Power | 642 lf   | \$28.14 /lf | \$18,066   |
| #169 70 AMP EMT Composite feeders copper - Large Power | 648 lf   | \$28.14 /lf | \$18,235   |
| #171 70 AMP EMT Composite feeders copper - Large Power | 718 lf   | \$28.14 /lf | \$20,205   |
| #173 40 AMP EMT Composite feeders copper - Large Power | 661 lf   | \$28.14 /lf | \$18,601   |
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Gilbane

01/20/2023 Rev.3

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST   | TOTAL COST |
|--|----------|-------------|------------|
| #174 40 AMP EMT Composite feeders copper - Large Power | 656 lf   | \$28.14 /lf | \$18,460   |
| #175 80 AMP EMT Composite feeders copper - Large Power | 739 lf   | \$33.82 /lf | \$24,993   |
| #177 80 AMP EMT Composite feeders copper - Large Power | 743 lf   | \$33.82 /lf | \$25,128   |
| #179 80 AMP EMT Composite feeders copper - Large Power | 752 lf   | \$33.82 /lf | \$25,433   |
| #182 60 AMP EMT Composite feeders copper - Large Power | 722 lf   | \$28.14 /lf | \$20,317   |
| #187 40 AMP EMT Composite feeders copper - Large Power | 438 lf   | \$21.13 /lf | \$9,254    |
| #232 40 AMP EMT Composite feeders copper - Large Power | 341 lf   | \$21.00 /lf | \$7,161    |
| #233 40 AMP EMT Composite feeders copper - Large Power | 347 lf   | \$21.00 /lf | \$7,287    |
| #243 40 AMP EMT Composite feeders copper - Large Power | 399 If   | \$21.00 /lf | \$8,379    |
| #244 40 AMP EMT Composite feeders copper - Large Power | 403 lf   | \$21.00 /lf | \$8,463    |
| #245 30 AMP EMT Composite feeders copper - Large Power | 411 lf   | \$19.55 /lf | \$8,035    |
| #246 40 AMP EMT Composite feeders copper - Large Power | 312 lf   | \$21.00 /lf | \$6,552    |
| #247 35 AMP EMT Composite feeders copper - Large Power | 319 lf   | \$20.31 /lf | \$6,479    |
| #248 40 AMP EMT Composite feeders copper - Large Power | 303 lf   | \$21.00 /lf | \$6,363    |
| #249 30 AMP EMT Composite feeders copper - Large Power | 314 lf   | \$19.55 /lf | \$6,138    |
| #251 40 AMP EMT Composite feeders copper - Large Power | 327 lf   | \$21.00 /lf | \$6,867    |
| #252 30 AMP EMT Composite feeders copper - Large Power | 337 lf   | \$19.55 /lf | \$6,588    |
| #253 40 AMP EMT Composite feeders copper - Large Power | 421 lf   | \$21.00 /lf | \$8,841    |
| #256 40 AMP EMT Composite feeders copper - Large Power | 328 If   | \$21.00 /lf | \$6,888    |
| #259 40 AMP EMT Composite feeders copper - Large Power | 294 If   | \$21.00 /lf | \$6,174    |
| #261 40 AMP EMT Composite feeders copper - Large Power | 304 If   | \$21.00 /lf | \$6,384    |
| #263 40 AMP EMT Composite feeders copper - Large Power | 218 lf   | \$21.00 /lf | \$4,578    |
| #264 35 AMP EMT Composite feeders copper - Large Power | 216 lf   | \$20.31 /lf | \$4,387    |
| #265 40 AMP EMT Composite feeders copper - Large Power | 209 If   | \$21.00 /lf | \$4,389    |
| #266 35 AMP EMT Composite feeders copper - Large Power | 210 lf   | \$20.31 /lf | \$4,265    |
| #271 40 AMP EMT Composite feeders copper - Large Power | 228 lf   | \$21.00 /lf | \$4,788    |
| #273 40 AMP EMT Composite feeders copper - Large Power | 222 If   | \$21.00 /lf | \$4,662    |
| #275 40 AMP EMT Composite feeders copper - Large Power | 550 lf   | \$21.00 /lf | \$11,550   |
| #277 40 AMP EMT Composite feeders copper - Large Power | 493 lf   | \$21.00 /lf | \$10,353   |
| #279 40 AMP EMT Composite feeders copper - Large Power | 490 lf   | \$21.00 /lf | \$10,290   |
| #281 40 AMP EMT Composite feeders copper - Large Power | 483 lf   | \$23.60 /lf | \$11,401   |
| #283 40 AMP EMT Composite feeders copper - Large Power | 452 lf   | \$23.60 /lf | \$10,669   |
| #285 40 AMP EMT Composite feeders copper - Large Power | 447 lf   | \$21.00 /lf | \$9,387    |
| #287 40 AMP EMT Composite feeders copper - Large Power | 443 If   | \$21.00 /lf | \$9,303    |
| #291 30 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243    |
| #292 30 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243    |
| #300 35 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243    |
| #302 35 AMP EMT Composite feeders copper - Large Power | 120 lf   | \$18.69 /lf | \$2,243    |
| #044 50 AMP EMT Composite feeders copper - Large Power | 35 lf    | \$29.71 /lf | \$1,040    |
| #047 50 AMP EMT Composite feeders copper - Large Power | 362 lf   | \$29.71 /lf | \$10,753   |
| #050 50 AMP EMT Composite feeders copper - Large Power | 482 lf   | \$29.71 /lf | \$14,318   |
| #053 50 AMP EMT Composite feeders copper - Large Power | 307 lf   | \$29.71 /lf | \$9,120    |
| #056 50 AMP EMT Composite feeders copper - Large Power | 447 lf   | \$29.71 /lf | \$13,278   |
| #059 50 AMP EMT Composite feeders copper - Large Power | 291 lf   | \$29.71 /lf | \$8,644    |
| #062 50 AMP EMT Composite feeders copper - Large Power | 474 lf   | \$29.71 /lf | \$14,080   |
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Gilbane

01/20/2023 Rev.3

60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST       |
|---|----------|--------------|------------------|
| #065 50 AMP EMT Composite feeders copper - Large Power  | 280 lf   | \$29.71 /lf  | \$8,318          |
| #125 50 AMP EMT Composite feeders copper - Large Power  | 548 lf   | \$29.71 /lf  | \$16,279         |
| #130 50 AMP EMT Composite feeders copper - Large Power  | 571 lf   | \$29.71 /lf  | \$16,962         |
| #134 50 AMP EMT Composite feeders copper - Large Power  | 342 lf   | \$29.71 /lf  | \$10,159         |
| #234 60 AMP EMT Composite feeders copper - Large Power  | 356 lf   | \$26.58 /lf  | \$9 <i>,</i> 462 |
| #235 60 AMP EMT Composite feeders copper - Large Power  | 366 lf   | \$26.58 /lf  | \$9,727          |
| #290 45 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #299 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #301 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #303 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #305 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #306 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #307 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #308 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #309 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #310 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #311 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #312 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #313 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #314 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #315 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #316 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #317 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #318 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #319 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #320 35 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$18.69 /lf  | \$2,243          |
| #321 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #323 50 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #324 35 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$18.69 /lf  | \$2,243          |
| #325 35 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$18.69 /lf  | \$2,243          |
| #326 45 AMP EMT Composite feeders copper - Large Power  | 120 lf   | \$28.14 /lf  | \$3,376          |
| #036 100 AMP MI Composite feeders Copper - Large Power  | 35 lf    | \$108.05 /lf | \$3,782          |
| #037 100 AMP EMT Composite feeders Copper - Large Power | 372 lf   | \$36.01 /lf  | \$13,395         |
| #038 100 AMP EMT Composite feeders Copper - Large Power | 474 lf   | \$36.01 /lf  | \$17,068         |
| #039 100 AMP EMT Composite feeders Copper - Large Power | 249 lf   | \$36.01 /lf  | \$8,966          |
| #040 100 AMP EMT Composite feeders Copper - Large Power | 283 lf   | \$36.01 /lf  | \$10,190         |
| #041 100 AMP EMT Composite feeders Copper - Large Power | 442 lf   | \$36.01 /lf  | \$15,916         |
| #042 100 AMP EMT Composite feeders Copper - Large Power | 470 lf   | \$36.01 /lf  | \$16,924         |
| #043 100 AMP EMT Composite feeders Copper - Large Power | 265 lf   | \$36.01 /lf  | \$9,542          |
| #132 125 AMP EMT Composite feeders Copper - Large Power | 388 lf   | \$36.01 /lf  | \$13,972         |
| #144 100 AMP EMT Composite feeders Copper - Large Power | 528 lf   | \$36.01 /lf  | \$19,014         |
| #184 100 AMP EMT Composite feeders Copper - Large Power | 1,025 lf | \$36.01 /lf  | \$36,911         |
| #228 100 AMP EMT Composite feeders Copper - Large Power | 502 lf   | \$36.01 /lf  | \$18,077         |
| #230 100 AMP EMT Composite feeders Copper - Large Power | 255 lf   | \$36.01 /lf  | \$9,183          |
| #241 100 AMP EMT Composite feeders Copper - Large Power | 525 lf   | \$36.01 /lf  | \$18,905         |



60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST        |
|---|----------|--------------|-------------------|
| #242 80 AMP EMT Composite feeders Copper - Large Power                  | 165 lf   | \$31.60 /lf  | \$5,214           |
| #293 90 AMP EMT Composite feeders Copper - Large Power                  | 120 lf   | \$33.82 /lf  | \$4,059           |
| #295 90 AMP EMT Composite feeders Copper - Large Power                  | 120 lf   | \$33.82 /lf  | \$4,059           |
| #328 90 AMP EMT Composite feeders Copper - Large Power                  | 120 lf   | \$33.82 /lf  | \$4,059           |
| #329 110 AMP EMT Composite feeders Copper - Large Power                 | 120 lf   | \$33.82 /lf  | \$4,059           |
| #005 2000 AMP EMT Composite feeders Copper - Large Power                | 149 lf   | \$821.92 /lf | \$122,466         |
| #008 200 AMP EMT Composite feeders Copper - Large Power                 | 34 If    | \$102.06 /lf | \$3,470           |
| #011 200 AMP EMT Composite feeders Copper - Large Power                 | 382 lf   | \$102.06 /lf | \$38,987          |
| #014 200 AMP EMT Composite feeders Copper - Large Power                 | 481 lf   | \$102.06 /lf | \$49,092          |
| #017 200 AMP EMT Composite feeders Copper - Large Power                 | 278 lf   | \$102.06 /lf | \$28,373          |
| #020 200 AMP EMT Composite feeders Copper - Large Power                 | 448 lf   | \$102.06 /lf | \$45,723          |
| #023 200 AMP EMT Composite feeders Copper - Large Power                 | 285 lf   | \$102.06 /lf | \$29,087          |
| #026 200 AMP EMT Composite feeders Copper - Large Power                 | 478 lf   | \$102.06 /lf | \$48,785          |
| #029 200 AMP EMT Composite feeders Copper - Large Power                 | 274 lf   | \$102.06 /lf | \$27 <i>,</i> 965 |
| #071 200 AMP EMT Composite feeders Copper - Large Power                 | 76 lf    | \$102.06 /lf | \$7,757           |
| #083 Fire Pump Assume 200 AMP MI Composite feeders Copper - Large Power | 87 lf    | \$243.86 /lf | \$21,215          |
| #106 200 AMP EMT Composite feeders Copper - Large Power                 | 329 lf   | \$102.06 /lf | \$33,578          |
| #107 200 AMP EMT Composite feeders Copper - Large Power                 | 83 If    | \$102.06 /lf | \$8,471           |
| #183 150 AMP EMT Composite feeders Copper - Large Power                 | 347 lf   | \$65.49 /lf  | \$22,726          |
| #185 200 AMP EMT Composite feeders Copper - Large Power                 | 627 lf   | \$95.38 /lf  | \$59 <i>,</i> 803 |
| #211 150 AMP EMT Composite feeders Copper - Large Power                 | 84 If    | \$65.49 /lf  | \$5,501           |
| #212 175 AMP EMT Composite feeders Copper - Large Power                 | 316 lf   | \$89.47 /lf  | \$28,272          |
| #224 150 AMP EMT Composite feeders Copper - Large Power                 | 336 If   | \$65.49 /lf  | \$22,006          |
| #225 150 AMP EMT Composite feeders Copper - Large Power                 | 379 lf   | \$65.49 /lf  | \$24,822          |
| #087 225 AMP EMT Composite feeders Copper - Large Power                 | 35 lf    | \$102.06 /lf | \$3,572           |
| #090 225 AMP EMT Composite feeders Copper - Large Power                 | 490 lf   | \$102.06 /lf | \$50,010          |
| #094 225 AMP EMT Composite feeders Copper - Large Power                 | 391 lf   | \$102.06 /lf | \$39,906          |
| #097 225 AMP EMT Composite feeders Copper - Large Power                 | 499 If   | \$102.06 /lf | \$50,929          |
| #100 225 AMP EMT Composite feeders Copper - Large Power                 | 463 lf   | \$102.06 /lf | \$47,254          |
| #103 225 AMP EMT Composite feeders Copper - Large Power                 | 495 lf   | \$102.06 /lf | \$50,520          |
| #108 225 AMP EMT Composite feeders Copper - Large Power                 | 407 lf   | \$102.06 /lf | \$41,539          |
| #113 225 AMP EMT Composite feeders Copper - Large Power                 | 386 lf   | \$102.06 /lf | \$39,396          |
| #118 225 AMP EMT Composite feeders Copper - Large Power                 | 438 lf   | \$102.06 /lf | \$44,703          |
| #121 225 AMP EMT Composite feeders Copper - Large Power                 | 335 lf   | \$102.06 /lf | \$34,191          |
| #127 225 AMP EMT Composite feeders Copper - Large Power                 | 329 lf   | \$102.06 /lf | \$33,578          |
| #186 225 AMP EMT Composite feeders Copper - Large Power                 | 680 lf   | \$102.06 /lf | \$69,402          |
| #189 225 AMP EMT Composite feeders Copper - Large Power                 | 178 lf   | \$102.06 /lf | \$18,167          |
| #192 225 AMP EMT Composite feeders Copper - Large Power                 | 245 lf   | \$102.06 /lf | \$25,005          |
| #199 225 AMP EMT Composite feeders Copper - Large Power                 | 249 lf   | \$102.06 /lf | \$25,413          |
| #202 225 AMP EMT Composite feeders Copper - Large Power                 | 73 lf    | \$102.06 /lf | \$7,450           |
| #205 225 AMP EMT Composite feeders Copper - Large Power                 | 245 lf   | \$102.06 /lf | \$25,005          |
| #208 225 AMP EMT Composite feeders Copper - Large Power                 | 301 lf   | \$102.06 /lf | \$30,720          |
| #213 225 AMP EMT Composite feeders Copper - Large Power                 | 501 lf   | \$102.06 /lf | \$51,133          |
| #215 225 AMP EMT Composite feeders Copper - Large Power                 | 278 lf   | \$102.06 /lf | \$28,373          |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST       | TOTAL COST  |
|---|----------|-----------------|-------------|
| #218 225 AMP EMT Composite feeders Copper - Large Power   | 305 lf   | \$102.06 /lf    | \$31,129    |
| #221 225 AMP EMT Composite feeders Copper - Large Power   | 304 If   | \$102.06 /lf    | \$31,027    |
| #229 225 AMP EMT Composite feeders Copper - Large Power   | 255 lf   | \$102.06 /lf    | \$26,026    |
| #304 225 AMP EMT Composite feeders Copper - Large Power   | 120 lf   | \$91.95 /lf     | \$11,034    |
| #084 250 AMP EMT Composite feeders Copper - Large Power   | 55 lf    | \$101.96 /lf    | \$5,608     |
| #142 300 AMP EMT Composite feeders Copper - Large Power   | 685 lf   | \$134.44 /lf    | \$92,094    |
| #143 300 AMP EMT Composite feeders Copper - Large Power   | 624 lf   | \$134.44 /lf    | \$83,893    |
| #226 300 AMP EMT Composite feeders Copper - Large Power   | 428 lf   | \$134.44 /lf    | \$57,542    |
| #227 300 AMP EMT Composite feeders Copper - Large Power   | 466 lf   | \$134.44 /lf    | \$62,651    |
| #240 300 AMP EMT Composite feeders Copper - Large Power   | 259 lf   | \$134.44 /lf    | \$34,821    |
| #033 600 AMP EMT Composite feeders Copper - Large Power   | 36 If    | \$266.49 /lf    | \$9,594     |
| #034 400 AMP MI Composite feeders Copper - Large Power  | 73 lf    | \$451.98 /lf    | \$32,995    |
| #068 400 AMP MI Composite feeders Copper - Large Power  | 68 lf    | \$451.98 /lf    | \$30,735    |
| #069 400 AMP MI Composite feeders Copper - Large Power  | 72 lf    | \$451.98 /lf    | \$32,543    |
| #075 400 AMP MI Composite feeders Copper - Large Power  | 62 lf    | \$451.98 /lf    | \$28,023    |
| #081 600 AMP EMT Composite feeders Copper - Large Power   | 76 lf    | \$266.49 /lf    | \$20,253    |
| #195 400 AMP EMT Composite feeders Copper - Large Power   | 336 If   | \$181.45 /lf    | \$60,968    |
| #006 400 AMP EMT Composite feeders Copper - Large Power   | 82 If    | \$165.36 /lf    | \$13,560    |
| #032 800 AMP EMT Composite feeders Copper - Large Power   | 70 lf    | \$362.17 /lf    | \$25,352    |
| #076 800 AMP EMT Composite feeders Copper - Large Power   | 275 lf   | \$362.17 /lf    | \$99,596    |
| #003 1200 AMP EMT Composite feeders Copper - Large Power  | 372 lf   | \$544.21 /lf    | \$202,445   |
| #004 1200 AMP EMT Composite feeders Copper - Large Power  | 31 lf    | \$544.21 /lf    | \$16,870    |
| #077 1200 AMP EMT Composite feeders Copper - Large Power  | 31 lf    | \$544.21 /lf    | \$16,870    |
| #078 1200 AMP EMT Composite feeders Copper - Large Power  | 32 If    | \$544.21 /lf    | \$17,415    |
| #289 1200 AMP EMT Composite feeders Copper - Large Power  | 120 lf   | \$493.53 /lf    | \$59,223    |
| D5025 EMERGENCY GEN SET W/ATS   |          | \$0.11 / GSF    | \$43,169    |
| Auto Transfer Switch 3P - 250a  | 1.00 ea  | \$8,894.58 /ea  | \$8,895     |
| Auto Transfer Switch 3P - 400a  | 3.00 ea  | \$11,424.75 /ea | \$34,274    |
| D5027 MECHANICAL EQUIPMENT CONNECTIONS  |          | \$4.13 / GSF    | \$1,572,259 |
| E3EQ   AC - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                        | 53 ea    | \$655.72 /ea    | \$34,753    |
| E3EQ   30 AMP 3 POLE N1 fused disconnect 600 volt composite<br>unit                             | 6.00 ea  | \$655.72 /ea    | \$3,934     |
| E3EQ   30A Disconnect - Unassigned 30 AMP 3 POLE N1 fused<br>disconnect 600 volt composite unit | 112 ea   | \$655.72 /ea    | \$73,441    |
| E3EQ   AC - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                        | 2.00 ea  | \$655.72 /ea    | \$1,311     |
| E3EQ   BS - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                        | 11 ea    | \$655.72 /ea    | \$7,213     |
| E3EQ   CU-1 with VFD 35A composite unit connection only off riser                               | 1.00 ea  | \$448.22 /ea    | \$448       |
| E3EQ   CU-10A with VFD 40A composite unit connection only off riser                             | 1.00 ea  | \$448.22 /ea    | \$448       |
| E3EQ   CU-10B with VFD 30A composite unit connection only off riser                             | 1.00 ea  | \$448.22 /ea    | \$448       |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| E3EQ   CU-11A with VFD 80A composite unit connection only off riser | 1.00 ea  | \$936.66 /ea | \$937      |
| E3EQ   CU-11B with VFD 35A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-11C with VFD 35A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-12 with VFD 30A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-13A with VFD 40A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-13B with VFD 20A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-13C with VFD 20A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-14A with VFD 40A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-14B with VFD 20A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-15 with VFD 50A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-16 with VFD 20A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-17 with VFD 80A composite unit connection only off riser  | 1.00 ea  | \$936.66 /ea | \$937      |
| E3EQ   CU-19A with VFD 40A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-19B with VFD 20A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-2A with VFD 45A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-2B with VFD 20A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-3 with VFD 40A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-4A with VFD 80A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-4B with VFD 80A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-5A with VFD 40A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-5B with VFD 30A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-6A with VFD 40A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-6B with VFD 35 A composite unit connection only off riser | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-7 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| E3EQ   CU-8A with VFD 80 A composite unit connection only off riser  | 1.00 ea  | \$936.66 /ea | \$937      |
| E3EQ   CU-8B with VFD 60 A composite unit connection only off riser  | 1.00 ea  | \$727.02 /ea | \$727      |
| E3EQ   CU-9A with VFD 40 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-9B with VFD 30 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   CU-9C with VFD 20 A composite unit connection only off<br>riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   DCU1 30 A composite unit connection on mechanical<br>schedule includes feeder   | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   DF - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit   | 2.00 ea  | \$655.72 /ea | \$1,311    |
| E3EQ   DWP - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit  | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   ERV - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit  | 4.00 ea  | \$655.72 /ea | \$2,623    |
| E3EQ   ERV-1 with VFD 45 A composite unit connection only off<br>riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-2 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-3 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-4 with VFD 45 A composite unit connection only off<br>riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-5 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-6 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   ERV-7 with VFD 15 A composite unit connection off<br>Mechanical schedule with feeder                                      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   EUH - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit  | 34 ea    | \$655.72 /ea | \$22,295   |
| E3EQ   F with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder removed during recon 12-20-<br>2022 | 0.00 ea  |              | \$0        |
| E3EQ   F1 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder                                    | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F10 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder                                   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F11 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F12 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F13 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F14 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| E3EQ   F15 with VFD 15 A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F16 with VFD 15 A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F17 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder              | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F18 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder              | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F2 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder               | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F3 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F4 with VFD 90 A composite unit connection only off riser  | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   F5 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F6 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F7 with VFD 15 A composite unit connection only off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F8 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder               | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   F9 with VFD 15 A composite unit connection only off<br>Mechanical schedule with feeder               | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   Fire Pump Controler FBO composite unit connection only<br>off riser                                  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   FTU - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 9.00 ea  | \$655.72 /ea | \$5,902    |
| E3EQ   GV - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                    | 2.00 ea  | \$655.72 /ea | \$1,311    |
| E3EQ   GVI - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   GVR - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   KEF - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 5.00 ea  | \$655.72 /ea | \$3,279    |
| E3EQ   MAU1 with VFD 35 A composite unit connection only on<br>drawing not on riser includeds feeder        | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   MAU2 with VFD 60A composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   PE-1 with Cntrl composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   PE-2 with Cntrl composite unit connection only off riser   | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   PH - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                    | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   SA - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                    | 2.00 ea  | \$655.72 /ea | \$1,311    |
| E3EQ   VAC - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 1.00 ea  | \$655.72 /ea | \$656      |
| E3EQ   VAV - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                                   | 62 ea    | \$655.72 /ea | \$40,655   |
| E3EQ   VCU with VFD 20 A composite unit connection only off riser removed during Recon double up 12-20-2022 | 0.00 ea  |              | \$0        |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| E3EQ   VCU-5B with VFD 20 A composite unit connection only off riser      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-5D with VFD 20 A composite unit connection only off riser      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-6B with VFD 35 A composite unit connection only off riser      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-6D with VFD 35 A composite unit connection only off riser      | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H1B with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H1D with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H1F with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H2B with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H2D with VFD 20 A composite unit connection only<br>off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H2F with VFD 20 A composite unit connection only<br>off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H3A with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H3B with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H3D with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-H3F with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-M2B with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-M2C with VFD 80 A composite unit connection only<br>off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-M2D with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-M2F with VFD 35 A composite unit connection only<br>off riser  | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-R1B with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-R1D with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-R2B with VFD 35 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-R2C,E with VFD 50 A composite unit connection only off riser   | 2.00 ea  | \$448.22 /ea | \$896      |
| E3EQ   VCU-R3B with VFD 20 A composite unit connection only off riser     | 1.00 ea  | \$448.22 /ea | \$448      |
| E3EQ   VCU-R4B,D,F with VFD 35 A composite unit connection only off riser | 3.00 ea  | \$448.22 /ea | \$1,345    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST      | TOTAL COST |
|--|----------|----------------|------------|
| E3EQ   ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit | 55 ea    | \$727.02 /ea   | \$39,986   |
| E3EQ   H1A with VFD 40 A composite unit connection only off riser          | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   RTU - 60 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit  | 3.00 ea  | \$727.02 /ea   | \$2,181    |
| E3EQ   VAV Connection for electric Rehated coil - not shown on electrical  | 162 ea   | \$1,149.02 /ea | \$186,141  |
| E3EQ   VCU-1A with VFD 40 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-1B with VFD 40 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-2A with VFD 50 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-2B with VFD 50 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-3A,C with VFD 50 A composite unit connection only off riser     | 2.00 ea  | \$516.82 /ea   | \$1,034    |
| E3EQ   VCU-3B,D with VFD 35 A composite unit connection only off riser     | 2.00 ea  | \$516.82 /ea   | \$1,034    |
| E3EQ   VCU-4A with VFD 40 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-4B with VFD 35 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-4C with VFD 40 A composite unit connection only off<br>riser    | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-4D with VFD 35 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-5A with VFD 40 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-5C with VFD 40 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-6A with VFD 60 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-6C with VFD 60 A composite unit connection only off<br>riser    | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-7A with VFD 60 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-7B with VFD 60 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-7C with VFD 60 A composite unit connection only off<br>riser    | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-7D with VFD 60 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-8A with VFD 70 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-8B with VFD 70 A composite unit connection only off riser       | 1.00 ea  | \$516.82 /ea   | \$517      |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST      | TOTAL COST |
|--|----------|----------------|------------|
| E3EQ   VCU-8C with VFD 70 A composite unit connection only off riser                               | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-8D with VFD 70 A composite unit connection only off riser                               | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-9A,C,D with VFD 50 A composite unit connection only off riser                           | 3.00 ea  | \$516.82 /ea   | \$1,550    |
| E3EQ   VCU-9B with VFD 225 A composite unit connection only off riser                              | 1.00 ea  | \$655.72 /ea   | \$656      |
| E3EQ   VCU-H1A with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H1C with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H1E with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H2A with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H2C with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H2E with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H3C with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-H3E with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M1A with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M1B with VFD 40 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M2A with VFD 80 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-M2E with VFD 80 A composite unit connection only<br>off riser                           | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R1A with VFD 70 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R1C with VFD 70 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R2A with VFD 70 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VCU-R3A with VFD 35 A composite unit connection only off riser                              | 1.00 ea  | \$516.82 /ea   | \$517      |
| E3EQ   VRF branch selector 208 composite unit connection off mechanical schedule and feeder        | 47 ea    | \$516.82 /ea   | \$24,290   |
| E3EQ   AHU1 with VFD 150 A composite unit connection on<br>drawing not on riser includeds feeder   | 1.00 ea  | \$1,250.00 /ea | \$1,250    |
| E3EQ   AHU10 with VFD 300 A composite unit connection on mechanical schedule includeds feeder      | 1.00 ea  | \$2,500.00 /ea | \$2,500    |
| E3EQ   AHU2 with VFD 150 A composite unit connection only on drawing not on riser includeds feeder | 1.00 ea  | \$1,250.00 /ea | \$1,250    |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST      | TOTAL COST  |
|--|-----------|----------------|-------------|
| E3EQ   AHU3 with VFD 100 A composite unit connection on<br>mechanical schedule includeds feeder          | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   AHU4 with VFD 100 A composite unit connection on<br>mechanical schedule includeds feeder          | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   AHU5 with VFD 100 A composite unit connection on<br>mechanical schedule includeds feeder          | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   AHU6 with VFD 200 A composite unit connection on<br>mechanical schedule includeds feeder          | 1.00 ea   | \$1,421.00 /ea | \$1,421     |
| E3EQ   AHU7 with VFD 225 A composite unit connection on riser<br>not on drawings includeds feeder        | 1.00 ea   | \$1,421.00 /ea | \$1,421     |
| E3EQ   AHU8 with VFD 150 A composite unit connection on riser<br>not on drawings includeds feeder        | 1.00 ea   | \$1,250.00 /ea | \$1,250     |
| E3EQ   AHU9 with VFD 300 A composite unit connection on<br>mechanical schedule includeds feeder          | 1.00 ea   | \$2,500.00 /ea | \$2,500     |
| E3EQ   DC-1 ith VFD 100 A composite unit connection only off riser                                       | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   HRU4 with VFD 100 A composite unit connection only off riser                                      | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   HRU5 with VFD 100 A composite unit connection only off riser                                      | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   HV8 with VFD 80 A composite unit connection only off riser  | 1.00 ea   | \$920.18 /ea   | \$920       |
| E3EQ   HRU1 with VFD 300 A composite unit connection only off riser                                      | 1.00 ea   | \$4,785.56 /ea | \$4,786     |
| E3EQ   HRU2 with VFD 300 A composite unit connection only off<br>riser                                   | 1.00 ea   | \$4,785.56 /ea | \$4,786     |
| E3EQ   HRU3 with VFD 300 A composite unit connection only off riser                                      | 1.00 ea   | \$4,785.56 /ea | \$4,786     |
| E3EQ   EWH w/ junction box Composite Unit  | 11 ea     | \$655.72 /ea   | \$7,213     |
| E3EQ   FCU w/ junction box - Composite Unit  | 235 ea    | \$655.72 /ea   | \$154,094   |
| 20 AMP EMT Composite feeders copper - Mechanical   | 6,450 lf  | \$16.93 /lf    | \$109,199   |
| 30 AMP EMT Composite feeders copper - Mechanical   | 35,700 lf | \$18.69 /lf    | \$667,233   |
| 100 AMP EMT Composite feeders Copper - Mechanical  | 2,250 lf  | \$36.01 /lf    | \$81,019    |
| Small VFD on electrical, VFD's included with mechanical as shown on mechanical Drawings recon 11-28-2022 | 0.00 ls   |                | \$0         |
| D5029 SMALL POWER DEVICES & WIRING   |           | \$4.26 / GSF   | \$1,622,348 |
| Small Power \$/sf - Cafeteria  | 8,135 sf  | \$1.50 /sf     | \$12,202    |
| Wiremold Dual Channel Empty Raceway with wiring - no devices<br>included - Composite Unit                | 31 lf     | \$60.36 /lf    | \$1,894     |
| Wiremold Duplex Receptacle Only Composite Unit   | 15 ea     | \$45.60 /ea    | \$684       |
| Small Power \$/sf - Conference Rooms   | 719 sf    | \$5.00 /sf     | \$3,595     |
| Small Power \$/sf - Gym  | 11,959 sf | \$1.50 /sf     | \$17,939    |
| Small Power \$/sf - Kitchen / Servery  | 3,883 sf  | \$1.00 /sf     | \$3,883     |
| Small Power \$/sf - Media Center   | 2,460 sf  | \$4.00 /sf     | \$9,840     |
| Small Power \$/sf - Storage  | 1,622 sf  | \$0.50 /sf     | \$811       |
| Small Power \$/sf - Circulation  | 4,619 sf  | \$1.50 /sf     | \$6,929     |
| E3EQ   Auto 120 volt connetions - Assume Power is covered on<br>Electrical Power plans                   | 0.00 ea   |                | \$0         |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| E3EQ   Auto 208 volt connetions - Assume Power is covered on<br>Electrical Power plans             | 0.00 ea  |              | \$0        |
| E3EQ   Auto Technology 120 volt connections - Assume Power is covered on Electrical Power plans    | 0.00 ea  |              | \$0        |
| E3EQ   Auto Technology 208 volt connetions - Assume Power is<br>covered on Electrical Power plans  | 0.00 ea  |              | \$0        |
| E3EQ   Biotech 120 volt connetions - Assume Power is covered<br>on Electrical Power plans          | 0.00 ea  |              | \$0        |
| E3EQ   Carpentry 120 volt connetions - Assume Power is covered<br>on Electrical Power plans        | 0.00 ea  |              | \$0        |
| E3EQ   Carpentry 208 volt connetions Mechanical schedule with feeder                               | 0.00 ea  |              | \$0        |
| E3EQ   Carpentry 480 volt connetions Mechanical schedule with feeder                               | 0.00 ea  |              | \$0        |
| E3EQ   Cosmo 120 volt connetions - Assume Power is covered on<br>Electrical Power plans            | 0.00 ea  |              | \$0        |
| E3EQ   Cosmo 208 volt connetions - Assume Power is covered on<br>Electrical Power plans            | 0.00 ea  |              | \$0        |
| E3EQ   Dental 120 volt connetions - Assume Power is covered on<br>Electrical Power plans           | 0.00 ea  |              | \$0        |
| E3EQ   Dental 208 volt connetions - Assume Power is covered on<br>Electrical Power plans           | 0.00 ea  |              | \$0        |
| E3EQ   Drafting and Design 120 volt connetions - Assume Power is covered on Electrical Power plans | 0.00 ea  |              | \$0        |
| E3EQ   Drafting and Design 208 volt connetions - Assume Power is covered on Electrical Power plans | 0.00 ea  |              | \$0        |
| E3EQ   DVC Comp. Lab 120 volt connetions - Assume Power is covered on Electrical Power plans       | 0.00 ea  |              | \$0        |
| E3EQ   DVC Comp. Lab 208 volt connetions - Assume Power is<br>covered on Electrical Power plans    | 0.00 ea  |              | \$0        |
| E3EQ   Electrical 120 volt connetions - Assume Power is covered<br>on Electrical Power plans       | 0.00 ea  |              | \$0        |
| E3EQ   Health Assist 120 volt connetions - Assume Power is<br>covered on Electrical Power plans    | 0.00 ea  |              | \$0        |
| E3EQ   Health Assist 208 volt connetions - Assume Power is<br>covered on Electrical Power plans    | 0.00 ea  |              | \$0        |
| E3EQ   HVAC 120 volt connetions - Assume Power is covered on<br>Electrical Power plans             | 0.00 ea  |              | \$0        |
| E3EQ   HVAC 208 volt connetions - Assume Power is covered on<br>Electrical Power plans             | 0.00 ea  |              | \$0        |
| E3EQ   Kitchen: Culinary Arts Equipment 120 volt connetions<br>Mechanical schedule with feeder     | 96 ea    | \$448.22 /ea | \$43,029   |
| E3EQ   Kitchen: Culinary Arts Equipment 208 volt connetions<br>Mechanical schedule with feeder     | 22 ea    | \$448.22 /ea | \$9,861    |
| E3EQ   Kitchen: Culinary Arts Equipment 480 volt connetions<br>Mechanical schedule with feeder     | 2.00 ea  | \$448.22 /ea | \$896      |
| E3EQ   Kitchen: Main Equipment 120 volt connetions Mechanical<br>schedule with feeder              | 64 ea    | \$448.22 /ea | \$28,686   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTI   | ΤY | UNIT CO  | ST  | TOTAL COST |
|--|----------|----|----------|-----|------------|
| E3EQ   Kitchen: Main Equipment 208 volt connetions Mechanical<br>schedule with feeder      | 18 6     | ea | \$448.22 | /ea | \$8,068    |
| E3EQ   Kitchen: Main Equipment 480 volt connetions Mechanical<br>schedule with feeder      | 1.00 €   | ea | \$448.22 | /ea | \$448      |
| E3EQ   Medical 120 volt connetions - Assume Power is covered<br>on Electrical Power plans  | 0.00 €   | ea |          |     | \$0        |
| E3EQ   Medical 208 volt connetions - Assume Power is covered<br>on Electrical Power plans  | 0.00 €   | ea |          |     | \$0        |
| E3EQ   MF 120 volt connetions - Assume Power is covered on<br>Electrical Power plans       | 0.00 €   | ea |          |     | \$0        |
| E3EQ   MF 208 volt connetions - Assume Power is covered on<br>Electrical Power plans       | 0.00 €   | ea |          |     | \$0        |
| E3EQ   MF 480 volt connetions - Assume Power is covered on<br>Electrical Power plans       | 0.00 €   | ea |          |     | \$0        |
| E3EQ   Plumbing 120 volt connetions - Assume Power is covered<br>on Electrical Power plans | 0.00 €   | ea |          |     | \$0        |
| E3EQ   Robotics 120 volt connetions - Assume Power is covered<br>on Electrical Power plans | 0.00 €   | ea |          |     | \$0        |
| E3EQ   Robotics 208 volt connetions - Assume Power is covered<br>on Electrical Power plans | 0.00 €   | ea |          |     | \$0        |
| Switch: Tamper Resistant - S (1) Single pole Switch Composite unit                         | 103 6    | ea | \$78.72  | /ea | \$8,108    |
| FB: Floor box (type 2) Quad recep and Telcom provisions                                    | 1.00 e   | ea | \$558.85 | /ea | \$559      |
| FB: Quad Floor Box - Composite Unit  | 54 e     | ea | \$875.00 | /ea | \$47,250   |
| Transformer: 24 V XFMR Low Voltage transformer   | 24 e     | ea | \$217.48 | /ea | \$5,220    |
| Recep: Range receptacle Composite unit   | 1.00 e   | ea | \$115.23 | /ea | \$115      |
| Recep: 20 Amp Straight Blade 250V (Type 6-20R) Receptacle<br>Composite unit                | 1.00 €   | ea | \$131.58 | /ea | \$132      |
| Recep: 20A Twist lock (Type 4) 250V Receptacle Composite unit                              | 1.00 e   | ea | \$131.58 | /ea | \$132      |
| Recep: 30 Amp Straight Blade, 125V (Note 2) Nema Receptacle                                | 2.00 €   | ea | \$165.17 | /ea | \$330      |
| Recep: 30A Straight Blade (type 5) Nema Receptacle Composite unit                          | 4.00 e   | ea | \$165.17 | /ea | \$661      |
| Recep: 50 Amp Twist Lock Receptacle Composite unit   | 45 e     | ea | \$199.56 | /ea | \$8,980    |
| JB: Power Junction Box - FF, Furniture Flush mtd. Composite Unit                           | 6.00 e   | ea | \$105.00 | /ea | \$630      |
| JB: Power Junction Box - Typ. Composite Unit   | 151 e    | ea | \$85.04  | /ea | \$12,842   |
| JB: Power Junction Box - XP Composite Unit   | 2.00 €   | ea | \$125.00 | /ea | \$250      |
| Switch: EPO Switch at Shops  | 33 6     | ea | \$85.04  | /ea | \$2,806    |
| Recep: 12V Receptacle Composite unit   | 24 6     | ea | \$83.40  | /ea | \$2,002    |
| Recep: Duplex receptacle Composite unit  | 1,398 e  | ea | \$83.40  | /ea | \$116,589  |
| Recep: Duplex receptacle XP Composite unit   | 17 e     | ea | \$135.00 | /ea | \$2,295    |
| Recep: VPO - Duplex receptacle Composite unit  | 2.00 €   | ea | \$83.40  | /ea | \$167      |
| Recep: Duplex GFI receptacle Composite unit  | 360 e    | ea | \$116.68 | /ea | \$42,005   |
| Switch: EPO Switch at Shops XP   | 1.00 e   | ea | \$116.68 | /ea | \$117      |
| Recep: Quad receptacle Composite unit  | 436 6    | ea | \$119.92 | /ea | \$52,286   |
| Recep: Quad GFI receptacle Composite unit  | 40 e     | ea | \$186.35 | /ea | \$7,454    |
| 20 AMP EMT Composite feeders copper - Large Power  | 32,088 l | lf | \$16.93  | /lf | \$543,292  |
| 30 AMP EMT Composite feeders copper - Large Power  | 7,770 l  | lf | \$18.69  | /lf | \$145,228  |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY  | UNIT COST      | TOTAL COST  |
|---|-----------|----------------|-------------|
| 50 AMP EMT Composite feeders copper - Large Power                     | 1,350 lf  | \$26.14 /lf    | \$35,289    |
| CR: Cord Reel Power Only 30A Twistlock Composite Unit                 | 253 ea    | \$905.53 /ea   | \$229,099   |
| EV Charging Station - Single Composite Unit                           | 4.00 ea   | \$7,932.85 /ea | \$31,731    |
| 12/2 MC Cable Composite Unit  | 48,132 lf | \$3.70 /lf     | \$178,016   |
| D5040 LIGHTING  |           | \$14.18 / GSF  | \$5,396,888 |
| D5042 LIGHT FIXTURES  |           | \$11.92 / GSF  | \$4,536,083 |
| 20 AMP EMT Composite feeders copper - Large Power                     | 48,000 lf | \$16.93 /lf    | \$812,704   |
| PB Gym Light Composite Unit   | 36 ea     | \$661.71 /ea   | \$23,822    |
| RLH Composite Unit  | 8.00 ea   | \$561.71 /ea   | \$4,494     |
| RN2 Lighting Fixture  | 51 ea     | \$391.71 /ea   | \$19,977    |
| DPB2 Composite Unit   | 30 ea     | \$661.71 /ea   | \$19,851    |
| GSB Light Fixture   | 20 ea     | \$461.71 /ea   | \$9,234     |
| GSD Lighting Fixture  | 24 ea     | \$411.71 /ea   | \$9,881     |
| Light Fixture Recessed Can Composite Unit                             | 15 ea     | \$411.71 /ea   | \$6,176     |
| LSE Light Fixture   | 7.00 ea   | \$561.71 /ea   | \$3,932     |
| RC1 Recessed Can lighting Fixture                                     | 297 ea    | \$391.71 /ea   | \$116,338   |
| RE Lighting   | 80 ea     | \$391.71 /ea   | \$31,337    |
| RF Recessed Can light Fixture   | 63 ea     | \$391.71 /ea   | \$24,678    |
| RJ Square Recess Can Light Fixture                                    | 36 ea     | \$391.71 /ea   | \$14,102    |
| RK Lighting Fixturet  | 8.00 ea   | \$391.71 /ea   | \$3,134     |
| RN1 Light Fixture   | 8.00 ea   | \$391.71 /ea   | \$3,134     |
| RQ Lighting Fixture   | 25 ea     | \$391.71 /ea   | \$9,793     |
| RB2 2x4 Lighting Fixture  | 6.00 ea   | \$382.99 /ea   | \$2,298     |
| RDA 2x4   | 31 ea     | \$382.99 /ea   | \$11,873    |
| RL1 2X4 Lighting Fixture  | 201 ea    | \$382.99 /ea   | \$76,981    |
| RL2 2x4 Led Recessed Troffer Composite Unit                           | 62 ea     | \$382.99 /ea   | \$23,745    |
| RLE Lighting Fixture  | 32 ea     | \$761.71 /ea   | \$24,375    |
| RA2 Light Fixture   | 6.00 ea   | \$391.71 /ea   | \$2,350     |
| RDB 2x2   | 13 ea     | \$391.71 /ea   | \$5,092     |
| RA1 2X2 Lighting Fixture  | 179 ea    | \$391.71 /ea   | \$70,116    |
| RA3 Lighting Fixture  | 19 ea     | \$391.71 /ea   | \$7,443     |
| RB1 Lighting Fixture  | 150 ea    | \$391.71 /ea   | \$58,757    |
| RLC Lighting Fixture Composite Unit                                   | 1,871 ea  | \$179.96 /ea   | \$336,732   |
| GSC 8 foot  | 12 ea     | \$817.96 /ea   | \$9,816     |
| GSE Lighting Fixture  | 34 lf     | \$190.99 /lf   | \$6,402     |
| Light Fixture Recessed Slot Fixture Per Linear Foot Composite<br>Unit | 18 lf     | \$190.99 /lf   | \$3,437     |
| LPJ Recessed Slot Fixture Per Linear Foot Composite Unit              | 462 lf    | \$135.99 /lf   | \$62,874    |
| LSA linear Fixture per foot   | 743 lf    | \$135.99 /lf   | \$101,048   |
| LSB Per Linear Foot Composite Unit                                    | 197 lf    | \$135.99 /lf   | \$26,804    |
| RLA1 Light Fixture  | 763 lf    | \$135.99 /lf   | \$103,719   |
| RLA2 Lighting Fixture per Linear Foot                                 | 41 lf     | \$160.99 /lf   | \$6,677     |
| RLB-1 Linear fixtuire per foot  | 224 lf    | \$135.99 /lf   | \$30,415    |
| RLD1 Light fixture per foot   | 59 lf     | \$135.99 /lf   | \$8,034     |
| RLD3 Light Fixture per Linear foot                                    | 273 lf    | \$135.99 /lf   | \$37,135    |



60% CD Estimate - Reconciled incl VE

| DESCRIPTION   | QUANTITY | UNIT COS     | T TOTAL COST |
|---|----------|--------------|--------------|
| GPL2 4 foot   | 17 ea    | \$508.96 /   | ea \$8,652   |
| LPB Light Fixture   | 46 ea    | \$608.96 /   | ea \$28,012  |
| LPE Lighting Fixture  | 18 ea    | \$608.96 /   | ea \$10,961  |
| GPL1 8 foot   | 20 ea    | \$817.96 /   | ea \$16,359  |
| Light Fixture 8 Foot Pendant Mounted Fixture Composite Unit             | 133 ea   | \$627.96 /   | ea \$83,519  |
| LPA1 Light Fixture  | 3,653 ea | \$234.96 /   | ea \$858,293 |
| GPE Light Fixture   | 82 lf    | \$210.99 /   | lf \$17,210  |
| Light Fixture Pendant Mounted Fixture per linear foot Composite<br>Unit | 146 lf   | \$135.99 /   | lf \$19,894  |
| LPA2 per linear foott   | 17 lf    | \$190.99 /   | lf \$3,287   |
| LPC Lighting Fixture per Linear foot                                    | 1,452 lf | \$135.99 /   | lf \$197,468 |
| LPD Lighting Fixture per Linear foot                                    | 284 lf   | \$135.99 /   | lf \$38,653  |
| LPG Light Fixture per Linear Foot                                       | 73 lf    | \$135.99 /   | lf \$9,973   |
| LPK per Linear Foot   | 293 lf   | \$135.99 /   | lf \$39,839  |
| LPL Pendand per Linear Foot   | 299 lf   | \$135.99 /   | lf \$40,684  |
| LPM1 Lighting Fixture   | 80 lf    | \$135.99 /   | lf \$10,869  |
| GWD Wall Mounted Fixture  | 32 ea    | \$391.71 /   | ea \$12,535  |
| GWE1 Light Fxiture  | 39 ea    | \$561.71 /   | ea \$21,907  |
| GWE2 Light Fixture  | 28 ea    | \$561.71 /   | ea \$15,728  |
| LSG1 Lighting Fixture   | 74 ea    | \$561.71 /   | ea \$41,567  |
| LSH 4 Foot  | 24 ea    | \$561.71 /   | ea \$13,481  |
| LSH 8 foot  | 43 ea    | \$676.21 /   | ea \$29,077  |
| LSG2 Light Fixture  | 55 ea    | \$706.21 /   | ea \$38,842  |
| Light Fixture Wall Mounted Fixture Per Linear Foot Composite<br>Unit    | 60 lf    | \$190.99 /   | lf \$11,482  |
| LSH per linear foot   | 99 lf    | \$135.99 /   | lf \$13,402  |
| LSJ Light Fixture   | 75 lf    | \$135.99 /   | lf \$10,164  |
| RBL3 per Linear foot  | 55 lf    | \$135.99 /   | lf \$7,483   |
| RLB2 Lighting Fixture per Linear foot                                   | 556 lf   | \$135.99 /   | lf \$75,561  |
| RLB4 Lighting Fixture   | 75 lf    | \$135.99 /   | lf \$10,237  |
| RLD2 Light Fixture  | 76 lf    | \$135.99 /   | lf \$10,297  |
| GWB Light Fixture   | 11 ea    | \$618.96 /   | ea \$6,809   |
| GWC Exterior Wall mounted Light   | 15 ea    | \$668.96 /   | ea \$10,034  |
| RLF Lighti Fixture  | 10 ea    | \$818.96 /   | ea \$8,190   |
| RM Light Fixture  | 2.00 ea  | \$448.96 /   | ea \$898     |
| SWA Lighting Fixture  | 10 ea    | \$618.96 /   | ea \$6,190   |
| DPA Light Fixutre   | 10 ea    | \$618.96 /   | ea \$6,190   |
| DPB Lighting Fixture  | 12 ea    | \$718.96 /   | ea \$8,628   |
| GPB Fixture   | 126 ea   | \$818.96 /   | ea \$103,189 |
| GPK Light Fixture   | 20 ea    | \$1,240.98 / | ea \$24,820  |
| GSA Light Fixture   | 54 ea    | \$718.96 /   | ea \$38,824  |
| PD Lighti Fixture   | 76 ea    | \$618.96 /   | ea \$47,041  |
| PD1 Lighting Fixture  | 27 ea    | \$618.96 /   | ea \$16,712  |
| PF Lighting Fixture   | 60 ea    | \$618.96 /   | ea \$37,138  |
| PF1 Lighting Fixture  | 24 ea    | \$618.96 /   | ea \$14,855  |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANT  | TITY | UNIT CC      | ST    | TOTAL COST |
|---|--------|------|--------------|-------|------------|
| RP Lighting Fixturet  | 11     | ea   | \$448.96     | /ea   | \$4,939    |
| SA Light Fisxture   | 34     | ea   | \$818.96     | /ea   | \$27,845   |
| TA Lighting Track per Linear foot                           | 68     | lf   | \$97.37      | /lf   | \$6,610    |
| TA Track Head   | 25     | ea   | \$207.21     | /ea   | \$5,180    |
| Exit Sign   | 150    | ea   | \$391.71     | /ea   | \$58,757   |
| F1 Lighting Fixture   | 64     | ea   | \$200.00     | /ea   | \$12,800   |
| 12/2 MC Cable Composite Unit                                | 72,000 | lf   | \$3.70       | /lf   | \$266,292  |
| D5044 LIGHTING CONTROLS & WIRING                            |        |      | \$1.93       | / GSF | \$735,805  |
| S (1) Single pole Switch Composite unit                     | 13     | ea   | \$78.72      | /ea   | \$1,023    |
| SOR (1) Single pole Switch Composite unit                   | 5.00   | ea   | \$78.72      | /ea   | \$394      |
| ST Single Pole Switch                                       | 37     | ea   | \$78.72      | /ea   | \$2,913    |
| SS (2) Single pole Switches Composite unit                  | 2.00   | ea   | \$110.42     | /ea   | \$221      |
| SD (1) Dimmer Switch composite unit                         | 249    | ea   | \$155.59     | /ea   | \$38,741   |
| S3 (1) 3 way switch composite unit                          | 20     | ea   | \$85.00      | /ea   | \$1,700    |
| St3 (1) 3 way switch composite unit                         | 2.00   | ea   | \$85.00      | /ea   | \$170      |
| S3S3 (2) 3 way Switches Composite unit                      | 11     | ea   | \$123.12     | /ea   | \$1,354    |
| SLV (1) Low voltage Switch Composite unit                   | 58     | ea   | \$92.22      | /ea   | \$5,349    |
| Occupancy sensor Wall mounted Composite unit                | 43     | ea   | \$255.70     | /ea   | \$10,995   |
| SVSD Vacancy Senor Dimmer                                   | 75     | ea   | \$286.76     | /ea   | \$21,507   |
| Vacancy sensor Wall mounted Composite unit                  | 62     | ea   | \$286.76     | /ea   | \$17,779   |
| OS! Occupancy sensor Ceiling mounted Composite unit         | 246    | ea   | \$289.42     | /ea   | \$71,198   |
| Lighting Control Panel composite unit                       | 5.00   | ea   | \$4,964.04   | /ea   | \$24,820   |
| Recptacle Control Panel composite unit                      | 9.00   | ea   | \$4,964.04   | /ea   | \$44,676   |
| VS1 Vacancy sensor Ceiling mounted Composite unit           | 183    | ea   | \$250.32     | /ea   | \$45,809   |
| Daylight Sensor Ceiling Mounted Composite unit              | 124    | ea   | \$278.70     | /ea   | \$34,558   |
| 20 AMP EMT Composite feeders copper - Large Power           | 20,000 | lf   | \$16.93      | /lf   | \$338,627  |
| 12/2 MC Cable Composite Unit                                | 20,000 | lf   | \$3.70       | /lf   | \$73,970   |
| D5046 THEATRICAL LIGHTING                                   |        |      | \$0.33       | / GSF | \$125,000  |
| recon 11-28-2022  | 1.00   | ls   | \$100,000.00 | /ls   | \$100,000  |
| Theatrical Lighting and Dimming Equipment Recon 11-28-2022  | 1.00   | ls   | \$100,000.00 | /ls   | \$100,000  |
| Theatrical Lighting and other Equipment excluded 11-28-2022 | 0.00   | excl |              |       | \$0        |
| VE G09 Aud  | -1.00  | ls   | \$75,000.00  | /ls   | (\$75,000) |
| D5090 OTHER ELECTRICAL SYSTEMS                              |        |      | \$2.26       | / GSF | \$860,922  |
| D5094 GROUNDING & LIGHTNING PROTECTION SYS.                 |        |      | \$0.68       | / GSF | \$257,418  |
| Ground Rod - Copperciad 3/4" x 10'                          | 28     | ea   | \$126.99     | /ea   | \$3.556    |
| Lightening Protection Air Terminal                          | 258    | ea   | \$465.25     | /ea   | \$120.035  |
| LP Bonding Plate  | 46     | ea   | \$150.00     | /ea   | \$6.900    |
| Copper Ground Bus Bar .25"x 2" x 3 foot                     | 10     | ea   | \$546.75     | /ea   | \$5,467    |
| Copper Ground Bus Bar .25"x 2" x 4 foot                     | 1.00   | ea   | \$729.00     | /ea   | \$729      |
| Ground Test Well - Terra Cotta with Steel Lid               | 4.00   | ea   | \$489.00     | /ea   | \$1,956    |
| Misc Grounding Requirements                                 | 39,203 | gsf  | \$0.40       | /gsf  | \$15,681   |
| Cadweld Cable to Steel - 250 Max                            | 67     | ea   | \$74.99      | /ea   | \$5,024    |
| Lp Cadweld  | 44     | ea   | \$96.26      | /ea   | \$4,235    |
| Grouunding Cable Copper Bare Stranded # 4/0                 | 3,158  | lf   | \$7.41       | /lf   | \$23,411   |





| DESCRIPTION  | RIPTION QUANTITY |      | ON QUANTITY  |       | UNIT CO     | ST | TOTAL COST |
|--|------------------|------|--------------|-------|-------------|----|------------|
| Lightening Protection Cable Copper Bare Stranded # 4/0   | 9,500 lf         | f    | \$7.41       | /lf   | \$70,424    |    |            |
| D5095 MISCELLANEOUS ELECTRICAL SYSTEMS   |                  |      | \$1.59       | / GSF | \$603,503   |    |            |
| Electrical Permit asuumed to be waived by town   | 0.00 e           | ea   |              |       | \$0         |    |            |
| Full time Saftey Coordinator   | 1.00 e           | ea   | \$108,000.00 | /ea   | \$108,000   |    |            |
| General Foreman Non Working  | 1.00 e           | ea   | \$54,000.00  | /ea   | \$54,000    |    |            |
| Misc Expenses  | 392,032 g        | gsf  | \$1.51       | /gsf  | \$592,752   |    |            |
| Temp Lighting and Power  | 392,032 g        | gsf  | \$0.70       | /gsf  | \$275,206   |    |            |
| Utility Company Backcharges by owner   | 1.00 e           | excl | \$0.00       | /excl | \$0         |    |            |
| Trailers   | 1.00 e           | ea   | \$26,999.71  | /ea   | \$27,000    |    |            |
| BIM Modeling / As Builts   | 1.00 e           | ea   | \$157,544.55 | /ea   | \$157,545   |    |            |
| Relcoated Existing Overhead feed to other school due to new roadway recon 11-28-2022   | 1.00 e           | ea   | \$25,000.00  | /ea   | \$25,000    |    |            |
| VE Items E01 through E11, E14 through E21, E24 trough E26  | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE01 In each classroom, reduce lighting control zones from four<br>zones per classroom to three zones per classroom.   | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE02 For site lighting, control lighting with integral photocells at each light pole, in lieu of using the lighting control system on top of photocells to turn on/off fixtures. | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE03 Provide aluminum feeders for those within the main building 200Amps and larger. This does not include feeders run to the satellite buildings                                | -1.00 ls         | S    | \$150,000.00 | /Is   | (\$150,000) |    |            |
| VE04 Remove duct banks from main fire alarm control panel to all satellite/out buildings.  | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE05 Change the site lighting fixtures to the following: Beacon<br>Viper - https://hubbellcdn.com/specsheet/BEA_VIPERSPEC.pdf  | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE06 Shorten Duct Bank Primary, Telcom and Generator to more<br>in the range of to in the range of 500 If  | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE07 Move All Transformer closer to their prospective<br>Switchboards in the range of 50 linear feet per run currently<br>200+ feet away   | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE08 Utilize Aluminum Feeders 100 amps can be added to above   | -1.00 ls         | s    | \$150,000.00 | /ls   | (\$150,000) |    |            |
| VE09 Utilize Aluminum MC Feeders for feeds 100 amps to 225 amps can be added to above  | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE10 Eliminate Vehicle Charging Stations in Auto Shop quantity of 4  | 0.00 ls          | S    |              |       | \$0         |    |            |
| VE11 Reduce Cord Reel Quantity in shops reduce by 10 overall<br>NOW VE07 ACCEPTED - TARGET REDUCTION VIA COORDINATION  | -1.00 ls         | S    | \$16,000.00  | /ls   | (\$16,000)  |    |            |
| VE14 Utilize Lightning Preventor System in lieu of Lightening<br>Protection cannot be take with E12 - NOW VE E02 ACCEPTED  | -1.00 ls         | S    | \$100,000.00 | /ls   | (\$100,000) |    |            |
| VE15 Move Class Speech Reinforcement to tech Budget Wireless<br>Ceiling Panel  | 0.00 19          | s    |              |       | \$0         |    |            |
| VE16 Remove Draw-out Breakers from Main Switchboard  | 0.00 ls          | s    |              |       | \$0         |    |            |
| VE17 Have Single ended Switchboard would remove set of<br>Secondaries and remove Secondary Duct Bank reduces<br>redundancy NOW VE EO4 ACCEPTED                                   | -1.00 ls         | S    | \$175,000.00 | /Is   | (\$175,000) |    |            |
| VE18 Eliminate panels and transformers for Parking EV charging<br>Stations conduit, wire ,panels transformer and charging station  | 0.00 ls          | S    |              |       | \$0         |    |            |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST        | TOTAL COST  |
|--|-------------|------------------|-------------|
| VE19 Re-evaluate conduit and Service going from Maintenance<br>Building to Main Building(reduce spares and shorter conduits)   | 0.00 ls     |                  | \$0         |
| VE20 Eliminate Theatrical Dimming and rough in(eliminates all<br>Electrical Scope associated with Theater) - NOW VE E03A<br>ACCEPTED                                     | -1.00 ls    | \$25,000.00 /ls  | (\$25,000)  |
| VE21 Revaluate Conduit and how site Lighting is powered for<br>entrance near School Sign and power and communication for<br>sign potentially wirless NOW VE E11 ACCEPTED | -1.00 ls    | \$20,000.00 /Is  | (\$20,000)  |
| VE24 Reduce Security Camera counts(target)   | 0.00 ls     |                  | \$0         |
| VE25 Delete Sub Metering   | 0.00 ls     |                  | \$0         |
| VE26 Target Reduction in Lighting - \$1 / sqft   | 0.00 ls     |                  | \$0         |
| 27 COMMUNICATIONS  | 380,570 GSF | \$8.20 / GSF     | \$3,121,467 |
| D5090 OTHER ELECTRICAL SYSTEMS   |             | \$0.46 / GSF     | \$176,726   |
| D5092 CLOCK SYSTEMS  |             | \$0.46 / GSF     | \$176,726   |
| Clock Single Face Battery or 110 clock   | 235 ea      | \$547.40 /ea     | \$128,639   |
| Clock Rough in and Backboxes   | 1.00 ls     | \$29,999.97 /ls  | \$30,000    |
| LV Cabling (included in overall)   | 7,020 lf    | \$2.58 /lf       | \$18,087    |
| D6010 COMMUNICATIONS & SECURITY  |             | \$4.30 / GSF     | \$1,634,899 |
| D6013 TEL/DATA SYSTEM  |             | \$4.30 / GSF     | \$1,634,899 |
| Wiremold D2 Data Jack Only Composite Unit  | 6.00 ea     | \$306.97 /ea     | \$1,842     |
| Poke Thru D3 data con Composite Unit   | 4.00 ea     | \$1,259.53 /ea   | \$5,038     |
| Poke Thru D2 data con Composite Unit   | 75 ea       | \$1,084.65 /ea   | \$81,349    |
| Poke Thru D4 data con Composite Unit   | 12 ea       | \$1,284.65 /ea   | \$15,416    |
| IDF Room Fit-Out composite unit  | 8.00 ea     | \$15,000.00 /ea  | \$120,000   |
| MDF Room Fit-Out composite unit  | 1.00 ea     | \$30,000.00 /ea  | \$30,000    |
| Tel/data Backbone Cabling , additional Devices and Testing   | 1.00 ea     | \$400,000.00 /ea | \$400,000   |
| Poke Thru D1 data con Composite Unit   | 24 ea       | \$876.00 /ea     | \$21,024    |
| D1 Telephone jack with 3/4" Stub to accessible ceiling composite unit 30 feet  | 3.00 ea     | \$613.10 /ea     | \$1,839     |
| DPI - D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet   | 1.00 ea     | \$613.10 /ea     | \$613       |
| Vape D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet  | 69 ea       | \$613.10 /ea     | \$42,304    |
| VH - D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet  | 11 ea       | \$613.10 /ea     | \$6,744     |
| VH - D1 Data jack at additional TVs and Displays not labeled   | 76 ea       | \$613.10 /ea     | \$46,595    |
| WP - "VOIP" Wall Telephone Outlet  | 73 ea       | \$613.10 /ea     | \$44,756    |
| D2 Data jack with 3/4" Stub up to accessible ceiling composite unit 10 feet  | 2.00 ea     | \$503.30 /ea     | \$1,007     |
| EMP - Empty back box for Simman Cabling by Owner   | 3.00 ea     | \$421.70 /ea     | \$1,265     |
| S2 Data jack with 3/4" Stub up to accessible ceiling composite unit 30 feet  | 8.00 ea     | \$740.40 /ea     | \$5,923     |
| TD2 TelData jack with 3/4" Stub up to accessible ceiling composite unit 30 feet  | 10 ea       | \$740.40 /ea     | \$7,404     |
| D2 Data jack with 1/2" Stub to accessible ceiling composite unit 30 feet _2_   | 552 ea      | \$698.17 /ea     | \$385,387   |



#### 60% CD Estimate - Reconciled incl VE

| DESCRIPTION  | QUANTITY |      | QUANTITY     |       | QUANTITY    |  | FION QUANTITY |  | ITY UNIT COS |  | TOTAL COST |
|--|----------|------|--------------|-------|-------------|--|---------------|--|--------------|--|------------|
| VPL - Low Video Presentation Outlet composite unit 10 feet _1_                           | 105      | ea   | \$603.76     | /ea   | \$63,395    |  |               |  |              |  |            |
| VPH - High Video Presentation Outlet composite unit 10 feet                              | 105      | ea   | \$756.47     | /ea   | \$79,429    |  |               |  |              |  |            |
| D4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet              | 1.00     | еа   | \$995.00     | /ea   | \$995       |  |               |  |              |  |            |
| S4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet              | 2.00     | еа   | \$995.00     | /ea   | \$1,990     |  |               |  |              |  |            |
| Audio Visual Cabling Overall Value   | 1.00     | ea   | \$102,404.62 | /ea   | \$102,405   |  |               |  |              |  |            |
| IPTV and Video on Demand(overal IPTV and Video Demand) - shift to Tech Budget            | 0.00     | excl |              |       | \$0         |  |               |  |              |  |            |
| WAP jack ceiling mounted composite unit  | 208      | ea   | \$491.78     | /ea   | \$102,290   |  |               |  |              |  |            |
| Telcom not Defined in Media Center   | 2,648    | gsf  | \$6.00       | /gsf  | \$15,888    |  |               |  |              |  |            |
| 65" Signage - Wall Mtd Display - Composite Assembly                                      | 15       | excl | \$0.00       | /excl | \$0         |  |               |  |              |  |            |
| 75" Wall Mtd Display - Composite Assembly  | 103      | excl | \$0.00       | /excl | \$0         |  |               |  |              |  |            |
| Telcom Adjustment during recon 12-20-2022  | 1.00     | excl | \$50,000.00  | /excl | \$50,000    |  |               |  |              |  |            |
| D6030 SOUND AND A/V  |          |      | \$3.44       | / GSF | \$1,309,843 |  |               |  |              |  |            |
| D6031 AUDIO-VIDEO SYSTEMS  |          |      | \$2.80       | / GSF | \$1,067,380 |  |               |  |              |  |            |
| AV Rack, Floor Mtd.  | 0.00     | ea   |              |       | \$0         |  |               |  |              |  |            |
| AV Eg Rack Wall Mounted Rack   | 0.00     | ea   |              |       | \$0         |  |               |  |              |  |            |
| Local Audio System Suspended Speaker w/ 1" con to av rack                                | 8.00     | ea   | \$315.00     | /ea   | \$2,520     |  |               |  |              |  |            |
| Speech Reinforcement System  | 101      | ea   | \$2,342.00   | /ea   | \$236,542   |  |               |  |              |  |            |
| Fitness Center Audio Visual System   | 1.00     | ea   | \$16,613.77  | /ea   | \$16,614    |  |               |  |              |  |            |
| IC - Intercom Wall Plate, backbox w/ 1" Conduit to AV Rack                               | 1.00     | ea   | \$247.48     | /ea   | \$247       |  |               |  |              |  |            |
| Weight Audio Visual System   | 1.00     | ea   | \$17,500.00  | /ea   | \$17,500    |  |               |  |              |  |            |
| Gym Audio Visual System RACK   | 1.00     | ea   | \$25,357.14  | /ea   | \$25,357    |  |               |  |              |  |            |
| Studen Commons Audio Visual System   | 1.00     | ea   | \$94,918.89  | /ea   | \$94,919    |  |               |  |              |  |            |
| TP - AV Sys. Control Touch Plate, backbox w/ 1" Conduit to AV<br>Rack                    | 1.00     | ea   | \$220.88     | /ea   | \$221       |  |               |  |              |  |            |
| Auditorium ALS Assisted Listening System Antenna   | 1.00     | ea   | \$3,500.00   | /ea   | \$3,500     |  |               |  |              |  |            |
| Auditorium VPO Video Projector with 1" to AV rack  | 1.00     | ea   | \$2,500.00   | /ea   | \$2,500     |  |               |  |              |  |            |
| Auditorium AV Rack   | 2.00     | ea   | \$25,000.00  | /ea   | \$50,000    |  |               |  |              |  |            |
| Auditorium Dante Input Plate with 1" to AV rack  | 4.00     | ea   | \$1,500.00   | /ea   | \$6,000     |  |               |  |              |  |            |
| Auditorium Fill Speaker  | 2.00     | ea   | \$2,500.00   | /ea   | \$5,000     |  |               |  |              |  |            |
| Auditorium Intercom Wall Plate with 1" to AV rack  | 4.00     | ea   | \$1,500.00   | /ea   | \$6,000     |  |               |  |              |  |            |
| Auditorium Local Speakr in Hall Way  | 3.00     | ea   | \$500.00     | /ea   | \$1,500     |  |               |  |              |  |            |
| Auditorium LSS Loud Speaker  | 2.00     | ea   | \$2,500.00   | /ea   | \$5,000     |  |               |  |              |  |            |
| Auditorium Mon with Wall Plate with 1" to AV rack  | 2.00     | ea   | \$2,500.00   | /ea   | \$5,000     |  |               |  |              |  |            |
| Auditorium Motorized Projection Screen   | 1.00     | ea   | \$15,000.00  | /ea   | \$15,000    |  |               |  |              |  |            |
| Auditorium Projector   | 1.00     | ea   | \$50,000.00  | /ea   | \$50,000    |  |               |  |              |  |            |
| Auditorium Sub Woofer  | 2.00     | ea   | \$2,500.00   | /ea   | \$5,000     |  |               |  |              |  |            |
| Auditorium TP Touch Control Plate with 1" to AV rack                                     | 5.00     | ea   | \$3,500.00   | /ea   | \$17,500    |  |               |  |              |  |            |
| Auditorium/Stage Video   | 1.00     | ea   | \$62,247.71  | /ea   | \$62,248    |  |               |  |              |  |            |
| Cafeteria Local Speaker  | 16       | ea   | \$500.00     | /ea   | \$8,000     |  |               |  |              |  |            |
| Class Room and Conference Room Interactive Flat Panel excluded<br>shifted to tech Budget | 0.00     | excl |              |       | \$0         |  |               |  |              |  |            |
| Gym Local Speaker  | 24       | ea   | \$1,507.35   | /ea   | \$36,176    |  |               |  |              |  |            |




# MAIN BUILDING [ CONTINUED ]

| DESCRIPTION  | QUANTITY    | UNIT CC          | DST   | TOTAL COST  |
|--|-------------|------------------|-------|-------------|
| DAN - Dante Input Wall Panel, backbox w/ 1" Conduit to AV Rack                           | 1.00 ea     | \$505.61         | /ea   | \$506       |
| Video Projector  | 1.00 ea     | \$145.12         | /ea   | \$145       |
| Instructional AV Excluded part of tech budget  | 1.00 ea     | \$0.00           | /ea   | \$0         |
| Large AV Allowance   | 1.00 ea     | \$557,760.00     | /ea   | \$557,760   |
| Scoreboards Exterior Connection  | 1.00 ea     | \$1,625.41       | /ea   | \$1,625     |
| VE E01 - ADJUST BASED ON TECH / SECURITY FEEDBACK  | -1.00 ea    | \$165,000.00     | /ea   | (\$165,000) |
| D6032 SOUND/PA SYSTEMS   |             | \$0.64           | / GSF | \$242,462   |
| Public Address Speaker   | 653 ea      | \$200.00         | /ea   | \$130,600   |
| PA Horn Speaker  | 62 ea       | \$400.00         | /ea   | \$24,800    |
| VC - PA Speaker Volume Control   | 75 ea       | \$150.00         | /ea   | \$11,250    |
| LV Cabling for Speaker   | 44,950 lf   | \$2.58           | /lf   | \$115,812   |
| REduce PA During Recon   | -1.00 lf    | \$40,000.00      | /lf   | (\$40,000)  |
| 28 ELECTRONIC SAFETY & SECURITY  | 380,570 GSF | \$6.47           | / GSF | \$2,463,365 |
| D6010 COMMUNICATIONS & SECURITY  |             | \$4.19           | / GSF | \$1,593,763 |
| D6011 FIRE ALARM SYSTEM  |             | \$1.27           | / GSF | \$485.202   |
| Fire Alarm Manual pull station composite unit  | 54 ea       | \$271.61         | /ea   | \$14,667    |
| Fire Alarm Bell Exterior - WP composite unit   | 2.00 ea     | \$278.99         | /ea   | \$558       |
| Fire Alarm Smoke detector composite unit   | 102 ea      | \$338.62         | /ea   | \$34,539    |
| Fire Alarm Duct smoke detector with relay base composite unit                            | 24 ea       | \$707.94         | /ea   | \$16,990    |
| Fire Alarm Flow switch composite unit  | 7.00 ea     | \$242.39         | /ea   | \$1.697     |
| Fire Alarm Tamper switch composite unit  | 16 ea       | \$242.39         | /ea   | \$3,878     |
| Fire Alarm Sounder composite unit  | 44 ea       | \$274.64         | /ea   | \$12.084    |
| Fire Alarm Strobe Wall composite unit  | 73 ea       | \$268.00         | /ea   | \$19 564    |
| Fire Alarm BDA   | 2.00 ea     | \$509.44         | /ea   | \$1.019     |
| Fire Alarm Bernote indicating light composite unit                                       | 2.00 ea     | \$203.70         | /ea   | \$5,907     |
| Fire Alarm Sneaker strobe composite unit   | 427 ea      | \$203.76         | /ea   | \$139 823   |
| FACP   | 2.00 ea     | \$23 643 21      | /ea   | \$47,286    |
| Fire Alarm Terminal cabinet composite unit   | 9.00 ea     | \$1 395 43       | /ea   | \$12 559    |
| Control Relay  | 35 ea       | \$335.17         | /ea   | \$11 731    |
| Fire Alarm Monitor module composite unit   | 58 ea       | \$335.17         | /ea   | \$19.440    |
| FDS Fire Alarm   | 25 ea       | \$2 377 21       | /ea   | \$59.430    |
| AR Two Way Fire Dent Communication Station   | 0.00 ea     | <i>\L,S,T,L1</i> | / 64  | \$0.        |
| BP Fire Booster Panel  | 8.00 ea     | \$3 436 21       | /ea   | \$27 490    |
| Fire Alarm Annunciator medium composite unit   | 1.00 ea     | \$3 436 21       | /ea   | \$3 436     |
| Fire Alarm Annunciator large composite unit  | 12 ea       | \$4,425,21       | /ea   | \$53,102    |
|  |             | \$2.28           | / GSF | \$869 364   |
| Vane System Allowance 07-28-2022 Jacks are with Telcom                                   | 1.00 ls     | \$37 400 00      | //s   | \$37,400    |
| Device and install only  | 1.00 13     | \$37,400.00      | /13   | \$57,400    |
| 2" PVC with Fiber Optic Cable for Exiterior Cameras                                      | 8,100 lf    | \$29.31          | /lf   | \$237,411   |
| Cat 6 Cable  | 15,700 lf   | \$0.79           | /lf   | \$12,442    |
| Media Converters for Exterior Cameras  | 54 ea       | \$330.99         | /ea   | \$17,873    |
| CCTV Camera D1 Data jack with 1/2" Stub to accessible ceiling composite unit 10 feet _1_ | 210 ea      | \$356.76         | /ea   | \$74,920    |
| Security CCTV Head End - Medium Composite Unit   | 1.00 ea     | \$36,689.00      | /ea   | \$36,689    |

#### 60% CD Estimate - Reconciled incl VE



# MAIN BUILDING [ CONTINUED ]

| DESCRIPTION   | QUANT     | TITY | UNIT CC      | ST    | TOTAL COST  |
|---|-----------|------|--------------|-------|-------------|
| CCTV Video Camera - Fixed Bullet Camera, Exterior WP Assembly<br>Composite Unit Exterior Pole Mounted | 54        | ea   | \$1,576.00   | /ea   | \$85,104    |
| CCTV Video Camera - PTZ Dome Camera, Interior Assembly<br>Composite Unit                              | 130       | ea   | \$1,893.00   | /ea   | \$246,090   |
| Added 50,000 to Security/CCTv to align with LV Cosnultants Budget                                     | 1.00      | ea   | \$50,000.00  | /ea   | \$50,000    |
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit                           | 34        | ea   | \$2,101.00   | /ea   | \$71,434    |
| D6017 SECURITY ACCESS CONTROL   |           |      | \$0.63       | / GSF | \$239,197   |
| (1) 2" Empty PVC Conduit with pull string composite unit - Large<br>Power at lift Gate                | 350       | lf   | \$27.27      | /lf   | \$9,545     |
| Security Composite Cable Per Foot   | 33,150    | lf   | \$1.25       | /lf   | \$41,438    |
| Security Composite Cable Per Foot at lift Gate  | 1,050     | lf   | \$1.25       | /lf   | \$1,313     |
| Security SOS - Siren Operating System at lift gate  | 1.00      | ea   | \$186.75     | /ea   | \$187       |
| Security Chime Composite Unit   | 9.00      | ea   | \$203.75     | /ea   | \$1,834     |
| Security Motion Sensor Composite Unit   | 69        | ea   | \$179.28     | /ea   | \$12,370    |
| Security Card Reader Composite Unit   | 62        | ea   | \$259.29     | /ea   | \$16,076    |
| Security Card Reader Exterior WP Composite Unit   | 1.00      | ea   | \$299.66     | /ea   | \$300       |
| Security Key Pad Composite Unit   | 2.00      | ea   | \$475.28     | /ea   | \$951       |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit  | 63        | ea   | \$198.77     | /ea   | \$12,523    |
| Security WC - Door Contact / Roof Hatch Contact Composite Unit  | 9.00      | ea   | \$198.77     | /ea   | \$1,789     |
| Security Intercom Station Interior / Exterior WP Composite Unit                                       | 1.00      | ea   | \$522.81     | /ea   | \$523       |
| Security Intercom Unit With Video Master Station Composite<br>Unit                                    | 8.00      | ea   | \$1,319.70   | /ea   | \$10,558    |
| Security Intercom Station With Video Interior / Exterior WP<br>Composite Unit                         | 6.00      | ea   | \$684.76     | /ea   | \$4,109     |
| Security VES - Security Stantion with airphone intercom   | 1.00      | ea   | \$684.76     | /ea   | \$685       |
| Security Head End and Testing   | 1.00      | ea   | \$125,000.00 | /ea   | \$125,000   |
| D7050 DETECTION & ALARM   |           |      | \$2.29       | / GSF | \$869,602   |
| D6011 FIRE ALARM SYSTEM   |           |      | \$2.29       | / GSF | \$869,602   |
| Radio Master box  | 1.00      | ea   | \$9.007.46   | /ea   | \$9.007     |
| BDA   | 385.651   | gsf  | \$0.53       | /gsf  | \$203.440   |
| Testing - Fire Alarm  | 1.00      | ea   | \$6.655.28   | /ea   | \$6.655     |
| Area of Refuge  | 1.00      | ls   | \$12.000.00  | /ls   | \$12.000    |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit  | 50,000    | lf   | \$12.77      | /lf   | \$638,500   |
| 31 EARTHWORK  | 380,570 @ | ŝSF  | \$4.09       | / GSF | \$1,554,975 |
| A1010 STANDARD FOUNDATIONS  |           |      | \$4.09       | / GSF | \$1,554,975 |
| A9011 BACKFILL & COMPACTION   |           |      | \$4.09       | / GSF | \$1,554,975 |
| Excav. Column Footings  | 7,763     | су   | \$25.00      | /cy   | \$194,075   |
| Excav. Continuous & Retaining Wall Footings   | 16,675    | су   | \$25.00      | /cy   | \$416,875   |
| Excav. Pits   | 150       | су   | \$25.00      | /cy   | \$3,750     |
| Backfill & Compact Column Footings  | 5,655     | су   | \$45.00      | /cy   | \$254,475   |
| Backfill Pits   | 125       | су   | \$45.00      | /cy   | \$5,625     |
| Backfill Wall / Footings  | 15,115    | су   | \$45.00      | /cy   | \$680,175   |

60% CD Estimate - Reconciled incl VE



## MAIN BUILDING [ CONTINUED ]

| DESCRIPTION   | QUANTITY    | UNIT COST    | TOTAL COST    |
|---|-------------|--------------|---------------|
| 32 EXTERIOR IMPROVEMENTS  | 380,570 GSF | \$1.16 / GSF | \$442,737     |
| A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS  |             | \$0.91 / GSF | \$346,237     |
| A4096 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS  |             | \$0.91 / GSF | \$346,237     |
| Compacted Base   Under - ONSITE PROCESSED, REDUCED PER<br>RECON @ 12" - Place & Compact   | 5,295 cy    | \$17.00 /cy  | \$90,015      |
| Fine Grade Base   | 128,111 sf  | \$1.50 /sf   | \$192,167     |
| Rough Grade Base  | 128,111 sf  | \$0.50 /sf   | \$64,056      |
| B3020 ROOF APPURTENANCES  |             | \$0.25 / GSF | \$96,500      |
| G2061.4 SITE FURNISHINGS  |             | \$0.25 / GSF | \$96,500      |
| Roof Deck - Fiberglass Planters - deleted per VE  | 0.00 nic    |              | \$0           |
| Roof Deck - Raised Stacked 4x4 Wood Platers w Semi-intensive<br>green rf - deleted per VE | 0.00 nic    |              | \$0           |
| Roof Deck - Roof Pavers not on pedestals - pavers cut to follow roof pitches              | 3,860 sf    | \$25.00 /sf  | \$96,500      |
| Roof Deck - Synthetic Turf - deleted per VE   | 0.00 nic    |              | \$0           |
| Roof Deck - Wood Bench - surface mounted wood / metal link bench                          | 0.00 nic    |              | \$0           |
| Roof Deck - Wood Deck   | 0.00 nic    |              | \$0           |
| Roof Deck - Wood Pergola - deleted per VE   | 0.00 nic    |              | \$0           |
| Roof Deck - Wood Seatwalls, stacked   | 0.00 nic    |              | \$0           |
| TOTAL MAIN BUILDING   | <br>\$4     | 417.02 / GSF | \$158,705,642 |

#### TOTAL MAIN BUILDING

60% CD Estimate - Reconciled incl VE



## CONCESSIONS / TOILET BLDG

| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| 03 CONCRETE  | 0 GSF    | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS                         |          | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS                         |          | \$0.00 / GSF | \$0        |
| Continuous Strip Ftg - 150' x 2' x 1'              | 0.00 cy  |              | \$0        |
| Foundation Wall - 150' x 3' x 1'                   | 0.00 cy  |              | \$0        |
| A4010 STANDARD SLABS-ON-GRADE                      |          | \$0.00 / GSF | \$0        |
| A4010 STANDARD SLABS-ON-GRADE                      |          | \$0.00 / GSF | \$0        |
| SOG Complete \$/sf - 5", WWF Reinforcing           | 0.00 sf  |              | \$0        |
| 04 MASONRY   | 0 GSF    | \$0.00 / GSF | \$0        |
| B2010 EXTERIOR WALLS                               |          | \$0.00 / GSF | \$0        |
| B2012 EXTERIOR WALL CONSTRUCTION                   |          | \$0.00 / GSF | \$0        |
| Exterior CMU Veneer - large scale                  | 0.00 sf  |              | \$0        |
| Exterior Backup Wall CMU - 8"                      | 0.00 sf  |              | \$0        |
| C1010 INTERIOR PARTITIONS                          |          | \$0.00 / GSF | \$0        |
| C1011 INTERIOR FIXED PARTITIONS                    |          | \$0.00 / GSF | \$0        |
| Interior CMU - 8"                                  | 0.00 sf  |              | \$0        |
| 05 METALS  | 0 GSF    | \$0.00 / GSF | \$0        |
| C1090 INTERIOR SPECIALTIES                         |          | \$0.00 / GSF | \$0        |
| C1099 OTHER INTERIOR SPECIALTIES                   |          | \$0.00 / GSF | \$0        |
| Interior Misc.Metals Item -                        | 0.00 sf  |              | \$0        |
| 06 WOOD, PLASTICS, & COMPOSITES                    | 0 GSF    | \$0.00 / GSF | \$0        |
| B1020 ROOF CONSTRUCTION                            |          | \$0.00 / GSF | \$0        |
| B1021 ROOF STRUCTURAL FRAME                        |          | \$0.00 / GSF | \$0        |
| Delete per VM                                      | 0.00 sf  |              | \$0        |
| Wood Framing, Roof Truss \$/sf                     | 0.00 sf  |              | \$0        |
| B2010 EXTERIOR WALLS                               |          | \$0.00 / GSF | \$0        |
| B2012 EXTERIOR WALL CONSTRUCTION                   |          | \$0.00 / GSF | \$0        |
| Delete per VM                                      | 0.00 ls  |              | \$0        |
| Fiber Cement Panels - Exterior Wall                | 0.00 sf  |              | \$0        |
| C1010 INTERIOR PARTITIONS                          |          | \$0.00 / GSF | \$0        |
| C1011 INTERIOR FIXED PARTITIONS                    |          | \$0.00 / GSF | \$0        |
| Interior Rough Carpentry                           | 0.00 sf  |              | \$0        |
| 07 THERMAL & MOISTURE PROTECTION                   | 0 GSF    | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS                         |          | \$0.00 / GSF | \$0        |
| A1019 STANDARD FOUNDATION SUPPLEMENTARY COMPONENTS |          | \$0.00 / GSF | \$0        |
| Damproofing - Foundation Walls                     | 0.00 sf  |              | \$0        |
| Rigid Insulation @ Fndn. Walls                     | 0.00 sf  |              | \$0        |
| A4010 STANDARD SLABS-ON-GRADE                      |          | \$0.00 / GSF | \$0        |



| DESCRIPTION   | QUANTITY  | UNIT COST    | TOTAL COST |
|---|-----------|--------------|------------|
| A4096 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS                |           | \$0.00 / GSF | \$0        |
| Vapor Barrier @ SOG   | 0.00 sf   |              | \$0        |
| Rigid Insulation @ S.O.G.                                   | 0.00 sf   |              | \$0        |
| B3010 ROOFING   |           | \$0.00 / GSF | \$0        |
| B3012 LOW SLOPE MEMBRANE SYSTEMS                            |           | \$0.00 / GSF | \$0        |
| Delete per VM   | 0.00 sf   |              | \$0        |
| Standing Seam Metal Roof System                             | 0.00 sf   |              | \$0        |
| B3014.2 FLASHINGS & TRIM                                    |           | \$0.00 / GSF | \$0        |
| SS Snow Fence   | 0.00 ls   |              | \$0        |
| Metal Coping/Roof Edge                                      | 0.00 lf   |              | \$0        |
| B3014.4 GUTTERS & DOWNSPOUTS                                |           | \$0.00 / GSF | \$0        |
| Gutters   | 0.00 lf   |              | \$0        |
| Downspouts  | 0.00 nic  |              | \$0        |
| C1030 INTERIOR DOORS  |           | \$0.00 / GSF | \$0        |
| C1039 INTERIOR DOOR SUPPLEMENTARY COMPONENTS                |           | \$0.00 / GSF | \$0        |
| Misc. Interior Caulking - General                           | 0.00 sf   |              | \$0        |
| 08 OPENINGS   | 0 GSF     | \$0.00 / GSF | \$0        |
| B2050 EXTERIOR DOORS & GRILLES                              |           | \$0.00 / GSF | \$0        |
| B2051 EXTERIOR ENTRANCE DOORS                               |           | \$0.00 / GSF | \$0        |
| Door   SS Pair Exterior - Incl. Door, Frame, and Hardware   | 0.00 ea   |              | \$0        |
| Door   SS Single Exterior - Incl. Door, Frame, and Hardware | 0.00 ea   |              | \$0        |
| B2053.4 OVERHEAD & ROLL UP DOORS                            |           | \$0.00 / GSF | \$0        |
| Roll-up concession window counter door, SS                  | 0.00 ls   |              | \$0        |
| B2070 EXTERIOR LOUVERS & VENTS                              |           | \$0.00 / GSF | \$0        |
| B2071 EXTERIOR LOUVERS                                      |           | \$0.00 / GSF | \$0        |
| Louver - Exterior Aluminum                                  | 0.00 sf   |              | \$0        |
| C1030 INTERIOR DOORS  |           | \$0.00 / GSF | \$0        |
| C1031.4 STANDARD INTERIOR DOORS                             |           | \$0.00 / GSF | \$0        |
| Door type F- SS   | 0.00 ea   |              | \$0        |
| Door type R-Over head coiling                               | 0.00 ea   |              | \$0        |
| Frame- Type 1- SS   | 0.00 ea   |              | \$0        |
| Hardware   Interior Door Hardware Per Leaf                  | 0.00 leaf |              | \$0        |
| Install doors and hardware                                  | 0.00 hr   |              | \$0        |
| 09 FINISHES   | 0 GSF     | \$0.00 / GSF | \$0        |
| B2050 EXTERIOR DOORS & GRILLES                              |           | \$0.00 / GSF | \$0        |
| B2051 EXTERIOR ENTRANCE DOORS                               |           | \$0.00 / GSF | \$0        |
| Paint Exterior - Door Frms                                  | 0.00 ea   |              | \$0        |
| C1030 INTERIOR DOORS  |           | \$0.00 / GSF | \$0        |
| C1031.4 STANDARD INTERIOR DOORS                             |           | \$0.00 / GSF | \$0        |
| Paint Interior - Door & Frames                              | 0.00 ea   |              | \$0        |
| C2010 WALL FINISHES   |           | \$0.00 / GSF | \$0        |
|   |           |              |            |





| DESCRIPTION   | QUANTITY   | UNIT COST    | TOTAL COST |
|---|------------|--------------|------------|
| C2017 WALL PAINTING & COATING                               |            | \$0.00 / GSF | \$0        |
| Paint Interior Walls - Epoxy                                | 0.00 sf.   |              | \$0        |
| Misc. Interior Painting                                     | 0.00 allw  |              | \$0        |
| C2030 FLOORING  |            | \$0.00 / GSF | \$0        |
| C2035 RESILIENT FLOORING                                    |            | \$0.00 / GSF | \$0        |
| Epoxy Flooring - Poured                                     | 0.00 sf    |              | \$0        |
| Sealed Concrete   | 0.00 sf    |              | \$0        |
| C2050 CEILING FINISHES                                      |            | \$0.00 / GSF | \$0        |
| C2051 PLASTER & GYPSUM BOARD FINISH                         |            | \$0.00 / GSF | \$0        |
| GWB   GWB Ceiling, Typical                                  | 0.00 sf    |              | \$0        |
| VE - Delete   | 0.00 ls    |              | \$0        |
| C2056 PAINTING & STAINING CEILINGS                          |            | \$0.00 / GSF | \$0        |
| Paint   Painted Interior GWB - Typical Ceilings - Epoxy Pnt | 0.00 sf    |              | \$0        |
| 10 SPECIALTIES  | 0 GSF      | \$0.00 / GSF | \$0        |
| C1090 INTERIOR SPECIALTIES                                  |            | \$0.00 / GSF | \$0        |
| C1092.2 COMPARTMENTS & CUBICLES                             |            | \$0.00 / GSF | \$0        |
| Toilet Compartment - Stainless Steel - Standard             | 0.00 stall |              | \$0        |
| Toilet Compartment - Stainless Steel - Handicapped          | 0.00 stall |              | \$0        |
| Urinal Screen - Stainless Steel                             | 0.00 ea    |              | \$0        |
| C1092.4 TOILET, BATH, & LAUNDRY ACCESSORIES                 |            | \$0.00 / GSF | \$0        |
| Toilet Accessories - Men's Room                             | 0.00 ea    |              | \$0        |
| Toilet Accessories - Women's Room                           | 0.00 ea    |              | \$0        |
| 11 EQUIPMENT  | 0 GSF      | \$0.00 / GSF | \$0        |
| E1090 OTHER EQUIPMENT                                       |            | \$0.00 / GSF | \$0        |
| E1092 FOOD SERVICE EQUIPMENT                                |            | \$0.00 / GSF | \$0        |
| Food Service Equipment                                      | 0.00 nic   |              | \$0        |
| 22 PLUMBING   | 0 GSF      | \$0.00 / GSF | \$0        |
| D2000 PLUMBING EQUIPMENT                                    |            | \$0.00 / GSF | \$0        |
| D2000 PLUMBING FOUIPMENT                                    |            | \$0.00 / GSF | \$0        |
| Water Meter 4"  | 0.00 ea    |              | \$0        |
| Circulating Pump - DHWH                                     | 0.00 ea    |              | \$0        |
| Thermostatic Mixing Valve, 2"                               | 0.00 ea    |              | \$0        |
| Backflow Preventer (RP) 4"                                  | 0.00 ea    |              | \$0        |
| Kitchen Equipment Connections                               | 0.00 ls    |              | \$0        |
| Trap Primers & Associated Piping                            | 0.00 ea    |              | \$0        |
| Floor Drain W/Trap  | 0.00 ea    |              | \$0        |
| Local Grease Interceptor 35 GPM                             | 0.00 ea    |              | \$0        |
| Elevator Sump Pump  | 0.00 ea    |              | \$0        |
| Oil Interceptor Elevator                                    | 0.00 ea    |              | \$0        |
| Electric Water Heater - 30 Gallon 15 KW                     | 0.00 ea    |              | \$0        |



| DESCRIPTION                                 | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| Expansion Tank                              | 0.00 ea  |              | \$0        |
| D2010 DOMESTIC WATER DISTRIBUTION           |          | \$0.00 / GSF | \$0        |
| D2012 DOMESTIC WATER PIPING                 |          | \$0.00 / GSF | \$0        |
| Domestic Hot & Cold Water Piping            | 0.00 lf  |              | \$0        |
| Insulation                                  | 0.00 lf  |              | \$0        |
| Valves & Accessories                        | 0.00 ls  |              | \$0        |
| D2020 SANITARY DRAINAGE                     |          | \$0.00 / GSF | \$0        |
| D2026 SANITARY DRAIN PIPING - AG            |          | \$0.00 / GSF | \$0        |
| Sanitary Waste & Vent Piping - UG & AG      | 0.00 lf  |              | \$0        |
| D2040 PLUMBING FIXTURES                     |          | \$0.00 / GSF | \$0        |
| D2043 PLUMBING FIXTURES                     |          | \$0.00 / GSF | \$0        |
| Drinking Fountain - Exterior                | 0.00 ea  |              | \$0        |
| Water Closet - Wall Hung                    | 0.00 ea  |              | \$0        |
| Lavatory - Wall                             | 0.00 ea  |              | \$0        |
| Mop Sink                                    | 0.00 ea  |              | \$0        |
| Urinal                                      | 0.00 ea  |              | \$0        |
| Hose Bibb                                   | 0.00 ea  |              | \$0        |
| Wall Hydrant                                | 0.00 ea  |              | \$0        |
| D2090 MISC. PLUMBING SYSTEMS                |          | \$0.00 / GSF | \$0        |
| D2090 PLUMBING MISC ITEMS                   |          | \$0.00 / GSF | \$0        |
| Admin & Expenses                            | 0.00 ls  |              | \$0        |
| Delete Concessions Building - Add Alternate | 0.00 ls  |              | \$0        |
| 23 HEATING, VENTILATING, & AIR CONDITIONING | 0 GSF    | \$0.00 / GSF | \$0        |
| (HVAC)                                      |          |              |            |
| D3040 HVAC MAJOR EQUIPMENT                  |          | \$0.00 / GSF | \$0        |
| D3040 HVAC MAJOR EQUIPMENT                  |          | \$0.00 / GSF | \$0        |
| ERU-5                                       | 0.00 ea  |              | \$0        |
| Split Systems - 3T Heat Pump                | 0.00 ea  |              | \$0        |
| D3041 TERMINAL & PACKAGE UNITS              |          | \$0.00 / GSF | \$0        |
| Unit Heater - Elec                          | 0.00 ea  |              | \$0        |
| Cabinet Unit Heater (ceiling)               | 0.00 ea  |              | \$0        |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS    |          | \$0.00 / GSF | \$0        |
| D3053 HVAC AIR DISTRIBUTION                 |          | \$0.00 / GSF | \$0        |
| SM Coordination & Material Handling         | 0.00 ls  |              | \$0        |
| Ductwork - Galvanized                       | 0.00 lb  |              | \$0        |
| Air Duct Accessories                        | 0.00 ls  |              | \$0        |
| RGDs and Vents                              | 0.00 ea  |              | \$0        |
| D3060 CONTROLS & INSTRUMENTATION            |          | \$0.00 / GSF | \$0        |
| D3061 AUTOMATIC TEMPERATURE CONTROLS        |          | \$0.00 / GSF | \$0        |
| ATC - BMS - Split & ERV                     | 0.00 ls  |              | \$0        |
| D3070 SPECIAL PURPOSE HVAC SYSTEMS          |          | \$0.00 / GSF | \$0        |
| D3075 REFRIGERANT PIPING                    |          | \$0.00 / GSF | \$0        |



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| Split System Piping - Line Sets  | 0.00 ea  |              | \$0        |
| D3076 CONDENSATE DRAIN PIPING  |          | \$0.00 / GSF | \$0        |
| Condensate Drain Piping & Insulation                                       | 0.00 lf  |              | \$0        |
| Condensate Drain Pumps   | 0.00 ea  |              | \$0        |
| D3080 SYSTEMS TESTING & BALANCING  |          | \$0.00 / GSF | \$0        |
| D3080 AIR & WATER BALANCE  |          | \$0.00 / GSF | \$0        |
| Testing & Balancing  | 0.00 sf  |              | \$0        |
| D3090 OTHER HVAC SYSTEMS & EQUIP   |          | \$0.00 / GSF | \$0        |
| D3091 HVAC MISC ITEMS  |          | \$0.00 / GSF | \$0        |
| Rigging and Hoisting   | 0.00 ls  |              | \$0        |
| DElete per VE  | 0.00 ls  |              | \$0        |
| Project Expenses and Commissioning   | 0.00 ls  |              | \$0        |
| 26 ELECTRICAL  | 0 GSF    | \$0.00 / GSF | \$0        |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION                                    |          | \$0.00 / GSF | \$0        |
| D5021 MEDIUM VOLTAGE CONDUIT AND CABLING                                   |          | \$0.00 / GSF | \$0        |
| (1) 4" Empty PVC Conduit with pull string composite unit Spares<br>tel     | 0.00 lf  |              | \$0        |
| (2) 4" Empty PVC Conduit with pull string composite unit Spares            | 0.00 lf  |              | \$0        |
| D5023 LARGE POWER & DISTRIBUTION   |          | \$0.00 / GSF | \$0        |
| 30 KVA NEMA 1 Transformer composite unit                                   | 0.00 ea  |              | \$0        |
| 100 AMP 120/208 panel board surface mounted composite                      | 0.00 ea  |              | \$0        |
| 250 AMP 277/480 Panel board surface mounted composite unit                 | 0.00 ea  |              | \$0        |
| D5024 LARGE POWER FEEDER CONDUIT   |          | \$0.00 / GSF | \$0        |
| 250 AMP PVC Composite feeder copper - Large Power                          | 0.00 If  |              | \$0        |
| D5027 MECHANICAL EQUIPMENT CONNECTIONS                                     |          | \$0.00 / GSF | \$0        |
| AC 30A Con Assembly  | 0.00 ea  |              | \$0        |
| ERV - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit            | 0.00 ea  |              | \$0        |
| EUH 1 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite<br>unit       | 0.00 ea  |              | \$0        |
| E3EQ   ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit | 0.00 ea  |              | \$0        |
| EWH w/ JB 30 A composite unit connection and Feeder                        | 0.00 ea  |              | \$0        |
| 30 AMP EMT Composite feeders copper - Mechanical                           | 0.00 If  |              | \$0        |
| D5029 SMALL POWER DEVICES & WIRING   |          | \$0.00 / GSF | \$0        |
| Duplex GFI WP Receptacle Composite Unit                                    | 0.00 ea  |              | \$0        |
| Power Junction Box - Typ. Composite Unit                                   | 0.00 ea  |              | \$0        |
| Recep: Duplex receptacle Composite unit                                    | 0.00 ea  |              | \$0        |
| Duplex GFI receptacle Composite unit                                       | 0.00 ea  |              | \$0        |
| 20 AMP EMT Composite feeders copper - Large Power                          | 0.00 lf  |              | \$0        |
| 12/2 MC Cable Composite Unit   | 0.00 lf  |              | \$0        |
| D5040 LIGHTING   |          | \$0.00 / GSF | \$0        |
| D5042 LIGHT FIXTURES   |          | \$0.00 / GSF | \$0        |



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| 20 AMP EMT Composite feeders copper - Lighting Branch                      | 0.00 lf  |              | \$0        |
| F1 Lighting Fixture  | 0.00 ea  |              | \$0        |
| D5044 LIGHTING CONTROLS & WIRING   |          | \$0.00 / GSF | \$0        |
| S (1) Single pole Switch Composite unit                                    | 0.00 ea  |              | \$0        |
| SLV (1) Low voltage Switch Composite unit                                  | 0.00 ea  |              | \$0        |
| OS! Occupancy sensor Ceiling mounted Composite unit                        | 0.00 ea  |              | \$0        |
| 20 AMP EMT Composite feeders copper - Lighting Control Branch              | 0.00 lf  |              | \$0        |
| D5090 OTHER ELECTRICAL SYSTEMS   |          | \$0.00 / GSF | \$0        |
| D5094 GROUNDING & LIGHTNING PROTECTION SYS.                                |          | \$0.00 / GSF | \$0        |
| Grounding  | 0.00 gsf |              | \$0        |
| D5095 MISCELLANEOUS ELECTRICAL SYSTEMS                                     |          | \$0.00 / GSF | \$0        |
| Mis Expenses   | 0.00 gsf |              | \$0        |
| Delete per VE as alternate elec,comm, sec                                  | 0.00 ls  |              | \$0        |
| Temp Lighting and Power  | 0.00 gsf |              | \$0        |
| 27 COMMUNICATIONS  | 0 GSF    | \$0.00 / GSF | \$0        |
| D5090 OTHER ELECTRICAL SYSTEMS   |          | \$0.00 / GSF | \$0        |
| D5092 CLOCK SYSTEMS  |          | \$0.00 / GSF | \$0        |
| Clock Single Face Battery or 110 clock                                     | 0.00 ea  |              | \$0        |
| D6010 COMMUNICATIONS & SECURITY  |          | \$0.00 / GSF | \$0        |
| D6013 TEL/DATA SYSTEM  |          | \$0.00 / GSF | \$0        |
| Fit-Out Telcom Equipment composite unit                                    | 0.00 ea  |              | \$0        |
| WP - "VOIP" Wall Telephone Outlet  | 0.00 ea  |              | \$0        |
| D2 Data jack with 1/2" Stub to accessible ceiling composite unit 30 feet 2 | 0.00 ea  |              | \$0        |
| D6030 SOUND AND A/V  |          | \$0.00 / GSF | \$0        |
| D6032 SOUND/PA SYSTEMS   |          | \$0.00 / GSF | \$0        |
| Public Address Speaker   | 0.00 ea  |              | \$0        |
| LV Cabling for Speaker   | 0.00 lf  |              | \$0        |
| Sound/PA Head end at Concessions   | 0.00 ls  |              | \$0        |
| 28 ELECTRONIC SAFETY & SECURITY  | 0 GSF    | \$0.00 / GSF | \$0        |
| D6010 COMMUNICATIONS & SECURITY  |          | \$0.00 / GSF | \$0        |
| D6011 FIRE ALARM SYSTEM  |          | \$0.00 / GSF | \$0        |
| Fire Alarm Manual pull station composite unit                              | 0.00 ea  |              | \$0        |
| Fire Alarm Smoke detector composite unit                                   | 0.00 ea  |              | \$0        |
| Fire Alarm Heat detector composite unit                                    | 0.00 ea  |              | \$0        |
| D6011 FACP   | 0.00 ea  |              | \$0        |
| Control Relay  | 0.00 ea  |              | \$0        |
| Fire Alarm Annunciator medium composite unit                               | 0.00 ea  |              | \$0        |
| D6016 SURVEILLANCE CCTV SYSTEM   |          | \$0.00 / GSF | \$0        |
| Cat 6 Cable  | 0.00 lf  |              | \$0        |
| CCTV D1 Data Jacks   | 0.00 ea  |              | \$0        |
| CCTV Head End  | 0.00 ea  |              | \$0        |



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit | 0.00 ea  |              | \$0        |
| D6017 SECURITY ACCESS CONTROL   |          | \$0.00 / GSF | \$0        |
| Security Composite Cable Per Foot   | 0.00 lf  |              | \$0        |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit              | 0.00 ea  |              | \$0        |
| Delete per VE   | 0.00 ls  |              | \$0        |
| Security Control Unit - Small Composite Unit                                | 0.00 ea  |              | \$0        |
| D7050 DETECTION & ALARM   |          | \$0.00 / GSF | \$0        |
| D6011 FIRE ALARM SYSTEM   |          | \$0.00 / GSF | \$0        |
| Delete per VE   | 0.00 ea  |              | \$0        |
| (1) 4" Empty PVC Conduit with pull string composite unit Spares<br>FA       | 0.00 lf  |              | \$0        |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit                      | 0.00 lf  |              | \$0        |
| 31 EARTHWORK  | 0 GSF    | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS  |          | \$0.00 / GSF | \$0        |
| A9011 BACKFILL & COMPACTION   |          | \$0.00 / GSF | \$0        |
| Excavate, Backfill & Compact  | 0.00 ls  |              | \$0        |
| 33 UTILITIES  | 0 GSF    | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS  |          | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS  |          | \$0.00 / GSF | <b>\$0</b> |
| F&I Building Foundation Drainage - excl                                     | 0.00 ls  |              | \$0        |
| TOTAL CONCESSIONS / TOILET BLDG   | \$1      | 0.00 / GSF   | \$0        |

60% CD Estimate - Reconciled incl VE



#### LOCKER BLDG

| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| 03 CONCRETE  | 0 GSF    | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS   |          | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS   |          | \$0.00 / GSF | \$0        |
| Standard Concrete Foundation - Complete \$/sf - Locker Building -<br>strip & clmn ftgs   | 0.00 sf  |              | \$0        |
| A2010 WALLS FOR SUBGRADE ENCLOSURES  |          | \$0.00 / GSF | \$0        |
| A2011 SUBGRADE ENCLOSURE WALL CONSTRUCTION   |          | \$0.00 / GSF | \$0        |
| Standard Concrete Foundation - Complete \$/sf - Locker Building -<br>walls               | 0.00 cy  |              | \$0        |
| A4010 STANDARD SLABS-ON-GRADE  |          | \$0.00 / GSF | \$0        |
| A4010 STANDARD SLABS-ON-GRADE  |          | \$0.00 / GSF | \$0        |
| Standard Concrete Foundation - Complete \$/sf - Locker Building                          | 0.00 sf  |              | \$0        |
| B1010 FLOOR CONSTRUCTION   |          | \$0.00 / GSF | \$0        |
| B1012 FLOOR DECKS, SLABS, & TOPPINGS   |          | \$0.00 / GSF | \$0        |
| Welded Wire Mesh - Structural Slabs (Incl. Overlap) F&I                                  | 0.00 sf  |              | \$0        |
| Buy & Place Slab on Deck Concrete 5.25"  | 0.00 cy  |              | \$0        |
| Finish Concrete - Metal Deck   | 0.00 sf  |              | \$0        |
| 04 MASONRY   | 0 GSF    | \$0.00 / GSF | \$0        |
| B2010 EXTERIOR WALLS   |          | \$0.00 / GSF | \$0        |
| B2011 EXTERIOR WALL VENEER   |          | \$0.00 / GSF | \$0        |
| Exterior CMU - CMU Veneer  | 0.00 sf  |              | \$0        |
| B2012 EXTERIOR WALL CONSTRUCTION   |          | \$0.00 / GSF | \$0        |
| Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU,<br>Insul, AVB, NO INT GWB) | 0.00 sf  |              | \$0        |
| C1010 INTERIOR PARTITIONS  |          | \$0.00 / GSF | \$0        |
| C1011 INTERIOR FIXED PARTITIONS  |          | \$0.00 / GSF | \$0        |
| Interior CMU - 8"  | 0.00 sf  |              | \$0        |
| Interior CMU - 8" (Elevator Shaft)   | 0.00 sf  |              | \$0        |
| 05 METALS  | 0 GSF    | \$0.00 / GSF | \$0        |
| B1010 FLOOR CONSTRUCTION   |          | \$0.00 / GSF | \$0        |
| B1011 FLOOR STRUCTURAL FRAME   |          | \$0.00 / GSF | \$0        |
| Structural Steel Floor Framing - Col, Beams, Connections                                 | 0.00 ton |              | \$0        |
| Metal Decking - Floor, 2"  | 0.00 sf  |              | \$0        |
| B1020 ROOF CONSTRUCTION  |          | \$0.00 / GSF | \$0        |
| B1021 ROOF STRUCTURAL FRAME  |          | \$0.00 / GSF | \$0        |
| Structural Steel Roof Framing - Col, Beams, Connections                                  | 0.00 ton |              | \$0        |
| B1080 STAIRS   |          | \$0.00 / GSF | \$0        |
| B2017 BALCONY WALLS & RAILINGS   |          | \$0.00 / GSF | \$0        |
| Railing   Exterior Guardrail at Locker Building Ramp/Steps                               | 0.00 lf  |              | \$0        |
| C1030 INTERIOR DOORS   |          | \$0.00 / GSF | \$0        |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY | UNIT COST    | TOTAL COST |
|--|----------|--------------|------------|
| C1034 INTERIOR COILING DOORS                             |          | \$0.00 / GSF | \$0        |
| Support Steel - Interior Rolling Door/Grille Supports    | 0.00 ls  |              | \$0        |
| Support Steel - Misc Supports                            | 0.00 ls  |              | \$0        |
| 06 WOOD, PLASTICS, & COMPOSITES                          | 0 GSF    | \$0.00 / GSF | \$0        |
| B1020 ROOF CONSTRUCTION                                  |          | \$0.00 / GSF | \$0        |
| <b>B1029 ROOF CONSTRUCTION SUPPLEMENTARY COMPONENTS</b>  |          | \$0.00 / GSF | \$0        |
| Rough Carpentry Roofing                                  | 0.00 sf  |              | \$0        |
| C1010 INTERIOR PARTITIONS                                |          | \$0.00 / GSF | \$0        |
| C1011 INTERIOR FIXED PARTITIONS                          |          | \$0.00 / GSF | \$0        |
| Interior Rough Carpentry                                 | 0.00 sf  |              | \$0        |
| C1090 INTERIOR SPECIALTIES                               |          | \$0.00 / GSF | \$0        |
| C1097 STORAGE SPECIALTIES                                |          | \$0.00 / GSF | \$0        |
| Locker Benches   | 0.00 lf  |              | \$0        |
| C2010 WALL FINISHES                                      |          | \$0.00 / GSF | \$0        |
| C2013.4 WALL COVERINGS                                   |          | \$0.00 / GSF | \$0        |
| Interior Misc. Millwork not shown                        | 0.00 sf  |              | \$0        |
| C2019 WALL FINISH SUPPLEMENTARY COMPONENTS               |          | \$0.00 / GSF | \$0        |
| Interior Window Sills @ Exterior - Solid Surface         | 0.00 lf  |              | \$0        |
| 07 THERMAL & MOISTURE PROTECTION                         | 0 GSF    | \$0.00 / GSF | \$0        |
| A2020 BASEMENT WALL CONSTRUCTION                         |          | \$0.00 / GSF | \$0        |
| A2020 BASEMENT WALL CONSTRUCTION                         |          | \$0.00 / GSF | \$0        |
| Rigid Insulation @ Fndn. Walls                           | 0.00 sf  |              | \$0        |
| A2022 MOISTURE PROTECTION                                |          | \$0.00 / GSF | \$0        |
| Damproofing - Foundation Walls                           | 0.00 sf  |              | \$0        |
| Waterproofing - Foundation Walls @ Elevator Pit          | 0.00 sf  |              | \$0        |
| A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS             |          | \$0.00 / GSF | \$0        |
| A4096 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS             |          | \$0.00 / GSF | \$0        |
| Rigid Insulation @ S.O.G.                                | 0.00 sf  |              | \$0        |
| B1010 FLOOR CONSTRUCTION                                 |          | \$0.00 / GSF | \$0        |
| <b>B1019 FLOOR CONSTRUCTION SUPPLEMENTARY COMPONENTS</b> |          | \$0.00 / GSF | \$0        |
| Cementitious Spray Fireproofing (Beams & Columns)        | 0.00 sf  |              | \$0        |
| Misc. Patching of Fireproofing                           | 0.00 ls  |              | \$0        |
| Firestopping / Safing @ Building Perimeter \$/If         | 0.00 lf  |              | \$0        |
| B2010 EXTERIOR WALLS                                     |          | \$0.00 / GSF | \$0        |
| B2011 EXTERIOR WALL VENEER                               |          | \$0.00 / GSF | \$0        |
| Soffits  | 0.00 sf  |              | \$0        |
| B3010 ROOFING  |          | \$0.00 / GSF | \$0        |
| B3011 STEEP SLOPE ROOFING                                |          | \$0.00 / GSF | \$0        |
| Sheet Metal Roofing System Over Elevator Shaft           | 0.00 sf  |              | \$0        |
| B3012 LOW SLOPE MEMBRANE SYSTEMS                         |          | \$0.00 / GSF | \$0        |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST    | TOTAL COST |
|--|-----------|--------------|------------|
| Pre-Vegetated Roof Garden System   | 0.00 sf   |              | \$0        |
| Standing Seam Metal Roof   | 0.00 sf   |              | \$0        |
| B3013 ROOF INSULATION & FILL   |           | \$0.00 / GSF | \$0        |
| Tapered Roof Insulation - Premium, assume not required                         | 0.00 nic  |              | \$0        |
| B3014.2 FLASHINGS & TRIM   |           | \$0.00 / GSF | \$0        |
| Patch and Seal Roof Penetrations   | 0.00 ls   |              | \$0        |
| Metal Coping/Roof Edge   | 0.00 lf   |              | \$0        |
| B3014.4 GUTTERS & DOWNSPOUTS   |           | \$0.00 / GSF | \$0        |
| Gutters, not shown assume required   | 0.00 lf   |              | \$0        |
| Downspouts, not shown assume required  | 0.00 lf   |              | \$0        |
| B3020 ROOF APPURTENANCES   |           | \$0.00 / GSF | \$0        |
| B3020 ROOF APPURTENANCES   |           | \$0.00 / GSF | \$0        |
| Roof Access Hatch, assume required   | 0.00 ea   |              | \$0        |
| Roofing Pavers/Walkways - Membrane, not shown                                  | 0.00 allw |              | \$0        |
| C1030 INTERIOR DOORS   |           | \$0.00 / GSF | \$0        |
| C1039 INTERIOR DOOR SUPPLEMENTARY COMPONENTS                                   |           | \$0.00 / GSF | \$0        |
| Misc. Interior Caulking - General  | 0.00 sf   |              | \$0        |
| 08 OPENINGS  | 0 GSF     | \$0.00 / GSF | \$0        |
| B2020 EXTERIOR WINDOWS   |           | \$0.00 / GSF | \$0        |
| <b>B2023 EXTERIOR WINDOW WALL STOREFRONTS</b>                                  |           | \$0.00 / GSF | \$0        |
| Storefront   Insulating Glass in Aluminum Storefront System                    | 0.00 sf   |              | \$0        |
| B2029 CURTAIN WALLS  |           | \$0.00 / GSF | \$0        |
| Curtain Wall   Insulating Glass in Aluminum Curtain Wall System -<br>7" System | 0.00 sf   |              | \$0        |
| B2050 EXTERIOR DOORS & GRILLES   |           | \$0.00 / GSF | \$0        |
| B2051 EXTERIOR ENTRANCE DOORS  |           | \$0.00 / GSF | \$0        |
| Glass & Alum Doors - Double Exterior - Incl. Door, Frame, and<br>Hardware      | 0.00 ea   |              | \$0        |
| Glass & Alum Doors - Single Exterior - Incl. Door, Frame, and<br>Hardware      | 0.00 ea   |              | \$0        |
| B2053.4 OVERHEAD & ROLL UP DOORS   |           | \$0.00 / GSF | \$0        |
| Door   Insulated Overhead Coiling Door, Motor Operated, 3 each                 | 0.00 sf   |              | \$0        |
| C1030 INTERIOR DOORS   |           | \$0.00 / GSF | \$0        |
| C1031.4 STANDARD INTERIOR DOORS  |           | \$0.00 / GSF | \$0        |
| Door type AL2- 24" x 2'-9" & 23" x 24" Vision Panel                            | 0.00 ea   |              | \$0        |
| Door type F  | 0.00 ea   |              | \$0        |
| Door type R- Overhead door   | 0.00 ea   |              | \$0        |
| Frame- Alum  | 0.00 ea   |              | \$0        |
| Frame- Type 1  | 0.00 ea   |              | \$0        |
| Glazing   Interior doors and sidelights  | 0.00 sf   |              | \$0        |
| Hardware   Interior Door Hardware Per Leaf                                     | 0.00 leaf |              | \$0        |
| Install doors and hardware   | 0.00 hr   |              | \$0        |

Wakefield, MA

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST    | TOTAL COST |
|--|-----------|--------------|------------|
| 09 FINISHES  | 0 GSF     | \$0.00 / GSF | \$0        |
| B2050 EXTERIOR DOORS & GRILLES   |           | \$0.00 / GSF | \$0        |
| B2051 EXTERIOR ENTRANCE DOORS  |           | \$0.00 / GSF | \$0        |
| Paint Exterior - Doors   | 0.00 ea   | •            | \$0        |
| C1030 INTERIOR DOORS   |           | \$0.00 / GSF | \$0        |
| C1031.4 STANDARD INTERIOR DOORS  |           | \$0.00 / GSF | \$0        |
| Paint   Paint Interior Doors   | 0.00 leaf |              | \$0        |
| Paint Interior - Door & Frames   | 0.00 ea   |              | \$0        |
| C2010 WALL FINISHES  |           | \$0.00 / GSF | \$0        |
| C2014 TILE & TERRAZZO WALL FINISHES                                    |           | \$0.00 / GSF | \$0        |
| Ceramic Wall Tile  | 0.00 sf   |              | \$0        |
| Ceramic Wall Tile - ADJUST PER RECON - REDUCE FROM 42K SF<br>TO 25K SF | 0.00 sf   |              | \$0        |
| C2017 WALL PAINTING & COATING  |           | \$0.00 / GSF | \$0        |
| Paint Interior Walls - Epoxy   | 0.00 sf.  |              | \$0        |
| Misc. Interior Painting  | 0.00 allw |              | \$0        |
| C2030 FLOORING   |           | \$0.00 / GSF | \$0        |
| C2032.2 TILE FLOORING  |           | \$0.00 / GSF | \$0        |
| Ceramic Floor Tile   | 0.00 sf   |              | \$0        |
| C2035 RESILIENT FLOORING   |           | \$0.00 / GSF | \$0        |
| Epoxy Flooring - Poured  | 0.00 sf   |              | \$0        |
| C2036.4 MASONRY & STONE FLOORING                                       |           | \$0.00 / GSF | \$0        |
| Stone Thresholds at wet rooms  | 0.00 sf   |              | \$0        |
| C2050 CEILING FINISHES   |           | \$0.00 / GSF | \$0        |
| C2051 PLASTER & GYPSUM BOARD FINISH                                    |           | \$0.00 / GSF | \$0        |
| GWB   GWB Ceiling, Typical   | 0.00 sf   |              | \$0        |
| C2056 PAINTING & STAINING CEILINGS                                     |           | \$0.00 / GSF | \$0        |
| Paint   Painted Interior GWB - Typical Ceilings - Latex                | 0.00 sf   |              | \$0        |
| Paint   Exposed Painted Structural Steel & Metal Deck                  | 0.00 sf   |              | \$0        |
| 10 SPECIALTIES   | 0 GSF     | \$0.00 / GSF | \$0        |
| C1090 INTERIOR SPECIALTIES   |           | \$0.00 / GSF | \$0        |
| C1097 STORAGE SPECIALTIES  |           | \$0.00 / GSF | \$0        |
| Storage Wall Shelving - Metal (In F&E Estimate)                        | 0.00 lf   |              | \$0        |
| 14 CONVEYING EQUIPMENT   | 0 GSF     | \$0.00 / GSF | \$0        |
| D1010 ELEVATORS & LIFTS  |           | \$0.00 / GSF | \$0        |
| D1010 ELEVATORS & LIFTS  |           | \$0.00 / GSF | \$0        |
| Elevator incl cab finishes - add alt                                   | 0.00 alt  |              | \$0        |
| 21 FIRE SUPPRESSION  | 0 GSF     | \$0.00 / GSF | \$0        |
| D4010 SPRINKLERS   |           | \$0.00 / GSF | \$0        |
|  |           |              |            |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION                                 | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| D4011 WET SPRINKLER SYSTEM                  |          | \$0.00 / GSF | \$0        |
| Wet Sprinkler System - Delete Per Reconcile | 0.00 sf  |              | \$0        |
| 22 PLUMBING                                 | 0 GSF    | \$0.00 / GSF | \$0        |
| D2000 PLUMBING EQUIPMENT                    |          | \$0.00 / GSF | \$0        |
| D2000 PLUMBING EQUIPMENT                    |          | \$0.00 / GSF | \$0        |
| Water Meter 4"                              | 0.00 ea  |              | \$0        |
| Circulating Pump - DHWH                     | 0.00 ea  |              | \$0        |
| Thermostatic Mixing Valve, 2"               | 0.00 ea  |              | \$0        |
| Backflow Preventer (RP) 4"                  | 0.00 ea  |              | \$0        |
| Floor Drain W/Trap                          | 0.00 ea  |              | \$0        |
| Trench Drains                               | 0.00 ea  |              | \$0        |
| Roof Drains                                 | 0.00 ea  |              | \$0        |
| Elevator Sump Pump                          | 0.00 ea  |              | \$0        |
| Gas / Oil Interceptor                       | 0.00 ea  |              | \$0        |
| Oil Interceptor                             | 0.00 ea  |              | \$0        |
| Electric Water Heater - 60 KW               | 0.00 ea  |              | \$0        |
| Expansion Tank                              | 0.00 ea  |              | \$0        |
| D2010 DOMESTIC WATER DISTRIBUTION           |          | \$0.00 / GSF | \$0        |
| D2012 DOMESTIC WATER PIPING                 |          | \$0.00 / GSF | \$0        |
| Domestic Hot & Cold Water Piping            | 0.00 If  |              | \$0        |
| Insulation                                  | 0.00 lf  |              | \$0        |
| Valves & Accessories                        | 0.00 ls  |              | \$0        |
| D2020 SANITARY DRAINAGE                     |          | \$0.00 / GSF | \$0        |
| D2026 SANITARY DRAIN PIPING - AG            |          | \$0.00 / GSF | \$0        |
| Sanitary Waste & Vent Piping - UG & AG      | 0.00 If  |              | \$0        |
| D2040 PLUMBING FIXTURES                     |          | \$0.00 / GSF | \$0        |
| D2043 PLUMBING FIXTURES                     |          | \$0.00 / GSF | \$0        |
| Water Closet - Wall Hung                    | 0.00 ea  |              | \$0        |
| Lavatory - Wall                             | 0.00 ea  |              | \$0        |
| Mop Sink                                    | 0.00 ea  |              | \$0        |
| Drinking Foutain - Bi-Level Electric        | 0.00 ea  |              | \$0        |
| Shower - (Trim & Drain)                     | 0.00 ea  |              | \$0        |
| Hose Bibb                                   | 0.00 ea  |              | \$0        |
| Wall Hydrant                                | 0.00 ea  |              | \$0        |
| D2070 RAIN WATER DRAINAGE                   |          | \$0.00 / GSF | \$0        |
| D2072 STORM DRAIN PIPING - AG               |          | \$0.00 / GSF | \$0        |
| Storm Drainage Piping - UG & AG             | 0.00 lf  |              | \$0        |
| D2090 MISC. PLUMBING SYSTEMS                |          | \$0.00 / GSF | \$0        |
| D2090 PLUMBING MISC ITEMS                   |          | \$0.00 / GSF | \$0        |
| Admin & Expenses                            | 0.00 sf  |              | \$0        |
| Delete Locker Room Building - Add Alternate | 0.00 ls  |              | \$0        |

Wakefield, MA

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| 23 HEATING, VENTILATING, & AIR CONDITIONING                 | 0 GSF    | \$0.00 / GSF | \$0        |
| (HVAC)  |          |              |            |
| D3040 HVAC MAJOR EQUIPMENT                                  |          | \$0.00 / GSF | \$0        |
| D3040 HVAC MAJOR EQUIPMENT                                  |          | \$0.00 / GSF | \$0        |
| ERU-6   | 0.00 ea  |              | \$0        |
| Split Systems - 3T Heat Pump                                | 0.00 ea  |              | \$0        |
| VRF Equipment -18T  | 0.00 ls  |              | \$0        |
| VRF Fan Coil Units Install                                  | 0.00 ea  |              | \$0        |
| VRF-VCU Condenser Install                                   | 0.00 ea  |              | \$0        |
| D3041 TERMINAL & PACKAGE UNITS                              |          | \$0.00 / GSF | \$0        |
| Unit Heater - Elec  | 0.00 ea  |              | \$0        |
| Cabinet Unit Heater (ceiling)                               | 0.00 ea  |              | \$0        |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS                    |          | \$0.00 / GSF | \$0        |
| D3053 HVAC AIR DISTRIBUTION                                 |          | \$0.00 / GSF | \$0        |
| SM Coordination & Material Handling                         | 0.00 ls  |              | \$0        |
| Ductwork - Galvanized                                       | 0.00 lb  |              | \$0        |
| Air Duct Accessories  | 0.00 ls  |              | \$0        |
| RGDs and Vents  | 0.00 ea  |              | \$0        |
| D3060 CONTROLS & INSTRUMENTATION                            |          | \$0.00 / GSF | \$0        |
| D3061 AUTOMATIC TEMPERATURE CONTROLS                        |          | \$0.00 / GSF | \$0        |
| ATC - BMS   | 0.00 ls  |              | \$0        |
| ATC - BMS CO2 Monitoring                                    | 0.00 ls  |              | \$0        |
| D3070 SPECIAL PURPOSE HVAC SYSTEMS                          |          | \$0.00 / GSF | \$0        |
| D3075 REFRIGERANT PIPING                                    |          | \$0.00 / GSF | \$0        |
| Split System Piping - Line Sets                             | 0.00 ea  |              | \$0        |
| VRF Piping  | 0.00 sf  |              | \$0        |
| D3076 CONDENSATE DRAIN PIPING                               |          | \$0.00 / GSF | \$0        |
| Condensate Drain Piping & Insulation                        | 0.00 lf  |              | \$0        |
| Condensate Drain Pumps                                      | 0.00 ea  |              | \$0        |
| D3080 SYSTEMS TESTING & BALANCING                           |          | \$0.00 / GSF | \$0        |
| D3080 AIR & WATER BALANCE                                   |          | \$0.00 / GSF | \$0        |
| Testing & Balancing   | 0.00 sf  |              | \$0        |
| D3090 OTHER HVAC SYSTEMS & EQUIP                            |          | \$0.00 / GSF | \$0        |
| D3091 HVAC MISC ITEMS                                       |          | \$0.00 / GSF | \$0        |
| Rigging and Hoisting  | 0.00 ls  |              | \$0        |
| Project Expenses and Commissioning                          | 0.00 ls  |              | \$0        |
| 26 ELECTRICAL   | 0 GSF    | \$0.00 / GSF | \$0        |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION                     |          | \$0.00 / GSF | \$0        |
| D5023 LARGE POWER & DISTRIBUTION                            |          | \$0.00 / GSF | \$0        |
| 75 KVA NEMA 1 Transformer composite unit at Locker Building | 0.00 ea  |              | \$0        |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| 225 AMP 120/208 Panel board surface mounted composite unit at Locker Building               | 0.00 ea  |              | \$0        |
| 1200 AMP 277/480 Distribution Panel board surface mounted composite unit at Locker Building | 0.00 ea  |              | \$0        |
| D5024 LARGE POWER FEEDER CONDUIT  |          | \$0.00 / GSF | <b>\$0</b> |
| 1200 AMP PVC Composite feeder copper - Large Power  | 0.00 lf  |              | \$0        |
| (4) 4" Empty PVC Conduit with pull String composite unit - Large<br>Power                   | 0.00 If  |              | \$0        |
| D5025 EMERGENCY GEN SET W/ATS   |          | \$0.00 / GSF | \$0        |
| Emergency Feeders   | 0.00 gsf |              | \$0        |
| D5027 MECHANICAL EQUIPMENT CONNECTIONS  | C C      | \$0.00 / GSF | \$0        |
| AC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                              | 0.00 ea  |              | \$0        |
| E3EQ   DWP with VFD 30A composite unit on drawings not on riser includes feeder             | 0.00 ea  |              | \$0        |
| E3EQ   ERV-1 with VFD 15 A composite unit connection only off riser                         | 0.00 ea  |              | \$0        |
| E3EQ   F - 30 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                     | 0.00 ea  |              | \$0        |
| EUH 1 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit                           | 0.00 ea  |              | \$0        |
| SP - Sump pump at elev pit - 30 AMP 3 POLE N1 fused disconnect<br>600 volt composite unit   | 0.00 ea  |              | \$0        |
| E3EQ   ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt<br>composite unit                  | 0.00 ea  |              | \$0        |
| E3EQ   FCU w/ junction box - Composite Unit   | 0.00 ea  |              | \$0        |
| 30 AMP EMT Composite feeders copper - Mechanical  | 0.00 lf  |              | \$0        |
| D5029 SMALL POWER DEVICES & WIRING  |          | \$0.00 / GSF | \$0        |
| Small Power \$/sf - Locker Building   | 0.00 sf  |              | \$0        |
| Power Junction Box - Typ. Composite Unit includeds branch                                   | 0.00 ea  |              | \$0        |
| D5040 LIGHTING  |          | \$0.00 / GSF | \$0        |
| D5042 LIGHT FIXTURES  |          | \$0.00 / GSF | \$0        |
| 20 AMP EMT Composite feeders copper - Lighting Branch                                       | 0.00 lf  |              | \$0        |
| F1 Lighting Fixture   | 0.00 ea  |              | \$0        |
| D5044 LIGHTING CONTROLS & WIRING  |          | \$0.00 / GSF | \$0        |
| S (1) Single pole Switch Composite unit   | 0.00 ea  |              | \$0        |
| 20 AMP EMT Composite feeders copper - Lighting Control Branch                               | 0.00 lf  |              | \$0        |
| D5090 OTHER ELECTRICAL SYSTEMS  |          | \$0.00 / GSF | \$0        |
| D5094 GROUNDING & LIGHTNING PROTECTION SYS.   |          | \$0.00 / GSF | \$0        |
| Grounding   | 0.00 gsf |              | \$0        |
| D5095 MISCELLANEOUS ELECTRICAL SYSTEMS  |          | \$0.00 / GSF | \$0        |
| Mis Expenses  | 0.00 gsf |              | \$0        |
| Delete per VE as alternate elec,com,sec   | 0.00 gsf |              | \$0        |
| Temp Lighting and Power   | 0.00 gsf |              | \$0        |
| 27 COMMUNICATIONS   | 0 GSF    | \$0.00 / GSF | \$0        |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| D5090 OTHER ELECTRICAL SYSTEMS  |          | \$0.00 / GSF | \$0        |
| D5092 CLOCK SYSTEMS   |          | \$0.00 / GSF | \$0        |
| Clock Single Face Battery or 110 clock  | 0.00 ea  |              | \$0        |
| D6010 COMMUNICATIONS & SECURITY   |          | \$0.00 / GSF | \$0        |
| D6013 TEL/DATA SYSTEM   |          | \$0.00 / GSF | \$0        |
| Fit-Out Telcom Equipment composite unit                                       | 0.00 ea  |              | \$0        |
| D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet      | 0.00 ea  |              | \$0        |
| D1 Telephone jack with 3/4" Stub to accessible ceiling composite unit 30 feet | 0.00 ea  |              | \$0        |
| WP - "VOIP" Wall Telephone Outlet   | 0.00 ea  |              | \$0        |
| WAP jack ceiling mounted composite unit                                       | 0.00 ea  |              | \$0        |
| D6030 SOUND AND A/V   |          | \$0.00 / GSF | \$0        |
| D6032 SOUND/PA SYSTEMS  |          | \$0.00 / GSF | \$0        |
| Public Address Speaker  | 0.00 ea  |              | \$0        |
| Volume Controls   | 0.00 ea  |              | \$0        |
| LV Cabling for Speaker  | 0.00 lf  |              | \$0        |
| 28 ELECTRONIC SAFETY & SECURITY   | 0 GSF    | \$0.00 / GSF | \$0        |
| D6010 COMMUNICATIONS & SECURITY   |          | \$0.00 / GSF | \$0        |
| D6011 FIRE ALARM SYSTEM   |          | \$0.00 / GSF | \$0        |
| Fire Alarm Manual pull station composite unit                                 | 0.00 ea  |              | \$0        |
| Fire Alarm Smoke detector composite unit                                      | 0.00 ea  |              | \$0        |
| Fire Alarm Speaker strobe composite unit                                      | 0.00 ea  |              | \$0        |
| Control Relay   | 0.00 ea  |              | \$0        |
| Fire Alarm Monitor module composite unit                                      | 0.00 ea  |              | \$0        |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit                        | 0.00 lf  |              | \$0        |
| D6016 SURVEILLANCE CCTV SYSTEM  |          | \$0.00 / GSF | \$0        |
| Cat 6 Cable   | 0.00 lf  |              | \$0        |
| CCTV Head End   | 0.00 ea  |              | \$0        |
| CCTV Video Camera - PTZ Dome Camera, Interior Assembly<br>Composite Unit      | 0.00 ea  |              | \$0        |
| CCTV D1 Data Jacks  | 0.00 ea  |              | \$0        |
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit   | 0.00 ea  |              | \$0        |
| D6017 SECURITY ACCESS CONTROL   |          | \$0.00 / GSF | \$0        |
| Security Composite Cable Per Foot   | 0.00 lf  |              | \$0        |
| Security Card Reader Composite Unit   | 0.00 ea  |              | \$0        |
| Security Key Pad Composite Unit   | 0.00 ea  |              | \$0        |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit                | 0.00 ea  |              | \$0        |
| Security Control Unit - Small Composite Unit                                  | 0.00 ea  |              | \$0        |
| 33 UTILITIES  | 0 GSF    | \$0.00 / GSF | \$0        |
| A1010 STANDARD FOUNDATIONS  |          | \$0.00 / GSF | \$0        |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION                                       | QUANTITY | UNIT COST    | TOTAL COST |
|---|----------|--------------|------------|
| A1010 STANDARD FOUNDATIONS                        |          | \$0.00 / GSF | \$0        |
| F&I Building Foundation Drainage - Perforated PVC | 0.00 sf  |              | \$0        |
| TOTAL LOCKER BLDG                                 | \$(      | 0.00 / GSF   | \$0        |

60% CD Estimate - Reconciled incl VE



#### MAINTENANCE BLDG

| DESCRIPTION  | QUANTITY  | UNIT COST       | TOTAL COST |
|--|-----------|-----------------|------------|
| 03 CONCRETE  | 2,040 GSF | \$61.06 / GSF   | \$124,570  |
| A1010 STANDARD FOUNDATIONS   |           | \$15.20 / GSF   | \$31,000   |
| A1010 STANDARD FOUNDATIONS   |           | \$15.20 / GSF   | \$31,000   |
| Standard Concrete Foundation - Complete \$/sf - Maintenance<br>Building ADJUST PER RECON <\$20K> | 2,040 sf  | \$15.20 /sf     | \$31,000   |
| A2010 WALLS FOR SUBGRADE ENCLOSURES  |           | \$20.51 / GSF   | \$41,850   |
| A2011 SUBGRADE ENCLOSURE WALL CONSTRUCTION   |           | \$20.51 / GSF   | \$41,850   |
| Standard Concrete Foundation - Complete \$/sf - walls  | 27 cy     | \$1,550.00 /cy  | \$41,850   |
| A4010 STANDARD SLABS-ON-GRADE  |           | \$18.00 / GSF   | \$36,720   |
| A4010 STANDARD SLABS-ON-GRADE  |           | \$18.00 / GSF   | \$36,720   |
| Standard Concrete Foundation - Complete \$/sf - Maintenance<br>Building                          | 2,040 sf  | \$18.00 /sf     | \$36,720   |
| A6010 BUILDING SUBDRAINAGE   |           | \$7.35 / GSF    | \$15,000   |
| A6011 FOUNDATION DRAINAGE  |           | \$7.35 / GSF    | \$15,000   |
| Building Foundation Drainage - Perforated PVC (F&I) - ADDED<br>PER RECON                         | 332 lf    | \$45.18 /lf     | \$15,000   |
| 05 METALS  | 2,040 GSF | \$5.15 / GSF    | \$10,500   |
| C1030 INTERIOR DOORS   |           | \$5.15 / GSF    | \$10,500   |
| C1034 INTERIOR COILING DOORS   |           | \$5.15 / GSF    | \$10,500   |
| Support Steel - Interior Rolling Door/Grille Supports  | 1.00 ls   | \$10,500.00 /ls | \$10,500   |
| 06 WOOD, PLASTICS, & COMPOSITES  | 2,040 GSF | \$1.56 / GSF    | \$3,185    |
| B1020 ROOF CONSTRUCTION  |           | \$1.56 / GSF    | \$3,185    |
| <b>B1029 ROOF CONSTRUCTION SUPPLEMENTARY COMPONENTS</b>  |           | \$1.56 / GSF    | \$3,185    |
| Rough Carpentry Roofing  | 2,123 sf  | \$1.50 /sf      | \$3,185    |
| C1010 INTERIOR PARTITIONS  |           | \$0.00 / GSF    | \$0        |
| C1011 INTERIOR FIXED PARTITIONS  |           | \$0.00 / GSF    | \$0        |
| Interior Rough Carpentry   | 0.00 sf   |                 | \$0        |
| 07 THERMAL & MOISTURE PROTECTION   | 2,040 GSF | \$5.70 / GSF    | \$11,633   |
| A2020 BASEMENT WALL CONSTRUCTION   |           | \$3.88 / GSF    | \$7,905    |
| A2020 BASEMENT WALL CONSTRUCTION   |           | \$1.67 / GSF    | \$3,405    |
| Rigid Insulation @ Fndn. Walls   | 750 sf    | \$4.54 /sf      | \$3,405    |
| A2022 MOISTURE PROTECTION  |           | \$2.21 / GSF    | \$4,500    |
| Damproofing - Foundation Walls   | 750 sf    | \$6.00 /sf      | \$4,500    |
| A4010 STANDARD SLABS-ON-GRADE  |           | \$1.00 / GSF    | \$2,040    |
| A4010 STANDARD SLABS-ON-GRADE  |           | \$1.00 / GSF    | \$2,040    |
| Waterproof SOG - Vapor Barrier   | 2,040 sf  | \$1.00 /sf      | \$2,040    |
| B1010 FLOOR CONSTRUCTION   |           | \$0.00 / GSF    | \$0        |
| <b>B1019 FLOOR CONSTRUCTION SUPPLEMENTARY COMPONENTS</b>   |           | \$0.00 / GSF    | \$0        |
| Cementitious Spray Fireproofing (Beams & Columns)  | 0.00 sf   |                 | \$0        |



| DESCRIPTION   | QUANTITY  | UNIT COST        | TOTAL COST |
|---|-----------|------------------|------------|
| Firestopping / Safing @ Building Perimeter \$/lf                        | 0.00 lf   |                  | \$0        |
| B3010 ROOFING   |           | \$0.83 / GSF     | \$1,688    |
| B3012 LOW SLOPE MEMBRANE SYSTEMS  |           | \$0.00 / GSF     | \$0        |
| Roof System, assume provided by Pre-Engineered Building                 | 2,123 sf  | \$0.00 /sf       | \$0        |
| <b>B3013 ROOF INSULATION &amp; FILL</b>                                 |           | \$0.00 / GSF     | \$0        |
| Tapered Roof Insulation - Premium, assume not required                  | 0.00 nic  |                  | \$0        |
| B3014.4 GUTTERS & DOWNSPOUTS  |           | \$0.83 / GSF     | \$1,688    |
| Gutters, not shown assume required                                      | 60 lf     | \$20.00 /lf      | \$1,205    |
| Downspouts, not shown assume required                                   | 32 lf     | \$15.00 /lf      | \$483      |
| C1030 INTERIOR DOORS  |           | \$0.00 / GSF     | \$0        |
| C1039 INTERIOR DOOR SUPPLEMENTARY COMPONENTS                            |           | \$0.00 / GSF     | \$0        |
| Misc. Interior Caulking - General                                       | 0.00 sf   |                  | \$0        |
| 08 OPENINGS   | 2,040 GSF | \$43.21 / GSF    | \$88,150   |
| B2050 EXTERIOR DOORS & GRILLES  |           | \$21.56 / GSF    | \$43,975   |
| B2051 EXTERIOR ENTRANCE DOORS   |           | \$3.43 / GSF     | \$7,000    |
| Door   HM Single Exterior - Incl. Door, Frame, and Hardware             | 2.00 ea   | \$3,500.00 /ea   | \$7,000    |
| B2053.4 OVERHEAD & ROLL UP DOORS  |           | \$18.13 / GSF    | \$36,975   |
| Door   Motor Operated Overhead Door w/ Insulating Glass -<br>Typ., 3 ea | 435 sf    | \$85.00 /sf      | \$36,975   |
| C1030 INTERIOR DOORS  |           | \$21.65 / GSF    | \$44,175   |
| C1031.4 STANDARD INTERIOR DOORS   |           | \$21.65 / GSF    | \$44,175   |
| Door type F   | 3.00 ea   | \$385.00 /ea     | \$1,155    |
| Door type R- 12'x 12'   | 3.00 ea   | \$12,960.00 /ea  | \$38,880   |
| Frame- Type 1   | 3.00 ea   | \$300.00 /ea     | \$900      |
| Hardware   Interior Door Hardware Per Leaf                              | 3.00 leaf | \$600.00 /leaf   | \$1,800    |
| Install doors and hardware  | 16 hr     | \$90.00 /hr      | \$1,440    |
| 09 FINISHES   | 2,040 GSF | \$4.91 / GSF     | \$10,006   |
| B2050 EXTERIOR DOORS & GRILLES  |           | \$0.15 / GSF     | \$300      |
| B2051 EXTERIOR ENTRANCE DOORS   |           | \$0.15 / GSF     | \$300      |
| Paint Exterior - Doors  | 3.00 ea   | \$100.00 /ea     | \$300      |
| C1030 INTERIOR DOORS  |           | \$0.26 / GSF     | \$525      |
| C1031.4 STANDARD INTERIOR DOORS   |           | \$0.26 / GSF     | \$525      |
| Paint   Paint Interior Doors  | 3.00 leaf | \$100.00 /leaf   | \$300      |
| Paint Interior - Door & Frames  | 3.00 ea   | \$75.00 /ea      | \$225      |
| C2010 WALL FINISHES   |           | \$4.50 / GSF     | \$9,181    |
| C2017 WALL PAINTING & COATING   |           | \$4.50 / GSF     | \$9,181    |
| Paint Interior Walls - Epoxy  | 1,195 sf. | \$3.50 /sf.      | \$4,181    |
| Misc. Interior Painting   | 1.00 allw | \$5,000.00 /allw | \$5,000    |
| 13 SPECIAL CONSTRUCTION   | 2,040 GSF | \$73.68 / GSF    | \$150,300  |
| F1010 INTEGRATED CONSTRUCTION   |           | \$73.68 / GSF    | \$150,300  |

60% CD Estimate - Reconciled incl VE



| F1019 OTHER SPECIAL CONSTRUCTION<br>Pre Engineered Building: Complete - ADJUST PER RECON     \$37.68 / GSF     \$150,300       22 PLUMBING<br>D2000 PLUMBING EQUIPMENT     2,040 GSF     \$23.68 / GSF     \$48,305       D2000 PLUMBING EQUIPMENT     \$7.62 / GSF     \$15,550       Water Meter - 2"     1.00 ea     \$1,200,00 /ea     \$1,200       Backflow Preventer (IP) 2"     1.00 ea     \$1,000,00 /ea     \$3,000       Gas, / Oli Interceptor     1.00 ea     \$1,000,00 /ea     \$2,000       Floit of Use Elec Water Heater     1.00 ea     \$1,000,00 /ea     \$2,000       D2010 DOMESTIC WATER DISTIBUTION     \$3.43 / GSF     \$7,000     \$2,000 /la     \$2,000       D2012 DOMESTIC WATER PIPING     \$3.43 / GSF     \$7,000     \$3.43 / GSF     \$7,000       D2020 SANITARY DRAINAGE     \$3.68 / GSF     \$1,7,700     \$3.200 /lf     \$3.200 /lf <th>DESCRIPTION</th> <th>QUANTITY</th> <th>UNIT COST</th> <th>TOTAL COST</th>                                | DESCRIPTION  | QUANTITY  | UNIT COST      | TOTAL COST |
|--|--|-----------|----------------|------------|
| Pre Engineered Buildings Complete - ADJUST PER RECON     2,041 sf     \$75.00 /sf     \$15.03.00       22 PLUMBING     2,040 GSF     \$23.68 / GSF     \$548,305       D2000 PLUMBING EQUIPMENT     57.62 / GSF     \$51.550       Water Meter - 2'     1.00 ea     \$1.200.00 /ea     \$1.200.00 /ea       Backflow Preventer (RP) 2''     1.00 ea     \$1.200.00 /ea     \$3.000       Gas / Oll Interceptor     1.00 ea     \$1.000.00 /ea     \$5.000       Gas / Oll Interceptor     1.00 ea     \$5.000.00 /ea     \$2.800       Point Or Jain W/Trap     3.00 ea     \$3.000 ea     \$2.800       Diot Domestic Hot & Cold Water Piping     1.00 ea     \$1.000.00 /ea     \$2.800       Diot Domestic Hot & Cold Water Piping     1.00 lf     \$1.000.00 /if     \$1.000 /if     \$1.000 /if     \$1.000 /if     \$1.000.  | F1019 OTHER SPECIAL CONSTRUCTION                     |           | \$73.68 / GSF  | \$150,300  |
| 22 PLUMBING     2,040 GSF     \$23.68 / GSF     \$48,305       D2000 PLUMBING EQUIPMENT     \$7.62 / GSF     \$15,550       Water Meter - 2"     1.00 ea     \$1,2000 / ea     \$1,2000       Backflow Preventer (RP) 2"     1.00 ea     \$1,2000 / ea     \$1,2000       Backflow Preventer (RP) 2"     1.00 ea     \$1,2000 / ea     \$1,000 / ea     \$2,850       Point Draim W/Trap     3.00 ea     \$51,000 / ea     \$1,000 / ea     \$2,850     \$2010 DOMESTIC WATER PIPING     \$34.3 / GSF     \$7,000       Doll 2 DOMESTIC WATER PIPING     \$34.3 / GSF     \$1,000 / ff     \$1,00 / ff     \$1,00 / ff   | Pre Engineered Buildings Complete - ADJUST PER RECON | 2,004 sf  | \$75.00 /sf    | \$150,300  |
| D2000 PLUMBING EQUIPMENT     \$7.62 / 6SF     \$15,550       D2000 PLUMBING EQUIPMENT     \$7.62 / 6SF     \$15,200       Water Metter - 2"     1.00 ea     \$1,200.00 /ea     \$1,200       Backflow Preventer (RP) 2"     1.00 ea     \$1,500.00 /ea     \$3,000       Trap Primers & Associated Piping     3.00 ea     \$5,000.00 /ea     \$5,000       Gas / Ol Interceptor     1.00 ea     \$5,000.00 /ea     \$5,000       Point of Use Elec Water Heater     1.00 ea     \$5,000.00 /ea     \$5,000       D2010 DOMESTIC WATER DISTRIBUTION     \$3.43 / 6SF     \$7,000       Damestic Hot & Cold Water Piping     100 If     \$4.800 /ff     \$4,800       Insulation     100 If     \$1.200 /ff     \$1,200       Valves & Accessories     1.00 Is     \$1.000.00 /s     \$1,000       D2020 SANITARY DRAIN PIPING - AG     \$8.68 / 6SF     \$17,700     \$2.25 / 6SF     \$4,587       D2040 PLUMBING FXTURES     \$2.25 / 6SF     \$4,587     \$17,700     \$3,570 /ea     \$3,577       D2040 PLUMBING FXTURES     \$2.25 / 6SF     \$4,587     \$17,700     \$3,577       D2040 PLUMBING FXTURES  | 22 PLUMBING  | 2,040 GSF | \$23.68 / GSF  | \$48,305   |
| D2000 PLUMBING EQUIPMENT     \$7.62 / 65F     \$51,550       Water Meter - 2"     1.00 ea     \$1,200.00 /ea     \$1,200.       Backflow Preventer (RP) 2"     1.00 ea     \$51,000.00 /ea     \$31,000.       Trap Primers & Associated Piping     3.00 ea     \$1,000.00 /ea     \$50,000 /ea </td <td>D2000 PLUMBING EQUIPMENT</td> <td></td> <td>\$7.62 / GSF</td> <td>\$15,550</td> | D2000 PLUMBING EQUIPMENT                             |           | \$7.62 / GSF   | \$15,550   |
| Water Meter - 2"     1.00 ea     \$1,200.00 /ea     \$1,200       Backflow Preventer (RP) 2"     1.00 ea     \$1,200.00 /ea     \$1,200       Gas / Oll Interceptor     1.00 ea     \$5,000.00 /ea     \$5,000       Gas / Oll Interceptor     1.00 ea     \$5,000.00 /ea     \$5,000       Pior Drain W/Trap     3.00 ea     \$59,000 /ea     \$2,850       Point of Use Elec Water Heater     1.00 ea     \$1,000 /ea     \$2,850       D2010 DOMESTIC WATER PIPING     \$3.43 / 65F     \$7,000       Domestic Hot & Cold Water Piping     100 lf     \$4,800 /lf     \$4,800       Insulation     100 lf     \$12,000 /lf     \$1,000       Valves & Accessories     1.00 ls     \$1,000 /ls     \$1,000       D2026 SANITARY DRAIN PIPING - AG     \$8,68 / 65F     \$17,700       Sanitary Waste & Vent Piping - UG & AG     25,25 / 65F     \$4,587       D2040 PUMBING FIXTURES     \$2,25 / 65F     \$4,587       D2040 PUMBING FIXTURES     \$2,25 / 65F     \$4,587       Water Closet - Wall Hung     1.00 ea     \$1,870 / 65F     \$3,537       D2040 PUMBING FIXTURES     \$1,70 / 65F  | D2000 PLUMBING EQUIPMENT                             |           | \$7.62 / GSF   | \$15,550   |
| Backflow Preventer (RP) 2"     1.00 ea     \$1,500.00 /ea     \$1,500       Trap Primers & Associated Piping     3.00 ea     \$5,000.00 /ea     \$5,000.00 /ea       Gas / Oli Interceptor     1.00 ea     \$5,000.00 /ea     \$5,000.00 /ea       Point of Use Elec Water Heater     1.00 ea     \$5,000.00 /ea     \$2,850       Point of Use Elec Water Heater     1.00 ea     \$3,43 / 6SF     \$7,000       D2012 DOMESTIC WATER PIPING     \$3,43 / 6SF     \$7,000       Domestic Hot & Cold Water Piping     100 If     \$4,000 /lf     \$4,000       Insulation     100 IS     \$1,000.00 /ls     \$1,000       Valves & Accessories     1.00 Is     \$1,000.00 /ls     \$1,000       D2020 SANITARY DRAINAGE     \$8,68 / GSF     \$17,700       D2040 PLUMBING FIXTURES     \$2,25 / GSF     \$4,587       D2033 PLUMBING FIXTURES     \$2,25 / GSF     \$4,587       D2040 PLUMBING FIXTURES     \$2,24 / GSF     \$1,573       D2040 PLUMBING SYSTEMS     \$1,70 / GSF     \$3,468       D2090 PLUMBING SYSTEMS     \$1,70 / GSF     \$3,468       D2090 PLUMBING SYSTEMS     \$1,70 / GSF     \$3,468  | Water Meter - 2"                                     | 1.00 ea   | \$1,200.00 /ea | \$1,200    |
| Trap Primers & Associated Piping   3.00 ea   \$1,000.0 /ea   \$3,000     Gas / Oil Interceptor   1.00 ea   \$950.000 /ea   \$50.000     Pioint of Use Elec Water Heater   1.00 ea   \$51,000.00 /ea   \$28.85     Point of Use Elec Water Heater   1.00 ea   \$51,000.00 /ea   \$1,000     D2010 DOMESTIC WATER DISTRIBUTION   \$3.43 / GSF   \$7,000     D2012 DOMESTIC WATER PIPING   \$3.43 / GSF   \$7,000     D2012 DOMESTIC WATER PIPING   \$3.43 / GSF   \$7,000     D2012 DOMESTIC WATER PIPING   \$3.63 / GSF   \$1,000.0 /ls   \$1,000     Insulation   100 If   \$4.80.0 /lf   \$2,200     Valves & Accessories   1.00 Is   \$1,000.0 /ls   \$1,000     D2026 SANITARY DRAIN PIPING - AG   \$8.68 / GSF   \$17,700     Sanitary Waste & Vent Piping - UG & AG   295 If   \$6.000 /lf   \$12,70     D2040 PLUMBING FIXTURES   \$2.25 / GSF   \$4,587     Water Closet - Wall Hung   1.00 ea   \$13,73.00 /ea   \$13,73     Uavatory - Wall   1.00 ea   \$13,73.00 /ea   \$3358     D2090 PLUMBING MISC TIEMS   \$1.70 / GSF   \$3,468   \$3,468 <tr< td=""><td>Backflow Preventer (RP) 2"</td><td>1.00 ea</td><td>\$1,500.00 /ea</td><td>\$1,500</td></tr<>  | Backflow Preventer (RP) 2"                           | 1.00 ea   | \$1,500.00 /ea | \$1,500    |
| Gas / Oil Interceptor     1.00 ea     \$50,000 /ea     \$52,850       Point D'usin W/Trap     3.00 ea     \$595,000 /ea     \$2,850       Doto Drain W/Trap     3.00 ea     \$51,000.00 /ea     \$2,850       D2012 DOMESTIC WATER DISTRIBUTION     \$3.43 / GSF     \$7,000       Domestic Hot & Cold Water Piping     100 if     \$1.48 0.0 /if     \$4.800       Domestic Hot & Cold Water Piping     100 if     \$12.00 /if     \$1.200       Valves & Accessories     1.00 is     \$1,00.00 /is     \$1.00       D2020 SANITARY DRAIN AGE     \$8.68 / GSF     \$11,700       D2020 SANITARY DRAIN PIPING - AG     \$8.68 / GSF     \$11,700       Sanitary Waste & Vent Piping - UG & AG     295 if     \$600.0 /if     \$11,700       D2043 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$1,70 / GSF     \$1,87       Uavatory - Wall     1.00 ea     \$1,70 / GSF     \$3,486       D2090 PLUMBING FIXTURES     \$1,70 / GSF     \$3,486     Delete per VE     \$3.00 /a     \$3,38       D2090 PLUMBING MISC ITEMS     \$1,70 / GSF     \$3,486     Delet   | Trap Primers & Associated Piping                     | 3.00 ea   | \$1,000.00 /ea | \$3,000    |
| Floor Drain W/Trap     3.00 ea     \$950.00 /ea     \$2,850       Point Of Use Elec Water Heater     1.00 ea     \$1,000.00 /ea     \$1,000       D2010 DOMESTIC WATER DISTRIBUTION     \$3.43 / GSF     \$7,000       Damestic Hot & Cold Water Piping     100 lf     \$4.8.00 / lf     \$4,000       Insulation     100 lf     \$4.8.00 / lf     \$1,000       Valves & Accessories     100 ls     \$1,000.00 / ls     \$1,000       D2020 SANITARY DRAINAGE     \$8.68 / GSF     \$1,770       D2020 SANITARY DRAIN PIPING - AG     \$8.68 / GSF     \$17,700       Sanitary Waste & Vent Piping - UG & AG     295 lf     \$60.00 / lf     \$17,700       D2040 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       D2043 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$1,573.00 / ea     \$1,873       Hose Bibb     1.00 ea     \$3,57.00 / ea     \$3,58       D2090 MISC, PLUMBING MISC TTEMS     \$1,70 / GSF     \$3,468       D2090 PLUMBING MISC TTEMS     \$1,70 / GSF     \$3,468       D2090 PLUMBING MISC TTEMS     \$1,70 / GSF     \$3,468   | Gas / Oil Interceptor                                | 1.00 ea   | \$6,000.00 /ea | \$6,000    |
| Point of Use Elec Water Heater     1.00 ea     \$1,0000 /ea     \$1,0000       D2010 DOMESTIC WATER DISTRIBUTION     \$3.43 / GSF     \$7,000       D2012 DOMESTIC WATER DISTRIBUTION     \$3.43 / GSF     \$7,000       Domestic Hot & Cold Water Piping     100 lf     \$8.80 / GSF     \$1,000       Valves & Accessories     1.00 ls     \$1,000 / ls     \$1,000       D2026 SANITARY DRAINAGE     \$8.68 / GSF     \$17,700       D2026 SANITARY DRAIN PIPING - AG     \$8.68 / GSF     \$17,700       Sanitary Waste & Vent Piping - UG & AG     295 lf     \$6000 / lf     \$17,700       D2040 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587     \$4,587       Water Closet - Wall Hung     1.00 ea     \$1,773.00 / ea     \$1,573       Hose Bibb     1.00 ea     \$337.50 / ea     \$338       D2090 MISC, PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       Delete per VE     0.00 sf     \$1.70 / SF     \$3,468       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / GSF     \$1,434       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / GSF     \$1,434       D3040 HVAC MAJOR EQUIPMENT     \$3.230 / GSF     \$1,434 </td <td>Floor Drain W/Trap</td> <td>3.00 ea</td> <td>\$950.00 /ea</td> <td>\$2,850</td>  | Floor Drain W/Trap                                   | 3.00 ea   | \$950.00 /ea   | \$2,850    |
| D2010 DOMESTIC WATER DISTRIBUTION     \$3.43 / 65F     \$7,000       D2012 DOMESTIC WATER PIPING     \$3.43 / 65F     \$7,000       Domestic Hot & Cold Water Piping     100 If     \$48.00 / If     \$4,800       Insulation     100 If     \$12.00 / If     \$1,200       Valves & Accessories     1.00 Is     \$1,000.00 / /s     \$1,000       D2020 SANITARY DRAIN PIPING - AG     \$8.68 / 65F     \$17,700       D2043 PLUMBING FIXTURES     \$2.25 / 65F     \$4,587       D2043 PLUMBING FIXTURES     \$2.25 / 65F     \$4,587       Water Closet - Wall Hung     1.00 ea     \$2,470 / ea     \$2,470       Lavatory - Wall     1.00 ea     \$1,573.00 / ea     \$1,573       Hose Bibb     1.00 ea     \$1,570 / ea     \$358       D2090 PLUMBING SYSTEMS     \$1.70 / 65F     \$3,468       D2090 PLUMBING SYSTEMS     \$1.70 / 65F     \$3,468       D2090 PLUMBING A AIR CONDITIONING     \$2,040 sf     \$1.70 / sf     \$3,468       D2090 PLUMBING A AIR CONDITIONING     \$2,040 sf     \$1.70 / sf     \$3,468       D2090 PLUMBING A AIR CONDITIONING     \$2,040 cfsF     \$3,19 / 65F     \$  | Point of Use Elec Water Heater                       | 1.00 ea   | \$1,000.00 /ea | \$1,000    |
| D2012 DOMESTIC WATER PIPING     \$3.43 / GSF     \$7,000       Domestic Hot & Cold Water Piping     100 If     \$48.00 /If     \$48.00 /If     \$48.00 /If     \$48.00 /If     \$48.00 /If     \$48.00 /If     \$1,000 /Is     \$1,000 /IS </td <td>D2010 DOMESTIC WATER DISTRIBUTION</td> <td></td> <td>\$3.43 / GSF</td> <td>\$7,000</td>  | D2010 DOMESTIC WATER DISTRIBUTION                    |           | \$3.43 / GSF   | \$7,000    |
| Domestic Hot & Cold Water Piping     100     If     \$48.00     /if     \$48.00       Insulation     100     If     \$12.00     /if     \$12.00       Valves & Accessories     1.00     Is     \$1,000.00     /is     \$1,000       D2020 SANITARY DRAIN PIPING - AG     \$8.68     GSF     \$17,700       Sanitary Waste & Vent Piping - UG & AG     \$8.68     GSF     \$4,587       D2040 PLUMBING FIXTURES     \$2.25     GSF     \$4,587       D2043 PLUMBING FIXTURES     \$2.25     GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$1,87.300     /ea     \$1,573       Hose Bibb     1.00 ea     \$1,87.00     /ea     \$1,87.00       Water Closet - Wall Hung     1.00 ea     \$187.00     /ea     \$187.00       Walt Hydrant     1.00 ea     \$187.00     /ea     \$33.468       D2090 PLUMBING MISC ITEMS     \$1.70     /GSF     \$3,468       D2090 PLUMBING ALI CONDITIONING     \$2,040     SF     \$0.00     /S0       J3040 HVAC MAJOR EQUIPMENT     \$0.89     \$0.55 <t< td=""><td>D2012 DOMESTIC WATER PIPING</td><td></td><td>\$3.43 / GSF</td><td>\$7,000</td></t<>  | D2012 DOMESTIC WATER PIPING                          |           | \$3.43 / GSF   | \$7,000    |
| Insulation     100     If     \$12.00     /If     \$1,200       Valves & Accessories     1.00     Is     \$1,000.00     /Is     \$1,000       D2020 SANITARY DRAINAGE     \$8.68.6     GSF     \$1,7700       D2020 SANITARY DRAIN PIPING - AG     \$8.68.7     \$51,070,000     Sanitary Waste & Vent Piping - UG & AG     \$2.25     /GSF     \$4,587       D2040 PLUMBING FIXTURES     \$2.25     /GSF     \$4,587     \$4,587       D2043 PLUMBING FIXTURES     \$2.25     /GSF     \$4,587       Water Closet - Wall Hung     1.00     ea     \$1,573.00     /ea     \$2,470       Lavatory - Wall     1.00     ea     \$1,573.00     /ea     \$1,573.00     \$2,470       Lavatory - Wall     1.00     ea     \$1,573.00     /ea     \$1,573.00     /ea     \$3,470       Mall Hydrant     1.00     ea     \$1,570.0     /GSF     \$3,468     \$3,58       D2009 PLUMBING MISC ITEMS     \$1,70     /GSF     \$3,468     \$600     \$1     \$100     \$3,146       D2040 HVAC MAJOR EQUIPMENT     \$3,   | Domestic Hot & Cold Water Piping                     | 100 lf    | \$48.00 /lf    | \$4,800    |
| Valves & Accessories     1.00 is     \$1,000.0 //s     \$1,000       D2020 SANITARY DRAINAGE     \$8.68 / GSF     \$17,700       D2026 SANITARY DRAIN PIPING - AG     \$8.68 / GSF     \$17,700       Sanitary Waste & Vent Piping - UG & AG     295 if     \$60.00 /if     \$17,700       D2040 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       D2043 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$2,469.50 / ea     \$2,470       Lavatory - Wall     1.00 ea     \$187.00 / ea     \$1,573       Hose Bibb     1.00 ea     \$187.00 / ea     \$1,573       Wall Hydrant     1.00 ea     \$137.00 / ea     \$1373       Wall Hydrant     1.00 ea     \$137.00 / ea     \$1373       Wall Hydrant     1.00 ea     \$137.00 / ea     \$138.468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468     Delete per VE     \$0.00 sf     \$0       Z3 HEATING, VENTILATING, & AIR CONDITIONING     \$0.40 sf     \$1.70 / GSF     \$4,656     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818     \$1,818   | Insulation   | 100 lf    | \$12.00 /lf    | \$1,200    |
| D2020 SANITARY DRAINAGE     \$8.68 / GSF     \$17,700       D2026 SANITARY DRAIN PIPING - AG     \$8.68 / GSF     \$17,700       Sanitary Waste & Vent Piping - UG & AG     295 If     \$60.00 / Jf     \$17,700       D2040 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$2,26 / GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$1,573.00 /ea     \$2,173       Hose Bibb     1.00 ea     \$1,573.00 /ea     \$1,573       Water Closet - Wall Hung     1.00 ea     \$1,573.00 /ea     \$1,573       Water Closet - Wall Hung     1.00 ea     \$1,573.00 /ea     \$1,573       Wall Hydrant     1.00 ea     \$1,573.00 /ea     \$1,573       Wall Hydrant     1.00 ea     \$1,70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1,70 / GSF     \$3,468     D2090 NISC. PLUMBING & AIR CONDITIONING     \$2,040 sf     \$1,70 / SF     \$3,468       D2040 HVAC MAJOR EQUIPMENT     \$3,19 / GSF     \$6,514     \$0     \$0     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$2,30 / GSF     \$1,818     \$2,30 / GSF     \$1,818 <td>Valves &amp; Accessories</td> <td>1.00 ls</td> <td>\$1,000.00 /ls</td> <td>\$1,000</td>  | Valves & Accessories                                 | 1.00 ls   | \$1,000.00 /ls | \$1,000    |
| D2026 SANITARY DRAIN PIPING - AG     \$8.68 / GSF     \$17,700       Sanitary Waste & Vent Piping - UG & AG     295 If     \$60.00 //f     \$17,700       D2040 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       D2043 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$2,469.50 / ea     \$2,470       Lavatory - Wall     1.00 ea     \$1,573.00 / ea     \$187       Walt Plydrant     1.00 ea     \$317.00 / ea     \$187       Wall Hydrant     1.00 ea     \$337.50 / ea     \$358       D2090 MISC PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       D2090 MISC PLUMBING & AIR CONDITIONING     \$0.00 sf     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     \$0.00 sf     \$0       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       D3041 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       D3041 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$3,826       D3041 HVAC CMAJOR EQUIPMENT     \$2.30 /  | D2020 SANITARY DRAINAGE                              |           | \$8.68 / GSF   | \$17,700   |
| Sanitary Waste & Vent Piping - UG & AG     295 If     \$60.00 /If     \$17,700       D2040 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       D2043 PLUMBING FIXTURES     \$2.25 / GSF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$2,260,50 / ea     \$2,470       Lavatory - Wall     1.00 ea     \$1,573.00 / ea     \$21,573       Hose Bibb     1.00 ea     \$1,573.00 / ea     \$187       Wall Hydrant     1.00 ea     \$357.50 / ea     \$358       D2090 NIISC. PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       Delete per VE     0.00 sf     \$0     \$0       Z3 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$1,70 / GSF       D3040 HVAC MAJOR EQUIPMENT     \$3.319 / GSF     \$1,818     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$3.319 / GSF     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$3.320 / GSF     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$1,818  | D2026 SANITARY DRAIN PIPING - AG                     |           | \$8.68 / GSF   | \$17,700   |
| D2040 PLUMBING FIXTURES     \$2.25 / 6SF     \$4,587       D2043 PLUMBING FIXTURES     \$2.25 / 6SF     \$4,587       Water Closet - Wall Hung     1.00 ea     \$2,469.50 / ea     \$2,470       Lavatory - Wall     1.00 ea     \$2,469.50 / ea     \$2,470       Lavatory - Wall     1.00 ea     \$1,573.00 / ea     \$1,573       Hose Bibb     1.00 ea     \$187.00 / ea     \$187.00 / ea     \$1357.00 / ea     \$358       D2090 MISC. PLUMBING SYSTEMS     \$1.70 / 6SF     \$3,468     \$100 ea     \$317.00 / es     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / 6SF     \$3,468     \$0.00 sf     \$0     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696       Unit Heater - Elec     1.00 ea     \$1,818.00 / ea     \$1,434.00 / ea   | Sanitary Waste & Vent Piping - UG & AG               | 295 lf    | \$60.00 /lf    | \$17,700   |
| D2043 PLUMBING FIXTURES     \$2.25 / 65F     \$4,587       Water Closet - Wall Hung     1.00 ea     \$2,469.50 / ea     \$2,470       Lavatory - Wall     1.00 ea     \$1,573.00 / ea     \$1,573       Hose Bibb     1.00 ea     \$187.00 / ea     \$187       Wall Hydrant     1.00 ea     \$187.00 / ea     \$187       Wall Hydrant     1.00 ea     \$357.50 / ea     \$358       D2090 MISC. PLUMBING SYSTEMS     \$1.70 / 6SF     \$3468       D2090 PLUMBING MISC ITEMS     \$1.70 / 6SF     \$3468       Delete per VE     0.00 sf     \$0     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / 6SF     \$6,514       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / 6SF     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.20 / 6FS     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / ea     \$1,434       Cabinet Unit Heater - Elec     1.00 ea     \$1,434.00 / ea     \$1,434       Cabinet Unit Heater (ceiling)     1.00 ea     \$3,262.30 / ea     \$3,262  | D2040 PLUMBING FIXTURES                              |           | \$2.25 / GSF   | \$4,587    |
| Water Closet - Wall Hung     1.00 ea     \$2,469.50 /ea     \$2,470       Lavatory - Wall     1.00 ea     \$1,573.00 /ea     \$1,573       Hose Bibb     1.00 ea     \$187.00 /ea     \$187       Wall Hydrant     1.00 ea     \$187.00 /ea     \$187       Wall Hydrant     1.00 ea     \$357.50 /ea     \$358       D2090 MISC. PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       Delete per VE     0.00 sf     \$1.70 / SF     \$3,468       Delete per VE     0.00 sf     \$0.00 / SF     \$0       Z3 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / GSF     \$6,514       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       Exhaust Fan     1.00 ea     \$1,818.00 /ea     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696       Unit Heater - Elec     1.00 ea     \$1,434.00 /ea     \$1,434       Cabinet Unit Heater (ceiling)     1.00 ea     \$3,262.30 / ea     \$3,262 <td>D2043 PLUMBING FIXTURES</td> <td></td> <td>\$2.25 / GSF</td> <td>\$4,587</td>   | D2043 PLUMBING FIXTURES                              |           | \$2.25 / GSF   | \$4,587    |
| Lavatory - Wall     1.00 ea     \$1,573.00 /ea     \$1,573       Hose Bibb     1.00 ea     \$187.00 /ea     \$187       Wall Hydrant     1.00 ea     \$357.50 /ea     \$358       D2090 MISC. PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       Admin & Expenses     2,040 sf     \$1.70 / fSF     \$3,468       Delete per VE     0.00 sf     \$0     \$0     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC)     \$3.19 / GSF     \$6,514     \$0<   | Water Closet - Wall Hung                             | 1.00 ea   | \$2,469.50 /ea | \$2,470    |
| Hose Bibb     1.00 ea     \$187.00 /ea     \$187       Wall Hydrant     1.00 ea     \$357.50 /ea     \$358       D2090 MISC. PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       Admin & Expenses     2,040 sf     \$1.70 / GSF     \$3,468       Delete per VE     0.00 sf     \$0     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / GSF     \$6,514     \$0       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818     \$1,818       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696     \$1,434       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696       Unit Heater - Elec     1.00 ea     \$3,262.30 / ea     \$3,262       D3050 FACILITY HVAC DISTRIBUTION SYSTEMS     \$6,13 / GSF     \$12,507       D3053 HVAC AIR DISTRIBUTION   | Lavatory - Wall                                      | 1.00 ea   | \$1,573.00 /ea | \$1,573    |
| Wall Hydrant     1.00 ea     \$357.50 /ea     \$358       D2090 MISC. PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       Admin & Expenses     2,040 sf     \$1.70 / SF     \$3,468       Delete per VE     0.00 sf     \$1.70 / SF     \$3,468       Delete per VE     0.00 sf     \$1.70 / SF     \$3,468       Delete per VE     0.00 sf     \$1.70 / SF     \$3,468       Delete per VE     0.00 sf     \$1.70 / SF     \$3,468       Delete per VE     0.00 sf     \$1.70 / SF     \$3,468       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / GSF     \$6,514       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       Exhaust Fan     1.00 ea     \$1,818.00 / ea     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696       Unit Heater - Elec     1.00 ea     \$3,262.30 / ea     \$3,262       D3050 FACILITY HVAC DISTRIBUTION SYSTEMS     \$6.13 / GSF     \$12,507       D3053 HVAC AIR DISTRIBUTION     \$6.13 / GSF     \$12,507       SM Coordination & Material Handli   | Hose Bibb  | 1.00 ea   | \$187.00 /ea   | \$187      |
| D2090 MISC. PLUMBING SYSTEMS     \$1.70 / GSF     \$3,468       D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       Admin & Expenses     2,040 sf     \$1.70 / SF     \$3,468       Delete per VE     0.00 sf     \$0     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / GSF     \$6,514       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       Exhaust Fan     1.00 ea     \$1,818.00 /ea     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696       Unit Heater - Elec     1.00 ea     \$1,434.00 /ea     \$1,434       Cabinet Unit Heater (ceiling)     1.00 ea     \$3,262.30 /ea     \$3,262       D3050 FACILITY HVAC DISTRIBUTION SYSTEMS     \$6.13 / GSF     \$12,507       D3053 HVAC AIR DISTRIBUTION     \$6.13 / GSF     \$12,507       SM Coordination & Material Handling     1.00 ls     \$375.00 /ls     \$375       Ductwork - Galvanized     600 lb     \$14.88 /lb     \$8,927   | Wall Hydrant   | 1.00 ea   | \$357.50 /ea   | \$358      |
| D2090 PLUMBING MISC ITEMS     \$1.70 / GSF     \$3,468       Admin & Expenses     2,040 sf     \$1.70 / sf     \$3,468       Delete per VE     0.00 sf     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0       23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF     \$0       D3040 HVAC MAJOR EQUIPMENT     \$3.19 / GSF     \$6,514       D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       Exhaust Fan     1.00 ea     \$1,818.00 /ea     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696       Unit Heater - Elec     1.00 ea     \$1,434.00 / ea     \$1,434       Cabinet Unit Heater (ceiling)     1.00 ea     \$3,262.30 / ea     \$3,262       D3050 FACILITY HVAC DISTRIBUTION SYSTEMS     \$6.13 / GSF     \$12,507       D3053 HVAC AIR DISTRIBUTION     \$3,150 /s     \$3,75       SM Coordination & Material Handling     1.00 ls     \$37,500 /ls     \$375       Ductwork - Galvanized     600 lb     \$14.88 /lb     \$8,927  | D2090 MISC. PLUMBING SYSTEMS                         |           | \$1.70 / GSF   | \$3,468    |
| Admin & Expenses<br>Delete per VE2,040 sf\$1.70 /sf\$3,468<br>\$0.00 sf23 HEATING, VENTILATING, & AIR CONDITIONING<br>(HVAC)2,040 GSF\$0.00 / GSF\$0D3040 HVAC MAJOR EQUIPMENT<br>D3040 HVAC MAJOR EQUIPMENT\$3.19 / GSF\$6,514B3040 HVAC MAJOR EQUIPMENT\$0.89 / GSF\$6,514B3040 HVAC MAJOR EQUIPMENT\$0.89 / GSF\$1,818Exhaust Fan1.00 ea\$1,818.00 /ea\$1,818D3041 TERMINAL & PACKAGE UNITS\$2.30 / GSF\$4,696Unit Heater - Elec1.00 ea\$1,434.00 /ea\$1,434Cabinet Unit Heater (ceiling)1.00 ea\$3,262.30 /ea\$3,262D3050 FACILITY HVAC DISTRIBUTION SYSTEMS\$6.13 / GSF\$12,507SM Coordination & Material Handling1.00 ls\$375.00 /ls\$375SM Coordination & Material Handling1.00 ls\$375.00 /ls\$375Ductwork - Galvanized600 lb\$14.88 /lb\$8,927  | D2090 PLUMBING MISC ITEMS                            |           | \$1.70 / GSF   | \$3,468    |
| Delete per VE0.00 sf\$023 HEATING, VENTILATING, & AIR CONDITIONING<br>(HVAC)2,040 GSF\$0.00 / GSF\$0D3040 HVAC MAJOR EQUIPMENT\$3.19 / GSF\$6,514D3040 HVAC MAJOR EQUIPMENT\$0.89 / GSF\$1,818Exhaust Fan1.00 ea\$1,818.00 /ea\$1,818D3041 TERMINAL & PACKAGE UNITS\$2.30 / GSF\$4,696Unit Heater - Elec1.00 ea\$1,434.00 /ea\$1,434Cabinet Unit Heater (ceiling)1.00 ea\$3,262.30 /ea\$3,262D3050 FACILITY HVAC DISTRIBUTION SYSTEMS\$6.13 / GSF\$12,507D3053 HVAC AIR DISTRIBUTION\$1.00 ls\$375.00 /ls\$375.00SM Coordination & Material Handling1.00 ls\$375.00 /ls\$375.00Ductwork - Galvanized600 lb\$14.88 /lb\$8,927   | Admin & Expenses                                     | 2,040 sf  | \$1.70 /sf     | \$3,468    |
| 23 HEATING, VENTILATING, & AIR CONDITIONING     2,040 GSF     \$0.00 / GSF   | Delete per VE  | 0.00 sf   |                | \$0        |
| D3040 HVAC MAJOR EQUIPMENT   \$3.19 / GSF   \$6,514     D3040 HVAC MAJOR EQUIPMENT   \$0.89 / GSF   \$1,818     Exhaust Fan   1.00 ea   \$1,818.00 /ea   \$1,818     D3041 TERMINAL & PACKAGE UNITS   \$2.30 / GSF   \$4,696     Unit Heater - Elec   1.00 ea   \$1,434.00 /ea   \$1,434     Cabinet Unit Heater (ceiling)   1.00 ea   \$3,262.30 /ea   \$3,262     D3050 FACILITY HVAC DISTRIBUTION SYSTEMS   \$6.13 / GSF   \$12,507     D3053 HVAC AIR DISTRIBUTION   \$1.00 ls   \$375.00 /ls   \$375     SM Coordination & Material Handling   1.00 ls   \$375.00 /ls   \$375     Ductwork - Galvanized   600 lb   \$14.88 /lb   \$8,927  | 23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC)   | 2,040 GSF | \$0.00 / GSF   | \$0        |
| D3040 HVAC MAJOR EQUIPMENT     \$0.89 / GSF     \$1,818       Exhaust Fan     1.00 ea     \$1,818.00 /ea     \$1,818       D3041 TERMINAL & PACKAGE UNITS     \$2.30 / GSF     \$4,696       Unit Heater - Elec     1.00 ea     \$1,434.00 /ea     \$1,434       Cabinet Unit Heater (ceiling)     1.00 ea     \$3,262.30 /ea     \$3,262       D3050 FACILITY HVAC DISTRIBUTION SYSTEMS     \$6.13 / GSF     \$12,507       D3053 HVAC AIR DISTRIBUTION     \$6.13 / GSF     \$12,507       SM Coordination & Material Handling     1.00 ls     \$375.00 /ls     \$375       Ductwork - Galvanized     600 lb     \$14.88 /lb     \$8,927   | D3040 HVAC MAJOR EQUIPMENT                           |           | \$3.19 / GSF   | \$6,514    |
| Exhaust Fan   1.00 ea   \$1,818.00 /ea   \$1,818     D3041 TERMINAL & PACKAGE UNITS   \$2.30 / GSF   \$4,696     Unit Heater - Elec   1.00 ea   \$1,434.00 /ea   \$1,434     Cabinet Unit Heater (ceiling)   1.00 ea   \$3,262.30 /ea   \$3,262     D3050 FACILITY HVAC DISTRIBUTION SYSTEMS   \$6.13 / GSF   \$12,507     D3053 HVAC AIR DISTRIBUTION   \$6.13 / GSF   \$12,507     SM Coordination & Material Handling   1.00 ls   \$375.00 /ls   \$375     Ductwork - Galvanized   600 lb   \$14.88 /lb   \$8,927   | D3040 HVAC MAJOR EQUIPMENT                           |           | \$0.89 / GSF   | \$1,818    |
| D3041 TERMINAL & PACKAGE UNITS   \$2.30 / GSF   \$4,696     Unit Heater - Elec   1.00 ea   \$1,434.00 /ea   \$1,434     Cabinet Unit Heater (ceiling)   1.00 ea   \$3,262.30 /ea   \$3,262     D3050 FACILITY HVAC DISTRIBUTION SYSTEMS   \$6.13 / GSF   \$12,507     D3053 HVAC AIR DISTRIBUTION   \$6.13 / GSF   \$12,507     SM Coordination & Material Handling   1.00 ls   \$375.00 /ls   \$375     Ductwork - Galvanized   600 lb   \$14.88 /lb   \$8,927  | Exhaust Fan  | 1.00 ea   | \$1.818.00 /ea | \$1.818    |
| Unit Heater - Elec   1.00 ea   \$1,434.00 /ea   \$1,434     Cabinet Unit Heater (ceiling)   1.00 ea   \$3,262.30 /ea   \$3,262     D3050 FACILITY HVAC DISTRIBUTION SYSTEMS   \$6.13 / GSF   \$12,507     D3053 HVAC AIR DISTRIBUTION   \$6.13 / GSF   \$12,507     SM Coordination & Material Handling   1.00 ls   \$375.00 /ls   \$375     Ductwork - Galvanized   600 lb   \$14.88 /lb   \$8,927  | D3041 TERMINAL & PACKAGE UNITS                       |           | \$2.30 / GSF   | \$4.696    |
| Cabinet Unit Heater (ceiling)   1.00 ea   \$3,262.30 /ea   \$3,262     D3050 FACILITY HVAC DISTRIBUTION SYSTEMS   \$6.13 / GSF   \$12,507     D3053 HVAC AIR DISTRIBUTION   \$6.13 / GSF   \$12,507     SM Coordination & Material Handling   1.00 ls   \$375.00 /ls   \$375     Ductwork - Galvanized   600 lb   \$14.88 /lb   \$8,927  | Unit Heater - Elec                                   | 1.00 ea   | \$1.434.00 /ea | \$1.434    |
| D3050 FACILITY HVAC DISTRIBUTION SYSTEMS   \$6.13 / GSF   \$12,507     D3053 HVAC AIR DISTRIBUTION   \$6.13 / GSF   \$12,507     SM Coordination & Material Handling   1.00 ls   \$375.00 / ls   \$375     Ductwork - Galvanized   600 lb   \$14.88 / lb   \$8,927   | Cabinet Unit Heater (ceiling)                        | 1.00 ea   | \$3,262.30 /ea | \$3,262    |
| D3053 HVAC AIR DISTRIBUTION     \$6.13 / GSF     \$12,507       SM Coordination & Material Handling     1.00 ls     \$375.00 /ls     \$375       Ductwork - Galvanized     600 lb     \$14.88 /lb     \$8,927  | D3050 FACILITY HVAC DISTRIBUTION SYSTEMS             |           | \$6.13 / GSF   | \$12,507   |
| SM Coordination & Material Handling1.00 ls\$375.00 /ls\$375Ductwork - Galvanized600 lb\$14.88 /lb\$8,927   | D3053 HVAC AIR DISTRIBUTION                          |           | \$6,13 / GSF   | \$12.507   |
| Ductwork - Galvanized     600     Ib     \$14.88     /Ib     \$8,927   | SM Coordination & Material Handling                  | 1.00 ls   | \$375.00 /ls   | \$375      |
|  | Ductwork - Galvanized                                | 600 lb    | \$14.88 /lb    | \$8,927    |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY  | UNIT COST        | TOTAL COST |
|--|-----------|------------------|------------|
| Air Duct Accessories   | 1.00 ls   | \$1,000.00 /ls   | \$1,000    |
| Plenums  | 2.00 ea   | \$500.00 /ea     | \$1,000    |
| RGDs and Vents   | 4.00 ea   | \$301.25 /ea     | \$1,205    |
| D3060 CONTROLS & INSTRUMENTATION   |           | \$1.23 / GSF     | \$2,500    |
| D3061 AUTOMATIC TEMPERATURE CONTROLS                                       |           | \$1.23 / GSF     | \$2,500    |
| ATC - BMS CO2 Monitoring   | 1.00 ls   | \$2,500.00 /ls   | \$2,500    |
| D3080 SYSTEMS TESTING & BALANCING  |           | \$0.20 / GSF     | \$400      |
| D3080 AIR & WATER BALANCE  |           | \$0.20 / GSF     | \$400      |
| Testing & Balancing  | 1.00 ls   | \$400.00 /ls     | \$400      |
| D3090 OTHER HVAC SYSTEMS & EQUIP   |           | (\$10.75) / GSF  | (\$21,921) |
| D3091 HVAC MISC ITEMS  |           | (\$10.75) / GSF  | (\$21,921) |
| Delete per VE  | -1.00 ls  | \$24,420.86 /ls  | (\$24,421) |
| Project Expenses and Commissioning   | 1.00 ls   | \$2,500.00 /ls   | \$2,500    |
| 26 ELECTRICAL  | 2,040 GSF | \$22.86 / GSF    | \$46,627   |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION                                    |           | \$16.66 / GSF    | \$33,979   |
| D5023 LARGE POWER & DISTRIBUTION   |           | \$8.69 / GSF     | \$17,720   |
| 75 KVA NEMA 1 Transformer composite unit                                   | 1.00 ea   | \$10,373.93 /ea  | \$10,374   |
| 225 AMP 120/208 Panel board surface mounted composite unit                 | 1.00 ea   | \$4,107.12 /ea   | \$4,107    |
| 400 AMP 277/480 Panel board surface mounted composite unit                 | 1.00 ea   | \$7,078.62 /ea   | \$7,079    |
| Large Power and Distibution  | 2,040 gsf | \$4.00 /gsf      | \$8,160    |
| Large Power and Distibution Recon Reduction                                | -1.00 gsf | \$12,000.00 /gsf | (\$12,000) |
| D5027 MECHANICAL EQUIPMENT CONNECTIONS                                     |           | \$5.93 / GSF     | \$12,099   |
| E3EQ   ACCU 30A composite unit connection Mechanical<br>Schedule in feeder | 1.00 ea   | \$448.22 /ea     | \$448      |
| EUH 1 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite<br>unit       | 3.00 ea   | \$655.72 /ea     | \$1,967    |
| EUH 2 - 30 A composite unit connection and Feeder                          | 1.00 ea   | \$655.72 /ea     | \$656      |
| EWH 30 A composite unit connection and Feeder                              | 2.00 ea   | \$448.22 /ea     | \$896      |
| F - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit              | 1.00 ea   | \$655.72 /ea     | \$656      |
| 30 AMP EMT Composite feeders copper - Mechanical                           | 400 lf    | \$18.69 /lf      | \$7,476    |
| D5029 SMALL POWER DEVICES & WIRING   |           | \$2.04 / GSF     | \$4,160    |
| Small Power \$/sf - Maintenance Building                                   | 2,040 sf  | \$4.00 /sf       | \$8,160    |
| Small Power Reduction per rec  | -1.00 sf  | \$4,000.00 /sf   | (\$4,000)  |
| D5040 LIGHTING   |           | \$4.12 / GSF     | \$8,398    |
| D5042 LIGHT FIXTURES   |           | \$2.66 / GSF     | \$5,434    |
| 20 AMP EMT Composite feeders copper - Lighting Branch                      | 250 lf    | \$16.93 /lf      | \$4,233    |
| WP Exterior Wall Mounted Light Fixture                                     | 1.00 ea   | \$401.76 /ea     | \$402      |
| F1 Lighting Fixture  | 4.00 ea   | \$200.00 /ea     | \$800      |
| D5044 LIGHTING CONTROLS & WIRING   |           | \$1.45 / GSF     | \$2,964    |
| S3 (1) 3 way switch composite unit   | 2.00 ea   | \$85.00 /ea      | \$170      |
| Ceiling mounted occupancy sensor composite unit                            | 1.00 ea   | \$254.07 /ea     | \$254      |
| 20 AMP EMT Composite feeders copper - Lighting Control Branch              | 150 lf    | \$16.93 /lf      | \$2,540    |
| D5090 OTHER ELECTRICAL SYSTEMS   |           | \$2.08 / GSF     | \$4,250    |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY  | UNIT COST      | TOTAL COST      |
|---|-----------|----------------|-----------------|
| D5094 GROUNDING & LIGHTNING PROTECTION SYS.                                 |           | \$0.25 / GSF   | \$517           |
| Grounding   | 2,040 gsf | \$0.25 /gsf    | \$517           |
| D5095 MISCELLANEOUS ELECTRICAL SYSTEMS                                      |           | \$1.83 / GSF   | \$3,733         |
| Mis Expenses  | 2,040 gsf | \$2.00 /gsf    | \$4,081         |
| Mis Expenses Reduction per Recon  | -1.00 ea  | \$2,000.00 /ea | (\$2,000)       |
| Temp Lighting and Power   | 2,040 gsf | \$0.81 /gsf    | \$1,652         |
| 27 COMMUNICATIONS   | 2,040 GSF | \$1.75 / GSF   | \$3,567         |
| D5090 OTHER ELECTRICAL SYSTEMS  |           | \$0.09 / GSF   | \$174           |
| D5092 CLOCK SYSTEMS   |           | \$0.09 / GSF   | \$174           |
| Clock Single Face Battery or 110 clock                                      | 1.00 ea   | \$173.54 /ea   | \$174           |
| D6010 COMMUNICATIONS & SECURITY   |           | \$1.27 / GSF   | \$2,585         |
| D6013 TEL/DATA SYSTEM   |           | \$1.27 / GSF   | \$2,585         |
| Fit-Out Telcom Equipment composite unit                                     | 1.00 ea   | \$1,551.00 /ea | \$1,551         |
| WP - "VOIP" Wall Telephone Outlet   | 1.00 ea   | \$613.10 /ea   | \$613           |
| D2 Data jack with 1" Stub up to accessible ceiling composite unit 10 feet   | 1.00 ea   | \$529.51 /ea   | \$530           |
| Telcom Recon adjusment  | -1.00 ea  | \$600.00 /ea   | (\$600)         |
| WAP jack ceiling mounted composite unit                                     | 1.00 ea   | \$491.78 /ea   | \$492           |
| D6030 SOUND AND A/V   |           | \$0.40 / GSF   | \$808           |
| D6032 SOUND/PA SYSTEMS  |           | \$0.40 / GSF   | \$808           |
| PA Horn Speaker   | 1.00 ea   | \$400.00 /ea   | \$400           |
| Volume Controls   | 1.00 ea   | \$150.00 /ea   | \$150           |
| LV Cabling for Speaker  | 100 lf    | \$2.58 /lf     | \$258           |
| 28 ELECTRONIC SAFETY & SECURITY   | 2,040 GSF | \$5.85 / GSF   | \$11,927        |
| D6010 COMMUNICATIONS & SECURITY   |           | \$4.59 / GSF   | \$9,37 <b>3</b> |
| D6011 FIRE ALARM SYSTEM   |           | \$1.52 / GSF   | \$3,110         |
| Fire alarm manual pull station composite unit                               | 2.00 ea   | \$269.35 /ea   | \$539           |
| Fire Alarm Manual pull station composite unit                               | 2.00 ea   | \$271.61 /ea   | \$543           |
| Fire Alarm Heat detector composite unit                                     | 3.00 ea   | \$457.54 /ea   | \$1,373         |
| Fire alarm speaker strobe Ceiling WP composite unit                         | 2.00 ea   | \$327.77 /ea   | \$656           |
| D6016 SURVEILLANCE CCTV SYSTEM  |           | \$1.71 / GSF   | \$3,497         |
| Cat 6 Cable   | 50 lf     | \$0.79 /lf     | \$40            |
| CCTV Head End   | 1.00 ea   | \$1,000.00 /ea | \$1,000         |
| CCTV D1 Data Jacks  | 1.00 ea   | \$356.76 /ea   | \$357           |
| CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly<br>Composite Unit | 1.00 ea   | \$2,101.00 /ea | \$2,101         |
| D6017 SECURITY ACCESS CONTROL   |           | \$1.36 / GSF   | \$2,766         |
| Security Composite Cable Per Foot   | 350 lf    | \$1.25 /lf     | \$438           |
| Security Card Reader Composite Unit   | 1.00 ea   | \$259.29 /ea   | \$259           |
| Security Key Pad Composite Unit   | 1.00 ea   | \$475.28 /ea   | \$475           |
| Security DC - Door Contact / Roof Hatch Contact Composite Unit              | 5.00 ea   | \$198.77 /ea   | \$994           |
| Security Control Unit - Small Composite Unit                                | 1.00 ea   | \$1,200.00 /ea | \$1,200         |



| DESCRIPTION  | QUANTITY  | QUANTITY UNIT COST |          |
|--|-----------|--------------------|----------|
| Security Reduction per Recon                           | -1.00 ea  | \$600.00 /ea       | (\$600)  |
| D7050 DETECTION & ALARM                                |           | \$1.25 / GSF       | \$2,554  |
| D6011 FIRE ALARM SYSTEM                                |           | \$1.25 / GSF       | \$2,554  |
| 3/4" EMT 2#14 and 18/2 Twisted shielded composite unit | 200 lf    | \$12.77 /lf        | \$2,554  |
| 33 UTILITIES   | 2,040 GSF | \$5.00 / GSF       | \$10,200 |
| A1010 STANDARD FOUNDATIONS                             |           | \$5.00 / GSF       | \$10,200 |
| A1010 STANDARD FOUNDATIONS                             |           | \$5.00 / GSF       | \$10,200 |
| F&I Building Foundation Drainage - Perforated PVC      | 2,040 sf  | \$5.00 /sf         | \$10,200 |
| TOTAL MAINTENANCE BLDG                                 | \$25      | \$518,969          |          |

#### 60% CD Estimate - Reconciled incl VE



#### SITEWORK

| DESCRIPTION  | QUANTITY    | UNIT COST         | TOTAL COST  |
|--|-------------|-------------------|-------------|
| 01 GENERAL REQUIREMENTS  | 382,610 GSF | \$3.50 / GSF      | \$1,338,375 |
| Z1050 TEMPORARY FACILITIES & CONTROLS                              |             | \$3.50 / GSF      | \$1,338,375 |
| Z1055 TEMPORARY CONSTRUCTION                                       |             | \$3.50 / GSF      | \$1,338,375 |
| Emergency Spill Kit  | 1.00 ea     | \$2,000.00 /ea    | \$2,000     |
| Temporary Water and Electric Service - Hook-up & Maintenance       | 1.00 ls     | \$35,000.00 /ls   | \$35,000    |
| Temporary Walkways   | 1.00 ls     | \$50,000.00 /ls   | \$50,000    |
| Water Truck / Dust Control   | 1.00 ls     | \$30,000.00 /ls   | \$30,000    |
| Dewatering - Pumps / Maintenance - Demo/Foundation                 | 1.00 ls     | \$400,000.00 /ls  | \$400,000   |
| Temporary Access Roads - Farm Rd & Existing Campus Path            | 4,600 sy    | \$32.50 /sy       | \$149,500   |
| Temporary Laydown Area - Prep / Maintain                           | 14,275 sy   | \$25.00 /sy       | \$356,875   |
| Repair Existing Streets, Sidewalks                                 | 1.00 allw   | \$50,000.00 /allw | \$50,000    |
| Temporary Barriers & Public Safety                                 | 1.00 ls     | \$40,000.00 /ls   | \$40,000    |
| Temporary Bridge Crossing  | 1.00 ls     | \$150,000.00 /ls  | \$150,000   |
| Traffic Control - Install & Maintain                               | 1.00 ls     | \$25,000.00 /ls   | \$25,000    |
| Snow Removal   | 1.00 ls     | \$25,000.00 /ls   | \$25,000    |
| Street Sweeping  | 1.00 ls     | \$25,000.00 /ls   | \$25,000    |
| 02 EXISTING CONDITIONS   | 382,610 GSF | \$1.94 / GSF      | \$742,721   |
| G1020 SITE ELEMENTS DEMOLITION                                     |             | \$0.92 / GSF      | \$350,721   |
| G1023 INFRASTRUCTURE DEMOLITION                                    |             | \$0.92 / GSF      | \$350,721   |
| R&D Elec Conduit   | 581 lf      | \$27.00 /lf       | \$15,687    |
| R&D Elec DB  | 1,173 lf    | \$43.00 /lf       | \$50,439    |
| R&D Gas  | 132 lf      | \$27.00 /lf       | \$3,564     |
| R&D Sewer/Drain Pipe   | 4,122 lf    | \$31.00 /lf       | \$127,782   |
| R&D Water  | 2,859 lf    | \$31.00 /lf       | \$88,629    |
| Cut & Cap Water Service  | 2.00 ea     | \$16,500.00 /ea   | \$33,000    |
| R&D Sewer Drain Structure  | 51 ea       | \$620.00 /ea      | \$31,620    |
| Z1050 TEMPORARY FACILITIES & CONTROLS                              |             | \$1.02 / GSF      | \$392,000   |
| Z1055 TEMPORARY CONSTRUCTION                                       |             | \$1.02 / GSF      | \$392,000   |
| Temp Construction Fence w Rock Cores                               | 7,000 lf    | \$56.00 /lf       | \$392,000   |
| Wrap Building to Place Slabs - incl w GRs                          | 0.00 ls     |                   | \$0         |
| 10 SPECIALTIES   | 382,610 GSF | \$0.08 / GSF      | \$30,000    |
| G2060 SITE DEVELOPMENT   |             | \$0.08 / GSF      | \$30,000    |
| G2056 SIGNAGE  |             | \$0.08 / GSF      | \$30.000    |
| Custom Site / Building Sign Allowance                              | 1.00 allw   | \$30,000.00 /allw | \$30,000    |
| 11 EOUIPMENT   | 382.610 GSF | \$1.66 / GSF      | \$635.575   |
| G2050 ATHLETIC. RECREATIONAL & PLAYFIFLD AREAS                     |             | \$1.66 / GSF      | \$635.575   |
|  |             | \$1.66 / GSF      | ¢625 575    |
| Permanent Bleachers (F&I) including pressbox - ADJUST PER<br>RECON | 508 seat    | \$679.13 /seat    | \$345,000   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY    | UNIT COST        | TOTAL COST  |
|---|-------------|------------------|-------------|
| Sportsfield Specialties - Prefabricated Ticket Booth (material only)                    | 0.00 excl   |                  | \$0         |
| Sportsfield Specialties - Scoreboard - Football   | 1.00 ea     | \$100,000.00 /ea | \$100,000   |
| Sportsfield Specialties - Scoreboard - other  | 2.00 ea     | \$30,000.00 /ea  | \$60,000    |
| Sportsfield Specialties - Baseball - Bases, Sleeves (material only)                     | 0.00 ls     |                  | \$0         |
| Sportsfield Specialties - Softball - Bases, Sleeves (material only)                     | 0.00 ls     |                  | \$0         |
| Sportsfield Specialties - Pitching Rubber (material only)                               | 0.00 ea     |                  | \$0         |
| Sportsfield Specialties - Home Plate (material only)                                    | 0.00 ea     |                  | \$0         |
| Sportsfield Specialties - Stadium Safety Netting System (material only) - add alternate | 0.00 If     |                  | \$0         |
| Sportsfield Specialties - Baseball Batting Tunnel (material only)                       | 0.00 excl   |                  | \$0         |
| Sportsfield Specialties - Softball Batting Tunnel (material only)                       | 0.00 excl   |                  | \$0         |
| Sportsfield Specialties - Baseball / Softball Foul Pole (material only)                 | 0.00 ea     |                  | \$0         |
| Sportsfield Specialties - Baseball - Dugouts 8'x34' (material only)                     | 0.00 ea     |                  | \$0         |
| Sportsfield Specialties - Softball- Dugouts 8'x34' (material only)                      | 0.00 ea     |                  | \$0         |
| Sportsfield Specialties - Team Benches at Dugouts (material only)                       | 0.00 ea     |                  | \$0         |
| Sportsfield Specialties - Helmut Caddy / Bat Bin (material only)                        | 0.00 ea     |                  | \$0         |
| Sportsfield Specialties - Tension Netting Backstop - 32'h - Softball<br>(material only) | 0.00 lf     |                  | \$0         |
| Sportsfield Specialties - Tension Netting Backstop - 42'h - Baseball<br>(material only) | 0.00 lf     |                  | \$0         |
| Sportsfield Specialties - Football - Goal Posts (material only)                         | 2.00 ea     | \$6,330.00 /ea   | \$12,660    |
| Sportsfield Specialties - Football - Goal Posts Pads (material only)                    | 2.00 ea     | \$595.00 /ea     | \$1,190     |
| Sportsfield Specialties - Soccer Goal Safety System (material only)                     | 0.00 alt    |                  | \$0         |
| Sportsfield Specialties - Shot Put/Hammer Throw Ring (material only)                    | 1.00 ea     | \$385.00 /ea     | \$385       |
| Sportsfield Specialties - Shot Put Toe Board (material only)                            | 1.00 ea     | \$435.00 /ea     | \$435       |
| Sportsfield Specialties - Shot Put Cage (material only)                                 | 1.00 ea     | \$2,310.00 /ea   | \$2,310     |
| Sportsfield Specialties - Shot Put Backup Net (material only)                           | 1.00 ea     | \$395.00 /ea     | \$395       |
| Sportsfield Specialties - Pole Vault Box (material only)                                | 1.00 ea     | \$1,170.00 /ea   | \$1,170     |
| Sportsfield Specialties - Pole Vault Standard Forming System<br>(material only)         | 1.00 ea     | \$1,935.00 /ea   | \$1,935     |
| Sportsfield Specialties - Pole Vault Equipment Set (material only)                      | 1.00 ea     | \$21,970.00 /ea  | \$21,970    |
| Sportsfield Specialties - Long/Triple Jump Takeoff Boards<br>(material only)            | 1.00 ea     | \$1,085.00 /ea   | \$1,085     |
| Sportsfield Specialties - Tennis Court Nets - Net, Posts, Sleeves<br>(material only)    | 0.00 alt    |                  | \$0         |
| Exterior Athletic Equipment - Labor to Unbox, Assemble, & Install                       | 16 crdy     | \$5,440.00 /crdy | \$87,040    |
| Outdoor Fitness Equipment   | 0.00 alt    |                  | \$0         |
| Backstops   | 0.00 alt    |                  | \$0         |
| Softball - Field Backstops  | 0.00 alt    |                  | \$0         |
| 26 ELECTRICAL   | 382,610 GSF | \$6.58 / GSF     | \$2,518,620 |
| D5020 ELECTRICAL SERVICE & DISTRIBUTION   |             | \$3.84 / GSF     | \$1,468,781 |
| D5021 MEDIUM VOLTAGE CONDUIT AND CABLING  |             | \$1.27 / GSF     | \$484,408   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTIT  | Y UNIT CC      | DST   | TOTAL COST       |
|--|----------|----------------|-------|------------------|
| Precast Electric Manhole w/Cover 6 x 6 x 10 - 07/01/22<br>Maintenance Building                                       | 5.00 e   | a \$6,856.16   | /ea   | \$34,281         |
| Primary Above Ground Enclosures- 07/01/22 Main Distribution  | 12 e     | a \$5,806.14   | /ea   | \$69,674         |
| Ground Manholes and above Ground Enclosures  | 17 e     | a \$740.48     | /ea   | \$12,588         |
| Ground Transformer Pads - 07/01/22 Locker Building   | 1.00 e   | a \$2,683.37   | /ea   | \$2,683          |
| Ground Transformer Pads - 07/01/22 Main Distribution   | 2.00 e   | a \$2,683.37   | /ea   | \$5,367          |
| Layout Transformer Pads - 07/01/22 Locker Building   | 1.00 e   | a \$2,683.37   | /ea   | \$2,683          |
| Layout Transformer Pads - 07/01/22 Main Distribution   | 2.00 e   | a \$2,683.37   | /ea   | \$5 <i>,</i> 367 |
| Existing overhead Services Removed   | 312 e    | a \$19.84      | /ea   | \$6,191          |
| Feeder   #001 (2) 5" Empty PVC Conduit Spares for primary with<br>pull string composite unit - Large Power           | 1,818 lf | \$37.20        | /If   | \$67,626         |
| Feeder   #079 (4) 5" Empty PVC Conduit Spares for primary with<br>pull string composite unit - Large Power           | 1,838 lf | \$74.40        | /If   | \$136,747        |
| Feeder   #086 (4) 5" Emergency Empty PVC Conduit Spares for<br>primary with pull string composite unit - Large Power | 1,796 lf | \$74.40        | /lf   | \$133,622        |
| Telcom Cable Overhead  | 99 lf    | \$76.55        | /lf   | \$7,579          |
| D5022 MEDIUM VOLTAGE SWITCHGEAR AND PANELBOARD   |          | \$0.00         | / GSF | \$0              |
| 13.8KV 480/277 1200A Pad Mntd. Transformer to locker bldg. by Utility Company  | 1.00 e   | a \$0.00       | /ea   | \$0              |
| 13.8KV 480/277 Pad Mntd. Transformers to Main bldg. by Utility Company   | 2.00 e   | a \$0.00       | /ea   | \$0              |
| Generator by Utility Company   | 1.00 e   | a \$0.00       | /ea   | \$0              |
| D5024 LARGE POWER FEEDER CONDUIT   |          | \$2.54         | / GSF | \$970,693        |
| 225 AMP PVC Composite feeders Copper - Large Power EV<br>charging Station  | 401 lf   | \$102.06       | /If   | \$40,927         |
| 250 AMP PVC Composite feeder copper - Large Power to sports field lighting   | 650 lf   | \$98.13        | /If   | \$63,787         |
| 400 AMP PVC Composite feeder copper - Large Power<br>Maintenace Building   | 985 lf   | \$162.63       | /If   | \$160,188        |
| Feeder   #085 600 AMP PVC Composite feeder copper - Large<br>Power   | 295 lf   | \$243.95       | /lf   | \$71,965         |
| 600 AMP PVC Composite feeder copper - Large Power Temp   | 600 lf   | \$177.66       | /lf   | \$106,594        |
| Feeder   #002 4000 AMP PVC Composite feeder copper - Large<br>Power  | 169 lf   | \$1,464.53     | /If   | \$247,506        |
| Feeder   #080 4000 AMP PVC Composite feeder copper - Large<br>Power  | 191 lf   | \$1,464.53     | /lf   | \$279,726        |
| D5029 SMALL POWER DEVICES & WIRING   |          | \$0.01         | / GSF | \$3,043          |
| Power to field Scoreboards   | 2.00 g   | sf \$1,521.43  | /gsf  | \$3,043          |
| D5049 SITE LIGHTING  |          | \$0.03         | / GSF | \$10,637         |
| 100 AMP EMT Composite feeders Copper - Large Power   | 100 lf   | \$106.37       | /lf   | \$10,637         |
| D5040 LIGHTING   |          | \$2.73         | / GSF | \$1,042,819      |
| D5048 SPORTS LIGHTING  |          | \$1.13         | / GSF | \$431,378        |
| Site Lighting Branch   | 2,000 e  | a \$25.69      | /ea   | \$51,378         |
| Reduced sports lighting based on RLB quote per recn  | -1.00 e  | a \$120,000.00 | /ea   | (\$120,000)      |
| Sport Lighting S1 thru @4 for Football includes base install and rigging   | 4.00 e   | a \$125,000.00 | /ea   | \$500,000        |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST       | TOTAL COST |
|--|-------------|-----------------|------------|
| D5049 SITE LIGHTING  |             | \$1.60 / GSF    | \$611,441  |
| Ground Pole Base   | 112 ea      | \$499.22 /ea    | \$55,913   |
| Power to Digital Sign at entrance  | 1.00 ea     | \$1,466.67 /ea  | \$1,467    |
| Sitel Lighting Pole Base   | 112 ea      | \$993.66 /ea    | \$111,290  |
| Quazite Handhole Enclosure Composite Unit - Cover included   | 137 ea      | \$918.52 /ea    | \$125,837  |
| 2" PVC future  | 100 ea      | \$16.45 /ea     | \$1,645    |
| 2" PVC Gas Storage to building   | 918 ea      | \$16.45 /ea     | \$15,103   |
| 30 AMP PVC Composite feeder  | 64 lf       | \$16.89 /lf     | \$1,081    |
| 30 AMP PVC Composite feeder EV Shargins Station  | 800 lf      | \$16.89 /lf     | \$13,511   |
| Site Branch to Digital Sign 2"   | 918 ea      | \$14.77 /ea     | \$13,556   |
| Site Lighting Branch 2" branch   | 5,139 ea    | \$14.77 /ea     | \$75,887   |
| Electrical Vehicle Charging Station Charging Station @ Site VE<br>E09B CHARGING STATIONS FURNISHED BY OTHERS       | 0.00 ea     |                 | \$0        |
| Site Lighting - cantenary Lighting per linear foot 5 rows - VE-E-18 provisions for future only (savings ~\$11,300) | 0.00 ls     |                 | \$0        |
| EXW1 Light Fixture Exterior Wall Mounted Light Composite Unit  | 6.00 ea     | \$649.76 /ea    | \$3,899    |
| EXB1 Light Fixture Site Lit Bollard Composite Unit   | 25 ea       | \$1,886.51 /ea  | \$47,163   |
| 5000 Watt Ground Light Fixture Site Landscape Light Composite<br>Unit  | 6.00 ea     | \$436.26 /ea    | \$2,618    |
| Site Lighting EXP3   | 10 ea       | \$2,612.48 /ea  | \$26,125   |
| EXP1BC Light Fixture Site Pole Single Head Composite Unit  | 3.00 ea     | \$2,017.98 /ea  | \$6,054    |
| Exp4 Light Fixture Site Pole Single Head Composite Unit  | 1.00 ea     | \$2,017.98 /ea  | \$2,018    |
| Site Lighting cost reduction per REcon   | -1.00 ea    | \$35,000.00 /ea | (\$35,000) |
| Site Lighting EXF1   | 19 ea       | \$2,017.98 /ea  | \$38,342   |
| Site Lighting EXP1   | 37 ea       | \$2,017.98 /ea  | \$74,665   |
| Site Lighting EXP3   | 15 ea       | \$2,017.98 /ea  | \$30,270   |
| D5090 OTHER ELECTRICAL SYSTEMS   |             | \$0.02 / GSF    | \$7,020    |
| D5095 MISCELLANEOUS ELECTRICAL SYSTEMS   |             | \$0.02 / GSF    | \$7,020    |
| Quad Shak Lighting Power and Teldata   | 1.00 ea     | \$7,020.00 /ea  | \$7,020    |
| 27 COMMUNICATIONS  | 382,610 GSF | \$1.07 / GSF    | \$411,260  |
| D6010 COMMUNICATIONS & SECURITY  |             | \$1.07 / GSF    | \$411,260  |
| D6013 TEL/DATA SYSTEM  |             | \$1.07 / GSF    | \$411,260  |
| 4X6 Telcom Handhole  | 3.00 ea     | \$4,231.33 /ea  | \$12,694   |
| 6x6x10 Telcom Handhole   | 8.00 ea     | \$6,875.90 /ea  | \$55,007   |
| Keep Existing Telcom Service Operation Allowance   | 1.00 ea     | \$3,702.41 /ea  | \$3,702    |
| Telcom Utility Box   | 6.00 ea     | \$7,933.73 /ea  | \$47,602   |
| (1) 4" Empty PVC Conduit with pull String composite unit Fire<br>Alarm Concessions                                 | 563 lf      | \$38.47 /lf     | \$21,661   |
| (1) 4" Empty PVC Conduit with pull String composite unit for<br>telcom *   | 1,675 lf    | \$38.47 /lf     | \$64,437   |
| (1) 4" Empty PVC Conduit with pull String composite unit telcom<br>Concessions                                     | 563 lf      | \$38.47 /lf     | \$21,661   |
| (2) 4" Empty PVC Conduit with pull String composite unit spare<br>for telcom and Fire Alarm*                       | 1,670 lf    | \$18.95 /lf     | \$31,642   |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY    |                    | TOTAL COST   |
|---|-------------|--------------------|--------------|
| (4) 4" Empty PVC Conduit with pull String composite unit                        | 77 lf       | \$37.90 /lf        | \$2,918      |
| (8) 4" Empty PVC Conduit with pull String composite unit                        | 1,955 lf    | \$76.69 /lf        | \$149,934    |
| 28 ELECTRONIC SAFETY & SECURITY   | 382,610 GSF | \$0.14 / GSF       | \$54,061     |
| D7050 DETECTION & ALARM   |             | \$0.14 / GSF       | \$54,061     |
| D6011 FIRE ALARM SYSTEM   |             | \$0.08 / GSF       | \$29,061     |
| (1) 4" Empty PVC Conduit with pull String composite unit for Fire<br>Alarm*     | 1,675 lf    | \$17.35 /lf        | \$29,061     |
| D6017 SECURITY ACCESS CONTROL   |             | \$0.07 / GSF       | \$25,000     |
| Security Gate and Power added during Recon 12-20-2022                           | 1.00 ea     | \$25,000.00 /ea    | \$25,000     |
| 31 EARTHWORK  | 382,610 GSF | \$48.82 / GSF      | \$18,678,689 |
| G1010 SITE CLEARING   |             | \$2.43 / GSF       | \$930,412    |
| G1011 CLEARING & GRUBBING   |             | \$2.43 / GSF       | \$930,412    |
| Bulk Site Clearing & Grubbing   | 35 acre     | \$5,600.00 /acre   | \$196,000    |
| Strip Forest Mat P1 - Offsite Disposal - P1                                     | 10,000 cy   | \$42.00 /cy        | \$420,000    |
| Strip topsoil & screen & stockpile for re-use P1 - P2                           | 8,274 cy    | \$38.00 /cy        | \$314,412    |
| G1030 SITE ELEMENT RELOCATIONS  |             | \$30.63 / GSF      | \$11,720,304 |
| G1033 ROCK EXCAVATION   |             | \$26.30 / GSF      | \$10,060,948 |
| Mass Rock Blasting  | 138,361 cy  | \$20.00 /cy        | \$2,767,220  |
| Mass Rock Excavation  | 138,361 cy  | \$16.00 /cy        | \$2,213,776  |
| Mass Rock Processing  | 138,361 cy  | \$14.00 /cy        | \$1,937,054  |
| Allow for additional material handling due to logistics -<br>ADJUSTED PER RECON | 148,632 cy  | \$5.00 /cy         | \$743,160    |
| Allow for Rock Scaling  | 1.00 allw   | \$150,000.00 /allw | \$150,000    |
| PER RECON - ADD ROCK EXCAVATION TO SUBSURFACE SYTEM #2                          | 5,327 cy    | \$55.00 /cy        | \$292,967    |
| PER RECON - ADJUST TO 5' BELOW SLAB FOR OVERBLAST                               | 16,667 cy   | \$55.00 /cy        | \$916,667    |
| Trench Rock Blasting  | 10,001 cy   | \$75.00 /cy        | \$750,075    |
| Trench Rock Excavation  | 10,001 cy   | \$15.00 /cy        | \$150,015    |
| Trench Rock Processing  | 10,001 cy   | \$14.00 /cy        | \$140,014    |
| G1034 FILL & BORROW   |             | \$3.56 / GSF       | \$1,363,698  |
| Fill to get to sub grade elev - phase 1 - from onsite processed rock            | 49,222 cy   | \$18.00 /cy        | \$885,996    |
| Fill to get to sub grade elev - phase 2 - from onsite processed rock            | 26,539 cy   | \$18.00 /cy        | \$477,702    |
| G1035 TEMPORARY EROSION & SEDIMENT CONTROL                                      |             | \$0.77 / GSF       | \$295,659    |
| Antitracking Pads   | 6.00 ea     | \$5,500.00 /ea     | \$33,000     |
| Erosion Control Hay Bales / Silt Fence  | 8,377 lf    | \$10.50 /lf        | \$87,959     |
| Erosion Control Blankets & Mats   | 1.00 ls     | \$40,000.00 /ls    | \$40,000     |
| Erosion Control - CB Inlet Protection   | 149 ls      | \$300.00 /ls       | \$44,700     |
| Erosion Control - Maintain / remove   | 1.00 ls     | \$90,000.00 /ls    | \$90,000     |
| G1070 SITE EARTHWORK  |             | \$12.30 / GSF      | \$4,706,399  |
| G1072 EXCAVATION & FILL   |             | \$12.30 / GSF      | \$4,706,399  |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST       | TOTAL COST  |
|--|-------------|-----------------|-------------|
| Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 1      | 20,386 cy   | \$42.00 /cy     | \$856,212   |
| Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 2      | 39,376 cy   | \$42.00 /cy     | \$1,653,792 |
| Bulk Excavation Offsite Disposal - processed rock Phase 1 (sell) -<br>ADJUST PER RECON | 62,601 cy   | \$15.00 /cy     | \$939,015   |
| Excavate & Backfill for Site Improvements items (pads / stairs, etc)                   | 20,000 cy   | \$40.00 /cy     | \$800,000   |
| Rip Rap Slopes   | 3,267 cy    | \$140.00 /cy    | \$457,380   |
| G2010 ROADWAYS   |             | \$1.03 / GSF    | \$393,146   |
| G2011 ROADWAY PAVEMENT   |             | \$1.03 / GSF    | \$393,146   |
| Fine Grade Pavement Base   | 316,791 sf  | \$0.50 /sf      | \$158,396   |
| Backfill Pavement Base Mat'l processed material  | 15,650 cy   | \$15.00 /cy     | \$234,750   |
| G2030 PEDESTRIAN PLAZAS & WALKWAYS   |             | \$0.64 / GSF    | \$245,928   |
| G2031 PEDESTRIAN PAVEMENT  |             | \$0.64 / GSF    | \$245,928   |
| Prepare & Compact Subbase  | 78,756 sf   | \$0.50 /sf      | \$39,378    |
| Backfill Pavement Base Mat'l processed material  | 2,550 cy    | \$81.00 /cy     | \$206,550   |
| G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS  |             | \$1.78 / GSF    | \$682,500   |
| G2057 PLAYING FIELDS   |             | \$1.78 / GSF    | \$682,500   |
| Prepare & Compact Subbase  | 130,000 sf  | \$1.00 /sf      | \$130,000   |
| Subgrade layer @ Natural Playing surfaces, FB & Track                                  | 130,000 sf  | \$4.25 /sf      | \$552,500   |
| Subgrade layer @ Synthetic Playing surfaces  | 0.00 sf     |                 | \$0         |
| 32 EXTERIOR IMPROVEMENTS   | 382,610 GSF | \$23.63 / GSF   | \$9,039,919 |
| G2010 ROADWAYS   |             | \$5.82 / GSF    | \$2,227,958 |
| G2011 ROADWAY PAVEMENT   |             | \$3.54 / GSF    | \$1,354,954 |
| - Raised Crosswalks @ Bit Pavement   | 208 sy      | \$35.00 /sy     | \$7,280     |
| Bituminious Paving - Parking Lot Pavement  | 16,957 sy   | \$33.00 /sy     | \$559,581   |
| Bituminious Paving - Roadway Pavement  | 17,073 sy   | \$36.00 /sy     | \$614,628   |
| Concrete Paving - 6" Vehicular   | 6,139 sf    | \$16.50 /sf     | \$101,294   |
| Concrete Paving - 6" Vehicular @walkway to lower sportsfields                          | 4,374 sf    | \$16.50 /sf     | \$72,171    |
| G2012 ROADWAY CURBS & GUTTERS  |             | \$2.06 / GSF    | \$787,965   |
| Granite Curbing - Vertical (Staight & Radius)  | 10,994 lf   | \$68.00 /lf     | \$747,592   |
| Bituminous Curbing (Cape Cod Berm)   | 5,383 lf    | \$7.50 /lf      | \$40,373    |
| G2013 MARKING & SIGNAGE  |             | \$0.22 / GSF    | \$85,040    |
| Accessible Walkway Ramp  | 1,008 sf    | \$5.00 /sf      | \$5,040     |
| Painted Lines - Misc. Striping - Lane SWL, Stop Lines, etc.                            | 1.00 ls     | \$50,000.00 /ls | \$50,000    |
| SITE SIGNAGE - ADDED PER RECON   | 1.00 ls     | \$30,000.00 /ls | \$30,000    |
| G2030 PEDESTRIAN PLAZAS & WALKWAYS   |             | \$1.03 / GSF    | \$394,488   |
| G2031 PEDESTRIAN PAVEMENT  |             | \$1.03 / GSF    | \$394,488   |
| Asphalt Walkway Paving   | 5,420 sy    | \$33.00 /sy     | \$178,860   |
| Concrete Pad - Egress Pinned to Bldg   | 126 sf      | \$15.00 /sf     | \$1,890     |
| Concrete Paving - Gray Std Finish  | 18,958 sf   | \$12.00 /sf     | \$227,496   |
| Concrete Paving - Integral Color Exposed Aggregate                                     | 0.00 st     |                 | Ş0          |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY    | UNIT COST       | TOTAL COST  |
|---|-------------|-----------------|-------------|
| Concrete Paving - Integral Color Exposed Aggregate - accent<br>bands                        | 0.00 sf     |                 | \$0         |
| Concrete Paving - Integral Color Exposed Aggregate - accent<br>bands - etched               | 0.00 sf     |                 | \$0         |
| Concrete Paving - Ramps   | 324 sf      | \$15.00 /sf     | \$4,860     |
| Concrete Paving -PRE RECON, CORRECT TO CONCRETE VS<br>ASPHALT                               | -2449.00 sf | \$8.33 /sf      | (\$20,408)  |
| Stone Dust Walk - stabilized  | 179 sf      | \$10.00 /sf     | \$1,790     |
| Unit Pavers - Granite / Precast   | 0.00 excl   |                 | \$0         |
| G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS   |             | \$5.04 / GSF    | \$1,930,098 |
| G2057 PLAYING FIELDS  |             | \$5.04 / GSF    | \$1,930,098 |
| Asphalt Surface w top coating / striping @ Tennis Courts                                    | 0.00 alt    |                 | \$0         |
| Baseball / Softball / Soccer Fields- Engineered Infield Mix - add alt                       | 0.00 sf     |                 | \$0         |
| Baseball Field - Base scope, seeded lawn  | 65,000 sf   | \$1.00 /sf      | \$65,000    |
| Baseball Field - Natural Irrigated Baseball - Alt   | 0.00 alt    |                 | \$0         |
| BB / Soccer Field - Base Scope - Seeded Lawn  | 89,427 sf   | \$1.00 /sf      | \$89,427    |
| BB / Soccer Field - Natural Irrigated Turf BB / Soccer Field - alt -<br>CORRECTED PER RECON | 0.00 alt    |                 | \$0         |
| FB Field Natural Turf FB Field - ADJUSTED PER RECON   | 78,524 ls   | \$4.00 /ls      | \$314,096   |
| FB Field Synthetic Turf FB Field - Alternate  | 0.00 alt    |                 | \$0         |
| Poured in place Safety Surfacing  | 0.00 alt    |                 | \$0         |
| Resilient Track - ADJUST PER RECON  | 31,852 sf   | \$25.00 /sf     | \$796,300   |
| Resilient Track D Zone (FB Endzone) - ADJUST PER RECON                                      | 20,347 sf   | \$25.00 /sf     | \$508,675   |
| Trench Drain at Inner track perimeter   | 1,305 lf    | \$120.00 /lf    | \$156,600   |
| G2060 SITE DEVELOPMENT  |             | \$7.65 / GSF    | \$2,927,100 |
| G2033 EXTERIOR STEPS & RAMPS  |             | \$0.69 / GSF    | \$262,360   |
| Concrete Base for Site Entry Sign   | 1.00 ls     | \$10,000.00 /ls | \$10,000    |
| Concrete Pad - FB Bleachers only (Baseball / Softball = add alt)                            | 2,976 sf    | \$40.00 /sf     | \$119,040   |
| Concrete Pad - Generator  | 733 sf      | \$40.00 /sf     | \$29,320    |
| Concrete Pad - Transformer  | 500 sf      | \$40.00 /sf     | \$20,000    |
| Concrete Pad @ Team Bench W Overhead Shade  | 0.00 alt    |                 | \$0         |
| Concrete Stairs & Landings, pads @ egress   | 1,050 sf    | \$80.00 /sf     | \$84,000    |
| G2052 RETAINING WALLS   |             | \$1.39 / GSF    | \$531,170   |
| Retaining Walls Complete \$/If - segmental  | 492 lf      | \$560.00 /lf    | \$275,520   |
| Retaining Wall - Concrete (CIP) - PER RECON, ADD BENCH SHELF<br>AT CONTAINTERS              | 14 cy       | \$2,000.00 /cy  | \$28,000    |
| Retaining Wall - Concrete (CIP) - complete, footing & wall                                  | 116 cy      | \$1,400.00 /cy  | \$162,400   |
| Retaining Walls - Crushed Stone Base  | 725 cy      | \$90.00 /cy     | \$65,250    |
| G2059 OTHER SITE IMPROVEMENTS   |             | \$0.80 / GSF    | \$305,200   |
| Metal Guard Railing, Vehicular  | 3,295 lf    | \$45.00 /lf     | \$148,275   |
| Guardrail, Integral to CIP Retaining Wall   | 88 lf       | \$150.00 /lf    | \$13,200    |
| Painted Steel Full Railing @ Concrete Ramp @ Vehicular Walkway                              | 423 lf      | \$150.00 /lf    | \$63,450    |
| Sand Pit w CIP 8" wall / curb   | 89 sf       | \$75.00 /sf     | \$6,675     |
| Metal Pipe Bollards - Exterior  | 53 ea       | \$1,200.00 /ea  | \$63,600    |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANT  | ΓΙΤΥ | UNIT CC              | ST    | TOTAL COST          |
|--|--------|------|----------------------|-------|---------------------|
| Flagpoles w/ Base  | 1.00   | ls   | \$10,000.00          | /ls   | \$10,000            |
| G2061.4 SITE FURNISHINGS   |        |      | \$4.25               | / GSF | \$1,624,870         |
| Backless Wood Bench w Perforated Metal Skirting & LED Lighitng   | 31     | lf   | \$2,000.00           | /lf   | \$62,000            |
| Perforated Metal Panel, 6' x 11 lf   | 11     | lf   | \$2,000.00           | /lf   | \$22,000            |
| Pre-engineeered Boardwalk Ramp System  | 7,420  | sf   | \$150.00             | /sf   | \$1,113,000         |
| Pre-engineeered Boardwalk Stairs System  | 1,811  | sf   | \$170.00             | /sf   | \$307,870           |
| Wood Deck  | 404    | sf   | \$125.00             | /sf   | \$50,500            |
| Cafe Tables & Seats  | 17     | ea   | \$2,500.00           | /ea   | \$42,500            |
| Recycling / Trash Receptacle   | 2.00   | ea   | \$1,500.00           | /ea   | \$3,000             |
| Concession Table & Bench   | 0.00   | alt  |                      |       | \$0                 |
| Gabion Fence Wall w Metal Signage  | 24     | lf   | \$1,000.00           | /lf   | \$24,000            |
| Gabion Seat Wall w Wood Top - Curved   | 42     | lf   | \$750.00             | /lf   | \$31,500            |
| Gabion Seat Wall w Wood Top - Straight   | 44     | lf   | \$500.00             | /lf   | \$22,000            |
| Gabion Seat Wall w Wood Top - VE / Make Add Alt  | -1.00  | ls   | \$53 <i>,</i> 500.00 | /ls   | (\$53 <i>,</i> 500) |
| Metal Shipping containers - excluded - still shown but previous<br>VE / FFE                                    | 0.00   | ea   |                      |       | \$0                 |
| G2062 FENCES & GATES   |        |      | \$0.53               | / GSF | \$203,500           |
| Site Fencing - Ornamental - metal stair w integrated guardrail -<br>NW roof                                    | 1.00   | allw | \$5,000.00           | /allw | \$5,000             |
| Site Fencing - perforate metal screen panel - 8' ht (rooftop play area) - PER RECON, ADJUSTED TO STEEL PICKETT | 97     | lf   | \$350.00             | /If   | \$33,950            |
| Vehicle Access Gates   | 1.00   | ls   | \$25,000.00          | /ls   | \$25,000            |
| Site Fencing - 4'-0" high, Black Vinyl coated  | 2,498  | lf   | \$40.00              | /lf   | \$99,920            |
| Site Fencing - 6'-0" high, Black Vinyl coated  | 183    | lf   | \$50.00              | /lf   | \$9,150             |
| Site Fencing - 8'-0" high, Black Vinyl coated  | 281    | lf   | \$60.00              | /lf   | \$16,860            |
| Site Fencing - Horizontal Wood Slat 8'-0" high   | 27     | lf   | \$150.00             | /lf   | \$4,050             |
| Site Fencing - 10'-0" high, Black Vinyl coated   | 24     | lf   | \$80.00              | /lf   | \$1,920             |
| Site Gate - 4'-0" high   | 10     | ea   | \$250.00             | /ea   | \$2,500             |
| Site Gate - 6'-0" high   | 2.00   | ea   | \$275.00             | /ea   | \$550               |
| Site Gate - 8'-0" high   | 10     | ea   | \$375.00             | /ea   | \$3,750             |
| Site Gate -10'-0" high   | 2.00   | ea   | \$425.00             | /ea   | \$850               |
| G2080 LANDSCAPING  |        |      | \$3.42               | / GSF | \$1,310,276         |
| G2061.4 SITE FURNISHINGS   |        |      | \$0.14               | / GSF | \$55,000            |
| Seating Boulder - Furnish and Set, assume imported (ave weight > 2 tons ea)                                    | 11     | ea   | \$5,000.00           | /ea   | \$55,000            |
| G2081 PLANTING IRRIGATION  |        |      | \$0.85               | / GSF | \$324,141           |
| Irrigate natural turf baseball field   | 1.00   | ls   | \$65,000.00          | /ls   | \$65,000            |
| Irrigate natural turf football field   | 89,427 | sf   | \$1.50               | /sf   | \$134,141           |
| Planting Irrigation Complete - allow   | 1.00   | ls   | \$125,000.00         | /ls   | \$125,000           |
| G2082 TURF & GRASSES   |        |      | \$1.57               | / GSF | \$601,250           |
| Topsoil / Loam - From Stockpile - F&I  | 4.250  | су   | \$15.00              | /cv   | \$63.750            |
| Topsoil / Loam - Off-Site - F&I  | 4.250  | cv   | \$38.00              | /cv   | \$161.500           |
| Topsoil / Loam - PER RECONCILIATION - INCREASE QTY OF  | 2,000  | су   | \$38.00              | /cy   | \$76,000            |

#### 60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANTITY    | UNIT COST        | TOTAL COST         |
|--|-------------|------------------|--------------------|
| Topsoil / Loam- PER RECONCILIATION - INCREASE Unit Price OF<br>IMPORTED LOAM | 6,250 cy    | \$19.20 /cy      | \$120,000          |
| Hydroseeding (Includes Fine Grade)   | 300,000 sf  | \$0.50 /sf       | \$150,000          |
| Wetland Replication Allowance  | 2,000 sf    | \$15.00 /sf      | \$30,000           |
| G2083 PLANTS   |             | \$0.86 / GSF     | \$329,885          |
| Groundcover - Pennsylvania Sedge - plugs                                     | 451 ea      | \$7.50 /ea       | \$3,383            |
| Groundcover - Pennsylvania Sedge - plugs - PER RECON - DELETE<br>PENN SEDGE  | -451.00 ea  | \$7.50 /ea       | (\$3,383)          |
| Ornamental Grasses - Tufted Hair Grass - plugs                               | 2,592 ea    | \$7.50 /ea       | \$19,440           |
| Shrubs - Gro-Low Fragrant Sumac - 1 gal                                      | 202 ea      | \$75.00 /ea      | \$15,150           |
| 01 - October Glory Red Maple - 3" - 3.5" cal                                 | 3.00 ea     | \$1,550.00 /ea   | \$4 <i>,</i> 650   |
| 02 - Red Maple - 1" cal  | 10 ea       | \$650.00 /ea     | \$6,500            |
| 03 - Dawn Redwood - 3" cal   | 8.00 ea     | \$1,200.00 /ea   | \$9,600            |
| 04 - White Oak - 1.5" cal  | 18 ea       | \$650.00 /ea     | \$11,700           |
| 05 - Burr Oak - 2-2.5" cal   | 8.00 ea     | \$1,400.00 /ea   | \$11,200           |
| 06 - Redpoint Maple - 2.5" - 3" cal  | 29 ea       | \$1,150.00 /ea   | \$33,350           |
| 07 - Sugar Maple - 2.5" cal  | 5.00 ea     | \$1,000.00 /ea   | \$5,000            |
| 08 - Clump Paper Birch - 7-8' ht   | 22 ea       | \$750.00 /ea     | \$16,500           |
| 09 - Dura Heat River Birch - 6-7' ht   | 2.00 ea     | \$725.00 /ea     | \$1,450            |
| 10 - Heritage Birch - 10-12' ht  | 1.00 ea     | \$750.00 /ea     | \$750              |
| 11 - Whitespire Birch - 12-14' ht  | 6.00 ea     | \$1,100.00 /ea   | \$6,600            |
| 12 - Renaissance Upright Paper Birch - 12' - 14'                             | 9.00 ea     | \$1,000.00 /ea   | \$9,000            |
| 13 - American Beech - 2.5" cal   | 10 ea       | \$1,000.00 /ea   | \$10,000           |
| 14 - Black Gum - 2.5" cal  | 8.00 ea     | \$1,000.00 /ea   | \$8,000            |
| 15 - Swamp White Oak - 3" cal  | 7.00 ea     | \$1,200.00 /ea   | \$8,400            |
| 16 - Red Oak - 2.5" - 3" cal   | 21 ea       | \$1,300.00 /ea   | \$27,300           |
| 17 - American Elm - 2.5-3" cal   | 19 ea       | \$1,300.00 /ea   | \$24,700           |
| 18 - Eastern Red Cedar - 7-8'  | 12 ea       | \$785.00 /ea     | \$9.420            |
| 19 - Pitch Pine - 6-7' ht  | 14 ea       | \$900.00 /ea     | \$12,600           |
| 20 - White Pine - 8-10' ht   | 26 ea       | \$950.00 /ea     | \$24.700           |
| 21 - White Pine - 5-6' ht  | 11 ea       | \$675.00 /ea     | \$7.425            |
| 22 - Downy Serviceberry - 4.5-5' ht  | 6.00 ea     | \$575.00 /ea     | \$3.450            |
| 23 - Autumn Brilliance Serviceberry - 7-8' ht                                | 12 ea       | \$750.00 /ea     | \$9.000            |
| 24 - Donald Wyman Crabapple - 2"-2.5" cal                                    | 12 ea       | \$750.00 /ea     | \$9.000            |
| Mulch  | 1.00 ls     | \$15.000.00 /ls  | \$15.000           |
| Stakes & Guying  | 1.00 ls     | \$10,000.00 /ls  | \$10,000           |
| Warranty / Maint   | 0.00 incl   | ., ,             | \$0                |
| G5010 SITE COMMUNICATIONS SYSTEMS  |             | \$0.65 / GSF     | \$250.000          |
|  |             | \$0.65 / GSF     | \$250,000          |
| Traffic Signal Work - allow moved to G40                                     | 1.00 ls     | \$250,000.00 /ls | \$250,000          |
| 33 UTILITIES   | 382.610 GSF | \$20.92 / GSF    | \$8.004.220        |
| G3010 WATER LITH ITIES   |             | \$2 73 / GSF     | \$1 042 659        |
|  |             | \$2.73 / CSE     | ¢1,042,030         |
|  | 70.10       |                  | ₹ <b>1,042,658</b> |
| Excav / BKTI / Install - 2" Copper Water Line                                | 72 lt       | \$96.50 /lt      | \$6,948            |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION  | QUANT | TITY | UNIT CC             | ST    | TOTAL COST  |
|--|-------|------|---------------------|-------|-------------|
| Excav / Bkfl / Install - 4" DI Water Line                          | 236   | lf   | \$110.00            | /lf   | \$25,960    |
| Excav / Bkfl / Install - 6" DI run out to hydrant                  | 353   | lf   | \$120.00            | /lf   | \$42,360    |
| Excav / Bkfl / Install - 6" DI water service to bldg               | 52    | lf   | \$120.00            | /lf   | \$6,240     |
| Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg | 190   | lf   | \$130.00            | /lf   | \$24,700    |
| Excav / Bkfl / Install - 8" DICL Water Line - loop                 | 5,954 | lf   | \$130.00            | /lf   | \$774,020   |
| Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES                    | 1,500 | lf   | \$20.00             | /lf   | \$30,000    |
| Tap Existing Water Main  | 3.00  | cond | \$22,000.00         | /cond | \$66,000    |
| Test / Flush-out   | 1.00  | ls   | \$10,000.00         | /ls   | \$10,000    |
| Fire Hydrants  | 11    | ea   | \$5,130.00          | /ea   | \$56,430    |
| G3020 SANITARY SEWERAGE UTILITIES                                  |       |      | \$2.31              | / GSF | \$882,710   |
| G3020 SANITARY SEWERAGE UTILITIES                                  |       |      | \$2.31              | / GSF | \$882,710   |
| Relining existing sewer (videotape by others to confirm need)      | 0.00  | nic  |                     |       | \$0         |
| Sanitary Sewerage Piping, PVC, New 4" PVC                          | 87    | lf   | \$110.00            | /lf   | \$9,570     |
| Sanitary Sewerage Piping, PVC, New 4" PVC Vent pipe                | 145   | lf   | \$110.00            | /lf   | \$15,950    |
| Sanitary Sewerage Piping, PVC, New 6" Cast Iron                    | 174   | lf   | \$135.00            | /lf   | \$23,490    |
| Sanitary Sewerage Piping, PVC, New 6" PVC                          | 949   | lf   | \$120.00            | /lf   | \$113,880   |
| Sanitary Sewerage Piping, PVC, New 6" PVC, Forced Main             | 479   | lf   | \$78.00             | /lf   | \$37,362    |
| Sanitary Sewerage Piping, PVC, New 8"                              | 3,144 | lf   | \$130.00            | /lf   | \$408,720   |
| Sanitary Sewerage Pump Station                                     | 1.00  | ls   | \$141,200.00        | /ls   | \$141,200   |
| VE C04 - Delete Force Main / Pump Station / MH                     | -1.00 | ls   | \$234,052.00        | /ls   | (\$234,052) |
| OII/ Gas Seperator   | 3.00  | ea   | \$10,500.00         | /ea   | \$31,500    |
| Sanitary Manhole   | 39    | ea   | \$5 <i>,</i> 810.00 | /ea   | \$226,590   |
| Tie-in to Existing Manholes / Pipe                                 | 1.00  | cond | \$10,000.00         | /cond | \$10,000    |
| Grease Trap - Installed - 1,000 gal                                | 1.00  | ea   | \$8,500.00          | /ea   | \$8,500     |
| Grease Trap - Installed - 10,000 gal                               | 1.00  | ea   | \$90,000.00         | /ea   | \$90,000    |
| G3030 STORM DRAINAGE UTILITIES                                     |       |      | \$12.61             | / GSF | \$4,825,456 |
| G3032 STORM DRAINAGE PIPING  |       |      | \$3.39              | / GSF | \$1,296,762 |
| Excav / Bkfl / Install - 06" CPP Storm Drainage                    | 345   | lf   | \$80.00             | /lf   | \$27,600    |
| Excav / Bkfl / Install - 06" CPP Storm Drainage , underdrain       | 940   | lf   | \$80.00             | /lf   | \$75,200    |
| Excav / Bkfl / Install - 08" CPP Storm Drainage                    | 237   | lf   | \$86.00             | /lf   | \$20,382    |
| Excav / Bkfl / Install - 10" CPP Storm Drainage                    | 164   | lf   | \$89.00             | /lf   | \$14,596    |
| Excav / Bkfl / Install - 12" CPP Storm Drainage                    | 7,844 | lf   | \$92.00             | /lf   | \$721,648   |
| Excav / Bkfl / Install - 12" CPP Storm Drainage, perforated        | 458   | lf   | \$92.00             | /lf   | \$42,136    |
| Excav / Bkfl / Install - 15" CPP Storm Drainage                    | 213   | lf   | \$110.00            | /lf   | \$23,430    |
| Excav / Bkfl / Install - 18" CPP Storm Drainage                    | 971   | lf   | \$130.00            | /lf   | \$126,230   |
| Excav / Bkfl / Install - 24" CPP Storm Drainage                    | 1,112 | lf   | \$170.00            | /lf   | \$189,040   |
| Excav / Bkfl / Install - 30" CPP Storm Drainage                    | 75    | lf   | \$250.00            | /lf   | \$18,750    |
| Excav / Bkfl / Install - 36" CPP Storm Drainage                    | 0.00  | nic  |                     |       | \$0         |
| Trench Drain   | 151   | lf   | \$250.00            | /lf   | \$37,750    |
| G3033 STORM SEWER STRUCTURES                                       |       |      | \$3.19              | / GSF | \$1,218,930 |
| Storm Septors Water Quality Unit - Installed (WQS & WQI)           | 18    | ea   | \$13,500.00         | /ea   | \$243,000   |
| Precast Storm Manholes 4'- 6" - Installed                          | 78    | ea   | \$5,590.00          | /ea   | \$436,020   |
| Precast Culvert - installed  | 1.00  | ls   | \$90,000.00         | /ls   | \$90,000    |
| Precast Storm Catch Basins - Installed                             | 70    | ea   | \$4,990.00          | /ea   | \$349,300   |
|  | -     |      | . ,                 | •     | /           |

60% CD Estimate - Reconciled incl VE



| DESCRIPTION   | QUANTITY  | UNIT COST          | TOTAL COST   |
|---|-----------|--------------------|--------------|
| Storm Structures - Connect new pipe to Existing                               | 2.00 ea   | \$8,270.00 /ea     | \$16,540     |
| Precast Storm Oil/Water Separator Tank - Installed (OCS)                      | 6.00 ea   | \$5,030.00 /ea     | \$30,180     |
| Area Drains - Installed   | 17 ea     | \$3,170.00 /ea     | \$53,890     |
| G3036.4 SITE SUBDRAINAGE  |           | \$1.31 / GSF       | \$500,000    |
| Maintain Groundwater System Operation through construction (temp swales, etc) | 1.00 allw | \$500,000.00 /allw | \$500,000    |
| G3037 STORM DRAINAGE PONDS & RESERVOIRS                                       |           | \$4.73 / GSF       | \$1,809,764  |
| Underground Storm Water Retention System - #1                                 | 11,440 sf | \$42.00 /sf        | \$480,480    |
| Underground Storm Water Retention System - #2                                 | 14,063 sf | \$42.00 /sf        | \$590,646    |
| Underground Storm Water Retention System - #3                                 | 12,665 sf | \$42.00 /sf        | \$531,930    |
| Underground Storm Water Retention System - #4                                 | 3,921 sf  | \$42.00 /sf        | \$164,682    |
| Underground Storm Water Retention System - #5                                 | 703 sf    | \$42.00 /sf        | \$29,526     |
| Flared End / Swale  | 4.00 cond | \$2,500.00 /cond   | \$10,000     |
| Headwall  | 1.00 ea   | \$2,500.00 /ea     | \$2,500      |
| G3060 SITE FUEL DISTRIBUTION  |           | \$0.00 / GSF       | \$0          |
| G3066.2 GAS DISTRIBUTION PIPING (NATURAL & PROPANE)                           |           | \$0.00 / GSF       | \$0          |
| Excav / Bkfl / Install - 6" Natural Gas Line                                  | 0.00 lf   |                    | \$0          |
| G4020 SITE ELECTRICAL   |           | \$3.28 / GSF       | \$1,253,396  |
| G4025 DUCTBANKS, MANHOLES, & HANDHOLES  |           | \$3.28 / GSF       | \$1,253,396  |
| Adjust DB Section J Reduction   | -1.00 ls  | \$52,000.00 /ls    | (\$52,000)   |
| Exavate / Backfill / Install Elec MH  | 14 ea     | \$19,300.00 /ea    | \$270,200    |
| Excavate / Backfill / Concrete Encasement                                     | 4,271 lf  | \$130.00 /lf       | \$555,230    |
| Excavate / Backfill / Install- Precast Light pole / Bollard Base              | 107 ea    | \$2,350.00 /ea     | \$251,450    |
| Excavate / Backfill site lighting conduit                                     | 9,413 lf  | \$41.50 /lf        | \$390,640    |
| Reduction on Excavation and Backfill per recon                                | -1.00 ls  | \$100,000.00 /ls   | (\$100,000)  |
| VE C07 Reduce DB  | -1.00 ls  | \$62,124.00 /ls    | (\$62,124)   |
| TOTAL SITEWORK  | \$1(      | )8.34 / GSF        | \$41,453,440 |
### DRA ARCHITECTS / PMA CONSULTANTS NORTHEAST METROPOLITAN REGIONAL VOC. H.S. Wakefield, MA

### 60% CD Estimate - Reconciled incl VE



### **DEMO & ABATEMENT**

| DESCRIPTION   | QUANTITY   | UNIT COST            | TOTAL COST  |
|---|------------|----------------------|-------------|
| 02 EXISTING CONDITIONS                              | 0 GSF      | \$3,493,683.00 / GSF | \$3,493,683 |
| F2010 HAZARDOUS MATERIALS REMEDIATION               |            | \$1,819,675.00 / GSF | \$1,819,675 |
| F2019 OTHER HAZARDOUS SELECTIVE BUILDING DEMOLITION |            | \$1,819,675.00 / GSF | \$1,819,675 |
| Allowance for Hazardous Materials Abatement         | 1.00 ls    | \$1,919,675.00 /ls   | \$1,919,675 |
| VE - adjust   | -1.00 ls   | \$100,000.00 /ls     | (\$100,000) |
| F3010 STRUCTURE DEMOLITION                          |            | \$1,674,008.00 / GSF | \$1,674,008 |
| F3011 BUILDING DEMOLITION                           |            | \$1,674,008.00 / GSF | \$1,674,008 |
| Demolish Existing School Building                   | 239,144 sf | \$7.00 /sf           | \$1,674,008 |
| TOTAL DEMO & ABATEMENT                              | \$3,493    | \$3,493,683.00 / GSF |             |

## PROJECT SCOPE & BUDGET COST ESTIMATE - DESIGNER

COST ESTIMATE DESIGNER

6B.2.3 – 04 UNIFORMAT

60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

16 JANAURY 2023

# NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCOOL

WAKEFIELD, MA







# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

| LOCAT              | ION SUMMARY  |                  | Rat        | GFAR: 0<br>tes Current | Gross Floor Area<br>At January 2023 |
|--------------------|--|------------------|------------|------------------------|-------------------------------------|
| Ref                | Location   |                  | GFAR<br>SF | GFAR<br>USD/SF         | Total Cost<br>USD                   |
| BD                 | BASE DESIGN  |                  |            |                        |                                     |
| Α                  | Building   |                  |            |                        |                                     |
| A1                 | New School Building                                    |                  | 380,570.00 | 417.58                 | 158,916,659                         |
| A3                 | Maintenance Building                                   |                  | 2,040.00   | 333.38                 | 680,095                             |
|                    |  | A - Building     | 382,610.00 | 417.13                 | 159,596,754                         |
| В                  | Sitework   |                  |            |                        | 44,385,735                          |
|                    |  | BD - BASE DESIGN | 382,610.0  | 533.13                 | 203,982,489                         |
| ESTIM/             | ATED NET COST  |                  | 382,610    | 533.13                 | 203,982,489                         |
|                    |  |                  |            |                        |                                     |
| MARGI              | NS & ADJUSTMENTS                                       |                  |            |                        |                                     |
| Design             | & Estimating Contingency                               | 2.5 %            |            |                        | 5,099,564                           |
| Escalati           | on Allowance up to mid-point of Construction           | 4.5 %            |            |                        | 9,408,691                           |
| Sub-cor            | ntractor Bonds   | 1.2 %            |            |                        | 2,621,889                           |
| Insuran            | ce - CCIP (Change from GL)                             |                  |            |                        | 6,198,303                           |
| Cost of            | Traditional Insurance (Trade + GL)                     |                  |            |                        | -6,822,122                          |
| Builder's          | s Risk Insurance (per CM Pricing Exhibit 1)            |                  |            |                        | 365,272                             |
| Paymer             | nt & Performance Bond (per CM Pricing Exhibit 1)       |                  |            |                        | 1,850,710                           |
| Genera             | Conditions (per CM Pricing Exhibit 1)                  |                  |            |                        | 9,687,506                           |
| Genera             | Requirements (per CM Pricing Exhibit 1)                |                  |            |                        | 6,044,059                           |
| Allowan<br>Exhibit | ce for Additional Requirements not included in CN<br>1 | 1 Pricing        |            |                        | 1,000,000                           |
| CM Cor             | nstruction Contingency (per CM Pricing Exhibit 1)      | 2.5 %            |            |                        | 5,583,215                           |
| CM Fee             | (per CM Pricing Exhibit 1)                             |                  |            |                        | 4,205,160                           |
| ESTIM/             | ATED TOTAL COST  |                  | 382,610    | 651.38                 | 249,224,736                         |



### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY BD BASE DESIGN

A Building

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building Rates Current At January 2023 Ref Description **GFAR Total Cost USD/SF** USD A10 **Foundations** A1010 Standard Foundations 6.89 2,622,118 A10 - Foundations 6.89 2,622,118 A20 **Basement ConstructionSubgrade Enclosures** A2010 Walls for Subgrade Enclosures 7.92 3,014,742 A20 - Basement ConstructionSubgrade Enclosures 7.92 3,014,742 A40 Slabs-on-Grade Standard Slabs-on-Grade A4010 5.34 2,032,257 A4090 Slab-on-Grade Supplementary Components 0.06 21,941 A40 - Slabs-on-Grade 5.40 2,054,198 A60 Water and Gas Mitigation A6010 **Building Subdrainage** 2.11 802,508 A6020 **Off-Gassing Mitigation** 0.20 75,000 A60 - Water and Gas Mitigation 2.31 877,508 A90 Substructure Related Activities A9010 Substructure Excavation 4.14 1,575,130 **A90 - Substructure Related Activities** 4.14 1,575,130 **B10** Superstructure B1010 Floor Construction 44.44 16,913,031 B1020 Roof Construction 20.50 7,801,489 B1080 Stairs 4.07 1,550,040 **B10 - Superstructure** 69.01 26,264,560 **B20 Exterior Vertical Enclosures** B2010 Exterior Walls 34.05 12,959,967 B2020 Exterior Windows 16.31 6,207,882 B2050 Exterior Doors and Grilles 1.39 527,200 B2070 Exterior Louvers and Vents 0.20 77,580 **B20 - Exterior Vertical Enclosures** 51.96 19,772,629 **B30 Exterior Horizontal Enclosures** B3010 14.04 5,341,451 Roofing B3020 **Roof Appurtenances** 0.03 11,800



### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY BD BASE DESIGN

### A Building

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023 Ref Description **GFAR Total Cost USD/SF** USD B3060 Horizontal Openings Excl. B3080 **Overhead Exterior Enclosures** 0.85 324,170 **B30 - Exterior Horizontal Enclosures** 14.92 5,677,421 C10 Interior Construction C1010 Interior Partitions 31.39 11,947,355 C1020 Interior Windows 4.23 1,608,945 C1030 Interior Doors 3.26 1,239,835 C1040 Interior Grilles and Gates 1.52 579,000 C1090 **Interior Specialties** 9.62 3,659,834 **C10 - Interior Construction** 50.02 19,034,969 C20 **Interior Finishes** C2010 Wall Finishes 8.47 3,223,418 C2030 10.78 Flooring 4,102,407 C2040 **Stair Finishes** 0.50 190,627 C2050 **Ceiling Finishes** 12.13 4,617,448 C20 - Interior Finishes 31.88 12,133,900 D10 Conveying D1010 Vertical Conveying Systems 2.33 885,000 D10 - Conveying 2.33 885,000 D20 Plumbing D2010 **Domestic Water Distribution** 8.83 3,360,978 D2020 Sanitary Drainage 4.81 1,830,455 D2030 **Building Support Plumbing Systems** 3.45 1,313,159 D2050 General Service Compressed-Air 1.94 739,996 D2060 **Process Support Plumbing Systems** 1.59 606.121 **D20 - Plumbing** 20.63 7,850,709 D30 HVAC D3020 0.23 89,100 Heat Systems D3030 17.76 **Cooling Systems** 6,757,940 D3050 Facility HVAC Distribution Systems 43.96 16,731,326 D3060 **Controls & Instrumentations** 5.12 1,950,000



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY BD BASE DESIGN

### A Building

A Building GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023

| Ref   | Description   | GFAR<br>USD/SF | Total Cost<br>USD |
|-------|---|----------------|-------------------|
| D3070 | Special Purpose HVAC Systems                            | 6.31           | 2,400,802         |
|       | D30 - HVAC  | 73.39          | 27,929,168        |
| D40   | Fire Protection   |                |                   |
| D4010 | Fire Suppression  | 7.81           | 2,971,479         |
|       | D40 - Fire Protection                                   | 7.81           | 2,971,479         |
| D50   | Electrical  |                |                   |
| D5020 | Electrical Service and Distribution                     | 13.97          | 5,315,546         |
| D5030 | General Purpose Electrical Power                        | 5.86           | 2,229,852         |
| D5040 | Lighting  | 16.20          | 6,164,994         |
| D5080 | Miscellaneous Electrical Systems                        | 1.66           | 632,984           |
| D6060 | Distributed Communications and Monitoring               | 0.19           | 72,525            |
|       | D50 - Electrical  | 37.88          | 14,415,901        |
| D60   | Communications  |                |                   |
| D6010 | Data Communications                                     | 0.63           | 238,400           |
| D6020 | Voice Communications                                    |                | Excl.             |
| D6030 | Audio-Video Communication                               | 7.59           | 2,887,184         |
| D6060 | Distributed Communications and Monitoring               | 0.35           | 134,000           |
|       | D60 - Communications                                    | 8.57           | 3,259,584         |
| D70   | Electronic Safety and Security                          |                |                   |
| D7010 | Access Controls and Intrusion Detection                 | 0.68           | 260,575           |
| D7030 | Electronic Surveillance                                 | 2.98           | 1,134,810         |
| D7050 | Detection and Alarm                                     | 2.50           | 950,633           |
| D7090 | Electronic Safety and Security Supplementary Components | 0.08           | 30,000            |
|       | D70 - Electronic Safety and Security                    | 6.24           | 2,376,018         |
| E10   | Equipment   |                |                   |
| E1040 | Institutional Equipment                                 | 1.10           | 417,600           |
| E1070 | Entertainment and Recreational Equipment                |                | Excl.             |
| E1090 | Other Equipment   | 14.27          | 5,430,682         |
|       | E10 - Equipment   | 15.37          | 5,848,282         |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY **BD BASE DESIGN**

#### A Building

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023 Ref Description **Total Cost** GFAR USD/SF USD E20 Furnishings E2010 **Fixed Furnishings** 0.91 346,668 E20 - Furnishings 0.91 346,668 G30 Liquid and Gas Site Utilities G3010 Water Utilities 0.02 6,238 G3090 Liquid and Gas Site Utilities Supplementary Components 0.01 437 G30 - Liquid and Gas Site Utilities 0.02 6,675 **NEW SCHOOL BUILDING** 417.58 158,916,659



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY **BD BASE DESIGN**

### A Building

| A Building                         | GEAR: 380 570 00 SE Cost/SE: 417 58 |
|------------------------------------|-------------------------------------|
| A1 New School Building (continued) | Rates Current At January 2023       |
|                                    |                                     |

| Ref         | Description  | GFAR<br>USD/SF | Total Cost<br>USD |
|-------------|--|----------------|-------------------|
|             |  |                |                   |
| MARGINS     | & ADJUSTMENTS  |                |                   |
| Design & I  | Estimating Contingency   |                | 3,972,918         |
| Escalation  | Allowance up to mid-point of Construction                        |                | 7,330,030         |
| Sub-contra  | actor Bonds  |                | 2,042,635         |
| Insurance   | - CCIP (Change from GL)  |                | 4,828,913         |
| Cost of Tra | aditional Insurance (Trade + GL)                                 |                | -5,314,911        |
| Builder's R | tisk Insurance (per CM Pricing Exhibit 1)                        |                | 284,573           |
| Payment &   | Performance Bond (per CM Pricing Exhibit 1)                      |                | 1,441,833         |
| General C   | onditions (per CM Pricing Exhibit 1)                             |                | 7,547,246         |
| General R   | equirements (per CM Pricing Exhibit 1)                           |                | 4,708,746         |
| Allowance   | for Additional Requirements not included in CM Pricing Exhibit 1 |                | 779,070           |
| CM Const    | ruction Contingency (per CM Pricing Exhibit 1)                   |                | 4,349,715         |
| CM Fee (p   | er CM Pricing Exhibit 1)   |                | 3,276,114         |
| ESTIMATI    | ED TOTAL COST  | 510.19         | 194,163,541       |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

A Building

| A Building<br>A1 New Sch | nool Building  |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|------------|--------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| A10                      | FOUNDATIONS  |      |            |                                |                                    |
| A1010                    | Standard Foundations   |      |            |                                |                                    |
| 996                      | Concrete to isolated spread footings, 4500 PSI               | CY   | 1,855.18   | 325.00                         | 602,933                            |
| 529                      | Concrete to perimeter strip footings - 1' thick, 4500 PSI    | CY   | 120.65     | 325.00                         | 39,211                             |
| 586                      | Concrete to perimeter strip footings - 2' thick, 4500<br>PSI | CY   | 69.80      | 325.00                         | 22,685                             |
| 2403                     | Concrete to perimeter strip footings - 3' thick, 4500<br>PSI | CY   | 814.00     | 325.00                         | 264,550                            |
| 1000                     | Concrete to interior strip footings, 4500 PSI                | CY   | 156.00     | 325.00                         | 50,700                             |
| 588                      | Concrete to elevator mat footings - 3' thick, 4500 PSI       | CY   | 30.30      | 324.98                         | 9,847                              |
| 1117                     | Concrete to piers, 4500 PSI                                  | CY   | 105.94     | 325.00                         | 34,430                             |
| 521                      | Form isolated spread footings                                | SF   | 25,309.88  | 20.00                          | 506,198                            |
| 530                      | Form strip footings  | SF   | 9,517.69   | 20.00                          | 190,354                            |
| 589                      | Form elevator mat footings                                   | SF   | 279.00     | 20.00                          | 5,580                              |
| 1118                     | Form piers   | SF   | 7,266.20   | 25.00                          | 181,655                            |
| 522                      | Bar reinforcement to isolated spread footings                | Lb   | 186,496.27 | 1.80                           | 335,693                            |
| 587                      | Bar reinforcement to strip footings, allow 100 PCY           | Lb   | 168,290.00 | 1.80                           | 302,922                            |
| 590                      | Bar reinforcement to elevator mat footings                   | Lb   | 3,747.40   | 1.80                           | 6,746                              |
| 1119                     | Bar reinforcement to piers, allow                            | Lb   | 38,118.69  | 1.80                           | 68,614                             |
|                          | A1010 - Standard Foundations                                 |      |            | 6.89/SF                        | 2,622,118                          |
|                          | A10 - FOUNDATIONS  |      |            | 6.89/SF                        | 2,622,118                          |
| A20                      | BASEMENT CONSTRUCTIONSUBGRADE<br>ENCLOSURES                  |      |            |                                |                                    |
| A2010                    | Walls for Subgrade Enclosures                                |      |            |                                |                                    |
| 597                      | Concrete to basement retaining walls, 4500 PSI               | CY   | 767.00     | 325.00                         | 249,275                            |
| 599                      | Concrete to buttressed walls, 4500 PSI                       | CY   | 47.00      | 325.00                         | 15,275                             |
| 598                      | Concrete to perimeter frost walls, 4500 PSI                  | CY   | 837.73     | 325.00                         | 272,261                            |
| 1122                     | Concrete to interior foundation walls, 4500 PSI              | CY   | 111.50     | 325.00                         | 36,237                             |
| 615                      | Concrete to elevator pit walls, 4500 PSI                     | CY   | 14.20      | 325.00                         | 4,615                              |
| 603                      | Form basement retaining walls                                | SF   | 20,571.00  | 25.00                          | 514,275                            |
| 604                      | Form buttressed walls  | SF   | 2,525.00   | 25.00                          | 63,125                             |



USD

### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

Ref

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023 Unit Description Qty Rate **Total Cost** USD 605 Form perimeter frost walls SF 28,596.83 25.00 714,920 1123 Form interior foundation walls SF 7.734.70 25.00 193,367 SF 761.50 25.00 616 Form elevator pit walls 19,037 606 Bar reinforcement to basement retaining walls Lb 149,531.00 1.80 269,156 607 Bar reinforcement to buttressed walls, allow 10 PSF Lb 1.80 22,721 12,623.00 608 Bar reinforcement to perimeter frost walls Lb 48,054.42 1.80 86,498 1124 Bar reinforcement to interior foundation walls Lb 28,264.30 1.80 50,876 1.80 6,790 613 Bar reinforcement to elevator pit walls Lb 3,772.40 SF 614 Waterproofing to basement retaining walls and 17,752.60 15.00 266,289 footings and elevator pit walls and footings 617 Dampproofing to frost wall SF 14,298.85 6.00 85,793 618 SF Rigid insulation - 2" thick 32.051.46 4.50 144,232 A2010 - Walls for Subgrade Enclosures 7.92/SF 3,014,742 **A20 - BASEMENT CONSTRUCTIONSUBGRADE** 7.92/SF 3,014,742 **ENCLOSURES** SLABS-ON-GRADE A40 A4010 Standard Slabs-on-Grade 500 Concrete to slab on grade - 4" thick, 4000 PSI CY 784.00 320.00 250,880 501 Concrete to slab on grade - 6" thick, 4000 PSI CY 1,197.50 320.00 383,200 502 Form slab on grade SF 3,495.48 18.00 62,919 WWF reinforcement SF 503 1.30 166,575 128,133.75 698 Allowance for bar reinforcement Lb 64,066.97 1.80 115,321 LF 796 Allowance for thicken slab under CMU 1,802.00 125.00 225,250 2541 Slab thickening allowance reduction LS -100,000.00 1.00 -100,000 SF 504 Float finish to slab on grade 128,134.04 1.50 192,201 SF 505 Control joints 128,134.04 0.75 96,100 506 Air and vapor barrier SF 128.134.04 0.85 108.915

CY

CY

SF

7,518.10

7.518.10

128,134.04

Excavation for slab on grade

Prepare and compact sub-base

Remove and dispose of excavated material

508

509

510

1.50

Incl.

Incl.

192,201



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

Puilding (continued) А

| A1 New Sch | nool Building (continued)  |      |            | Rates Current A | t January 2023    |
|------------|--|------|------------|-----------------|-------------------|
| Ref        | Description  | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 513        | Re-use materials ILO Imported sand gravel fill - 12" thick         | CY   | 4,746.29   | 15.00           | 71,195            |
| 703        | Winter conditions  | LS   | 1.00       |                 | Excl.             |
| 707        | Mechanical pads  | Item |            |                 | 52,500            |
| 710        | Engineering, layout, safety, cleaning, etc.                        | Item |            |                 | 215,000           |
|            | A4010 - Standard Slabs-on-Grade                                    |      |            | 5.34/SF         | 2,032,257         |
| A4090      | Slab-on-Grade Supplementary Components                             |      |            |                 |                   |
| 507        | Rigid insulation - 2" thick  | SF   | 4,875.90   | 4.50            | 21,941            |
| 514        | Extruded polystyrene insulation, perimeter only 2' wide - 2" thick | SF   | 4,901.00   |                 | Excl.             |
|            | A4090 - Slab-on-Grade Supplementary Components                     |      |            | 0.06/SF         | 21,941            |
|            | A40 - SLABS-ON-GRADE   |      |            | 5.40/SF         | 2,054,198         |
| A60        | WATER AND GAS MITIGATION   |      |            |                 |                   |
| A6010      | Building Subdrainage   |      |            |                 |                   |
| 619        | Perimeter drain  | LF   | 2,440.12   | 50.00           | 122,006           |
| 686        | Under-slab drainage system   | SF   | 128,134.04 | 3.75            | 480,502           |
| 1835       | Allowance for Electrical and Plumbing earth work within footprint  | LS   | 1.00       | 200,000.00      | 200,000           |
|            | A6010 - Building Subdrainage                                       |      |            | 2.11/SF         | 802,508           |
| A6020      | Off-Gassing Mitigation   |      |            |                 |                   |
| 702        | Allowance for radon mitigation - 20 drops x 60'                    | LS   | 1.00       | 75,000.00       | 75,000            |
|            | A6020 - Off-Gassing Mitigation                                     |      |            | 0.20/SF         | 75,000            |
|            | A60 - WATER AND GAS MITIGATION                                     |      |            | 2.31/SF         | 877,508           |
| A90        | SUBSTRUCTURE RELATED ACTIVITIES                                    |      |            |                 |                   |
| A9010      | Substructure Excavation  |      |            |                 |                   |
| 591        | Excavation for foundation footings including spoils removal        | CY   | 12,574.11  | 31.00           | 389,797           |
| 593        | Prepare and compact foundation sub-base                            | SF   | 33,961.27  | 1.50            | 50,943            |
| 594        | Imported sand gravel fill below foundations - 12" thick            | CY   | 1,393.70   | 50.00           | 69,685            |
| 595        | Basement mass excavation   | CY   | 32,666.00  | 20.00           | 653,320           |
| 654        | Excavation for elevator pit including spoils removal               | CY   | 93.20      | 31.00           | 2,889             |
| 620        | Imported foundation backfill                                       | CY   | 7,082.56   | 30.00           | 212,476           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref   | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|------------|-------------|-------------------|
| 691   | Imported backfill to basement excavation   | CY   | 6,534.00   | 30.00       | 196,020           |
|       | A9010 - Substructure Excavation  |      |            | 4.14/SF     | 1,575,130         |
|       | A90 - SUBSTRUCTURE RELATED ACTIVITIES  |      |            | 4.14/SF     | 1,575,130         |
| B10   | SUPERSTRUCTURE   |      |            |             |                   |
| B1010 | Floor Construction   |      |            |             |                   |
| 535   | Galvanized composite metal floor deck - 2" deep, 20<br>GA                            | SF   | 248,934.40 | 6.00        | 1,493,606         |
| 1007  | Galvanized composite metal sloped floor deck - 2" deep (Auditorium) (none indicated) | SF   | 6,792.00   |             | Excl.             |
| 537   | Structural steel framing, including beams, columns, bracing                          | Т    | 1,794.1080 | 5,400.00    | 9,688,183         |
| 997   | Prestressed precast concrete hollow core plank, 10" thick                            | SF   | 16,116.00  | 45.00       | 725,220           |
| 538   | Light weight concrete topping, overall 5-1/4" thick, 4500 PSI                        | CY   | 4,033.70   | 450.00      | 1,815,165         |
| 998   | Normal weight concrete topping to precast planks, 2" thick, 4500 PSI                 | CY   | 100.00     | 350.00      | 35,000            |
| 539   | WWF reinforcement to floor deck  | SF   | 265,049.40 | 1.25        | 331,312           |
| 540   | Float finish to concrete topping   | SF   | 265,049.40 | 3.00        | 795,148           |
| 572   | Moment connection  | EA   | 253.00     | 750.00      | 189,750           |
| 648   | Expansion joint  | LF   | 459.00     | 125.00      | 57,375            |
| 748   | Wood floor deck - 2 layers 3/4" FRT plywood subfloor on 2x8 floor joists (Mezz)      | SF   | 1,746.00   | 50.00       | 87,300            |
| 749   | Geofoam rigid insulation (Auditorium stage) - 2'-0"<br>high (none indicated)         | SF   | 2,490.00   |             | Excl.             |
| 750   | Geofoam rigid insulation (Auditorium slope flooring) (none indicated)                | SF   | 2,755.00   |             | Excl.             |
| 542   | Allowance for miscellaneous connections and<br>framings                              | Т    | 179.4150   | 5,400.00    | 968,841           |
| 543   | Allowance for spray applied fireproofing (members only)                              | SF   | 248,934.40 | 3.75        | 933,504           |
| 1647  | Allowance for intumescent paint to round HSS columns                                 | SF   | 944.00     | 50.00       | 47,200            |
| 2530  | Allowance for intumescent paint to bracing   | SF   | 727.00     | 50.00       | 36,350            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref   | Description   | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|------------|-------------|-------------------|
| 720   | Allowance for shear studs   | EA   | 62,233.90  | 6.50        | 404,520           |
| 722   | Allowance for pour stops and bent plates  | LF   | 10,712.30  | 25.00       | 267,807           |
| 809   | Allowance for miscellaneous equipment pads (above ground)                                 | LS   | 1.00       | 50,000.00   | 50,000            |
| 2621  | Anticipated concrete savings due to Subcontractor<br>input                                | LS   | 1.00       | -250,000.00 | -250,000          |
| 2622  | Target tonnage reduction (0.25 PSF)   | Т    | -48.7500   | 5,400.00    | -263,250          |
| 2623  | Anticipated structural steel savings due to<br>Subcontractor input                        | LS   | 1.00       | -500,000.00 | -500,000          |
|       | B1010 - Floor Construction  |      |            | 44.44/SF    | 16,913,031        |
| B1020 | Roof Construction   |      |            |             |                   |
| 546   | Galvanized corrugated roof deck - 3" deep, type N   | SF   | 109,463.50 | 7.00        | 766,244           |
| 562   | Acoustic galvanized corrugated roof deck - 3" deep, type NA (Gym)                         | SF   | 11,604.00  | 15.00       | 174,060           |
| 2386  | Acoustic galvanized composite metal roof deck - 2"<br>deep, 18GA (Gym)                    | SF   | 989.00     | 10.50       | 10,385            |
| 558   | Galvanized composite metal roof deck - 2" deep, 20GA                                      | SF   | 16,973.00  | 6.00        | 101,838           |
| 2387  | Galvanized composite metal roof deck - 2" deep, 18GA                                      | SF   | 3,027.00   | 6.00        | 18,162            |
| 2384  | Galvanized steel roof deck - 1 1/2" deep, type B, 20<br>GA                                | SF   | 297.00     | 5.00        | 1,485             |
| 2385  | Galvanized steel roof deck - 1" deep  | SF   | 4,454.00   | 3.50        | 15,589            |
| 2391  | Structural steel roof joist - 60DLHSP1  | LF   | 167.00     | 185.00      | 30,895            |
| 2390  | Structural steel roof joist - 60DLHSP2  | LF   | 748.00     | 185.00      | 138,380           |
| 2389  | Structural steel roof joist - 60DLHSP3  | LF   | 250.00     | 185.00      | 46,250            |
| 2393  | Structural steel roof joist - 68DLHSP4  | LF   | 1,373.00   | 185.00      | 254,005           |
| 2392  | Structural steel roof joist - 68DLHSP5  | LF   | 317.00     | 185.00      | 58,645            |
| 547   | Structural steel framing, including beams, columns, bracing                               | Т    | 802.1690   | 5,400.00    | 4,331,713         |
| 2394  | Galvanized structural steel framing, including beams, columns (Roof Mechanical Equipment) | Т    | 29.1600    | 6,000.00    | 174,960           |
| 548   | Light weight concrete topping, overall 5-1/4" thick, 4500 PSI                             | CY   | 276.00     | 450.00      | 124,200           |



GFAR: 380,570.00 SF Cost/SF: 417.58

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Thew School Building (continued) |   |      |            | Rates Current A | At January 2023   |
|----------------------------------|---|------|------------|-----------------|-------------------|
| Ref                              | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 2388                             | Normal weight concrete topping, overall 6" thick, 4500 PSI              | CY   | 75.00      | 430.00          | 32,250            |
| 549                              | WWF reinforcement to floor deck   | SF   | 20,989.00  | 1.25            | 26,236            |
| 550                              | Float finish to concrete topping  | SF   | 20,989.00  | 3.00            | 62,967            |
| 567                              | Moment connection   | EA   | 416.00     | 750.00          | 312,000           |
| 551                              | Allowance for miscellaneous connections and<br>framings                 | Т    | 83.1310    | 5,400.00        | 448,907           |
| 688                              | Allowance for structural framing to roof screen, 8 PSF (none indicated) | Т    | 8.0800     |                 | Excl.             |
| 649                              | Expansion joint   | LF   | 177.00     | 125.00          | 22,125            |
| 719                              | Allowance for spray applied fireproofing (members only)                 | SF   | 146,804.50 | 3.75            | 550,517           |
| 721                              | Allowance for shear studs   | EA   | 3,027.00   | 6.50            | 19,676            |
| 1838                             | Miscellaneous roof blocking   | LS   | 1.00       | 80,000.00       | 80,000            |
|                                  | B1020 - Roof Construction   |      |            | 20.50/SF        | 7,801,489         |
| B1080                            | Stairs  |      |            |                 |                   |
| 182                              | 1'-6" High metal guardrail at Rotunda balcony                           | LF   | 195.00     | 100.00          | 19,500            |
| 183                              | 8'-0" High metal guardrail / gate at rooftop playground                 | LF   | 96.00      | 200.00          | 19,200            |
| 299                              | Wire mesh guardrail   | LF   | 1,162.40   |                 | Incl.             |
| 1816                             | Metal guardrail   | LF   | 336.00     |                 | Incl.             |
| 759                              | Metal handrail  | LF   | 538.90     |                 | Incl.             |
| 747                              | Metal stairs with concrete filled pans and landing - 4'-<br>6" wide     | FT/R | 20.00      | 2,850.00        | 57,000            |
| 2446                             | Metal stairs with concrete filled pans and landing - 4'-<br>9" wide     | FT/R | 48.00      | 2,950.00        | 141,600           |
| 661                              | Metal stairs with concrete filled pans and landing - 5'-<br>0" wide     | FT/R | 97.00      | 3,500.00        | 339,500           |
| 2447                             | Metal stairs with concrete filled pans and landing - 6'-<br>4" wide     | FT/R | 20.00      | 5,000.00        | 100,000           |
| 2448                             | Metal stairs with concrete filled pans and landing - 7'-<br>9" wide     | FT/R | 48.00      | 5,300.00        | 254,400           |
| 2445                             | Metal stairs with concrete filled pans and landing - 9'-<br>9" wide     | FT/R | 96.00      | 6,350.00        | 609,600           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

\_ \_ \_ \_ \_

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 417.58 Rates Current At January 2023 Unit Qty Rate Total Cost

| Ref   | Description   | Unit | Qty       | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|-----------|-------------|-------------------|
| 1135  | Metal stairs with concrete filled pans and landing - 5'-<br>3" wide (none indicated)  | FT/R | 97.00     |             | Excl.             |
| 662   | Metal stairs with concrete filled pans and landing - 5'-<br>6" wide (none indicated)  | FT/R | 20.00     |             | Excl.             |
| 663   | Metal stairs with concrete filled pans and landing - 8'-<br>0" wide (none indicated)  | FT/R | 48.00     |             | Excl.             |
| 1134  | Metal stairs with concrete filled pans and landing - 8'-<br>3" wide (none indicate)   | FT/R | 48.00     |             | Excl.             |
| 665   | Metal stairs with concrete filled pans and landing - 10'-<br>0" wide (none indicated) | FT/R | 48.00     |             | Excl.             |
| 1133  | Metal stairs with concrete filled pans and landing - 10'-<br>3" wide (none indicated) | FT/R | 48.00     |             | Excl.             |
| 664   | Metal stairs with concrete filled pans and landing - 10'-<br>6" wide (none indicated) | FT/R | 48.00     |             | Excl.             |
| 1475  | Metal stair with handrail and integrated guardrail - 5'-6" wide (none indicated)      | FT/R | 3.00      |             | Excl.             |
| 1679  | Concrete stair to Auditorium - 4'-1" wide (none indicated)                            | FT/R | 35.00     |             | Excl.             |
| 1680  | Access ladder   | LF   | 84.00     | 110.00      | 9,240             |
|       | B1080 - Stairs  |      |           | 4.07/SF     | 1,550,040         |
|       | B10 - SUPERSTRUCTURE  |      |           | 69.01/SF    | 26,264,560        |
| B20   | EXTERIOR VERTICAL ENCLOSURES  |      |           |             |                   |
| B2010 | Exterior Walls  |      |           |             |                   |
| 22    | 2" Thick Granite veneer   | SF   |           | 150.00      | 0                 |
| 2582  | Cast stone ILO Granite veneer   | SF   | 2,912.00  | 50.00       | 145,600           |
| 1651  | 4" Thick Cast stone veneer  | SF   | 8,752.00  | 50.00       | 437,600           |
| 29    | 4" Thick CMU Veneer   | SF   | 36,572.18 | 39.00       | 1,426,315         |
| 30    | Insulated metal panel   | SF   | 15,290.00 | 90.00       | 1,376,100         |
| 23    | Flat-lock metal tile  | SF   | 5,892.90  | 100.00      | 589,290           |
| 44    | Corrugated metal panel  | SF   | 4,332.00  | 60.00       | 259,920           |
| 1652  | Brick veneer  | SF   | 21,789.00 | 48.00       | 1,045,872         |
| 2562  | Extend roof membrane to perimeter wall  | SF   | 2,584.00  | 12.00       | 31,008            |
| 128   | Cladding to entrance columns  | SF   | 178.00    | 125.00      | 22,250            |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

A1 New School Building (continued)

| 1 New School Building (continued) |  |      |            | Rates Current A | At January 2023   |
|-----------------------------------|--|------|------------|-----------------|-------------------|
| Ref                               | Description  | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 1777                              | 8" thick CMU shear walls                                   | SF   | 6,457.00   | 40.00           | 258,280           |
| 1137                              | 12" thick CMU shear walls                                  | SF   | 5,755.00   | 50.00           | 287,750           |
| 72                                | 8" Thick CMU back-up                                       | SF   | 2,015.77   | 35.00           | 70,552            |
| 71                                | 12" Thick CMU back-up                                      | SF   | 1,639.00   | 45.00           | 73,755            |
| 27                                | ACM rainscreen system to crown ribs, including back-<br>up | SF   | 4,198.00   | 90.00           | 377,820           |
| 150                               | ACM rainscreen system                                      | SF   | 5,378.00   | 90.00           | 484,020           |
| 25                                | ACM Panel system at cornice                                | SF   | 11,052.00  | 175.00          | 1,934,100         |
| 1663                              | ACM Band   | SF   | 2,721.00   | 90.00           | 244,890           |
| 2546                              | 5/8" Thick gypsum sheathing                                | SF   | 88,450.00  | 3.50            | 309,575           |
| 2543                              | 2" Thick rigid insulation                                  | SF   | 56,229.90  | 5.00            | 281,150           |
| 2544                              | 3" Thick rigid insulation                                  | SF   | 16,378.97  | 7.00            | 114,653           |
| 2559                              | 3" Thick batt insulation                                   | SF   | 33,613.00  | 4.00            | 134,452           |
| 2555                              | 2 1/2" Thick mineral fiber insulation                      | SF   | 8,351.00   | 3.25            | 27,141            |
| 2563                              | 3 1/2" Thick mineral fiber insulation                      | SF   | 13,259.00  | 4.00            | 53,036            |
| 2556                              | 3 1/2" Thick mineral wool insulation                       | SF   | 10,225.00  | 4.00            | 40,900            |
| 2557                              | 2" Thick closed cell spray foam                            | SF   | 49,252.00  | 3.25            | 160,069           |
| 2558                              | 6" Thick closed cell spray foam                            | SF   | 4,781.00   | 6.00            | 28,686            |
| 2547                              | 8" Light gauge metal stud back-up                          | SF   | 2,334.00   | 16.00           | 37,344            |
| 2548                              | 6" Light gauge metal stud back-up                          | SF   | 82,330.00  | 14.00           | 1,152,620         |
| 2549                              | 4" Light gauge metal stud back-up                          | SF   | 10,333.00  | 11.00           | 113,663           |
| 2550                              | 3 5/8" Light gauge metal stud back-up                      | SF   | 10,681.00  | 10.50           | 112,151           |
| 2551                              | 2 1/2" Light gauge metal stud back-up                      | SF   | 5,756.00   | 9.00            | 51,804            |
| 2560                              | 5/8" Thick gypsum board lining                             | SF   | 69,489.00  | 4.50            | 312,701           |
| 2545                              | Fluid applied air and vapor barrier                        | SF   | 104,442.79 | 6.50            | 678,878           |
| 190                               | Allowance for miscellaneous sealing and caulking           | SF   | 165,760.99 | 2.00            | 331,522           |
| 2624                              | 8" CMU backing ILO 12" CMU at Gymnasium / Team<br>Room     | SF   | 4,550.00   | -10.00          | -45,500           |
|                                   | B2010 - Exterior Walls                                     |      |            | 34.05/SF        | 12,959,967        |
| B2020                             | Exterior Windows   |      |            |                 |                   |
| 48                                | Aluminum curtain wall system, with insulating glass        | SF   | 24,824.00  | 155.00          | 3,847,720         |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

A Building

| A Building<br>A1 New Sch | nool Building (continued)  |      | GFAR: 3   | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|-----------|-------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty       | Rate<br>USD                   | Total Cost<br>USD                  |
| 49                       | Aluminum storefront system, with insulating glass  | SF   | 3,977.90  | 125.00                        | 497,237                            |
| 212                      | Aluminum storefront system - none indicated  | SF   | 3,337.00  |                               | Excl.                              |
| 98                       | Insulated translucent wall panel system with glazed operable sashes                                  | SF   | 2,631.00  | 175.00                        | 460,425                            |
| 1627                     | Aluminum window system, with insulating glass  | SF   | 10,222.00 | 125.00                        | 1,277,750                          |
| 1645                     | Premium for spandrel glass   | SF   | 475.00    | 10.00                         | 4,750                              |
| 2575                     | Premium for bullet resistant glazing   | LS   | 1.00      | 120,000.00                    | 120,000                            |
|                          | B2020 - Exterior Windows   |      |           | 16.31/SF                      | 6,207,882                          |
| B2050                    | Exterior Doors and Grilles   |      |           |                               |                                    |
| 1227                     | 16'-0" x 12'-8" Motor operated overhead door with insulating glass                                   | EA   | 1.00      | 22,000.00                     | 22,000                             |
| 100                      | 14'-0" x 13'-4" Motor operated overhead door with insulating glass                                   | EA   | 1.00      | 19,000.00                     | 19,000                             |
| 2450                     | 14'-0" x 12'-8" Motor operated overhead door with insulating glass                                   | EA   | 1.00      | 17,000.00                     | 17,000                             |
| 101                      | 12'-0" x 13'-4" Motor operated overhead door with insulating glass                                   | EA   | 4.00      | 16,000.00                     | 64,000                             |
| 1307                     | 12'-0" x 12'-8" Motor operated overhead door with insulating glass                                   | EA   | 4.00      | 14,500.00                     | 58,000                             |
| 1214                     | 8'-0" x 10'-0" Motor operated overhead insulated rolling door  | EA   | 1.00      | 10,000.00                     | 10,000                             |
| 2451                     | 8'-0" x 7'-4" Motor operated overhead insulated rolling door   | EA   | 1.00      | 7,500.00                      | 7,500                              |
| 134                      | 3'-0" x 7'-0" Single leaf hollow metal door, including frame, finish, and hardware                   | EA   | 13.00     | 1,350.00                      | 17,550                             |
| 2449                     | 3'-0" x 7'-0" Single leaf hollow metal door with vision panel, including frame, finish, and hardware | EA   | 1.00      | 1,500.00                      | 1,500                              |
| 1230                     | 3'-0" x 7'-0" Single leaf aluminum glazed door,<br>including frame, finish, and hardware             | EA   | 4.00      | 5,850.00                      | 23,400                             |
| 1232                     | 3'-6" x 7'-0" Single leaf aluminum glazed door,<br>including frame, finish, and hardware             | EA   | 4.00      | 6,850.00                      | 27,400                             |
| 1239                     | 2@ 3'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair | 3.00      | 12,000.00                     | 36,000                             |
| 1234                     | 2@ 3'-0" x 7'-4" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair | 3.00      | 12,500.00                     | 37,500                             |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| A Building<br>A1 New Sch | hool Building (continued)  |      | GFAR: 3   | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|-----------|-------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty       | Rate<br>USD                   | Total Cost<br>USD                  |
| 2452                     | 2@ 3'-0" x 8'-0" Double leaf aluminum glazed door, including frame, finish, and hardware                   | Pair | 2.00      | 13,000.00                     | 26,000                             |
| 1235                     | 2@ 3'-4" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware                   | Pair | 3.00      | 12,500.00                     | 37,500                             |
| 1240                     | 2@ 3'-6" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware                   | Pair | 7.00      | 12,750.00                     | 89,250                             |
| 2453                     | 2@ 4'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware                   | Pair | 1.00      | 13,000.00                     | 13,000                             |
| 135                      | 2@ 3'-0" x 7'-2" Double leaf hollow metal door, including frame, finish, and hardware                      | Pair | 1.00      | 2,500.00                      | 2,500                              |
| 2477                     | Exterior door sidelight  | SF   | 181.00    | 100.00                        | 18,100                             |
|                          | B2050 - Exterior Doors and Grilles   |      |           | 1.39/SF                       | 527,200                            |
| B2070                    | Exterior Louvers and Vents   |      |           |                               |                                    |
| 99                       | Louver   | SF   | 775.80    | 100.00                        | 77,580                             |
|                          | B2070 - Exterior Louvers and Vents   |      |           | 0.20/SF                       | 77,580                             |
|                          | <b>B20 - EXTERIOR VERTICAL ENCLOSURES</b>  |      |           | 51.96/SF                      | 19,772,629                         |
| B30                      | EXTERIOR HORIZONTAL ENCLOSURES   |      |           |                               |                                    |
| B3010                    | Roofing  |      |           |                               |                                    |
| 164                      | TPO Membrane roofing - Type A; single ply membrane over cover board on 6 1/2" min. roof insulation         | SF   | 71,686.00 | 30.00                         | 2,150,580                          |
| 1479                     | TPO Membrane roofing - Type B; single ply membrane over cover board on 4 1/2" min. tapered roof insulation | SF   | 68,665.00 | 30.00                         | 2,059,950                          |
| 169                      | Tapered insulation cricket (premium over PVC roofing)  | SF   | 18,047.00 | 7.00                          | 126,329                            |
| 154                      | ACM Panel system at horizontal entrance soffit / window bay soffit   | SF   | 2,460.00  | 105.00                        | 258,300                            |
| 158                      | Metal coping on top of exterior wall (building signage wall)   | SF   | 298.00    | 75.00                         | 22,350                             |
| 159                      | Metal coping on top of exterior wall (Rotunda balcony wall)  | SF   | 770.00    | 75.00                         | 57,750                             |
| 174                      | Metal coping on top of exterior wall (rooftop<br>playground perimeter wall)                                | SF   | 257.00    | 75.00                         | 19,275                             |
| 349                      | Extensive green roof   | SF   | 4,801.00  | 60.00                         | 288,060                            |
| 354                      | Rooftop pavers   | SF   | 1,704.00  | 30.00                         | 51,120                             |
| 353                      | Rubber roof tiles  | SF   | 3,823.00  | 30.00                         | 114,690                            |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

| 1 New Sch | nool Building (continued)  |      | GFAR: 3    | 880,570.00 SF (<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|-----------|--|------|------------|------------------------------------|------------------------------------|
| Ref       | Description  | Unit | Qty        | Rate<br>USD                        | Total Cost<br>USD                  |
| 1715      | Walkway pad  | SF   | 10,973.00  | 8.00                               | 87,784                             |
| 191       | Allowance for miscellaneous trims and flashings  | SF   | 140,351.00 | 0.75                               | 105,263                            |
|           | _<br>B3010 - Roofing   |      |            | 14.04/SF                           | 5,341,451                          |
| B3020     | Roof Appurtenances   |      |            |                                    |                                    |
| 168       | Roof hatch   | EA   | 1.00       | 5,500.00                           | 5,500                              |
| 1485      | Smoke hatch  | EA   | 3.00       |                                    | Excl.                              |
| 1491      | Roof access ladder, 2'-0" wide   | LF   | 18.00      | 350.00                             | 6,300                              |
| 181       | 7'-6" High RTU screen - none indicated   | LF   | 270.00     |                                    | Excl.                              |
| 1492      | Ballasted guardrail (none indicated)   | LF   | 66.00      |                                    | Excl.                              |
|           | B3020 - Roof Appurtenances   |      |            | 0.03/SF                            | 11,800                             |
| B3060     | Horizontal Openings  |      |            |                                    |                                    |
| 96        | Glazed dome, prefabricated self-supporting insulating glass in aluminum framing - removed from scope | SF   | 750.00     |                                    | Excl.                              |
|           | _<br>B3060 - Horizontal Openings   |      |            |                                    | Excl.                              |
| B3080     | Overhead Exterior Enclosures   |      |            |                                    |                                    |
| 1452      | Exterior aluminum composite material soffit  | SF   | 2,947.00   | 110.00                             | 324,170                            |
|           | B3080 - Overhead Exterior Enclosures   |      |            | 0.85/SF                            | 324,170                            |
|           | <b>B30 - EXTERIOR HORIZONTAL ENCLOSURES</b>  |      |            | 14.92/SF                           | 5,677,421                          |
| C10       | INTERIOR CONSTRUCTION  |      |            |                                    |                                    |
| C1010     | Interior Partitions  |      |            |                                    |                                    |
| 129       | Wire mesh partition - 8'-0" high   | LF   | 287.00     | 250.00                             | 71,750                             |
| 1561      | CMU partition, 4" thick (Type 4.0)   | SF   | 4,592.10   | 25.00                              | 114,802                            |
| 267       | CMU partition, 8" thick (Type 8.0)   | SF   | 55,734.59  | 28.00                              | 1,560,569                          |
| 2410      | CMU partition, 8" thick, 1 hour fire rated (Type 8.1)  | SF   | 1,546.00   | 35.00                              | 54,110                             |
| 1562      | CMU partition, 8" thick, 2 hour fire rated (Type 8.2)  | SF   | 16,525.00  | 40.00                              | 661,000                            |
| 268       | CMU partition, 12" thick (Type 12.0)   | SF   | 11,277.20  | 30.00                              | 338,316                            |
| 1563      | CMU partition, 12" thick, 2 hour fire rated (Type 12.2)  | SF   | 941.00     | 35.00                              | 32,935                             |
| 1776      | CMU shear walls, 8" thick  | SF   | 23,368.00  | 30.00                              | 701,040                            |
| 1138      | CMU shear walls, 12" thick   | SF   | 16,688.00  | 35.00                              | 584,080                            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref  | Description  | Unit | Qty       | Rate<br>USD | Total Cost<br>USD |
|------|--|------|-----------|-------------|-------------------|
| 414  | Gypsum board partition - 3-5/8" metal stud with 1 layer 5/8" GWB on both side with 3-1/2" acoustic batt insulation (Type G4.0)                             | SF   | 836.00    | 17.00       | 14,212            |
| 408  | Gypsum board partition - 6" metal stud with 1 layer 5/8" GWB on both side with 5" acoustic batt insulation (Type G6.0)                                     | SF   | 65,609.00 | 19.50       | 1,279,376         |
| 415  | Gypsum board partition - 6" metal stud with 2 layer 5/8" GWB one side and 1 layer 5/8" GWB another side with 5" acoustic batt insulation (Type G6.0A)      | SF   | 55,602.00 | 21.00       | 1,167,642         |
| 412  | Gypsum board partition - 6" metal stud with 2 layer<br>5/8" GWB on both sides with 5" acoustic batt<br>insulation (Type G6.0B)                             | SF   | 55,883.00 | 22.75       | 1,271,338         |
| 2412 | Gypsum board partition - 6" metal stud staggered in 8"<br>metal track with 2 layer 5/8" GWB on both sides with<br>5" acoustic batt insulation (Type G6.0C) | SF   | 717.00    | 27.00       | 19,359            |
| 2413 | Gypsum board partition - 6" metal stud with 1 layer<br>5/8" GWB on both sides with 5" acoustic batt<br>insulation, 1 hour fire rated (Type G6.1)           | SF   | 4,851.00  | 21.75       | 105,509           |
| 1550 | Gypsum board partition - 6" metal stud with 2 layer<br>5/8" GWB on both sides with 5" acoustic batt<br>insulation, 1 hour fire rated (Type G6.1B)          | SF   | 3,094.00  | 25.50       | 78,897            |
| 409  | Gypsum board partition - 6" metal stud with 2 layer 5/8" GWB on both sides with 5" acoustic batt insulation, 2 hour fire rated (Type G6.2)                 | SF   | 16,427.00 | 28.50       | 468,170           |
| 459  | Gypsum board furring - 7/8" metal stud with 1 layer 5/8" GWB (Type F1.0)   | SF   | 2,347.00  | 7.50        | 17,603            |
| 2411 | Gypsum board furring - 1-5/8" metal stud with 1 layer<br>5/8" GWB (Type F2.0)  | SF   | 5,737.00  | 8.50        | 48,765            |
| 1552 | Gypsum board furring - 2-1/2" metal stud with 1 layer 5/8" GWB (Type F3.0)   | SF   | 2,553.00  | 9.50        | 24,254            |
| 410  | Gypsum board furring - 3-5/8" metal stud with 1 layer<br>5/8" GWB (Type F4.0)  | SF   | 31,633.99 | 11.00       | 347,974           |
| 432  | Gypsum board furring - 3-5/8" metal stud with 2 layer 5/8" GWB (Type F4.0A)  | SF   | 8,838.00  | 13.50       | 119,313           |
| 411  | Gypsum board furring - 6" metal stud with 1 layer 5/8"<br>GWB (Type F6.0)  | SF   | 52,856.00 | 12.50       | 660,700           |
| 413  | Gypsum board furring - 6" metal stud with 2 layer 5/8"<br>GWB (Type F6.0A)   | SF   | 44,667.00 | 15.00       | 670,005           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref   | Description   | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|------------|-------------|-------------------|
| 1565  | Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" GWB another side with 5-1/2" acoustic batt insulation, 1 hour fire rated (Type S6.1) | SF   | 1,400.00   | 28.50       | 39,900            |
| 433   | Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" GWB another side with 5-1/2" acoustic batt insulation, 2 hour fire rated (Type S6.2) | SF   | 24,066.00  | 30.00       | 721,980           |
| 464   | Gypsum board partition - 2x4 wood stud with 1 layer 3/4" FRT plywood sheathing on both sides  | SF   | 2,879.00   | 17.00       | 48,943            |
| 1571  | Gypsum board furring - 2x4 wood stud with 1 layer<br>3/4" FRT plywood sheathing on one side   | SF   | 5,267.00   | 12.50       | 65,838            |
| 488   | Allowance for miscellaneous sealing and caulking  | SF   | 411,859.00 | 0.50        | 205,930           |
| 489   | Allowance for miscellaneous fire stopping   | SF   | 411,859.00 | 0.25        | 102,964           |
| 806   | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Masonry Trade)  | SF   | 411,859.00 | 0.50        | 205,930           |
| 808   | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Drywall Trade)  | SF   | 411,859.00 | 0.35        | 144,151           |
|       | C1010 - Interior Partitions   |      |            | 31.39/SF    | 11,947,355        |
| C1020 | Interior Windows  |      |            |             |                   |
| 112   | Interior door sidelights with safety glass  | SF   | 4,203.00   | 60.00       | 252,180           |
| 153   | Interior storefront   | SF   | 5,316.00   | 90.00       | 478,440           |
| 166   | Interior fixed borrowed lights  | SF   | 1,075.00   | 65.00       | 69,875            |
| 137   | Interior security transaction window - 4'-0" x 6'-0"  | EA   | 1.00       | 2,000.00    | 2,000             |
| 138   | Interior acoustically rated sliding window - 8'-8" x 3'-8"<br>- none indicated  | EA   | 1.00       |             | Excl.             |
| 155   | Fire rated glazing system - 2 hour fire rated   | SF   | 3,988.00   | 200.00      | 797,600           |
| 794   | Premium for color art glass panels  | SF   | 177.00     | 50.00       | 8,850             |
|       | C1020 - Interior Windows  |      |            | 4.23/SF     | 1,608,945         |
| C1030 | Interior Doors  |      |            |             |                   |
| 102   | 3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware  | EA   | 50.00      | 1,570.00    | 78,500            |
| 2455  | 3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)  | EA   | 2.00       | 1,750.00    | 3,500             |
| 1287  | 3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)  | EA   | 13.00      | 1,850.00    | 24,050            |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

A1

| 1 New Sch | ool Building (continued)   |      | GFAR: 38 | 0,570.00 SF C<br>Rates Current A | Cost/SF: 417.58<br>t January 2023 |
|-----------|--|------|----------|----------------------------------|-----------------------------------|
| Ref       | Description  | Unit | Qty      | Rate<br>USD                      | Total Cost<br>USD                 |
| 2454      | 3'-6"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)                                   | EA   | 1.00     | 2,000.00                         | 2,000                             |
| 1320      | 3'-0"x7'-0" Single leaf aluminum doors, including<br>frame, finish and hardware with 2'-0"x(2'-9"+1'-11")<br>safety glass vision panel | EA   | 8.00     | 2,875.00                         | 23,000                            |
| 1323      | 3'-6"x7'-0" Single leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel       | EA   | 2.00     | 3,275.00                         | 6,550                             |
| 1263      | 3'-0"x4'-0" Single leaf wooden doors, including frame, finish and hardware   | EA   | 2.00     | 1,050.00                         | 2,100                             |
| 106       | 3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware   | EA   | 289.00   | 1,845.00                         | 533,205                           |
| 2456      | 3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (45 min fire-rated)   | EA   | 13.00    | 1,950.00                         | 25,350                            |
| 1262      | 3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (90 min fire-rated)   | EA   | 10.00    | 2,100.00                         | 21,000                            |
| 1270      | 3'-6"x7'-0" Single leaf wooden doors, including frame, finish and hardware   | EA   | 4.00     | 2,150.00                         | 8,600                             |
| 1275      | 3'-0"x7'-0" Single leaf wooden doors, including frame,<br>finish and hardware with 2'-0"x2'-11" safety glass<br>vision panel           | EA   | 6.00     | 2,450.00                         | 14,700                            |
| 1283      | 3'-0"x7'-0" Single leaf wooden doors, including frame,<br>finish and hardware with 2'-0"x(2'-9"+1'-11") safety<br>glass vision panel   | EA   | 1.00     | 2,450.00                         | 2,450                             |
| 1215      | 3'-0"x7'-0" Single leaf wooden safety glazed doors, including frame, finish and hardware   | EA   | 1.00     | 2,450.00                         | 2,450                             |
| 2459      | 3'-0"x7'-0" Single leaf wire mesh doors, including frame, finish and hardware  | EA   | 1.00     | 1,500.00                         | 1,500                             |
| 1339      | 3'-4"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware  | EA   | 1.00     | 1,700.00                         | 1,700                             |
| 1338      | 4'-0"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware  | EA   | 3.00     | 2,050.00                         | 6,150                             |
| 2462      | 3'-0" x 3'-6" Glass rail gate (Multi-Purpose RM<br>Balcony)  | EA   | 2.00     | 850.00                           | 1,700                             |
| 103       | 2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware   | Pair | 14.00    | 3,000.00                         | 42,000                            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref  | Description  | Unit | Qty  | Rate<br>USD | Total Cost<br>USD |
|------|--|------|------|-------------|-------------------|
| 1289 | 2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware   | Pair | 7.00 | 3,100.00    | 21,700            |
| 2469 | 2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)   | Pair | 6.00 | 3,300.00    | 19,800            |
| 1288 | 2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)   | Pair | 5.00 | 3,500.00    | 17,500            |
| 2467 | 2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)   | Pair | 3.00 | 3,600.00    | 10,800            |
| 1291 | 2@3'-6"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware   | Pair | 1.00 | 3,500.00    | 3,500             |
| 2474 | 2@3'-6"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware   | SF   | 1.00 | 3,600.00    | 3,600             |
| 1292 | 2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware  | Pair | 1.00 | 3,850.00    | 3,850             |
| 2470 | 2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)  | Pair | 1.00 | 4,250.00    | 4,250             |
| 2475 | 2@3'-0"x7'-0" Double leaf hollow metal doors,<br>including frame, finish and hardware with 2'-0"x2'-11"<br>safety glass vision panel                   | Pair | 1.00 | 4,250.00    | 4,250             |
| 2476 | 2@3'-10"x7'-0" Double leaf hollow metal doors,<br>including frame, finish and hardware with 2'-0"x2'-11"<br>safety glass vision panel                  | Pair | 1.00 | 5,750.00    | 5,750             |
| 1318 | 2@3'-0"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                     | Pair | 3.00 | 5,750.00    | 17,250            |
| 1319 | 2@3'-0"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel (90 min fire-rated) | Pair | 2.00 | 9,600.00    | 19,200            |
| 2473 | 2@3'-0"x7'-3" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                     | SF   | 2.00 | 6,000.00    | 12,000            |
| 1326 | 2@3'-3"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                     | Pair | 1.00 | 6,000.00    | 6,000             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description   | Unit | Qty   | Rate<br>USD | Total Cost<br>USD |
|------|---|------|-------|-------------|-------------------|
| 105  | 2@3'-6"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                      | Pair | 4.00  | 6,500.00    | 26,000            |
| 2466 | 2@3'-6"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel (90 min fire-rated)  | Pair | 2.00  | 10,000.00   | 20,000            |
| 1330 | 2@3'-10"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel (90 min fire-rated) | Pair | 2.00  | 10,850.00   | 21,700            |
| 107  | 2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware  | Pair | 23.00 | 3,500.00    | 80,500            |
| 1278 | 2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                        | Pair | 2.00  | 4,750.00    | 9,500             |
| 1266 | 2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)  | Pair | 8.00  | 4,000.00    | 32,000            |
| 2468 | 2@3'-6"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)  | Pair | 2.00  | 4,500.00    | 9,000             |
| 2472 | 2@3'-10"x7'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated)   | Pair | 2.00  | 5,000.00    | 10,000            |
| 1268 | 2@3'-10"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)   | Pair | 2.00  | 5,175.00    | 10,350            |
| 1271 | 2@3'-0"x7'-2" Double leaf wooden doors, including frame, finish and hardware  | Pair | 3.00  | 3,585.00    | 10,755            |
| 1272 | 2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware  | Pair | 6.00  | 4,000.00    | 24,000            |
| 2471 | 2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated)  | Pair | 1.00  | 4,200.00    | 4,200             |
| 1340 | 2@3'-0"x7'-10" Double leaf wire mesh doors, including frame, finish and hardware  | Pair | 3.00  | 2,025.00    | 6,075             |
| 1341 | 2@3'-6"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware   | Pair | 3.00  | 3,150.00    | 9,450             |
| 1342 | 2@3'-6"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware   | Pair | 2.00  | 3,250.00    | 6,500             |
| 1343 | 2@3'-7"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware   | Pair | 1.00  | 3,250.00    | 3,250             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description   | Unit | Qty    | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|--------|-------------|-------------------|
| 1344  | 2@3'-7 1/4"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware | Pair | 1.00   | 3,250.00    | 3,250             |
| 1345  | 2@3'-8"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware     | Pair | 1.00   | 3,350.00    | 3,350             |
|       | C1030 - Interior Doors  |      |        | 3.26/SF     | 1,239,835         |
| C1040 | Interior Grilles and Gates  |      |        |             |                   |
| 2458  | 6'-0" x 10'-0" Rolling security grille door   | EA   | 4.00   | 15,000.00   | 60,000            |
| 113   | 4'-6" x 3'-10" Overhead coiling stainless steel counter door                        | EA   | 1.00   | 4,000.00    | 4,000             |
| 2461  | 15'-0" x 9'-0" Fire-rated partition / door (2-hr fire-rated)                        | EA   | 2.00   | 47,500.00   | 95,000            |
| 2460  | 14'-8" x 10'-0" Fire-rated partition / door (2-hr fire-<br>rated)                   | EA   | 1.00   | 50,000.00   | 50,000            |
| 2463  | 8'-3" x 12'-0" Fire-rated folding partition / door (2-hr fire -rated)               | EA   | 2.00   | 35,000.00   | 70,000            |
| 2464  | 42'-0" x 15'-0" Curved fire-rated folding partition / door (2-hr fire-rated)        | EA   | 1.00   | 300,000.00  | 300,000           |
|       | C1040 - Interior Grilles and Gates  |      |        | 1.52/SF     | 579,000           |
| C1090 | Interior Specialties  |      |        |             |                   |
| 277   | Restroom accessories - Toilet partition   | EA   | 35.00  | 1,300.00    | 45,500            |
| 287   | Restroom accessories - Toilet partition, ADA  | EA   | 13.00  | 1,700.00    | 22,100            |
| 302   | Restroom accessories - Urinal partition   | EA   | 42.00  | 700.00      | 29,400            |
| 280   | Restroom accessories - Tissue paper dispenser                                       | EA   | 86.00  | 125.00      | 10,750            |
| 281   | Restroom accessories - Grab bar   | EA   | 134.00 | 180.00      | 24,120            |
| 305   | Restroom accessories - Shower grab bar  | Set  | 10.00  | 450.00      | 4,500             |
| 282   | Restroom accessories - Napkin disposal  | EA   | 70.00  | 500.00      | 35,000            |
| 283   | Restroom accessories - Robe hook  | EA   | 90.00  | 100.00      | 9,000             |
| 284   | Restroom accessories - Soap dispenser   | EA   | 64.00  | 150.00      | 9,600             |
| 285   | Restroom accessories - Shower curtain and rod                                       | EA   | 10.00  | 200.00      | 2,000             |
| 304   | Restroom accessories - Shower seat  | EA   | 10.00  | 600.00      | 6,000             |
| 291   | Restroom accessories - Framed mirror  | EA   | 64.00  | 800.00      | 51,200            |
| 292   | Restroom accessories - Towel dispenser/waste receptacle                             | EA   | 56.00  | 850.00      | 47,600            |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| <b>Building</b><br>1 New Sc | hool Building (continued)  |      | GFAR: 38   | 0,570.00 SF 0<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|-----------------------------|--|------|------------|----------------------------------|------------------------------------|
| Ref                         | Description  | Unit | Qty        | Rate<br>USD                      | Total Cost<br>USD                  |
| 303                         | Restroom accessories - Baby changing table - none indicated      | EA   | 5.00       |                                  | Excl.                              |
| 1815                        | Wire mesh guardrail to Shop Mezz                                 | LF   | 252.00     | 320.00                           | 80,640                             |
| 1537                        | Metal guardrail to Mezzanine                                     | LF   | 460.00     | 300.00                           | 138,000                            |
| 802                         | Metal railing to auditorium - none indicated                     | LF   | 167.00     |                                  | Excl.                              |
| 301                         | Glass guardrail (Second Floor Corridor)                          | LF   | 230.80     | 580.00                           | 133,864                            |
| 754                         | Allowance for elevator pit ladder, cover, etc                    | EA   | 2.00       |                                  | Excl.                              |
| 319                         | Allowance for markerboards - 4'x4'                               | EA   | 37.00      | 225.00                           | 8,325                              |
| 339                         | Allowance for markerboards - 6'x4'                               | EA   | 39.00      | 350.00                           | 13,650                             |
| 1533                        | Allowance for markerboards - 8'x4'                               | EA   | 3.00       | 470.00                           | 1,410                              |
| 1534                        | Allowance for markerboards - 10'x4'                              | EA   | 12.00      | 580.00                           | 6,960                              |
| 320                         | Allowance for tackboards - 4'x4'                                 | EA   | 41.00      | 170.00                           | 6,970                              |
| 335                         | Allowance for tackboards - 8'x4'                                 | EA   | 4.00       | 330.00                           | 1,320                              |
| 1535                        | Allowance for tackboards - 12'x4'                                | EA   | 2.00       | 500.00                           | 1,000                              |
| 321                         | Allowance for visual display rails                               | Item |            |                                  | 10,000                             |
| 329                         | Metal lockers - 2 tier 15"x15" (Corridors)                       | EA   | 354.00     | 800.00                           | 283,200                            |
| 2509                        | Metal lockers - 2 tier 15"x15" (Team Locker / Auto<br>Collision) | EA   | 255.00     | 800.00                           | 204,000                            |
| 2510                        | Metal lockers - 3 tier 15"x15" (Locker / Shops)                  | EA   | 479.00     | 700.00                           | 335,300                            |
| 2478                        | Mirror (Fitness)   | SF   | 201.00     | 35.00                            | 7,035                              |
| 753                         | Allowance for janitor accessories                                | EA   | 12.00      | 750.00                           | 9,000                              |
| 327                         | Allowance for cubicle curtain at nurse's area                    | EA   | 2.00       | 1,800.00                         | 3,600                              |
| 1547                        | Allowance for cubicle curtain at Health /Medical<br>Assisting    | EA   | 15.00      | 1,800.00                         | 27,000                             |
| 328                         | Allowance for corner guards                                      | Item |            |                                  | 8,000                              |
| 331                         | Allowance for closet and utility shelving                        | Item |            |                                  | 6,000                              |
| 332                         | Allowance for AED with cabinets                                  | EA   | 12.00      | 2,000.00                         | 24,000                             |
| 293                         | Allowance for miscellaneous metals                               | SF   | 411,002.89 | 1.00                             | 411,003                            |
| 294                         | Allowance for rough carpentry                                    | SF   | 411,002.89 | 0.75                             | 308,252                            |
| 295                         | Allowance for wood blocking                                      | SF   | 411,002.89 | 1.25                             | 513,753                            |
| 296                         | Allowance for fire extinguisher and cabinets                     | EA   | 165.08     | 850.00                           | 140,318                            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

A Building

| A1 New Sch | nool Building (continued)  |      | GFAR:      | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 At |
|------------|--|------|------------|--------------------------------|---------------------------------------|
| Ref        | Description  | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                     |
| 297        | Allowance for interior signage   | SF   | 411,002.89 | 0.85                           | 349,353                               |
| 298        | Allowance for exterior signage   | Item |            |                                | 15,000                                |
| 807        | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade) | SF   | 411,002.89 | 0.35                           | 143,851                               |
| 2505       | Glass guardrail (Stair 1)  | LF   | 108.00     | 580.00                         | 62,640                                |
| 2508       | Glass guardrail (Multi-purpose RM)   | LF   | 189.00     | 580.00                         | 109,620                               |
|            | C1090 - Interior Specialties   |      |            | 9.62/SF                        | 3,659,834                             |
|            | C10 - INTERIOR CONSTRUCTION  |      |            | 50.02/SF                       | 19,034,969                            |
| C20        | INTERIOR FINISHES  |      |            |                                |                                       |
| C2010      | Wall Finishes  |      |            |                                |                                       |
| 141        | Ceramic tile   | SF   | 16,547.50  | 22.00                          | 364,045                               |
| 142        | Thin porcelain tile  | SF   | 20,481.00  | 25.00                          | 512,025                               |
| 144        | Wood veneer panels (Media Center)  | SF   | 1,999.00   | 65.00                          | 129,935                               |
| 1810       | Wood fiber acoustical panels   | SF   | 3,946.00   | 85.00                          | 335,410                               |
| 782        | Fabric wrap acoustical panel (Multi-Purpose RM)  | SF   | 2,002.00   | 50.00                          | 100,100                               |
| 781        | Vinyl wall covering (Multi-Purpose RM)   | SF   | 1,175.00   | 40.00                          | 47,000                                |
| 147        | Decorative fabric metal panels (Stage)   | SF   | 474.00     | 70.00                          | 33,180                                |
| 1678       | Phenolic resin panel system  | SF   | 2,726.00   | 85.00                          | 231,710                               |
| 2479       | 2" Granite veneer panel  | SF   | 393.00     | 110.00                         | 43,230                                |
| 146        | Flat lock metal tiles  | SF   | 624.00     | 100.00                         | 62,400                                |
| 148        | FRP panels   | SF   | 6,573.00   | 25.00                          | 164,325                               |
| 2609       | Delete interior flat lock metal tiles  | SF   | 624.00     | -100.00                        | -62,400                               |
| 2610       | Porcelain tiles ILO flat lock metal tiles  | SF   | 624.00     | 25.00                          | 15,600                                |
| 170        | Prepare and apply epoxy paint  | SF   | 205,122.87 | 3.50                           | 717,930                               |
| 172        | Prepare and apply paint to GWB   | SF   | 309,973.50 | 1.25                           | 387,467                               |
| 841        | Plastic laminate window sills  | LF   | 2,334.60   | 75.00                          | 175,095                               |
| 1670       | Metal column cover   | SF   | 304.00     | 135.00                         | 41,040                                |
| 1682       | Decorative wood acoustic wall reflector (Auditorium) - none indicated                  | SF   | 1,890.00   |                                | Excl.                                 |
| 1681       | Perforated metal panels (Auditorium) - none indicated                                  | SF   | 670.00     |                                | Excl.                                 |
| 1683       | Decorative wood panels (Auditorium) - none indicated                                   | SF   | 6,273.00   |                                | Excl.                                 |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref   | Description                                 | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|------------|-------------|-------------------|
| 2613  | Reduce ceramic wall tile area by 10%        | SF   | 1,655.00   | -22.00      | -36,410           |
| 2614  | Reduce porcelain wall tile area by 10%      | SF   | 2,049.00   | -25.00      | -51,225           |
| 2615  | Painting ILO wall tiles                     | SF   | 3,703.00   | 3.50        | 12,961            |
|       | C2010 - Wall Finishes                       |      |            | 8.47/SF     | 3,223,418         |
| C2030 | Flooring                                    |      |            |             |                   |
| 2     | ASF, Rubber athletic flooring               | SF   | 3,073.00   | 20.00       | 61,460            |
| 3     | CPT-1, Carpet                               | SY   | 268.00     | 70.00       | 18,760            |
| 2375  | CPT-2, Carpet                               | SY   | 737.00     | 70.00       | 51,590            |
| 2377  | CPT-4/5, Carpet                             | SY   | 648.00     | 70.00       | 45,360            |
| 2378  | CPT-6, Carpet                               | SY   | 451.00     | 70.00       | 31,570            |
| 2379  | CPT-7, Carpet                               | SY   | 98.00      | 70.00       | 6,860             |
| 1418  | RC, Resilient carpet                        | SF   | 4,017.00   | 6.00        | 24,102            |
| 1398  | PP, Porcelain floor tiles                   | SF   | 19,070.00  | 30.00       | 572,100           |
| 4     | CMT, Ceramic mosaic tile                    | SF   | 5,098.50   | 20.00       | 101,970           |
| 5     | SCONC, Sealed concrete                      | SF   | 109,188.62 | 1.50        | 163,782           |
| 6     | EF, Epoxy flooring and base                 | SF   | 12,269.85  | 15.00       | 184,047           |
| 8     | FGC, Foot grille carpet                     | SF   | 1,090.00   | 70.00       | 76,300            |
| 9     | LIN, Linoleum                               | SF   | 121,581.60 | 10.00       | 1,215,816         |
| 14    | RR-L, Rubber tile (non-photoluminesent)     | SF   | 3,152.90   | 16.50       | 52,023            |
| 2380  | SV, Sheet vinyl                             | SF   | 36,459.10  | 12.00       | 437,509           |
| 2376  | MULT, Sheet vinyl - multipurpose            | SF   | 7,246.70   | 12.00       | 86,960            |
| 18    | SV-SR, Sheet vinyl - slip resistant         | SF   | 1,476.00   | 12.00       | 17,712            |
| 1401  | LVT, Luxury vinyl tile                      | SF   | 2,573.00   | 8.00        | 20,584            |
| 19    | WOC1, Walk off carpet                       | SY   | 441.10     | 65.00       | 28,671            |
| 2374  | WOC2, Walk off carpet                       | SY   | 35.00      | 65.00       | 2,275             |
| 20    | WAF, Wood athletic flooring                 | SF   | 12,150.00  | 20.00       | 243,000           |
| 21    | Wood sprung stage flooring - none indicated | SF   | 2,475.00   |             | Excl.             |
| 10    | Resilient base                              | LF   | 39,754.15  | 5.00        | 198,771           |
| 1744  | Sheet vinyl base                            | LF   | 6,643.00   | 5.00        | 33,215            |
| 1707  | Porcelain tile base                         | LF   | 835.00     | 25.00       | 20,875            |



### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | ool Building (continued)   |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|-----------|--|------|------------|--------------------------------|------------------------------------|
| Ref       | Description  | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 11        | Ceramic tile base  | LF   | 2,483.80   | 20.00                          | 49,676                             |
| 2482      | 6" Tall pre-cast terrazzo base   | LF   | 933.00     | 30.00                          | 27,990                             |
| 2483      | Millwork base  | LF   | 191.00     | 30.00                          | 5,730                              |
| 815       | High performance adhesive  | SF   | 215,799.00 | 1.50                           | 323,699                            |
|           | C2030 - Flooring   |      |            | 10.78/SF                       | 4,102,407                          |
| C2040     | Stair Finishes   |      |            |                                |                                    |
| 15        | Rubber stair treads and risers   | SF   | 7,625.10   | 25.00                          | 190,627                            |
| 1441      | Wood stair treads and risers - none indicated  | SF   | 94.00      |                                | Excl.                              |
| 1445      | Carpet stair treads and risers   | SF   | 307.00     |                                | Incl.                              |
|           | C2040 - Stair Finishes   |      |            | 0.50/SF                        | 190,627                            |
| C2050     | Ceiling Finishes   |      |            |                                |                                    |
| 31        | Acoustic ceiling (ACT-1) - 2' x 2' NRC acoustic ceiling tile   | SF   | 176,958.80 | 8.00                           | 1,415,670                          |
| 32        | Acoustic ceiling (ACT-2) - 2' x 2' Washable acoustic ceiling tile  | SF   | 5,647.00   | 8.00                           | 45,176                             |
| 33        | Acoustic ceiling (ACT-3) - 2' x 2' NRC tegular acoustic ceiling tile   | SF   | 13,065.00  | 8.00                           | 104,520                            |
| 34        | Acoustic ceiling (ACT-4) - 2' x 6' NRC tegular acoustic ceiling tile   | SF   | 4,725.00   | 12.00                          | 56,700                             |
| 1447      | Acoustic ceiling (ACT-5)   | SF   | 4,433.00   | 12.00                          | 53,196                             |
| 46        | Acoustic preformed ceiling panels at Media Center  | SF   | 1,852.00   | 65.00                          | 120,380                            |
| 1455      | Acoustic ceiling reflector at Stage  | SF   | 332.00     | 95.00                          | 31,540                             |
| 37        | Gypsum board ceiling   | SF   | 19,532.20  | 20.00                          | 390,644                            |
| 41        | Gypsum board ceiling, moisture resistant   | SF   | 6,756.55   | 25.00                          | 168,913                            |
| 38        | LMC-2, Linear metal ceiling with wood appearance   | SF   | 11,726.00  | 65.00                          | 762,190                            |
| 39        | Paint to gypsum board ceiling  | SF   | 32,378.66  | 1.50                           | 48,568                             |
| 2407      | Suspended pipe rail ceiling system (Multi Purpose RM)  | SF   | 3,290.00   | 15.00                          | 49,350                             |
| 40        | Paint to exposed ceiling   | SF   | 71,289.20  | 1.50                           | 106,933                            |
| 42        | Sound isolator ceiling - 2 layer 5/8" GWB over 7/8"<br>metal furring and 1-1/2" cold rolled channels with 3-<br>1/2" batt insulation (adjust unit rate per reconciliation) | SF   | 54,555.00  | 25.50                          | 1,391,153                          |
| 75        | Allowance for gypsum board soffit - allow 20% of GWB   | SF   | 3,906.60   | 25.00                          | 97,665                             |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

A Building

| A Building<br>A1 New School Building (continued) |  | GFAR: 380,570.00 SF Cost/SF: 417.58<br>Rates Current At January 2023 |        |             |                   |
|--|--|--|--------|-------------|-------------------|
| Ref  | Description  | Unit   | Qty    | Rate<br>USD | Total Cost<br>USD |
| 2406   | 4" Metal suspension trim   | LF   | 497.00 | 50.00       | 24,850            |
| 2586   | Use different sound isolation ceiling                              | LS   | 1.00   | -250,000.00 | -250,000          |
|  | C2050 - Ceiling Finishes   |  |        | 12.13/SF    | 4,617,448         |
|  | C20 - INTERIOR FINISHES  |  |        | 31.88/SF    | 12,133,900        |
| D10  | CONVEYING  |  |        |             |                   |
| D1010  | Vertical Conveying Systems   |  |        |             |                   |
| 687  | Traction passenger elevator, 5 stops, open both sides, 3500 pounds | EA   | 1.00   | 475,000.00  | 475,000           |
| 2511   | Traction service elevator, 4 stops, 5000 pounds                    | EA   | 1.00   | 360,000.00  | 360,000           |
| 1791   | Allowance for elevator usage to support miscellaneous trades       | LS   | 1.00   |             | Excl.             |
| 2512   | Elevator car allowance (per section 14150)                         | EA   | 2.00   | 25,000.00   | 50,000            |
|  | D1010 - Vertical Conveying Systems                                 |  |        | 2.33/SF     | 885,000           |
|  | D10 - CONVEYING  |  |        | 2.33/SF     | 885,000           |
| D20  | PLUMBING   |  |        |             |                   |
| D2010  | Domestic Water Distribution  |  |        |             |                   |
| 1886   | Plumbing Fixtures  | Note   |        |             |                   |
| 2072   | P-1, Water Closet - Flush Valve - Wall Mounted                     | EA   | 33.00  | 1,700.00    | 56,100            |
| 2073   | P-1A, Water Closet - Flush Valve - Wall Mounted, accessible        | EA   | 54.00  | 1,850.00    | 99,900            |
| 2074   | P-2, Urinal - Wall Hung  | EA   | 8.00   | 1,600.00    | 12,800            |
| 2075   | P-2A, Urinal - Wall Hung, accessible                               | EA   | 24.00  | 1,700.00    | 40,800            |
| 2076   | P-3, Lavatory - Rectangular - Wall Mounted 19X17                   | EA   | 52.00  | 1,450.00    | 75,400            |
| 2077   | P-3B, Basin Type Lavatory - Oval                                   | EA   | 7.00   | 1,250.00    | 8,750             |
| 2078   | P-3C, Restroom Lavatory - Oval                                     | EA   | 6.00   | 1,250.00    | 7,500             |
| 2079   | P-4,Mop Receptor   | EA   | 6.00   | 1,600.00    | 9,600             |
| 2404   | P-4A, Mop Receptor, accessible                                     | EA   | 2.00   | 1,700.00    | 3,400             |
| 2080   | P-5, Drinking Fountain - Recessed                                  | EA   | 9.00   | 2,800.00    | 25,200            |
| 2081   | P-5A, Drinking Fountain - Bi-Level - Wall Mounted                  | EA   | 5.00   | 3,800.00    | 19,000            |
| 2082   | P-6, Shower Base   | EA   | 7.00   | 2,500.00    | 17,500            |
| 2381   | P-6A, Shower, accessible   | EA   | 4.00   | 3,500.00    | 14,000            |



GFAR: 380,570.00 SF Cost/SF: 417.58

Rate

Rates Current At January 2023

**Total Cost** 

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

2083

2084

2085

2086

2087

2088

2089

2090

2095

447

2099

Ref

A1 New School Building (continued)

Description

USD USD P-7, Emergency Eye Wash ΕA 7.00 1,500.00 10,500 P-8, Emergency Eyewash-Shower ΕA 21.00 2,200.00 46,200 PX-1, Sink - Casework Sink - Furnished by others -ΕA 48.00 450.00 21,600 Install only PX-2, Sink - Casework Sink with Eyewash- Furnished 7.00 450.00 3,150 ΕA by others - Install only PX-3, Sink - Cosmetology Sink - Furnished by others -EΑ 15.00 450.00 6,750 Install only PX-4, Sink - Science Room Sink - Furnished by others ΕA 45.00 450.00 20,250 - Install only PX-5, Sink - Lab Sink - Furnished by others - Install ΕA 35.00 450.00 15,750 only PX-6, Dental Station - Furnished by others - Install ΕA 16.00 600.00 9,600 only Allowance for missing/ miscellaneous plumbing SF 411,003.00 0.15 61,650 fixtures(Main building building) Water Distribution and Components Note Connection to main(6")- (Main building) ΕA 1.00 1,200.00 1,200 Capped-HW & CW connection(pg-9/note-5) FΔ 2 00 300 00 600

Unit

Qty

| 2103 | Capped-HW & CW connection(pg-9/note-5)   | EA | 2.00   | 300.00    | 600    |
|------|--|----|--------|-----------|--------|
| 2104 | Plumbing fixture- hook up(domestic water)  | EA | 245.00 | 400.00    | 98,000 |
| 2105 | Kitchen equipment - hook up(water)   | EA | 80.00  | 500.00    | 40,000 |
| 2106 | Laboratory sink- hook up(water)  | EA | 150.00 | 600.00    | 90,000 |
| 2107 | PX-6, Dental station- hook up(1/2" CW)   | EA | 16.00  | 600.00    | 9,600  |
| 2108 | RB07, Water -hook up c/w BFP(1")   | EA | 1.00   | 800.00    | 800    |
| 2112 | 6", Water meter c/w bfp assembly   | EA | 1.00   | 13,000.00 | 13,000 |
| 2113 | Triplex booster pump(Syncroflo)  | EA | 1.00   | 85,000.00 | 85,000 |
| 453  | Chlorine/PH monitor system with 100 gal. tanks - (allowance)                     | EA | 1.00   | 10,000.00 | 10,000 |
| 458  | Chlorine/PH monitor system with 200 gal. tanks - (allowance)                     | EA | 1.00   | 18,000.00 | 18,000 |
| 2114 | PH-1, Neutralization system for science rooms                                    | EA | 1.00   | 80,000.00 | 80,000 |
| 2115 | Backflow preventer(for NPCW to science rooms)                                    | EA | 1.00   | 1,500.00  | 1,500  |
| 2116 | 1/2", Stacked reduced pressure backflow preventer(to serve janitors sink)(pg-21) | EA | 2.00   | 600.00    | 1,200  |



GFAR: 380,570.00 SF Cost/SF: 417.58

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| 1 New School Building (continued) |  |      |       | Rates Current At January 2023 |                   |
|-----------------------------------|--|------|-------|-------------------------------|-------------------|
| Ref                               | Description  | Unit | Qty   | Rate<br>USD                   | Total Cost<br>USD |
| 2117                              | 3/4", Reduced pressure backflow preventer (allowance)(pg-13)   | EA   | 1.00  | 800.00                        | 800               |
| 2118                              | 2", Stacked reduced pressure backflow preventer (allowance)(pg-12)   | EA   | 3.00  | 2,500.00                      | 7,500             |
| 2119                              | 2", Stacked reduced pressure backflow preventer (allowance)(pg-16)   | EA   | 3.00  | 2,500.00                      | 7,500             |
| 2120                              | EWH-1, Electric storage water heater(Durawatt-460), 90 kW  | EA   | 2.00  | 82,432.00                     | 164,864           |
| 2121                              | EWH-2, Electric storage water heater(Durawatt-460), 90 kW  | EA   | 2.00  | 82,432.00                     | 164,864           |
| 2122                              | EWH-3, Electric storage water heater(DSE-100), 100 gal - (serves NPHW for science rooms)                                 | EA   | 3.00  | 60,000.00                     | 180,000           |
| 2123                              | EWH-4, Electric storage water heater(Durawatt-460), 99 kW  | EA   | 2.00  | 82,432.00                     | 164,864           |
| 2124                              | EWH-5, Electric storage water heater(DSE-10), 6 kW, 10 gal   | EA   | 1.00  | 6,500.00                      | 6,500             |
| 2125                              | Electric water heaters (serving plumbing vocational shop)(pg-8)  | EA   | 2.00  |                               | Incl.             |
| 2126                              | Ceiling hung Electric water heater(serving toilet rooms & duplicating room sink)   | EA   | 1.00  |                               | Incl.             |
| 2127                              | Gas fired water heater(serving plumbing/pipe fitting shop), 130 Gal, 400 CFH(PVI conquest condensing water heater)(pg-9) | EA   | 3.00  | 39,673.67                     | 119,021           |
| 2131                              | Temperature maintenance re-heater for NPHW system  | EA   | 1.00  | 10,000.00                     | 10,000            |
| 2132                              | HWRP, Recirculation pump   | EA   | 13.00 | 2,500.00                      | 32,500            |
| 2133                              | ET, Expansion tank   | EA   | 13.00 | 500.00                        | 6,500             |
| 2134                              | Mixing valve(serving water heaters)  | EA   | 13.00 | 500.00                        | 6,500             |
| 2135                              | Dual mixing valve assembly   | EA   | 1.00  | 750.00                        | 750               |
| 2136                              | Triple mixing valve assembly   | EA   | 1.00  | 1,000.00                      | 1,000             |
| 2137                              | Thermostatic mixing valve(serving kitchen- hand sink)<br>(pg-29- fixture schedule)                                       | EA   | 11.00 | 400.00                        | 4,400             |
| 2138                              | Emergency mixing valve(serving emergency eye wash)   | EA   | 2.00  | 400.00                        | 800               |
| 2139                              | Emergency mixing valve(serving emergency shower/<br>eye wash)  | EA   | 2.00  | 600.00                        | 1,200             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|------|--|------|----------|-------------|-------------------|
| 2140 | Housekeeping pad(to be carried elsewhere in this estimate)         | Note |          |             | Excl.             |
| 2513 | Trap seal primer c/w tubing  | EA   | 170.00   | 300.00      | 51,000            |
| 2141 | HB, Hose bib   | EA   | 29.00    | 300.00      | 8,700             |
| 2142 | WH, Non freeze wall hydrant  | EA   | 9.00     | 500.00      | 4,500             |
| 2145 | 1/2" to 1", copper distribution c/w fittings, supports etc.        | LF   | 4,145.00 | 23.00       | 95,335            |
| 2146 | 1-1/4" to 1-1/2", copper distribution c/w fittings, supports etc.  | LF   | 3,748.00 | 40.00       | 149,920           |
| 2147 | 2" to 3",copper distribution c/w fittings, supports etc.           | LF   | 4,699.00 | 103.00      | 483,997           |
| 2148 | 4",copper distribution c/w fittings, supports etc.                 | LF   | 322.00   | 215.00      | 69,230            |
| 2149 | 6",copper distribution c/w fittings, supports etc.                 | LF   | 187.00   | 470.00      | 87,890            |
| 2150 | Thermal pipe insulation - 1/2" to 1" copper pipe                   | LF   | 4,145.00 | 6.50        | 26,943            |
| 2151 | Thermal pipe insulation - 1-1/4" to 1-1/2" copper pipe             | LF   | 3,748.00 | 13.00       | 48,724            |
| 2152 | Thermal pipe insulation - 2" to 3", copper distribution            | LF   | 4,699.00 | 20.00       | 93,980            |
| 2153 | Thermal pipe insulation - 4", copper distribution                  | LF   | 322.00   | 25.00       | 8,050             |
| 2154 | Thermal pipe insulation - 6", copper distribution                  | LF   | 187.00   | 35.00       | 6,545             |
| 2158 | Water meter c/w bfp assembly- hook up(6")                          | EA   | 1.00     | 1,200.00    | 1,200             |
| 2159 | Triplex booster pump- hook up                                      | EA   | 1.00     | 4,000.00    | 4,000             |
| 2514 | Chlorine/PH monitor system- hook up                                | EA   | 2.00     | 750.00      | 1,500             |
| 2160 | Neutralization system- hook up                                     | EA   | 1.00     | 8,000.00    | 8,000             |
| 2161 | Gas fired water heater- hook up                                    | EA   | 3.00     | 750.00      | 2,250             |
| 2162 | Electric water heater- hook up(small)                              | EA   | 1.00     | 550.00      | 550               |
| 2164 | Electric water heater- hook up(large)                              | EA   | 9.00     | 750.00      | 6,750             |
| 2166 | NPHW temperature maintenance station- hook up                      | EA   | 1.00     | 750.00      | 750               |
| 2167 | Circulating pump - hook up   | EA   | 13.00    | 750.00      | 9,750             |
| 2168 | Expansion tank - hook up   | EA   | 13.00    | 300.00      | 3,900             |
| 2169 | Mixing valve - hook up   | EA   | 30.00    | 500.00      | 15,000            |
| 2170 | RBFP- hook up  | EA   | 10.00    | 550.00      | 5,500             |
| 1373 | Hookup - plumbing  | EA   | 38.00    | 400.00      | 15,200            |
| 2171 | Student plumbing booth- hook up(water)(pg-9/note-4)<br>(allowance) | EA   | 33.00    | 400.00      | 13,200            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|------------|-------------|-------------------|
| 2172  | Allowance for missing/ miscellaneous domestic water<br>system c/w fixture rough in, hot & cold water piping,<br>non-potable piping, tempered piping etc.(Main<br>building) | SF   | 411,003.00 | 0.25        | 102,751           |
| 2176  | Subcontractor GCs/GRs  | Item |            |             | 227,000           |
| 2604  | Remove urinals and FD's from single occupancy toilet rooms (VE-P01)  | LS   | 1.00       | -85,000.00  | -85,000           |
| 2601  | Delete toilet room at Maintenance Building(VE-P02)   | LS   | 1.00       | -20,000.00  | -20,000           |
|       | D2010 - Domestic Water Distribution  |      |            | 8.83/SF     | 3,360,978         |
| D2020 | Sanitary Drainage  |      |            |             |                   |
| 2177  | Connection to main   | EA   | 15.00      | 750.00      | 11,250            |
| 2178  | Plumbing fixture - hook-ups(sanitary & vent)   | EA   | 245.00     | 400.00      | 98,000            |
| 2179  | Kitchen equipment - hook up(sanitary/indirect waste & vent)  | EA   | 68.00      | 400.00      | 27,200            |
| 2180  | Laboratory sink- hook up(acid waste & vent)  | EA   | 150.00     | 600.00      | 90,000            |
| 2181  | PX-6, Dental station- hook up(waste & vent)  | EA   | 16.00      | 400.00      | 6,400             |
| 2183  | Grease trap for triple sink, 50 gpm  | EA   | 3.00       | 11,000.00   | 33,000            |
| 2185  | Gas/oil interceptor (for garage drainage system)   | EA   | 4.00       | 20,000.00   | 80,000            |
| 2186  | Local grease trap for dishwasher, 35 gpm   | EA   | 3.00       | 8,000.00    | 24,000            |
| 2187  | Local grease trap(serving culinary arts kitchen), 50 gpm   | EA   | 1.00       | 11,000.00   | 11,000            |
| 2317  | Local grease trap, 75 gpm  | EA   | 1.00       | 22,000.00   | 22,000            |
| 2191  | Gas/ oil separator(allowance)  | EA   | 1.00       | 8,000.00    | 8,000             |
| 2480  | Condensate pump (assumed one per each FCU and AC units)  | EA   | 314.00     | 300.00      | 94,200            |
| 2192  | Trench drain(serving auto collision/auto technology & metal fabrication areas)   | EA   | 8.00       | 350.00      | 2,800             |
| 2194  | FD, Floor drain  | EA   | 162.00     | 450.00      | 72,900            |
| 2195  | Condensate receptor  | EA   | 8.00       | 500.00      | 4,000             |
| 2196  | Kitchen grate  | EA   | 30.00      | 200.00      | 6,000             |
| 2197  | CO, Clean out  | EA   | 113.00     | 350.00      | 39,550            |
| 2198  | Clean out (serving acid waste)   | EA   | 25.00      | 450.00      | 11,250            |
| 2205  | 1-1/2", Sanitary piping c/w fittings- Ag   | LF   | 13.00      | 38.00       | 494               |


## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description   | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|------------|-------------|-------------------|
| 2206  | 2", Sanitary piping c/w fittings - Ag   | LF   | 349.60     | 40.00       | 13,984            |
| 2207  | 3", Sanitary piping c/w fittings - Ag   | LF   | 671.00     | 45.00       | 30,195            |
| 2208  | 4", Sanitary piping c/w fittings - Ag   | LF   | 1,478.70   | 50.00       | 73,935            |
| 2209  | 6", Sanitary piping c/w fittings - Ag   | LF   | 489.00     | 60.00       | 29,340            |
| 2212  | 2", Sanitary piping c/w fittings - Bg   | LF   | 66.30      | 40.00       | 2,652             |
| 2213  | 3", Sanitary piping c/w fittings - Bg   | LF   | 172.00     | 45.00       | 7,740             |
| 2214  | 4", Sanitary piping c/w fittings - Bg   | LF   | 1,132.50   | 50.00       | 56,625            |
| 2215  | 6", Sanitary piping c/w fittings - Bg   | LF   | 2,651.80   | 55.00       | 145,849           |
| 2217  | 2", Acid waste drainage PP piping- Single containment c/w fittings-Ag   | LF   | 816.00     | 61.00       | 49,776            |
| 2218  | 3", Acid waste drainage PP piping- Single containment c/w fittings-Ag   | LF   | 1,061.00   | 88.00       | 93,368            |
| 2219  | 4", Acid waste drainage PP piping- Single containment c/w fittings-Ag   | LF   | 311.00     | 116.00      | 36,076            |
| 2263  | No excavation & backfill- assumed   | Note |            |             | Excl.             |
| 2262  | No cutting and patching assumed   | Note |            |             | Excl.             |
| 2383  | 8", Radon mitigation vent riser from below slab   | EA   | 14.00      |             | Incl.             |
| 2225  | Allowance for vent piping   | LS   | 1.00       | 240,000.00  | 240,000           |
| 2229  | 8", Vent piping c/w fitting, support, etc (radon<br>mitigation) (Riser from lower slab till roof serving every<br>10,000 SF)                | LF   | 1,008.00   | 65.00       | 65,520            |
| 2230  | Allowance for acid vent piping  | LS   | 1.00       | 140,000.00  | 140,000           |
| 2400  | Student plumbing booth- hook up(drain)(pg-9/note-4)   | EA   | 34.00      | 400.00      | 13,600            |
| 2234  | Allowance for missing/ miscellaneous sanitary<br>drainage system c/w piping, vents, ejectors, clean-out,<br>acid waste, etc.(Main building) | SF   | 411,003.00 | 0.25        | 102,751           |
| 2238  | Subcontractor GCs/GRs   | Item |            |             | 87,000            |
|       | D2020 - Sanitary Drainage   |      |            | 4.81/SF     | 1,830,455         |
| D2030 | Building Support Plumbing Systems   |      |            |             |                   |
| 1883  | Connection to main  | EA   | 9.00       | 750.00      | 6,750             |
| 1884  | SP-1, Simplex elevator pit sump pump, 50 gpm  | EA   | 1.00       | 7,500.00    | 7,500             |
| 1885  | SP-2, Simplex elevator pit sump pump, 50 gpm  | EA   | 1.00       | 7,500.00    | 7,500             |
| 2240  | Scupper type drains(at low roof)/(pg-24/note-1)   | EA   | 10.00      | 500.00      | 5,000             |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|------------|-------------|-------------------|
| 2241  | 3" TD, Terrace drain c/w grate   | EA   | 4.00       | 550.00      | 2,200             |
| 2242  | 4" RD/OFD, Roof Drain/ Overflow drain  | EA   | 93.00      | 1,200.00    | 111,600           |
| 2243  | 6" RD/OFD, Roof Drain/ Overflow drain  | EA   | 3.00       | 1,300.00    | 3,900             |
| 2244  | Flat grate under pavers(serving roof drains)(pg-10)                                | EA   | 2.00       | 200.00      | 400               |
| 2245  | Clean out  | EA   | 85.00      | 350.00      | 29,750            |
| 2246  | 4", Storm drain piping c/w fittings, supports - Ag                                 | LF   | 1,876.84   | 70.00       | 131,379           |
| 2247  | 6", Storm drain piping c/w fittings, supports - Ag                                 | LF   | 4,801.90   | 110.00      | 528,209           |
| 2248  | 8", Storm drain piping c/w fittings, supports - Ag                                 | LF   | 741.00     | 180.00      | 133,380           |
| 2250  | 4", Storm drain piping c/w fittings, supports - Bg                                 | LF   | 4.00       | 57.00       | 228               |
| 2251  | 6", Storm drain piping c/w fittings, supports - Bg                                 | LF   | 446.70     | 100.00      | 44,670            |
| 2252  | 8", Storm drain piping c/w fittings, supports - Bg                                 | LF   | 498.00     | 142.00      | 70,716            |
| 2253  | 10", Storm drain piping c/w fittings, supports - Bg                                | LF   | 316.00     | 186.00      | 58,776            |
| 2254  | No excavation & backfill- assumed  | Note |            |             | Excl.             |
| 2255  | No cutting and patching assumed  | Note |            |             | Excl.             |
| 2256  | Elevator pit sump pump- hook up  | EA   | 2.00       | 1,500.00    | 3,000             |
| 2257  | Allowance for missing/ miscellaneous storm water<br>drainage system(Main building) | SF   | 411,003.00 | 0.20        | 82,201            |
| 2261  | Subcontractor GCs/GRs  | Item |            |             | 86,000            |
|       | D2030 - Building Support Plumbing Systems  |      |            | 3.45/SF     | 1,313,159         |
| D2050 | General Service Compressed-Air   |      |            |             |                   |
| 1893  | AC-1, Air compressor(auto collision/ metal fabrication)<br>c/w receiver & dryer    | EA   | 1.00       | 53,448.00   | 53,448            |
| 1898  | AC-2, Air compressor c/w tank(Votech shops)  | EA   | 1.00       | 33,032.00   | 33,032            |
| 1900  | AC-3, Air compressor c/w tank (Biotech shops)                                      | EA   | 1.00       | 38,820.00   | 38,820            |
| 1901  | AC-4, Air compressor c/w tank (Draft and design)                                   | EA   | 1.00       | 18,735.00   | 18,735            |
| 2264  | AC-5, Air compressor c/w tank (Dental)   | EA   | 1.00       | 78,500.00   | 78,500            |
| 2265  | AC-6, Air compressor c/w tank (Robotics)   | EA   | 1.00       | 19,000.00   | 19,000            |
| 2266  | 400 gal, Air receiver tank(serving AC-1)   | EA   | 1.00       |             | Incl.             |
| 2267  | Air dryer(serving AC-1)  | EA   | 1.00       |             | Incl.             |
| 2268  | Master compressed air shut-off(for auto collision area)<br>(allowance)             | EA   | 1.00       | 2,500.00    | 2,500             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description   | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|------------|-------------|-------------------|
| 2271  | Compressed air - branch piping  | LF   | 487.00     | 40.00       | 19,480            |
| 2272  | Compressed air - main piping  | LF   | 2,757.00   | 47.00       | 129,579           |
| 2273  | Compressed air- hook up c/w pressure gauge, air filter, condensate filter, pressure regulator   | EA   | 44.00      | 500.00      | 22,000            |
| 2274  | Compressed air- hook up c/w shutoff valve, pressure gauge, air filter, condensate filter, pressure regulator (pg-21/note-1)                             | EA   | 9.00       | 550.00      | 4,950             |
| 2275  | Compressed air- hook up c/w shut off valve, pressure<br>gauge, air filter, air pressure regulator, 50' hose reel<br>(pg-8/note-1)(Carpentry shop)       | EA   | 15.00      | 1,800.00    | 27,000            |
| 2397  | Compressed air- hook up c/w shut off valve, pressure<br>gauge, air filter, air pressure regulator, 50' hose reel<br>(pg-9/note-1)(HVAC technology shop) | EA   | 10.00      | 1,800.00    | 18,000            |
| 2276  | Compressed air- paint booth- hook up  | EA   | 2.00       | 550.00      | 1,100             |
| 2277  | Compressed air- hook up( to equipment)  | EA   | 1.00       | 550.00      | 550               |
| 2278  | Air compressor - hook up  | EA   | 6.00       | 550.00      | 3,300             |
| 2279  | Air compressor tank- hook up  | EA   | 6.00       | 550.00      | 3,300             |
| 2280  | Air receiver - hook up  | EA   | 1.00       | 550.00      | 550               |
| 2281  | Air dryer- hook up  | EA   | 1.00       | 550.00      | 550               |
| 2282  | Dust collector- hook up   | EA   | 1.00       | 550.00      | 550               |
| 2283  | Dental station- hook up(CA)   | EA   | 16.00      | 550.00      | 8,800             |
| 2284  | Biotech labs- ceiling panels- hook up(CA)(allowance)  | EA   | 5.00       | 550.00      | 2,750             |
| 2285  | Allowance for missing/ miscellaneous compressed air system(Main building)   | SF   | 411,003.00 | 0.50        | 205,502           |
| 2289  | Subcontractor GCs/GRs   | Item |            |             | 48,000            |
|       | D2050 - General Service Compressed-Air  |      |            | 1.94/SF     | 739,996           |
| D2060 | Process Support Plumbing Systems  |      |            |             |                   |
| 1895  | VAC-1, Vacuum pump(biotech lab)   | EA   | 1.00       | 19,700.00   | 19,700            |
| 2290  | VAC-2, Vacuum pump(dental)  | EA   | 1.00       | 18,000.00   | 18,000            |
| 2291  | Gas meter assembly(to be by others)   | EA   | 1.00       |             | Excl.             |
| 2398  | Kitchen emergency gas shut-off system c/w main<br>control panel, shut-off switch, gas solenoid valve, CO<br>detectors, etc(allowance)                   | EA   | 4.00       | 5,000.00    | 20,000            |
| 2293  | Vacuum piping c/w fittings, support, etc- main  | LF   | 296.00     | 55.00       | 16,280            |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | nool Building (continued)   |      | GFAR: 38 | 30,570.00 SF C<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|-----------|---|------|----------|-----------------------------------|------------------------------------|
| Ref       | Description   | Unit | Qty      | Rate<br>USD                       | Total Cost<br>USD                  |
| 2295      | 1-1/4" to 1-1/2", Sch.40 steel natural gas distribution c/w fittings, supports etc. | LF   | 6.00     | 45.00                             | 270                                |
| 2296      | 2" to 2-1/2",Sch.40 steel natural gas distribution c/w fittings, supports etc.      | LF   | 52.00    | 80.00                             | 4,160                              |
| 2297      | 3",Sch.40 steel natural gas distribution c/w fittings, supports etc.                | LF   | 121.00   | 100.00                            | 12,100                             |
| 2298      | 4",Sch.40 steel natural gas distribution c/w fittings, supports etc.                | LF   | 822.00   | 120.00                            | 98,640                             |
| 2300      | Oxygen piping c/w fittings, support, etc  | LF   | 167.00   | 55.00                             | 9,185                              |
| 2301      | Argon piping c/w fittings, support, etc   | LF   | 166.00   | 55.00                             | 9,130                              |
| 1747      | Allowances for argon piping   | LF   | 713.00   | 55.00                             | 39,215                             |
| 2302      | Acetylene piping c/w fittings, support, etc   | LF   | 168.00   | 55.00                             | 9,240                              |
| 2303      | Welding booth -hook up(O2)  | EA   | 22.00    | 550.00                            | 12,100                             |
| 2304      | Welding booth -hook up(Ar)  | EA   | 22.00    | 550.00                            | 12,100                             |
| 2305      | Welding booth -hook up(C2H2- acetylene)   | EA   | 22.00    | 550.00                            | 12,100                             |
| 1757      | Allowances for miscellaneous argon, oxygen & acetylene hookups                      | LS   | 1.00     | 25,000.00                         | 25,000                             |
| 2306      | Oxygen storage tank- hook up c/w manifolds, shutoff valves, etc                     | EA   | 1.00     | 10,000.00                         | 10,000                             |
| 2307      | Argon storage tank- hook up c/w manifolds, shutoff valves, etc                      | EA   | 1.00     | 10,000.00                         | 10,000                             |
| 2308      | Acetylene storage tank- hook up c/w manifolds, shutoff valves, etc                  | EA   | 1.00     | 10,000.00                         | 10,000                             |
| 2517      | Vacuum pump- hook up  | EA   | 2.00     | 1,500.00                          | 3,000                              |
| 2309      | Biotech labs- ceiling panels- hook up(Vacuum)<br>(allowance)                        | EA   | 5.00     | 550.00                            | 2,750                              |
| 2310      | Dental station- hook up(Vacuum)   | EA   | 16.00    | 550.00                            | 8,800                              |
| 2399      | Kitchen emergency gas shut-off system- hook up                                      | EA   | 4.00     | 550.00                            | 2,200                              |
| 2311      | Water heater - hook up(NG)  | EA   | 3.00     | 550.00                            | 1,650                              |
| 2312      | Paint booth- hook up(NG)  | EA   | 2.00     | 550.00                            | 1,100                              |
| 2313      | Kitchen equipment - hook up(natural gas)  | EA   | 24.00    | 550.00                            | 13,200                             |
| 2314      | Biotech labs- ceiling panels- hook up(NG)(allowance)                                | EA   | 5.00     | 550.00                            | 2,750                              |
| 2531      | Student plumbing booth- hook up(NG)   | EA   | 34.00    | 550.00                            | 18,700                             |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

| A Building<br>A1 New Sch | nool Building (continued)   |      | GFAR: 3    | 880,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|---|------|------------|--------------------------------|------------------------------------|
| Ref                      | Description   | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 1756                     | Allowances for misc NG valves and accessories   | LS   | 1.00       | 15,000.00                      | 15,000                             |
| 1746                     | Main control panel at each gas hood - allow   | No   | 8.00       | 4,000.00                       | 32,000                             |
| 2315                     | Allowances for additional main building gas system (natural gas/O2/Ar/C2H2)   | SF   | 411,003.00 | 0.25                           | 102,751                            |
| 2316                     | Subcontractor GCs/GRs   | Item |            |                                | 55,000                             |
|                          | D2060 - Process Support Plumbing Systems  |      |            | 1.59/SF                        | 606,121                            |
|                          | D20 - PLUMBING  |      |            | 20.63/SF                       | 7,850,709                          |
| D30                      | HVAC  |      |            |                                |                                    |
| D3020                    | Heat Systems  |      |            |                                |                                    |
| 1847                     | EUH-1, Electric unit heater, 15 kW  | EA   | 15.00      | 2,750.00                       | 41,250                             |
| 1865                     | EUH-2, Electric unit heater, 1.5 kW   | EA   | 15.00      | 1,200.00                       | 18,000                             |
| 1866                     | EUH-3, Electric unit heater, 3 kW   | EA   | 6.00       | 1,600.00                       | 9,600                              |
| 1867                     | EUH-4 & 5, Electric unit heater, 10 kW  | EA   | 9.00       | 2,250.00                       | 20,250                             |
|                          | D3020 - Heat Systems  |      |            | 0.23/SF                        | 89,100                             |
| D3030                    | Cooling Systems   |      |            |                                |                                    |
| 1667                     | LG HVAC equipments consisting of DX-split units,<br>FCU c/w condenser units, branch circuit controllers,<br>VCU's (serving RTU's, MAU's, AHU's, HRU's), etc.                        | LS   | 1.00       | 3,692,000.00                   | 3,692,000                          |
| 1189                     | AC- 0-1/6/7 / 1-3 / 2-4, DX split system air conditioning<br>unit 3 ton, 36 mbh cooling capacity c/w outdoor air-<br>cooled condensing unit   | EA   | 4.00       |                                | Incl.                              |
| 1190                     | AC- 0-2 to 0-5 / 1-1/2/4 to 10 / 2-1/2/3/5 to 10 / 3-1 to 6 / 4-1 to 7, DX split system air conditioning unit 2 ton, 24 mbh cooling capacity c/w outdoor air-cooled condensing unit | EA   | 32.00      |                                | Incl.                              |
| 1859                     | AC-H-01 to 03 / 04.1 to 04.4 / , DX split system air conditioning unit 1.5 ton, 18 mbh cooling capacity c/w outdoor air-cooled condensing unit                                      | EA   | 7.00       |                                | Incl.                              |
| 1860                     | AC-H-05 - 06, DX split system air conditioning unit 4<br>ton, 48 mbh cooling capacity c/w outdoor air-cooled<br>condensing unit   | EA   | 2.00       |                                | Incl.                              |
| 1193                     | FCU, DX-cooled fan coil units 0.5 ton   | EA   | 41.00      |                                | Incl.                              |
| 1194                     | FCU, DX-cooled fan coil units 0.6 ton   | EA   | 21.00      |                                | Incl.                              |
| 1195                     | FCU, DX-cooled fan coil units 0.8 ton   | EA   | 27.00      |                                | Incl.                              |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description   | Unit | Qty        | Rate<br>USD  | Total Cost<br>USD |
|-------|---|------|------------|--------------|-------------------|
| 1197  | FCU, DX-cooled fan coil units 1 ton   | EA   | 5.00       |              | Incl.             |
| 1196  | FCU, DX-cooled fan coil units 1.3 ton   | EA   | 9.00       |              | Incl.             |
| 1198  | FCU, DX-cooled fan coil units 1.5 ton   | EA   | 15.00      |              | Incl.             |
| 1200  | FCU, DX-cooled fan coil units 2 ton   | EA   | 42.00      |              | Incl.             |
| 1202  | FCU, DX-cooled fan coil units 2.3 ton   | EA   | 11.00      |              | Incl.             |
| 1203  | FCU, DX-cooled fan coil units 3 ton   | EA   | 68.00      |              | Incl.             |
| 1204  | FCU, DX-cooled fan coil units 3.5 ton   | EA   | 16.00      |              | Incl.             |
| 1205  | FCU, DX-cooled fan coil units 4 ton   | EA   | 10.00      |              | Incl.             |
| 1206  | FCU, DX-cooled fan coil units 4.5 ton   | EA   | 4.00       |              | Incl.             |
| 1568  | Refrigeration piping c/w fittings, supports, etc.   | LF   | 52,802.00  | 45.00        | 2,376,090         |
| 1684  | Allowance for refrigerant   | Lb   | 12,700.00  | 25.00        | 317,500           |
| 1709  | RTU - hook ups  | EA   | 2.00       | 750.00       | 1,500             |
| 1710  | MAU - hook ups  | EA   | 2.00       | 750.00       | 1,500             |
| 1711  | HRU - hook ups  | EA   | 5.00       | 750.00       | 3,750             |
| 1712  | AHU - hook ups  | EA   | 10.00      | 750.00       | 7,500             |
| 1713  | ERV - hook ups  | EA   | 5.00       | 750.00       | 3,750             |
| 1974  | FCU - hook ups  | EA   | 269.00     | 500.00       | 134,500           |
| 1975  | AC units - hook ups   | EA   | 45.00      | 500.00       | 22,500            |
| 2481  | Allowance for missing/ miscellaneous  | SF   | 493,374.89 | 0.40         | 197,350           |
|       | D3030 - Cooling Systems   |      |            | 17.76/SF     | 6,757,940         |
| D3050 | Facility HVAC Distribution Systems  |      |            |              |                   |
| 1677  | YORK HVAC equipments consisting of RTU's, AHU's, MAU's and HRU's  | LS   | 1.00       | 6,799,000.00 | 6,799,000         |
| 1154  | RTU-1, DX-cooled roof-top air handling unit, 1,165 cfm c/w air-cooled VRF condensing units (6 ton), electric pre heat, etc.             | EA   | 1.00       |              | Incl.             |
| 1155  | RTU-2, DX-cooled roof-top air handling unit, 14,000<br>cfm c/w air-cooled VRF condensing units (3 x 16 ton),<br>electric pre heat, etc. | EA   | 1.00       |              | Incl.             |
| 1157  | MAU-1, DX-cooled make-up air unit, 6,510 cfm c/w air-<br>cooled VRF condensing units (2 x 18 ton), electric pre<br>heat, etc.           | EA   | 1.00       |              | Incl.             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description   | Unit | Qty  | Rate<br>USD | Total Cost<br>USD |
|------|---|------|------|-------------|-------------------|
| 1158 | MAU-2, DX-cooled make-up air unit, 15,605 cfm c/w air-cooled VRF condensing units (3 x 30 ton), electric pre heat, etc.                   | EA   | 1.00 |             | Incl.             |
| 1159 | AHU-1 & 2, DX-cooled indoor air handling unit, 20,000 cfm c/w air-cooled VRF condensing units (3 x22 ton), electric pre heat, etc.        | EA   | 2.00 |             | Incl.             |
| 1160 | AHU-3, DX-cooled indoor air handling unit, 15,475 cfm c/w air-cooled VRF condensing units (2 x 26 ton), electric pre heat, etc.           | EA   | 1.00 |             | Incl.             |
| 1161 | AHU-4, DX-cooled indoor air handling unit, 9,405 cfm c/w air-cooled VRF condensing units (2 x18 ton & 2 x14 ton), electric pre heat, etc. | EA   | 1.00 |             | Incl.             |
| 1162 | AHU-5, DX-cooled indoor air handling unit, 7,275 cfm c/w air-cooled VRF condensing units (2 x12 ton), electric pre heat, etc.             | EA   | 1.00 |             | Incl.             |
| 1163 | AHU-6, DX-cooled indoor air handling unit, 6,570 cfm c/w air-cooled VRF condensing units (2 x10 ton), electric pre heat, etc.             | EA   | 1.00 |             | Incl.             |
| 1164 | AHU-7, DX-cooled indoor air handling unit, 8,265 cfm c/w air-cooled VRF condensing units (2 x14 ton), electric pre heat, etc.             | EA   | 1.00 |             | Incl.             |
| 1165 | AHU-8, DX-cooled indoor air handling unit, 10,255 cfm c/w air-cooled VRF condensing units (2 x20 ton), electric pre heat, etc.            | EA   | 1.00 |             | Incl.             |
| 1166 | AHU-9, DX-cooled indoor air handling unit, 3,555 cfm c/w air-cooled VRF condensing units (2 x14 ton), electric pre heat, etc.             | EA   | 1.00 |             | Incl.             |
| 1167 | AHU-10, DX-cooled indoor air handling unit, 9,485 cfm c/w air-cooled VRF condensing units (2 x22 ton), electric pre heat, etc.            | EA   | 1.00 |             | Incl.             |
| 1142 | ERV-1, Energy recovery ventilator, 695 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.                               | EA   | 1.00 | 13,000.00   | 13,000            |
| 1143 | ERV-2, Energy recovery ventilator, 285 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.                               | EA   | 1.00 | 6,000.00    | 6,000             |
| 1144 | ERV-3, Energy recovery ventilator, 1,100 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.                             | EA   | 1.00 | 20,000.00   | 20,000            |
| 1145 | ERV-4, Energy recovery ventilator, 1,795 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.                             | EA   | 1.00 | 32,500.00   | 32,500            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description   | Unit | Qty  | Rate<br>USD | Total Cost<br>USD |
|------|---|------|------|-------------|-------------------|
| 1840 | ERV-7, Energy recovery ventilator, 250 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.   | EA   | 1.00 | 5,500.00    | 5,500             |
| 1150 | HRU-1 to 3, DX-cooled dedicated outdoor air roof-top<br>units, 16,000 cfm c/w air-cooled VRF condensing units<br>(3 x24 ton), electric pre heat, etc. | EA   | 3.00 |             | Incl.             |
| 1151 | HRU-4, DX-cooled dedicated outdoor air roof-top<br>units, 7,070 cfm c/w air-cooled VRF condensing units<br>(2 x18 ton), electric pre heat, etc.       | EA   | 1.00 |             | Incl.             |
| 1153 | HRU-5, DX-cooled dedicated outdoor air roof-top<br>units, 2,760 cfm c/w air-cooled VRF condensing units<br>(2 x 6 ton), electric pre heat, etc.       | EA   | 1.00 |             | Incl.             |
| 1168 | F-1 & 8, Exhaust fan, 600 cfm   | EA   | 2.00 | 1,250.00    | 2,500             |
| 1169 | F-2, 4 & 17, Exhaust fan, 900 cfm   | EA   | 3.00 | 1,875.00    | 5,625             |
| 1170 | F-3, Exhaust fan, 9,600 cfm   | EA   | 1.00 | 20,000.00   | 20,000            |
| 1171 | F-5, Exhaust fan, 2,600 cfm   | EA   | 1.00 | 5,415.00    | 5,415             |
| 1174 | F-7, Exhaust fan, 2,100 cfm   | EA   | 1.00 | 4,370.00    | 4,370             |
| 1175 | F-9, Exhaust fan, 500 cfm   | EA   | 1.00 | 1,050.00    | 1,050             |
| 1178 | F-11 & 12, Exhaust fan, 360 cfm   | EA   | 2.00 | 750.00      | 1,500             |
| 1180 | F-13, Exhaust fan, 18,400 cfm   | EA   | 1.00 | 38,275.00   | 38,275            |
| 1181 | F-15 & 16, Exhaust fan, 15,000 cfm  | EA   | 2.00 | 31,200.00   | 62,400            |
| 1182 | F-18, Exhaust fan, 415 cfm  | EA   | 1.00 | 950.00      | 950               |
| 1849 | F-20, Exhaust fan, 450 cfm  | EA   | 1.00 | 950.00      | 950               |
| 1183 | KEF-1, Kitchen exhaust fan, 2,800 cfm   | EA   | 2.00 | 5,825.00    | 11,650            |
| 1184 | KEF-2, Kitchen exhaust fan, 3,300 cfm   | EA   | 2.00 | 5,870.00    | 11,740            |
| 1185 | KEF-3, Kitchen exhaust fan, 1,850 cfm   | EA   | 1.00 | 3,850.00    | 3,850             |
| 1186 | KEF-4, Kitchen exhaust fan, 2,365 cfm   | EA   | 1.00 | 4,925.00    | 4,925             |
| 1188 | KEF-5, Kitchen exhaust fan, 9,390 cfm   | EA   | 1.00 | 10,725.00   | 10,725            |
| 1878 | DF-1, Destratification fan, 18' blade dia   | EA   | 2.00 | 19,550.00   | 39,100            |
| 1872 | FTU-1 to 3, Fan terminal unit - electric heating, 1590 cfm, 16 kW   | EA   | 3.00 | 1,250.00    | 3,750             |
| 1873 | FTU-4, Fan terminal unit - electric heating, 825 cfm, 8<br>kW   | EA   | 1.00 | 950.00      | 950               |
| 1874 | FTU-5 & 6, Fan terminal unit - electric heating, 1230 cfm, 12 kW  | EA   | 2.00 | 1,150.00    | 2,300             |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|------|--|------|------------|-------------|-------------------|
| 1875 | FTU-7, Fan terminal unit - electric heating, 1500 cfm, 15 kW                     | EA   | 1.00       | 1,250.00    | 1,250             |
| 1876 | FTU-8 & 9, Fan terminal unit - electric heating, 2250 cfm, 22 kW                 | EA   | 2.00       | 1,750.00    | 3,500             |
| 1191 | Allowance for relocation of existing Dust collector including fan and abort gate | EA   | 1.00       | 5,000.00    | 5,000             |
| 1982 | Kitchen exhaust hood   | EA   | 2.00       | 2,500.00    | 5,000             |
| 1877 | Sound attenuators  | EA   | 10.00      | 8,000.00    | 80,000            |
| 1192 | BS, VRF branch circuit selector  | EA   | 46.00      |             | Incl.             |
| 1209 | Air cleaners (Airboss 2500)  | EA   | 3.00       | 4,000.00    | 12,000            |
| 1972 | VAV box (small)  | EA   | 267.00     | 1,350.00    | 360,450           |
| 2592 | VAV box (small) - VE   | EA   | -60.00     | 1,350.00    | -81,000           |
| 1305 | VAV box (medium)   | EA   | 21.00      | 1,750.00    | 36,750            |
| 2596 | VAV box (medium) - VE  | EA   | 20.00      | 1,750.00    | 35,000            |
| 1306 | VAV box (large)  | EA   | 1.00       | 2,500.00    | 2,500             |
| 1216 | Galvanized duct work c/w fittings, supports, etc.                                | Lb   | 344,250.00 | 15.00       | 5,163,750         |
| 1217 | Thermal insulation   | SF   | 136,000.00 | 6.50        | 884,000           |
| 1243 | 4" to 6", Round galvanized duct work c/w fittings, supports, etc                 | LF   | 3,095.80   | 65.00       | 201,227           |
| 1242 | 7" to 8", Round galvanized duct work c/w fittings, supports, etc                 | LF   | 1,701.00   | 70.00       | 119,070           |
| 1346 | 10" to 12", Round galvanized duct work c/w fittings, supports, etc               | LF   | 2,539.60   | 80.00       | 203,168           |
| 1241 | 14" to 16", Round galvanized duct work c/w fittings, supports, etc               | LF   | 1,357.00   | 85.00       | 115,345           |
| 1245 | 18" to 20", Round galvanized duct work c/w fittings, supports, etc               | LF   | 134.09     | 90.00       | 12,068            |
| 1317 | 22" to 24", Round galvanized duct work c/w fittings, supports, etc               | LF   | 257.00     | 95.00       | 24,415            |
| 1968 | 26" to 28", Round galvanized duct work c/w fittings, supports, etc               | LF   | 610.00     | 110.00      | 67,100            |
| 1220 | 30" to 32", Round galvanized duct work c/w fittings, supports, etc               | LF   | 1,053.00   | 125.00      | 131,625           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|------|--|------|----------|-------------|-------------------|
| 1223 | 34" to 36", Round galvanized duct work c/w fittings, supports, etc | LF   | 1,197.00 | 130.00      | 155,610           |
| 1225 | 38" to 40", Round galvanized duct work c/w fittings, supports, etc | LF   | 457.00   | 150.00      | 68,550            |
| 1226 | 42" to 44", Round galvanized duct work c/w fittings, supports, etc | LF   | 386.00   | 155.00      | 59,830            |
| 1978 | 46", Round galvanized duct work c/w fittings, supports, etc        | LF   | 96.00    | 160.00      | 15,360            |
| 1397 | 48" to 50", Round galvanized duct work c/w fittings, supports, etc | LF   | 1,038.00 | 165.00      | 171,270           |
| 2070 | 52" to 54", Round galvanized duct work c/w fittings, supports, etc | LF   | 29.00    | 170.00      | 4,930             |
| 1228 | 60", Round SS duct work c/w fittings, supports, etc                | LF   | 99.00    | 180.00      | 17,820            |
| 1302 | Diffusers (small)  | EA   | 8.00     | 150.00      | 1,200             |
| 1218 | A & A1, Diffusers (medium)   | EA   | 279.00   | 250.00      | 69,750            |
| 1301 | A3, Side-wall diffuser   | EA   | 11.00    | 300.00      | 3,300             |
| 1969 | D/D1/D2, Linear slot diffuser                                      | EA   | 96.00    | 450.00      | 43,200            |
| 1970 | E/H, Linear slot diffuser  | EA   | 46.00    | 450.00      | 20,700            |
| 1971 | F/G, Linear slot diffuser  | EA   | 182.00   | 475.00      | 86,450            |
| 1290 | Grilles (small)  | EA   | 2.00     | 100.00      | 200               |
| 1300 | C/C1, Grilles (medium)   | EA   | 284.00   | 175.00      | 49,700            |
| 1303 | C2, Side-wall grilles  | EA   | 26.00    | 350.00      | 9,100             |
| 1236 | Louver   | SF   | 1,093.00 | 75.00       | 81,975            |
| 2421 | Plenum, 48"x12"x8"   | EA   | 16.00    | 1,300.00    | 20,800            |
| 2071 | Plenum, 84"x6"   | EA   | 1.00     | 2,000.00    | 2,000             |
| 1399 | Plenum, 60"x10"  | EA   | 11.00    | 1,500.00    | 16,500            |
| 1321 | Plenum, 36"  | EA   | 1.00     | 1,750.00    | 1,750             |
| 2069 | Plenum, 48"x30"  | EA   | 1.00     | 1,750.00    | 1,750             |
| 1979 | Plenum, 90"x78"  | EA   | 2.00     | 2,500.00    | 5,000             |
| 1247 | Plenum, 96"x50"  | EA   | 3.00     | 2,250.00    | 6,750             |
| 1246 | Tubing storage reel (CAR-MON TSR-S32)                              | EA   | 2.00     | 1,800.00    | 3,600             |
| 1248 | Tubing storage reel (CAR-MON TSR-S24)                              | EA   | 6.00     | 1,500.00    | 9,000             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|------------|-------------|-------------------|
| 1980  | LTX flex hose, 4" dia x 15' type c/w RYA dual adaptor, tube sling, spring balancer and flahe set   | EA   | 6.00       | 1,250.00    | 7,500             |
| 1299  | BD, Balancing damper   | EA   | 330.00     | 500.00      | 165,000           |
| 1976  | BD, Balancing damper (large)   | EA   | 8.00       | 850.00      | 6,800             |
| 1572  | Combination fire/smoke damper  | EA   | 21.00      | 750.00      | 15,750            |
| 1977  | FD, Fire damper  | EA   | 12.00      | 550.00      | 6,600             |
| 1983  | Bryant OVM096 oil fired furnace  | EA   | 2.00       | 11,500.00   | 23,000            |
| 1984  | York TL8E 95% efficient furnace  | EA   | 4.00       | 10,000.00   | 40,000            |
| 1981  | Relocate and installation of spark detection and<br>suppression system   | EA   | 1.00       | 3,000.00    | 3,000             |
| 1567  | Allowance for miscellaneous/missing items  | SF   | 411,859.00 | 2.00        | 823,718           |
| 2199  | 1/2" to 1", Condensate piping c/w fittings - Ag  | LF   | 7,119.00   | 35.00       | 249,165           |
| 2200  | 1-1/4" to 1-1/2", Condensate piping c/w fittings- Ag   | LF   | 2,017.00   | 40.00       | 80,680            |
| 2201  | 2", Condensate piping c/w fittings - Ag  | LF   | 124.00     | 45.00       | 5,580             |
| 2203  | Condensate piping from walk-in cooler/ walk-in freezer   | LF   | 30.00      | 35.00       | 1,050             |
| 2540  | Equipment cost adjustment, confirmed in meeting  | LS   | 1.00       | -100,000.00 | -100,000          |
| 2578  | HVAC Distribution system   | SF   | -857.00    | 15.00       | -12,855           |
|       | D3050 - Facility HVAC Distribution Systems   |      |            | 43.96/SF    | 16,731,326        |
| D3060 | Controls & Instrumentations  |      |            |             |                   |
| 1708  | BAS control system c/w computer station, graphics, wiring, testing etc.  | Pt   | 1,500.00   | 1,300.00    | 1,950,000         |
|       | D3060 - Controls & Instrumentations  |      |            | 5.12/SF     | 1,950,000         |
| D3070 | Special Purpose HVAC Systems   |      |            |             |                   |
| 783   | Testing, balancing and commissioning   | SF   | 411,002.89 | 0.80        | 328,802           |
| 1560  | General requirements: supervision, shop drawings,<br>asbuilt, tags, markers, tools, rentals, BIM, cleaning,<br>storage, material handling, seismic restraints, permits,<br>fees etc. | ltem |            |             | 2,072,000         |
|       | D3070 - Special Purpose HVAC Systems   |      |            | 6.31/SF     | 2,400,802         |
|       | D30 - HVAC   |      |            | 73.39/SF    | 27,929,168        |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description  | Unit | Qty       | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|-----------|-------------|-------------------|
| D40   | FIRE PROTECTION  |      |           |             |                   |
| D4010 | Fire Suppression   |      |           |             |                   |
| 787   | General requirements: supervision, shop drawings,<br>asbuilt, tags, markers, tools, rentals, BIM, cleaning,<br>storage, material handling, seismic restraints, permits,<br>fees etc. | Item |           |             | 299,000           |
| 1510  | Fire pump, 1000 gpm c/w Control Panel  | EA   | 1.00      | 100,000.00  | 100,000           |
| 1515  | JP, Jockey pump c/w Control Panel  | EA   | 1.00      | 8,500.00    | 8,500             |
| 1513  | 8" (ERW) FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 35.00     | 180.00      | 6,300             |
| 1497  | 6" (ERW) FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 2,000.00  | 150.00      | 300,000           |
| 1504  | 4" (CS) SPK, Fire specialty piping c/w fittings,<br>supports, etc.   | LF   | 10,350.00 | 85.00       | 879,750           |
| 1899  | 2.5" (CS) SPK, Fire specialty piping c/w fittings, supports, etc.  | LF   | 550.00    | 65.00       | 35,750            |
| 1523  | 2" (CS) SPK, Fire specialty piping c/w fittings,<br>supports, etc.   | LF   | 20.00     | 60.00       | 1,200             |
| 2606  | 1 to 1-1/2" Fire specialty piping c/w fittings, supports, etc.   | LF   | 17,030.00 | 40.00       | 681,200           |
| 1558  | 6"(ERW), Fire riser piping c/w fittings, supports, etc.  | LF   | 500.00    | 160.00      | 80,000            |
| 1548  | 3" (CS), Drain riser piping c/w fittings, supports, etc.   | LF   | 500.00    | 75.00       | 37,500            |
| 1507  | Double check valve Backflow preventor assembly, 8"   | EA   | 1.00      | 10,000.00   | 10,000            |
| 1498  | Zone control valve assembly, 4"  | EA   | 20.00     | 4,500.00    | 90,000            |
| 1844  | Post Indicator/Isolation Valve, 8"   | EA   | 7.00      | 2,500.00    | 17,500            |
| 1845  | Post Indicator/Isolation Valve, 6"   | EA   | 17.00     | 2,000.00    | 34,000            |
| 1870  | Post Indicator/Isolation Valve, 4"   | EA   | 17.00     | 1,400.00    | 23,800            |
| 1521  | Check Valve, 8"  | EA   | 4.00      | 3,000.00    | 12,000            |
| 1905  | Check Valve, 6"  | EA   | 1.00      | 1,800.00    | 1,800             |
| 1869  | Check Valve, 4"  | EA   | 2.00      | 1,500.00    | 3,000             |
| 1904  | Check Valve, 2"  | EA   | 1.00      | 900.00      | 900               |
| 1846  | Drain Valve 3"   | EA   | 9.00      | 650.00      | 5,850             |
| 1906  | OS&Y Gate Valve, 8"  | EA   | 1.00      | 3,200.00    | 3,200             |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|------------|-------------|-------------------|
| 1907  | OS&Y Gate Valve, 6"  | EA   | 2.00       | 2,400.00    | 4,800             |
| 1908  | OS&Y Gate Valve, 2"  | EA   | 2.00       | 1,300.00    | 2,600             |
| 1512  | Main alarm check valve, 6"                                   | EA   | 3.00       | 2,200.00    | 6,600             |
| 1540  | Fire department valve assembly, 2-1/2"                       | EA   | 40.00      | 1,200.00    | 48,000            |
| 1881  | Fire Hose Cabinet  | EA   | 9.00       | 2,200.00    | 19,800            |
| 1843  | Fire Department Connection 4x4" c/w chain and cap            | EA   | 2.00       | 4,000.00    | 8,000             |
| 1508  | FP water service connection, 10"                             | EA   | 1.00       | 10,000.00   | 10,000            |
| 1514  | FPT, Fire protection test header                             | EA   | 1.00       | 1,500.00    | 1,500             |
| 1559  | Roof hydrant assembly-allow                                  | EA   | 1.00       | 1,500.00    | 1,500             |
| 1502  | Sprinkler heads c/w drop piping                              | EA   | 3,406.00   | 160.00      | 544,960           |
| 1940  | Hookup for Fire pump   | EA   | 1.00       | 2,000.00    | 2,000             |
| 1939  | Hookup for Jockey pump                                       | EA   | 1.00       | 1,000.00    | 1,000             |
| 1525  | Cap, 2.5"  | EA   | 8.00       | 150.00      | 1,200             |
| 1516  | Cap, 4"  | EA   | 30.00      | 100.00      | 3,000             |
| 1517  | Cap, 6"  | EA   | 5.00       | 200.00      | 1,000             |
| 2577  | Sprinkler system   | SF   | -857.00    | 2.50        | -2,143            |
| 2599  | 8" FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 35.00      | -40.00      | -1,400            |
| 2598  | 6", Fire riser piping c/w fittings, supports, etc.           | LF   | 500.00     | -35.00      | -17,500           |
| 2597  | 6" FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 2,000.00   | -35.00      | -70,000           |
| 2595  | 4" SPK, Fire specialty piping c/w fittings, supports, etc.   | LF   | 10,350.00  | -20.00      | -207,000          |
| 2594  | 3", Drain riser piping c/w fittings, supports, etc.          | LF   | 500.00     | -17.50      | -8,750            |
| 2591  | 2.5" SPK, Fire specialty piping c/w fittings, supports, etc. | LF   | 550.00     | -16.25      | -8,938            |
|       | D4010 - Fire Suppression                                     |      |            | 7.81/SF     | 2,971,479         |
|       | D40 - FIRE PROTECTION  |      |            | 7.81/SF     | 2,971,479         |
| D50   | ELECTRICAL   |      |            |             |                   |
| D5020 | Electrical Service and Distribution                          |      |            |             |                   |
| 2409  | System grounding grid and tie ins to building                | SF   | 411,003.00 | 0.15        | 61,650            |
| 945   | Main switchboard 4000 amps MSB-1A & 1B                       | EA   | 2.00       | 220,000.00  | 440,000           |
| 946   | Primary 4000 amp service #1                                  | EA   | 1.00       | 18,750.00   | 18,750            |
| 947   | Primary 4000 amp service #2                                  | EA   | 1.00       | 18,750.00   | 18,750            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref | Description                                      | Unit | Qty   | Rate<br>USD | Total Cost<br>USD |
|-----|--|------|-------|-------------|-------------------|
| 948 | Emergency generator 300 kva (by utility company) | Note |       |             | Excl.             |
| 950 | Transfer switch 400 amps                         | EA   | 3.00  | 14,500.00   | 43,500            |
| 952 | Panel SB-DPH-LLA 800 amps                        | EA   | 1.00  | 32,800.00   | 32,800            |
| 953 | Panel EM-DPH-LLA 400 amps                        | EA   | 1.00  | 23,600.00   | 23,600            |
| 954 | Panel EM-DPH-ELEV-LLA 400 amps                   | EA   | 1.00  | 23,600.00   | 23,600            |
| 955 | Elev #1 200 amps                                 | EA   | 1.00  | 2,280.00    | 2,280             |
| 956 | Elev #2 200 amps                                 | EA   | 1.00  | 2,280.00    | 2,280             |
| 957 | ELEV disconnect 200 amps                         | EA   | 2.00  | 2,200.00    | 4,400             |
| 958 | Fire pump connection & controller connection     | EA   | 1.00  | 1,475.00    | 1,475             |
| 960 | DPH-LLA 1200 amps                                | EA   | 1.00  | 38,500.00   | 38,500            |
| 961 | DPH-LLB 1200 amps                                | EA   | 1.00  | 38,500.00   | 38,500            |
| 962 | DPH-LLC 1200 amps                                | EA   | 1.00  | 38,500.00   | 38,500            |
| 963 | DPH-LLD 1200 amps                                | EA   | 1.00  | 38,500.00   | 38,500            |
| 964 | DSH-4A 2000 amps                                 | EA   | 1.00  | 38,500.00   | 38,500            |
| 965 | DSH4B 1600 amps                                  | EA   | 1.00  | 32,800.00   | 32,800            |
| 966 | MPH-2A & 2B 1200 amps                            | EA   | 1.00  | 32,800.00   | 32,800            |
| 967 | Disconnect switches 60 amps                      | EA   | 4.00  | 625.00      | 2,500             |
| 968 | Disconnect switches 100 amps                     | EA   | 12.00 | 950.00      | 11,400            |
| 969 | Disconnect switches 200 amps                     | EA   | 12.00 | 1,850.00    | 22,200            |
| 970 | EWH #1 & #2 200 amp connection                   | EA   | 2.00  | 2,350.00    | 4,700             |
| 971 | Disconnects 400 amps                             | EA   | 9.00  | 2,350.00    | 21,150            |
| 972 | System metering                                  | EA   | 1.00  | 145,800.00  | 145,800           |
| 973 | System grounding                                 | EA   | 1.00  | 12,800.00   | 12,800            |
| 974 | Coordination Study                               | EA   | 1.00  | 35,400.00   | 35,400            |
| 975 | Arc Flash  | EA   | 1.00  | 22,500.00   | 22,500            |
| 977 | Panels 225 amps                                  | EA   | 18.00 | 4,650.00    | 83,700            |
| 978 | Panels 400 amps                                  | EA   | 19.00 | 5,450.00    | 103,550           |
| 979 | Panels 100 amps                                  | EA   | 12.00 | 3,250.00    | 39,000            |
| 986 | Panel GEN-EM-DPH-LLA 800 amps                    | EA   | 1.00  | 45,750.00   | 45,750            |
| 987 | Generator emergency grounding                    | EA   | 1.00  | 8,540.00    | 8,540             |
| 989 | Dry transformer - 30kVA                          | EA   | 12.00 | 3,875.00    | 46,500            |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref  | Description   | Unit | Qty       | Rate<br>USD | Total Cost<br>USD |
|------|---|------|-----------|-------------|-------------------|
| 991  | Dry transformer - 75kVA                                     | EA   | 2.00      | 5,250.00    | 10,500            |
| 992  | Dry transformer - 115kVA                                    | EA   | 19.00     | 8,575.00    | 162,925           |
| 993  | Dry transformer - 225kVA                                    | EA   | 2.00      | 12,500.00   | 25,000            |
| 1717 | Feeders 60 amps CU  | LF   | 12,400.00 | 21.98       | 272,552           |
| 1718 | Feeders 90 amps CU  | LF   | 6,220.00  | 32.79       | 203,954           |
| 1719 | Feeders 100 amps CU   | LF   | 4,160.00  |             | Excl.             |
| 1720 | Feeders 150 amps CU   | LF   | 960.00    |             | Excl.             |
| 1721 | Feeder 200 amps CU  | LF   | 3,600.00  |             | Excl.             |
| 1722 | Feeders 225 amps CU   | LF   | 4,860.00  |             | Excl.             |
| 1723 | Feeders 400 amps CU   | LF   | 6,120.00  |             | Excl.             |
| 1724 | Feeders 600 amps CU   | LF   | 640.00    |             | Excl.             |
| 1725 | Feeders 800 amps CU   | LF   | 840.00    |             | Excl.             |
| 1726 | Feeders 1200 amps CU  | LF   | 1,920.00  |             | Excl.             |
| 1727 | Feeders 4000 amps CU  | LF   | 460.00    |             | Excl.             |
| 1729 | 400 amps temporary transfer switch for roll up generator    | EA   | 1.00      | 23,500.00   | 23,500            |
| 1730 | Emergency generator communication conduit & wire            | EA   | 1.00      | 18,500.00   | 18,500            |
| 1818 | Panel Sub-Metering 100 amps BFM-II and c/t's                | EA   | 34.00     |             | Excl.             |
| 1819 | Panel Sub-Metering 225 amps                                 | EA   | 25.00     |             | Excl.             |
| 1820 | Panel Sub-Metering 400 amps                                 | EA   | 21.00     |             | Excl.             |
| 1821 | Panel Sub-Metering 1200 amps                                | EA   | 1.00      |             | Excl.             |
| 1822 | Panel Sub-Metering 1600 amps                                | EA   | 1.00      |             | Excl.             |
| 1823 | Panel Sub-Metering 2000 amps                                | EA   | 1.00      |             | Excl.             |
| 1824 | Panel Sub-Metering misc add ons computer<br>monitoring etc. | EA   | 1.00      |             | Excl.             |
| 1825 | Panel Sub-Metering branch metering 20 amps                  | EA   | 60.00     |             | Excl.             |
| 2518 | Feeders 100 amps AL   | LF   | 4,160.00  | 26.42       | 109,907           |
| 2519 | Feeders 150 amps AL   | LF   | 960.00    | 33.23       | 31,901            |
| 2520 | Feeder 200 amps AL  | LF   | 3,600.00  | 48.54       | 174,744           |
| 2521 | Feeders 225 amps AL   | LF   | 4,860.00  | 52.85       | 256,851           |
| 2522 | Feeders 400 amps AL   | LF   | 6,120.00  | 97.08       | 594,130           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

| A1 New Sch | nool Building (continued)                           |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------|---|------|------------|--------------------------------|------------------------------------|
| Ref        | Description   | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 2523       | Feeders 600 amps AL                                 | LF   | 640.00     | 146.10                         | 93,504                             |
| 2524       | Feeders 800 amps AL                                 | LF   | 840.00     | 219.17                         | 184,103                            |
| 2525       | Feeders 1200 amps AL                                | LF   | 1,920.00   | 402.87                         | 773,510                            |
| 2526       | Feeders 4000 amps AL                                | LF   | 460.00     | 1,207.80                       | 555,588                            |
| 2565       | Temp power  | SF   | 411,003.00 | 0.70                           | 287,702                            |
|            | D5020 - Electrical Service and Distribution         |      |            | 13.97/SF                       | 5,315,546                          |
| D5030      | General Purpose Electrical Power                    |      |            |                                |                                    |
| 768        | Interior electronic scoreboard & shot clock         | EA   | 1.00       | 8,620.00                       | 8,620                              |
| 1001       | Mechanical connections (VFD) 30 amps                | EA   | 51.00      | 4,360.00                       | 222,360                            |
| 1002       | Mechanical connections (VFD) 60 amps                | EA   | 53.00      | 6,404.00                       | 339,412                            |
| 1003       | Mechanical connections (VFD) 100 amps               | EA   | 5.00       | 7,066.00                       | 35,330                             |
| 1004       | Mechanical connections (VFD) 200 amps               | EA   | 5.00       | 18,322.00                      | 91,610                             |
| 1005       | Mechanical connections (VFD) 400 amps               | EA   | 1.00       | 34,400.00                      | 34,400                             |
| 1528       | Rec exp proof                                       | EA   | 6.00       | 5,645.00                       | 33,870                             |
| 1529       | Rec and cord drop                                   | EA   | 240.00     | 1,850.00                       | 444,000                            |
| 1530       | Power floor box                                     | EA   | 75.00      | 725.00                         | 54,375                             |
| 1531       | Rec power   | EA   | 728.00     | 125.00                         | 91,000                             |
| 1532       | Rec GFI   | EA   | 173.00     | 325.00                         | 56,225                             |
| 1551       | Rec power Special rec 30 amps                       | EA   | 43.00      | 650.00                         | 27,950                             |
| 1556       | Rec quad  | EA   | 210.00     | 285.00                         | 59,850                             |
| 1557       | Misc. mechanical equipment and equipment connection | EA   | 80.00      | 4,985.00                       | 398,800                            |
| 2373       | EV Chargers in auto shop                            | EA   | 4.00       | 12,450.00                      | 49,800                             |
| 1731       | Power conduit & wire                                | EA   | 1,216.00   | 175.00                         | 212,800                            |
| 1781       | Kitchen & Culinary equipment rough-in & connections | EA   | 149.00     | 425.00                         | 63,325                             |
| 1783       | Shop equipment connections & dust collector         | EA   | 1.00       | 12,500.00                      | 12,500                             |
| 1784       | Vehicle Co2 system connection (power)               | EA   | 1.00       | 1,625.00                       | 1,625                              |
| 2628       | Reduce cord reel quantity in shops                  | LS   | 1.00       | -8,000.00                      | -8,000                             |
|            | D5030 - General Purpose Electrical Power            |      |            | 5.86/SF                        | 2,229,852                          |
| D5040      | Lighting  |      |            |                                |                                    |
| 2503       | School stage rigging                                | EA   | 1.00       | 8,750.00                       | 8,750                              |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sc | hool Building (continued)   |      | GFAR: 3  | 880,570.00 SF (<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|----------|---|------|----------|------------------------------------|------------------------------------|
| Ref      | Description   | Unit | Qty      | Rate<br>USD                        | Total Cost<br>USD                  |
| 764      | School stage lighting   | EA   | 1.00     | 110,000.00                         | 110,000                            |
| 2504     | School stage lighting & control   | EA   | 1.00     | 32,500.00                          | 32,500                             |
| 765      | School theatrical lighting & controls   | EA   | 1.00     | 250,000.00                         | 250,000                            |
| 1014     | Lighting type DPA - 32" decorative pendant                                      | EA   | 10.00    | 850.00                             | 8,500                              |
| 2320     | Lighting type DPB - 4' long x 6" dia. pendant                                   | EA   | 12.00    | 1,190.00                           | 14,280                             |
| 2321     | Lighting type DPB-2 - 4' long x 6" dia. pendant                                 | EA   | 30.00    | 1,250.00                           | 37,500                             |
| 1016     | Lighting type GPB - 15.1" dia. pendant  | EA   | 126.00   | 1,390.00                           | 175,140                            |
| 1019     | Lighting type GPE - 26' dia. direct/indirect ring pendant                       | EA   | 1.00     | 600.00                             | 600                                |
| 2322     | Lighting type GPK - 60" dia. direct/indirect ring<br>pendant                    | EA   | 20.00    | 1,080.00                           | 21,600                             |
| 2323     | Lighting type GPL-1 - 8' long linear pendant                                    | EA   | 20.00    | 640.00                             | 12,800                             |
| 2324     | Lighting type GPL-2 - 4' long linear pendant                                    | EA   | 17.00    | 710.00                             | 12,070                             |
| 1023     | Lighting type GSA - 24" dia. surface pendant                                    | EA   | 56.00    | 1,040.00                           | 58,240                             |
| 1024     | Lighting type GSB - 11" dia. surface downlight                                  | EA   | 19.00    | 580.00                             | 11,020                             |
| 1025     | Lighting type GSC - surface linear  | LF   | 100.00   | 690.00                             | 69,000                             |
| 2326     | Lighting type GSD - 2" dia. surface round cylinder<br>downlight                 | EA   | 22.00    | 770.00                             | 16,940                             |
| 2325     | Lighting type GSE - 2"x8" wall indirect   | LF   | 161.00   | 95.00                              | 15,295                             |
| 1027     | Lighting type GWB - 8"x9" surface wall sconce exterior                          | EA   | 11.00    | 560.00                             | 6,160                              |
| 1028     | Lighting type GWC - 8"x12" adjustable direct/indirect<br>wall cylinder exterior | EA   | 14.00    | 870.00                             | 12,180                             |
| 2327     | Lighting type GWD - 2' long indirect/direct wall sconce                         | EA   | 32.00    | 1,150.00                           | 36,800                             |
| 2328     | Lighting type GWE-1 - 25" long wall linear                                      | EA   | 40.00    | 630.00                             | 25,200                             |
| 2329     | Lighting type GWE-2 - 25" long wall linear                                      | EA   | 32.00    | 660.00                             | 21,120                             |
| 2330     | Lighting type GWF - 6" dia. adjustable wall cylinder                            | EA   | 24.00    | 420.00                             | 10,080                             |
| 1029     | Lighting type LPA-1 - pendant linear  | LF   | 3,527.00 | 57.00                              | 201,039                            |
| 2331     | Lighting type LPA-2 - pendant linear  | LF   | 26.00    | 125.00                             | 3,250                              |
| 1030     | Lighting type LPB - pendant linear  | LF   | 161.00   | 185.00                             | 29,785                             |
| 1031     | Lighting type LPC - pendant linear  | LF   | 1,408.00 | 225.00                             | 316,800                            |
| 2332     | Lighting type LPD - pendant linear  | LF   | 285.00   | 175.00                             | 49,875                             |
| 1032     | Lighting type LPE - pendant linear  | LF   | 81.00    | 155.00                             | 12,555                             |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description   | Unit | Qty    | Rate<br>USD | Total Cost<br>USD |
|------|---|------|--------|-------------|-------------------|
| 2333 | Lighting type LPG - pendant linear                  | LF   | 73.00  | 101.00      | 7,373             |
| 2336 | Lighting type LPH - 8' long pendant linear          | EA   | 133.00 | 440.00      | 58,520            |
| 2337 | Lighting type LPJ - pendant linear                  | LF   | 549.00 | 75.00       | 41,175            |
| 2335 | Lighting type LPK - pendant linear                  | LF   | 289.00 | 85.00       | 24,565            |
| 2334 | Lighting type LPL - pendant linear                  | LF   | 295.00 | 80.00       | 23,600            |
| 2338 | Lighting type LPM-1 - pendant linear                | LF   | 79.00  | 66.00       | 5,214             |
| 2339 | Lighting type LPM-2 - pendant linear                | LF   | 149.00 | 75.00       | 11,175            |
| 1035 | Lighting type LSA - undercabinet                    | LF   | 858.00 | 55.00       | 47,190            |
| 1036 | Lighting type LSB - linear cove                     | LF   | 217.00 | 85.00       | 18,445            |
| 2341 | Lighting type LSG-1 - 4' long linear                | EA   | 74.00  | 3,000.00    | 222,000           |
| 2342 | Lighting type LSG-2 - 8' long linear                | EA   | 51.00  | 3,250.00    | 165,750           |
| 2340 | Lighting type LSH - strip light                     | LF   | 541.00 | 790.00      | 427,390           |
| 1044 | Lighting type LSJ - wall linear                     | LF   | 29.00  | 580.00      | 16,820            |
| 2343 | Lighting type PB - 16.24" dia. pendant              | EA   | 36.00  | 960.00      | 34,560            |
| 2345 | Lighting type PD - 4" dia. pendant cylinder         | EA   | 76.00  | 1,040.00    | 79,040            |
| 2344 | Lighting type PD-1 - 4" dia. pendant cylinder       | EA   | 21.00  | 1,150.00    | 24,150            |
| 2347 | Lighting type PF - 4" dia. pendant cylinder         | EA   | 60.00  | 580.00      | 34,800            |
| 2346 | Lighting type PF-1 - 4" dia. pendant cylinder       | EA   | 24.00  | 590.00      | 14,160            |
| 1052 | Lighting type RA-1 - 2 X 2 recessed troffer         | EA   | 185.00 | 440.00      | 81,400            |
| 2349 | Lighting type RA-2 - 2 X 2 recessed troffer         | EA   | 6.00   | 460.00      | 2,760             |
| 2348 | Lighting type RA-3 - 2 X 2 recessed troffer         | EA   | 19.00  | 480.00      | 9,120             |
| 1053 | Lighting type RB-1 - 2 X 2 recessed troffer         | EA   | 207.00 | 620.00      | 128,340           |
| 2350 | Lighting type RB-2 - 2 X 4 recessed troffer         | EA   | 6.00   | 670.00      | 4,020             |
| 1054 | Lighting type RC-1 - 2.5x2.5 recessed downlight     | EA   | 288.00 | 680.00      | 195,840           |
| 2351 | Lighting type RC-2 - 2.5x2.5 recessed downlight     | EA   | 16.00  | 530.00      | 8,480             |
| 1055 | Lighting type RDA - 24"x48" recessed food downlight | EA   | 31.00  | 580.00      | 17,980            |
| 2352 | Lighting type RDB - 24"x24" recessed food downlight | EA   | 13.00  | 590.00      | 7,670             |
| 1056 | Lighting type RE - 4" dia. recessed downlight       | EA   | 31.00  | 510.00      | 15,810            |
| 1057 | Lighting type RF - 2.5" dia. recessed wall wash     | EA   | 73.00  | 470.00      | 34,310            |
| 1061 | Lighting type RJ - 6"x6" recessed downlight         | EA   | 36.00  | 810.00      | 29,160            |
| 2353 | Lighting type RK - 2.5"x2.5" recessed downlight     | EA   | 8.00   | 630.00      | 5,040             |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref  | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|------|--|------|----------|-------------|-------------------|
| 2356 | Lighting type RL-1 - 2x4 recessed troffer                | EA   | 191.00   | 490.00      | 93,590            |
| 2358 | Lighting type RL-2 - 2x4 recessed troffer                | EA   | 62.00    | 520.00      | 32,240            |
| 2357 | Lighting type RM - 4" dia. recessed downlight            | EA   | 6.00     | 470.00      | 2,820             |
| 2359 | Lighting type RN-1 - 4" dia. recessed downlight          | EA   | 15.00    | 410.00      | 6,150             |
| 2355 | Lighting type RN-2 - 4" dia. recessed downlight          | EA   | 42.00    | 420.00      | 17,640            |
| 2354 | Lighting type RP - 4" dia. recessed wall wash            | EA   | 11.00    | 460.00      | 5,060             |
| 2360 | Lighting type RQ - 4" dia. recessed downlight            | EA   | 25.00    | 510.00      | 12,750            |
| 1063 | Lighting type RLA-1 - recessed linear wall wash          | LF   | 665.00   | 420.00      | 279,300           |
| 2361 | Lighting type RLA-2 - recessed linear wall wash          | LF   | 41.00    | 440.00      | 18,040            |
| 1064 | Lighting type RLB-1 - indirect wall wash                 | LF   | 259.00   | 425.00      | 110,075           |
| 2364 | Lighting type RLB-2 - indirect wall wash                 | LF   | 653.00   | 385.00      | 251,405           |
| 2363 | Lighting type RLB-3 - indirect wall wash                 | LF   | 135.00   | 325.00      | 43,875            |
| 2362 | Lighting type RLB-4 - indirect wall wash                 | LF   | 76.00    | 580.00      | 44,080            |
| 2369 | Lighting type RLC - indirect reflector                   | LF   | 1,841.00 | 410.00      | 754,810           |
| 1066 | Lighting type RLD-1 - recessed linear                    | LF   | 59.00    | 425.00      | 25,075            |
| 2366 | Lighting type RLD-2 - recessed linear                    | LF   | 76.00    | 415.00      | 31,540            |
| 2367 | Lighting type RLD-3 - recessed linear                    | LF   | 272.00   | 410.00      | 111,520           |
| 1067 | Lighting type RLE - 4' long recessed linear              | EA   | 32.00    | 418.00      | 13,376            |
| 1068 | Lighting type RLF - 48" long in ground linear            | EA   | 10.00    | 1,020.00    | 10,200            |
| 2368 | Lighting type RLG-1 - indirect wall wash                 | LF   | 10.00    | 1,080.00    | 10,800            |
| 1070 | Lighting type RLH - 3' long semi recessed wall wash      | EA   | 8.00     | 1,410.00    | 11,280            |
| 1071 | Lighting type SA - 8" dia in-grade uplight wall wash     | EA   | 34.00    | 680.00      | 23,120            |
| 1072 | Lighting type SWA - wall sconce exterior                 | EA   | 16.00    | 850.00      | 13,600            |
| 1073 | Lighting type T1 - pendant rack                          | LF   | 65.00    | 37.00       | 2,405             |
| 1074 | Lighting type TA - 3.5" dia. rack spot                   | EA   | 25.00    | 450.00      | 11,250            |
| 1033 | Lighting type LPF circle pendant linear (none indicated) | EA   | 5.00     |             | Excl.             |
| 1038 | Lighting type LSD surface w/p (none indicated)           | EA   | 164.00   |             | Excl.             |
| 1015 | Lighting type GPA 48" pendant (none indicated)           | EA   | 2.00     |             | Excl.             |
| 1020 | Lighting type GPF 118" circle pendant (none indicated)   | EA   | 4.00     |             | Excl.             |
| 1021 | Lighting type GPH 6" pendant (none indicated)            | EA   | 16.00    |             | Excl.             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref   | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|------------|-------------|-------------------|
| 1022  | Lighting type GPJ 30" stem pendant (none indicated)      | EA   | 5.00       |             | Excl.             |
| 1026  | Lighting type GWA wall cove light (none indicated)       | EA   | 8.00       |             | Excl.             |
| 1039  | Lighting type LSE linear al channel (none indicated)     | EA   | 25.00      |             | Excl.             |
| 1040  | Lighting type LSF linear (none indicated)                | EA   | 4.00       |             | Excl.             |
| 1043  | Lighting type LSI led strip (none indicated)             | EA   | 2.00       |             | Excl.             |
| 1045  | Lighting type LSK linear strip (none indicated)          | EA   | 4.00       |             | Excl.             |
| 1046  | Lighting type LSL direct linear (none indicated)         | EA   | 8.00       |             | Excl.             |
| 1047  | Lighting type PA 8" pendant (none indicated)             | EA   | 12.00      |             | Excl.             |
| 1049  | Lighting type PC 7" pendant (none indicated)             | EA   | 43.00      |             | Excl.             |
| 1050  | Lighting type PD 7" pendant (none indicated)             | EA   | 8.00       |             | Excl.             |
| 1051  | Lighting type PE 30" pendant (none indicated)            | EA   | 5.00       |             | Excl.             |
| 1058  | Lighting type RG 2 X 4 recessed (none indicated)         | EA   | 14.00      |             | Excl.             |
| 1059  | Lighting type RH 2 X 4 recessed troffer (none indicated) | EA   | 49.00      |             | Excl.             |
| 1060  | Lighting type RI downlight (none indicated)              | EA   | 112.00     |             | Excl.             |
| 1062  | Lighting type RSA step light (none indicated)            | EA   | 6.00       |             | Excl.             |
| 1526  | Lighting Exits   | EA   | 151.00     | 320.00      | 48,320            |
| 1527  | Lighting type F1 - 4' long linear OFCI                   | EA   | 44.00      | 115.00      | 5,060             |
| 1732  | Lighting conduit & wire                                  | EA   | 1,743.00   | 185.00      | 322,455           |
| 1743  | Lighting control   | SF   | 411,002.89 | 0.75        | 308,252           |
| 1786  | Theater lighting control interface                       | EA   | 1.00       | 5,500.00    | 5,500             |
| 1787  | Stage lighting control interface                         | EA   | 1.00       | 4,500.00    | 4,500             |
| 1788  | Lighting control classroom 2 zone control                | EA   | 106.00     | 1,745.00    | 184,970           |
| 2627  | Reduce stage lighting and dimmer                         | LS   | 1.00       | -25,000.00  | -25,000           |
|       | D5040 - Lighting   |      |            | 16.20/SF    | 6,164,994         |
| D5080 | Miscellaneous Electrical Systems                         |      |            |             |                   |
| 647   | Lightning protection                                     | SF   | 411,003.00 | 0.65        | 267,152           |
| 763   | P.V System 249 kw (rough in conduit for future)          | EA   | 1.00       | 75,800.00   | 75,800            |
| 767   | Seismic restraints electrical                            | SF   | 411,003.00 | 0.35        | 143,851           |
| 777   | Owner independent testing agency                         | EA   | 1.00       |             | Excl.             |
| 1738  | Electrical permits                                       | SF   | 411,002.89 | 0.15        | 61,650            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

| A1 New Sch | nool Building (continued)                                |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------|--|------|------------|--------------------------------|------------------------------------|
| Ref        | Description  | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 1739       | Electrical testing & commissioning                       | SF   | 411,002.89 | 0.20                           | 82,201                             |
| 1740       | Electrical firestopping                                  | SF   | 411,002.89 | 0.25                           | 102,750                            |
| 1785       | Electrical access panel                                  | EA   | 1.00       | 9,580.00                       | 9,580                              |
| 2626       | Utilize lightning preventor ILO lightning protection     | LS   | 1.00       | -50,000.00                     | -50,000                            |
| 2629       | Reduce EV charging stations                              | LS   | 1.00       | -60,000.00                     | -60,000                            |
|            | D5080 - Miscellaneous Electrical Systems                 |      |            | 1.66/SF                        | 632,984                            |
| D6060      | Distributed Communications and Monitoring                |      |            |                                |                                    |
| 1737       | Clocks backbone wiring                                   | EA   | 1.00       | 7,850.00                       | 7,850                              |
| 1742       | Clocks conduit & wire                                    | EA   | 199.00     | 325.00                         | 64,675                             |
|            | D6060 - Distributed Communications and Monitoring        |      |            | 0.19/SF                        | 72,525                             |
|            | D50 - ELECTRICAL   |      |            | 37.88/SF                       | 14,415,901                         |
| D60        | COMMUNICATIONS   |      |            |                                |                                    |
| D6010      | Data Communications                                      |      |            |                                |                                    |
| 1676       | WAP wireless access point                                | EA   | 180.00     | 850.00                         | 153,000                            |
| 1736       | Data backbone cabling                                    | EA   | 1.00       | 85,400.00                      | 85,400                             |
|            | D6010 - Data Communications                              |      |            | 0.63/SF                        | 238,400                            |
| D6020      | Voice Communications                                     |      |            |                                |                                    |
| 640        | TV & Video (rough in & equipment) - move to FF&E         | SF   | 411,859.00 |                                | Excl.                              |
|            | D6020 - Voice Communications                             |      |            |                                | Excl.                              |
| D6030      | Audio-Video Communication                                |      |            |                                |                                    |
| 643        | Inst. AV System (rough in & equipment) - move to<br>FF&E | SF   | 411,859.00 |                                | Excl.                              |
| 1691       | Speech reinforcement system SFR rough in                 | EA   | 93.00      | 575.00                         | 53,475                             |
| 1695       | Video presentation screen outlet (flat screen) rough in  | EA   | 94.00      | 1,500.00                       | 141,000                            |
| 1741       | Sound conduit & wire                                     | EA   | 696.00     | 625.00                         | 435,000                            |
| 2532       | Tel/Data A/V cabling system rough in                     | SF   | 411,003.00 | 3.00                           | 1,233,009                          |
| 2533       | IPTV and Video on demand system                          | EA   | 1.00       |                                | Excl.                              |
| 2534       | Large venue A/V system                                   | EA   | 1.00       | 500,500.00                     | 500,500                            |
| 2535       | Classroom speech reinforcement system                    | EA   | 1.00       | 222,200.00                     | 222,200                            |
| 2536       | Inst. A/V system   | EA   | 1.00       |                                | Excl.                              |
|            |  |      |            |                                |                                    |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

| A Building<br>A1 New Sch | nool Building (continued)                                  |      | GFAR: 38 | 30,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|----------|-------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty      | Rate<br>USD                   | Total Cost<br>USD                  |
| 2537                     | P.A. system  | EA   | 1.00     | 302,000.00                    | 302,000                            |
|                          | D6030 - Audio-Video Communication                          |      |          | 7.59/SF                       | 2,887,184                          |
| D6060                    | Distributed Communications and Monitoring                  |      |          |                               |                                    |
| 2538                     | Clock system   | EA   | 1.00     | 134,000.00                    | 134,000                            |
|                          | D6060 - Distributed Communications and Monitoring          |      |          | 0.35/SF                       | 134,000                            |
|                          | D60 - COMMUNICATIONS                                       |      |          | 8.57/SF                       | 3,259,584                          |
| D70                      | ELECTRONIC SAFETY AND SECURITY                             |      |          |                               |                                    |
| D7010                    | Access Controls and Intrusion Detection                    |      |          |                               |                                    |
| 1733                     | Security conduit & wire                                    | EA   | 273.00   | 275.00                        | 75,075                             |
| 1735                     | Security backbone cabling                                  | EA   | 1.00     | 185,500.00                    | 185,500                            |
|                          | D7010 - Access Controls and Intrusion Detection            |      |          | 0.68/SF                       | 260,575                            |
| D7030                    | Electronic Surveillance                                    |      |          |                               |                                    |
| 760                      | Vape detection system rough in                             | EA   | 1.00     | 36,960.00                     | 36,960                             |
| 1685                     | CCTV cameras rough in                                      | EA   | 160.00   | 1,685.00                      | 269,600                            |
| 1778                     | Security conduit & wire                                    | EA   | 160.00   | 750.00                        | 120,000                            |
| 1779                     | Security backbone cabling                                  | EA   | 1.00     | 8,250.00                      | 8,250                              |
| 2539                     | Security system & CCTV                                     | EA   | 1.00     | 900,000.00                    | 900,000                            |
| 2625                     | Adjust estimate based on Technology/Security<br>Consultant | LS   | 1.00     | -200,000.00                   | -200,000                           |
|                          | D7030 - Electronic Surveillance                            |      |          | 2.98/SF                       | 1,134,810                          |
| D7050                    | Detection and Alarm  |      |          |                               |                                    |
| 1629                     | Fire alarm control panel                                   | EA   | 1.00     | 12,200.00                     | 12,200                             |
| 1630                     | Fire alarm annunciator                                     | EA   | 17.00    | 9,850.00                      | 167,450                            |
| 1631                     | Fire alarm pull station                                    | EA   | 40.00    | 650.00                        | 26,000                             |
| 1632                     | Fire alarm smoke detector                                  | EA   | 228.00   | 325.00                        | 74,100                             |
| 1636                     | Fire alarm audio/visual alarm                              | EA   | 487.00   | 410.00                        | 199,670                            |
| 1637                     | Fire alarm audio only alarm                                | EA   | 45.00    | 385.00                        | 17,325                             |
| 1640                     | Fire alarm flow and tamper switch                          | EA   | 126.00   | 560.00                        | 70,560                             |
| 1643                     | Fire alarm testing & commissioning                         | EA   | 972.00   | 115.00                        | 111,780                            |
| 1734                     | Fire alarm conduit & wire                                  | EA   | 943.00   | 275.00                        | 259,325                            |
| 1780                     | Fire alarm communication system interface                  | EA   | 1.00     | 4,580.00                      | 4,580                              |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

| A Building<br>A1 New Sch | nool Building (continued)   |      | GFAR: 38 | 0,570.00 SF C<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|---|------|----------|----------------------------------|------------------------------------|
| Ref                      | Description   | Unit | Qty      | Rate<br>USD                      | Total Cost<br>USD                  |
| 1782                     | Kitchen fire suppression connection (sbo)   | EA   | 1.00     | 8,500.00                         | 8,500                              |
| 2576                     | Fire alarm fixture and wiring   | SF   | -857.00  | 1.00                             | -857                               |
|                          | D7050 - Detection and Alarm   |      |          | 2.50/SF                          | 950,633                            |
| D7090                    | Electronic Safety and Security Supplementary<br>Components                                      |      |          |                                  |                                    |
| 761                      | Visitor management system rough in  | EA   | 1.00     | 5,000.00                         | 5,000                              |
| 810                      | Gun/gunshot detection system  | EA   | 1.00     | 25,000.00                        | 25,000                             |
|                          | D7090 - Electronic Safety and Security Supplementary<br>Components                              |      |          | 0.08/SF                          | 30,000                             |
|                          | D70 - ELECTRONIC SAFETY AND SECURITY  |      |          | 6.24/SF                          | 2,376,018                          |
| E10                      | EQUIPMENT   |      |          |                                  |                                    |
| E1040                    | Institutional Equipment   |      |          |                                  |                                    |
| 340                      | Fixed audience seating (Multipurpose Room)  | EA   | 546.00   | 600.00                           | 327,600                            |
| 341                      | Motorized projection screen - 20'x14' (Auditorium)  | EA   | 1.00     |                                  | Incl.                              |
| 343                      | Motorized projection screen (Gymnasium)   | EA   | 1.00     |                                  | Incl.                              |
| 342                      | Interactive wall mounted display (Education room)   | EA   | 89.00    |                                  | Incl.                              |
| 344                      | Large format digital information display (Cafeteria Commons)                                    | EA   | 4.00     |                                  | Incl.                              |
| 2573                     | Fume hoods, ductless  | EA   | 6.00     | 15,000.00                        | 90,000                             |
|                          | E1040 - Institutional Equipment   |      |          | 1.10/SF                          | 417,600                            |
| E1070                    | Entertainment and Recreational Equipment  |      |          |                                  |                                    |
| 2506                     | Rooftop playground equipment; Composite sensory<br>panel  | LS   | 1.00     |                                  | Excl.                              |
| 2507                     | Rooftop playground equipment; Rhapsody vibra<br>chimes  | EA   | 3.00     |                                  | Excl.                              |
| 363                      | Rooftop playground equipment; 2-5 spinner - none indicated                                      | EA   | 1.00     |                                  | Excl.                              |
| 365                      | Rooftop playground equipment; 2-5 main play<br>structure - none indicated                       | EA   | 1.00     |                                  | Excl.                              |
| 1705                     | Rooftop playground equipment; Dome climber - none indicated                                     | EA   | 1.00     |                                  | Excl.                              |
| 364                      | Rooftop playground equipment; PIP rubber mound with composite wood arch bridge - none indicated | EA   | 1.00     |                                  | Excl.                              |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

A Building

A1 New School Building (continued)

| Ref   | Description   | Unit | Qty      | Rate<br>USD  | Total Cost<br>USD |
|-------|---|------|----------|--------------|-------------------|
| 366   | Rooftop playground equipment; PIP rubber mound with embankment slide - none indicated                                   | EA   | 1.00     |              | Excl.             |
|       | E1070 - Entertainment and Recreational Equipment  |      |          |              | Excl.             |
| E1090 | Other Equipment   |      |          |              |                   |
| 345   | Food service equipment (Main Kitchen & Culinary<br>Kitchen)   | LS   | 1.00     | 2,400,000.00 | 2,400,000         |
| 2583  | Food service equipment - adjustment per<br>reconciliation   | LS   | 1.00     | -50,000.00   | -50,000           |
| 1799  | Loading dock equipment  | EA   | 1.00     | 2,500.00     | 2,500             |
| 1800  | Extended scissor alignment lift rack (12,000 lbs.)  | EA   | 1.00     | 17,250.00    | 17,250            |
| 890   | Move Automotive Refinishing, Automotive Technology<br>Lifts, HVAC & Plumbing Equipment, Dental, and<br>Carpentry (FF&E) | LS   | 1.00     |              | Excl.             |
| 322   | Custom display cases  | Item |          |              | 50,000            |
| 729   | Custom bench with solid surface bench top   | LF   | 208.00   | 500.00       | 104,000           |
| 730   | Custom reception desk with solid surface top  | LF   | 28.00    | 1,000.00     | 28,000            |
| 2491  | Custom desk (Media Center)  | LF   | 40.00    | 1,000.00     | 40,000            |
| 2490  | Custom cafe counter with quartz countertop  | LF   | 27.00    | 1,000.00     | 27,000            |
| 1700  | Base cabinet with solid surface counter (School Store)  | LF   | 11.00    | 800.00       | 8,800             |
| 2489  | Base cabinet with solid surface island (School Store)   | LF   | 11.00    | 1,000.00     | 11,000            |
| 1699  | HAVC workstation countertop   | EA   | 48.00    | 500.00       | 24,000            |
| 1703  | Workshop countertop (Robotics)  | LF   | 29.00    | 100.00       | 2,900             |
| 1698  | Locker bench  | LF   | 132.90   | 125.00       | 16,612            |
| 1704  | Dish return counter   | LF   | 4.80     | 275.00       | 1,320             |
| 2571  | Furnish and install Cosmetology equipment, etc.   | LS   | 1.00     | 265,000.00   | 265,000           |
| 2572  | Install owner furnished equipment   | LS   | 1.00     | 99,000.00    | 99,000            |
| 1809  | Workshop equipment (with FF&E)  | LS   | 1.00     |              | Excl.             |
| 1762  | Casework: Solid surface countertop, plastic laminate  | LF   | 1,326.00 | 200.00       | 265,200           |
| 1769  | Casework: Stainless steel countertop  | LF   | 610.00   | 450.00       | 274,500           |
| 1763  | Casework: Full height cabinet   | LF   | 380.00   | 750.00       | 285,000           |
| 1765  | Casework: Base cabinet with solid surface countertop  | LF   | 1,581.00 | 450.00       | 711,450           |
| 1766  | Casework: Upper cabinet   | LF   | 988.00   | 250.00       | 247,000           |



GFAR: 380,570.00 SF Cost/SF: 417.58

Rates Current At January 2023

## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

2493

1770

2494

2497

2495

2496

2499

2500

2501

Ref

A1 New School Building (continued)

Description Unit **Total Cost** Qty Rate USD USD LF 18,000 Casework; Mail slots cabinet 12.00 1,500.00 Casework: Shelf LF 79.00 150.00 11,850 Casework; Full height 3-layer locker LF 35.00 1,000.00 35,000 Casework; 1-layer locker LF 5.00 500.00 2,500 Casework; 4'-0" tall cubicle LF 30.00 800.00 24,000 Casework; File cabinet LF 14.00 1,200.00 16,800 Casework; Full height storage cabinet with glass door LF 4.00 1,500.00 6,000 8" UC Student booth (Plumbing & Pipefitting) ΕA 14.00 Incl. LC Student booth (Plumbing & Pipefitting) ΕA 14.00 Incl.

| 2502  | Student booth (Electrical Technology)                                       | EA  | 38.00     |             | Incl.     |
|-------|---|-----|-----------|-------------|-----------|
| 2515  | Student booth (HVAC Technology)   | EA  | 48.00     |             | Incl.     |
| 2584  | Casework reconciliation adjustment  | LS  | 1.00      | -240,000.00 | -240,000  |
| 1808  | Residential equipment   | Set | 4.00      | 5,000.00    | 20,000    |
| 1801  | Theater rigging   | LS  | 1.00      | 200,000.00  | 200,000   |
| 1802  | Gymnasium wall padding  | SF  | 946.00    | 30.00       | 28,380    |
| 1803  | Gymnasium batting cage  | EA  | 1.00      | 5,500.00    | 5,500     |
| 1811  | Gymnasium flexible stainless steel safety netting                           | SF  | 3,016.00  | 30.00       | 90,480    |
| 1804  | Gymnasium dividers  | SF  | 2,582.00  | 20.00       | 51,640    |
| 1805  | Gymnasium basketball backdrop   | EA  | 6.00      | 10,000.00   | 60,000    |
| 1806  | Electronic scoreboards and shot clocks                                      | LS  | 1.00      | 40,000.00   | 40,000    |
| 1807  | Telescoping bleachers (Gymnasium)   | LS  | 1.00      | 230,000.00  | 230,000   |
|       | <br>E1090 - Other Equipment   |     |           | 14.27/SF    | 5,430,682 |
|       | E10 - EQUIPMENT   |     |           | 15.37/SF    | 5,848,282 |
| E20   | FURNISHINGS   |     |           |             |           |
| E2010 | Fixed Furnishings   |     |           |             |           |
| 323   | Window roller shades, manual operated (Classrooms, Science Labs, Art rooms) | SF  | 29,333.20 | 10.00       | 293,332   |
| 803   | Window roller shades, manual operated                                       | EA  | 174.00    |             | Incl.     |
| 324   | Window roller shades, electrically operated (Media Center)                  | SF  | 2,314.00  | 20.00       | 46,280    |
| 325   | Vertical blinds, manual operated (Administration)                           | SF  | 588.00    | 12.00       | 7,056     |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

| Ref     | Description   | Unit | Qty    | Rate<br>USD | Total Cost<br>USD |
|---------|---|------|--------|-------------|-------------------|
| 326     | Tension shade system, electrically operated (Dome skylight) - none indicated                                    | SF   | 750.00 |             | Excl.             |
|         | E2010 - Fixed Furnishings   |      |        | 0.91/SF     | 346,668           |
|         | E20 - FURNISHINGS   |      |        | 0.91/SF     | 346,668           |
| G30     | LIQUID AND GAS SITE UTILITIES   |      |        |             |                   |
| G3010   | Water Utilities   |      |        |             |                   |
| 1381    | 6", Ductile iron pipe   | LF   | 95.99  | 60.00       | 5,759             |
| 1448    | Cleaning, testing, trace wiring etc.  | LF   | 95.82  | 5.00        | 479               |
| 569     | Excavation and backfill (with site preparation)   | LF   | 95.82  |             | Incl.             |
|         | G3010 - Water Utilities   |      |        | 0.02/SF     | 6,238             |
| G3090   | Liquid and Gas Site Utilities Supplementary<br>Components   |      |        |             |                   |
| 1798    | General requirements: supervision, shop drawings, as-<br>built drawings, equipment rentals, fees, permits, etc. | Item |        |             | 437               |
|         | G3090 - Liquid and Gas Site Utilities Supplementary<br>Components   |      |        | 0.01/SF     | 437               |
|         | G30 - LIQUID AND GAS SITE UTILITIES   |      |        | 0.02/SF     | 6,675             |
| NEW SCH | IOOL BUILDING   |      |        | 417.58/SF   | 158.916.659       |



### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY BD BASE DESIGN

A Building

GFAR: 2,040.00 SF Cost/SF: 333.38 A3 Maintenance Building Rates Current At January 2023 Ref Description GFAR **Total Cost** USD/SF USD A10 **Foundations** A1010 Standard Foundations 17.25 35.198 A10 - Foundations 17.25 35,198 A20 **Basement ConstructionSubgrade Enclosures** A2010 Walls for Subgrade Enclosures 25.75 52,521 A20 - Basement ConstructionSubgrade Enclosures 25.75 52,521 A40 Slabs-on-Grade Standard Slabs-on-Grade A4010 15.55 31,728 A4090 Slab-on-Grade Supplementary Components 2.42 4,947 A40 - Slabs-on-Grade 17.98 36,675 A60 Water and Gas Mitigation A6010 **Building Subdrainage** 7.97 16.257 A60 - Water and Gas Mitigation 7.97 16,257 A90 **Substructure Related Activities** A9010 Substructure Excavation 7.51 15,330 A90 - Substructure Related Activities 7.51 15,330 **B20 Exterior Vertical Enclosures** B2010 Exterior Walls 25.05 51,107 B2050 **Exterior Doors and Grilles** 22.65 46,200 **B20 - Exterior Vertical Enclosures** 47.70 97,307 **B30 Exterior Horizontal Enclosures** B3010 Roofing Incl. **B30 - Exterior Horizontal Enclosures** Incl. C10 Interior Construction C1010 Interior Partitions 6.89 14.056 C1030 Interior Doors 0.77 1,570 C1090 Interior Specialties 7.19 14,660 **C10 - Interior Construction** 14.85 30,286 C20 **Interior Finishes** C2010 Wall Finishes 1.22 2,495 C2030 Flooring 2.27 4,637



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY BD BASE DESIGN

### A Building

A Building GFAR: 2,040.00 SF Cost/SF: 333.38 A3 Maintenance Building (continued) Rates Current At January 2023

| Ref   | Description                               |                         | GFAR<br>USD/SF | Total Cost<br>USD |
|-------|---|-------------------------|----------------|-------------------|
| C2050 | Ceiling Finishes                          |                         | 2.36           | 4,820             |
|       |   | C20 - Interior Finishes | 5.86           | 11,952            |
| D20   | Plumbing                                  |                         |                |                   |
| D2010 | Domestic Water Distribution               |                         | 20.12          | 41,037            |
| D2020 | Sanitary Drainage                         |                         | 12.89          | 26,299            |
| D2030 | Building Support Plumbing Systems         |                         | 5.51           | 11,235            |
| D2060 | Process Support Plumbing Systems          |                         |                | Excl.             |
|       |   | D20 - Plumbing          | 38.52          | 78,571            |
| D30   | HVAC                                      |                         |                |                   |
| D3020 | Heat Systems                              |                         | 4.63           | 9,450             |
| D3030 | Cooling Systems                           |                         | 0.40           | 817               |
| D3050 | Facility HVAC Distribution Systems        |                         | 38.97          | 79,491            |
| D3070 | Special Purpose HVAC Systems              |                         | 4.23           | 8,634             |
|       |   | D30 - HVAC              | 48.23          | 98,392            |
| D40   | Fire Protection                           |                         |                |                   |
| D4030 | Fire Protection Specialties               |                         | 0.29           | 600               |
|       |   | D40 - Fire Protection   | 0.29           | 600               |
| D50   | Electrical                                |                         |                |                   |
| D5020 | Electrical Service and Distribution       |                         | 3.00           | 6,126             |
| D5030 | General Purpose Electrical Power          |                         | 0.37           | 750               |
| D5040 | Lighting                                  |                         | 1.83           | 3,742             |
| D5080 | Miscellaneous Electrical Systems          |                         | 0.60           | 1,225             |
| D6060 | Distributed Communications and Monitoring |                         | 0.16           | 325               |
|       |   | D50 - Electrical        | 5.96           | 12,168            |
| D60   | Communications                            |                         |                |                   |
| D6010 | Data Communications                       |                         | 0.42           | 850               |
| D6030 | Audio-Video Communication                 |                         | 0.92           | 1,875             |
|       |   | D60 - Communications    | 1.34           | 2,725             |
| D70   | Electronic Safety and Security            |                         |                |                   |
| D7010 | Access Controls and Intrusion Detection   |                         | 0.81           | 1,650             |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY **BD BASE DESIGN**

#### A Building

GFAR: 2,040.00 SF Cost/SF: 333.38 A3 Maintenance Building (continued) Rates Current At January 2023 Ref Description **Total Cost** GFAR USD/SF USD Detection and Alarm D7050 1.87 3,820 **D70 - Electronic Safety and Security** 2.68 5,470 F10 **Special Construction** F1020 **Special Structures** 75.07 153,150 F10 - Special Construction 75.07 153,150 G30 Liquid and Gas Site Utilities G3010 Water Utilities 4.96 10,118 G3020 Sanitary Sewerage Utilities 10.38 21,184 G3090 Liquid and Gas Site Utilities Supplementary Components 1.07 2,191 G30 - Liquid and Gas Site Utilities 16.42 33,493 MAINTENANCE BUILDING 333.38 680.095



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY BD BASE DESIGN

| A3 Maintenance Building (continued) | Rates Current At January 2023     |  |  |  |
|-------------------------------------|-----------------------------------|--|--|--|
|                                     | GFAR: 2,040.00 SF Cost/SF: 333.38 |  |  |  |

| Ref         | Description  | GFAR<br>USD/SF | Total Cost<br>USD |
|-------------|--|----------------|-------------------|
|             |  |                |                   |
| MARGINS     | & ADJUSTMENTS  |                |                   |
| Design & E  | Estimating Contingency   |                | 17,002            |
| Escalation  | Allowance up to mid-point of Construction                        |                | 31,369            |
| Sub-contra  | actor Bonds  |                | 8,742             |
| Insurance   | - CCIP (Change from GL)  |                | 20,666            |
| Cost of Tra | aditional Insurance (Trade + GL)                                 |                | -22,746           |
| Builder's R | isk Insurance (per CM Pricing Exhibit 1)                         |                | 1,218             |
| Payment &   | Performance Bond (per CM Pricing Exhibit 1)                      |                | 6,170             |
| General C   | onditions (per CM Pricing Exhibit 1)                             |                | 32,299            |
| General R   | equirements (per CM Pricing Exhibit 1)                           |                | 20,151            |
| Allowance   | for Additional Requirements not included in CM Pricing Exhibit 1 |                | 3,334             |
| CM Constr   | ruction Contingency (per CM Pricing Exhibit 1)                   |                | 18,615            |
| CM Fee (p   | er CM Pricing Exhibit 1)   |                | 14,020            |
| ESTIMATI    | ED TOTAL COST  | 407.32         | 830,935           |



### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

A Building

GFAR: 2,040.00 SF Cost/SF: 333.38 A3 Maintenance Building Rates Current At January 2023 Unit Ref Description Qty Rate **Total Cost** USD USD A10 FOUNDATIONS A1010 **Standard Foundations** Concrete to isolated spread footings, 4500 PSI CY 996 23.12 325.00 7,514 529 Concrete to perimeter strip footings - 1' thick, 4500 PSI CY 9.85 324.97 3,201 Concrete to piers, 4500 PSI CY 325.34 1117 1.46 475 521 Form isolated spread footings SF 432.02 20.00 8,640 530 Form strip footings SF 245.11 20.00 4,902 SF 25.00 1118 Form piers 157.50 3,937 522 Bar reinforcement to isolated spread footings 2,118.83 1.80 3,814 Lb 587 Bar reinforcement to strip footings, allow 100 PCY Lb 983.40 1.80 1,770 1119 Bar reinforcement to piers, allow Lb 525.01 1.80 945 A1010 - Standard Foundations 17.25/SF 35,198 **A10 - FOUNDATIONS** 17.25/SF 35,198 A20 **BASEMENT CONSTRUCTIONSUBGRADE ENCLOSURES** A2010 Walls for Subgrade Enclosures 598 Concrete to perimeter frost walls, 4500 PSI CY 31.47 325.01 10,228 605 Form perimeter frost walls SF 1,274.47 25.00 31,862 2,077.38 3,739 608 Bar reinforcement to perimeter frost walls Lb 1.80 617 Dampproofing to frost wall SF 637.25 6.00 3,824 618 Rigid insulation - 2" thick SF 637.24 4.50 2.868 A2010 - Walls for Subgrade Enclosures 25.75/SF 52,521 **A20 - BASEMENT CONSTRUCTIONSUBGRADE** 25.75/SF 52,521 **ENCLOSURES** A40 SLABS-ON-GRADE Standard Slabs-on-Grade A4010 501 Concrete to slab on grade - 6" thick, 4000 PSI CY 33.30 320.00 10,656 502 Form slab on grade SF 88.72 18.00 1,597 WWF reinforcement 503 SF 1,798.05 1.30 2,337 698 Allowance for bar reinforcement Lb 899.03 1.80 1,618 504 Float finish to slab on grade SF 1.50 2,697 1,798.06 505 Control joints SF 1,798.06 0.75 1,349



GFAR: 2,040.00 SF Cost/SF: 333.38

### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

A3 Maintenance Building (continued)

| A3 Maintena | ance Building (continued)                                   |      | Rat      | es Current At | January 2023      |
|-------------|---|------|----------|---------------|-------------------|
| Ref         | Description   | Unit | Qty      | Rate<br>USD   | Total Cost<br>USD |
| 506         | Air and vapor barrier                                       | SF   | 1,798.06 | 0.85          | 1,528             |
| 508         | Excavation for slab on grade                                | CY   | 111.00   |               | Incl.             |
| 509         | Remove and dispose of excavated material                    | CY   | 111.00   |               | Incl.             |
| 510         | Prepare and compact sub-base                                | SF   | 1,798.06 | 1.50          | 2,697             |
| 513         | Re-use materials ILO Imported sand gravel fill - 12" thick  | CY   | 66.61    | 15.00         | 999               |
| 703         | Winter conditions   | LS   | 1.00     |               | Excl.             |
| 707         | Mechanical pads   | Item |          |               | 3,750             |
| 710         | Engineering, layout, safety, cleaning, etc.                 | Item |          |               | 2,500             |
|             | A4010 - Standard Slabs-on-Grade                             |      |          | 15.55/SF      | 31,728            |
| A4090       | Slab-on-Grade Supplementary Components                      |      |          |               |                   |
| 656         | Rigid insulation - 1" thick                                 | SF   | 1,799.00 | 2.75          | 4,947             |
|             | A4090 - Slab-on-Grade Supplementary Components              |      |          | 2.42/SF       | 4,947             |
|             | A40 - SLABS-ON-GRADE  |      |          | 17.98/SF      | 36,675            |
| A60         | WATER AND GAS MITIGATION                                    |      |          |               |                   |
| A6010       | Building Subdrainage  |      |          |               |                   |
| 619         | Perimeter drain   | LF   | 190.28   | 50.00         | 9,514             |
| 686         | Under-slab drainage system                                  | SF   | 1,798.06 | 3.75          | 6,743             |
|             | A6010 - Building Subdrainage                                |      |          | 7.97/SF       | 16,257            |
|             | A60 - WATER AND GAS MITIGATION                              |      |          | 7.97/SF       | 16,257            |
| A90         | SUBSTRUCTURE RELATED ACTIVITIES                             |      |          |               |                   |
| A9010       | Substructure Excavation                                     |      |          |               |                   |
| 591         | Excavation for foundation footings including spoils removal | CY   | 262.19   | 31.00         | 8,128             |
| 593         | Prepare and compact foundation sub-base                     | SF   | 585.53   | 1.50          | 878               |
| 594         | Imported sand gravel fill below foundations - 12" thick     | CY   | 21.70    | 50.00         | 1,085             |
| 620         | Imported foundation backfill                                | CY   | 174.64   | 30.00         | 5,239             |
|             | A9010 - Substructure Excavation                             |      |          | 7.51/SF       | 15,330            |
|             | A90 - SUBSTRUCTURE RELATED ACTIVITIES                       |      |          | 7.51/SF       | 15,330            |
| B20         | EXTERIOR VERTICAL ENCLOSURES                                |      |          |               |                   |
| B2010       | Exterior Walls  |      |          |               |                   |
| 29          | 4" Thick CMU Veneer   | SF   | 571.02   | 39.00         | 22,270            |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### **LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN**

#### A Building

GFAR: 2,040.00 SF Cost/SF: 333.38 A3 Maintenance Building (continued) Rates Current At January 2023 Ref Description Unit Qty Rate **Total Cost** USD USD 72 8" Thick CMU back-up SF 571.03 35.00 19,986 2544 3" Thick rigid insulation SF 571.03 7.00 3,997 Fluid applied air and vapor barrier SF 571.01 6.50 3,712 2545 190 Allowance for miscellaneous sealing and caulking SF 571.01 2.00 1,142 B2010 - Exterior Walls 25.05/SF 51,107 **Exterior Doors and Grilles** B2050 238 12'-0" x 12'-0" Motor operated overhead door with insulating ΕA 3.00 14,500.00 43,500 glass 134 3'-0" x 7'-0" Single leaf hollow metal door, including frame, EΑ 2.00 1,350.00 2,700 finish, and hardware B2050 - Exterior Doors and Grilles 22.65/SF 46,200 **B20 - EXTERIOR VERTICAL ENCLOSURES** 47.70/SF 97,307 **B30** EXTERIOR HORIZONTAL ENCLOSURES B3010 Roofing

| 206   | Maintenance roof assembly (included with PEMB)                                       | SF | 2,071.00 |         | Incl.  |
|-------|--|----|----------|---------|--------|
|       | <br>B3010 - Roofing  |    |          |         | Incl.  |
|       | <b>B30 - EXTERIOR HORIZONTAL ENCLOSURES</b>  |    |          |         | Incl.  |
| C10   | INTERIOR CONSTRUCTION  |    |          |         |        |
| C1010 | Interior Partitions  |    |          |         |        |
| 267   | CMU partition, 8" thick (Type 8.0)   | SF | 335.01   | 28.00   | 9,380  |
| 410   | Gypsum board furring - 3-5/8" metal stud with 1 layer 5/8"<br>GWB (Type F4.0)        | SF | 128.01   | 11.00   | 1,408  |
| 488   | Allowance for miscellaneous sealing and caulking                                     | SF | 2,042.00 | 0.50    | 1,021  |
| 489   | Allowance for miscellaneous fire stopping  | SF | 2,042.00 | 0.25    | 511    |
| 806   | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Masonry Trade) | SF | 2,042.00 | 0.50    | 1,021  |
| 808   | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Drywall Trade) | SF | 2,042.00 | 0.35    | 715    |
|       | C1010 - Interior Partitions  |    |          | 6.89/SF | 14,056 |
|       |  |    |          |         |        |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A3 Maintenance Building (continued)

GFAR: 2,040.00 SF Cost/SF: 333.38 Rates Current At January 2023

| Ref   | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|----------|-------------|-------------------|
| C1030 | Interior Doors   |      |          |             |                   |
| 102   | 3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware       | EA   | 1.00     | 1,570.00    | 1,570             |
|       | C1030 - Interior Doors   |      |          | 0.77/SF     | 1,570             |
| C1090 | Interior Specialties   |      |          |             |                   |
| 280   | Restroom accessories - Tissue paper dispenser  | EA   | 1.00     | 125.00      | 125               |
| 281   | Restroom accessories - Grab bar  | EA   | 2.00     | 180.00      | 360               |
| 282   | Restroom accessories - Napkin disposal   | EA   | 1.00     | 500.00      | 500               |
| 283   | Restroom accessories - Robe hook   | EA   | 1.00     | 100.00      | 100               |
| 284   | Restroom accessories - Soap dispenser  | EA   | 1.00     | 150.00      | 150               |
| 291   | Restroom accessories - Framed mirror   | EA   | 1.00     | 800.00      | 800               |
| 292   | Restroom accessories - Towel dispenser/waste receptacle                                | EA   | 1.00     | 850.00      | 850               |
| 293   | Allowance for miscellaneous metals   | SF   | 2,042.01 | 1.00        | 2,042             |
| 294   | Allowance for rough carpentry  | SF   | 2,042.01 | 0.75        | 1,532             |
| 295   | Allowance for wood blocking  | SF   | 2,042.01 | 1.25        | 2,553             |
| 296   | Allowance for fire extinguisher and cabinets   | EA   | 0.82     | 850.00      | 697               |
| 297   | Allowance for interior signage   | SF   | 2,042.01 | 0.85        | 1,736             |
| 298   | Allowance for exterior signage   | Item |          |             | 2,500             |
| 807   | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade) | SF   | 2,042.01 | 0.35        | 715               |
|       | C1090 - Interior Specialties   |      |          | 7.19/SF     | 14,660            |
|       | C10 - INTERIOR CONSTRUCTION  |      |          | 14.85/SF    | 30,286            |
| C20   | INTERIOR FINISHES  |      |          |             |                   |
| C2010 | Wall Finishes  |      |          |             |                   |
| 170   | Prepare and apply epoxy paint  | SF   | 448.33   | 3.50        | 1,569             |
| 171   | Prepare and apply paint to CMU   | SF   | 617.40   | 1.50        | 926               |
|       | C2010 - Wall Finishes  |      |          | 1.22/SF     | 2,495             |
| C2030 | Flooring   |      |          |             |                   |
| 5     | SCONC, Sealed concrete   | SF   | 1,681.68 | 1.50        | 2,523             |
| 6     | EF, Epoxy flooring and base  | SF   | 85.45    | 15.00       | 1,282             |



### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

A Building

GFAR: 2,040.00 SF Cost/SF: 333.38 A3 Maintenance Building (continued) Rates Current At January 2023 Ref Description Unit Qty Rate **Total Cost** USD USD 10 Resilient base LF 166.45 5.00 832 C2030 - Flooring 4,637 2.27/SF C2050 **Ceiling Finishes** 41 Gypsum board ceiling, moisture resistant SF 85.35 25.00 2,134 SF 39 Paint to gypsum board ceiling 85.34 1.50 128 40 Paint to exposed ceiling SF 1,705.10 1.50 2,558 C2050 - Ceiling Finishes 2.36/SF 4,820 **C20 - INTERIOR FINISHES** 5.86/SF 11,952 D20 PLUMBING **Domestic Water Distribution** D2010 1886 **Plumbing Fixtures** Note 2073 P-1A, Water Closet - Flush Valve - Wall Mounted, accessible ΕA 1.00 1,850.00 1,850 2076 P-3, Lavatory - Rectangular - Wall Mounted 19X17 EΑ 1.00 1,450 1,450.00 2097 Allowance for missing/ miscellaneous plumbing fixtures SF 2,042.00 1.00 2,042 (Maintenance building) 447 Water Distribution and Components Note 2102 Connection to main(2")-(Maintenance building) ΕA 1.00 500.00 500 2.00 2104 Plumbing fixture- hook up(domestic water) ΕA 400.00 800 2109 2", water meter c/w reduced pressure backflow preventer -ΕA 1.00 5,000.00 5,000 Maintenance building (allowance) 1311 2", Reduced pressure backflow preventer - allow -ΕA 1.00 2,500.00 2,500 maintenance building 1316 Undercounter - point of use type electric water heater, 4.5 kw 1.00 6,500.00 6,500 EΑ (Maintenance building) 2140 Housekeeping pad(to be carried elsewhere in this estimate) Note Excl. 900 2513 Trap seal primer c/w tubing ΕA 3.00 300.00 2141 HB, Hose bib ΕA 1.00 300.00 300 1101 WH, Wall Hydrant - Mild Climate ΕA 1.00 1,750.00 1,750 LF 465 Domestic water piping, copper L, 1" - ag 36.50 30.00 1,095 466 Domestic water piping, copper L, 2" - ag LF 66.60 58.99 3,929 1308 Domestic water piping, copper K, 2" - bg LF 18.00 75.00 1,350 1365 Thermal pipe insulation - 1/2" to 1" copper pipe LF 36.50 6.49 237



GFAR: 2,040.00 SF Cost/SF: 333.38

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A3 Maintenance Building (continued)

| A3 Maintena | ance Building (continued)   |      | Rat      | tes Current At | January 2023      |
|-------------|---|------|----------|----------------|-------------------|
| Ref         | Description   | Unit | Qty      | Rate<br>USD    | Total Cost<br>USD |
| 1368        | Thermal pipe insulation - 2" copper pipe  | LF   | 84.60    | 13.00          | 1,100             |
| 2155        | Water meter c/w bfp assembly- hook up(2")   | EA   | 1.00     | 750.00         | 750               |
| 2165        | Undercounter point of use type electric water heater- hook up                             | EA   | 1.00     | 550.00         | 550               |
| 2170        | RBFP- hook up   | EA   | 1.00     | 550.00         | 550               |
| 1373        | Hookup - plumbing   | EA   | 2.00     | 400.00         | 800               |
| 2174        | Allowance for missing/ miscellaneous domestic water system (Maintenance building)         | SF   | 2,042.00 | 2.00           | 4,084             |
| 2176        | Subcontractor GCs/GRs   | Item |          |                | 3,000             |
|             | D2010 - Domestic Water Distribution   |      |          | 20.12/SF       | 41,037            |
| D2020       | Sanitary Drainage   |      |          |                |                   |
| 2178        | Plumbing fixture - hook-ups(sanitary & vent)  | EA   | 2.00     | 400.00         | 800               |
| 1322        | Grease/oil separator - Maintenance building   | EA   | 1.00     | 8,000.00       | 8,000             |
| 2194        | FD, Floor drain   | EA   | 3.00     | 450.00         | 1,350             |
| 2197        | CO, Clean out   | EA   | 2.00     | 350.00         | 700               |
| 2214        | 4", Sanitary piping c/w fittings - Bg   | LF   | 176.50   | 50.00          | 8,825             |
| 2263        | No excavation & backfill- assumed   | Note |          |                | Excl.             |
| 2262        | No cutting and patching assumed   | Note |          |                | Excl.             |
| 1296        | 1-1/2" to 2, Vent c/w fittings, supports, etc, ag   | LF   | 23.10    | 45.02          | 1,040             |
| 1304        | 1-1/2" to 2, Vent piping, bg  | LF   | 10.00    | 50.00          | 500               |
| 2236        | Allowance for missing/ miscellaneous sanitary drainage<br>system(Maintenance building)    | SF   | 2,042.00 | 2.00           | 4,084             |
| 2238        | Subcontractor GCs/GRs   | Item |          |                | 1,000             |
|             | D2020 - Sanitary Drainage   |      |          | 12.89/SF       | 26,299            |
| D2030       | Building Support Plumbing Systems   |      |          |                |                   |
| 2242        | 4" RD/OFD, Roof Drain/ Overflow drain   | EA   | 2.00     | 1,200.00       | 2,400             |
| 2246        | 4", Storm drain piping c/w fittings, supports - Ag  | LF   | 82.76    | 70.00          | 5,793             |
| 2254        | No excavation & backfill- assumed   | Note |          |                | Excl.             |
| 2255        | No cutting and patching assumed   | Note |          |                | Excl.             |
| 2259        | Allowance for missing/ miscellaneous storm water drainage<br>system(Maintenance building) | SF   | 2,042.00 | 1.00           | 2,042             |


# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A3 Maintenance Building (continued)

GFAR: 2,040.00 SF Cost/SF: 333.38 Rates Current At January 2023

| Ref   | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|----------|-------------|-------------------|
| 2261  | Subcontractor GCs/GRs  | Item |          |             | 1,000             |
|       | D2030 - Building Support Plumbing Systems                            |      |          | 5.51/SF     | 11,235            |
| D2060 | Process Support Plumbing Systems                                     |      |          |             |                   |
| 2529  | Allowance for maintenance building gas system (assumed not required) | Note |          |             | Excl.             |
|       | D2060 - Process Support Plumbing Systems                             |      |          |             | Excl.             |
|       | D20 - PLUMBING   |      |          | 38.52/SF    | 78,571            |
| D30   | HVAC   |      |          |             |                   |
| D3020 | Heat Systems   |      |          |             |                   |
| 1847  | EUH-1, Electric unit heater, 15 kW                                   | EA   | 3.00     | 2,750.00    | 8,250             |
| 1865  | EUH-2, Electric unit heater, 1.5 kW                                  | EA   | 1.00     | 1,200.00    | 1,200             |
|       | D3020 - Heat Systems   |      |          | 4.63/SF     | 9,450             |
| D3030 | Cooling Systems  |      |          |             |                   |
| 2481  | Allowance for missing/ miscellaneous                                 | SF   | 2,042.01 | 0.40        | 817               |
|       | D3030 - Cooling Systems  |      |          | 0.40/SF     | 817               |
| D3050 | Facility HVAC Distribution Systems                                   |      |          |             |                   |
| 1848  | F-19, Exhaust fan, 1,700 cfm   | EA   | 1.00     | 3,540.00    | 3,540             |
| 1216  | Galvanized duct work c/w fittings, supports, etc.                    | Lb   | 3,375.00 | 15.00       | 50,625            |
| 1217  | Thermal insulation   | SF   | 1,400.00 | 6.50        | 9,100             |
| 1245  | 18" to 20", Round galvanized duct work c/w fittings, supports, etc   | LF   | 69.91    | 90.00       | 6,292             |
| 1303  | C2, Side-wall grilles  | EA   | 3.00     | 350.00      | 1,050             |
| 1236  | Louver   | SF   | 12.00    | 75.00       | 900               |
| 2423  | Plenum, 36"x24"x24"  | EA   | 1.00     | 1,750.00    | 1,750             |
| 2424  | Plenum, 72"x24"x24"  | EA   | 1.00     | 2,150.00    | 2,150             |
| 1567  | Allowance for miscellaneous/missing items                            | SF   | 2,042.00 | 2.00        | 4,084             |
|       | D3050 - Facility HVAC Distribution Systems                           |      |          | 38.97/SF    | 79,491            |
| D3070 | Special Purpose HVAC Systems   |      |          |             |                   |
| 783   | Testing, balancing and commissioning                                 | SF   | 2,042.01 | 0.80        | 1,634             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

A Building

A3 Maintenance Building (continued)

GFAR: 2,040.00 SF Cost/SF: 333.38 Rates Current At January 2023

| Ref   | Description   | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|----------|-------------|-------------------|
| 1560  | General requirements: supervision, shop drawings, asbuilt,<br>tags, markers, tools, rentals, BIM, cleaning, storage, material<br>handling, seismic restraints, permits, fees etc. | Item |          |             | 7,000             |
|       | D3070 - Special Purpose HVAC Systems  |      |          | 4.23/SF     | 8,634             |
|       | D30 - HVAC  |      |          | 48.23/SF    | 98,392            |
| D40   | FIRE PROTECTION   |      |          |             |                   |
| D4030 | Fire Protection Specialties   |      |          |             |                   |
| 2372  | Allowance for Fire Extinguishers  | EA   | 2.00     | 300.00      | 600               |
|       | D4030 - Fire Protection Specialties   |      |          | 0.29/SF     | 600               |
|       | D40 - FIRE PROTECTION   |      |          | 0.29/SF     | 600               |
| D50   | ELECTRICAL  |      |          |             |                   |
| D5020 | Electrical Service and Distribution   |      |          |             |                   |
| 217   | Distribution maintenance building   | SF   | 2,042.00 | 3.00        | 6,126             |
|       | D5020 - Electrical Service and Distribution   |      |          | 3.00/SF     | 6,126             |
| D5030 | General Purpose Electrical Power  |      |          |             |                   |
| 1531  | Rec power   | EA   | 6.00     | 125.00      | 750               |
|       | D5030 - General Purpose Electrical Power  |      |          | 0.37/SF     | 750               |
| D5040 | Lighting  |      |          |             |                   |
| 1526  | Lighting Exits  | EA   | 2.00     | 320.00      | 640               |
| 1527  | Lighting type F1 - 4' long linear OFCI  | EA   | 4.00     | 115.00      | 460               |
| 1732  | Lighting conduit & wire   | EA   | 6.00     | 185.00      | 1,110             |
| 1743  | Lighting control  | SF   | 2,042.01 | 0.75        | 1,532             |
|       | D5040 - Lighting  |      |          | 1.83/SF     | 3,742             |
| D5080 | Miscellaneous Electrical Systems  |      |          |             |                   |
| 1738  | Electrical permits  | SF   | 2,042.01 | 0.15        | 306               |
| 1739  | Electrical testing & commissioning  | SF   | 2,042.01 | 0.20        | 408               |
| 1740  | Electrical firestopping   | SF   | 2,042.01 | 0.25        | 511               |
|       | D5080 - Miscellaneous Electrical Systems  |      |          | 0.60/SF     | 1,225             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A3 Maintenance Building (continued)

GFAR: 2,040.00 SF Cost/SF: 333.38 Rates Current At January 2023

| Ref   | Description                                       | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|----------|-------------|-------------------|
| D6060 | Distributed Communications and Monitoring         |      |          |             |                   |
| 1742  | Clocks conduit & wire                             | EA   | 1.00     | 325.00      | 325               |
|       | D6060 - Distributed Communications and Monitoring |      |          | 0.16/SF     | 325               |
|       | D50 - ELECTRICAL                                  |      |          | 5.96/SF     | 12,168            |
| D60   | COMMUNICATIONS                                    |      |          |             |                   |
| D6010 | Data Communications                               |      |          |             |                   |
| 1676  | WAP wireless access point                         | EA   | 1.00     | 850.00      | 850               |
|       | D6010 - Data Communications                       |      |          | 0.42/SF     | 850               |
| D6030 | Audio-Video Communication                         |      |          |             |                   |
| 1741  | Sound conduit & wire                              | EA   | 3.00     | 625.00      | 1,875             |
|       | D6030 - Audio-Video Communication                 |      |          | 0.92/SF     | 1,875             |
|       | D60 - COMMUNICATIONS                              |      |          | 1.34/SF     | 2,725             |
| D70   | ELECTRONIC SAFETY AND SECURITY                    |      |          |             |                   |
| D7010 | Access Controls and Intrusion Detection           |      |          |             |                   |
| 1733  | Security conduit & wire                           | EA   | 6.00     | 275.00      | 1,650             |
|       | D7010 - Access Controls and Intrusion Detection   |      |          | 0.81/SF     | 1,650             |
| D7050 | Detection and Alarm                               |      |          |             |                   |
| 1631  | Fire alarm pull station                           | EA   | 2.00     | 650.00      | 1,300             |
| 1632  | Fire alarm smoke detector                         | EA   | 1.00     | 325.00      | 325               |
| 1636  | Fire alarm audio/visual alarm                     | EA   | 2.00     | 410.00      | 820               |
| 1734  | Fire alarm conduit & wire                         | EA   | 5.00     | 275.00      | 1,375             |
|       | D7050 - Detection and Alarm                       |      |          | 1.87/SF     | 3,820             |
|       | D70 - ELECTRONIC SAFETY AND SECURITY              |      |          | 2.68/SF     | 5,470             |
| F10   | SPECIAL CONSTRUCTION                              |      |          |             |                   |
| F1020 | Special Structures                                |      |          |             |                   |
| 657   | Pre-engineered building                           | SF   | 2,042.00 | 75.00       | 153,150           |
|       | F1020 - Special Structures                        |      |          | 75.07/SF    | 153,150           |
|       | F10 - SPECIAL CONSTRUCTION                        |      |          | 75.07/SF    | 153,150           |
|       |   |      |          |             |                   |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM BD BASE DESIGN

A Building

 A Building
 GFAR: 2,040.00 SF
 Cost/SF: 333.38

 A3 Maintenance Building (continued)
 Rates Current At January 2023

 Ref
 Description
 Unit
 Qty
 Rate
 Total Cost

| Ref     | Description   | Unit | Qty   | Rate<br>USD | Total Cost<br>USD |
|---------|---|------|-------|-------------|-------------------|
| G30     | LIQUID AND GAS SITE UTILITIES   |      |       |             |                   |
| G3010   | Water Utilities   |      |       |             |                   |
| 1383    | Connection to building  | EA   | 1.00  | 600.00      | 600               |
| 1382    | 2", copper  | LF   | 76.90 | 70.00       | 5,383             |
| 1955    | Tee 8"x8"x2"  | EA   | 1.00  | 2,500.00    | 2,500             |
| 1380    | 2", Water valve - allow   | EA   | 1.00  | 1,250.00    | 1,250             |
| 1448    | Cleaning, testing, trace wiring etc.  | LF   | 76.90 | 5.01        | 385               |
| 569     | Excavation and backfill (with site preparation)   | LF   | 76.90 |             | Incl.             |
|         | G3010 - Water Utilities   |      |       | 4.96/SF     | 10,118            |
| G3020   | Sanitary Sewerage Utilities   |      |       |             |                   |
| 1391    | Connection to building sanitary service   | EA   | 4.00  | 500.00      | 2,000             |
| 1388    | SMH, Sanitary manhole   | EA   | 2.00  | 6,000.00    | 12,000            |
| 1941    | 6",sanitary sewer, cast iron  | LF   | 10.58 | 110.02      | 1,164             |
| 1387    | 6",sanitary sewer, PVC  | LF   | 13.48 | 85.01       | 1,146             |
| 1943    | 4",sanitary sewer, PVC  | LF   | 33.08 | 45.01       | 1,489             |
| 1392    | 6",sanitary sewer, PVC  | LF   | 38.75 | 74.99       | 2,906             |
| 2318    | Cleaning, testing, trace wiring etc.  | LF   | 95.75 | 5.00        | 479               |
| 577     | Excavation and backfill (with site preparation)   | LF   | 95.75 |             | Incl.             |
|         | G3020 - Sanitary Sewerage Utilities   |      |       | 10.38/SF    | 21,184            |
| G3090   | Liquid and Gas Site Utilities Supplementary Components  |      |       |             |                   |
| 1798    | General requirements: supervision, shop drawings, as-built drawings, equipment rentals, fees, permits, etc. | Item |       |             | 2,191             |
|         | G3090 - Liquid and Gas Site Utilities Supplementary<br>Components   |      |       | 1.07/SF     | 2,191             |
|         | G30 - LIQUID AND GAS SITE UTILITIES   |      |       | 16.42/SF    | 33,493            |
| MAINTEN | ANCE BUILDING   |      |       | 333.38/SF   | 680,095           |
|         |   |      |       |             |                   |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY

**BD Base Design** B Sitework

Rates Current At January 2023

| Ref   | Description                                 |                            | GFAR<br>USD/SF | Total Cost<br>USD |
|-------|---|----------------------------|----------------|-------------------|
| D10   | Conveying                                   |                            |                |                   |
| D1010 | Vertical Conveying Systems                  |                            |                | Excl.             |
|       |   | D10 - Conveying            |                | Excl.             |
| D20   | Plumbing                                    |                            |                |                   |
| D2030 | Building Support Plumbing Systems           |                            |                | Excl.             |
|       |   | D20 - Plumbing             |                | Excl.             |
| F20   | Facility Remidiation                        |                            |                |                   |
| F2010 | Hazardous Materials Remediation             |                            |                | 1,900,000         |
|       |   | F20 - Facility Remidiation |                | 1,900,000         |
| F30   | Demolition                                  |                            |                |                   |
| F3010 | Structure Demolition                        |                            |                | 1,708,622         |
|       |   | F30 - Demolition           |                | 1,708,622         |
| G10   | Site Preparation                            |                            |                |                   |
| G1010 | Site Clearing                               |                            |                | 1,598,650         |
| G1020 | Site Elements Demolition                    |                            |                | 1,298,331         |
| G1070 | Site Earthwork                              |                            |                | 15,463,581        |
|       |   | G10 - Site Preparation     |                | 18,360,562        |
| G20   | Site Improvements                           |                            |                |                   |
| G2010 | Roadways                                    |                            |                | 1,754,108         |
| G2020 | Parking Lots                                |                            |                | 1,875,571         |
| G2030 | Pedestrian Plazas and Walkways              |                            |                | 637,162           |
| G2050 | Athletic, Recreational, and Playfield Areas |                            |                | 3,071,545         |
| G2060 | Site Development                            |                            |                | 2,542,695         |
| G2080 | Landscaping                                 |                            |                | 1,132,330         |
|       |   | G20 - Site Improvements    |                | 11,013,411        |
| G30   | Liquid and Gas Site Utilities               |                            |                |                   |
| G3010 | Water Utilities                             |                            |                | 1,049,868         |
| G3020 | Sanitary Sewerage Utilities                 |                            |                | 755,978           |
| G3030 | Storm Drainage Utilities                    |                            |                | 4,336,160         |
| G3050 | Site Energy Distribution                    |                            |                | 94,550            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY

#### BD Base Design

B Sitework (continued)

Rates Current At January 2023

| Ref     | Description  | GFAR<br>USD/SF | Total Cost<br>USD |
|---------|--|----------------|-------------------|
| G3090   | Liquid and Gas Site Utilities Supplementary Components |                | 453,555           |
|         | G30 - Liquid and Gas Site Utilities                    |                | 6,690,111         |
| G40     | Electrical Site Improvements                           |                |                   |
| G4010   | Site Electric Distribution Systems                     |                | 3,039,027         |
| G4050   | Site Lighting  |                | 1,116,892         |
|         | G40 - Electrical Site Improvements                     |                | 4,155,919         |
| G50     | Site Communications                                    |                |                   |
| G5010   | Site Communications                                    |                | 357,110           |
|         | G50 - Site Communications                              |                | 357,110           |
| G90     | Miscellaneous Site Construction                        |                |                   |
| G9010   | Other Site Construction                                |                | 200,000           |
|         | G90 - Miscellaneous Site Construction                  |                | 200,000           |
| SITEWOR | K  |                | 44,385,735        |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS SUMMARY

#### BD Base Design

B Sitework (continued)

Rates Current At January 2023

| Ref         | Description  | GFAR<br>USD/SF | Total Cost<br>USD |
|-------------|--|----------------|-------------------|
|             |  |                |                   |
| MARGINS     | & ADJUSTMENTS  |                |                   |
| Design & I  | Estimating Contingency   |                | 1,109,644         |
| Escalation  | Allowance up to mid-point of Construction                        |                | 2,047,292         |
| Sub-contra  | actor Bonds  |                | 570,512           |
| Insurance   | - CCIP (Change from GL)  |                | 1,348,724         |
| Cost of Tra | aditional Insurance (Trade + GL)                                 |                | -1,484,465        |
| Builder's R | isk Insurance (per CM Pricing Exhibit 1)                         |                | 79,481            |
| Payment 8   | Performance Bond (per CM Pricing Exhibit 1)                      |                | 402,707           |
| General C   | onditions (per CM Pricing Exhibit 1)                             |                | 2,107,961         |
| General R   | equirements (per CM Pricing Exhibit 1)                           |                | 1,315,162         |
| Allowance   | for Additional Requirements not included in CM Pricing Exhibit 1 |                | 217,596           |
| CM Const    | ruction Contingency (per CM Pricing Exhibit 1)                   |                | 1,214,885         |
| CM Fee (p   | er CM Pricing Exhibit 1)   |                | 915,026           |
| ESTIMATI    | ED TOTAL COST  |                | 54,230,260        |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

**BD Base Design** B Sitework

| B Sitework |   |      |            | Rates Current At | January 2023      |
|------------|---|------|------------|------------------|-------------------|
| Ref        | Description                                 | Unit | Qty        | Rate<br>USD      | Total Cost<br>USD |
| D10        | CONVEYING                                   |      |            |                  |                   |
| D1010      | Vertical Conveying Systems                  |      |            |                  |                   |
| 752        | Passenger elevator, 2 stops                 | EA   | 1.00       |                  | Excl.             |
|            | D1010 - Vertical Conveying Systems          |      |            |                  | Excl.             |
|            | D10 - CONVEYING                             |      |            |                  | Excl.             |
| D20        | PLUMBING                                    |      |            |                  |                   |
| D2030      | Building Support Plumbing Systems           |      |            |                  |                   |
| 1760       | Allowances for sump pump for press booth    | No   | 1.00       |                  | Excl.             |
|            | D2030 - Building Support Plumbing Systems   |      |            |                  | Excl.             |
|            | D20 - PLUMBING                              |      |            |                  | Excl.             |
| F20        | FACILITY REMIDIATION                        |      |            |                  |                   |
| F2010      | Hazardous Materials Remediation             |      |            |                  |                   |
| 552        | Allowance for hazardous materials abatement | LS   | 1.00       | 1,900,000.00     | 1,900,000         |
|            | F2010 - Hazardous Materials Remediation     |      |            |                  | 1,900,000         |
|            | F20 - FACILITY REMIDIATION                  |      |            |                  | 1,900,000         |
| F30        | DEMOLITION                                  |      |            |                  |                   |
| F3010      | Structure Demolition                        |      |            |                  |                   |
| 553        | Demolish existing school building           | SF   | 239,144.00 | 7.00             | 1,674,008         |
| 554        | Demolish miscellaneous support/outbuildings | SF   | 5,769.00   | 6.00             | 34,614            |
|            | F3010 - Structure Demolition                |      |            |                  | 1,708,622         |
|            | F30 - DEMOLITION                            |      |            |                  | 1,708,622         |
| G10        | SITE PREPARATION                            |      |            |                  |                   |
| G1010      | Site Clearing                               |      |            |                  |                   |
| 672        | Dust control                                | LS   | 1.00       | 75,000.00        | 75,000            |
| 676        | Clearing and grubbing                       | Acre | 34.900     | 8,500.00         | 296,650           |
| 677        | Tree removal                                | EA   | 100.00     | 850.00           | 85,000            |
| 678        | Site fencing including maintenance          | LF   | 7,000.00   | 56.00            | 392,000           |
| 679        |   | LS   | 1.00       | 150,000.00       | 150,000           |
| 680        | Submittals, as-builts, layout, survey, etc. | LS   | 1.00       | 600,000.00       | 600,000           |
|            | G1010 - Site Clearing                       |      |            |                  | 1,598,650         |
|            |   |      |            |                  |                   |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### BD Base Design

| Silework (continued) |  |      |              | Rates Current At | January 2023      |
|----------------------|--|------|--------------|------------------|-------------------|
| Ref                  | Description  | Unit | Qty          | Rate<br>USD      | Total Cost<br>USD |
| G1020                | Site Elements Demolition   |      |              |                  |                   |
| 523                  | Remove and dispose of existing catch basins                                    | EA   | 33.00        | 750.00           | 24,750            |
| 524                  | Remove and dispose of existing manholes  | EA   | 23.00        | 750.00           | 17,250            |
| 1841                 | Remove and dispose of existing hydrant   | EA   | 3.00         | 500.00           | 1,500             |
| 525                  | Remove and dispose existing utilities piping including excavation and backfill | LF   | 7,868.00     | 65.00            | 511,420           |
| 526                  | Protect and maintain existing hydrant  | EA   | 1.00         | 500.00           | 500               |
| 1839                 | Maintain and protect manhole/catch basin/drain line/water line                 | EA   | 19.00        | 1,500.00         | 28,500            |
| 527                  | Cap water main   | EA   | 3.00         | 400.00           | 1,200             |
| 1842                 | Allowances for plugging pipes  | EA   | 4.00         | 600.00           | 2,400             |
| 533                  | Break-out and remove existing pavements  | SF   | 261,335.00   | 1.75             | 457,336           |
| 534                  | Break-out and remove existing basketball courts                                | SF   | 12,883.00    | 1.75             | 22,545            |
| 536                  | Remove and dispose existing light poles and<br>associated wiring               | EA   | 16.00        | 300.00           | 4,800             |
| 541                  | Remove and dispose existing light sconces and<br>associated wiring             | EA   | 25.00        | 100.00           | 2,500             |
| 544                  | Remove and dispose of existing fencing   | LF   | 1,920.00     | 22.50            | 43,200            |
| 545                  | Remove and dispose of existing metal guardrail                                 | LF   | 741.00       | 30.00            | 22,230            |
| 555                  | Remove and dispose of buried fuel tanks  | EA   | 2.00         | 30,000.00        | 60,000            |
| 556                  | Remove and dispose of above grade gas tanks                                    | EA   | 4.00         | 500.00           | 2,000             |
| 557                  | Remove and dispose of sliding gate   | EA   | 6.00         | 400.00           | 2,400             |
| 559                  | Remove and dispose of jersey barrier   | LF   | 40.00        | 30.00            | 1,200             |
| 560                  | Remove and dispose of trailers   | EA   | 4.00         | 1,300.00         | 5,200             |
| 1439                 | Remove and dispose backstop  | LF   | 196.00       | 25.00            | 4,900             |
| 561                  | Allowance for miscellaneous site demolition not<br>indicated on plans          | SF   | 1,517,556.00 |                  | Excl.             |
| 762                  | Existing building electrical demolition (phased)                               | EA   | 1.00         | 75,000.00        | 75,000            |
| 1442                 | Remove and dispose benches   | EA   | 2.00         | 350.00           | 700               |
| 1443                 | Demolish concrete retaining walls  | LF   | 66.00        | 50.00            | 3,300             |
| 1444                 | Remove and dispose of recreational equipment                                   | LS   | 1.00         | 3,500.00         | 3,500             |
|                      | G1020 - Site Elements Demolition   |      |              |                  | 1,298,331         |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| Sitework (continued)          |   |      |              | Rates Current A | t January 2023    |
|-------------------------------|---|------|--------------|-----------------|-------------------|
| Ref                           | Description   | Unit | Qty          | Rate<br>USD     | Total Cost<br>USD |
| G1070                         | Site Earthwork  |      |              |                 |                   |
| 666                           | Excavate to proposed level  | CY   | 59,189.00    | 18.00           | 1,065,402         |
| 667                           | Excavate to proposed level, rock excavation including survey, drilling, stockpile, striping, etc. | CY   | 162,710.00   | 50.00           | 8,135,500         |
| 1813                          | Miscellaneous trenching, etc.   | CY   | 14,666.00    | 60.00           | 879,960           |
| 668                           | Fill to proposed level using excavated materials  | CY   | 108,316.00   | 12.00           | 1,299,792         |
| 1697                          | Remove excess materials from site   | CY   | 97,371.00    | 14.00           | 1,363,194         |
| 2568                          | Striping including spoil removal (Phase 1)  | CY   | 10,000.00    | 30.00           | 300,000           |
| 2569                          | Strip and stockpile for re-use (Phase 2)  | CY   | 7,600.00     | 18.00           | 136,800           |
| 669                           | Allowance for fine grading  | SF   | 1,451,369.00 | 0.35            | 507,979           |
| 670                           | Allowance for dewatering  | LS   | 1.00         | 450,000.00      | 450,000           |
| 673                           | Inlet protection  | EA   | 143.00       | 350.00          | 50,050            |
| 674                           | Construction entrance   | EA   | 3.00         | 7,500.00        | 22,500            |
| 675                           | Haybale and silt fencing including maintenance  | LF   | 10,585.00    | 12.50           | 132,313           |
| 813                           | Temporary access road and repairs   | LS   | 1.00         | 150,000.00      | 150,000           |
| 814                           | Temporary walkways  | LS   | 1.00         | 50,000.00       | 50,000            |
| 1828                          | Erosion control blankets and mats   | LS   | 1.00         | 40,000.00       | 40,000            |
| 1829                          | Additional erosion control maintenance and removal  | LS   | 1.00         | 90,000.00       | 90,000            |
| 733                           | Excavate for roadway paving   | CY   | 3,546.00     | 16.00           | 56,736            |
| 1482                          | Remove spoils from site (roadway)   | CY   | 3,546.00     | 14.00           | 49,644            |
| 738                           | Excavate for parking lot paving   | CY   | 11,070.00    | 16.00           | 177,120           |
| 1476                          | Remove spoils from site (parking lot paving)  | CY   | 11,070.00    | 14.00           | 154,980           |
| 743                           | Excavate for walkways paving  | CY   | 2,663.00     | 16.00           | 42,608            |
| 1518                          | Remove spoils from site (walkways paving)   | CY   | 2,663.00     | 14.00           | 37,282            |
| 755                           | Excavate athletic fields  | CY   | 4,890.70     | 16.00           | 78,251            |
| 1826                          | Remove spoils from site (athletic fields)   | CY   | 4,890.70     | 14.00           | 68,470            |
| 1814                          | Allowance for rock scaling  | LS   | 1.00         | 150,000.00      | 150,000           |
| 2618                          | Raise dropped footing to within 5' depth  | LS   | 1.00         | -25,000.00      | -25,000           |
|                               | G1070 - Site Earthwork  |      |              |                 | 15,463,581        |
| G10 - SITE PREPARATION 18,360 |   |      |              |                 | 18,360,562        |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| B Sitework ( | (continued)  |      |            | Rates Current At | January 2023      |
|--------------|--|------|------------|------------------|-------------------|
| Ref          | Description  | Unit | Qty        | Rate<br>USD      | Total Cost<br>USD |
| G20          | SITE IMPROVEMENTS  |      |            |                  |                   |
| G2010        | Roadways   |      |            |                  |                   |
| 735          | Stock pile excavated materials for re-use (none indicated)   | CY   | 3,546.00   |                  | Excl.             |
| 734          | Prepare and compact subbase                                  | SF   | 91,940.00  | 0.75             | 68,955            |
| 736          | Granular fill, 12" thick, re-use excavated materials         | CY   | 3,406.00   | 15.00            | 51,090            |
| 247          | Vehicular asphalt paving, 4" overall thickness               | SY   | 10,216.00  | 40.00            | 408,640           |
| 1483         | Imported compacted gravel borrow                             | CY   | 2,271.00   |                  | Excl.             |
| 1484         | Imported dense grade crushed stone                           | CY   | 1,136.00   |                  | Excl.             |
| 248          | Vertical granite curb  | LF   | 6,242.00   | 60.00            | 374,520           |
| 828          | Cape cod berm  | LF   | 813.00     | 20.00            | 16,260            |
| 258          | Riprap swale (re-use existing or blasted materials)          | SF   | 66,872.00  | 12.00            | 802,464           |
| 737          | Pavement markings  | SF   | 91,940.00  | 0.35             | 32,179            |
|              | G2010 - Roadways   |      |            |                  | 1,754,108         |
| G2020        | Parking Lots   |      |            |                  |                   |
| 739          | Stock pile excavated materials for re-use (none indicated)   | CY   | 11,070.00  |                  | Excl.             |
| 740          | Prepare and compact subbase                                  | SF   | 233,385.00 | 0.75             | 175,039           |
| 742          | Granular fill, re-use excavated materials                    | CY   | 8,644.00   | 15.00            | 129,660           |
| 1480         | Imported compacted gravel borrow                             | CY   | 5,826.00   |                  | Excl.             |
| 1481         | Imported dense grade crushed stone                           | CY   | 2,819.00   |                  | Excl.             |
| 253          | Asphalt paving, 4" overall thickness                         | SY   | 25,363.00  | 40.00            | 1,014,520         |
| 290          | Vehicular concrete paving, 6" thick                          | SY   | 569.00     | 115.00           | 65,435            |
| 255          | Vertical granite curb  | LF   | 4,700.00   | 60.00            | 282,000           |
| 671          | Cape cod berm  | LF   | 5,174.00   | 20.00            | 103,480           |
| 262          | Accessible pavement markings                                 | SF   | 5,025.00   | 3.25             | 16,331            |
| 263          | Crosswalk markings   | SF   | 1,282.00   | 3.25             | 4,167             |
| 265          | EV pavement markings   | EA   | 10.00      | 600.00           | 6,000             |
| 266          | Electric vehicle charging station (refer to Site Electrical) | EA   | 5.00       |                  | Incl.             |
| 261          | Green vehicle pavement markings                              | EA   | 22.00      | 850.00           | 18,700            |
| 257          | Handicap vehicle pavement markings                           | EA   | 19.00      | 650.00           | 12,350            |
|              |  |      |            |                  |                   |



Rates Current At January 2023

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### BD Base Design

| Ref   | Description   | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|------------|-------------|-------------------|
| 357   | Parking line marking  | LF   | 8,476.00   | 5.65        | 47,889            |
|       | G2020 - Parking Lots  |      |            |             | 1,875,571         |
| G2030 | Pedestrian Plazas and Walkways                                      |      |            |             |                   |
| 744   | Stock pile excavated materials for re-use (none indicated)          | CY   | 2,663.00   |             | Excl.             |
| 745   | Prepare and compact subbase   | SF   | 73,687.60  | 0.75        | 55,266            |
| 746   | Granular fill, re-use excavated materials                           | CY   | 1,870.00   | 15.00       | 28,050            |
| 1519  | Imported compacted gravel borrow                                    | CY   | 1,149.00   |             | Excl.             |
| 1520  | Imported dense grade crushed stone                                  | CY   | 570.00     |             | Excl.             |
| 256   | Asphalt walkway pavement  | SY   | 5,125.00   | 35.00       | 179,375           |
| 718   | Vehicular concrete walkway  | SY   | 456.00     | 115.00      | 52,440            |
| 264   | Accessible curb ramp  | SF   | 379.00     |             | Incl.             |
| 269   | Integral color aggregate concrete paving (item deleted)             | SF   | 4,772.00   |             | Excl.             |
| 1830  | Extra over for accent bands   | LS   | 1.00       |             | Excl.             |
| 273   | Granite pavers, type A (item deleted)                               | SF   | 895.00     |             | Excl.             |
| 279   | Concrete unit plank pavers, type B (item deleted)                   | SF   | 1,010.00   |             | Excl.             |
| 362   | Concrete walkway paving   | SF   | 23,466.60  | 13.00       | 305,066           |
| 1487  | Extra over for etched texts (item deleted)                          | EA   | 91.00      |             | Excl.             |
| 367   | Detectable warning  | SF   | 377.00     | 45.00       | 16,965            |
|       | G2030 - Pedestrian Plazas and Walkways                              |      |            |             | 637,162           |
| G2050 | Athletic, Recreational, and Playfield Areas                         |      |            |             |                   |
| 756   | Stock pile excavated materials for re-use (none indicated)          | CY   | 4,890.70   |             | Excl.             |
| 757   | Prepare and compact subbase   | SF   | 135,608.90 | 0.75        | 101,707           |
| 758   | Granular base to athletic fields, re-use excavated materials        | CY   | 2,511.40   | 15.00       | 37,671            |
| 1573  | Imported compacted gravel borrow                                    | CY   | 67.00      | 50.00       | 3,350             |
| 1574  | Imported dense grade crushed stone                                  | CY   | 2,445.30   |             | Excl.             |
| 2567  | Repair existing irrigation affected by infiltration<br>construction | SF   | 80,549.20  | 1.00        | 80,549            |
| 389   | Natural grass to Football Court/Field                               | SF   | 78,287.50  | 4.00        | 313,150           |
| 2396  | Irrigation to Football Court/Field natural grass turf               | SF   | 78,287.50  | 1.50        | 117,431           |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

### **BD Base Design**

| Sitework (continued) |   |      | F         | Rates Current At | January 2023      |
|----------------------|---|------|-----------|------------------|-------------------|
| Ref                  | Description   | Unit | Qty       | Rate<br>USD      | Total Cost<br>USD |
| 405                  | Urethane resilient track surfacing (D-Zone)                                 | SF   | 21,811.00 | 25.00            | 545,275           |
| 404                  | Urethane resilient track surfacing on asphalt (6-Lane Track)                | SF   | 31,943.00 | 25.00            | 798,575           |
| 693                  | 6'-0" High BVC chainlink fence  | LF   | 413.10    | 95.00            | 39,244            |
| 397                  | 4'-0" High BVC chainlink fence  | LF   | 1,505.20  | 60.00            | 90,312            |
| 398                  | 4'-0" High BVC chainlink fence single leaf gate                             | EA   | 3.00      | 350.00           | 1,050             |
| 694                  | 4'-0" High BVC chainlink fence double leaf gate                             | EA   | 2.00      | 700.00           | 1,400             |
| 697                  | Shotput cage - allow 20' high   | LF   | 69.00     | 350.00           | 24,150            |
| 406                  | Trench drain  | LF   | 1,307.00  | 100.00           | 130,700           |
| 396                  | Electronic scoreboard - steel posts with concrete<br>footing                | EA   | 1.00      | 8,000.00         | 8,000             |
| 417                  | Football goal post and footing  | EA   | 2.00      | 20,000.00        | 40,000            |
| 416                  | 20'-0" high sports netting  | LF   | 397.80    | 500.00           | 198,900           |
| 418                  | Long jump runway  | SF   | 1,908.00  |                  | Incl.             |
| 419                  | Long jump pit   | SF   | 755.00    | 20.00            | 15,100            |
| 420                  | Shotput throwing pad and landing sector                                     | SF   | 200.00    |                  | Incl.             |
| 1706                 | Cast-in-place grandstand footings, 2' dia x 5' deep                         | EA   | 24.00     | 850.00           | 20,400            |
| 2484                 | Cast-in-place slab on grade for grandstand, 4" deep                         | SF   | 3,072.00  | 7.00             | 21,504            |
| 2485                 | Cast-in-place slab on grade for grandstand, 5" deep                         | SF   | 497.00    | 11.00            | 5,467             |
| 2486                 | Cast-in-place grade beam for grandstand, 1'-0" wide x 3'-6" deep            | LF   | 135.00    | 210.00           | 28,350            |
| 2487                 | Galvanized structural steel supporting framing                              | Т    | 24.7200   |                  | Incl.             |
| 690                  | Asphalt pad   | SY   | 46.00     | 60.00            | 2,760             |
| 695                  | Pole vault runway   | SF   | 633.00    |                  | Incl.             |
| 696                  | Pole vault box  | EA   | 1.00      | 1,500.00         | 1,500             |
| 699                  | Aluminum bleacher system including and ramp -<br>Football field, 500 person | LS   | 1.00      | 345,000.00       | 345,000           |
| 700                  | Allowance for concrete footings to bleacher system (refer to Press Booth)   | SF   | 5,144.00  |                  | Incl.             |
| 701                  | Outdoor fitness equipment - by Owner  | EA   | 5.00      |                  | Excl.             |
| 770                  | Exterior scoreboard football  | EA   | 1.00      | 100,000.00       | 100,000           |
|                      | -<br>G2050 - Athletic, Recreational, and Playfield Areas                    |      |           |                  | 3,071,545         |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| Sitework (continued) |   |      | R        | Rates Current At January 2023 |                   |  |  |
|----------------------|---|------|----------|-------------------------------|-------------------|--|--|
| Ref                  | Description   | Unit | Qty      | Rate<br>USD                   | Total Cost<br>USD |  |  |
| G2060                | Site Development  |      |          |                               |                   |  |  |
| 259                  | Streel guardrail along access ways                              | LF   | 3,400.00 | 65.00                         | 221,000           |  |  |
| 260                  | Segmented retaining wall  | LF   | 495.00   | 550.00                        | 272,250           |  |  |
| 1576                 | Gabion fence, 15" x 42" (item deleted)                          | LF   | 24.00    |                               | Excl.             |  |  |
| 1577                 | Gabion fence signage (item deleted)                             | EA   | 8.00     |                               | Excl.             |  |  |
| 278                  | Cafe wood backless seat (item deleted)                          | EA   | 48.00    |                               | Excl.             |  |  |
| 1583                 | Cafe wood back chair  | EA   | 24.00    | 1,500.00                      | 36,000            |  |  |
| 289                  | Dumpster - by Owner   | EA   | 2.00     |                               | Excl.             |  |  |
| 778                  | Poured in place rubber safety surfacing                         | SF   | 933.00   |                               | Excl.             |  |  |
| 369                  | Exterior steel bollard (at walkway)                             | EA   | 56.00    | 750.00                        | 42,000            |  |  |
| 370                  | 4'-0" High wire mesh fence (item deleted)                       | LF   | 114.00   |                               | Excl.             |  |  |
| 682                  | 6'-0" High wire mesh fence                                      | LF   | 99.00    |                               | Excl.             |  |  |
| 2419                 | Metal roof screen panel and gate, 8'-0" high                    | LF   | 97.00    | 150.00                        | 14,550            |  |  |
| 371                  | 4'-0" High Gabion fence wall with metal signage                 | LF   | 25.00    |                               | Excl.             |  |  |
| 372                  | 4'-0" High ornamental fence                                     | LF   | 16.00    | 350.00                        | 5,600             |  |  |
| 377                  | 8'-0" High chain link double leaf gate                          | Pair | 6.00     | 950.00                        | 5,700             |  |  |
| 378                  | 8'-0" High BVC chainlink fence                                  | LF   | 277.00   | 120.00                        | 33,240            |  |  |
| 2416                 | 6'-0" High BVC chainlink fence                                  | LF   | 35.00    | 95.00                         | 3,325             |  |  |
| 2417                 | 6'-0" High chain link double leaf gate                          | Pair | 1.00     | 900.00                        | 900               |  |  |
| 2420                 | 4'-0" High chainlink fence at top of rock face cut              | LF   | 751.00   | 75.00                         | 56,325            |  |  |
| 387                  | 10'-0" High BVC chainlink fence                                 | LF   | 718.00   |                               | Excl.             |  |  |
| 380                  | Equipment concrete pad  | SF   | 489.00   | 30.00                         | 14,670            |  |  |
| 381                  | Wood deck   | SF   | 401.00   | 125.00                        | 50,125            |  |  |
| 399                  | Pre-engineered elevated boardwalk ramping system                | SF   | 8,856.00 | 110.00                        | 974,160           |  |  |
| 1575                 | Pre-engineered stairs   | SF   | 736.00   | 150.00                        | 110,400           |  |  |
| 401                  | CIP Concrete ramp   | SF   | 2,774.00 |                               | Excl.             |  |  |
| 402                  | Handrail to stairs / ramps                                      | LF   | 2,482.00 | 150.00                        | 372,300           |  |  |
| 373                  | CIP Retaining wall/ bench shelf                                 | CY   | 74.00    | 1,800.00                      | 133,200           |  |  |
| 728                  | CIP strip footing for retaining walls/bench shelf               | CY   | 89.00    | 1,000.00                      | 89,000            |  |  |
| 1578                 | Custom perforated seat box, 3/16" thick, 2' x 8' (item deleted) | EA   | 6.00     |                               | Excl.             |  |  |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| 3 Sitework (continued) |  |      |            | Rates Current At | January 2023      |
|------------------------|--|------|------------|------------------|-------------------|
| Ref                    | Description  | Unit | Qty        | Rate<br>USD      | Total Cost<br>USD |
| 1579                   | Custom perforated seat box, $3/16$ " thick, 2' x 2' (item deleted) | EA   | 4.00       |                  | Excl.             |
| 1580                   | Custom solid panel set box, 1/4" thick, 2' x 8' (item deleted)     | EA   | 3.00       |                  | Excl.             |
| 1584                   | Backless straight inline bench, 23.5" x 87.5" L                    | EA   | 5.00       | 3,600.00         | 18,000            |
| 1585                   | Backed straight inline bench, 23.5" x 87.5" L                      | EA   | 3.00       | 4,100.00         | 12,300            |
| 1586                   | Cafe table, 36" square   | EA   | 6.00       | 3,050.00         | 18,300            |
| 1588                   | Playground picnic table/bench                                      | EA   | 1.00       | 4,600.00         | 4,600             |
| 1589                   | Trash receptacle, 50 liter capacity                                | EA   | 6.00       | 1,800.00         | 10,800            |
| 1590                   | "Flo" bike racks   | EA   | 3.00       | 1,150.00         | 3,450             |
| 2414                   | Sliding vehicular metal gate, 46' L x 3' Ht.                       | EA   | 1.00       | 25,000.00        | 25,000            |
| 2415                   | Swing vehicular swing gate, allow 21' L x 3' Ht.                   | EA   | 1.00       | 5,000.00         | 5,000             |
| 2418                   | Flush cast-in-place concrete wall                                  | LF   | 42.00      | 250.00           | 10,500            |
|                        | G2060 - Site Development   |      |            |                  | 2,542,695         |
| G2080                  | Landscaping  |      |            |                  |                   |
| 789                    | Imported planting mix  | CY   | 5,154.20   | 60.00            | 309,252           |
| 2542                   | Use stockpile material   | CY   | 5,154.20   | 15.00            | 77,313            |
| 407                    | Low mow lawn   | SF   | 310,127.50 | 0.50             | 155,064           |
| 1646                   | Restoration seed mix   | SF   | 36,418.00  | 0.35             | 12,746            |
| 791                    | Lawn irrigation system - not required                              | SF   | 310,127.50 |                  | Excl.             |
| 1591                   | Boulder seating  | EA   | 11.00      | 7,500.00         | 82,500            |
| 2401                   | Seeding lawn prospect athletic fields                              | SF   | 199,762.90 | 0.95             | 189,775           |
| 1595                   | Trees  | Note |            |                  |                   |
| 1596                   | October glory red maple, 3.0-3.5" Cal.                             | EA   | 3.00       | 1,200.00         | 3,600             |
| 1597                   | Red maple, 1" Cal.   | EA   | 10.00      | 700.00           | 7,000             |
| 1598                   | Dawn redwood, 3" Cal.  | EA   | 8.00       | 1,200.00         | 9,600             |
| 1599                   | White oak, 1.5" Cal.   | EA   | 18.00      | 700.00           | 12,600            |
| 1600                   | Burr oak, 2-2.5" Cal.  | EA   | 8.00       | 1,000.00         | 8,000             |
| 1601                   | Deciduous Trees  | Note |            |                  |                   |
| 1602                   | Redpointe maple, 2.5-3" Cal.                                       | EA   | 29.00      | 1,000.00         | 29,000            |
| 1603                   | Sugar maple, 2.5" Cal.   | EA   | 5.00       | 1,000.00         | 5,000             |
| 1604                   | Clump paper birch, 7-8' Ht.  | EA   | 22.00      | 800.00           | 17,600            |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| Description<br>Dura heat river birch, 6-7' Ht.<br>Heritage birch, 10-12' Ht. | <b>Unit</b><br>EA  | <b>Qty</b>  | Rate<br>USD  | Total Cost<br>USD   |
|--|--|---|--|---|
| Dura heat river birch, 6-7' Ht.<br>Heritage birch, 10-12' Ht.                | EA   | 2 00  |  |   |
| Heritage birch, 10-12' Ht.   |  | 2.00  | 800.00   | 1,600   |
|  | EA   | 1.00  | 1,200.00   | 1,200   |
| Whitespire birch, 12-14' Ht.   | EA   | 6.00  | 1,200.00   | 7,200   |
| Renaissance upright paper birch, 10-12' Ht.                                  | EA   | 9.00  | 1,200.00   | 10,800  |
| American beech, 2-2.5" Cal.  | EA   | 10.00   | 1,000.00   | 10,000  |
| Black gum, 2.5" Cal.   | EA   | 8.00  | 1,000.00   | 8,000   |
| Swamp white oak, 3" Cal.   | EA   | 7.00  | 1,200.00   | 8,400   |
| Red oak, 2.5-3" Cal.   | EA   | 21.00   | 1,000.00   | 21,000  |
| American elm, 2.5-3" Cal.  | EA   | 19.00   | 1,000.00   | 19,000  |
| Evergreen Trees  | Note   |   |  |   |
| Eastern red cedar, 7-8' Ht.  | EA   | 12.00   | 800.00   | 9,600   |
| Pitch pine, 6-7' Ht.   | EA   | 14.00   | 800.00   | 11,200  |
| White pine, 8-10' Ht.  | EA   | 26.00   | 800.00   | 20,800  |
| White pine, 5-6' Ht.   | EA   | 11.00   | 500.00   | 5,500   |
| Ornamental Trees   | Note   |   |  |   |
| Downy serviceberry, 4.5-5' Ht.   | EA   | 6.00  | 500.00   | 3,000   |
| "Autumn Brilliance" serviceberry, 7-8' Ht.                                   | EA   | 12.00   | 800.00   | 9,600   |
| Donald wyman crabapple, 2-2.5" Cal.  | EA   | 12.00   | 1,000.00   | 12,000  |
| Ground Covers  | Note   |   |  |   |
| Pennsylvania sedge, plugs  | EA   | 2,592.00  | 10.00  | 25,920  |
| Shrubs   | Note   |   |  |   |
| Gro-low fragrant sumac, 1 Gal.   | EA   | 202.00  | 20.00  | 4,040   |
| Wetland Replication Area   | Note   |   |  |   |
| Red maple, 3-4' Ht.  | EA   | 5.00  | 450.00   | 2,250   |
| Yellow birch, 3-4' Ht.   | EA   | 4.00  | 450.00   | 1,800   |
| Winterberry, 3-4' Ht.  | EA   | 6.00  | 450.00   | 2,700   |
| Common spicebush, 3-4' Ht.   | EA   | 6.00  | 20.00  | 120   |
| Sweet pepperbush, 3-4' Ht.   | EA   | 8.00  | 150.00   | 1,200   |
| Cinnamon fern, 1#  | EA   | 20.00   | 30.00  | 600   |
| Skunk cabbage, 1#  | EA   | 20.00   | 25.00  | 500   |
| Tussock sedge, 2" plug   | EA   | 40.00   | 25.00  | 1,000   |
|  | <ul> <li>Heinage birch, 10-12 Ht.</li> <li>Whitespire birch, 12-14' Ht.</li> <li>Renaissance upright paper birch, 10-12' Ht.</li> <li>American beech, 2-2.5" Cal.</li> <li>Black gum, 2.5" Cal.</li> <li>Swamp white oak, 3" Cal.</li> <li>Red oak, 2.5-3" Cal.</li> <li>American elm, 2.5-3" Cal.</li> <li>Evergreen Trees</li> <li>Eastern red cedar, 7-8' Ht.</li> <li>Pitch pine, 8-7' Ht.</li> <li>White pine, 8-10' Ht.</li> <li>White pine, 5-6' Ht.</li> <li>Ornamental Trees</li> <li>Downy serviceberry, 4.5-5' Ht.</li> <li>"Autumn Brilliance" serviceberry, 7-8' Ht.</li> <li>Donald wyman crabapple, 2-2.5" Cal.</li> <li>Ground Covers</li> <li>Pennsylvania sedge, plugs</li> <li>Shrubs</li> <li>Gro-low fragrant sumac, 1 Gal.</li> <li>Wetland Replication Area</li> <li>Red maple, 3-4' Ht.</li> <li>Yellow birch, 3-4' Ht.</li> <li>Sweet pepperbush, 3-4' Ht.</li> <li>Sweet pepperbush, 3-4' Ht.</li> <li>Cinnamon fern, 1#</li> <li>Skunk cabbage, 1#</li> <li>Tussock sedge, 2" plug</li> </ul> | Heintage birch, 10-12 Ht.EAWhitespire birch, 12-14' Ht.EARenaissance upright paper birch, 10-12' Ht.EAAmerican beech, 2-2.5" Cal.EABlack gum, 2.5" Cal.EASwamp white oak, 3" Cal.EARed oak, 2.5-3" Cal.EAAmerican elm, 2.5-3" Cal.EAEvergreen TreesNoteEastern red cedar, 7-8' Ht.EAPitch pine, 6-7' Ht.EAWhite pine, 8-10' Ht.EAOrnamental TreesNoteDowny serviceberry, 4.5-5' Ht.EA''Autumn Brilliance'' serviceberry, 7-8' Ht.EAOrnald wyman crabapple, 2-2.5" Cal.EAGround CoversNoteGro-low fragrant sumac, 1 Gal.EAWetland Replication AreaNoteRed maple, 3-4' Ht.EAYellow birch, 3-4' Ht.EASweet pepperbush, 3-4' Ht.EASweet | Heinage bitch, 10-12 Ht.       EA       1.00         Whitespire birch, 12-14' Ht.       EA       6.00         Renaissance upright paper birch, 10-12' Ht.       EA       9.00         American beech, 2-2.5" Cal.       EA       10.00         Black gum, 2.5" Cal.       EA       8.00         Swamp white oak, 3" Cal.       EA       7.00         Red oak, 2.5-3" Cal.       EA       19.00         Evergreen Trees       Note       19.00         Evergreen Trees       Note       12.00         Pitch pine, 6-7' Ht.       EA       12.00         White pine, 8-10' Ht.       EA       14.00         White pine, 8-10' Ht.       EA       14.00         White pine, 5-6' Ht.       EA       11.00         Ornamental Trees       Note       1000         Downy serviceberry, 4.5-5' Ht.       EA       12.00         Ground Covers       Note       1000         Pennsylvania sedge, plugs       EA       2,592.00         Shrubs       Note       1000         Gro-low fragrant sumac, 1 Gal.       EA       202.00         Wetland Replication Area       Note       1000         Red maple, 3-4' Ht.       EA       6.00 | Heinage birch, 10-12 HL.       EA       1.00       1,200.00         Whitespire birch, 12-14' HL.       EA       6.00       1,200.00         Renaissance upright paper birch, 10-12' HL.       EA       9.00       1,200.00         American beech, 2-2.5" Cal.       EA       10.00       1,000.00         Black gum, 2.5" Cal.       EA       7.00       1,200.00         Red oak, 2.5-3" Cal.       EA       7.00       1,200.00         American elm, 2.5-3" Cal.       EA       19.00       1,000.00         Evergreen Trees       Note       1       200.00         Eastern red cedar, 7-8' HL.       EA       12.00       800.00         Pitch pine, 6-7' Ht.       EA       14.00       800.00         White pine, 8-10' Ht.       EA       26.00       800.00         Ornamental Trees       Note       0       500.00         Downy serviceberry, 4.5-5' Ht.       EA       12.00       1000.00         "Autumn Brilliance" serviceberry, 7-8' Ht.       EA       12.00       800.00         Ornald wyman crabapple, 2-2.5" Cal.       EA       2,592.00       10.00         Gro-low fragrant sumac, 1 Gal.       EA       2,592.00       10.00         Shrubs       Note       2000 |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| B Sitework (continued) |  |      | F        | Rates Current At | January 2023      |
|------------------------|--|------|----------|------------------|-------------------|
| Ref                    | Description  | Unit | Qty      | Rate<br>USD      | Total Cost<br>USD |
| 2434                   | Soft rush, 2" plug   | EA   | 20.00    | 30.00            | 600               |
| 2435                   | Cardinal flower, 2" plug   | EA   | 20.00    | 25.00            | 500               |
| 2436                   | White wood aster, 2" plug  | EA   | 20.00    | 25.00            | 500               |
| 2437                   | Great blue lobelia, 2" plug  | EA   | 20.00    | 25.00            | 500               |
| 2438                   | Wetland Buffer Zone  | Note |          |                  |                   |
| 2439                   | Red oak, 3-4' Ht.  | EA   | 5.00     | 450.00           | 2,250             |
| 2440                   | Pignut hickory, 3-4' Ht.   | EA   | 4.00     | 450.00           | 1,800             |
| 2441                   | Eastern white pine, 3-4' Ht.                                       | EA   | 4.00     | 450.00           | 1,800             |
| 2442                   | Witch hazel, 3-4' Ht.  | EA   | 4.00     | 450.00           | 1,800             |
| 2443                   | Sassafras, 3-4' Ht.  | EA   | 5.00     | 450.00           | 2,250             |
| 2444                   | Nannyberry, 3-4' Ht.   | EA   | 5.00     | 450.00           | 2,250             |
|                        | G2080 - Landscaping  |      |          |                  | 1,132,330         |
|                        | G20 - SITE IMPROVEMENTS  |      |          |                  | 11,013,411        |
| G30                    | LIQUID AND GAS SITE UTILITIES                                      |      |          |                  |                   |
| G3010                  | Water Utilities  |      |          |                  |                   |
| 1967                   | Connect proposed water main to existing 1/2" water line            | EA   | 1.00     | 15,000.00        | 15,000            |
| 1375                   | Connect to existing water line on old Nahant road -<br>allow 100ft | EA   | 1.00     | 100,000.00       | 100,000           |
| 1386                   | Remove existing fitting and connect to main existing               | EA   | 1.00     | 15,000.00        | 15,000            |
| 1383                   | Connection to building   | EA   | 2.00     | 600.00           | 1,200             |
| 1374                   | 8", Ductile iron pipe  | LF   | 6,155.00 | 90.00            | 553,950           |
| 1381                   | 6", Ductile iron pipe  | LF   | 403.01   | 60.00            | 24,181            |
| 1951                   | 6", bend   | EA   | 3.00     | 650.00           | 1,950             |
| 1950                   | 8", bend   | EA   | 52.00    | 950.00           | 49,400            |
| 1953                   | Tee 8"x8"x6"   | EA   | 12.00    | 2,300.00         | 27,600            |
| 1954                   | Tee 8"x8"x8"   | EA   | 5.00     | 2,040.00         | 10,200            |
| 1962                   | Reducer 8"x4"  | EA   | 1.00     | 850.00           | 850               |
| 1376                   | 8", Water valve  | EA   | 42.00    | 2,500.00         | 105,000           |
| 1379                   | 6", Water valve  | EA   | 13.00    | 1,800.00         | 23,400            |
| 1385                   | 4", Water valve  | EA   | 1.00     | 1,400.00         | 1,400             |
| 1378                   | 6", Hydrant  | EA   | 12.00    | 5,200.00         | 62,400            |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| 3 Sitework (continued) |  |      |          | Rates Current At | January 2023      |
|------------------------|--|------|----------|------------------|-------------------|
| Ref                    | Description  | Unit | Qty      | Rate<br>USD      | Total Cost<br>USD |
| 1377                   | Trust block  | EA   | 73.00    | 350.00           | 25,550            |
| 1448                   | Cleaning, testing, trace wiring etc.   | LF   | 6,557.68 | 5.00             | 32,787            |
| 569                    | Excavation and backfill (with site preparation)  | LF   | 6,557.68 |                  | Incl.             |
|                        | G3010 - Water Utilities  |      |          |                  | 1,049,868         |
| G3020                  | Sanitary Sewerage Utilities  |      |          |                  |                   |
| 1391                   | Connection to building sanitary service  | EA   | 22.00    | 500.00           | 11,000            |
| 1394                   | Submersible sanitary pump c/w with piping and valves - allow                                 | EA   |          | 23,000.00        | 0                 |
| 1389                   | Sewer pump station   | EA   |          | 140,000.00       | 0                 |
| 1390                   | Sewer valve chamber structure  | EA   |          | 15,000.00        | 0                 |
| 1388                   | SMH, Sanitary manhole  | EA   | 30.00    | 6,000.00         | 180,000           |
| 1941                   | 6",sanitary sewer, cast iron   | LF   | 183.82   | 110.00           | 20,220            |
| 1387                   | 6",sanitary sewer, PVC   | LF   | 1,110.82 | 85.00            | 94,419            |
| 1943                   | 4",sanitary sewer, PVC   | LF   | 253.52   | 45.00            | 11,408            |
| 1392                   | 6",sanitary sewer, PVC   | LF   | 427.45   | 75.00            | 32,059            |
| 1949                   | 8",sanitary sewer, PVC   | LF   | 2,960.00 | 120.00           | 355,200           |
| 1393                   | Thrust block   | EA   | 2.00     | 650.00           | 1,300             |
| 1964                   | Replace existing sewer manhole with drop sewer<br>manhole and connect to existing sewer line | EA   | 1.00     | 7,500.00         | 7,500             |
| 2318                   | Cleaning, testing, trace wiring etc.   | LF   | 4,934.35 | 5.00             | 24,672            |
| 1963                   | Clean and line existing 1550 LF of 8" sewer main   | LF   | 1,550.00 |                  | Excl.             |
| 577                    | Excavation and backfill (with site preparation)  | LF   | 4,934.35 |                  | Incl.             |
| 2184                   | Exterior grease trap(serving kitchen waste), 10,000 gal(allowance)                           | EA   | 1.00     | 75,000.00        | 75,000            |
| 2570                   | Exterior grease trap(serving kitchen waste), 1000 gal<br>(allowance)                         | EA   | 1.00     | 8,000.00         | 8,000             |
| 2589                   | 6",sanitary sewer, PVC, forcemain  | LF   | -480.00  | 85.00            | -40,800           |
| 2590                   | Excavation and backfill  | LF   | -480.00  | 50.00            | -24,000           |
|                        | G3020 - Sanitary Sewerage Utilities  |      |          |                  | 755,978           |
| G3030                  | Storm Drainage Utilities   |      |          |                  |                   |
| 1862                   | 6", PVC underdrain   | LF   | 454.00   | 75.00            | 34,050            |
| 1863                   | 8", PVC underdrain   | LF   | 63.00    | 120.00           | 7,560             |



### Rider RLB Levett Bucknall

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| Sitework (continued) |   |      | R        | ates Current At | January 2023      |
|----------------------|---|------|----------|-----------------|-------------------|
| Ref                  | Description   | Unit | Qty      | Rate<br>USD     | Total Cost<br>USD |
| 1879                 | 8", PVC   | LF   | 32.00    | 120.00          | 3,840             |
| 1858                 | 4", HDPE underdrain for subsurface system 1 to 5          | LF   | 324.00   | 20.00           | 6,480             |
| 1433                 | 6", HDPE underdrain for subsurface system 1 to 5          | LF   | 916.00   | 21.00           | 19,236            |
| 1910                 | 12", perforated CPP, Corrugated HDPE storm drain pipe     | LF   | 468.00   | 37.00           | 17,316            |
| 1411                 | 6", HDPE storm drain pipe                                 | LF   | 261.00   | 21.00           | 5,481             |
| 1909                 | 6", CPP, Underdrain, Corrugated HDPE storm drain pipe     | LF   | 728.00   | 21.00           | 15,288            |
| 1861                 | 6", CPP, Corrugated HDPE storm drain pipe                 | LF   | 157.00   | 21.00           | 3,297             |
| 1864                 | 8", CPP, Corrugated HDPE storm drain pipe                 | LF   | 160.00   | 25.00           | 4,000             |
| 1409                 | 10", CPP, Corrugated HDPE storm drain pipe                | LF   | 187.00   | 31.00           | 5,797             |
| 1400                 | 12", CPP, Corrugated HDPE storm drain pipe                | LF   | 8,462.70 | 37.00           | 313,120           |
| 1403                 | 15", CCP, Corrugated HDPE storm drain pipe                | LF   | 298.00   | 54.00           | 16,092            |
| 1405                 | 18", CCP, Corrugated HDPE storm drain pipe                | LF   | 1,165.00 | 80.00           | 93,200            |
| 1406                 | 24", CCP, Corrugated HDPE storm drain pipe                | LF   | 1,240.00 | 120.00          | 148,800           |
| 1412                 | Area drain  | EA   | 16.00    | 3,000.00        | 48,000            |
| 1413                 | Catch basins  | EA   | 76.00    | 5,000.00        | 380,000           |
| 1414                 | Curb inlet  | EA   | 5.00     | 6,500.00        | 32,500            |
| 1431                 | 12", clean out  | EA   | 1.00     | 1,000.00        | 1,000             |
| 1415                 | DMH - Drain manhole - 4'                                  | EA   | 67.00    | 6,500.00        | 435,500           |
| 1416                 | DMH - Drain manhole - 5'                                  | EA   | 11.00    | 8,500.00        | 93,500            |
| 1417                 | DMH - Drain manhole - 6'                                  | EA   | 2.00     | 10,000.00       | 20,000            |
| 1422                 | Remove and replace existing DMH                           | EA   | 1.00     | 10,000.00       | 10,000            |
| 1419                 | FES - Flared End Section                                  | EA   | 2.00     | 2,500.00        | 5,000             |
| 1420                 | Headwall  | EA   | 3.00     | 6,000.00        | 18,000            |
| 1421                 | OCS, Outlet control structure                             | EA   | 5.00     | 6,000.00        | 30,000            |
| 1423                 | WQS, Water quality structure                              | EA   | 19.00    | 15,000.00       | 285,000           |
| 1425                 | Trench drain  | LF   | 152.00   | 250.00          | 38,000            |
| 1424                 | Connection to building                                    | EA   | 17.00    | 1,000.00        | 17,000            |
| 1426                 | Connect to existing CB and convert the existing CB to DMH | EA   | 1.00     | 10,000.00       | 10,000            |
| 1427                 | Connect to existing manhole                               | EA   | 2.00     | 2,500.00        | 5,000             |

## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### BD Base Design

B Sitework (continued)



Rates Current At January 2023

Description Unit **Total Cost** Ref Qty Rate USD USD LF 1432 Precast concrete culvert - assumed 20'x3' 40.00 2,600.00 104,000 1434 Subsurface#1 - 210 MC-3500 c/w 14 c/w manifold EA 1.00 265,500.00 265,500 1435 Subsurface#2 - 279 MC-3500 c/w manifold EA 343,800.00 343,800 1.00 1436 Subsurface#3 - 238 MC-3500 c/w manifold ΕA 1.00 294,950.00 294,950 1437 Subsurface#4 - 104 SC-740 c/w manifold ΕA 69.250.00 1.00 69.250 1438 Subsurface#5 - 16 SC-740 c/w outlet manifold EA 1.00 14,500.00 14,500 1854 Subsurface#1 - area SF 11,442.00 Incl. SF 1853 Subsurface#2 - area 14,193.00 Incl. 1852 Subsurface#3 - area SF 12,998.00 Incl. SF 1851 Subsurface#4 - area 3,999.00 Incl. SF 1855 Subsurface#5 - area 716.00 Incl. 1775 Inspection ports No 63.00 1,275.00 80,325 1774 Allowances for non-woven geotextile LS 1.00 20,000.00 20,000 602 Excavation and backfill (refer to site preparation) LF 14,907.70 Incl. 1773 Excavation and backfill for subsurface system CY 14,450.00 40.00 578,000 74,538 2319 Cleaning, testing, trace wiring etc. LF 14,907.70 5.00 611 Bioretention basin including piping, bedding, planting SF 3,848.00 5.00 19,240 mix, excavation, etc. LS 681 Allowance for temporary retention basin including 1.00 350,000.00 350,000 piping, etc. G3030 - Storm Drainage Utilities 4,336,160 G3050 Site Energy Distribution Proposed gas meter - install only - supply by others ΕA 1.00 3,000.00 3,000 1958 LF 1957 Proposed natural gas piping - HDPE 1,511.00 Excl. 1960 Bend ΕA 20.00 Excl. 1959 Connection to building service ΕA 1.00 1,000 1,000.00 ΕA 15,000 1966 Connect to the main service 1.00 15,000.00 LF 1965 Excavation and backfill (with site preparation) 1,511.00 50.00 75,550

G3050 - Site Energy Distribution

94,550



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

## LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| B Sitework (continued) |  |      |        | Rates Current At | January 2023      |
|------------------------|--|------|--------|------------------|-------------------|
| Ref                    | Description  | Unit | Qty    | Rate<br>USD      | Total Cost<br>USD |
| G3090                  | Liquid and Gas Site Utilities Supplementary<br>Components  |      |        |                  |                   |
| 793                    | Allowance for miscellaneous site utilities not yet designed  | LS   | 1.00   |                  | Excl.             |
| 1798                   | General requirements: supervision, shop drawings, as -built drawings, equipment rentals, fees, permits, etc. | Item |        |                  | 453,555           |
|                        | G3090 - Liquid and Gas Site Utilities Supplementary<br>Components  |      |        |                  | 453,555           |
|                        | G30 - LIQUID AND GAS SITE UTILITIES  |      |        |                  | 6,690,111         |
| G40                    | ELECTRICAL SITE IMPROVEMENTS   |      |        |                  |                   |
| G4010                  | Site Electric Distribution Systems   |      |        |                  |                   |
| 811                    | Secondary 4000 amp feeder to school electrical room  | LF   | 260.00 | 969.00           | 251,940           |
| 184                    | Primary 4000 amp feeder #1 (8-4" conduits) utility supplied cable  | LF   | 940.00 | 382.98           | 360,001           |
| 185                    | Primary 4000 amp feeder #2 (8-4" conduits) utility supplied cable  | LF   | 931.00 | 382.98           | 356,554           |
| 186                    | Fire Pump feeder 200 amps (2-4" conduits)  | LF   | 376.00 | 56.00            | 21,056            |
| 187                    | Secondary generator feeder (4-400 amp feeds)   | LF   | 680.00 | 140.20           | 95,336            |
| 188                    | Secondary feeder to maintenance building 400 amp service)  | LF   | 619.00 | 246.66           | 152,683           |
| 201                    | Field electrical service 75 kva transformer service EV Charging Stations                                     | EA   | 3.00   | 42,040.00        | 126,120           |
| 204                    | Field service to concessions 250 amps  | LF   | 592.00 | 65.00            | 38,480            |
| 205                    | Field service to athletic building 1200 amps   | LF   | 94.00  | 125.50           | 11,797            |
| 208                    | Primary to padmount transformer for field buildings  | LF   | 220.00 | 88.00            | 19,360            |
| 213                    | Sports field grounding   | EA   | 1.00   | 8,500.00         | 8,500             |
| 706                    | Secondary service manholes   | EA   | 11.00  | 2,450.00         | 26,950            |
| 766                    | Utility pole modifications (not included)  | EA   | 1.00   |                  | Excl.             |
| 1836                   | Electrical duct bank concrete encasement   | EA   | 1.00   | 1,320,250.00     | 1,320,250         |
| 1837                   | Electrical (E & B) in another division of the estimate   | Note |        |                  | Excl.             |
| 2566                   | Traffic Signals  | EA   | 1.00   | 250,000.00       | 250,000           |
|                        | G4010 - Site Electric Distribution Systems   |      |        |                  | 3,039,027         |
| G4050                  | Site Lighting  |      |        |                  |                   |
| 214                    | Sports field lighting conduit & wire (pole lights)   | EA   | 1.00   | 76,500.00        | 76,500            |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| B Sitework ( | (continued)   |      | F      | Rates Current At | January 2023      |
|--------------|---|------|--------|------------------|-------------------|
| Ref          | Description   | Unit | Qty    | Rate<br>USD      | Total Cost<br>USD |
| 215          | Sports field lighting control   | EA   | 1.00   | 17,467.00        | 17,467            |
| 772          | Site bench lighting   | EA   | 1.00   | 8,550.00         | 8,550             |
| 774          | Electronic gate entrance S & Install incl elect conn                              | EA   | 1.00   | 26,500.00        | 26,500            |
| 934          | Type LST 11 flagpole (cluster)  | EA   | 3.00   | 570.00           | 1,710             |
| 936          | Double head 25 ft pole  | EA   | 8.00   | 5,790.00         | 46,320            |
| 937          | Single head 16 ft pole  | EA   | 34.00  | 5,000.00         | 170,000           |
| 938          | Single head 14 ft pole  | EA   | 58.00  | 4,675.00         | 271,150           |
| 940          | Digital message board   | EA   | 1.00   | 2,030.00         | 2,030             |
| 941          | Monument sign lighting  | EA   | 1.00   | 2,240.00         | 2,240             |
| 943          | Musco Football lighting   | EA   | 4.00   | 85,000.00        | 340,000           |
| 1789         | Electric vehicle dual charging system   | EA   | 10.00  | 12,800.00        | 128,000           |
| 1790         | Electric vehicle dual charging system distribution<br>panels                      | EA   | 5.00   | 7,285.00         | 36,425            |
| 2630         | Re-evaluate conduit and ho site lighting is powered for entrance near School Sign | LS   | 1.00   | -10,000.00       | -10,000           |
|              | G4050 - Site Lighting   |      |        |                  | 1,116,892         |
|              | G40 - ELECTRICAL SITE IMPROVEMENTS  |      |        |                  | 4,155,919         |
| G50          | SITE COMMUNICATIONS   |      |        |                  |                   |
| G5010        | Site Communications   |      |        |                  |                   |
| 189          | Secondary communications feeder 8-4" conduits                                     | LF   | 680.00 | 210.00           | 142,800           |
| 192          | Communications to maintenance building (4-4" conduits)                            | LF   | 640.00 | 107.00           | 68,480            |
| 209          | Secondary communications feeder 8-4" conduits for<br>Athletic fields              | LF   | 685.00 | 210.00           | 143,850           |
| 1671         | Outdoor CCTV Bullet cameras incl fiber cabling pole mtd                           | EA   | 2.00   | 990.00           | 1,980             |
|              | G5010 - Site Communications   |      |        |                  | 357,110           |
|              | G50 - SITE COMMUNICATIONS   |      |        |                  | 357,110           |
|              |   |      |        |                  |                   |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

### LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

#### **BD Base Design**

| Sitework | (continued)   |      | Rate   | s Current A | t January 2023    |
|----------|---|------|--------|-------------|-------------------|
| Ref      | Description   | Unit | Qty    | Rate<br>USD | Total Cost<br>USD |
| G90      | MISCELLANEOUS SITE CONSTRUCTION   |      |        |             |                   |
| G9010    | Other Site Construction   |      |        |             |                   |
| 167      | Farm street driveway intersection improvement including paving milling and overall, granite curbs, traffic signal, etc. | LS   | 1.00 2 | 00,000.00   | 200,000           |
|          | G9010 - Other Site Construction   |      |        |             | 200,000           |
|          | <b>G90 - MISCELLANEOUS SITE CONSTRUCTION</b>  |      |        |             | 200,000           |
| SITEWOR  | K   |      |        |             | 44,385,735        |
|          |   |      |        |             |                   |

COST ESTIMATE DESIGNER

CSI MASTERFORMAT

6B.2.3 – 04

60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

16 JANAURY 2023

# NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCOOL

WAKEFIELD, MA







# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

| LOCAT              | ION SUMMARY  |                  | Rat        | GFAR: 0<br>tes Current | Gross Floor Area<br>At January 2023 |
|--------------------|--|------------------|------------|------------------------|-------------------------------------|
| Ref                | Location   |                  | GFAR<br>SF | GFAR<br>USD/SF         | Total Cost<br>USD                   |
| BD                 | BASE DESIGN  |                  |            |                        |                                     |
| Α                  | Building   |                  |            |                        |                                     |
| A1                 | New School Building                                    |                  | 380,570.00 | 417.58                 | 158,916,659                         |
| A3                 | Maintenance Building                                   |                  | 2,040.00   | 333.38                 | 680,095                             |
|                    |  | A - Building     | 382,610.00 | 417.13                 | 159,596,754                         |
| В                  | Sitework   |                  |            |                        | 44,385,735                          |
|                    |  | BD - BASE DESIGN | 382,610.0  | 533.13                 | 203,982,489                         |
| ESTIM/             | ATED NET COST  |                  | 382,610    | 533.13                 | 203,982,489                         |
|                    |  |                  |            |                        |                                     |
| MARGI              | NS & ADJUSTMENTS                                       |                  |            |                        |                                     |
| Design             | & Estimating Contingency                               | 2.5 %            |            |                        | 5,099,564                           |
| Escalati           | on Allowance up to mid-point of Construction           | 4.5 %            |            |                        | 9,408,691                           |
| Sub-cor            | ntractor Bonds   | 1.2 %            |            |                        | 2,621,889                           |
| Insuran            | ce - CCIP (Change from GL)                             |                  |            |                        | 6,198,303                           |
| Cost of            | Traditional Insurance (Trade + GL)                     |                  |            |                        | -6,822,122                          |
| Builder's          | s Risk Insurance (per CM Pricing Exhibit 1)            |                  |            |                        | 365,272                             |
| Paymer             | nt & Performance Bond (per CM Pricing Exhibit 1)       |                  |            |                        | 1,850,710                           |
| Genera             | Conditions (per CM Pricing Exhibit 1)                  |                  |            |                        | 9,687,506                           |
| Genera             | Requirements (per CM Pricing Exhibit 1)                |                  |            |                        | 6,044,059                           |
| Allowan<br>Exhibit | ce for Additional Requirements not included in CN<br>1 | 1 Pricing        |            |                        | 1,000,000                           |
| CM Cor             | nstruction Contingency (per CM Pricing Exhibit 1)      | 2.5 %            |            |                        | 5,583,215                           |
| CM Fee             | (per CM Pricing Exhibit 1)                             |                  |            |                        | 4,205,160                           |
| ESTIM/             | ATED TOTAL COST  |                  | 382,610    | 651.38                 | 249,224,736                         |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS SUMMARY BD BASE DESIGN

## A Building

A1 New School Building

| GFAR: 380,570.00 SF Cost/SF: 417.58 | 5 |
|-------------------------------------|---|
| Rates Current At January 2023       | 5 |

| Ref | Description                                | GFAR<br>USD/SF | Total Cost<br>USD |
|-----|--|----------------|-------------------|
| 03  | Concrete                                   | 29.50          | 11,225,498        |
| 04  | Masonry                                    | 21.01          | 7,996,236         |
| 05  | Metals                                     | 56.07          | 21,338,634        |
| 06  | Wood, Plastics, and Composites             | 8.16           | 3,104,088         |
| 07  | Thermal and Moisture Protection            | 42.54          | 16,188,641        |
| 08  | Openings                                   | 26.71          | 10,163,391        |
| 09  | Finishings                                 | 55.67          | 21,184,882        |
| 10  | Specialties                                | 4.62           | 1,758,211         |
| 11  | Equipment                                  | 9.23           | 3,513,350         |
| 12  | Furnishings                                | 1.87           | 710,668           |
| 14  | Conveying Equipment                        | 2.33           | 885,000           |
| 21  | Fire Suppression                           | 7.81           | 2,971,479         |
| 22  | Plumbing                                   | 20.63          | 7,850,709         |
| 23  | Heating, Ventilating, and Air Conditioning | 73.39          | 27,929,168        |
| 26  | Electrical                                 | 37.69          | 14,343,376        |
| 27  | Communications                             | 8.85           | 3,369,069         |
| 28  | Electronic Safety and Security             | 6.15           | 2,339,058         |
| 31  | Earthwork                                  | 5.36           | 2,038,526         |
| 33  | Utilities                                  | 0.02           | 6,675             |
| NEW | SCHOOL BUILDING                            | 417.58         | 158,916,659       |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS SUMMARY BD BASE DESIGN

A Building

A1 New School Building

GFAR: 380,570.00 SF Cost/SF: 417.58 Rates Current At January 2023

| Ref Description  | GFAR<br>USD/SF | Total Cost<br>USD |  |  |
|--|----------------|-------------------|--|--|
|  |                |                   |  |  |
| MARGINS & ADJUSTMENTS  |                |                   |  |  |
| Design & Estimating Contingency  |                | 3,972,918         |  |  |
| Escalation Allowance up to mid-point of Construction                       |                | 7,330,030         |  |  |
| Sub-contractor Bonds   |                | 2,042,635         |  |  |
| Insurance - CCIP (Change from GL)  |                | 4,828,913         |  |  |
| Cost of Traditional Insurance (Trade + GL)                                 |                | -5,314,911        |  |  |
| Builder's Risk Insurance (per CM Pricing Exhibit 1)                        |                | 284,573           |  |  |
| Payment & Performance Bond (per CM Pricing Exhibit 1)                      |                |                   |  |  |
| General Conditions (per CM Pricing Exhibit 1)                              |                | 7,547,246         |  |  |
| General Requirements (per CM Pricing Exhibit 1)                            |                | 4,708,746         |  |  |
| Allowance for Additional Requirements not included in CM Pricing Exhibit 1 |                | 779,070           |  |  |
| CM Construction Contingency (per CM Pricing Exhibit 1)                     |                | 4,349,715         |  |  |
| CM Fee (per CM Pricing Exhibit 1)  |                | 3,276,114         |  |  |
| ESTIMATED TOTAL COST   | 510.19         | 194,163,541       |  |  |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

| A Building<br>A1 New Sch | nool Building  |      | GFAR: 3    | 880,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|------------|--------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 03                       | CONCRETE   |      |            |                                |                                    |
| A1010                    | Standard Foundations   |      |            |                                |                                    |
| 996                      | Concrete to isolated spread footings, 4500 PSI               | CY   | 1,855.18   | 325.00                         | 602,933                            |
| 529                      | Concrete to perimeter strip footings - 1' thick, 4500<br>PSI | CY   | 120.65     | 325.00                         | 39,211                             |
| 586                      | Concrete to perimeter strip footings - 2' thick, 4500<br>PSI | CY   | 69.80      | 325.00                         | 22,685                             |
| 2403                     | Concrete to perimeter strip footings - 3' thick, 4500<br>PSI | CY   | 814.00     | 325.00                         | 264,550                            |
| 1000                     | Concrete to interior strip footings, 4500 PSI                | CY   | 156.00     | 325.00                         | 50,700                             |
| 588                      | Concrete to elevator mat footings - 3' thick, 4500 PSI       | CY   | 30.30      | 324.98                         | 9,847                              |
| 1117                     | Concrete to piers, 4500 PSI                                  | CY   | 105.94     | 325.00                         | 34,430                             |
| 521                      | Form isolated spread footings                                | SF   | 25,309.88  | 20.00                          | 506,198                            |
| 530                      | Form strip footings  | SF   | 9,517.69   | 20.00                          | 190,354                            |
| 589                      | Form elevator mat footings                                   | SF   | 279.00     | 20.00                          | 5,580                              |
| 1118                     | Form piers   | SF   | 7,266.20   | 25.00                          | 181,655                            |
| 522                      | Bar reinforcement to isolated spread footings                | Lb   | 186,496.27 | 1.80                           | 335,693                            |
| 587                      | Bar reinforcement to strip footings, allow 100 PCY           | Lb   | 168,290.00 | 1.80                           | 302,922                            |
| 590                      | Bar reinforcement to elevator mat footings                   | Lb   | 3,747.40   | 1.80                           | 6,746                              |
| 1119                     | Bar reinforcement to piers, allow                            | Lb   | 38,118.69  | 1.80                           | 68,614                             |
|                          | A1010 - Standard Foundations                                 |      |            | 6.89/SF                        | 2,622,118                          |
| A2010                    | Walls for Subgrade Enclosures                                |      |            |                                |                                    |
| 597                      | Concrete to basement retaining walls, 4500 PSI               | CY   | 767.00     | 325.00                         | 249,275                            |
| 599                      | Concrete to buttressed walls, 4500 PSI                       | CY   | 47.00      | 325.00                         | 15,275                             |
| 598                      | Concrete to perimeter frost walls, 4500 PSI                  | CY   | 837.73     | 325.00                         | 272,261                            |
| 1122                     | Concrete to interior foundation walls, 4500 PSI              | CY   | 111.50     | 325.00                         | 36,237                             |
| 615                      | Concrete to elevator pit walls, 4500 PSI                     | CY   | 14.20      | 325.00                         | 4,615                              |
| 603                      | Form basement retaining walls                                | SF   | 20,571.00  | 25.00                          | 514,275                            |
| 604                      | Form buttressed walls  | SF   | 2,525.00   | 25.00                          | 63,125                             |
| 605                      | Form perimeter frost walls                                   | SF   | 28,596.83  | 25.00                          | 714,920                            |
| 1123                     | Form interior foundation walls                               | SF   | 7,734.70   | 25.00                          | 193,367                            |





#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Buildina

| A1 New School Building (continued) |   |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------------------------------|---|------|------------|--------------------------------|------------------------------------|
| Ref                                | Description   | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 616                                | Form elevator pit walls                                   | SF   | 761.50     | 25.00                          | 19,037                             |
| 606                                | Bar reinforcement to basement retaining walls             | Lb   | 149,531.00 | 1.80                           | 269,156                            |
| 607                                | Bar reinforcement to buttressed walls, allow 10 PSF       | Lb   | 12,623.00  | 1.80                           | 22,721                             |
| 608                                | Bar reinforcement to perimeter frost walls                | Lb   | 48,054.42  | 1.80                           | 86,498                             |
| 1124                               | Bar reinforcement to interior foundation walls            | Lb   | 28,264.30  | 1.80                           | 50,876                             |
| 613                                | Bar reinforcement to elevator pit walls                   | Lb   | 3,772.40   | 1.80                           | 6,790                              |
|                                    | A2010 - Walls for Subgrade Enclosures                     |      |            | 6.62/SF                        | 2,518,428                          |
| A4010                              | Standard Slabs-on-Grade                                   |      |            |                                |                                    |
| 500                                | Concrete to slab on grade - 4" thick, 4000 PSI            | CY   | 784.00     | 320.00                         | 250,880                            |
| 501                                | Concrete to slab on grade - 6" thick, 4000 PSI            | CY   | 1,197.50   | 320.00                         | 383,200                            |
| 502                                | Form slab on grade  | SF   | 3,495.48   | 18.00                          | 62,919                             |
| 503                                | WWF reinforcement   | SF   | 128,133.75 | 1.30                           | 166,575                            |
| 698                                | Allowance for bar reinforcement                           | Lb   | 64,066.97  | 1.80                           | 115,321                            |
| 796                                | Allowance for thicken slab under CMU                      | LF   | 1,802.00   | 125.00                         | 225,250                            |
| 2541                               | Slab thickening allowance reduction                       | LS   | 1.00       | -100,000.00                    | -100,000                           |
| 504                                | Float finish to slab on grade                             | SF   | 128,134.04 | 1.50                           | 192,201                            |
| 505                                | Control joints  | SF   | 128,134.04 | 0.75                           | 96,100                             |
| 703                                | Winter conditions   | LS   | 1.00       |                                | Excl.                              |
| 707                                | Mechanical pads   | Item |            |                                | 52,500                             |
| 710                                | Engineering, layout, safety, cleaning, etc.               | Item |            |                                | 215,000                            |
|                                    | A4010 - Standard Slabs-on-Grade                           |      |            | 4.36/SF                        | 1,659,946                          |
| A6010                              | Building Subdrainage                                      |      |            |                                |                                    |
| 619                                | Perimeter drain   | LF   | 2,440.12   | 50.00                          | 122,006                            |
| 686                                | Under-slab drainage system                                | SF   | 128,134.04 | 3.75                           | 480,502                            |
|                                    | A6010 - Building Subdrainage                              |      |            | 1.58/SF                        | 602,508                            |
| A6020                              | Off-Gassing Mitigation                                    |      |            |                                |                                    |
| 702                                | Allowance for radon mitigation - 20 drops x 60'           | LS   | 1.00       | 75,000.00                      | 75,000                             |
|                                    | A6020 - Off-Gassing Mitigation                            |      |            | 0.20/SF                        | 75,000                             |
| B1010                              | Floor Construction  |      |            |                                |                                    |
| 997                                | Prestressed precast concrete hollow core plank, 10" thick | SF   | 16,116.00  | 45.00                          | 725,220                            |



GFAR: 380,570.00 SF Cost/SF: 417.58

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| A1 New School Building (continued) |  |      |            | Rates Current A | t January 2023    |
|------------------------------------|--|------|------------|-----------------|-------------------|
| Ref                                | Description  | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 538                                | Light weight concrete topping, overall 5-1/4" thick, 4500 PSI        | CY   | 4,033.70   | 450.00          | 1,815,165         |
| 998                                | Normal weight concrete topping to precast planks, 2" thick, 4500 PSI | CY   | 100.00     | 350.00          | 35,000            |
| 539                                | WWF reinforcement to floor deck                                      | SF   | 265,049.40 | 1.25            | 331,312           |
| 540                                | Float finish to concrete topping                                     | SF   | 265,049.40 | 3.00            | 795,148           |
| 809                                | Allowance for miscellaneous equipment pads (above ground)            | LS   | 1.00       | 50,000.00       | 50,000            |
| 2621                               | Anticipated concrete savings due to Subcontractor<br>input           | LS   | 1.00       | -250,000.00     | -250,000          |
|                                    | B1010 - Floor Construction   |      |            | 9.20/SF         | 3,501,845         |
| B1020                              | Roof Construction  |      |            |                 |                   |
| 548                                | Light weight concrete topping, overall 5-1/4" thick, 4500 PSI        | CY   | 276.00     | 450.00          | 124,200           |
| 2388                               | Normal weight concrete topping, overall 6" thick, 4500<br>PSI        | CY   | 75.00      | 430.00          | 32,250            |
| 549                                | WWF reinforcement to floor deck                                      | SF   | 20,989.00  | 1.25            | 26,236            |
| 550                                | Float finish to concrete topping                                     | SF   | 20,989.00  | 3.00            | 62,967            |
|                                    | B1020 - Roof Construction  |      |            | 0.65/SF         | 245,653           |
| B1080                              | Stairs   |      |            |                 |                   |
| 1679                               | Concrete stair to Auditorium - 4'-1" wide (none indicated)           | FT/R | 35.00      |                 | Excl.             |
|                                    | B1080 - Stairs   |      |            |                 | Excl.             |
|                                    | 03 - CONCRETE  |      |            | 29.50/SF        | 11,225,498        |
| 04                                 | MASONRY  |      |            |                 |                   |
| B2010                              | Exterior Walls   |      |            |                 |                   |
| 22                                 | 2" Thick Granite veneer  | SF   |            | 150.00          | 0                 |
| 2582                               | Cast stone ILO Granite veneer  | SF   | 2,912.00   | 50.00           | 145,600           |
| 1651                               | 4" Thick Cast stone veneer   | SF   | 8,752.00   | 50.00           | 437,600           |
| 29                                 | 4" Thick CMU Veneer  | SF   | 36,572.18  | 39.00           | 1,426,315         |
| 1652                               | Brick veneer   | SF   | 21,789.00  | 48.00           | 1,045,872         |
| 1777                               | 8" thick CMU shear walls   | SF   | 6,457.00   | 40.00           | 258,280           |
| 1137                               | 12" thick CMU shear walls  | SF   | 5,755.00   | 50.00           | 287,750           |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023 Unit Ref Description Qty Rate **Total Cost** USD USD 72 8" Thick CMU back-up SF 2,015.77 35.00 70,552 71 12" Thick CMU back-up SF 1,639.00 45.00 73,755 8" CMU backing ILO 12" CMU at Gymnasium / Team SF 2624 4,550.00 -10.00 -45,500 Room B2010 - Exterior Walls 9.72/SF 3,700,224 C1010 **Interior Partitions** 1561 CMU partition, 4" thick (Type 4.0) SF 4,592.10 25.00 114,802 267 CMU partition, 8" thick (Type 8.0) SF 55,734.59 28.00 1,560,569 2410 CMU partition, 8" thick, 1 hour fire rated (Type 8.1) SF 1,546.00 35.00 54,110 1562 CMU partition, 8" thick, 2 hour fire rated (Type 8.2) SF 16,525.00 40.00 661,000 268 CMU partition, 12" thick (Type 12.0) SF 30.00 338,316 11,277.20 CMU partition, 12" thick, 2 hour fire rated (Type 12.2) SF 1563 941.00 35.00 32,935 CMU shear walls, 8" thick SF 23,368.00 30.00 701,040 1776 1138 CMU shear walls, 12" thick SF 16,688.00 35.00 584,080 806 Allowance for miscellaneous clean-up, additional SF 0.50 411,859.00 205,930 labor, safety, etc. (Masonry Trade) C1010 - Interior Partitions 11.17/SF 4,252,782 C2010 Wall Finishes SF 2479 2" Granite veneer panel 393.00 110.00 43,230 C2010 - Wall Finishes 0.11/SF 43.230 04 - MASONRY 21.01/SF 7,996,236 05 **METALS Floor Construction** B1010 535 Galvanized composite metal floor deck - 2" deep, 20 SF 248,934.40 6.00 1,493,606 GA 1007 Galvanized composite metal sloped floor deck - 2" SF 6,792.00 Excl. deep (Auditorium) (none indicated) 537 Structural steel framing, including beams, columns, Т 1,794.1080 5,400.00 9,688,183 bracing

572 Moment connection ΕA 253.00 750.00 542 Allowance for miscellaneous connections and т 179.4150 5,400.00 framings

189,750

968,841



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | nool Building (continued)   |      | GFAR: 3    | 880,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|-----------|---|------|------------|--------------------------------|------------------------------------|
| Ref       | Description   | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 720       | Allowance for shear studs   | EA   | 62,233.90  | 6.50                           | 404,520                            |
| 722       | Allowance for pour stops and bent plates  | LF   | 10,712.30  | 25.00                          | 267,807                            |
| 2622      | Target tonnage reduction (0.25 PSF)   | Т    | -48.7500   | 5,400.00                       | -263,250                           |
| 2623      | Anticipated structural steel savings due to<br>Subcontractor input                        | LS   | 1.00       | -500,000.00                    | -500,000                           |
|           | B1010 - Floor Construction  |      |            | 32.19/SF                       | 12,249,457                         |
| B1020     | Roof Construction   |      |            |                                |                                    |
| 546       | Galvanized corrugated roof deck - 3" deep, type N   | SF   | 109,463.50 | 7.00                           | 766,244                            |
| 562       | Acoustic galvanized corrugated roof deck - 3" deep, type NA (Gym)                         | SF   | 11,604.00  | 15.00                          | 174,060                            |
| 2386      | Acoustic galvanized composite metal roof deck - 2" deep, 18GA (Gym)                       | SF   | 989.00     | 10.50                          | 10,385                             |
| 558       | Galvanized composite metal roof deck - 2" deep, 20GA                                      | SF   | 16,973.00  | 6.00                           | 101,838                            |
| 2387      | Galvanized composite metal roof deck - 2" deep, 18GA                                      | SF   | 3,027.00   | 6.00                           | 18,162                             |
| 2384      | Galvanized steel roof deck - 1 1/2" deep, type B, 20<br>GA                                | SF   | 297.00     | 5.00                           | 1,485                              |
| 2385      | Galvanized steel roof deck - 1" deep  | SF   | 4,454.00   | 3.50                           | 15,589                             |
| 2391      | Structural steel roof joist - 60DLHSP1  | LF   | 167.00     | 185.00                         | 30,895                             |
| 2390      | Structural steel roof joist - 60DLHSP2  | LF   | 748.00     | 185.00                         | 138,380                            |
| 2389      | Structural steel roof joist - 60DLHSP3  | LF   | 250.00     | 185.00                         | 46,250                             |
| 2393      | Structural steel roof joist - 68DLHSP4  | LF   | 1,373.00   | 185.00                         | 254,005                            |
| 2392      | Structural steel roof joist - 68DLHSP5  | LF   | 317.00     | 185.00                         | 58,645                             |
| 547       | Structural steel framing, including beams, columns, bracing                               | Т    | 802.1690   | 5,400.00                       | 4,331,713                          |
| 2394      | Galvanized structural steel framing, including beams, columns (Roof Mechanical Equipment) | Т    | 29.1600    | 6,000.00                       | 174,960                            |
| 567       | Moment connection   | EA   | 416.00     | 750.00                         | 312,000                            |
| 551       | Allowance for miscellaneous connections and<br>framings                                   | Т    | 83.1310    | 5,400.00                       | 448,907                            |
| 688       | Allowance for structural framing to roof screen, 8 PSF (none indicated)                   | Т    | 8.0800     |                                | Excl.                              |



GFAR: 380,570.00 SF Cost/SF: 417.58

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| A1 New Sch | nool Building (continued)   |      |          | Rates Current | At January 2023   |
|------------|---|------|----------|---------------|-------------------|
| Ref        | Description   | Unit | Qty      | Rate<br>USD   | Total Cost<br>USD |
| 721        | Allowance for shear studs   | EA   | 3,027.00 | 6.50          | 19,676            |
|            | B1020 - Roof Construction   |      |          | 18.14/SF      | 6,903,194         |
| B1080      | Stairs  |      |          |               |                   |
| 182        | 1'-6" High metal guardrail at Rotunda balcony   | LF   | 195.00   | 100.00        | 19,500            |
| 183        | 8'-0" High metal guardrail / gate at rooftop playground                               | LF   | 96.00    | 200.00        | 19,200            |
| 299        | Wire mesh guardrail   | LF   | 1,162.40 |               | Incl.             |
| 1816       | Metal guardrail   | LF   | 336.00   |               | Incl.             |
| 759        | Metal handrail  | LF   | 538.90   |               | Incl.             |
| 747        | Metal stairs with concrete filled pans and landing - 4'-<br>6" wide                   | FT/R | 20.00    | 2,850.00      | 57,000            |
| 2446       | Metal stairs with concrete filled pans and landing - 4'-<br>9" wide                   | FT/R | 48.00    | 2,950.00      | 141,600           |
| 661        | Metal stairs with concrete filled pans and landing - 5'-<br>0" wide                   | FT/R | 97.00    | 3,500.00      | 339,500           |
| 2447       | Metal stairs with concrete filled pans and landing - 6'-<br>4" wide                   | FT/R | 20.00    | 5,000.00      | 100,000           |
| 2448       | Metal stairs with concrete filled pans and landing - 7'-<br>9" wide                   | FT/R | 48.00    | 5,300.00      | 254,400           |
| 2445       | Metal stairs with concrete filled pans and landing - 9'-<br>9" wide                   | FT/R | 96.00    | 6,350.00      | 609,600           |
| 1135       | Metal stairs with concrete filled pans and landing - 5'-<br>3" wide (none indicated)  | FT/R | 97.00    |               | Excl.             |
| 662        | Metal stairs with concrete filled pans and landing - 5'-<br>6" wide (none indicated)  | FT/R | 20.00    |               | Excl.             |
| 663        | Metal stairs with concrete filled pans and landing - 8'-<br>0" wide (none indicated)  | FT/R | 48.00    |               | Excl.             |
| 1134       | Metal stairs with concrete filled pans and landing - 8'-<br>3" wide (none indicate)   | FT/R | 48.00    |               | Excl.             |
| 665        | Metal stairs with concrete filled pans and landing - 10'-<br>0" wide (none indicated) | FT/R | 48.00    |               | Excl.             |
| 1133       | Metal stairs with concrete filled pans and landing - 10'-<br>3" wide (none indicated) | FT/R | 48.00    |               | Excl.             |
| 664        | Metal stairs with concrete filled pans and landing - 10'-<br>6" wide (none indicated) | FT/R | 48.00    |               | Excl.             |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| A Building<br>A1 New Sch | nool Building (continued)  |      | GFAR: 3    | 880,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|------------|--------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 1475                     | Metal stair with handrail and integrated guardrail - 5'-6" wide (none indicated)       | FT/R | 3.00       |                                | Excl.                              |
| 1680                     | Access ladder  | LF   | 84.00      | 110.00                         | 9,240                              |
|                          | B1080 - Stairs   |      |            | 4.07/SF                        | 1,550,040                          |
| B3020                    | Roof Appurtenances   |      |            |                                |                                    |
| 1491                     | Roof access ladder, 2'-0" wide   | LF   | 18.00      | 350.00                         | 6,300                              |
| 181                      | 7'-6" High RTU screen - none indicated   | LF   | 270.00     |                                | Excl.                              |
| 1492                     | Ballasted guardrail (none indicated)   | LF   | 66.00      |                                | Excl.                              |
|                          | B3020 - Roof Appurtenances   |      |            | 0.02/SF                        | 6,300                              |
| C1090                    | Interior Specialties   |      |            |                                |                                    |
| 1815                     | Wire mesh guardrail to Shop Mezz   | LF   | 252.00     | 320.00                         | 80,640                             |
| 1537                     | Metal guardrail to Mezzanine   | LF   | 460.00     | 300.00                         | 138,000                            |
| 802                      | Metal railing to auditorium - none indicated   | LF   | 167.00     |                                | Excl.                              |
| 293                      | Allowance for miscellaneous metals   | SF   | 411,002.89 | 1.00                           | 411,003                            |
|                          | C1090 - Interior Specialties   |      |            | 1.65/SF                        | 629,643                            |
|                          | 05 - METALS  |      |            | 56.07/SF                       | 21,338,634                         |
| 06                       | WOOD, PLASTICS, AND COMPOSITES   |      |            |                                |                                    |
| B1010                    | Floor Construction   |      |            |                                |                                    |
| 748                      | Wood floor deck - 2 layers 3/4" FRT plywood subfloor on 2x8 floor joists (Mezz)        | SF   | 1,746.00   | 50.00                          | 87,300                             |
|                          | B1010 - Floor Construction   |      |            | 0.23/SF                        | 87,300                             |
| B1020                    | Roof Construction  |      |            |                                |                                    |
| 1838                     | Miscellaneous roof blocking  | LS   | 1.00       | 80,000.00                      | 80,000                             |
|                          | B1020 - Roof Construction  |      |            | 0.21/SF                        | 80,000                             |
| C1090                    | Interior Specialties   |      |            |                                |                                    |
| 294                      | Allowance for rough carpentry  | SF   | 411,002.89 | 0.75                           | 308,252                            |
| 295                      | Allowance for wood blocking  | SF   | 411,002.89 | 1.25                           | 513,753                            |
| 807                      | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade) | SF   | 411,002.89 | 0.35                           | 143,851                            |
|                          | C1090 - Interior Specialties   |      |            | 2.54/SF                        | 965,856                            |



GFAR: 380,570.00 SF Cost/SF: 417.58

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

| A1 New School Building (continued) |  |      |          | Rates Current A | t January 2023    |
|------------------------------------|--|------|----------|-----------------|-------------------|
| Ref                                | Description  | Unit | Qty      | Rate<br>USD     | Total Cost<br>USD |
| E1090                              | Other Equipment  |      |          |                 |                   |
| 322                                | Custom display cases                                   | Item |          |                 | 50,000            |
| 729                                | Custom bench with solid surface bench top              | LF   | 208.00   | 500.00          | 104,000           |
| 730                                | Custom reception desk with solid surface top           | LF   | 28.00    | 1,000.00        | 28,000            |
| 2491                               | Custom desk (Media Center)                             | LF   | 40.00    | 1,000.00        | 40,000            |
| 2490                               | Custom cafe counter with quartz countertop             | LF   | 27.00    | 1,000.00        | 27,000            |
| 1700                               | Base cabinet with solid surface counter (School Store) | LF   | 11.00    | 800.00          | 8,800             |
| 2489                               | Base cabinet with solid surface island (School Store)  | LF   | 11.00    | 1,000.00        | 11,000            |
| 1699                               | HAVC workstation countertop                            | EA   | 48.00    | 500.00          | 24,000            |
| 1703                               | Workshop countertop (Robotics)                         | LF   | 29.00    | 100.00          | 2,900             |
| 1698                               | Locker bench   | LF   | 132.90   | 125.00          | 16,612            |
| 1704                               | Dish return counter                                    | LF   | 4.80     | 275.00          | 1,320             |
| 1762                               | Casework: Solid surface countertop, plastic laminate   | LF   | 1,326.00 | 200.00          | 265,200           |
| 1769                               | Casework: Stainless steel countertop                   | LF   | 610.00   | 450.00          | 274,500           |
| 1763                               | Casework: Full height cabinet                          | LF   | 380.00   | 750.00          | 285,000           |
| 1765                               | Casework: Base cabinet with solid surface countertop   | LF   | 1,581.00 | 450.00          | 711,450           |
| 1766                               | Casework: Upper cabinet                                | LF   | 988.00   | 250.00          | 247,000           |
| 2493                               | Casework; Mail slots cabinet                           | LF   | 12.00    | 1,500.00        | 18,000            |
| 1770                               | Casework: Shelf  | LF   | 79.00    | 150.00          | 11,850            |
| 2494                               | Casework; Full height 3-layer locker                   | LF   | 35.00    | 1,000.00        | 35,000            |
| 2497                               | Casework; 1-layer locker                               | LF   | 5.00     | 500.00          | 2,500             |
| 2495                               | Casework; 4'-0" tall cubicle                           | LF   | 30.00    | 800.00          | 24,000            |
| 2496                               | Casework; File cabinet                                 | LF   | 14.00    | 1,200.00        | 16,800            |
| 2499                               | Casework; Full height storage cabinet with glass door  | LF   | 4.00     | 1,500.00        | 6,000             |
| 2500                               | 8" UC Student booth (Plumbing & Pipefitting)           | EA   | 14.00    |                 | Incl.             |
| 2501                               | LC Student booth (Plumbing & Pipefitting)              | EA   | 14.00    |                 | Incl.             |
| 2502                               | Student booth (Electrical Technology)                  | EA   | 38.00    |                 | Incl.             |
| 2515                               | Student booth (HVAC Technology)                        | EA   | 48.00    |                 | Incl.             |


# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Buildina

| A Building<br>A1 New Sch | nool Building (continued)  |      | GFAR: 3    | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|------------|-------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty        | Rate<br>USD                   | Total Cost<br>USD                  |
| 2584                     | Casework reconciliation adjustment   | LS   | 1.00       | -240,000.00                   | -240,000                           |
|                          | <br>E1090 - Other Equipment  |      |            | 5.18/SF                       | 1,970,932                          |
|                          | 06 - WOOD, PLASTICS, AND COMPOSITES  |      |            | 8.16/SF                       | 3,104,088                          |
| 07                       | THERMAL AND MOISTURE PROTECTION  |      |            |                               |                                    |
| A2010                    | Walls for Subgrade Enclosures  |      |            |                               |                                    |
| 614                      | Waterproofing to basement retaining walls and footings and elevator pit walls and footings | SF   | 17,752.60  | 15.00                         | 266,289                            |
| 617                      | Dampproofing to frost wall   | SF   | 14,298.85  | 6.00                          | 85,793                             |
| 618                      | Rigid insulation - 2" thick  | SF   | 32,051.46  | 4.50                          | 144,232                            |
|                          | A2010 - Walls for Subgrade Enclosures  |      |            | 1.30/SF                       | 496,314                            |
| A4010                    | Standard Slabs-on-Grade  |      |            |                               |                                    |
| 506                      | Air and vapor barrier  | SF   | 128,134.04 | 0.85                          | 108,915                            |
|                          | A4010 - Standard Slabs-on-Grade  |      |            | 0.29/SF                       | 108,915                            |
| A4090                    | Slab-on-Grade Supplementary Components   |      |            |                               |                                    |
| 507                      | Rigid insulation - 2" thick  | SF   | 4,875.90   | 4.50                          | 21,941                             |
| 514                      | Extruded polystyrene insulation, perimeter only 2' wide - 2" thick                         | SF   | 4,901.00   |                               | Excl.                              |
|                          | A4090 - Slab-on-Grade Supplementary Components   |      |            | 0.06/SF                       | 21,941                             |
| B1010                    | Floor Construction   |      |            |                               |                                    |
| 648                      | Expansion joint  | LF   | 459.00     | 125.00                        | 57,375                             |
| 749                      | Geofoam rigid insulation (Auditorium stage) - 2'-0"<br>high (none indicated)               | SF   | 2,490.00   |                               | Excl.                              |
| 750                      | Geofoam rigid insulation (Auditorium slope flooring)<br>(none indicated)                   | SF   | 2,755.00   |                               | Excl.                              |
| 543                      | Allowance for spray applied fireproofing (members only)                                    | SF   | 248,934.40 | 3.75                          | 933,504                            |
| 1647                     | Allowance for intumescent paint to round HSS columns                                       | SF   | 944.00     | 50.00                         | 47,200                             |
| 2530                     | Allowance for intumescent paint to bracing   | SF   | 727.00     | 50.00                         | 36,350                             |
|                          | B1010 - Floor Construction   |      |            | 2.82/SF                       | 1,074,429                          |
| B1020                    | Roof Construction  |      |            |                               |                                    |
| 649                      | Expansion joint  | LF   | 177.00     | 125.00                        | 22,125                             |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | lool Building (continued)   |      |            | Rates Current A | t January 2023    |
|-----------|---|------|------------|-----------------|-------------------|
| Ref       | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 719       | Allowance for spray applied fireproofing (members only)             | SF   | 146,804.50 | 3.75            | 550,517           |
|           | B1020 - Roof Construction   |      |            | 1.50/SF         | 572,642           |
| B2010     | Exterior Walls  |      |            |                 |                   |
| 30        | Insulated metal panel   | SF   | 15,290.00  | 90.00           | 1,376,100         |
| 23        | Flat-lock metal tile  | SF   | 5,892.90   | 100.00          | 589,290           |
| 44        | Corrugated metal panel  | SF   | 4,332.00   | 60.00           | 259,920           |
| 2562      | Extend roof membrane to perimeter wall                              | SF   | 2,584.00   | 12.00           | 31,008            |
| 128       | Cladding to entrance columns  | SF   | 178.00     | 125.00          | 22,250            |
| 27        | ACM rainscreen system to crown ribs, including back-<br>up          | SF   | 4,198.00   | 90.00           | 377,820           |
| 150       | ACM rainscreen system   | SF   | 5,378.00   | 90.00           | 484,020           |
| 25        | ACM Panel system at cornice   | SF   | 11,052.00  | 175.00          | 1,934,100         |
| 1663      | ACM Band  | SF   | 2,721.00   | 90.00           | 244,890           |
| 2546      | 5/8" Thick gypsum sheathing   | SF   | 88,450.00  | 3.50            | 309,575           |
| 2543      | 2" Thick rigid insulation   | SF   | 56,229.90  | 5.00            | 281,150           |
| 2544      | 3" Thick rigid insulation   | SF   | 16,378.97  | 7.00            | 114,653           |
| 2559      | 3" Thick batt insulation  | SF   | 33,613.00  | 4.00            | 134,452           |
| 2555      | 2 1/2" Thick mineral fiber insulation                               | SF   | 8,351.00   | 3.25            | 27,141            |
| 2563      | 3 1/2" Thick mineral fiber insulation                               | SF   | 13,259.00  | 4.00            | 53,036            |
| 2556      | 3 1/2" Thick mineral wool insulation                                | SF   | 10,225.00  | 4.00            | 40,900            |
| 2557      | 2" Thick closed cell spray foam                                     | SF   | 49,252.00  | 3.25            | 160,069           |
| 2558      | 6" Thick closed cell spray foam                                     | SF   | 4,781.00   | 6.00            | 28,686            |
| 2545      | Fluid applied air and vapor barrier                                 | SF   | 104,442.79 | 6.50            | 678,878           |
| 190       | Allowance for miscellaneous sealing and caulking                    | SF   | 165,760.99 | 2.00            | 331,522           |
|           | B2010 - Exterior Walls  |      |            | 19.65/SF        | 7,479,460         |
| B2020     | Exterior Windows  |      |            |                 |                   |
| 98        | Insulated translucent wall panel system with glazed operable sashes | SF   | 2,631.00   | 175.00          | 460,425           |
|           | B2020 - Exterior Windows  |      |            | 1.21/SF         | 460,425           |



GFAR: 380,570.00 SF Cost/SF: 417.58

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

| A1 New Sch | nool Building (continued)  |      |            | Rates Current A | At January 2023   |
|------------|--|------|------------|-----------------|-------------------|
| Ref        | Description  | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| B3010      | Roofing  |      |            |                 |                   |
| 164        | TPO Membrane roofing - Type A; single ply membrane over cover board on 6 1/2" min. roof insulation         | SF   | 71,686.00  | 30.00           | 2,150,580         |
| 1479       | TPO Membrane roofing - Type B; single ply membrane over cover board on 4 1/2" min. tapered roof insulation | SF   | 68,665.00  | 30.00           | 2,059,950         |
| 169        | Tapered insulation cricket (premium over PVC roofing)  | SF   | 18,047.00  | 7.00            | 126,329           |
| 154        | ACM Panel system at horizontal entrance soffit / window bay soffit   | SF   | 2,460.00   | 105.00          | 258,300           |
| 158        | Metal coping on top of exterior wall (building signage wall)   | SF   | 298.00     | 75.00           | 22,350            |
| 159        | Metal coping on top of exterior wall (Rotunda balcony wall)  | SF   | 770.00     | 75.00           | 57,750            |
| 174        | Metal coping on top of exterior wall (rooftop<br>playground perimeter wall)                                | SF   | 257.00     | 75.00           | 19,275            |
| 349        | Extensive green roof   | SF   | 4,801.00   | 60.00           | 288,060           |
| 354        | Rooftop pavers   | SF   | 1,704.00   | 30.00           | 51,120            |
| 353        | Rubber roof tiles  | SF   | 3,823.00   | 30.00           | 114,690           |
| 1715       | Walkway pad  | SF   | 10,973.00  | 8.00            | 87,784            |
| 191        | Allowance for miscellaneous trims and flashings  | SF   | 140,351.00 | 0.75            | 105,263           |
|            | B3010 - Roofing  |      |            | 14.04/SF        | 5,341,451         |
| B3080      | Overhead Exterior Enclosures   |      |            |                 |                   |
| 1452       | Exterior aluminum composite material soffit  | SF   | 2,947.00   | 110.00          | 324,170           |
|            | B3080 - Overhead Exterior Enclosures   |      |            | 0.85/SF         | 324,170           |
| C1010      | Interior Partitions  |      |            |                 |                   |
| 488        | Allowance for miscellaneous sealing and caulking   | SF   | 411,859.00 | 0.50            | 205,930           |
| 489        | Allowance for miscellaneous fire stopping  | SF   | 411,859.00 | 0.25            | 102,964           |
|            | C1010 - Interior Partitions  |      |            | 0.81/SF         | 308,894           |
|            | 07 - THERMAL AND MOISTURE PROTECTION   |      |            | 42.54/SF        | 16,188,641        |
| 08         | OPENINGS   |      |            |                 |                   |
| B2020      | Exterior Windows   |      |            |                 |                   |
| 48         | Aluminum curtain wall system, with insulating glass  | SF   | 24,824.00  | 155.00          | 3,847,720         |
| 49         | Aluminum storefront system, with insulating glass  | SF   | 3,977.90   | 125.00          | 497,237           |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Buildina

| A Building<br>A1 New School Building (continued) |  | GFAR: 3 | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |                   |
|--|--|---------|-------------------------------|------------------------------------|-------------------|
| Ref  | Description  | Unit    | Qty                           | Rate<br>USD                        | Total Cost<br>USD |
| 212  | Aluminum storefront system - none indicated  | SF      | 3,337.00                      |                                    | Excl.             |
| 1627   | Aluminum window system, with insulating glass  | SF      | 10,222.00                     | 125.00                             | 1,277,750         |
| 1645   | Premium for spandrel glass   | SF      | 475.00                        | 10.00                              | 4,750             |
| 2575   | Premium for bullet resistant glazing   | LS      | 1.00                          | 120,000.00                         | 120,000           |
|  | B2020 - Exterior Windows   |         |                               | 15.10/SF                           | 5,747,457         |
| B2050  | Exterior Doors and Grilles   |         |                               |                                    |                   |
| 1227   | 16'-0" x 12'-8" Motor operated overhead door with insulating glass                                   | EA      | 1.00                          | 22,000.00                          | 22,000            |
| 100  | 14'-0" x 13'-4" Motor operated overhead door with insulating glass                                   | EA      | 1.00                          | 19,000.00                          | 19,000            |
| 2450   | 14'-0" x 12'-8" Motor operated overhead door with insulating glass                                   | EA      | 1.00                          | 17,000.00                          | 17,000            |
| 101  | 12'-0" x 13'-4" Motor operated overhead door with insulating glass                                   | EA      | 4.00                          | 16,000.00                          | 64,000            |
| 1307   | 12'-0" x 12'-8" Motor operated overhead door with insulating glass                                   | EA      | 4.00                          | 14,500.00                          | 58,000            |
| 1214   | 8'-0" x 10'-0" Motor operated overhead insulated rolling door  | EA      | 1.00                          | 10,000.00                          | 10,000            |
| 2451   | 8'-0" x 7'-4" Motor operated overhead insulated rolling door   | EA      | 1.00                          | 7,500.00                           | 7,500             |
| 134  | 3'-0" x 7'-0" Single leaf hollow metal door, including frame, finish, and hardware                   | EA      | 13.00                         | 1,350.00                           | 17,550            |
| 2449   | 3'-0" x 7'-0" Single leaf hollow metal door with vision panel, including frame, finish, and hardware | EA      | 1.00                          | 1,500.00                           | 1,500             |
| 1230   | 3'-0" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware                | EA      | 4.00                          | 5,850.00                           | 23,400            |
| 1232   | 3'-6" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware                | EA      | 4.00                          | 6,850.00                           | 27,400            |
| 1239   | 2@ 3'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair    | 3.00                          | 12,000.00                          | 36,000            |
| 1234   | 2@ 3'-0" x 7'-4" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair    | 3.00                          | 12,500.00                          | 37,500            |
| 2452   | 2@ 3'-0" x 8'-0" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair    | 2.00                          | 13,000.00                          | 26,000            |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

| A1 New Sch | nool Building (continued)  |      | GFAR: 38 | 0,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------|--|------|----------|------------------------------|------------------------------------|
| Ref        | Description  | Unit | Qty      | Rate<br>USD                  | Total Cost<br>USD                  |
| 1235       | 2@ 3'-4" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair | 3.00     | 12,500.00                    | 37,500                             |
| 1240       | 2@ 3'-6" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair | 7.00     | 12,750.00                    | 89,250                             |
| 2453       | 2@ 4'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware             | Pair | 1.00     | 13,000.00                    | 13,000                             |
| 135        | 2@ 3'-0" x 7'-2" Double leaf hollow metal door, including frame, finish, and hardware                | Pair | 1.00     | 2,500.00                     | 2,500                              |
| 2477       | Exterior door sidelight  | SF   | 181.00   | 100.00                       | 18,100                             |
|            | B2050 - Exterior Doors and Grilles   |      |          | 1.39/SF                      | 527,200                            |
| B2070      | Exterior Louvers and Vents   |      |          |                              |                                    |
| 99         | Louver   | SF   | 775.80   | 100.00                       | 77,580                             |
|            | B2070 - Exterior Louvers and Vents   |      |          | 0.20/SF                      | 77,580                             |
| B3020      | Roof Appurtenances   |      |          |                              |                                    |
| 168        | Roof hatch   | EA   | 1.00     | 5,500.00                     | 5,500                              |
| 1485       | Smoke hatch  | EA   | 3.00     |                              | Excl.                              |
|            | B3020 - Roof Appurtenances   |      |          | 0.01/SF                      | 5,500                              |
| B3060      | Horizontal Openings  |      |          |                              |                                    |
| 96         | Glazed dome, prefabricated self-supporting insulating glass in aluminum framing - removed from scope | SF   | 750.00   |                              | Excl.                              |
|            | B3060 - Horizontal Openings  |      |          |                              | Excl.                              |
| C1010      | Interior Partitions  |      |          |                              |                                    |
| 129        | Wire mesh partition - 8'-0" high   | LF   | 287.00   | 250.00                       | 71,750                             |
|            | C1010 - Interior Partitions  |      |          | 0.19/SF                      | 71,750                             |
| C1020      | Interior Windows   |      |          |                              |                                    |
| 112        | Interior door sidelights with safety glass   | SF   | 4,203.00 | 60.00                        | 252,180                            |
| 153        | Interior storefront  | SF   | 5,316.00 | 90.00                        | 478,440                            |
| 166        | Interior fixed borrowed lights   | SF   | 1,075.00 | 65.00                        | 69,875                             |
| 137        | Interior security transaction window - 4'-0" x 6'-0"   | EA   | 1.00     | 2,000.00                     | 2,000                              |
| 138        | Interior acoustically rated sliding window - 8'-8" x 3'-8"<br>- none indicated                       | EA   | 1.00     |                              | Excl.                              |
| 155        | Fire rated glazing system - 2 hour fire rated  | SF   | 3,988.00 | 200.00                       | 797,600                            |



GFAR: 380,570.00 SF Cost/SF: 417.58

### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | nool Building (continued)  |      |        | Rates Current A | t January 2023    |
|-----------|--|------|--------|-----------------|-------------------|
| Ref       | Description  | Unit | Qty    | Rate<br>USD     | Total Cost<br>USD |
| 794       | Premium for color art glass panels   | SF   | 177.00 | 50.00           | 8,850             |
|           | C1020 - Interior Windows   |      |        | 4.23/SF         | 1,608,945         |
| C1030     | Interior Doors   |      |        |                 |                   |
| 102       | 3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware   | EA   | 50.00  | 1,570.00        | 78,500            |
| 2455      | 3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)                                 | EA   | 2.00   | 1,750.00        | 3,500             |
| 1287      | 3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)                                 | EA   | 13.00  | 1,850.00        | 24,050            |
| 2454      | 3'-6"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)                                 | EA   | 1.00   | 2,000.00        | 2,000             |
| 1320      | 3'-0"x7'-0" Single leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel     | EA   | 8.00   | 2,875.00        | 23,000            |
| 1323      | 3'-6"x7'-0" Single leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel     | EA   | 2.00   | 3,275.00        | 6,550             |
| 1263      | 3'-0"x4'-0" Single leaf wooden doors, including frame, finish and hardware   | EA   | 2.00   | 1,050.00        | 2,100             |
| 106       | 3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware   | EA   | 289.00 | 1,845.00        | 533,205           |
| 2456      | 3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (45 min fire-rated)                                       | EA   | 13.00  | 1,950.00        | 25,350            |
| 1262      | 3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (90 min fire-rated)                                       | EA   | 10.00  | 2,100.00        | 21,000            |
| 1270      | 3'-6"x7'-0" Single leaf wooden doors, including frame, finish and hardware   | EA   | 4.00   | 2,150.00        | 8,600             |
| 1275      | 3'-0"x7'-0" Single leaf wooden doors, including frame,<br>finish and hardware with 2'-0"x2'-11" safety glass<br>vision panel         | EA   | 6.00   | 2,450.00        | 14,700            |
| 1283      | 3'-0"x7'-0" Single leaf wooden doors, including frame,<br>finish and hardware with 2'-0"x(2'-9"+1'-11") safety<br>glass vision panel | EA   | 1.00   | 2,450.00        | 2,450             |
| 1215      | 3'-0"x7'-0" Single leaf wooden safety glazed doors, including frame, finish and hardware   | EA   | 1.00   | 2,450.00        | 2,450             |
|           |  |      |        |                 |                   |



GFAR: 380,570.00 SF Cost/SF: 417.58

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

| AT New Sci | ioor Building (continued)   |      | ŀ     | Rates Current A | t January 2023    |
|------------|---|------|-------|-----------------|-------------------|
| Ref        | Description   | Unit | Qty   | Rate<br>USD     | Total Cost<br>USD |
| 2459       | 3'-0"x7'-0" Single leaf wire mesh doors, including frame, finish and hardware   | EA   | 1.00  | 1,500.00        | 1,500             |
| 1339       | 3'-4"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware   | EA   | 1.00  | 1,700.00        | 1,700             |
| 1338       | 4'-0"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware   | EA   | 3.00  | 2,050.00        | 6,150             |
| 2462       | 3'-0" x 3'-6" Glass rail gate (Multi-Purpose RM<br>Balcony)   | EA   | 2.00  | 850.00          | 1,700             |
| 103        | 2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware  | Pair | 14.00 | 3,000.00        | 42,000            |
| 1289       | 2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware  | Pair | 7.00  | 3,100.00        | 21,700            |
| 2469       | 2@3'-0"x7'-0" Double leaf hollow metal doors,<br>including frame, finish and hardware (45 min fire-<br>rated)                         | Pair | 6.00  | 3,300.00        | 19,800            |
| 1288       | 2@3'-0"x7'-0" Double leaf hollow metal doors,<br>including frame, finish and hardware (90 min fire-<br>rated)                         | Pair | 5.00  | 3,500.00        | 17,500            |
| 2467       | 2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)                                | Pair | 3.00  | 3,600.00        | 10,800            |
| 1291       | 2@3'-6"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware  | Pair | 1.00  | 3,500.00        | 3,500             |
| 2474       | 2@3'-6"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware  | SF   | 1.00  | 3,600.00        | 3,600             |
| 1292       | 2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware   | Pair | 1.00  | 3,850.00        | 3,850             |
| 2470       | 2@3'-10"x7'-0" Double leaf hollow metal doors,<br>including frame, finish and hardware (45 min fire-<br>rated)                        | Pair | 1.00  | 4,250.00        | 4,250             |
| 2475       | 2@3'-0"x7'-0" Double leaf hollow metal doors,<br>including frame, finish and hardware with 2'-0"x2'-11"<br>safety glass vision panel  | Pair | 1.00  | 4,250.00        | 4,250             |
| 2476       | 2@3'-10"x7'-0" Double leaf hollow metal doors,<br>including frame, finish and hardware with 2'-0"x2'-11"<br>safety glass vision panel | Pair | 1.00  | 5,750.00        | 5,750             |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New School Building (continued) Rates Current |   |      | Rates Current A | At January 2023 |                   |
|---|---|------|-----------------|-----------------|-------------------|
| Ref   | Description   | Unit | Qty             | Rate<br>USD     | Total Cost<br>USD |
| 1318  | 2@3'-0"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                      | Pair | 3.00            | 5,750.00        | 17,250            |
| 1319  | 2@3'-0"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel (90 min fire-rated)  | Pair | 2.00            | 9,600.00        | 19,200            |
| 2473  | 2@3'-0"x7'-3" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                      | SF   | 2.00            | 6,000.00        | 12,000            |
| 1326  | 2@3'-3"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                      | Pair | 1.00            | 6,000.00        | 6,000             |
| 105   | 2@3'-6"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                      | Pair | 4.00            | 6,500.00        | 26,000            |
| 2466  | 2@3'-6"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel (90 min fire-rated)  | Pair | 2.00            | 10,000.00       | 20,000            |
| 1330  | 2@3'-10"x7'-0" Double leaf aluminum doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel (90 min fire-rated) | Pair | 2.00            | 10,850.00       | 21,700            |
| 107   | 2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware  | Pair | 23.00           | 3,500.00        | 80,500            |
| 1278  | 2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel                        | Pair | 2.00            | 4,750.00        | 9,500             |
| 1266  | 2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)  | Pair | 8.00            | 4,000.00        | 32,000            |
| 2468  | 2@3'-6"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)  | Pair | 2.00            | 4,500.00        | 9,000             |
| 2472  | 2@3'-10"x7'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated)   | Pair | 2.00            | 5,000.00        | 10,000            |
| 1268  | 2@3'-10"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)   | Pair | 2.00            | 5,175.00        | 10,350            |
| 1271  | 2@3'-0"x7'-2" Double leaf wooden doors, including frame, finish and hardware  | Pair | 3.00            | 3,585.00        | 10,755            |
| 1272  | 2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware  | Pair | 6.00            | 4,000.00        | 24,000            |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | ool Building (continued)   |      |        | Rates Current A | t January 2023    |
|-----------|--|------|--------|-----------------|-------------------|
| Ref       | Description  | Unit | Qty    | Rate<br>USD     | Total Cost<br>USD |
| 2471      | 2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated) | Pair | 1.00   | 4,200.00        | 4,200             |
| 1340      | 2@3'-0"x7'-10" Double leaf wire mesh doors, including frame, finish and hardware                 | Pair | 3.00   | 2,025.00        | 6,075             |
| 1341      | 2@3'-6"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware                  | Pair | 3.00   | 3,150.00        | 9,450             |
| 1342      | 2@3'-6"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware                  | Pair | 2.00   | 3,250.00        | 6,500             |
| 1343      | 2@3'-7"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware                  | Pair | 1.00   | 3,250.00        | 3,250             |
| 1344      | 2@3'-7 1/4"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware              | Pair | 1.00   | 3,250.00        | 3,250             |
| 1345      | 2@3'-8"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware                  | Pair | 1.00   | 3,350.00        | 3,350             |
|           | C1030 - Interior Doors   |      |        | 3.26/SF         | 1,239,835         |
| C1040     | Interior Grilles and Gates   |      |        |                 |                   |
| 2458      | 6'-0" x 10'-0" Rolling security grille door  | EA   | 4.00   | 15,000.00       | 60,000            |
| 113       | 4'-6" x 3'-10" Overhead coiling stainless steel counter door                                     | EA   | 1.00   | 4,000.00        | 4,000             |
| 2461      | 15'-0" x 9'-0" Fire-rated partition / door (2-hr fire-rated)                                     | EA   | 2.00   | 47,500.00       | 95,000            |
| 2460      | 14'-8" x 10'-0" Fire-rated partition / door (2-hr fire-<br>rated)                                | EA   | 1.00   | 50,000.00       | 50,000            |
| 2463      | 8'-3" x 12'-0" Fire-rated folding partition / door (2-hr fire -rated)                            | EA   | 2.00   | 35,000.00       | 70,000            |
| 2464      | 42'-0" x 15'-0" Curved fire-rated folding partition / door (2-hr fire-rated)                     | EA   | 1.00   | 300,000.00      | 300,000           |
|           | C1040 - Interior Grilles and Gates   |      |        | 1.52/SF         | 579,000           |
| C1090     | Interior Specialties   |      |        |                 |                   |
| 301       | Glass guardrail (Second Floor Corridor)  | LF   | 230.80 | 580.00          | 133,864           |
| 2505      | Glass guardrail (Stair 1)  | LF   | 108.00 | 580.00          | 62,640            |
| 2508      | Glass guardrail (Multi-purpose RM)   | LF   | 189.00 | 580.00          | 109,620           |
|           | C1090 - Interior Specialties   |      |        | 0.80/SF         | 306,124           |
|           | 08 - OPENINGS  |      |        | 26.71/SF        | 10,163,391        |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

| A Building<br>A1 New Sch | nool Building (continued)  |      | GFAR: 3   | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|-----------|-------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty       | Rate<br>USD                   | Total Cost<br>USD                  |
| 09                       | FINISHINGS   |      |           |                               |                                    |
| B2010                    | Exterior Walls   |      |           |                               |                                    |
| 2547                     | 8" Light gauge metal stud back-up  | SF   | 2,334.00  | 16.00                         | 37,344                             |
| 2548                     | 6" Light gauge metal stud back-up  | SF   | 82,330.00 | 14.00                         | 1,152,620                          |
| 2549                     | 4" Light gauge metal stud back-up  | SF   | 10,333.00 | 11.00                         | 113,663                            |
| 2550                     | 3 5/8" Light gauge metal stud back-up  | SF   | 10,681.00 | 10.50                         | 112,151                            |
| 2551                     | 2 1/2" Light gauge metal stud back-up  | SF   | 5,756.00  | 9.00                          | 51,804                             |
| 2560                     | 5/8" Thick gypsum board lining   | SF   | 69,489.00 | 4.50                          | 312,701                            |
|                          | B2010 - Exterior Walls   |      |           | 4.68/SF                       | 1,780,283                          |
| C1010                    | Interior Partitions  |      |           |                               |                                    |
| 414                      | Gypsum board partition - 3-5/8" metal stud with 1 layer 5/8" GWB on both side with 3-1/2" acoustic batt insulation (Type G4.0)                             | SF   | 836.00    | 17.00                         | 14,212                             |
| 408                      | Gypsum board partition - 6" metal stud with 1 layer 5/8" GWB on both side with 5" acoustic batt insulation (Type G6.0)                                     | SF   | 65,609.00 | 19.50                         | 1,279,376                          |
| 415                      | Gypsum board partition - 6" metal stud with 2 layer 5/8" GWB one side and 1 layer 5/8" GWB another side with 5" acoustic batt insulation (Type G6.0A)      | SF   | 55,602.00 | 21.00                         | 1,167,642                          |
| 412                      | Gypsum board partition - 6" metal stud with 2 layer<br>5/8" GWB on both sides with 5" acoustic batt<br>insulation (Type G6.0B)                             | SF   | 55,883.00 | 22.75                         | 1,271,338                          |
| 2412                     | Gypsum board partition - 6" metal stud staggered in 8"<br>metal track with 2 layer 5/8" GWB on both sides with<br>5" acoustic batt insulation (Type G6.0C) | SF   | 717.00    | 27.00                         | 19,359                             |
| 2413                     | Gypsum board partition - 6" metal stud with 1 layer<br>5/8" GWB on both sides with 5" acoustic batt<br>insulation, 1 hour fire rated (Type G6.1)           | SF   | 4,851.00  | 21.75                         | 105,509                            |
| 1550                     | Gypsum board partition - 6" metal stud with 2 layer 5/8" GWB on both sides with 5" acoustic batt insulation, 1 hour fire rated (Type G6.1B)                | SF   | 3,094.00  | 25.50                         | 78,897                             |
| 409                      | Gypsum board partition - 6" metal stud with 2 layer 5/8" GWB on both sides with 5" acoustic batt insulation, 2 hour fire rated (Type G6.2)                 | SF   | 16,427.00 | 28.50                         | 468,170                            |
| 459                      | Gypsum board furring - 7/8" metal stud with 1 layer 5/8" GWB (Type F1.0)   | SF   | 2,347.00  | 7.50                          | 17,603                             |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| A Building<br>A1 New Sch | nool Building (continued)   |      | GFAR: :    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|---|------|------------|--------------------------------|------------------------------------|
| Ref                      | Description   | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 2411                     | Gypsum board furring - 1-5/8" metal stud with 1 layer 5/8" GWB (Type F2.0)  | SF   | 5,737.00   | 8.50                           | 48,765                             |
| 1552                     | Gypsum board furring - 2-1/2" metal stud with 1 layer 5/8" GWB (Type F3.0)  | SF   | 2,553.00   | 9.50                           | 24,254                             |
| 410                      | Gypsum board furring - 3-5/8" metal stud with 1 layer 5/8" GWB (Type F4.0)  | SF   | 31,633.99  | 11.00                          | 347,974                            |
| 432                      | Gypsum board furring - 3-5/8" metal stud with 2 layer 5/8" GWB (Type F4.0A)   | SF   | 8,838.00   | 13.50                          | 119,313                            |
| 411                      | Gypsum board furring - 6" metal stud with 1 layer 5/8"<br>GWB (Type F6.0)   | SF   | 52,856.00  | 12.50                          | 660,700                            |
| 413                      | Gypsum board furring - 6" metal stud with 2 layer 5/8"<br>GWB (Type F6.0A)  | SF   | 44,667.00  | 15.00                          | 670,005                            |
| 1565                     | Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" GWB another side with 5-1/2" acoustic batt insulation, 1 hour fire rated (Type S6.1) | SF   | 1,400.00   | 28.50                          | 39,900                             |
| 433                      | Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" GWB another side with 5-1/2" acoustic batt insulation, 2 hour fire rated (Type S6.2) | SF   | 24,066.00  | 30.00                          | 721,980                            |
| 464                      | Gypsum board partition - 2x4 wood stud with 1 layer<br>3/4" FRT plywood sheathing on both sides   | SF   | 2,879.00   | 17.00                          | 48,943                             |
| 1571                     | Gypsum board furring - 2x4 wood stud with 1 layer<br>3/4" FRT plywood sheathing on one side   | SF   | 5,267.00   | 12.50                          | 65,838                             |
| 808                      | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Drywall Trade)  | SF   | 411,859.00 | 0.35                           | 144,151                            |
|                          | C1010 - Interior Partitions   |      |            | 19.22/SF                       | 7,313,929                          |
| C2010                    | Wall Finishes   |      |            |                                |                                    |
| 141                      | Ceramic tile  | SF   | 16,547.50  | 22.00                          | 364,045                            |
| 142                      | Thin porcelain tile   | SF   | 20,481.00  | 25.00                          | 512,025                            |
| 144                      | Wood veneer panels (Media Center)   | SF   | 1,999.00   | 65.00                          | 129,935                            |
| 1810                     | Wood fiber acoustical panels  | SF   | 3,946.00   | 85.00                          | 335,410                            |
| 782                      | Fabric wrap acoustical panel (Multi-Purpose RM)   | SF   | 2,002.00   | 50.00                          | 100,100                            |
| 781                      | Vinyl wall covering (Multi-Purpose RM)  | SF   | 1,175.00   | 40.00                          | 47,000                             |
| 147                      | Decorative fabric metal panels (Stage)  | SF   | 474.00     | 70.00                          | 33,180                             |
| 1678                     | Phenolic resin panel system   | SF   | 2,726.00   | 85.00                          | 231,710                            |



GFAR: 380,570.00 SF Cost/SF: 417.58

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

|       | loor building (continued)   |      |            | Rates Current A | At January 2023   |
|-------|---|------|------------|-----------------|-------------------|
| Ref   | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 146   | Flat lock metal tiles   | SF   | 624.00     | 100.00          | 62,400            |
| 148   | FRP panels  | SF   | 6,573.00   | 25.00           | 164,325           |
| 2609  | Delete interior flat lock metal tiles                                 | SF   | 624.00     | -100.00         | -62,400           |
| 2610  | Porcelain tiles ILO flat lock metal tiles                             | SF   | 624.00     | 25.00           | 15,600            |
| 170   | Prepare and apply epoxy paint   | SF   | 205,122.87 | 3.50            | 717,930           |
| 172   | Prepare and apply paint to GWB  | SF   | 309,973.50 | 1.25            | 387,467           |
| 841   | Plastic laminate window sills   | LF   | 2,334.60   | 75.00           | 175,095           |
| 1670  | Metal column cover  | SF   | 304.00     | 135.00          | 41,040            |
| 1682  | Decorative wood acoustic wall reflector (Auditorium) - none indicated | SF   | 1,890.00   |                 | Excl.             |
| 1681  | Perforated metal panels (Auditorium) - none indicated                 | SF   | 670.00     |                 | Excl.             |
| 1683  | Decorative wood panels (Auditorium) - none indicated                  | SF   | 6,273.00   |                 | Excl.             |
| 2613  | Reduce ceramic wall tile area by 10%                                  | SF   | 1,655.00   | -22.00          | -36,410           |
| 2614  | Reduce porcelain wall tile area by 10%                                | SF   | 2,049.00   | -25.00          | -51,225           |
| 2615  | Painting ILO wall tiles   | SF   | 3,703.00   | 3.50            | 12,961            |
|       | C2010 - Wall Finishes   |      |            | 8.36/SF         | 3,180,188         |
| C2030 | Flooring  |      |            |                 |                   |
| 2     | ASF, Rubber athletic flooring   | SF   | 3,073.00   | 20.00           | 61,460            |
| 3     | CPT-1, Carpet   | SY   | 268.00     | 70.00           | 18,760            |
| 2375  | CPT-2, Carpet   | SY   | 737.00     | 70.00           | 51,590            |
| 2377  | CPT-4/5, Carpet   | SY   | 648.00     | 70.00           | 45,360            |
| 2378  | CPT-6, Carpet   | SY   | 451.00     | 70.00           | 31,570            |
| 2379  | CPT-7, Carpet   | SY   | 98.00      | 70.00           | 6,860             |
| 1418  | RC, Resilient carpet  | SF   | 4,017.00   | 6.00            | 24,102            |
| 1398  | PP, Porcelain floor tiles   | SF   | 19,070.00  | 30.00           | 572,100           |
| 4     | CMT, Ceramic mosaic tile  | SF   | 5,098.50   | 20.00           | 101,970           |
| 5     | SCONC, Sealed concrete  | SF   | 109,188.62 | 1.50            | 163,782           |
| 6     | EF, Epoxy flooring and base   | SF   | 12,269.85  | 15.00           | 184,047           |
| 8     | FGC, Foot grille carpet   | SF   | 1,090.00   | 70.00           | 76,300            |
| 9     | LIN, Linoleum   | SF   | 121,581.60 | 10.00           | 1,215,816         |
| 14    | RR-L, Rubber tile (non-photoluminesent)                               | SF   | 3,152.90   | 16.50           | 52,023            |
|       |   |      |            |                 |                   |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | nool Building (continued)  |      |            | Rates Current | At January 2023   |
|-----------|--|------|------------|---------------|-------------------|
| Ref       | Description  | Unit | Qty        | Rate<br>USD   | Total Cost<br>USD |
| 2380      | SV, Sheet vinyl  | SF   | 36,459.10  | 12.00         | 437,509           |
| 2376      | MULT, Sheet vinyl - multipurpose                                     | SF   | 7,246.70   | 12.00         | 86,960            |
| 18        | SV-SR, Sheet vinyl - slip resistant                                  | SF   | 1,476.00   | 12.00         | 17,712            |
| 1401      | LVT, Luxury vinyl tile   | SF   | 2,573.00   | 8.00          | 20,584            |
| 19        | WOC1, Walk off carpet  | SY   | 441.10     | 65.00         | 28,671            |
| 2374      | WOC2, Walk off carpet  | SY   | 35.00      | 65.00         | 2,275             |
| 20        | WAF, Wood athletic flooring  | SF   | 12,150.00  | 20.00         | 243,000           |
| 21        | Wood sprung stage flooring - none indicated                          | SF   | 2,475.00   |               | Excl.             |
| 10        | Resilient base   | LF   | 39,754.15  | 5.00          | 198,771           |
| 1744      | Sheet vinyl base   | LF   | 6,643.00   | 5.00          | 33,215            |
| 1707      | Porcelain tile base  | LF   | 835.00     | 25.00         | 20,875            |
| 11        | Ceramic tile base  | LF   | 2,483.80   | 20.00         | 49,676            |
| 2482      | 6" Tall pre-cast terrazzo base                                       | LF   | 933.00     | 30.00         | 27,990            |
| 2483      | Millwork base  | LF   | 191.00     | 30.00         | 5,730             |
| 815       | High performance adhesive  | SF   | 215,799.00 | 1.50          | 323,699           |
|           | C2030 - Flooring   |      |            | 10.78/SF      | 4,102,407         |
| C2040     | Stair Finishes   |      |            |               |                   |
| 15        | Rubber stair treads and risers                                       | SF   | 7,625.10   | 25.00         | 190,627           |
| 1441      | Wood stair treads and risers - none indicated                        | SF   | 94.00      |               | Excl.             |
| 1445      | Carpet stair treads and risers                                       | SF   | 307.00     |               | Incl.             |
|           | C2040 - Stair Finishes   |      |            | 0.50/SF       | 190,627           |
| C2050     | Ceiling Finishes   |      |            |               |                   |
| 31        | Acoustic ceiling (ACT-1) - 2' x 2' NRC acoustic ceiling tile         | SF   | 176,958.80 | 8.00          | 1,415,670         |
| 32        | Acoustic ceiling (ACT-2) - 2' x 2' Washable acoustic ceiling tile    | SF   | 5,647.00   | 8.00          | 45,176            |
| 33        | Acoustic ceiling (ACT-3) - 2' x 2' NRC tegular acoustic ceiling tile | SF   | 13,065.00  | 8.00          | 104,520           |
| 34        | Acoustic ceiling (ACT-4) - 2' x 6' NRC tegular acoustic ceiling tile | SF   | 4,725.00   | 12.00         | 56,700            |
| 1447      | Acoustic ceiling (ACT-5)   | SF   | 4,433.00   | 12.00         | 53,196            |
| 46        | Acoustic preformed ceiling panels at Media Center                    | SF   | 1,852.00   | 65.00         | 120,380           |



### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023 Unit Ref Description Qty Rate **Total Cost** USD USD 1455 Acoustic ceiling reflector at Stage SF 332.00 95.00 31,540 37 Gypsum board ceiling SF 19,532.20 20.00 390,644 SF 41 Gypsum board ceiling, moisture resistant 6,756.55 25.00 168,913 38 LMC-2, Linear metal ceiling with wood appearance SF 11,726.00 65.00 762,190 SF 1.50 48,568 39 Paint to gypsum board ceiling 32,378.66 2407 Suspended pipe rail ceiling system (Multi Purpose SF 3,290.00 15.00 49,350 RM) 40 Paint to exposed ceiling SF 71,289.20 1.50 106,933 Sound isolator ceiling - 2 layer 5/8" GWB over 7/8" SF 42 54,555.00 25.50 1,391,153 metal furring and 1-1/2" cold rolled channels with 3-1/2" batt insulation (adjust unit rate per reconciliation) 75 Allowance for gypsum board soffit - allow 20% of GWB SF 25.00 97,665 3,906.60 2406 LF 4" Metal suspension trim 497.00 50.00 24,850 2586 Use different sound isolation ceiling LS -250,000.00 -250,000 1.00 C2050 - Ceiling Finishes 4.617.448 12.13/SF 09 - FINISHINGS 55.67/SF 21,184,882 10 SPECIALTIES C1090 **Interior Specialties** ΕA 277 Restroom accessories - Toilet partition 35.00 1,300.00 45,500 287 Restroom accessories - Toilet partition, ADA ΕA 13.00 1,700.00 22,100 42.00 700.00 302 Restroom accessories - Urinal partition EA 29,400 Restroom accessories - Tissue paper dispenser 280 86.00 125.00 10,750 ΕA 281 Restroom accessories - Grab bar EA 134.00 180.00 24,120 Set 305 Restroom accessories - Shower grab bar 10.00 450.00 4,500 282 Restroom accessories - Napkin disposal EA 70.00 500.00 35,000 283 Restroom accessories - Robe hook EA 90.00 100.00 9.000 284 Restroom accessories - Soap dispenser EA 64.00 150.00 9,600 285 Restroom accessories - Shower curtain and rod ΕA 10.00 200.00 2,000 304 ΕA 10.00 600.00 6.000 Restroom accessories - Shower seat 291 Restroom accessories - Framed mirror ΕA 64.00 800.00 51,200 292 Restroom accessories - Towel dispenser/waste ΕA 56.00 850.00 47.600 receptacle



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| A1 New Sch | nool Building (continued)                                     |      |            | Rates Current A | At January 2023   |
|------------|---|------|------------|-----------------|-------------------|
| Ref        | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 303        | Restroom accessories - Baby changing table - none indicated   | EA   | 5.00       |                 | Excl.             |
| 754        | Allowance for elevator pit ladder, cover, etc                 | EA   | 2.00       |                 | Excl.             |
| 319        | Allowance for markerboards - 4'x4'                            | EA   | 37.00      | 225.00          | 8,325             |
| 339        | Allowance for markerboards - 6'x4'                            | EA   | 39.00      | 350.00          | 13,650            |
| 1533       | Allowance for markerboards - 8'x4'                            | EA   | 3.00       | 470.00          | 1,410             |
| 1534       | Allowance for markerboards - 10'x4'                           | EA   | 12.00      | 580.00          | 6,960             |
| 320        | Allowance for tackboards - 4'x4'                              | EA   | 41.00      | 170.00          | 6,970             |
| 335        | Allowance for tackboards - 8'x4'                              | EA   | 4.00       | 330.00          | 1,320             |
| 1535       | Allowance for tackboards - 12'x4'                             | EA   | 2.00       | 500.00          | 1,000             |
| 321        | Allowance for visual display rails                            | Item |            |                 | 10,000            |
| 329        | Metal lockers - 2 tier 15"x15" (Corridors)                    | EA   | 354.00     | 800.00          | 283,200           |
| 2509       | Metal lockers - 2 tier 15"x15" (Team Locker / Auto Collision) | EA   | 255.00     | 800.00          | 204,000           |
| 2510       | Metal lockers - 3 tier 15"x15" (Locker / Shops)               | EA   | 479.00     | 700.00          | 335,300           |
| 2478       | Mirror (Fitness)  | SF   | 201.00     | 35.00           | 7,035             |
| 753        | Allowance for janitor accessories                             | EA   | 12.00      | 750.00          | 9,000             |
| 327        | Allowance for cubicle curtain at nurse's area                 | EA   | 2.00       | 1,800.00        | 3,600             |
| 1547       | Allowance for cubicle curtain at Health /Medical<br>Assisting | EA   | 15.00      | 1,800.00        | 27,000            |
| 328        | Allowance for corner guards                                   | Item |            |                 | 8,000             |
| 331        | Allowance for closet and utility shelving                     | Item |            |                 | 6,000             |
| 332        | Allowance for AED with cabinets                               | EA   | 12.00      | 2,000.00        | 24,000            |
| 296        | Allowance for fire extinguisher and cabinets                  | EA   | 165.08     | 850.00          | 140,318           |
| 297        | Allowance for interior signage                                | SF   | 411,002.89 | 0.85            | 349,353           |
| 298        | Allowance for exterior signage                                | Item |            |                 | 15,000            |
|            | C1090 - Interior Specialties                                  |      |            | 4.62/SF         | 1,758,211         |
|            | 10 - SPECIALTIES  |      |            | 4.62/SF         | 1,758,211         |
| 11         | EQUIPMENT   |      |            |                 |                   |
| E1040      | Institutional Equipment                                       |      |            |                 |                   |
| 340        | Fixed audience seating (Multipurpose Room)                    | EA   | 546.00     | 600.00          | 327,600           |





#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

| A1 New Sch | nool Building (continued)   |      | GFAR: 3 | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------|---|------|---------|-------------------------------|------------------------------------|
| Ref        | Description   | Unit | Qty     | Rate<br>USD                   | Total Cost<br>USD                  |
| 341        | Motorized projection screen - 20'x14' (Auditorium)  | EA   | 1.00    |                               | Incl.                              |
| 343        | Motorized projection screen (Gymnasium)   | EA   | 1.00    |                               | Incl.                              |
| 342        | Interactive wall mounted display (Education room)   | EA   | 89.00   |                               | Incl.                              |
| 344        | Large format digital information display (Cafeteria Commons)  | EA   | 4.00    |                               | Incl.                              |
| 2573       | Fume hoods, ductless  | EA   | 6.00    | 15,000.00                     | 90,000                             |
|            | E1040 - Institutional Equipment   |      |         | 1.10/SF                       | 417,600                            |
| E1070      | Entertainment and Recreational Equipment  |      |         |                               |                                    |
| 2506       | Rooftop playground equipment; Composite sensory<br>panel  | LS   | 1.00    |                               | Excl.                              |
| 2507       | Rooftop playground equipment; Rhapsody vibra chimes   | EA   | 3.00    |                               | Excl.                              |
| 363        | Rooftop playground equipment; 2-5 spinner - none indicated  | EA   | 1.00    |                               | Excl.                              |
| 365        | Rooftop playground equipment; 2-5 main play<br>structure - none indicated   | EA   | 1.00    |                               | Excl.                              |
| 1705       | Rooftop playground equipment; Dome climber - none indicated   | EA   | 1.00    |                               | Excl.                              |
| 364        | Rooftop playground equipment; PIP rubber mound<br>with composite wood arch bridge - none indicated                      | EA   | 1.00    |                               | Excl.                              |
| 366        | Rooftop playground equipment; PIP rubber mound<br>with embankment slide - none indicated                                | EA   | 1.00    |                               | Excl.                              |
|            | E1070 - Entertainment and Recreational Equipment  |      |         |                               | Excl.                              |
| E1090      | Other Equipment   |      |         |                               |                                    |
| 345        | Food service equipment (Main Kitchen & Culinary<br>Kitchen)   | LS   | 1.00    | 2,400,000.00                  | 2,400,000                          |
| 2583       | Food service equipment - adjustment per<br>reconciliation   | LS   | 1.00    | -50,000.00                    | -50,000                            |
| 1799       | Loading dock equipment  | EA   | 1.00    | 2,500.00                      | 2,500                              |
| 1800       | Extended scissor alignment lift rack (12,000 lbs.)  | EA   | 1.00    | 17,250.00                     | 17,250                             |
| 890        | Move Automotive Refinishing, Automotive Technology<br>Lifts, HVAC & Plumbing Equipment, Dental, and<br>Carpentry (FF&E) | LS   | 1.00    |                               | Excl.                              |
| 1809       | Workshop equipment (with FF&E)  | LS   | 1.00    |                               | Excl.                              |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Buildina

| A1 New Sch | nool Building (continued)  |      | GFAR: 3   | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------|--|------|-----------|-------------------------------|------------------------------------|
| Ref        | Description  | Unit | Qty       | Rate<br>USD                   | Total Cost<br>USD                  |
| 1808       | Residential equipment  | Set  | 4.00      | 5,000.00                      | 20,000                             |
| 1801       | Theater rigging  | LS   | 1.00      | 200,000.00                    | 200,000                            |
| 1802       | Gymnasium wall padding   | SF   | 946.00    | 30.00                         | 28,380                             |
| 1803       | Gymnasium batting cage   | EA   | 1.00      | 5,500.00                      | 5,500                              |
| 1811       | Gymnasium flexible stainless steel safety netting                            | SF   | 3,016.00  | 30.00                         | 90,480                             |
| 1804       | Gymnasium dividers   | SF   | 2,582.00  | 20.00                         | 51,640                             |
| 1805       | Gymnasium basketball backdrop  | EA   | 6.00      | 10,000.00                     | 60,000                             |
| 1806       | Electronic scoreboards and shot clocks                                       | LS   | 1.00      | 40,000.00                     | 40,000                             |
| 1807       | Telescoping bleachers (Gymnasium)  | LS   | 1.00      | 230,000.00                    | 230,000                            |
|            | E1090 - Other Equipment  |      |           | 8.13/SF                       | 3,095,750                          |
|            | 11 - EQUIPMENT   |      |           | 9.23/SF                       | 3,513,350                          |
| 12         | FURNISHINGS  |      |           |                               |                                    |
| E1090      | Other Equipment  |      |           |                               |                                    |
| 2571       | Furnish and install Cosmetology equipment, etc.                              | LS   | 1.00      | 265,000.00                    | 265,000                            |
| 2572       | Install owner furnished equipment  | LS   | 1.00      | 99,000.00                     | 99,000                             |
|            | E1090 - Other Equipment  |      |           | 0.96/SF                       | 364,000                            |
| E2010      | Fixed Furnishings  |      |           |                               |                                    |
| 323        | Window roller shades, manual operated (Classrooms, Science Labs, Art rooms)  | SF   | 29,333.20 | 10.00                         | 293,332                            |
| 803        | Window roller shades, manual operated  | EA   | 174.00    |                               | Incl.                              |
| 324        | Window roller shades, electrically operated (Media Center)                   | SF   | 2,314.00  | 20.00                         | 46,280                             |
| 325        | Vertical blinds, manual operated (Administration)                            | SF   | 588.00    | 12.00                         | 7,056                              |
| 326        | Tension shade system, electrically operated (Dome skylight) - none indicated | SF   | 750.00    |                               | Excl.                              |
|            | <br>E2010 - Fixed Furnishings  |      |           | 0.91/SF                       | 346,668                            |
|            | 12 - FURNISHINGS   |      |           | 1.87/SF                       | 710,668                            |
| 14         | CONVEYING EQUIPMENT  |      |           |                               |                                    |
| D1010      | Vertical Conveying Systems   |      |           |                               |                                    |
| 687        | Traction passenger elevator, 5 stops, open both sides, 3500 pounds           | EA   | 1.00      | 475,000.00                    | 475,000                            |
| 2511       | Traction service elevator, 4 stops, 5000 pounds                              | EA   | 1.00      | 360,000.00                    | 360,000                            |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Buildina

| A Building<br>A1 New Sch | nool Building (continued)  |      | GFAR: 3   | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|-----------|-------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty       | Rate<br>USD                   | Total Cost<br>USD                  |
| 1791                     | Allowance for elevator usage to support miscellaneous trades   | LS   | 1.00      |                               | Excl.                              |
| 2512                     | Elevator car allowance (per section 14150)   | EA   | 2.00      | 25,000.00                     | 50,000                             |
|                          | D1010 - Vertical Conveying Systems   |      |           | 2.33/SF                       | 885,000                            |
|                          | 14 - CONVEYING EQUIPMENT   |      |           | 2.33/SF                       | 885,000                            |
| 21                       | FIRE SUPPRESSION   |      |           |                               |                                    |
| D4010                    | Fire Suppression   |      |           |                               |                                    |
| 787                      | General requirements: supervision, shop drawings,<br>asbuilt, tags, markers, tools, rentals, BIM, cleaning,<br>storage, material handling, seismic restraints, permits,<br>fees etc. | Item |           |                               | 299,000                            |
| 1510                     | Fire pump, 1000 gpm c/w Control Panel  | EA   | 1.00      | 100,000.00                    | 100,000                            |
| 1515                     | JP, Jockey pump c/w Control Panel  | EA   | 1.00      | 8,500.00                      | 8,500                              |
| 1513                     | 8" (ERW) FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 35.00     | 180.00                        | 6,300                              |
| 1497                     | 6" (ERW) FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 2,000.00  | 150.00                        | 300,000                            |
| 1504                     | 4" (CS) SPK, Fire specialty piping c/w fittings,<br>supports, etc.   | LF   | 10,350.00 | 85.00                         | 879,750                            |
| 1899                     | 2.5" (CS) SPK, Fire specialty piping c/w fittings, supports, etc.  | LF   | 550.00    | 65.00                         | 35,750                             |
| 1523                     | 2" (CS) SPK, Fire specialty piping c/w fittings,<br>supports, etc.   | LF   | 20.00     | 60.00                         | 1,200                              |
| 2606                     | 1 to 1-1/2" Fire specialty piping c/w fittings, supports, etc.   | LF   | 17,030.00 | 40.00                         | 681,200                            |
| 1558                     | 6"(ERW), Fire riser piping c/w fittings, supports, etc.  | LF   | 500.00    | 160.00                        | 80,000                             |
| 1548                     | 3" (CS), Drain riser piping c/w fittings, supports, etc.   | LF   | 500.00    | 75.00                         | 37,500                             |
| 1507                     | Double check valve Backflow preventor assembly, 8"   | EA   | 1.00      | 10,000.00                     | 10,000                             |
| 1498                     | Zone control valve assembly, 4"  | EA   | 20.00     | 4,500.00                      | 90,000                             |
| 1844                     | Post Indicator/Isolation Valve, 8"   | EA   | 7.00      | 2,500.00                      | 17,500                             |
| 1845                     | Post Indicator/Isolation Valve, 6"   | EA   | 17.00     | 2,000.00                      | 34,000                             |
| 1870                     | Post Indicator/Isolation Valve, 4"   | EA   | 17.00     | 1,400.00                      | 23,800                             |
| 1521                     | Check Valve, 8"  | EA   | 4.00      | 3,000.00                      | 12,000                             |
| 1905                     | Check Valve, 6"  | EA   | 1.00      | 1,800.00                      | 1,800                              |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

| 1 New Scl | nool Building (continued)                                    |      |           | Rates Current A | t January 2023    |
|-----------|--|------|-----------|-----------------|-------------------|
| Ref       | Description  | Unit | Qty       | Rate<br>USD     | Total Cost<br>USD |
| 1869      | Check Valve, 4"  | EA   | 2.00      | 1,500.00        | 3,000             |
| 1904      | Check Valve, 2"  | EA   | 1.00      | 900.00          | 900               |
| 1846      | Drain Valve 3"   | EA   | 9.00      | 650.00          | 5,850             |
| 1906      | OS&Y Gate Valve, 8"  | EA   | 1.00      | 3,200.00        | 3,200             |
| 1907      | OS&Y Gate Valve, 6"  | EA   | 2.00      | 2,400.00        | 4,800             |
| 1908      | OS&Y Gate Valve, 2"  | EA   | 2.00      | 1,300.00        | 2,600             |
| 1512      | Main alarm check valve, 6"                                   | EA   | 3.00      | 2,200.00        | 6,600             |
| 1540      | Fire department valve assembly, 2-1/2"                       | EA   | 40.00     | 1,200.00        | 48,000            |
| 1881      | Fire Hose Cabinet  | EA   | 9.00      | 2,200.00        | 19,800            |
| 1843      | Fire Department Connection 4x4" c/w chain and cap            | EA   | 2.00      | 4,000.00        | 8,000             |
| 1508      | FP water service connection, 10"                             | EA   | 1.00      | 10,000.00       | 10,000            |
| 1514      | FPT, Fire protection test header                             | EA   | 1.00      | 1,500.00        | 1,500             |
| 1559      | Roof hydrant assembly-allow                                  | EA   | 1.00      | 1,500.00        | 1,500             |
| 1502      | Sprinkler heads c/w drop piping                              | EA   | 3,406.00  | 160.00          | 544,960           |
| 1940      | Hookup for Fire pump   | EA   | 1.00      | 2,000.00        | 2,000             |
| 1939      | Hookup for Jockey pump                                       | EA   | 1.00      | 1,000.00        | 1,000             |
| 1525      | Cap, 2.5"  | EA   | 8.00      | 150.00          | 1,200             |
| 1516      | Cap, 4"  | EA   | 30.00     | 100.00          | 3,000             |
| 1517      | Cap, 6"  | EA   | 5.00      | 200.00          | 1,000             |
| 2577      | Sprinkler system   | SF   | -857.00   | 2.50            | -2,143            |
| 2599      | 8" FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 35.00     | -40.00          | -1,400            |
| 2598      | 6", Fire riser piping c/w fittings, supports, etc.           | LF   | 500.00    | -35.00          | -17,500           |
| 2597      | 6" FSP, Fire specialty piping c/w fittings, supports, etc.   | LF   | 2,000.00  | -35.00          | -70,000           |
| 2595      | 4" SPK, Fire specialty piping c/w fittings, supports, etc.   | LF   | 10,350.00 | -20.00          | -207,000          |
| 2594      | 3", Drain riser piping c/w fittings, supports, etc.          | LF   | 500.00    | -17.50          | -8,750            |
| 2591      | 2.5" SPK, Fire specialty piping c/w fittings, supports, etc. | LF   | 550.00    | -16.25          | -8,938            |
|           | D4010 - Fire Suppression                                     |      |           | 7.81/SF         | 2,971,479         |
|           | 21 - FIRE SUPPRESSION  |      |           | 7.81/SF         | 2,971,479         |
|           |  |      |           |                 |                   |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

| A Building<br>A1 New Sch | nool Building (continued)  |      | GFAR: 3    | 30,570.00 SF (<br>Rates Current / | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|------------|-----------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty        | Rate<br>USD                       | Total Cost<br>USD                  |
| 22                       | PLUMBING   |      |            |                                   |                                    |
| D2010                    | Domestic Water Distribution  |      |            |                                   |                                    |
| 1886                     | Plumbing Fixtures  | Note |            |                                   |                                    |
| 2072                     | P-1, Water Closet - Flush Valve - Wall Mounted                                 | EA   | 33.00      | 1,700.00                          | 56,100                             |
| 2073                     | P-1A, Water Closet - Flush Valve - Wall Mounted, accessible                    | EA   | 54.00      | 1,850.00                          | 99,900                             |
| 2074                     | P-2, Urinal - Wall Hung  | EA   | 8.00       | 1,600.00                          | 12,800                             |
| 2075                     | P-2A, Urinal - Wall Hung, accessible   | EA   | 24.00      | 1,700.00                          | 40,800                             |
| 2076                     | P-3, Lavatory - Rectangular - Wall Mounted 19X17                               | EA   | 52.00      | 1,450.00                          | 75,400                             |
| 2077                     | P-3B, Basin Type Lavatory - Oval   | EA   | 7.00       | 1,250.00                          | 8,750                              |
| 2078                     | P-3C, Restroom Lavatory - Oval   | EA   | 6.00       | 1,250.00                          | 7,500                              |
| 2079                     | P-4,Mop Receptor   | EA   | 6.00       | 1,600.00                          | 9,600                              |
| 2404                     | P-4A, Mop Receptor, accessible   | EA   | 2.00       | 1,700.00                          | 3,400                              |
| 2080                     | P-5, Drinking Fountain - Recessed  | EA   | 9.00       | 2,800.00                          | 25,200                             |
| 2081                     | P-5A, Drinking Fountain - Bi-Level - Wall Mounted                              | EA   | 5.00       | 3,800.00                          | 19,000                             |
| 2082                     | P-6, Shower Base   | EA   | 7.00       | 2,500.00                          | 17,500                             |
| 2381                     | P-6A, Shower, accessible   | EA   | 4.00       | 3,500.00                          | 14,000                             |
| 2083                     | P-7, Emergency Eye Wash  | EA   | 7.00       | 1,500.00                          | 10,500                             |
| 2084                     | P-8, Emergency Eyewash-Shower  | EA   | 21.00      | 2,200.00                          | 46,200                             |
| 2085                     | PX-1, Sink - Casework Sink - Furnished by others -<br>Install only             | EA   | 48.00      | 450.00                            | 21,600                             |
| 2086                     | PX-2, Sink - Casework Sink with Eyewash- Furnished by others - Install only    | EA   | 7.00       | 450.00                            | 3,150                              |
| 2087                     | PX-3, Sink - Cosmetology Sink - Furnished by others -<br>Install only          | EA   | 15.00      | 450.00                            | 6,750                              |
| 2088                     | PX-4, Sink - Science Room Sink - Furnished by others - Install only            | EA   | 45.00      | 450.00                            | 20,250                             |
| 2089                     | PX-5, Sink - Lab Sink - Furnished by others - Install only                     | EA   | 35.00      | 450.00                            | 15,750                             |
| 2090                     | PX-6, Dental Station - Furnished by others - Install only                      | EA   | 16.00      | 600.00                            | 9,600                              |
| 2095                     | Allowance for missing/ miscellaneous plumbing fixtures(Main building building) | SF   | 411,003.00 | 0.15                              | 61,650                             |





GFAR: 380,570.00 SF Cost/SF: 417.58

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sc | hool Building (continued)  |      |        | Rates Current A | t January 2023    |
|----------|--|------|--------|-----------------|-------------------|
| Ref      | Description  | Unit | Qty    | Rate<br>USD     | Total Cost<br>USD |
| 447      | Water Distribution and Components  | Note |        |                 |                   |
| 2099     | Connection to main(6")- (Main building)  | EA   | 1.00   | 1,200.00        | 1,200             |
| 2103     | Capped-HW & CW connection(pg-9/note-5)   | EA   | 2.00   | 300.00          | 600               |
| 2104     | Plumbing fixture- hook up(domestic water)  | EA   | 245.00 | 400.00          | 98,000            |
| 2105     | Kitchen equipment - hook up(water)   | EA   | 80.00  | 500.00          | 40,000            |
| 2106     | Laboratory sink- hook up(water)  | EA   | 150.00 | 600.00          | 90,000            |
| 2107     | PX-6, Dental station- hook up(1/2" CW)   | EA   | 16.00  | 600.00          | 9,600             |
| 2108     | RB07, Water -hook up c/w BFP(1")   | EA   | 1.00   | 800.00          | 800               |
| 2112     | 6", Water meter c/w bfp assembly   | EA   | 1.00   | 13,000.00       | 13,000            |
| 2113     | Triplex booster pump(Syncroflo)  | EA   | 1.00   | 85,000.00       | 85,000            |
| 453      | Chlorine/PH monitor system with 100 gal. tanks - (allowance)                             | EA   | 1.00   | 10,000.00       | 10,000            |
| 458      | Chlorine/PH monitor system with 200 gal. tanks -<br>(allowance)                          | EA   | 1.00   | 18,000.00       | 18,000            |
| 2114     | PH-1, Neutralization system for science rooms  | EA   | 1.00   | 80,000.00       | 80,000            |
| 2115     | Backflow preventer(for NPCW to science rooms)  | EA   | 1.00   | 1,500.00        | 1,500             |
| 2116     | 1/2", Stacked reduced pressure backflow preventer(to serve janitors sink)(pg-21)         | EA   | 2.00   | 600.00          | 1,200             |
| 2117     | 3/4", Reduced pressure backflow preventer (allowance)(pg-13)                             | EA   | 1.00   | 800.00          | 800               |
| 2118     | 2", Stacked reduced pressure backflow preventer<br>(allowance)(pg-12)                    | EA   | 3.00   | 2,500.00        | 7,500             |
| 2119     | 2", Stacked reduced pressure backflow preventer (allowance)(pg-16)                       | EA   | 3.00   | 2,500.00        | 7,500             |
| 2120     | EWH-1, Electric storage water heater(Durawatt-460),<br>90 kW                             | EA   | 2.00   | 82,432.00       | 164,864           |
| 2121     | EWH-2, Electric storage water heater(Durawatt-460),<br>90 kW                             | EA   | 2.00   | 82,432.00       | 164,864           |
| 2122     | EWH-3, Electric storage water heater(DSE-100), 100 gal - (serves NPHW for science rooms) | EA   | 3.00   | 60,000.00       | 180,000           |
| 2123     | EWH-4, Electric storage water heater(Durawatt-460),<br>99 kW                             | EA   | 2.00   | 82,432.00       | 164,864           |
| 2124     | EWH-5, Electric storage water heater(DSE-10), 6 kW, 10 gal                               | EA   | 1.00   | 6,500.00        | 6,500             |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Scl | nool Building (continued)  |      |          | Rates Current A | t January 2023    |
|-----------|--|------|----------|-----------------|-------------------|
| Ref       | Description  | Unit | Qty      | Rate<br>USD     | Total Cost<br>USD |
| 2125      | Electric water heaters (serving plumbing vocational shop)(pg-8)  | EA   | 2.00     |                 | Incl.             |
| 2126      | Ceiling hung Electric water heater(serving toilet rooms & duplicating room sink)   | EA   | 1.00     |                 | Incl.             |
| 2127      | Gas fired water heater(serving plumbing/pipe fitting shop), 130 Gal, 400 CFH(PVI conquest condensing water heater)(pg-9) | EA   | 3.00     | 39,673.67       | 119,021           |
| 2131      | Temperature maintenance re-heater for NPHW system  | EA   | 1.00     | 10,000.00       | 10,000            |
| 2132      | HWRP, Recirculation pump   | EA   | 13.00    | 2,500.00        | 32,500            |
| 2133      | ET, Expansion tank   | EA   | 13.00    | 500.00          | 6,500             |
| 2134      | Mixing valve(serving water heaters)  | EA   | 13.00    | 500.00          | 6,500             |
| 2135      | Dual mixing valve assembly   | EA   | 1.00     | 750.00          | 750               |
| 2136      | Triple mixing valve assembly   | EA   | 1.00     | 1,000.00        | 1,000             |
| 2137      | Thermostatic mixing valve(serving kitchen- hand sink)<br>(pg-29- fixture schedule)                                       | EA   | 11.00    | 400.00          | 4,400             |
| 2138      | Emergency mixing valve(serving emergency eye wash)   | EA   | 2.00     | 400.00          | 800               |
| 2139      | Emergency mixing valve(serving emergency shower/<br>eye wash)  | EA   | 2.00     | 600.00          | 1,200             |
| 2140      | Housekeeping pad(to be carried elsewhere in this estimate)   | Note |          |                 | Excl.             |
| 2513      | Trap seal primer c/w tubing  | EA   | 170.00   | 300.00          | 51,000            |
| 2141      | HB, Hose bib   | EA   | 29.00    | 300.00          | 8,700             |
| 2142      | WH, Non freeze wall hydrant  | EA   | 9.00     | 500.00          | 4,500             |
| 2145      | 1/2" to 1", copper distribution c/w fittings, supports etc.  | LF   | 4,145.00 | 23.00           | 95,335            |
| 2146      | 1-1/4" to 1-1/2", copper distribution c/w fittings, supports etc.  | LF   | 3,748.00 | 40.00           | 149,920           |
| 2147      | 2" to 3", copper distribution c/w fittings, supports etc.  | LF   | 4,699.00 | 103.00          | 483,997           |
| 2148      | 4",copper distribution c/w fittings, supports etc.   | LF   | 322.00   | 215.00          | 69,230            |
| 2149      | 6",copper distribution c/w fittings, supports etc.   | LF   | 187.00   | 470.00          | 87,890            |
| 2150      | Thermal pipe insulation - 1/2" to 1" copper pipe   | LF   | 4,145.00 | 6.50            | 26,943            |
| 2151      | Thermal pipe insulation - 1-1/4" to 1-1/2" copper pipe   | LF   | 3,748.00 | 13.00           | 48,724            |
| 2152      | Thermal pipe insulation - 2" to 3", copper distribution  | LF   | 4,699.00 | 20.00           | 93,980            |

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**



GFAR: 380,570.00 SF Cost/SF: 417.58

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | nool Building (continued)  |      |            | Rates Current A | t January 2023    |
|-----------|--|------|------------|-----------------|-------------------|
| Ref       | Description  | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 2153      | Thermal pipe insulation - 4",copper distribution   | LF   | 322.00     | 25.00           | 8,050             |
| 2154      | Thermal pipe insulation - 6",copper distribution   | LF   | 187.00     | 35.00           | 6,545             |
| 2158      | Water meter c/w bfp assembly- hook up(6")  | EA   | 1.00       | 1,200.00        | 1,200             |
| 2159      | Triplex booster pump- hook up  | EA   | 1.00       | 4,000.00        | 4,000             |
| 2514      | Chlorine/PH monitor system- hook up  | EA   | 2.00       | 750.00          | 1,500             |
| 2160      | Neutralization system- hook up   | EA   | 1.00       | 8,000.00        | 8,000             |
| 2161      | Gas fired water heater- hook up  | EA   | 3.00       | 750.00          | 2,250             |
| 2162      | Electric water heater- hook up(small)  | EA   | 1.00       | 550.00          | 550               |
| 2164      | Electric water heater- hook up(large)  | EA   | 9.00       | 750.00          | 6,750             |
| 2166      | NPHW temperature maintenance station- hook up  | EA   | 1.00       | 750.00          | 750               |
| 2167      | Circulating pump - hook up   | EA   | 13.00      | 750.00          | 9,750             |
| 2168      | Expansion tank - hook up   | EA   | 13.00      | 300.00          | 3,900             |
| 2169      | Mixing valve - hook up   | EA   | 30.00      | 500.00          | 15,000            |
| 2170      | RBFP- hook up  | EA   | 10.00      | 550.00          | 5,500             |
| 1373      | Hookup - plumbing  | EA   | 38.00      | 400.00          | 15,200            |
| 2171      | Student plumbing booth- hook up(water)(pg-9/note-4)<br>(allowance)   | EA   | 33.00      | 400.00          | 13,200            |
| 2172      | Allowance for missing/ miscellaneous domestic water<br>system c/w fixture rough in, hot & cold water piping,<br>non-potable piping, tempered piping etc.(Main<br>building) | SF   | 411,003.00 | 0.25            | 102,751           |
| 2176      | Subcontractor GCs/GRs  | Item |            |                 | 227,000           |
| 2604      | Remove urinals and FD's from single occupancy toilet rooms (VE-P01)  | LS   | 1.00       | -85,000.00      | -85,000           |
| 2601      | Delete toilet room at Maintenance Building(VE-P02)   | LS   | 1.00       | -20,000.00      | -20,000           |
|           | D2010 - Domestic Water Distribution  |      |            | 8.83/SF         | 3,360,978         |
| D2020     | Sanitary Drainage  |      |            |                 |                   |
| 2177      | Connection to main   | EA   | 15.00      | 750.00          | 11,250            |
| 2178      | Plumbing fixture - hook-ups(sanitary & vent)   | EA   | 245.00     | 400.00          | 98,000            |
| 2179      | Kitchen equipment - hook up(sanitary/indirect waste & vent)  | EA   | 68.00      | 400.00          | 27,200            |
| 2180      | Laboratory sink- hook up(acid waste & vent)  | EA   | 150.00     | 600.00          | 90,000            |

### 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4



#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023 Unit Ref Description Qty Rate **Total Cost** USD USD PX-6, Dental station- hook up(waste & vent) 2181 EA 16.00 400.00 6,400 2183 Grease trap for triple sink, 50 gpm ΕA 3.00 11,000.00 33,000 ΕA 20,000.00 2185 Gas/oil interceptor (for garage drainage system) 4.00 80,000 2186 Local grease trap for dishwasher, 35 gpm ΕA 3.00 8,000.00 24,000 2187 Local grease trap(serving culinary arts kitchen), 50 EA 1.00 11,000.00 11,000 gpm 2317 Local grease trap, 75 gpm EA 1.00 22,000.00 22,000 2191 Gas/ oil separator(allowance) EA 1.00 8,000.00 8,000 2480 Condensate pump (assumed one per each FCU and EA 314.00 300.00 94,200 AC units) Trench drain(serving auto collision/auto technology & 2192 EA 8.00 350.00 2,800 metal fabrication areas) 2194 FD, Floor drain EA 162.00 450.00 72,900 ΕA 2195 8.00 500.00 4,000 Condensate receptor EA 6,000 2196 Kitchen grate 30.00 200.00 2197 CO. Clean out EA 113.00 350.00 39.550 2198 Clean out (serving acid waste) EA 25.00 450.00 11,250 LF 2205 1-1/2", Sanitary piping c/w fittings- Ag 13.00 38.00 494 2206 2", Sanitary piping c/w fittings - Ag LF 349.60 40.00 13,984 2207 LF 45.00 3", Sanitary piping c/w fittings - Ag 671.00 30,195 2208 4", Sanitary piping c/w fittings - Ag LF 1,478.70 50.00 73,935 2209 LF 60.00 6", Sanitary piping c/w fittings - Ag 489.00 29,340 2212 LF 66.30 40.00 2,652 2", Sanitary piping c/w fittings - Bg 2213 3", Sanitary piping c/w fittings - Bg LF 172.00 45.00 7,740 LF 2214 4", Sanitary piping c/w fittings - Bg 1,132.50 50.00 56,625 LF 2215 6", Sanitary piping c/w fittings - Bg 2,651.80 55.00 145,849 2217 2", Acid waste drainage PP piping- Single containment LF 816.00 61.00 49,776 c/w fittings-Ag 2218 3", Acid waste drainage PP piping- Single containment LF 1.061.00 88.00 93.368 c/w fittings-Ag 4", Acid waste drainage PP piping- Single containment LF 116.00 36.076 2219 311.00 c/w fittings-Ag



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

Duilding (continued) А

| 1 New Sch | nool Building (continued)   |      |            | Rates Current A | t January 2023    |
|-----------|---|------|------------|-----------------|-------------------|
| Ref       | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 2263      | No excavation & backfill- assumed   | Note |            |                 | Excl.             |
| 2262      | No cutting and patching assumed   | Note |            |                 | Excl.             |
| 2383      | 8", Radon mitigation vent riser from below slab   | EA   | 14.00      |                 | Incl.             |
| 2225      | Allowance for vent piping   | LS   | 1.00       | 240,000.00      | 240,000           |
| 2229      | 8", Vent piping c/w fitting, support, etc (radon<br>mitigation) (Riser from lower slab till roof serving every<br>10,000 SF)                | LF   | 1,008.00   | 65.00           | 65,520            |
| 2230      | Allowance for acid vent piping  | LS   | 1.00       | 140,000.00      | 140,000           |
| 2400      | Student plumbing booth- hook up(drain)(pg-9/note-4)   | EA   | 34.00      | 400.00          | 13,600            |
| 2234      | Allowance for missing/ miscellaneous sanitary<br>drainage system c/w piping, vents, ejectors, clean-out,<br>acid waste, etc.(Main building) | SF   | 411,003.00 | 0.25            | 102,751           |
| 2238      | Subcontractor GCs/GRs   | Item |            |                 | 87,000            |
|           | D2020 - Sanitary Drainage   |      |            | 4.81/SF         | 1,830,455         |
| D2030     | Building Support Plumbing Systems   |      |            |                 |                   |
| 1883      | Connection to main  | EA   | 9.00       | 750.00          | 6,750             |
| 1884      | SP-1, Simplex elevator pit sump pump, 50 gpm  | EA   | 1.00       | 7,500.00        | 7,500             |
| 1885      | SP-2, Simplex elevator pit sump pump, 50 gpm  | EA   | 1.00       | 7,500.00        | 7,500             |
| 2240      | Scupper type drains(at low roof)/(pg-24/note-1)   | EA   | 10.00      | 500.00          | 5,000             |
| 2241      | 3" TD, Terrace drain c/w grate  | EA   | 4.00       | 550.00          | 2,200             |
| 2242      | 4" RD/OFD, Roof Drain/ Overflow drain   | EA   | 93.00      | 1,200.00        | 111,600           |
| 2243      | 6" RD/OFD, Roof Drain/ Overflow drain   | EA   | 3.00       | 1,300.00        | 3,900             |
| 2244      | Flat grate under pavers(serving roof drains)(pg-10)   | EA   | 2.00       | 200.00          | 400               |
| 2245      | Clean out   | EA   | 85.00      | 350.00          | 29,750            |
| 2246      | 4", Storm drain piping c/w fittings, supports - Ag  | LF   | 1,876.84   | 70.00           | 131,379           |
| 2247      | 6", Storm drain piping c/w fittings, supports - Ag  | LF   | 4,801.90   | 110.00          | 528,209           |
| 2248      | 8", Storm drain piping c/w fittings, supports - Ag  | LF   | 741.00     | 180.00          | 133,380           |
| 2250      | 4", Storm drain piping c/w fittings, supports - Bg  | LF   | 4.00       | 57.00           | 228               |
| 2251      | 6", Storm drain piping c/w fittings, supports - Bg  | LF   | 446.70     | 100.00          | 44,670            |
| 2252      | 8", Storm drain piping c/w fittings, supports - Bg  | LF   | 498.00     | 142.00          | 70,716            |
| 2253      | 10", Storm drain piping c/w fittings, supports - Bg   | LF   | 316.00     | 186.00          | 58,776            |
| 2254      | No excavation & backfill- assumed   | Note |            |                 | Excl.             |



GFAR: 380,570.00 SF Cost/SF: 417.58

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

| AT New Sci | ioor Building (continued)   |      |            | Rates Current A | t January 2023    |
|------------|---|------|------------|-----------------|-------------------|
| Ref        | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 2255       | No cutting and patching assumed   | Note |            |                 | Excl.             |
| 2256       | Elevator pit sump pump- hook up   | EA   | 2.00       | 1,500.00        | 3,000             |
| 2257       | Allowance for missing/ miscellaneous storm water drainage system(Main building)   | SF   | 411,003.00 | 0.20            | 82,201            |
| 2261       | Subcontractor GCs/GRs   | Item |            |                 | 86,000            |
|            | _<br>D2030 - Building Support Plumbing Systems  |      |            | 3.45/SF         | 1,313,159         |
| D2050      | General Service Compressed-Air  |      |            |                 |                   |
| 1893       | AC-1, Air compressor(auto collision/ metal fabrication)<br>c/w receiver & dryer   | EA   | 1.00       | 53,448.00       | 53,448            |
| 1898       | AC-2, Air compressor c/w tank(Votech shops)   | EA   | 1.00       | 33,032.00       | 33,032            |
| 1900       | AC-3, Air compressor c/w tank (Biotech shops)   | EA   | 1.00       | 38,820.00       | 38,820            |
| 1901       | AC-4, Air compressor c/w tank (Draft and design)  | EA   | 1.00       | 18,735.00       | 18,735            |
| 2264       | AC-5, Air compressor c/w tank (Dental)  | EA   | 1.00       | 78,500.00       | 78,500            |
| 2265       | AC-6, Air compressor c/w tank (Robotics)  | EA   | 1.00       | 19,000.00       | 19,000            |
| 2266       | 400 gal, Air receiver tank(serving AC-1)  | EA   | 1.00       |                 | Incl.             |
| 2267       | Air dryer(serving AC-1)   | EA   | 1.00       |                 | Incl.             |
| 2268       | Master compressed air shut-off(for auto collision area)<br>(allowance)  | EA   | 1.00       | 2,500.00        | 2,500             |
| 2271       | Compressed air - branch piping  | LF   | 487.00     | 40.00           | 19,480            |
| 2272       | Compressed air - main piping  | LF   | 2,757.00   | 47.00           | 129,579           |
| 2273       | Compressed air- hook up c/w pressure gauge, air filter, condensate filter, pressure regulator   | EA   | 44.00      | 500.00          | 22,000            |
| 2274       | Compressed air- hook up c/w shutoff valve, pressure gauge, air filter, condensate filter, pressure regulator (pg-21/note-1)                             | EA   | 9.00       | 550.00          | 4,950             |
| 2275       | Compressed air- hook up c/w shut off valve, pressure<br>gauge, air filter, air pressure regulator, 50' hose reel<br>(pg-8/note-1)(Carpentry shop)       | EA   | 15.00      | 1,800.00        | 27,000            |
| 2397       | Compressed air- hook up c/w shut off valve, pressure<br>gauge, air filter, air pressure regulator, 50' hose reel<br>(pg-9/note-1)(HVAC technology shop) | EA   | 10.00      | 1,800.00        | 18,000            |
| 2276       | Compressed air- paint booth- hook up  | EA   | 2.00       | 550.00          | 1,100             |
| 2277       | Compressed air- hook up( to equipment)  | EA   | 1.00       | 550.00          | 550               |
| 2278       | Air compressor - hook up  | EA   | 6.00       | 550.00          | 3,300             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Buildina

| A1 New Sch | nool Building (continued)   |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------|---|------|------------|--------------------------------|------------------------------------|
| Ref        | Description   | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 2279       | Air compressor tank- hook up  | EA   | 6.00       | 550.00                         | 3,300                              |
| 2280       | Air receiver - hook up  | EA   | 1.00       | 550.00                         | 550                                |
| 2281       | Air dryer- hook up  | EA   | 1.00       | 550.00                         | 550                                |
| 2282       | Dust collector- hook up   | EA   | 1.00       | 550.00                         | 550                                |
| 2283       | Dental station- hook up(CA)   | EA   | 16.00      | 550.00                         | 8,800                              |
| 2284       | Biotech labs- ceiling panels- hook up(CA)(allowance)  | EA   | 5.00       | 550.00                         | 2,750                              |
| 2285       | Allowance for missing/ miscellaneous compressed air system(Main building)   | SF   | 411,003.00 | 0.50                           | 205,502                            |
| 2289       | Subcontractor GCs/GRs   | Item |            |                                | 48,000                             |
|            | D2050 - General Service Compressed-Air  |      |            | 1.94/SF                        | 739,996                            |
| D2060      | Process Support Plumbing Systems  |      |            |                                |                                    |
| 1895       | VAC-1, Vacuum pump(biotech lab)   | EA   | 1.00       | 19,700.00                      | 19,700                             |
| 2290       | VAC-2, Vacuum pump(dental)  | EA   | 1.00       | 18,000.00                      | 18,000                             |
| 2291       | Gas meter assembly(to be by others)   | EA   | 1.00       |                                | Excl.                              |
| 2398       | Kitchen emergency gas shut-off system c/w main<br>control panel, shut-off switch, gas solenoid valve, CO<br>detectors, etc(allowance) | EA   | 4.00       | 5,000.00                       | 20,000                             |
| 2293       | Vacuum piping c/w fittings, support, etc- main  | LF   | 296.00     | 55.00                          | 16,280                             |
| 2295       | 1-1/4" to 1-1/2", Sch.40 steel natural gas distribution c/w fittings, supports etc.   | LF   | 6.00       | 45.00                          | 270                                |
| 2296       | 2" to 2-1/2",Sch.40 steel natural gas distribution c/w fittings, supports etc.  | LF   | 52.00      | 80.00                          | 4,160                              |
| 2297       | 3",Sch.40 steel natural gas distribution c/w fittings, supports etc.  | LF   | 121.00     | 100.00                         | 12,100                             |
| 2298       | 4",Sch.40 steel natural gas distribution c/w fittings, supports etc.  | LF   | 822.00     | 120.00                         | 98,640                             |
| 2300       | Oxygen piping c/w fittings, support, etc  | LF   | 167.00     | 55.00                          | 9,185                              |
| 2301       | Argon piping c/w fittings, support, etc   | LF   | 166.00     | 55.00                          | 9,130                              |
| 1747       | Allowances for argon piping   | LF   | 713.00     | 55.00                          | 39,215                             |
| 2302       | Acetylene piping c/w fittings, support, etc   | LF   | 168.00     | 55.00                          | 9,240                              |
| 2303       | Welding booth -hook up(O2)  | EA   | 22.00      | 550.00                         | 12,100                             |
| 2304       | Welding booth -hook up(Ar)  | EA   | 22.00      | 550.00                         | 12,100                             |
| 2305       | Welding booth -hook up(C2H2- acetylene)   | EA   | 22.00      | 550.00                         | 12,100                             |
|            |   |      |            |                                |                                    |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| A1 New School Building (continued) |   |      |            | Rates Current A | t January 2023    |
|------------------------------------|---|------|------------|-----------------|-------------------|
| Ref                                | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 1757                               | Allowances for miscellaneous argon, oxygen & acetylene hookups              | LS   | 1.00       | 25,000.00       | 25,000            |
| 2306                               | Oxygen storage tank- hook up c/w manifolds, shutoff valves, etc             | EA   | 1.00       | 10,000.00       | 10,000            |
| 2307                               | Argon storage tank- hook up c/w manifolds, shutoff valves, etc              | EA   | 1.00       | 10,000.00       | 10,000            |
| 2308                               | Acetylene storage tank- hook up c/w manifolds, shutoff valves, etc          | EA   | 1.00       | 10,000.00       | 10,000            |
| 2517                               | Vacuum pump- hook up  | EA   | 2.00       | 1,500.00        | 3,000             |
| 2309                               | Biotech labs- ceiling panels- hook up(Vacuum)<br>(allowance)                | EA   | 5.00       | 550.00          | 2,750             |
| 2310                               | Dental station- hook up(Vacuum)   | EA   | 16.00      | 550.00          | 8,800             |
| 2399                               | Kitchen emergency gas shut-off system- hook up                              | EA   | 4.00       | 550.00          | 2,200             |
| 2311                               | Water heater - hook up(NG)  | EA   | 3.00       | 550.00          | 1,650             |
| 2312                               | Paint booth- hook up(NG)  | EA   | 2.00       | 550.00          | 1,100             |
| 2313                               | Kitchen equipment - hook up(natural gas)                                    | EA   | 24.00      | 550.00          | 13,200            |
| 2314                               | Biotech labs- ceiling panels- hook up(NG)(allowance)                        | EA   | 5.00       | 550.00          | 2,750             |
| 2531                               | Student plumbing booth- hook up(NG)   | EA   | 34.00      | 550.00          | 18,700            |
| 1756                               | Allowances for misc NG valves and accessories                               | LS   | 1.00       | 15,000.00       | 15,000            |
| 1746                               | Main control panel at each gas hood - allow                                 | No   | 8.00       | 4,000.00        | 32,000            |
| 2315                               | Allowances for additional main building gas system (natural gas/O2/Ar/C2H2) | SF   | 411,003.00 | 0.25            | 102,751           |
| 2316                               | Subcontractor GCs/GRs   | Item |            |                 | 55,000            |
|                                    | D2060 - Process Support Plumbing Systems                                    |      |            | 1.59/SF         | 606,121           |
|                                    | 22 - PLUMBING   |      |            | 20.63/SF        | 7,850,709         |
| 23                                 | HEATING, VENTILATING, AND AIR CONDITIONING                                  |      |            |                 |                   |
| D3020                              | Heat Systems  |      |            |                 |                   |
| 1847                               | EUH-1, Electric unit heater, 15 kW  | EA   | 15.00      | 2,750.00        | 41,250            |
| 1865                               | EUH-2, Electric unit heater, 1.5 kW   | EA   | 15.00      | 1,200.00        | 18,000            |
| 1866                               | EUH-3, Electric unit heater, 3 kW   | EA   | 6.00       | 1,600.00        | 9,600             |
| 1867                               | EUH-4 & 5, Electric unit heater, 10 kW                                      | EA   | 9.00       | 2,250.00        | 20,250            |
|                                    | D3020 - Heat Systems  |      |            | 0.23/SF         | 89,100            |



### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New Sch | nool Building (continued)   |      | GFAR: 3   | 80,570.00 SF C<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|-----------|---|------|-----------|-----------------------------------|------------------------------------|
| Ref       | Description   | Unit | Qty       | Rate<br>USD                       | Total Cost<br>USD                  |
| D3030     | Cooling Systems   |      |           |                                   |                                    |
| 1667      | LG HVAC equipments consisting of DX-split units,<br>FCU c/w condenser units, branch circuit controllers,<br>VCU's (serving RTU's, MAU's, AHU's, HRU's), etc.                        | LS   | 1.00      | 3,692,000.00                      | 3,692,000                          |
| 1189      | AC- 0-1/6/7 / 1-3 / 2-4, DX split system air conditioning<br>unit 3 ton, 36 mbh cooling capacity c/w outdoor air-<br>cooled condensing unit   | EA   | 4.00      |                                   | Incl.                              |
| 1190      | AC- 0-2 to 0-5 / 1-1/2/4 to 10 / 2-1/2/3/5 to 10 / 3-1 to 6 / 4-1 to 7, DX split system air conditioning unit 2 ton, 24 mbh cooling capacity c/w outdoor air-cooled condensing unit | EA   | 32.00     |                                   | Incl.                              |
| 1859      | AC-H-01 to 03 / 04.1 to 04.4 / , DX split system air conditioning unit 1.5 ton, 18 mbh cooling capacity c/w outdoor air-cooled condensing unit                                      | EA   | 7.00      |                                   | Incl.                              |
| 1860      | AC-H-05 - 06, DX split system air conditioning unit 4<br>ton, 48 mbh cooling capacity c/w outdoor air-cooled<br>condensing unit   | EA   | 2.00      |                                   | Incl.                              |
| 1193      | FCU, DX-cooled fan coil units 0.5 ton   | EA   | 41.00     |                                   | Incl.                              |
| 1194      | FCU, DX-cooled fan coil units 0.6 ton   | EA   | 21.00     |                                   | Incl.                              |
| 1195      | FCU, DX-cooled fan coil units 0.8 ton   | EA   | 27.00     |                                   | Incl.                              |
| 1197      | FCU, DX-cooled fan coil units 1 ton   | EA   | 5.00      |                                   | Incl.                              |
| 1196      | FCU, DX-cooled fan coil units 1.3 ton   | EA   | 9.00      |                                   | Incl.                              |
| 1198      | FCU, DX-cooled fan coil units 1.5 ton   | EA   | 15.00     |                                   | Incl.                              |
| 1200      | FCU, DX-cooled fan coil units 2 ton   | EA   | 42.00     |                                   | Incl.                              |
| 1202      | FCU, DX-cooled fan coil units 2.3 ton   | EA   | 11.00     |                                   | Incl.                              |
| 1203      | FCU, DX-cooled fan coil units 3 ton   | EA   | 68.00     |                                   | Incl.                              |
| 1204      | FCU, DX-cooled fan coil units 3.5 ton   | EA   | 16.00     |                                   | Incl.                              |
| 1205      | FCU, DX-cooled fan coil units 4 ton   | EA   | 10.00     |                                   | Incl.                              |
| 1206      | FCU, DX-cooled fan coil units 4.5 ton   | EA   | 4.00      |                                   | Incl.                              |
| 1568      | Refrigeration piping c/w fittings, supports, etc.   | LF   | 52,802.00 | 45.00                             | 2,376,090                          |
| 1684      | Allowance for refrigerant   | Lb   | 12,700.00 | 25.00                             | 317,500                            |
| 1709      | RTU - hook ups  | EA   | 2.00      | 750.00                            | 1,500                              |
| 1710      | MAU - hook ups  | EA   | 2.00      | 750.00                            | 1,500                              |
| 1711      | HRU - hook ups  | EA   | 5.00      | 750.00                            | 3,750                              |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Buildina

| A1 New Sc | hool Building (continued)   |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|-----------|---|------|------------|--------------------------------|------------------------------------|
| Ref       | Description   | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 1712      | AHU - hook ups  | EA   | 10.00      | 750.00                         | 7,500                              |
| 1713      | ERV - hook ups  | EA   | 5.00       | 750.00                         | 3,750                              |
| 1974      | FCU - hook ups  | EA   | 269.00     | 500.00                         | 134,500                            |
| 1975      | AC units - hook ups   | EA   | 45.00      | 500.00                         | 22,500                             |
| 2481      | Allowance for missing/ miscellaneous  | SF   | 493,374.89 | 0.40                           | 197,350                            |
|           | D3030 - Cooling Systems   |      |            | 17.76/SF                       | 6,757,940                          |
| D3050     | Facility HVAC Distribution Systems  |      |            |                                |                                    |
| 1677      | YORK HVAC equipments consisting of RTU's, AHU's, MAU's and HRU's  | LS   | 1.00       | 6,799,000.00                   | 6,799,000                          |
| 1154      | RTU-1, DX-cooled roof-top air handling unit, 1,165 cfm c/w air-cooled VRF condensing units (6 ton), electric pre heat, etc.               | EA   | 1.00       |                                | Incl.                              |
| 1155      | RTU-2, DX-cooled roof-top air handling unit, 14,000<br>cfm c/w air-cooled VRF condensing units (3 x 16 ton),<br>electric pre heat, etc.   | EA   | 1.00       |                                | Incl.                              |
| 1157      | MAU-1, DX-cooled make-up air unit, 6,510 cfm c/w air-<br>cooled VRF condensing units (2 x 18 ton), electric pre<br>heat, etc.             | EA   | 1.00       |                                | Incl.                              |
| 1158      | MAU-2, DX-cooled make-up air unit, 15,605 cfm c/w<br>air-cooled VRF condensing units (3 x 30 ton), electric<br>pre heat, etc.             | EA   | 1.00       |                                | Incl.                              |
| 1159      | AHU-1 & 2, DX-cooled indoor air handling unit, 20,000<br>cfm c/w air-cooled VRF condensing units (3 x22 ton),<br>electric pre heat, etc.  | EA   | 2.00       |                                | Incl.                              |
| 1160      | AHU-3, DX-cooled indoor air handling unit, 15,475 cfm<br>c/w air-cooled VRF condensing units (2 x 26 ton),<br>electric pre heat, etc.     | EA   | 1.00       |                                | Incl.                              |
| 1161      | AHU-4, DX-cooled indoor air handling unit, 9,405 cfm c/w air-cooled VRF condensing units (2 x18 ton & 2 x14 ton), electric pre heat, etc. | EA   | 1.00       |                                | Incl.                              |
| 1162      | AHU-5, DX-cooled indoor air handling unit, 7,275 cfm<br>c/w air-cooled VRF condensing units (2 x12 ton),<br>electric pre heat, etc.       | EA   | 1.00       |                                | Incl.                              |
| 1163      | AHU-6, DX-cooled indoor air handling unit, 6,570 cfm c/w air-cooled VRF condensing units (2 x10 ton), electric pre heat, etc.             | EA   | 1.00       |                                | Incl.                              |
|           |   |      |            |                                |                                    |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

| 1 New School Building (continued) |   | Rates Current At January 2023 |      |             |                   |
|-----------------------------------|---|-------------------------------|------|-------------|-------------------|
| Ref                               | Description   | Unit                          | Qty  | Rate<br>USD | Total Cost<br>USD |
| 1164                              | AHU-7, DX-cooled indoor air handling unit, 8,265 cfm c/w air-cooled VRF condensing units (2 x14 ton), electric pre heat, etc.                         | EA                            | 1.00 |             | Incl.             |
| 1165                              | AHU-8, DX-cooled indoor air handling unit, 10,255 cfm c/w air-cooled VRF condensing units (2 x20 ton), electric pre heat, etc.                        | EA                            | 1.00 |             | Incl.             |
| 1166                              | AHU-9, DX-cooled indoor air handling unit, 3,555 cfm<br>c/w air-cooled VRF condensing units (2 x14 ton),<br>electric pre heat, etc.                   | EA                            | 1.00 |             | Incl.             |
| 1167                              | AHU-10, DX-cooled indoor air handling unit, 9,485 cfm<br>c/w air-cooled VRF condensing units (2 x22 ton),<br>electric pre heat, etc.                  | EA                            | 1.00 |             | Incl.             |
| 1142                              | ERV-1, Energy recovery ventilator, 695 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.   | EA                            | 1.00 | 13,000.00   | 13,000            |
| 1143                              | ERV-2, Energy recovery ventilator, 285 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.   | EA                            | 1.00 | 6,000.00    | 6,000             |
| 1144                              | ERV-3, Energy recovery ventilator, 1,100 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.   | EA                            | 1.00 | 20,000.00   | 20,000            |
| 1145                              | ERV-4, Energy recovery ventilator, 1,795 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.   | EA                            | 1.00 | 32,500.00   | 32,500            |
| 1840                              | ERV-7, Energy recovery ventilator, 250 cfm, c/w air-<br>cooled VRF condensing unit, electric pre heat, etc.   | EA                            | 1.00 | 5,500.00    | 5,500             |
| 1150                              | HRU-1 to 3, DX-cooled dedicated outdoor air roof-top<br>units, 16,000 cfm c/w air-cooled VRF condensing units<br>(3 x24 ton), electric pre heat, etc. | EA                            | 3.00 |             | Incl.             |
| 1151                              | HRU-4, DX-cooled dedicated outdoor air roof-top<br>units, 7,070 cfm c/w air-cooled VRF condensing units<br>(2 x18 ton), electric pre heat, etc.       | EA                            | 1.00 |             | Incl.             |
| 1153                              | HRU-5, DX-cooled dedicated outdoor air roof-top<br>units, 2,760 cfm c/w air-cooled VRF condensing units<br>(2 x 6 ton), electric pre heat, etc.       | EA                            | 1.00 |             | Incl.             |
| 1168                              | F-1 & 8, Exhaust fan, 600 cfm   | EA                            | 2.00 | 1,250.00    | 2,500             |
| 1169                              | F-2, 4 & 17, Exhaust fan, 900 cfm   | EA                            | 3.00 | 1,875.00    | 5,625             |
| 1170                              | F-3, Exhaust fan, 9,600 cfm   | EA                            | 1.00 | 20,000.00   | 20,000            |
| 1171                              | F-5, Exhaust fan, 2,600 cfm   | EA                            | 1.00 | 5,415.00    | 5,415             |
| 1174                              | F-7, Exhaust fan, 2,100 cfm   | EA                            | 1.00 | 4,370.00    | 4,370             |



GFAR: 380,570.00 SF Cost/SF: 417.58

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

| 1 New School Building (continued) Rates Current At Ja |  |      | t January 2023 |             |                   |
|---|--|------|----------------|-------------|-------------------|
| Ref   | Description  | Unit | Qty            | Rate<br>USD | Total Cost<br>USD |
| 1175  | F-9, Exhaust fan, 500 cfm  | EA   | 1.00           | 1,050.00    | 1,050             |
| 1178  | F-11 & 12, Exhaust fan, 360 cfm  | EA   | 2.00           | 750.00      | 1,500             |
| 1180  | F-13, Exhaust fan, 18,400 cfm  | EA   | 1.00           | 38,275.00   | 38,275            |
| 1181  | F-15 & 16, Exhaust fan, 15,000 cfm   | EA   | 2.00           | 31,200.00   | 62,400            |
| 1182  | F-18, Exhaust fan, 415 cfm   | EA   | 1.00           | 950.00      | 950               |
| 1849  | F-20, Exhaust fan, 450 cfm   | EA   | 1.00           | 950.00      | 950               |
| 1183  | KEF-1, Kitchen exhaust fan, 2,800 cfm  | EA   | 2.00           | 5,825.00    | 11,650            |
| 1184  | KEF-2, Kitchen exhaust fan, 3,300 cfm  | EA   | 2.00           | 5,870.00    | 11,740            |
| 1185  | KEF-3, Kitchen exhaust fan, 1,850 cfm  | EA   | 1.00           | 3,850.00    | 3,850             |
| 1186  | KEF-4, Kitchen exhaust fan, 2,365 cfm  | EA   | 1.00           | 4,925.00    | 4,925             |
| 1188  | KEF-5, Kitchen exhaust fan, 9,390 cfm  | EA   | 1.00           | 10,725.00   | 10,725            |
| 1878  | DF-1, Destratification fan, 18' blade dia  | EA   | 2.00           | 19,550.00   | 39,100            |
| 1872  | FTU-1 to 3, Fan terminal unit - electric heating, 1590<br>cfm, 16 kW             | EA   | 3.00           | 1,250.00    | 3,750             |
| 1873  | FTU-4, Fan terminal unit - electric heating, 825 cfm, 8<br>kW                    | EA   | 1.00           | 950.00      | 950               |
| 1874  | FTU-5 & 6, Fan terminal unit - electric heating, 1230 cfm, 12 kW                 | EA   | 2.00           | 1,150.00    | 2,300             |
| 1875  | FTU-7, Fan terminal unit - electric heating, 1500 cfm,<br>15 kW                  | EA   | 1.00           | 1,250.00    | 1,250             |
| 1876  | FTU-8 & 9, Fan terminal unit - electric heating, 2250 cfm, 22 kW                 | EA   | 2.00           | 1,750.00    | 3,500             |
| 1191  | Allowance for relocation of existing Dust collector including fan and abort gate | EA   | 1.00           | 5,000.00    | 5,000             |
| 1982  | Kitchen exhaust hood   | EA   | 2.00           | 2,500.00    | 5,000             |
| 1877  | Sound attenuators  | EA   | 10.00          | 8,000.00    | 80,000            |
| 1192  | BS, VRF branch circuit selector  | EA   | 46.00          |             | Incl.             |
| 1209  | Air cleaners (Airboss 2500)  | EA   | 3.00           | 4,000.00    | 12,000            |
| 1972  | VAV box (small)  | EA   | 267.00         | 1,350.00    | 360,450           |
| 2592  | VAV box (small) - VE   | EA   | -60.00         | 1,350.00    | -81,000           |
| 1305  | VAV box (medium)   | EA   | 21.00          | 1,750.00    | 36,750            |
| 2596  | VAV box (medium) - VE  | EA   | 20.00          | 1,750.00    | 35,000            |
|   |  |      |                |             |                   |





GFAR: 380,570.00 SF Cost/SF: 417.58

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

| 1 New Sci | nool Building (continued)  |      |            | Rates Current A | At January 2023   |
|-----------|--|------|------------|-----------------|-------------------|
| Ref       | Description  | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 1306      | VAV box (large)  | EA   | 1.00       | 2,500.00        | 2,500             |
| 1216      | Galvanized duct work c/w fittings, supports, etc.                  | Lb   | 344,250.00 | 15.00           | 5,163,750         |
| 1217      | Thermal insulation   | SF   | 136,000.00 | 6.50            | 884,000           |
| 1243      | 4" to 6", Round galvanized duct work c/w fittings, supports, etc   | LF   | 3,095.80   | 65.00           | 201,227           |
| 1242      | 7" to 8", Round galvanized duct work c/w fittings, supports, etc   | LF   | 1,701.00   | 70.00           | 119,070           |
| 1346      | 10" to 12", Round galvanized duct work c/w fittings, supports, etc | LF   | 2,539.60   | 80.00           | 203,168           |
| 1241      | 14" to 16", Round galvanized duct work c/w fittings, supports, etc | LF   | 1,357.00   | 85.00           | 115,345           |
| 1245      | 18" to 20", Round galvanized duct work c/w fittings, supports, etc | LF   | 134.09     | 90.00           | 12,068            |
| 1317      | 22" to 24", Round galvanized duct work c/w fittings, supports, etc | LF   | 257.00     | 95.00           | 24,415            |
| 1968      | 26" to 28", Round galvanized duct work c/w fittings, supports, etc | LF   | 610.00     | 110.00          | 67,100            |
| 1220      | 30" to 32", Round galvanized duct work c/w fittings, supports, etc | LF   | 1,053.00   | 125.00          | 131,625           |
| 1223      | 34" to 36", Round galvanized duct work c/w fittings, supports, etc | LF   | 1,197.00   | 130.00          | 155,610           |
| 1225      | 38" to 40", Round galvanized duct work c/w fittings, supports, etc | LF   | 457.00     | 150.00          | 68,550            |
| 1226      | 42" to 44", Round galvanized duct work c/w fittings, supports, etc | LF   | 386.00     | 155.00          | 59,830            |
| 1978      | 46", Round galvanized duct work c/w fittings, supports, etc        | LF   | 96.00      | 160.00          | 15,360            |
| 1397      | 48" to 50", Round galvanized duct work c/w fittings, supports, etc | LF   | 1,038.00   | 165.00          | 171,270           |
| 2070      | 52" to 54", Round galvanized duct work c/w fittings, supports, etc | LF   | 29.00      | 170.00          | 4,930             |
| 1228      | 60", Round SS duct work c/w fittings, supports, etc                | LF   | 99.00      | 180.00          | 17,820            |
| 1302      | Diffusers (small)  | EA   | 8.00       | 150.00          | 1,200             |
| 1218      | A & A1, Diffusers (medium)   | EA   | 279.00     | 250.00          | 69,750            |
| 1301      | A3, Side-wall diffuser   | EA   | 11.00      | 300.00          | 3,300             |





#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 417.58 Rates Current At January 2023

| Ref  | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|------|--|------|------------|-------------|-------------------|
| 1969 | D/D1/D2, Linear slot diffuser  | EA   | 96.00      | 450.00      | 43,200            |
| 1970 | E/H, Linear slot diffuser  | EA   | 46.00      | 450.00      | 20,700            |
| 1971 | F/G, Linear slot diffuser  | EA   | 182.00     | 475.00      | 86,450            |
| 1290 | Grilles (small)  | EA   | 2.00       | 100.00      | 200               |
| 1300 | C/C1, Grilles (medium)   | EA   | 284.00     | 175.00      | 49,700            |
| 1303 | C2, Side-wall grilles  | EA   | 26.00      | 350.00      | 9,100             |
| 1236 | Louver   | SF   | 1,093.00   | 75.00       | 81,975            |
| 2421 | Plenum, 48"x12"x8"   | EA   | 16.00      | 1,300.00    | 20,800            |
| 2071 | Plenum, 84"x6"   | EA   | 1.00       | 2,000.00    | 2,000             |
| 1399 | Plenum, 60"x10"  | EA   | 11.00      | 1,500.00    | 16,500            |
| 1321 | Plenum, 36"  | EA   | 1.00       | 1,750.00    | 1,750             |
| 2069 | Plenum, 48"x30"  | EA   | 1.00       | 1,750.00    | 1,750             |
| 1979 | Plenum, 90"x78"  | EA   | 2.00       | 2,500.00    | 5,000             |
| 1247 | Plenum, 96"x50"  | EA   | 3.00       | 2,250.00    | 6,750             |
| 1246 | Tubing storage reel (CAR-MON TSR-S32)  | EA   | 2.00       | 1,800.00    | 3,600             |
| 1248 | Tubing storage reel (CAR-MON TSR-S24)  | EA   | 6.00       | 1,500.00    | 9,000             |
| 1980 | LTX flex hose, 4" dia x 15' type c/w RYA dual adaptor, tube sling, spring balancer and flahe set | EA   | 6.00       | 1,250.00    | 7,500             |
| 1299 | BD, Balancing damper   | EA   | 330.00     | 500.00      | 165,000           |
| 1976 | BD, Balancing damper (large)   | EA   | 8.00       | 850.00      | 6,800             |
| 1572 | Combination fire/smoke damper  | EA   | 21.00      | 750.00      | 15,750            |
| 1977 | FD, Fire damper  | EA   | 12.00      | 550.00      | 6,600             |
| 1983 | Bryant OVM096 oil fired furnace  | EA   | 2.00       | 11,500.00   | 23,000            |
| 1984 | York TL8E 95% efficient furnace  | EA   | 4.00       | 10,000.00   | 40,000            |
| 1981 | Relocate and installation of spark detection and<br>suppression system                           | EA   | 1.00       | 3,000.00    | 3,000             |
| 1567 | Allowance for miscellaneous/missing items  | SF   | 411,859.00 | 2.00        | 823,718           |
| 2199 | 1/2" to 1", Condensate piping c/w fittings - Ag  | LF   | 7,119.00   | 35.00       | 249,165           |
| 2200 | 1-1/4" to 1-1/2", Condensate piping c/w fittings- Ag   | LF   | 2,017.00   | 40.00       | 80,680            |
| 2201 | 2", Condensate piping c/w fittings - Ag  | LF   | 124.00     | 45.00       | 5,580             |
| 2203 | Condensate piping from walk-in cooler/ walk-in freezer   | LF   | 30.00      | 35.00       | 1,050             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

| A1 New School Building (continued) |  |      | GFAR: 3    | 380,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------------------------------|--|------|------------|--------------------------------|------------------------------------|
| Ref                                | Description  | Unit | Qty        | Rate<br>USD                    | Total Cost<br>USD                  |
| 2540                               | Equipment cost adjustment, confirmed in meeting  | LS   | 1.00       | -100,000.00                    | -100,000                           |
| 2578                               | HVAC Distribution system   | SF   | -857.00    | 15.00                          | -12,855                            |
|                                    | D3050 - Facility HVAC Distribution Systems   |      |            | 43.96/SF                       | 16,731,326                         |
| D3060                              | Controls & Instrumentations  |      |            |                                |                                    |
| 1708                               | BAS control system c/w computer station, graphics, wiring, testing etc.  | Pt   | 1,500.00   | 1,300.00                       | 1,950,000                          |
|                                    | D3060 - Controls & Instrumentations  |      |            | 5.12/SF                        | 1,950,000                          |
| D3070                              | Special Purpose HVAC Systems   |      |            |                                |                                    |
| 783                                | Testing, balancing and commissioning   | SF   | 411,002.89 | 0.80                           | 328,802                            |
| 1560                               | General requirements: supervision, shop drawings,<br>asbuilt, tags, markers, tools, rentals, BIM, cleaning,<br>storage, material handling, seismic restraints, permits,<br>fees etc. | Item |            |                                | 2,072,000                          |
|                                    | D3070 - Special Purpose HVAC Systems   |      |            | 6.31/SF                        | 2,400,802                          |
|                                    | 23 - HEATING, VENTILATING, AND AIR<br>CONDITIONING   |      |            | 73.39/SF                       | 27,929,168                         |
| 26                                 | ELECTRICAL   |      |            |                                |                                    |
| D5020                              | Electrical Service and Distribution  |      |            |                                |                                    |
| 2409                               | System grounding grid and tie ins to building  | SF   | 411,003.00 | 0.15                           | 61,650                             |
| 945                                | Main switchboard 4000 amps MSB-1A & 1B   | EA   | 2.00       | 220,000.00                     | 440,000                            |
| 946                                | Primary 4000 amp service #1  | EA   | 1.00       | 18,750.00                      | 18,750                             |
| 947                                | Primary 4000 amp service #2  | EA   | 1.00       | 18,750.00                      | 18,750                             |
| 948                                | Emergency generator 300 kva (by utility company)   | Note |            |                                | Excl.                              |
| 950                                | Transfer switch 400 amps   | EA   | 3.00       | 14,500.00                      | 43,500                             |
| 952                                | Panel SB-DPH-LLA 800 amps  | EA   | 1.00       | 32,800.00                      | 32,800                             |
| 953                                | Panel EM-DPH-LLA 400 amps  | EA   | 1.00       | 23,600.00                      | 23,600                             |
| 954                                | Panel EM-DPH-ELEV-LLA 400 amps   | EA   | 1.00       | 23,600.00                      | 23,600                             |
| 955                                | Elev #1 200 amps   | EA   | 1.00       | 2,280.00                       | 2,280                              |
| 956                                | Elev #2 200 amps   | EA   | 1.00       | 2,280.00                       | 2,280                              |
| 957                                | ELEV disconnect 200 amps   | EA   | 2.00       | 2,200.00                       | 4,400                              |
| 958                                | Fire pump connection & controller connection   | EA   | 1.00       | 1,475.00                       | 1,475                              |
| 960                                | DPH-LLA 1200 amps  | EA   | 1.00       | 38,500.00                      | 38,500                             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

A1 New School Building (continued)

| Ref  | Description                    | Unit | Qty       | Rate<br>USD | Total Cost<br>USD |
|------|--------------------------------|------|-----------|-------------|-------------------|
| 961  | DPH-LLB 1200 amps              | EA   | 1.00      | 38,500.00   | 38,500            |
| 962  | DPH-LLC 1200 amps              | EA   | 1.00      | 38,500.00   | 38,500            |
| 963  | DPH-LLD 1200 amps              | EA   | 1.00      | 38,500.00   | 38,500            |
| 964  | DSH-4A 2000 amps               | EA   | 1.00      | 38,500.00   | 38,500            |
| 965  | DSH4B 1600 amps                | EA   | 1.00      | 32,800.00   | 32,800            |
| 966  | MPH-2A & 2B 1200 amps          | EA   | 1.00      | 32,800.00   | 32,800            |
| 967  | Disconnect switches 60 amps    | EA   | 4.00      | 625.00      | 2,500             |
| 968  | Disconnect switches 100 amps   | EA   | 12.00     | 950.00      | 11,400            |
| 969  | Disconnect switches 200 amps   | EA   | 12.00     | 1,850.00    | 22,200            |
| 970  | EWH #1 & #2 200 amp connection | EA   | 2.00      | 2,350.00    | 4,700             |
| 971  | Disconnects 400 amps           | EA   | 9.00      | 2,350.00    | 21,150            |
| 972  | System metering                | EA   | 1.00      | 145,800.00  | 145,800           |
| 973  | System grounding               | EA   | 1.00      | 12,800.00   | 12,800            |
| 974  | Coordination Study             | EA   | 1.00      | 35,400.00   | 35,400            |
| 975  | Arc Flash                      | EA   | 1.00      | 22,500.00   | 22,500            |
| 977  | Panels 225 amps                | EA   | 18.00     | 4,650.00    | 83,700            |
| 978  | Panels 400 amps                | EA   | 19.00     | 5,450.00    | 103,550           |
| 979  | Panels 100 amps                | EA   | 12.00     | 3,250.00    | 39,000            |
| 986  | Panel GEN-EM-DPH-LLA 800 amps  | EA   | 1.00      | 45,750.00   | 45,750            |
| 987  | Generator emergency grounding  | EA   | 1.00      | 8,540.00    | 8,540             |
| 989  | Dry transformer - 30kVA        | EA   | 12.00     | 3,875.00    | 46,500            |
| 991  | Dry transformer - 75kVA        | EA   | 2.00      | 5,250.00    | 10,500            |
| 992  | Dry transformer - 115kVA       | EA   | 19.00     | 8,575.00    | 162,925           |
| 993  | Dry transformer - 225kVA       | EA   | 2.00      | 12,500.00   | 25,000            |
| 1717 | Feeders 60 amps CU             | LF   | 12,400.00 | 21.98       | 272,552           |
| 1718 | Feeders 90 amps CU             | LF   | 6,220.00  | 32.79       | 203,954           |
| 1719 | Feeders 100 amps CU            | LF   | 4,160.00  |             | Excl.             |
| 1720 | Feeders 150 amps CU            | LF   | 960.00    |             | Excl.             |

LF

LF

LF

3,600.00

4,860.00

6,120.00

GFAR: 380,570.00 SF Cost/SF: 417.58 Rates Current At January 2023

Feeders 225 amps CU

Feeders 400 amps CU

1721 Feeder 200 amps CU

1722

1723

Excl.

Excl.

Excl.


GFAR: 380,570.00 SF Cost/SF: 417.58

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

## A Building

A1 New School Building (continued)

| A1 New School Building (continued) |   |      |            | Rates Current A | t January 2023    |
|------------------------------------|---|------|------------|-----------------|-------------------|
| Ref                                | Description   | Unit | Qty        | Rate<br>USD     | Total Cost<br>USD |
| 1724                               | Feeders 600 amps CU   | LF   | 640.00     |                 | Excl.             |
| 1725                               | Feeders 800 amps CU   | LF   | 840.00     |                 | Excl.             |
| 1726                               | Feeders 1200 amps CU  | LF   | 1,920.00   |                 | Excl.             |
| 1727                               | Feeders 4000 amps CU  | LF   | 460.00     |                 | Excl.             |
| 1729                               | 400 amps temporary transfer switch for roll up generator    | EA   | 1.00       | 23,500.00       | 23,500            |
| 1730                               | Emergency generator communication conduit & wire            | EA   | 1.00       | 18,500.00       | 18,500            |
| 1818                               | Panel Sub-Metering 100 amps BFM-II and c/t's                | EA   | 34.00      |                 | Excl.             |
| 1819                               | Panel Sub-Metering 225 amps                                 | EA   | 25.00      |                 | Excl.             |
| 1820                               | Panel Sub-Metering 400 amps                                 | EA   | 21.00      |                 | Excl.             |
| 1821                               | Panel Sub-Metering 1200 amps                                | EA   | 1.00       |                 | Excl.             |
| 1822                               | Panel Sub-Metering 1600 amps                                | EA   | 1.00       |                 | Excl.             |
| 1823                               | Panel Sub-Metering 2000 amps                                | EA   | 1.00       |                 | Excl.             |
| 1824                               | Panel Sub-Metering misc add ons computer<br>monitoring etc. | EA   | 1.00       |                 | Excl.             |
| 1825                               | Panel Sub-Metering branch metering 20 amps                  | EA   | 60.00      |                 | Excl.             |
| 2518                               | Feeders 100 amps AL   | LF   | 4,160.00   | 26.42           | 109,907           |
| 2519                               | Feeders 150 amps AL   | LF   | 960.00     | 33.23           | 31,901            |
| 2520                               | Feeder 200 amps AL  | LF   | 3,600.00   | 48.54           | 174,744           |
| 2521                               | Feeders 225 amps AL   | LF   | 4,860.00   | 52.85           | 256,851           |
| 2522                               | Feeders 400 amps AL   | LF   | 6,120.00   | 97.08           | 594,130           |
| 2523                               | Feeders 600 amps AL   | LF   | 640.00     | 146.10          | 93,504            |
| 2524                               | Feeders 800 amps AL   | LF   | 840.00     | 219.17          | 184,103           |
| 2525                               | Feeders 1200 amps AL  | LF   | 1,920.00   | 402.87          | 773,510           |
| 2526                               | Feeders 4000 amps AL  | LF   | 460.00     | 1,207.80        | 555,588           |
| 2565                               | Temp power  | SF   | 411,003.00 | 0.70            | 287,702           |
|                                    | D5020 - Electrical Service and Distribution                 |      |            | 13.97/SF        | 5,315,546         |
| D5030                              | General Purpose Electrical Power                            |      |            |                 |                   |
| 768                                | Interior electronic scoreboard & shot clock                 | EA   | 1.00       | 8,620.00        | 8,620             |
| 1001                               | Mechanical connections (VFD) 30 amps                        | EA   | 51.00      | 4,360.00        | 222,360           |
| 1002                               | Mechanical connections (VFD) 60 amps                        | EA   | 53.00      | 6,404.00        | 339,412           |
|                                    |   |      |            |                 |                   |





GFAR: 380,570.00 SF Cost/SF: 417.58

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

A1 New School Building (continued)

| 1 New Sch | nool Building (continued)                                    |      |          | Rates Current A | t January 2023    |
|-----------|--|------|----------|-----------------|-------------------|
| Ref       | Description  | Unit | Qty      | Rate<br>USD     | Total Cost<br>USD |
| 1003      | Mechanical connections (VFD) 100 amps                        | EA   | 5.00     | 7,066.00        | 35,330            |
| 1004      | Mechanical connections (VFD) 200 amps                        | EA   | 5.00     | 18,322.00       | 91,610            |
| 1005      | Mechanical connections (VFD) 400 amps                        | EA   | 1.00     | 34,400.00       | 34,400            |
| 1528      | Rec exp proof  | EA   | 6.00     | 5,645.00        | 33,870            |
| 1529      | Rec and cord drop  | EA   | 240.00   | 1,850.00        | 444,000           |
| 1530      | Power floor box  | EA   | 75.00    | 725.00          | 54,375            |
| 1531      | Rec power  | EA   | 728.00   | 125.00          | 91,000            |
| 1532      | Rec GFI  | EA   | 173.00   | 325.00          | 56,225            |
| 1551      | Rec power Special rec 30 amps                                | EA   | 43.00    | 650.00          | 27,950            |
| 1556      | Rec quad   | EA   | 210.00   | 285.00          | 59,850            |
| 1557      | Misc. mechanical equipment and equipment connection          | EA   | 80.00    | 4,985.00        | 398,800           |
| 2373      | EV Chargers in auto shop                                     | EA   | 4.00     | 12,450.00       | 49,800            |
| 1731      | Power conduit & wire   | EA   | 1,216.00 | 175.00          | 212,800           |
| 1781      | Kitchen & Culinary equipment rough-in & connections          | EA   | 149.00   | 425.00          | 63,325            |
| 1783      | Shop equipment connections & dust collector                  | EA   | 1.00     | 12,500.00       | 12,500            |
| 1784      | Vehicle Co2 system connection (power)                        | EA   | 1.00     | 1,625.00        | 1,625             |
| 2628      | Reduce cord reel quantity in shops                           | LS   | 1.00     | -8,000.00       | -8,000            |
|           | D5030 - General Purpose Electrical Power                     |      |          | 5.86/SF         | 2,229,852         |
| D5040     | Lighting   |      |          |                 |                   |
| 2503      | School stage rigging   | EA   | 1.00     | 8,750.00        | 8,750             |
| 764       | School stage lighting  | EA   | 1.00     | 110,000.00      | 110,000           |
| 2504      | School stage lighting & control                              | EA   | 1.00     | 32,500.00       | 32,500            |
| 765       | School theatrical lighting & controls                        | EA   | 1.00     | 250,000.00      | 250,000           |
| 1014      | Lighting type DPA - 32" decorative pendant                   | EA   | 10.00    | 850.00          | 8,500             |
| 2320      | Lighting type DPB - 4' long x 6" dia. pendant                | EA   | 12.00    | 1,190.00        | 14,280            |
| 2321      | Lighting type DPB-2 - 4' long x 6" dia. pendant              | EA   | 30.00    | 1,250.00        | 37,500            |
| 1016      | Lighting type GPB - 15.1" dia. pendant                       | EA   | 126.00   | 1,390.00        | 175,140           |
| 1019      | Lighting type GPE - 26' dia. direct/indirect ring pendant    | EA   | 1.00     | 600.00          | 600               |
| 2322      | Lighting type GPK - 60" dia. direct/indirect ring<br>pendant | EA   | 20.00    | 1,080.00        | 21,600            |

## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**



USD

12,800

12,070

58,240

11,020

69,000

16,940

15,295

6,160

12.180

36,800

25,200

21,120

10.080

3,250

29,785

49,875

12,555

7,373

58,520

41,175

24,565

23,600

5.214

11,175

47,190

18,445

222,000

75.00

85.00

80.00

66.00

75.00

55.00

85.00

3,000.00

GFAR: 380,570.00 SF Cost/SF: 417.58

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

2337

2335

2334

2338

2339

1035

1036

2341

A1 New School Building (continued) Rates Current At January 2023 Unit Ref Description Qty Rate **Total Cost** USD ΕA 2323 Lighting type GPL-1 - 8' long linear pendant 20.00 640.00 2324 Lighting type GPL-2 - 4' long linear pendant ΕA 17.00 710.00 1023 ΕA Lighting type GSA - 24" dia. surface pendant 56.00 1,040.00 1024 Lighting type GSB - 11" dia. surface downlight ΕA 19.00 580.00 1025 Lighting type GSC - surface linear LF 100.00 690.00 2326 Lighting type GSD - 2" dia. surface round cylinder ΕA 22.00 770.00 downlight 2325 Lighting type GSE - 2"x8" wall indirect LF 161.00 95.00 1027 Lighting type GWB - 8"x9" surface wall sconce exterior EΑ 11.00 560.00 1028 Lighting type GWC - 8"x12" adjustable direct/indirect EA 14.00 870.00 wall cylinder exterior 2327 Lighting type GWD - 2' long indirect/direct wall sconce ΕA 32.00 1,150.00 2328 ΕA Lighting type GWE-1 - 25" long wall linear 40.00 630.00 2329 Lighting type GWE-2 - 25" long wall linear ΕA 32.00 660.00 2330 24.00 Lighting type GWF - 6" dia. adjustable wall cylinder EA 420.00 1029 Lighting type LPA-1 - pendant linear LF 3,527.00 57.00 201,039 LF 2331 Lighting type LPA-2 - pendant linear 26.00 125.00 LF 1030 161.00 185.00 Lighting type LPB - pendant linear LF 1031 Lighting type LPC - pendant linear 1,408.00 225.00 316,800 2332 Lighting type LPD - pendant linear LF 285.00 175.00 1032 LF 81.00 155.00 Lighting type LPE - pendant linear 2333 Lighting type LPG - pendant linear LF 73.00 101.00 2336 Lighting type LPH - 8' long pendant linear ΕA 133.00 440.00

LF

LF

LF

LF

LF

LF

LF

ΕA

549.00

289.00

295.00

79.00

149.00

858.00

217.00

74.00

Lighting type LPJ - pendant linear

Lighting type LPK - pendant linear

Lighting type LPL - pendant linear

Lighting type LSA - undercabinet

Lighting type LSG-1 - 4' long linear

Lighting type LSB - linear cove

Lighting type LPM-1 - pendant linear

Lighting type LPM-2 - pendant linear

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**



GFAR: 380,570.00 SF Cost/SF: 417.58

### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

A1 New School Building (continued)

| 1 New School Building (continued) |   |      |        | Rates Current A | t January 2023    |
|-----------------------------------|---|------|--------|-----------------|-------------------|
| Ref                               | Description   | Unit | Qty    | Rate<br>USD     | Total Cost<br>USD |
| 2342                              | Lighting type LSG-2 - 8' long linear                | EA   | 51.00  | 3,250.00        | 165,750           |
| 2340                              | Lighting type LSH - strip light                     | LF   | 541.00 | 790.00          | 427,390           |
| 1044                              | Lighting type LSJ - wall linear                     | LF   | 29.00  | 580.00          | 16,820            |
| 2343                              | Lighting type PB - 16.24" dia. pendant              | EA   | 36.00  | 960.00          | 34,560            |
| 2345                              | Lighting type PD - 4" dia. pendant cylinder         | EA   | 76.00  | 1,040.00        | 79,040            |
| 2344                              | Lighting type PD-1 - 4" dia. pendant cylinder       | EA   | 21.00  | 1,150.00        | 24,150            |
| 2347                              | Lighting type PF - 4" dia. pendant cylinder         | EA   | 60.00  | 580.00          | 34,800            |
| 2346                              | Lighting type PF-1 - 4" dia. pendant cylinder       | EA   | 24.00  | 590.00          | 14,160            |
| 1052                              | Lighting type RA-1 - 2 X 2 recessed troffer         | EA   | 185.00 | 440.00          | 81,400            |
| 2349                              | Lighting type RA-2 - 2 X 2 recessed troffer         | EA   | 6.00   | 460.00          | 2,760             |
| 2348                              | Lighting type RA-3 - 2 X 2 recessed troffer         | EA   | 19.00  | 480.00          | 9,120             |
| 1053                              | Lighting type RB-1 - 2 X 2 recessed troffer         | EA   | 207.00 | 620.00          | 128,340           |
| 2350                              | Lighting type RB-2 - 2 X 4 recessed troffer         | EA   | 6.00   | 670.00          | 4,020             |
| 1054                              | Lighting type RC-1 - 2.5x2.5 recessed downlight     | EA   | 288.00 | 680.00          | 195,840           |
| 2351                              | Lighting type RC-2 - 2.5x2.5 recessed downlight     | EA   | 16.00  | 530.00          | 8,480             |
| 1055                              | Lighting type RDA - 24"x48" recessed food downlight | EA   | 31.00  | 580.00          | 17,980            |
| 2352                              | Lighting type RDB - 24"x24" recessed food downlight | EA   | 13.00  | 590.00          | 7,670             |
| 1056                              | Lighting type RE - 4" dia. recessed downlight       | EA   | 31.00  | 510.00          | 15,810            |
| 1057                              | Lighting type RF - 2.5" dia. recessed wall wash     | EA   | 73.00  | 470.00          | 34,310            |
| 1061                              | Lighting type RJ - 6"x6" recessed downlight         | EA   | 36.00  | 810.00          | 29,160            |
| 2353                              | Lighting type RK - 2.5"x2.5" recessed downlight     | EA   | 8.00   | 630.00          | 5,040             |
| 2356                              | Lighting type RL-1 - 2x4 recessed troffer           | EA   | 191.00 | 490.00          | 93,590            |
| 2358                              | Lighting type RL-2 - 2x4 recessed troffer           | EA   | 62.00  | 520.00          | 32,240            |
| 2357                              | Lighting type RM - 4" dia. recessed downlight       | EA   | 6.00   | 470.00          | 2,820             |
| 2359                              | Lighting type RN-1 - 4" dia. recessed downlight     | EA   | 15.00  | 410.00          | 6,150             |
| 2355                              | Lighting type RN-2 - 4" dia. recessed downlight     | EA   | 42.00  | 420.00          | 17,640            |
| 2354                              | Lighting type RP - 4" dia. recessed wall wash       | EA   | 11.00  | 460.00          | 5,060             |
| 2360                              | Lighting type RQ - 4" dia. recessed downlight       | EA   | 25.00  | 510.00          | 12,750            |
| 1063                              | Lighting type RLA-1 - recessed linear wall wash     | LF   | 665.00 | 420.00          | 279,300           |
| 2361                              | Lighting type RLA-2 - recessed linear wall wash     | LF   | 41.00  | 440.00          | 18,040            |
| 1064                              | Lighting type RLB-1 - indirect wall wash            | LF   | 259.00 | 425.00          | 110,075           |

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**



### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

| A Building<br>A1 New School Building (continued) |  |      | GFAR: 3  | 80,570.00 SF 0<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|--|--|------|----------|-----------------------------------|------------------------------------|
| Ref  | Description  | Unit | Qty      | Rate<br>USD                       | Total Cost<br>USD                  |
| 2364   | Lighting type RLB-2 - indirect wall wash                 | LF   | 653.00   | 385.00                            | 251,405                            |
| 2363   | Lighting type RLB-3 - indirect wall wash                 | LF   | 135.00   | 325.00                            | 43,875                             |
| 2362   | Lighting type RLB-4 - indirect wall wash                 | LF   | 76.00    | 580.00                            | 44,080                             |
| 2369   | Lighting type RLC - indirect reflector                   | LF   | 1,841.00 | 410.00                            | 754,810                            |
| 1066   | Lighting type RLD-1 - recessed linear                    | LF   | 59.00    | 425.00                            | 25,075                             |
| 2366   | Lighting type RLD-2 - recessed linear                    | LF   | 76.00    | 415.00                            | 31,540                             |
| 2367   | Lighting type RLD-3 - recessed linear                    | LF   | 272.00   | 410.00                            | 111,520                            |
| 1067   | Lighting type RLE - 4' long recessed linear              | EA   | 32.00    | 418.00                            | 13,376                             |
| 1068   | Lighting type RLF - 48" long in ground linear            | EA   | 10.00    | 1,020.00                          | 10,200                             |
| 2368   | Lighting type RLG-1 - indirect wall wash                 | LF   | 10.00    | 1,080.00                          | 10,800                             |
| 1070   | Lighting type RLH - 3' long semi recessed wall wash      | EA   | 8.00     | 1,410.00                          | 11,280                             |
| 1071   | Lighting type SA - 8" dia in-grade uplight wall wash     | EA   | 34.00    | 680.00                            | 23,120                             |
| 1072   | Lighting type SWA - wall sconce exterior                 | EA   | 16.00    | 850.00                            | 13,600                             |
| 1073   | Lighting type T1 - pendant rack                          | LF   | 65.00    | 37.00                             | 2,405                              |
| 1074   | Lighting type TA - 3.5" dia. rack spot                   | EA   | 25.00    | 450.00                            | 11,250                             |
| 1033   | Lighting type LPF circle pendant linear (none indicated) | EA   | 5.00     |                                   | Excl.                              |
| 1038   | Lighting type LSD surface w/p (none indicated)           | EA   | 164.00   |                                   | Excl.                              |
| 1015   | Lighting type GPA 48" pendant (none indicated)           | EA   | 2.00     |                                   | Excl.                              |
| 1020   | Lighting type GPF 118" circle pendant (none indicated)   | EA   | 4.00     |                                   | Excl.                              |
| 1021   | Lighting type GPH 6" pendant (none indicated)            | EA   | 16.00    |                                   | Excl.                              |
| 1022   | Lighting type GPJ 30" stem pendant (none indicated)      | EA   | 5.00     |                                   | Excl.                              |
| 1026   | Lighting type GWA wall cove light (none indicated)       | EA   | 8.00     |                                   | Excl.                              |
| 1039   | Lighting type LSE linear al channel (none indicated)     | EA   | 25.00    |                                   | Excl.                              |
| 1040   | Lighting type LSF linear (none indicated)                | EA   | 4.00     |                                   | Excl.                              |
| 1043   | Lighting type LSI led strip (none indicated)             | EA   | 2.00     |                                   | Excl.                              |
| 1045   | Lighting type LSK linear strip (none indicated)          | EA   | 4.00     |                                   | Excl.                              |
| 1046   | Lighting type LSL direct linear (none indicated)         | EA   | 8.00     |                                   | Excl.                              |
| 1047   | Lighting type PA 8" pendant (none indicated)             | EA   | 12.00    |                                   | Excl.                              |
| 1049   | Lighting type PC 7" pendant (none indicated)             | EA   | 43.00    |                                   | Excl.                              |
| 1050   | Lighting type PD 7" pendant (none indicated)             | EA   | 8.00     |                                   | Excl.                              |



## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

GFAR: 380,570.00 SF Cost/SF: 417.58 A1 New School Building (continued) Rates Current At January 2023 Unit Ref Description Qty Rate **Total Cost** USD USD ΕA 1051 Lighting type PE 30" pendant (none indicated) 5.00 Excl. 1058 Lighting type RG 2 X 4 recessed (none indicated) ΕA 14.00 Excl. Lighting type RH 2 X 4 recessed troffer (none ΕA 1059 49.00 Excl. indicated) 1060 ΕA 112.00 Lighting type RI downlight (none indicated) Excl. 1062 Lighting type RSA step light (none indicated) EA 6.00 Excl. 1526 Lighting Exits EA 151.00 320.00 48,320 1527 Lighting type F1 - 4' long linear OFCI EA 44.00 115.00 5,060 1732 Lighting conduit & wire EA 1,743.00 185.00 322,455 1743 Lighting control SF 411,002.89 0.75 308,252 1786 Theater lighting control interface ΕA 1.00 5,500.00 5,500 1787 ΕA Stage lighting control interface 1.00 4,500.00 4,500 1788 Lighting control classroom 2 zone control EA 106.00 1,745.00 184,970 2627 Reduce stage lighting and dimmer LS 1.00 -25,000.00 -25,000 D5040 - Lighting 16.20/SF 6.164.994 D5080 **Miscellaneous Electrical Systems** SF 647 Lightning protection 411,003.00 0.65 267,152 763 P.V System 249 kw (rough in conduit for future) ΕA 1.00 75,800.00 75,800 767 Seismic restraints electrical SF 411,003.00 0.35 143,851 777 Owner independent testing agency ΕA 1.00 Excl. 1738 Electrical permits SF 411,002.89 0.15 61,650 1739 Electrical testing & commissioning SF 411,002.89 0.20 82,201 SF 1740 Electrical firestopping 411,002.89 0.25 102,750 1785 Electrical access panel EA 1.00 9,580.00 9,580 2626 LS -50,000.00 Utilize lightning preventor ILO lightning protection 1.00 -50,000 2629 Reduce EV charging stations LS 1.00 -60,000.00 -60,000 D5080 - Miscellaneous Electrical Systems 1.66/SF 632,984 **26 - ELECTRICAL** 37.69/SF 14.343.376 27 COMMUNICATIONS D6010 **Data Communications** EA 180.00 850.00 1676 WAP wireless access point 153,000



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

| A Building<br>A1 New Sch | nool Building (continued)                                |      | GFAR: 3    | 80,570.00 SF (<br>Rates Current A | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|------------|-----------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty        | Rate<br>USD                       | Total Cost<br>USD                  |
| 1736                     | Data backbone cabling                                    | EA   | 1.00       | 85,400.00                         | 85,400                             |
|                          | D6010 - Data Communications                              |      |            | 0.63/SF                           | 238,400                            |
| D6020                    | Voice Communications                                     |      |            |                                   |                                    |
| 640                      | TV & Video (rough in & equipment) - move to FF&E         | SF   | 411,859.00 |                                   | Excl.                              |
|                          | D6020 - Voice Communications                             |      |            |                                   | Excl.                              |
| D6030                    | Audio-Video Communication                                |      |            |                                   |                                    |
| 643                      | Inst. AV System (rough in & equipment) - move to<br>FF&E | SF   | 411,859.00 |                                   | Excl.                              |
| 1691                     | Speech reinforcement system SFR rough in                 | EA   | 93.00      | 575.00                            | 53,475                             |
| 1695                     | Video presentation screen outlet (flat screen) rough in  | EA   | 94.00      | 1,500.00                          | 141,000                            |
| 1741                     | Sound conduit & wire                                     | EA   | 696.00     | 625.00                            | 435,000                            |
| 2532                     | Tel/Data A/V cabling system rough in                     | SF   | 411,003.00 | 3.00                              | 1,233,009                          |
| 2533                     | IPTV and Video on demand system                          | EA   | 1.00       |                                   | Excl.                              |
| 2534                     | Large venue A/V system                                   | EA   | 1.00       | 500,500.00                        | 500,500                            |
| 2535                     | Classroom speech reinforcement system                    | EA   | 1.00       | 222,200.00                        | 222,200                            |
| 2536                     | Inst. A/V system   | EA   | 1.00       |                                   | Excl.                              |
| 2537                     | P.A. system  | EA   | 1.00       | 302,000.00                        | 302,000                            |
|                          | D6030 - Audio-Video Communication                        |      |            | 7.59/SF                           | 2,887,184                          |
| D6060                    | Distributed Communications and Monitoring                |      |            |                                   |                                    |
| 1737                     | Clocks backbone wiring                                   | EA   | 1.00       | 7,850.00                          | 7,850                              |
| 1742                     | Clocks conduit & wire                                    | EA   | 199.00     | 325.00                            | 64,675                             |
| 2538                     | Clock system   | EA   | 1.00       | 134,000.00                        | 134,000                            |
|                          | D6060 - Distributed Communications and Monitoring        |      |            | 0.54/SF                           | 206,525                            |
| D7030                    | Electronic Surveillance                                  |      |            |                                   |                                    |
| 760                      | Vape detection system rough in                           | EA   | 1.00       | 36,960.00                         | 36,960                             |
|                          | D7030 - Electronic Surveillance                          |      |            | 0.10/SF                           | 36,960                             |
|                          | 27 - COMMUNICATIONS                                      |      |            | 8.85/SF                           | 3,369,069                          |
| 28                       | ELECTRONIC SAFETY AND SECURITY                           |      |            |                                   |                                    |
| D7010                    | Access Controls and Intrusion Detection                  |      |            |                                   |                                    |
| 1733                     | Security conduit & wire                                  | EA   | 273.00     | 275.00                            | 75,075                             |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

| A Building<br>A1 New Sch | nool Building (continued)  |      | GFAR: 38 | 80,570.00 SF<br>Rates Current | Cost/SF: 417.58<br>At January 2023 |
|--------------------------|--|------|----------|-------------------------------|------------------------------------|
| Ref                      | Description  | Unit | Qty      | Rate<br>USD                   | Total Cost<br>USD                  |
| 1735                     | Security backbone cabling  | EA   | 1.00     | 185,500.00                    | 185,500                            |
|                          | D7010 - Access Controls and Intrusion Detection                    |      |          | 0.68/SF                       | 260,575                            |
| D7030                    | Electronic Surveillance  |      |          |                               |                                    |
| 1685                     | CCTV cameras rough in  | EA   | 160.00   | 1,685.00                      | 269,600                            |
| 1778                     | Security conduit & wire  | EA   | 160.00   | 750.00                        | 120,000                            |
| 1779                     | Security backbone cabling  | EA   | 1.00     | 8,250.00                      | 8,250                              |
| 2539                     | Security system & CCTV   | EA   | 1.00     | 900,000.00                    | 900,000                            |
| 2625                     | Adjust estimate based on Technology/Security<br>Consultant         | LS   | 1.00     | -200,000.00                   | -200,000                           |
|                          | D7030 - Electronic Surveillance                                    |      |          | 2.88/SF                       | 1,097,850                          |
| D7050                    | Detection and Alarm  |      |          |                               |                                    |
| 1629                     | Fire alarm control panel   | EA   | 1.00     | 12,200.00                     | 12,200                             |
| 1630                     | Fire alarm annunciator   | EA   | 17.00    | 9,850.00                      | 167,450                            |
| 1631                     | Fire alarm pull station  | EA   | 40.00    | 650.00                        | 26,000                             |
| 1632                     | Fire alarm smoke detector  | EA   | 228.00   | 325.00                        | 74,100                             |
| 1636                     | Fire alarm audio/visual alarm                                      | EA   | 487.00   | 410.00                        | 199,670                            |
| 1637                     | Fire alarm audio only alarm  | EA   | 45.00    | 385.00                        | 17,325                             |
| 1640                     | Fire alarm flow and tamper switch                                  | EA   | 126.00   | 560.00                        | 70,560                             |
| 1643                     | Fire alarm testing & commissioning                                 | EA   | 972.00   | 115.00                        | 111,780                            |
| 1734                     | Fire alarm conduit & wire  | EA   | 943.00   | 275.00                        | 259,325                            |
| 1780                     | Fire alarm communication system interface                          | EA   | 1.00     | 4,580.00                      | 4,580                              |
| 1782                     | Kitchen fire suppression connection (sbo)                          | EA   | 1.00     | 8,500.00                      | 8,500                              |
| 2576                     | Fire alarm fixture and wiring                                      | SF   | -857.00  | 1.00                          | -857                               |
|                          | D7050 - Detection and Alarm  |      |          | 2.50/SF                       | 950,633                            |
| D7090                    | Electronic Safety and Security Supplementary<br>Components         |      |          |                               |                                    |
| 761                      | Visitor management system rough in                                 | EA   | 1.00     | 5,000.00                      | 5,000                              |
| 810                      | Gun/gunshot detection system                                       | EA   | 1.00     | 25,000.00                     | 25,000                             |
|                          | D7090 - Electronic Safety and Security Supplementary<br>Components |      |          | 0.08/SF                       | 30,000                             |
|                          | 28 - ELECTRONIC SAFETY AND SECURITY                                |      |          | 6.15/SF                       | 2,339,058                          |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

| A1 New Sch | nool Building (continued)   |      | GFAR: 3    | Rates Current | Cost/SF: 417.58<br>At January 2023 |
|------------|---|------|------------|---------------|------------------------------------|
| Ref        | Description   | Unit | Qty        | Rate<br>USD   | Total Cost<br>USD                  |
| 31         | EARTHWORK   |      |            |               |                                    |
| A4010      | Standard Slabs-on-Grade   |      |            |               |                                    |
| 508        | Excavation for slab on grade                                      | CY   | 7,518.10   |               | Incl.                              |
| 509        | Remove and dispose of excavated material                          | CY   | 7,518.10   |               | Incl.                              |
| 510        | Prepare and compact sub-base                                      | SF   | 128,134.04 | 1.50          | 192,201                            |
| 513        | Re-use materials ILO Imported sand gravel fill - 12" thick        | CY   | 4,746.29   | 15.00         | 71,195                             |
|            | A4010 - Standard Slabs-on-Grade                                   |      |            | 0.69/SF       | 263,396                            |
| A6010      | Building Subdrainage  |      |            |               |                                    |
| 1835       | Allowance for Electrical and Plumbing earth work within footprint | LS   | 1.00       | 200,000.00    | 200,000                            |
|            | <br>A6010 - Building Subdrainage                                  |      |            | 0.53/SF       | 200,000                            |
| A9010      | Substructure Excavation   |      |            |               |                                    |
| 591        | Excavation for foundation footings including spoils removal       | CY   | 12,574.11  | 31.00         | 389,797                            |
| 593        | Prepare and compact foundation sub-base                           | SF   | 33,961.27  | 1.50          | 50,943                             |
| 594        | Imported sand gravel fill below foundations - 12" thick           | CY   | 1,393.70   | 50.00         | 69,685                             |
| 595        | Basement mass excavation  | CY   | 32,666.00  | 20.00         | 653,320                            |
| 654        | Excavation for elevator pit including spoils removal              | CY   | 93.20      | 31.00         | 2,889                              |
| 620        | Imported foundation backfill                                      | CY   | 7,082.56   | 30.00         | 212,476                            |
| 691        | Imported backfill to basement excavation                          | CY   | 6,534.00   | 30.00         | 196,020                            |
|            | A9010 - Substructure Excavation                                   |      |            | 4.14/SF       | 1,575,130                          |
|            | 31 - EARTHWORK  |      |            | 5.36/SF       | 2,038,526                          |
| 33         | UTILITIES   |      |            |               |                                    |
| G3010      | Water Utilities   |      |            |               |                                    |
| 1381       | 6", Ductile iron pipe   | LF   | 95.99      | 60.00         | 5,759                              |
| 1448       | Cleaning, testing, trace wiring etc.                              | LF   | 95.82      | 5.00          | 479                                |
| 569        | Excavation and backfill (with site preparation)                   | LF   | 95.82      |               | Incl.                              |
|            | G3010 - Water Utilities   |      |            | 0.02/SF       | 6,238                              |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

#### A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 417.58 Rates Current At January 2023

| Ref     | Description   | Unit | Qty | Rate<br>USD | Total Cost<br>USD |
|---------|---|------|-----|-------------|-------------------|
| G3090   | Liquid and Gas Site Utilities Supplementary<br>Components   |      |     |             |                   |
| 1798    | General requirements: supervision, shop drawings, as-<br>built drawings, equipment rentals, fees, permits, etc. | Item |     |             | 437               |
|         | G3090 - Liquid and Gas Site Utilities Supplementary<br>Components   |      |     | 0.01/SF     | 437               |
|         | 33 - UTILITIES  |      |     | 0.02/SF     | 6,675             |
| NEW SCH | OOL BUILDING  |      |     | 417.58/SF   | 158,916,659       |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS SUMMARY BD BASE DESIGN

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| A Building              | GEAR: 2 040 00 SE Cost/SE: 333 38 |
|-------------------------|-----------------------------------|
| A3 Maintenance Building | Rates Current At January 2023     |
|                         |                                   |

| Ref  | Description                                | GFAR<br>USD/SF | Total Cost<br>USD |
|------|--|----------------|-------------------|
| 03   | Concrete                                   | 60.68          | 123,788           |
| 04   | Masonry                                    | 25.81          | 52,657            |
| 05   | Metals                                     | 1.00           | 2,042             |
| 06   | Wood, Plastics, and Composites             | 2.35           | 4,800             |
| 07   | Thermal and Moisture Protection            | 11.54          | 23,550            |
| 08   | Openings                                   | 23.42          | 47,770            |
| 09   | Finishings                                 | 6.90           | 14,075            |
| 10   | Specialties                                | 3.83           | 7,818             |
| 13   | Special Construction                       | 75.07          | 153,150           |
| 21   | Fire Suppression                           | 0.29           | 600               |
| 22   | Plumbing                                   | 38.52          | 78,571            |
| 23   | Heating, Ventilating, and Air Conditioning | 48.23          | 98,392            |
| 26   | Electrical                                 | 5.81           | 11,843            |
| 27   | Communications                             | 1.50           | 3,050             |
| 28   | Electronic Safety and Security             | 2.68           | 5,470             |
| 31   | Earthwork                                  | 9.33           | 19,026            |
| 33   | Utilities                                  | 16.42          | 33,493            |
| MAIN | ITENANCE BUILDING                          | 333.38         | 680,095           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS SUMMARY BD BASE DESIGN

A Building

A3 Maintenance Building

GFAR: 2,040.00 SF Cost/SF: 333.38 Rates Current At January 2023

| Ref Description  | GFAR<br>USD/SF | Total Cost<br>USD |
|--|----------------|-------------------|
|  |                |                   |
| MARGINS & ADJUSTMENTS  |                |                   |
| Design & Estimating Contingency  |                | 17,002            |
| Escalation Allowance up to mid-point of Construction                       |                | 31,369            |
| Sub-contractor Bonds   |                | 8,742             |
| Insurance - CCIP (Change from GL)  |                | 20,666            |
| Cost of Traditional Insurance (Trade + GL)                                 |                | -22,746           |
| Builder's Risk Insurance (per CM Pricing Exhibit 1)                        |                | 1,218             |
| Payment & Performance Bond (per CM Pricing Exhibit 1)                      |                | 6,170             |
| General Conditions (per CM Pricing Exhibit 1)                              |                | 32,299            |
| General Requirements (per CM Pricing Exhibit 1)                            |                | 20,151            |
| Allowance for Additional Requirements not included in CM Pricing Exhibit 1 |                | 3,334             |
| CM Construction Contingency (per CM Pricing Exhibit 1)                     |                | 18,615            |
| CM Fee (per CM Pricing Exhibit 1)  |                | 14,020            |
| ESTIMATED TOTAL COST   | 407.32         | 830,935           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

| A Building<br>A3 Mainten | ance Building   |      | GFAR: 2,04<br>Rat | 40.00 SF Co<br>es Current At | ost/SF: 333.38<br>January 2023 |
|--------------------------|---|------|-------------------|------------------------------|--------------------------------|
| Ref                      | Description   | Unit | Qty               | Rate<br>USD                  | Total Cost<br>USD              |
| 03                       | CONCRETE  |      |                   |                              |                                |
| A1010                    | Standard Foundations                                      |      |                   |                              |                                |
| 996                      | Concrete to isolated spread footings, 4500 PSI            | CY   | 23.12             | 325.00                       | 7,514                          |
| 529                      | Concrete to perimeter strip footings - 1' thick, 4500 PSI | CY   | 9.85              | 324.97                       | 3,201                          |
| 1117                     | Concrete to piers, 4500 PSI                               | CY   | 1.46              | 325.34                       | 475                            |
| 521                      | Form isolated spread footings                             | SF   | 432.02            | 20.00                        | 8,640                          |
| 530                      | Form strip footings                                       | SF   | 245.11            | 20.00                        | 4,902                          |
| 1118                     | Form piers  | SF   | 157.50            | 25.00                        | 3,937                          |
| 522                      | Bar reinforcement to isolated spread footings             | Lb   | 2,118.83          | 1.80                         | 3,814                          |
| 587                      | Bar reinforcement to strip footings, allow 100 PCY        | Lb   | 983.40            | 1.80                         | 1,770                          |
| 1119                     | Bar reinforcement to piers, allow                         | Lb   | 525.01            | 1.80                         | 945                            |
|                          | A1010 - Standard Foundations                              |      |                   | 17.25/SF                     | 35,198                         |
| A2010                    | Walls for Subgrade Enclosures                             |      |                   |                              |                                |
| 598                      | Concrete to perimeter frost walls, 4500 PSI               | CY   | 31.47             | 325.01                       | 10,228                         |
| 605                      | Form perimeter frost walls                                | SF   | 1,274.47          | 25.00                        | 31,862                         |
| 608                      | Bar reinforcement to perimeter frost walls                | Lb   | 2,077.38          | 1.80                         | 3,739                          |
|                          | A2010 - Walls for Subgrade Enclosures                     |      |                   | 22.47/SF                     | 45,829                         |
| A4010                    | Standard Slabs-on-Grade                                   |      |                   |                              |                                |
| 501                      | Concrete to slab on grade - 6" thick, 4000 PSI            | CY   | 33.30             | 320.00                       | 10,656                         |
| 502                      | Form slab on grade  | SF   | 88.72             | 18.00                        | 1,597                          |
| 503                      | WWF reinforcement   | SF   | 1,798.05          | 1.30                         | 2,337                          |
| 698                      | Allowance for bar reinforcement                           | Lb   | 899.03            | 1.80                         | 1,618                          |
| 504                      | Float finish to slab on grade                             | SF   | 1,798.06          | 1.50                         | 2,697                          |
| 505                      | Control joints  | SF   | 1,798.06          | 0.75                         | 1,349                          |
| 703                      | Winter conditions   | LS   | 1.00              |                              | Excl.                          |
| 707                      | Mechanical pads   | Item |                   |                              | 3,750                          |
| 710                      | Engineering, layout, safety, cleaning, etc.               | Item |                   |                              | 2,500                          |
|                          | A4010 - Standard Slabs-on-Grade                           |      |                   | 12.99/SF                     | 26,504                         |
| A6010                    | Building Subdrainage                                      |      |                   |                              |                                |
| 619                      | Perimeter drain   | LF   | 190.28            | 50.00                        | 9,514                          |
|                          |   |      |                   |                              |                                |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

A3 Maintenance Building (continued)

GFAR: 2,040.00 SF Cost/SF: 333.38 Rates Current At January 2023

| Ref   | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|----------|-------------|-------------------|
| 686   | Under-slab drainage system   | SF   | 1,798.06 | 3.75        | 6,743             |
|       | A6010 - Building Subdrainage   |      |          | 7.97/SF     | 16,257            |
|       | 03 - CONCRETE  |      |          | 60.68/SF    | 123,788           |
| 04    | MASONRY  |      |          |             |                   |
| B2010 | Exterior Walls   |      |          |             |                   |
| 29    | 4" Thick CMU Veneer  | SF   | 571.02   | 39.00       | 22,270            |
| 72    | 8" Thick CMU back-up   | SF   | 571.03   | 35.00       | 19,986            |
|       | B2010 - Exterior Walls   |      |          | 20.71/SF    | 42,256            |
| C1010 | Interior Partitions  |      |          |             |                   |
| 267   | CMU partition, 8" thick (Type 8.0)   | SF   | 335.01   | 28.00       | 9,380             |
| 806   | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Masonry Trade)   | SF   | 2,042.00 | 0.50        | 1,021             |
|       | C1010 - Interior Partitions  |      |          | 5.10/SF     | 10,401            |
|       | 04 - MASONRY   |      |          | 25.81/SF    | 52,657            |
| 05    | METALS   |      |          |             |                   |
| C1090 | Interior Specialties   |      |          |             |                   |
| 293   | Allowance for miscellaneous metals   | SF   | 2,042.01 | 1.00        | 2,042             |
|       | C1090 - Interior Specialties   |      |          | 1.00/SF     | 2,042             |
|       | 05 - METALS  |      |          | 1.00/SF     | 2,042             |
| 06    | WOOD, PLASTICS, AND COMPOSITES   |      |          |             |                   |
| C1090 | Interior Specialties   |      |          |             |                   |
| 294   | Allowance for rough carpentry  | SF   | 2,042.01 | 0.75        | 1,532             |
| 295   | Allowance for wood blocking  | SF   | 2,042.01 | 1.25        | 2,553             |
| 807   | Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade) | SF   | 2,042.01 | 0.35        | 715               |
|       | C1090 - Interior Specialties   |      |          | 2.35/SF     | 4,800             |
|       | 06 - WOOD, PLASTICS, AND COMPOSITES  |      |          | 2.35/SF     | 4,800             |
| 07    | THERMAL AND MOISTURE PROTECTION  |      |          |             |                   |
| A2010 | Walls for Subgrade Enclosures  |      |          |             |                   |
| 617   | Dampproofing to frost wall   | SF   | 637.25   | 6.00        | 3,824             |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

| A Building<br>A3 Maintena | ance Building (continued)  |      | GFAR: 2,0<br>Rat | 40.00 SF Co<br>tes Current At | ost/SF: 333.38<br>January 2023 |
|---------------------------|--|------|------------------|-------------------------------|--------------------------------|
| Ref                       | Description  | Unit | Qty              | Rate<br>USD                   | Total Cost<br>USD              |
| 618                       | Rigid insulation - 2" thick  | SF   | 637.24           | 4.50                          | 2,868                          |
|                           | A2010 - Walls for Subgrade Enclosures  |      |                  | 3.28/SF                       | 6,692                          |
| A4010                     | Standard Slabs-on-Grade  |      |                  |                               |                                |
| 506                       | Air and vapor barrier  | SF   | 1,798.06         | 0.85                          | 1,528                          |
|                           | A4010 - Standard Slabs-on-Grade  |      |                  | 0.75/SF                       | 1,528                          |
| A4090                     | Slab-on-Grade Supplementary Components   |      |                  |                               |                                |
| 656                       | Rigid insulation - 1" thick  | SF   | 1,799.00         | 2.75                          | 4,947                          |
|                           | A4090 - Slab-on-Grade Supplementary Components                                     |      |                  | 2.42/SF                       | 4,947                          |
| B2010                     | Exterior Walls   |      |                  |                               |                                |
| 2544                      | 3" Thick rigid insulation  | SF   | 571.03           | 7.00                          | 3,997                          |
| 2545                      | Fluid applied air and vapor barrier  | SF   | 571.01           | 6.50                          | 3,712                          |
| 190                       | Allowance for miscellaneous sealing and caulking                                   | SF   | 571.01           | 2.00                          | 1,142                          |
|                           | B2010 - Exterior Walls   |      |                  | 4.34/SF                       | 8,851                          |
| B3010                     | Roofing  |      |                  |                               |                                |
| 206                       | Maintenance roof assembly (included with PEMB)                                     | SF   | 2,071.00         |                               | Incl.                          |
|                           | B3010 - Roofing  |      |                  |                               | Incl.                          |
| C1010                     | Interior Partitions  |      |                  |                               |                                |
| 488                       | Allowance for miscellaneous sealing and caulking                                   | SF   | 2,042.00         | 0.50                          | 1,021                          |
| 489                       | Allowance for miscellaneous fire stopping  | SF   | 2,042.00         | 0.25                          | 511                            |
|                           | C1010 - Interior Partitions  |      |                  | 0.75/SF                       | 1,532                          |
|                           | 07 - THERMAL AND MOISTURE PROTECTION   |      |                  | 11.54/SF                      | 23,550                         |
| 08                        | OPENINGS   |      |                  |                               |                                |
| B2050                     | Exterior Doors and Grilles   |      |                  |                               |                                |
| 238                       | 12'-0" x 12'-0" Motor operated overhead door with insulating glass                 | EA   | 3.00             | 14,500.00                     | 43,500                         |
| 134                       | 3'-0" x 7'-0" Single leaf hollow metal door, including frame, finish, and hardware | EA   | 2.00             | 1,350.00                      | 2,700                          |
|                           | B2050 - Exterior Doors and Grilles   |      |                  | 22.65/SF                      | 46,200                         |



GFAR: 2,040.00 SF Cost/SF: 333.38

Rates Current At January 2023

## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

#### A Building

102

410

808

170

171

5

6

10

Ref

09

A3 Maintenance Building (continued)

Description Unit Qty Rate **Total Cost** USD USD C1030 **Interior Doors** 3'-0"x7'-0" Single leaf hollow metal doors, including frame, ΕA 1.00 1,570.00 1,570 finish and hardware C1030 - Interior Doors 0.77/SF 1,570 **08 - OPENINGS** 23.42/SF 47,770 **FINISHINGS Interior Partitions** C1010 Gypsum board furring - 3-5/8" metal stud with 1 layer 5/8" SF 128.01 11.00 1,408 GWB (Type F4.0) Allowance for miscellaneous clean-up, additional labor, safety, SF 2,042.00 0.35 715 etc. (Drywall Trade) C1010 - Interior Partitions 1.04/SF 2,123 C2010 Wall Finishes Prepare and apply epoxy paint SF 448.33 3.50 1,569 Prepare and apply paint to CMU SF 617.40 1.50 926 C2010 - Wall Finishes 1.22/SF 2,495 C2030 Flooring SCONC, Sealed concrete SF 1,681.68 1.50 2,523 EF, Epoxy flooring and base SF 85.45 15.00 1,282 Resilient base LF 166.45 5.00 832 1 6 2 7 2 27/CE C2020 Election

|       | 62030 - Fi00ility                             |    |          | 2.21/5F | 4,037  |
|-------|---|----|----------|---------|--------|
| C2050 | Ceiling Finishes                              |    |          |         |        |
| 41    | Gypsum board ceiling, moisture resistant      | SF | 85.35    | 25.00   | 2,134  |
| 39    | Paint to gypsum board ceiling                 | SF | 85.34    | 1.50    | 128    |
| 40    | Paint to exposed ceiling                      | SF | 1,705.10 | 1.50    | 2,558  |
|       | C2050 - Ceiling Finishes                      |    |          | 2.36/SF | 4,820  |
|       | 09 - FINISHINGS                               |    |          | 6.90/SF | 14,075 |
| 10    | SPECIALTIES                                   |    |          |         |        |
| C1090 | Interior Specialties                          |    |          |         |        |
| 280   | Restroom accessories - Tissue paper dispenser | EA | 1.00     | 125.00  | 125    |
| 281   | Restroom accessories - Grab bar               | EA | 2.00     | 180.00  | 360    |
|       |   |    |          |         |        |



GFAR: 2,040.00 SF Cost/SF: 333.38

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

### A Building

| A3 Maintenance Building (continued) |   |      | Rat      | es Current At | January 2023      |
|-------------------------------------|---|------|----------|---------------|-------------------|
| Ref                                 | Description   | Unit | Qty      | Rate<br>USD   | Total Cost<br>USD |
| 282                                 | Restroom accessories - Napkin disposal  | EA   | 1.00     | 500.00        | 500               |
| 283                                 | Restroom accessories - Robe hook  | EA   | 1.00     | 100.00        | 100               |
| 284                                 | Restroom accessories - Soap dispenser   | EA   | 1.00     | 150.00        | 150               |
| 291                                 | Restroom accessories - Framed mirror  | EA   | 1.00     | 800.00        | 800               |
| 292                                 | Restroom accessories - Towel dispenser/waste receptacle                       | EA   | 1.00     | 850.00        | 850               |
| 296                                 | Allowance for fire extinguisher and cabinets                                  | EA   | 0.82     | 850.00        | 697               |
| 297                                 | Allowance for interior signage  | SF   | 2,042.01 | 0.85          | 1,736             |
| 298                                 | Allowance for exterior signage  | Item |          |               | 2,500             |
|                                     | C1090 - Interior Specialties  |      |          | 3.83/SF       | 7,818             |
|                                     | 10 - SPECIALTIES  |      |          | 3.83/SF       | 7,818             |
| 13                                  | SPECIAL CONSTRUCTION  |      |          |               |                   |
| F1020                               | Special Structures  |      |          |               |                   |
| 657                                 | Pre-engineered building   | SF   | 2,042.00 | 75.00         | 153,150           |
|                                     | F1020 - Special Structures  |      |          | 75.07/SF      | 153,150           |
|                                     | 13 - SPECIAL CONSTRUCTION   |      |          | 75.07/SF      | 153,150           |
| 21                                  | FIRE SUPPRESSION  |      |          |               |                   |
| D4030                               | Fire Protection Specialties   |      |          |               |                   |
| 2372                                | Allowance for Fire Extinguishers  | EA   | 2.00     | 300.00        | 600               |
|                                     | D4030 - Fire Protection Specialties   |      |          | 0.29/SF       | 600               |
|                                     | 21 - FIRE SUPPRESSION   |      |          | 0.29/SF       | 600               |
| 22                                  | PLUMBING  |      |          |               |                   |
| D2010                               | Domestic Water Distribution   |      |          |               |                   |
| 1886                                | Plumbing Fixtures   | Note |          |               |                   |
| 2073                                | P-1A, Water Closet - Flush Valve - Wall Mounted, accessible                   | EA   | 1.00     | 1,850.00      | 1,850             |
| 2076                                | P-3, Lavatory - Rectangular - Wall Mounted 19X17                              | EA   | 1.00     | 1,450.00      | 1,450             |
| 2097                                | Allowance for missing/ miscellaneous plumbing fixtures (Maintenance building) | SF   | 2,042.00 | 1.00          | 2,042             |
| 447                                 | Water Distribution and Components   | Note |          |               |                   |
| 2102                                | Connection to main(2")-(Maintenance building)                                 | EA   | 1.00     | 500.00        | 500               |
| 2104                                | Plumbing fixture- hook up(domestic water)                                     | EA   | 2.00     | 400.00        | 800               |



GFAR: 2,040.00 SF Cost/SF: 333.38

Rates Current At January 2023

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

| Ref   | Description   | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|----------|-------------|-------------------|
| 2109  | 2", water meter c/w reduced pressure backflow preventer -<br>Maintenance building (allowance) | EA   | 1.00     | 5,000.00    | 5,000             |
| 1311  | 2", Reduced pressure backflow preventer - allow - maintenance building                        | EA   | 1.00     | 2,500.00    | 2,500             |
| 1316  | Undercounter - point of use type electric water heater, 4.5 kw (Maintenance building)         | EA   | 1.00     | 6,500.00    | 6,500             |
| 2140  | Housekeeping pad(to be carried elsewhere in this estimate)                                    | Note |          |             | Excl.             |
| 2513  | Trap seal primer c/w tubing   | EA   | 3.00     | 300.00      | 900               |
| 2141  | HB, Hose bib  | EA   | 1.00     | 300.00      | 300               |
| 1101  | WH, Wall Hydrant - Mild Climate   | EA   | 1.00     | 1,750.00    | 1,750             |
| 465   | Domestic water piping, copper L, 1" - ag  | LF   | 36.50    | 30.00       | 1,095             |
| 466   | Domestic water piping, copper L, 2" - ag  | LF   | 66.60    | 58.99       | 3,929             |
| 1308  | Domestic water piping, copper K, 2" - bg  | LF   | 18.00    | 75.00       | 1,350             |
| 1365  | Thermal pipe insulation - 1/2" to 1" copper pipe  | LF   | 36.50    | 6.49        | 237               |
| 1368  | Thermal pipe insulation - 2" copper pipe  | LF   | 84.60    | 13.00       | 1,100             |
| 2155  | Water meter c/w bfp assembly- hook up(2")   | EA   | 1.00     | 750.00      | 750               |
| 2165  | Undercounter point of use type electric water heater- hook up                                 | EA   | 1.00     | 550.00      | 550               |
| 2170  | RBFP- hook up   | EA   | 1.00     | 550.00      | 550               |
| 1373  | Hookup - plumbing   | EA   | 2.00     | 400.00      | 800               |
| 2174  | Allowance for missing/ miscellaneous domestic water system (Maintenance building)             | SF   | 2,042.00 | 2.00        | 4,084             |
| 2176  | Subcontractor GCs/GRs   | Item |          |             | 3,000             |
|       | D2010 - Domestic Water Distribution   |      |          | 20.12/SF    | 41,037            |
| D2020 | Sanitary Drainage   |      |          |             |                   |
| 2178  | Plumbing fixture - hook-ups(sanitary & vent)  | EA   | 2.00     | 400.00      | 800               |
| 1322  | Grease/oil separator - Maintenance building   | EA   | 1.00     | 8,000.00    | 8,000             |
| 2194  | FD, Floor drain   | EA   | 3.00     | 450.00      | 1,350             |
| 2197  | CO, Clean out   | EA   | 2.00     | 350.00      | 700               |
| 2214  | 4", Sanitary piping c/w fittings - Bg   | LF   | 176.50   | 50.00       | 8,825             |
| 2263  | No excavation & backfill- assumed   | Note |          |             | Excl.             |
| 2262  | No cutting and patching assumed   | Note |          |             | Excl.             |
| 1296  | 1-1/2" to 2, Vent c/w fittings, supports, etc, ag   | LF   | 23.10    | 45.02       | 1,040             |



GFAR: 2,040.00 SF Cost/SF: 333.38

Rates Current At January 2023

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

| Ref   | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|----------|-------------|-------------------|
| 1304  | 1-1/2" to 2, Vent piping, bg   | LF   | 10.00    | 50.00       | 500               |
| 2236  | Allowance for missing/ miscellaneous sanitary drainage system(Maintenance building)    | SF   | 2,042.00 | 2.00        | 4,084             |
| 2238  | Subcontractor GCs/GRs  | Item |          |             | 1,000             |
|       | D2020 - Sanitary Drainage  |      |          | 12.89/SF    | 26,299            |
| D2030 | Building Support Plumbing Systems  |      |          |             |                   |
| 2242  | 4" RD/OFD, Roof Drain/ Overflow drain  | EA   | 2.00     | 1,200.00    | 2,400             |
| 2246  | 4", Storm drain piping c/w fittings, supports - Ag                                     | LF   | 82.76    | 70.00       | 5,793             |
| 2254  | No excavation & backfill- assumed  | Note |          |             | Excl.             |
| 2255  | No cutting and patching assumed  | Note |          |             | Excl.             |
| 2259  | Allowance for missing/ miscellaneous storm water drainage system(Maintenance building) | SF   | 2,042.00 | 1.00        | 2,042             |
| 2261  | Subcontractor GCs/GRs  | Item |          |             | 1,000             |
|       | D2030 - Building Support Plumbing Systems  |      |          | 5.51/SF     | 11,235            |
| D2060 | Process Support Plumbing Systems   |      |          |             |                   |
| 2529  | Allowance for maintenance building gas system (assumed not required)                   | Note |          |             | Excl.             |
|       | D2060 - Process Support Plumbing Systems   |      |          |             | Excl.             |
|       | 22 - PLUMBING  |      |          | 38.52/SF    | 78,571            |
| 23    | HEATING, VENTILATING, AND AIR CONDITIONING   |      |          |             |                   |
| D3020 | Heat Systems   |      |          |             |                   |
| 1847  | EUH-1, Electric unit heater, 15 kW   | EA   | 3.00     | 2,750.00    | 8,250             |
| 1865  | EUH-2, Electric unit heater, 1.5 kW  | EA   | 1.00     | 1,200.00    | 1,200             |
|       | D3020 - Heat Systems   |      |          | 4.63/SF     | 9,450             |
| D3030 | Cooling Systems  |      |          |             |                   |
| 2481  | Allowance for missing/ miscellaneous   | SF   | 2,042.01 | 0.40        | 817               |
|       | D3030 - Cooling Systems  |      |          | 0.40/SF     | 817               |
| D3050 | Facility HVAC Distribution Systems   |      |          |             |                   |
| 1848  | F-19, Exhaust fan, 1,700 cfm   | EA   | 1.00     | 3,540.00    | 3,540             |
| 1216  | Galvanized duct work c/w fittings, supports, etc.                                      | Lb   | 3,375.00 | 15.00       | 50,625            |
| 1217  | Thermal insulation   | SF   | 1,400.00 | 6.50        | 9,100             |



GFAR: 2,040.00 SF Cost/SF: 333.38

Rates Current At January 2023

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

| Ref   | Description   | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|---|------|----------|-------------|-------------------|
| 1245  | 18" to 20", Round galvanized duct work c/w fittings, supports, etc  | LF   | 69.91    | 90.00       | 6,292             |
| 1303  | C2, Side-wall grilles   | EA   | 3.00     | 350.00      | 1,050             |
| 1236  | Louver  | SF   | 12.00    | 75.00       | 900               |
| 2423  | Plenum, 36"x24"x24"   | EA   | 1.00     | 1,750.00    | 1,750             |
| 2424  | Plenum, 72"x24"x24"   | EA   | 1.00     | 2,150.00    | 2,150             |
| 1567  | Allowance for miscellaneous/missing items   | SF   | 2,042.00 | 2.00        | 4,084             |
|       | D3050 - Facility HVAC Distribution Systems  |      |          | 38.97/SF    | 79,491            |
| D3070 | Special Purpose HVAC Systems  |      |          |             |                   |
| 783   | Testing, balancing and commissioning  | SF   | 2,042.01 | 0.80        | 1,634             |
| 1560  | General requirements: supervision, shop drawings, asbuilt,<br>tags, markers, tools, rentals, BIM, cleaning, storage, material<br>handling, seismic restraints, permits, fees etc. | ltem |          |             | 7,000             |
|       | D3070 - Special Purpose HVAC Systems  |      |          | 4.23/SF     | 8,634             |
|       | 23 - HEATING, VENTILATING, AND AIR CONDITIONING   |      |          | 48.23/SF    | 98,392            |
| 26    | ELECTRICAL  |      |          |             |                   |
| D5020 | Electrical Service and Distribution   |      |          |             |                   |
| 217   | Distribution maintenance building   | SF   | 2,042.00 | 3.00        | 6,126             |
|       | D5020 - Electrical Service and Distribution   |      |          | 3.00/SF     | 6,126             |
| D5030 | General Purpose Electrical Power  |      |          |             |                   |
| 1531  | Rec power   | EA   | 6.00     | 125.00      | 750               |
|       | D5030 - General Purpose Electrical Power  |      |          | 0.37/SF     | 750               |
| D5040 | Lighting  |      |          |             |                   |
| 1526  | Lighting Exits  | EA   | 2.00     | 320.00      | 640               |
| 1527  | Lighting type F1 - 4' long linear OFCI  | EA   | 4.00     | 115.00      | 460               |
| 1732  | Lighting conduit & wire   | EA   | 6.00     | 185.00      | 1,110             |
| 1743  | Lighting control  | SF   | 2,042.01 | 0.75        | 1,532             |
|       | D5040 - Lighting  |      |          | 1.83/SF     | 3,742             |
| D5080 | Miscellaneous Electrical Systems  |      |          |             |                   |
| 1738  | Electrical permits  | SF   | 2,042.01 | 0.15        | 306               |
| 1739  | Electrical testing & commissioning  | SF   | 2,042.01 | 0.20        | 408               |



GFAR: 2,040.00 SF Cost/SF: 333.38

## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE -**REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM **BD BASE DESIGN**

A Building

A3 Maintenance Building (continued)

Rates Current At January 2023 Unit Ref Description Qty Rate **Total Cost** USD USD 1740 Electrical firestopping SF 2,042.01 0.25 511 D5080 - Miscellaneous Electrical Systems 0.60/SF 1,225 26 - ELECTRICAL 5.81/SF 11,843 27 COMMUNICATIONS D6010 **Data Communications** 1676 WAP wireless access point ΕA 1.00 850.00 850 D6010 - Data Communications 850 0.42/SF **Audio-Video Communication** D6030 1741 Sound conduit & wire ΕA 3.00 625.00 1,875 D6030 - Audio-Video Communication 0.92/SF 1,875 D6060 **Distributed Communications and Monitoring** 1742 Clocks conduit & wire EA 1.00 325.00 325 D6060 - Distributed Communications and Monitoring 0.16/SF 325 **27 - COMMUNICATIONS** 1.50/SF 3,050 28 ELECTRONIC SAFETY AND SECURITY D7010 **Access Controls and Intrusion Detection** EΑ 6.00 1733 Security conduit & wire 275.00 1,650 D7010 - Access Controls and Intrusion Detection 0.81/SF 1.650 D7050 **Detection and Alarm** ΕA 2.00 1,300 1631 Fire alarm pull station 650.00 1632 Fire alarm smoke detector ΕA 1.00 325.00 325 1636 Fire alarm audio/visual alarm ΕA 2.00 410.00 820 1734 Fire alarm conduit & wire ΕA 5.00 275.00 1,375 D7050 - Detection and Alarm 1.87/SF 3,820 2.68/SF 28 - ELECTRONIC SAFETY AND SECURITY 5,470 31 EARTHWORK A4010 Standard Slabs-on-Grade 508 Excavation for slab on grade CY 111.00 Incl. 509 Remove and dispose of excavated material CY 111.00 Incl. 510 Prepare and compact sub-base SF 1,798.06 1.50 2,697



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Buildina

| A Building<br>A3 Mainten | ance Building (continued)                                   |      | GFAR: 2,04<br>Rat | 40.00 SF Co<br>es Current At | ost/SF: 333.38<br>January 2023 |
|--------------------------|---|------|-------------------|------------------------------|--------------------------------|
| Ref                      | Description   | Unit | Qty               | Rate<br>USD                  | Total Cost<br>USD              |
| 513                      | Re-use materials ILO Imported sand gravel fill - 12" thick  | CY   | 66.61             | 15.00                        | 999                            |
|                          | A4010 - Standard Slabs-on-Grade                             |      |                   | 1.81/SF                      | 3,696                          |
| A9010                    | Substructure Excavation                                     |      |                   |                              |                                |
| 591                      | Excavation for foundation footings including spoils removal | CY   | 262.19            | 31.00                        | 8,128                          |
| 593                      | Prepare and compact foundation sub-base                     | SF   | 585.53            | 1.50                         | 878                            |
| 594                      | Imported sand gravel fill below foundations - 12" thick     | CY   | 21.70             | 50.00                        | 1,085                          |
| 620                      | Imported foundation backfill                                | CY   | 174.64            | 30.00                        | 5,239                          |
|                          | A9010 - Substructure Excavation                             |      |                   | 7.51/SF                      | 15,330                         |
|                          | 31 - EARTHWORK  |      |                   | 9.33/SF                      | 19,026                         |
| 33                       | UTILITIES   |      |                   |                              |                                |
| G3010                    | Water Utilities   |      |                   |                              |                                |
| 1383                     | Connection to building                                      | EA   | 1.00              | 600.00                       | 600                            |
| 1382                     | 2", copper  | LF   | 76.90             | 70.00                        | 5,383                          |
| 1955                     | Tee 8"x8"x2"  | EA   | 1.00              | 2,500.00                     | 2,500                          |
| 1380                     | 2", Water valve - allow                                     | EA   | 1.00              | 1,250.00                     | 1,250                          |
| 1448                     | Cleaning, testing, trace wiring etc.                        | LF   | 76.90             | 5.01                         | 385                            |
| 569                      | Excavation and backfill (with site preparation)             | LF   | 76.90             |                              | Incl.                          |
|                          | G3010 - Water Utilities                                     |      |                   | 4.96/SF                      | 10,118                         |
| G3020                    | Sanitary Sewerage Utilities                                 |      |                   |                              |                                |
| 1391                     | Connection to building sanitary service                     | EA   | 4.00              | 500.00                       | 2,000                          |
| 1388                     | SMH, Sanitary manhole                                       | EA   | 2.00              | 6,000.00                     | 12,000                         |
| 1941                     | 6",sanitary sewer, cast iron                                | LF   | 10.58             | 110.02                       | 1,164                          |
| 1387                     | 6",sanitary sewer, PVC                                      | LF   | 13.48             | 85.01                        | 1,146                          |
| 1943                     | 4",sanitary sewer, PVC                                      | LF   | 33.08             | 45.01                        | 1,489                          |
| 1392                     | 6",sanitary sewer, PVC                                      | LF   | 38.75             | 74.99                        | 2,906                          |
| 2318                     | Cleaning, testing, trace wiring etc.                        | LF   | 95.75             | 5.00                         | 479                            |
| 577                      | Excavation and backfill (with site preparation)             | LF   | 95.75             |                              | Incl.                          |
|                          | G3020 - Sanitary Sewerage Utilities                         |      |                   | 10.38/SF                     | 21,184                         |
|                          |   |      |                   |                              |                                |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

### A Building

A3 Maintenance Building (continued)

GFAR: 2,040.00 SF Cost/SF: 333.38 Rates Current At January 2023

| Ref     | Description   | Unit | Qty | Rate<br>USD | Total Cost<br>USD |
|---------|---|------|-----|-------------|-------------------|
| G3090   | Liquid and Gas Site Utilities Supplementary Components  |      |     |             |                   |
| 1798    | General requirements: supervision, shop drawings, as-built drawings, equipment rentals, fees, permits, etc. | Item |     |             | 2,191             |
|         | G3090 - Liquid and Gas Site Utilities Supplementary<br>Components   |      |     | 1.07/SF     | 2,191             |
|         | 33 - UTILITIES  |      |     | 16.42/SF    | 33,493            |
| MAINTEN | ANCE BUILDING   |      | 3   | 33.38/SF    | 680,095           |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

## LOCATION DIVISIONS SUMMARY

**BD Base Design** B Sitework

Rates Current At January 2023

| Ref  | Description                    | GFAR<br>USD/SF | Total Cost<br>USD |
|------|--------------------------------|----------------|-------------------|
| 01   | General Requirements           |                | 1,475,000         |
| 02   | Existing Conditions            |                | 5,298,953         |
| 11   | Equipment                      |                | 709,550           |
| 14   | Conveying Equipment            |                | Excl.             |
| 22   | Plumbing                       |                | Excl.             |
| 26   | Electrical                     |                | 4,155,919         |
| 27   | Communications                 |                | 355,130           |
| 28   | Electronic Safety and Security |                | 1,980             |
| 31   | Earthwork                      |                | 16,648,483        |
| 32   | Exterior Improvements          |                | 9,050,609         |
| 33   | Utilities                      |                | 6,690,111         |
| SITE | WORK                           |                | 44,385,735        |
|      |                                |                |                   |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

## LOCATION DIVISIONS SUMMARY

**BD Base Design** B Sitework

Rates Current At January 2023

|  |                | 3                 |
|--|----------------|-------------------|
| Ref Description  | GFAR<br>USD/SF | Total Cost<br>USD |
|  |                |                   |
| MARGINS & ADJUSTMENTS  |                |                   |
| Design & Estimating Contingency  |                | 1,109,644         |
| Escalation Allowance up to mid-point of Construction                       |                | 2,047,292         |
| Sub-contractor Bonds   |                | 570,512           |
| Insurance - CCIP (Change from GL)  |                | 1,348,724         |
| Cost of Traditional Insurance (Trade + GL)                                 |                | -1,484,465        |
| Builder's Risk Insurance (per CM Pricing Exhibit 1)                        |                | 79,481            |
| Payment & Performance Bond (per CM Pricing Exhibit 1)                      |                | 402,707           |
| General Conditions (per CM Pricing Exhibit 1)                              |                | 2,107,961         |
| General Requirements (per CM Pricing Exhibit 1)                            |                | 1,315,162         |
| Allowance for Additional Requirements not included in CM Pricing Exhibit 1 |                | 217,596           |
| CM Construction Contingency (per CM Pricing Exhibit 1)                     |                | 1,214,885         |
| CM Fee (per CM Pricing Exhibit 1)  |                | 915,026           |
| ESTIMATED TOTAL COST   |                | 54,230,260        |



# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

## LOCATION DIVISIONS/ELEMENTS ITEM

**BD Base Design** B Sitework

| B Sitework |  |      |            | Rates Current At | January 2023      |
|------------|--|------|------------|------------------|-------------------|
| Ref        | Description  | Unit | Qty        | Rate<br>USD      | Total Cost<br>USD |
| 01         | GENERAL REQUIREMENTS   |      |            |                  |                   |
| G1010      | Site Clearing  |      |            |                  |                   |
| 672        | Dust control   | LS   | 1.00       | 75,000.00        | 75,000            |
| 679        | Mobilization   | LS   | 1.00       | 150,000.00       | 150,000           |
| 680        | Submittals, as-builts, layout, survey, etc.                                    | LS   | 1.00       | 600,000.00       | 600,000           |
|            | G1010 - Site Clearing  |      |            |                  | 825,000           |
| G1070      | Site Earthwork   |      |            |                  |                   |
| 670        | Allowance for dewatering   | LS   | 1.00       | 450,000.00       | 450,000           |
| 813        | Temporary access road and repairs  | LS   | 1.00       | 150,000.00       | 150,000           |
| 814        | Temporary walkways   | LS   | 1.00       | 50,000.00        | 50,000            |
|            | G1070 - Site Earthwork   |      |            |                  | 650,000           |
|            | 01 - GENERAL REQUIREMENTS  |      |            |                  | 1,475,000         |
| 02         | EXISTING CONDITIONS  |      |            |                  |                   |
| F2010      | Hazardous Materials Remediation  |      |            |                  |                   |
| 552        | Allowance for hazardous materials abatement                                    | LS   | 1.00       | 1,900,000.00     | 1,900,000         |
|            | F2010 - Hazardous Materials Remediation  |      |            |                  | 1,900,000         |
| F3010      | Structure Demolition   |      |            |                  |                   |
| 553        | Demolish existing school building  | SF   | 239,144.00 | 7.00             | 1,674,008         |
| 554        | Demolish miscellaneous support/outbuildings                                    | SF   | 5,769.00   | 6.00             | 34,614            |
|            | F3010 - Structure Demolition   |      |            |                  | 1,708,622         |
| G1010      | Site Clearing  |      |            |                  |                   |
| 678        | Site fencing including maintenance   | LF   | 7,000.00   | 56.00            | 392,000           |
|            | G1010 - Site Clearing  |      |            |                  | 392,000           |
| G1020      | Site Elements Demolition   |      |            |                  |                   |
| 523        | Remove and dispose of existing catch basins                                    | EA   | 33.00      | 750.00           | 24,750            |
| 524        | Remove and dispose of existing manholes  | EA   | 23.00      | 750.00           | 17,250            |
| 1841       | Remove and dispose of existing hydrant   | EA   | 3.00       | 500.00           | 1,500             |
| 525        | Remove and dispose existing utilities piping including excavation and backfill | LF   | 7,868.00   | 65.00            | 511,420           |
| 526        | Protect and maintain existing hydrant  | EA   | 1.00       | 500.00           | 500               |
| 1839       | Maintain and protect manhole/catch basin/drain line/water line                 | EA   | 19.00      | 1,500.00         | 28,500            |

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**



## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| 3 Sitework | (continued)   | Rates Current At January |              |             | January 2023      |
|------------|---|--------------------------|--------------|-------------|-------------------|
| Ref        | Description   | Unit                     | Qty          | Rate<br>USD | Total Cost<br>USD |
| 527        | Cap water main  | EA                       | 3.00         | 400.00      | 1,200             |
| 1842       | Allowances for plugging pipes   | EA                       | 4.00         | 600.00      | 2,400             |
| 533        | Break-out and remove existing pavements                                     | SF                       | 261,335.00   | 1.75        | 457,336           |
| 534        | Break-out and remove existing basketball courts                             | SF                       | 12,883.00    | 1.75        | 22,545            |
| 536        | Remove and dispose existing light poles and associated wiring               | EA                       | 16.00        | 300.00      | 4,800             |
| 541        | Remove and dispose existing light sconces and<br>associated wiring          | EA                       | 25.00        | 100.00      | 2,500             |
| 544        | Remove and dispose of existing fencing                                      | LF                       | 1,920.00     | 22.50       | 43,200            |
| 545        | Remove and dispose of existing metal guardrail                              | LF                       | 741.00       | 30.00       | 22,230            |
| 555        | Remove and dispose of buried fuel tanks                                     | EA                       | 2.00         | 30,000.00   | 60,000            |
| 556        | Remove and dispose of above grade gas tanks                                 | EA                       | 4.00         | 500.00      | 2,000             |
| 557        | Remove and dispose of sliding gate  | EA                       | 6.00         | 400.00      | 2,400             |
| 559        | Remove and dispose of jersey barrier  | LF                       | 40.00        | 30.00       | 1,200             |
| 560        | Remove and dispose of trailers  | EA                       | 4.00         | 1,300.00    | 5,200             |
| 1439       | Remove and dispose backstop   | LF                       | 196.00       | 25.00       | 4,900             |
| 561        | Allowance for miscellaneous site demolition not<br>indicated on plans       | SF                       | 1,517,556.00 |             | Excl.             |
| 762        | Existing building electrical demolition (phased)                            | EA                       | 1.00         | 75,000.00   | 75,000            |
| 1442       | Remove and dispose benches  | EA                       | 2.00         | 350.00      | 700               |
| 1443       | Demolish concrete retaining walls   | LF                       | 66.00        | 50.00       | 3,300             |
| 1444       | Remove and dispose of recreational equipment                                | LS                       | 1.00         | 3,500.00    | 3,500             |
|            | G1020 - Site Elements Demolition  |                          |              |             | 1,298,331         |
|            | 02 - EXISTING CONDITIONS  |                          |              |             | 5,298,953         |
| 11         | EQUIPMENT   |                          |              |             |                   |
| G2050      | Athletic, Recreational, and Playfield Areas                                 |                          |              |             |                   |
| 697        | Shotput cage - allow 20' high   | LF                       | 69.00        | 350.00      | 24,150            |
| 417        | Football goal post and footing  | EA                       | 2.00         | 20,000.00   | 40,000            |
| 416        | 20'-0" high sports netting  | LF                       | 397.80       | 500.00      | 198,900           |
| 696        | Pole vault box  | EA                       | 1.00         | 1,500.00    | 1,500             |
| 699        | Aluminum bleacher system including and ramp -<br>Football field, 500 person | LS                       | 1.00         | 345,000.00  | 345,000           |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| B Sitework | (continued)  |      | Rates Current At January |             |                   |
|------------|--|------|--------------------------|-------------|-------------------|
| Ref        | Description  | Unit | Qty                      | Rate<br>USD | Total Cost<br>USD |
| 770        | Exterior scoreboard football   | EA   | 1.00                     | 100,000.00  | 100,000           |
|            | G2050 - Athletic, Recreational, and Playfield Areas                      |      |                          |             | 709,550           |
|            | 11 - EQUIPMENT   |      |                          |             | 709,550           |
| 14         | CONVEYING EQUIPMENT  |      |                          |             |                   |
| D1010      | Vertical Conveying Systems   |      |                          |             |                   |
| 752        | Passenger elevator, 2 stops  | EA   | 1.00                     |             | Excl.             |
|            | D1010 - Vertical Conveying Systems                                       |      |                          |             | Excl.             |
|            | 14 - CONVEYING EQUIPMENT   |      |                          |             | Excl.             |
| 22         | PLUMBING   |      |                          |             |                   |
| D2030      | Building Support Plumbing Systems  |      |                          |             |                   |
| 1760       | Allowances for sump pump for press booth                                 | No   | 1.00                     |             | Excl.             |
|            | D2030 - Building Support Plumbing Systems                                |      |                          |             | Excl.             |
|            | 22 - PLUMBING  |      |                          |             | Excl.             |
| 26         | ELECTRICAL   |      |                          |             |                   |
| G4010      | Site Electric Distribution Systems                                       |      |                          |             |                   |
| 811        | Secondary 4000 amp feeder to school electrical room                      | LF   | 260.00                   | 969.00      | 251,940           |
| 184        | Primary 4000 amp feeder #1 (8-4" conduits) utility supplied cable        | LF   | 940.00                   | 382.98      | 360,001           |
| 185        | Primary 4000 amp feeder #2 (8-4" conduits) utility supplied cable        | LF   | 931.00                   | 382.98      | 356,554           |
| 186        | Fire Pump feeder 200 amps (2-4" conduits)                                | LF   | 376.00                   | 56.00       | 21,056            |
| 187        | Secondary generator feeder (4-400 amp feeds)                             | LF   | 680.00                   | 140.20      | 95,336            |
| 188        | Secondary feeder to maintenance building 400 amp service)                | LF   | 619.00                   | 246.66      | 152,683           |
| 201        | Field electrical service 75 kva transformer service EV Charging Stations | EA   | 3.00                     | 42,040.00   | 126,120           |
| 204        | Field service to concessions 250 amps                                    | LF   | 592.00                   | 65.00       | 38,480            |
| 205        | Field service to athletic building 1200 amps                             | LF   | 94.00                    | 125.50      | 11,797            |
| 208        | Primary to padmount transformer for field buildings                      | LF   | 220.00                   | 88.00       | 19,360            |
| 213        | Sports field grounding   | EA   | 1.00                     | 8,500.00    | 8,500             |
| 706        | Secondary service manholes   | EA   | 11.00                    | 2,450.00    | 26,950            |
| 766        | Utility pole modifications (not included)                                | EA   | 1.00                     |             | Excl.             |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| B Sitework ( | continued)   |      |        | Rates Current At | January 2023      |
|--------------|--|------|--------|------------------|-------------------|
| Ref          | Description  | Unit | Qty    | Rate<br>USD      | Total Cost<br>USD |
| 1836         | Electrical duct bank concrete encasement   | EA   | 1.00   | 1,320,250.00     | 1,320,250         |
| 1837         | Electrical (E & B) in another division of the estimate                               | Note |        |                  | Excl.             |
| 2566         | Traffic Signals  | EA   | 1.00   | 250,000.00       | 250,000           |
|              | G4010 - Site Electric Distribution Systems   |      |        |                  | 3,039,027         |
| G4050        | Site Lighting  |      |        |                  |                   |
| 214          | Sports field lighting conduit & wire (pole lights)                                   | EA   | 1.00   | 76,500.00        | 76,500            |
| 215          | Sports field lighting control  | EA   | 1.00   | 17,467.00        | 17,467            |
| 772          | Site bench lighting  | EA   | 1.00   | 8,550.00         | 8,550             |
| 774          | Electronic gate entrance S & Install incl elect conn                                 | EA   | 1.00   | 26,500.00        | 26,500            |
| 934          | Type LST 11 flagpole (cluster)   | EA   | 3.00   | 570.00           | 1,710             |
| 936          | Double head 25 ft pole   | EA   | 8.00   | 5,790.00         | 46,320            |
| 937          | Single head 16 ft pole   | EA   | 34.00  | 5,000.00         | 170,000           |
| 938          | Single head 14 ft pole   | EA   | 58.00  | 4,675.00         | 271,150           |
| 940          | Digital message board  | EA   | 1.00   | 2,030.00         | 2,030             |
| 941          | Monument sign lighting   | EA   | 1.00   | 2,240.00         | 2,240             |
| 943          | Musco Football lighting  | EA   | 4.00   | 85,000.00        | 340,000           |
| 1789         | Electric vehicle dual charging system  | EA   | 10.00  | 12,800.00        | 128,000           |
| 1790         | Electric vehicle dual charging system distribution<br>panels                         | EA   | 5.00   | 7,285.00         | 36,425            |
| 2630         | Re-evaluate conduit and ho site lighting is powered for<br>entrance near School Sign | LS   | 1.00   | -10,000.00       | -10,000           |
|              | G4050 - Site Lighting  |      |        |                  | 1,116,892         |
|              | 26 - ELECTRICAL  |      |        |                  | 4,155,919         |
| 27           | COMMUNICATIONS   |      |        |                  |                   |
| G5010        | Site Communications  |      |        |                  |                   |
| 189          | Secondary communications feeder 8-4" conduits  | LF   | 680.00 | 210.00           | 142,800           |
| 192          | Communications to maintenance building (4-4" conduits)                               | LF   | 640.00 | 107.00           | 68,480            |
| 209          | Secondary communications feeder 8-4" conduits for<br>Athletic fields                 | LF   | 685.00 | 210.00           | 143,850           |
|              | G5010 - Site Communications  |      |        |                  | 355,130           |
|              | 27 - COMMUNICATIONS  |      |        |                  | 355,130           |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| B Sitework | (continued)   |      |              | Rates Current At | January 2023      |
|------------|---|------|--------------|------------------|-------------------|
| Ref        | Description   | Unit | Qty          | Rate<br>USD      | Total Cost<br>USD |
| 28         | ELECTRONIC SAFETY AND SECURITY  |      |              |                  |                   |
| G5010      | Site Communications   |      |              |                  |                   |
| 1671       | Outdoor CCTV Bullet cameras incl fiber cabling pole mtd   | EA   | 2.00         | 990.00           | 1,980             |
|            | G5010 - Site Communications   |      |              |                  | 1,980             |
|            | 28 - ELECTRONIC SAFETY AND SECURITY   |      |              |                  | 1,980             |
| 31         | EARTHWORK   |      |              |                  |                   |
| G1010      | Site Clearing   |      |              |                  |                   |
| 676        | Clearing and grubbing   | Acre | 34.900       | 8,500.00         | 296,650           |
| 677        | Tree removal  | EA   | 100.00       | 850.00           | 85,000            |
|            | G1010 - Site Clearing   |      |              |                  | 381,650           |
| G1070      | Site Earthwork  |      |              |                  |                   |
| 666        | Excavate to proposed level  | CY   | 59,189.00    | 18.00            | 1,065,402         |
| 667        | Excavate to proposed level, rock excavation including survey, drilling, stockpile, striping, etc. | CY   | 162,710.00   | 50.00            | 8,135,500         |
| 1813       | Miscellaneous trenching, etc.   | CY   | 14,666.00    | 60.00            | 879,960           |
| 668        | Fill to proposed level using excavated materials  | CY   | 108,316.00   | 12.00            | 1,299,792         |
| 1697       | Remove excess materials from site   | CY   | 97,371.00    | 14.00            | 1,363,194         |
| 2568       | Striping including spoil removal (Phase 1)  | CY   | 10,000.00    | 30.00            | 300,000           |
| 2569       | Strip and stockpile for re-use (Phase 2)  | CY   | 7,600.00     | 18.00            | 136,800           |
| 669        | Allowance for fine grading  | SF   | 1,451,369.00 | 0.35             | 507,979           |
| 673        | Inlet protection  | EA   | 143.00       | 350.00           | 50,050            |
| 674        | Construction entrance   | EA   | 3.00         | 7,500.00         | 22,500            |
| 675        | Haybale and silt fencing including maintenance  | LF   | 10,585.00    | 12.50            | 132,313           |
| 1828       | Erosion control blankets and mats   | LS   | 1.00         | 40,000.00        | 40,000            |
| 1829       | Additional erosion control maintenance and removal  | LS   | 1.00         | 90,000.00        | 90,000            |
| 733        | Excavate for roadway paving   | CY   | 3,546.00     | 16.00            | 56,736            |
| 1482       | Remove spoils from site (roadway)   | CY   | 3,546.00     | 14.00            | 49,644            |
| 738        | Excavate for parking lot paving   | CY   | 11,070.00    | 16.00            | 177,120           |
| 1476       | Remove spoils from site (parking lot paving)  | CY   | 11,070.00    | 14.00            | 154,980           |
| 743        | Excavate for walkways paving  | CY   | 2,663.00     | 16.00            | 42,608            |
| 1518       | Remove spoils from site (walkways paving)   | CY   | 2,663.00     | 14.00            | 37,282            |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| 3 Sitework | (continued)  | Rates Current At Jar |            |             | January 2023      |
|------------|--|----------------------|------------|-------------|-------------------|
| Ref        | Description  | Unit                 | Qty        | Rate<br>USD | Total Cost<br>USD |
| 755        | Excavate athletic fields                                   | CY                   | 4,890.70   | 16.00       | 78,251            |
| 1826       | Remove spoils from site (athletic fields)                  | CY                   | 4,890.70   | 14.00       | 68,470            |
| 1814       | Allowance for rock scaling                                 | LS                   | 1.00       | 150,000.00  | 150,000           |
| 2618       | Raise dropped footing to within 5' depth                   | LS                   | 1.00       | -25,000.00  | -25,000           |
|            | G1070 - Site Earthwork                                     |                      |            |             | 14,813,581        |
| G2010      | Roadways   |                      |            |             |                   |
| 735        | Stock pile excavated materials for re-use (none indicated) | CY                   | 3,546.00   |             | Excl.             |
| 734        | Prepare and compact subbase                                | SF                   | 91,940.00  | 0.75        | 68,955            |
| 736        | Granular fill, 12" thick, re-use excavated materials       | CY                   | 3,406.00   | 15.00       | 51,090            |
| 1483       | Imported compacted gravel borrow                           | CY                   | 2,271.00   |             | Excl.             |
| 1484       | Imported dense grade crushed stone                         | CY                   | 1,136.00   |             | Excl.             |
| 258        | Riprap swale (re-use existing or blasted materials)        | SF                   | 66,872.00  | 12.00       | 802,464           |
|            | G2010 - Roadways   |                      |            |             | 922,509           |
| G2020      | Parking Lots   |                      |            |             |                   |
| 739        | Stock pile excavated materials for re-use (none indicated) | CY                   | 11,070.00  |             | Excl.             |
| 740        | Prepare and compact subbase                                | SF                   | 233,385.00 | 0.75        | 175,039           |
| 742        | Granular fill, re-use excavated materials                  | CY                   | 8,644.00   | 15.00       | 129,660           |
| 1480       | Imported compacted gravel borrow                           | CY                   | 5,826.00   |             | Excl.             |
| 1481       | Imported dense grade crushed stone                         | CY                   | 2,819.00   |             | Excl.             |
|            | G2020 - Parking Lots                                       |                      |            |             | 304,699           |
| G2030      | Pedestrian Plazas and Walkways                             |                      |            |             |                   |
| 744        | Stock pile excavated materials for re-use (none indicated) | CY                   | 2,663.00   |             | Excl.             |
| 745        | Prepare and compact subbase                                | SF                   | 73,687.60  | 0.75        | 55,266            |
| 746        | Granular fill, re-use excavated materials                  | CY                   | 1,870.00   | 15.00       | 28,050            |
| 1519       | Imported compacted gravel borrow                           | CY                   | 1,149.00   |             | Excl.             |
| 1520       | Imported dense grade crushed stone                         | CY                   | 570.00     |             | Excl.             |
|            | G2030 - Pedestrian Plazas and Walkways                     |                      |            |             | 83,316            |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| 3 Sitework (                  | continued)   | Rates Current At Jan |            |             | t January 2023    |
|-------------------------------|--|----------------------|------------|-------------|-------------------|
| Ref                           | Description  | Unit                 | Qty        | Rate<br>USD | Total Cost<br>USD |
| G2050                         | Athletic, Recreational, and Playfield Areas                  |                      |            |             |                   |
| 756                           | Stock pile excavated materials for re-use (none indicated)   | CY                   | 4,890.70   |             | Excl.             |
| 757                           | Prepare and compact subbase                                  | SF                   | 135,608.90 | 0.75        | 101,707           |
| 758                           | Granular base to athletic fields, re-use excavated materials | CY                   | 2,511.40   | 15.00       | 37,671            |
| 1573                          | Imported compacted gravel borrow                             | CY                   | 67.00      | 50.00       | 3,350             |
| 1574                          | Imported dense grade crushed stone                           | CY                   | 2,445.30   |             | Excl.             |
|                               | G2050 - Athletic, Recreational, and Playfield Areas          |                      |            |             | 142,728           |
| 31 - EARTHWORK                |  |                      |            | 16,648,483  |                   |
| 32                            | EXTERIOR IMPROVEMENTS  |                      |            |             |                   |
| G2010                         | Roadways   |                      |            |             |                   |
| 247                           | Vehicular asphalt paving, 4" overall thickness               | SY                   | 10,216.00  | 40.00       | 408,640           |
| 248                           | Vertical granite curb  | LF                   | 6,242.00   | 60.00       | 374,520           |
| 828                           | Cape cod berm  | LF                   | 813.00     | 20.00       | 16,260            |
| 737                           | Pavement markings  | SF                   | 91,940.00  | 0.35        | 32,179            |
|                               | G2010 - Roadways   |                      |            |             | 831,599           |
| G2020                         | Parking Lots   |                      |            |             |                   |
| 253                           | Asphalt paving, 4" overall thickness                         | SY                   | 25,363.00  | 40.00       | 1,014,520         |
| 290                           | Vehicular concrete paving, 6" thick                          | SY                   | 569.00     | 115.00      | 65,435            |
| 255                           | Vertical granite curb  | LF                   | 4,700.00   | 60.00       | 282,000           |
| 671                           | Cape cod berm  | LF                   | 5,174.00   | 20.00       | 103,480           |
| 262                           | Accessible pavement markings                                 | SF                   | 5,025.00   | 3.25        | 16,331            |
| 263                           | Crosswalk markings   | SF                   | 1,282.00   | 3.25        | 4,167             |
| 265                           | EV pavement markings   | EA                   | 10.00      | 600.00      | 6,000             |
| 266                           | Electric vehicle charging station (refer to Site Electrical) | EA                   | 5.00       |             | Incl.             |
| 261                           | Green vehicle pavement markings                              | EA                   | 22.00      | 850.00      | 18,700            |
| 257                           | Handicap vehicle pavement markings                           | EA                   | 19.00      | 650.00      | 12,350            |
| 357                           | Parking line marking   | LF                   | 8,476.00   | 5.65        | 47,889            |
| G2020 - Parking Lots 1,570,87 |  |                      |            |             | 1,570,872         |



## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| 3 Sitework ( | continued)  | Rates Current At January |           |             | January 2023      |
|--------------|---|--------------------------|-----------|-------------|-------------------|
| Ref          | Description   | Unit                     | Qty       | Rate<br>USD | Total Cost<br>USD |
| G2030        | Pedestrian Plazas and Walkways                                      |                          |           |             |                   |
| 256          | Asphalt walkway pavement  | SY                       | 5,125.00  | 35.00       | 179,375           |
| 718          | Vehicular concrete walkway  | SY                       | 456.00    | 115.00      | 52,440            |
| 264          | Accessible curb ramp  | SF                       | 379.00    |             | Incl.             |
| 269          | Integral color aggregate concrete paving (item deleted)             | SF                       | 4,772.00  |             | Excl.             |
| 1830         | Extra over for accent bands   | LS                       | 1.00      |             | Excl.             |
| 273          | Granite pavers, type A (item deleted)                               | SF                       | 895.00    |             | Excl.             |
| 279          | Concrete unit plank pavers, type B (item deleted)                   | SF                       | 1,010.00  |             | Excl.             |
| 362          | Concrete walkway paving   | SF                       | 23,466.60 | 13.00       | 305,066           |
| 1487         | Extra over for etched texts (item deleted)                          | EA                       | 91.00     |             | Excl.             |
| 367          | Detectable warning  | SF                       | 377.00    | 45.00       | 16,965            |
|              | G2030 - Pedestrian Plazas and Walkways                              |                          |           |             | 553,846           |
| G2050        | Athletic, Recreational, and Playfield Areas                         |                          |           |             |                   |
| 2567         | Repair existing irrigation affected by infiltration<br>construction | SF                       | 80,549.20 | 1.00        | 80,549            |
| 389          | Natural grass to Football Court/Field                               | SF                       | 78,287.50 | 4.00        | 313,150           |
| 2396         | Irrigation to Football Court/Field natural grass turf               | SF                       | 78,287.50 | 1.50        | 117,431           |
| 405          | Urethane resilient track surfacing (D-Zone)                         | SF                       | 21,811.00 | 25.00       | 545,275           |
| 404          | Urethane resilient track surfacing on asphalt (6-Lane Track)        | SF                       | 31,943.00 | 25.00       | 798,575           |
| 693          | 6'-0" High BVC chainlink fence                                      | LF                       | 413.10    | 95.00       | 39,244            |
| 397          | 4'-0" High BVC chainlink fence                                      | LF                       | 1,505.20  | 60.00       | 90,312            |
| 398          | 4'-0" High BVC chainlink fence single leaf gate                     | EA                       | 3.00      | 350.00      | 1,050             |
| 694          | 4'-0" High BVC chainlink fence double leaf gate                     | EA                       | 2.00      | 700.00      | 1,400             |
| 406          | Trench drain  | LF                       | 1,307.00  | 100.00      | 130,700           |
| 396          | Electronic scoreboard - steel posts with concrete<br>footing        | EA                       | 1.00      | 8,000.00    | 8,000             |
| 418          | Long jump runway  | SF                       | 1,908.00  |             | Incl.             |
| 419          | Long jump pit   | SF                       | 755.00    | 20.00       | 15,100            |
| 420          | Shotput throwing pad and landing sector                             | SF                       | 200.00    |             | Incl.             |
| 1706         | Cast-in-place grandstand footings, 2' dia x 5' deep                 | EA                       | 24.00     | 850.00      | 20,400            |
| 2484         | Cast-in-place slab on grade for grandstand, 4" deep                 | SF                       | 3,072.00  | 7.00        | 21,504            |





## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| 3 Sitework ( | continued)  | Rates Current At January |          |             | January 2023      |
|--------------|---|--------------------------|----------|-------------|-------------------|
| Ref          | Description   | Unit                     | Qty      | Rate<br>USD | Total Cost<br>USD |
| 2485         | Cast-in-place slab on grade for grandstand, 5" deep                       | SF                       | 497.00   | 11.00       | 5,467             |
| 2486         | Cast-in-place grade beam for grandstand, 1'-0" wide x 3'-6" deep          | LF                       | 135.00   | 210.00      | 28,350            |
| 2487         | Galvanized structural steel supporting framing                            | Т                        | 24.7200  |             | Incl.             |
| 690          | Asphalt pad   | SY                       | 46.00    | 60.00       | 2,760             |
| 695          | Pole vault runway   | SF                       | 633.00   |             | Incl.             |
| 700          | Allowance for concrete footings to bleacher system (refer to Press Booth) | SF                       | 5,144.00 |             | Incl.             |
| 701          | Outdoor fitness equipment - by Owner                                      | EA                       | 5.00     |             | Excl.             |
|              | G2050 - Athletic, Recreational, and Playfield Areas                       |                          |          |             | 2,219,267         |
| G2060        | Site Development  |                          |          |             |                   |
| 259          | Streel guardrail along access ways  | LF                       | 3,400.00 | 65.00       | 221,000           |
| 260          | Segmented retaining wall  | LF                       | 495.00   | 550.00      | 272,250           |
| 1576         | Gabion fence, 15" x 42" (item deleted)                                    | LF                       | 24.00    |             | Excl.             |
| 1577         | Gabion fence signage (item deleted)                                       | EA                       | 8.00     |             | Excl.             |
| 278          | Cafe wood backless seat (item deleted)                                    | EA                       | 48.00    |             | Excl.             |
| 1583         | Cafe wood back chair  | EA                       | 24.00    | 1,500.00    | 36,000            |
| 289          | Dumpster - by Owner   | EA                       | 2.00     |             | Excl.             |
| 778          | Poured in place rubber safety surfacing                                   | SF                       | 933.00   |             | Excl.             |
| 369          | Exterior steel bollard (at walkway)                                       | EA                       | 56.00    | 750.00      | 42,000            |
| 370          | 4'-0" High wire mesh fence (item deleted)                                 | LF                       | 114.00   |             | Excl.             |
| 682          | 6'-0" High wire mesh fence  | LF                       | 99.00    |             | Excl.             |
| 2419         | Metal roof screen panel and gate, 8'-0" high                              | LF                       | 97.00    | 150.00      | 14,550            |
| 371          | 4'-0" High Gabion fence wall with metal signage                           | LF                       | 25.00    |             | Excl.             |
| 372          | 4'-0" High ornamental fence   | LF                       | 16.00    | 350.00      | 5,600             |
| 377          | 8'-0" High chain link double leaf gate                                    | Pair                     | 6.00     | 950.00      | 5,700             |
| 378          | 8'-0" High BVC chainlink fence  | LF                       | 277.00   | 120.00      | 33,240            |
| 2416         | 6'-0" High BVC chainlink fence  | LF                       | 35.00    | 95.00       | 3,325             |
| 2417         | 6'-0" High chain link double leaf gate                                    | Pair                     | 1.00     | 900.00      | 900               |
| 2420         | 4'-0" High chainlink fence at top of rock face cut                        | LF                       | 751.00   | 75.00       | 56,325            |
| 387          | 10'-0" High BVC chainlink fence   | LF                       | 718.00   |             | Excl.             |
| 380          | Equipment concrete pad  | SF                       | 489.00   | 30.00       | 14,670            |

# 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4



Rates Current At January 2023

## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| Ref   | Description  | Unit | Qty        | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|------------|-------------|-------------------|
| 381   | Wood deck  | SF   | 401.00     | 125.00      | 50,125            |
| 399   | Pre-engineered elevated boardwalk ramping system                   | SF   | 8,856.00   | 110.00      | 974,160           |
| 1575  | Pre-engineered stairs  | SF   | 736.00     | 150.00      | 110,400           |
| 401   | CIP Concrete ramp  | SF   | 2,774.00   |             | Excl.             |
| 402   | Handrail to stairs / ramps   | LF   | 2,482.00   | 150.00      | 372,300           |
| 373   | CIP Retaining wall/ bench shelf                                    | CY   | 74.00      | 1,800.00    | 133,200           |
| 728   | CIP strip footing for retaining walls/bench shelf                  | CY   | 89.00      | 1,000.00    | 89,000            |
| 1578  | Custom perforated seat box, $3/16$ " thick, 2' x 8' (item deleted) | EA   | 6.00       |             | Excl.             |
| 1579  | Custom perforated seat box, $3/16$ " thick, 2' x 2' (item deleted) | EA   | 4.00       |             | Excl.             |
| 1580  | Custom solid panel set box, 1/4" thick, 2' x 8' (item deleted)     | EA   | 3.00       |             | Excl.             |
| 1584  | Backless straight inline bench, 23.5" x 87.5" L                    | EA   | 5.00       | 3,600.00    | 18,000            |
| 1585  | Backed straight inline bench, 23.5" x 87.5" L                      | EA   | 3.00       | 4,100.00    | 12,300            |
| 1586  | Cafe table, 36" square   | EA   | 6.00       | 3,050.00    | 18,300            |
| 1588  | Playground picnic table/bench                                      | EA   | 1.00       | 4,600.00    | 4,600             |
| 1589  | Trash receptacle, 50 liter capacity                                | EA   | 6.00       | 1,800.00    | 10,800            |
| 1590  | "Flo" bike racks   | EA   | 3.00       | 1,150.00    | 3,450             |
| 2414  | Sliding vehicular metal gate, 46' L x 3' Ht.                       | EA   | 1.00       | 25,000.00   | 25,000            |
| 2415  | Swing vehicular swing gate, allow 21' L x 3' Ht.                   | EA   | 1.00       | 5,000.00    | 5,000             |
| 2418  | Flush cast-in-place concrete wall                                  | LF   | 42.00      | 250.00      | 10,500            |
|       | G2060 - Site Development   |      |            |             | 2,542,695         |
| G2080 | Landscaping  |      |            |             |                   |
| 789   | Imported planting mix  | CY   | 5,154.20   | 60.00       | 309,252           |
| 2542  | Use stockpile material   | CY   | 5,154.20   | 15.00       | 77,313            |
| 407   | Low mow lawn   | SF   | 310,127.50 | 0.50        | 155,064           |
| 1646  | Restoration seed mix   | SF   | 36,418.00  | 0.35        | 12,746            |
| 791   | Lawn irrigation system - not required                              | SF   | 310,127.50 |             | Excl.             |
| 1591  | Boulder seating  | EA   | 11.00      | 7,500.00    | 82,500            |
| 2401  | Seeding lawn prospect athletic fields                              | SF   | 199,762.90 | 0.95        | 189,775           |
| 1595  | Trees  | Note |            |             |                   |

## **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**



## LOCATION DIVISIONS/ELEMENTS ITEM

### **BD Base Design**

| Sitework | (continued)                                 | Rates Current At January 2023 |          |             |                   |
|----------|---|-------------------------------|----------|-------------|-------------------|
| Ref      | Description                                 | Unit                          | Qty      | Rate<br>USD | Total Cost<br>USD |
| 1596     | October glory red maple, 3.0-3.5" Cal.      | EA                            | 3.00     | 1,200.00    | 3,600             |
| 1597     | Red maple, 1" Cal.                          | EA                            | 10.00    | 700.00      | 7,000             |
| 1598     | Dawn redwood, 3" Cal.                       | EA                            | 8.00     | 1,200.00    | 9,600             |
| 1599     | White oak, 1.5" Cal.                        | EA                            | 18.00    | 700.00      | 12,600            |
| 1600     | Burr oak, 2-2.5" Cal.                       | EA                            | 8.00     | 1,000.00    | 8,000             |
| 1601     | Deciduous Trees                             | Note                          |          |             |                   |
| 1602     | Redpointe maple, 2.5-3" Cal.                | EA                            | 29.00    | 1,000.00    | 29,000            |
| 1603     | Sugar maple, 2.5" Cal.                      | EA                            | 5.00     | 1,000.00    | 5,000             |
| 1604     | Clump paper birch, 7-8' Ht.                 | EA                            | 22.00    | 800.00      | 17,600            |
| 1605     | Dura heat river birch, 6-7' Ht.             | EA                            | 2.00     | 800.00      | 1,600             |
| 1606     | Heritage birch, 10-12' Ht.                  | EA                            | 1.00     | 1,200.00    | 1,200             |
| 1607     | Whitespire birch, 12-14' Ht.                | EA                            | 6.00     | 1,200.00    | 7,200             |
| 1608     | Renaissance upright paper birch, 10-12' Ht. | EA                            | 9.00     | 1,200.00    | 10,800            |
| 1609     | American beech, 2-2.5" Cal.                 | EA                            | 10.00    | 1,000.00    | 10,000            |
| 1610     | Black gum, 2.5" Cal.                        | EA                            | 8.00     | 1,000.00    | 8,000             |
| 1611     | Swamp white oak, 3" Cal.                    | EA                            | 7.00     | 1,200.00    | 8,400             |
| 1612     | Red oak, 2.5-3" Cal.                        | EA                            | 21.00    | 1,000.00    | 21,000            |
| 1613     | American elm, 2.5-3" Cal.                   | EA                            | 19.00    | 1,000.00    | 19,000            |
| 1614     | Evergreen Trees                             | Note                          |          |             |                   |
| 1615     | Eastern red cedar, 7-8' Ht.                 | EA                            | 12.00    | 800.00      | 9,600             |
| 1616     | Pitch pine, 6-7' Ht.                        | EA                            | 14.00    | 800.00      | 11,200            |
| 1617     | White pine, 8-10' Ht.                       | EA                            | 26.00    | 800.00      | 20,800            |
| 1618     | White pine, 5-6' Ht.                        | EA                            | 11.00    | 500.00      | 5,500             |
| 1619     | Ornamental Trees                            | Note                          |          |             |                   |
| 1620     | Downy serviceberry, 4.5-5' Ht.              | EA                            | 6.00     | 500.00      | 3,000             |
| 1621     | "Autumn Brilliance" serviceberry, 7-8' Ht.  | EA                            | 12.00    | 800.00      | 9,600             |
| 1622     | Donald wyman crabapple, 2-2.5" Cal.         | EA                            | 12.00    | 1,000.00    | 12,000            |
| 1623     | Ground Covers                               | Note                          |          |             |                   |
| 1624     | Pennsylvania sedge, plugs                   | EA                            | 2,592.00 | 10.00       | 25,920            |
| 1625     | Shrubs                                      | Note                          |          |             |                   |
| 1626     | Gro-low fragrant sumac, 1 Gal.              | EA                            | 202.00   | 20.00       | 4,040             |
|          |   |                               |          |             |                   |


### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**

#### LOCATION DIVISIONS/ELEMENTS ITEM

#### **BD Base Design**

| B Sitework ( | continued)  |      | F     | Rates Current At | January 2023      |
|--------------|---|------|-------|------------------|-------------------|
| Ref          | Description   | Unit | Qty   | Rate<br>USD      | Total Cost<br>USD |
| 2425         | Wetland Replication Area  | Note |       |                  |                   |
| 2426         | Red maple, 3-4' Ht.   | EA   | 5.00  | 450.00           | 2,250             |
| 2427         | Yellow birch, 3-4' Ht.  | EA   | 4.00  | 450.00           | 1,800             |
| 2428         | Winterberry, 3-4' Ht.   | EA   | 6.00  | 450.00           | 2,700             |
| 2429         | Common spicebush, 3-4' Ht.  | EA   | 6.00  | 20.00            | 120               |
| 2430         | Sweet pepperbush, 3-4' Ht.  | EA   | 8.00  | 150.00           | 1,200             |
| 2431         | Cinnamon fern, 1#   | EA   | 20.00 | 30.00            | 600               |
| 2432         | Skunk cabbage, 1#   | EA   | 20.00 | 25.00            | 500               |
| 2433         | Tussock sedge, 2" plug  | EA   | 40.00 | 25.00            | 1,000             |
| 2434         | Soft rush, 2" plug  | EA   | 20.00 | 30.00            | 600               |
| 2435         | Cardinal flower, 2" plug  | EA   | 20.00 | 25.00            | 500               |
| 2436         | White wood aster, 2" plug   | EA   | 20.00 | 25.00            | 500               |
| 2437         | Great blue lobelia, 2" plug   | EA   | 20.00 | 25.00            | 500               |
| 2438         | Wetland Buffer Zone   | Note |       |                  |                   |
| 2439         | Red oak, 3-4' Ht.   | EA   | 5.00  | 450.00           | 2,250             |
| 2440         | Pignut hickory, 3-4' Ht.  | EA   | 4.00  | 450.00           | 1,800             |
| 2441         | Eastern white pine, 3-4' Ht.  | EA   | 4.00  | 450.00           | 1,800             |
| 2442         | Witch hazel, 3-4' Ht.   | EA   | 4.00  | 450.00           | 1,800             |
| 2443         | Sassafras, 3-4' Ht.   | EA   | 5.00  | 450.00           | 2,250             |
| 2444         | Nannyberry, 3-4' Ht.  | EA   | 5.00  | 450.00           | 2,250             |
|              | G2080 - Landscapir  | ng   |       |                  | 1,132,330         |
| G9010        | Other Site Construction   |      |       |                  |                   |
| 167          | Farm street driveway intersection improvement including paving milling and overall, granite curbs, traffic signal, etc. | LS   | 1.00  | 200,000.00       | 200,000           |
|              | G9010 - Other Site Construction   | on   |       |                  | 200,000           |
|              | 32 - EXTERIOR IMPROVEMENT   | S    |       |                  | 9,050,609         |
| 33           | UTILITIES   |      |       |                  |                   |
| G3010        | Water Utilities   |      |       |                  |                   |
| 1967         | Connect proposed water main to existing 1/2" water line   | EA   | 1.00  | 15,000.00        | 15,000            |
| 1375         | Connect to existing water line on old Nahant road -<br>allow 100ft  | EA   | 1.00  | 100,000.00       | 100,000           |





Rates Current At January 2023

#### LOCATION DIVISIONS/ELEMENTS ITEM

#### **BD Base Design**

| Ref   | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|-------|--|------|----------|-------------|-------------------|
| 1386  | Remove existing fitting and connect to main existing   | EA   | 1.00     | 15,000.00   | 15,000            |
| 1383  | Connection to building   | EA   | 2.00     | 600.00      | 1,200             |
| 1374  | 8", Ductile iron pipe  | LF   | 6,155.00 | 90.00       | 553,950           |
| 1381  | 6", Ductile iron pipe  | LF   | 403.01   | 60.00       | 24,181            |
| 1951  | 6", bend   | EA   | 3.00     | 650.00      | 1,950             |
| 1950  | 8", bend   | EA   | 52.00    | 950.00      | 49,400            |
| 1953  | Tee 8"x8"x6"   | EA   | 12.00    | 2,300.00    | 27,600            |
| 1954  | Tee 8"x8"x8"   | EA   | 5.00     | 2,040.00    | 10,200            |
| 1962  | Reducer 8"x4"  | EA   | 1.00     | 850.00      | 850               |
| 1376  | 8", Water valve  | EA   | 42.00    | 2,500.00    | 105,000           |
| 1379  | 6", Water valve  | EA   | 13.00    | 1,800.00    | 23,400            |
| 1385  | 4", Water valve  | EA   | 1.00     | 1,400.00    | 1,400             |
| 1378  | 6", Hydrant  | EA   | 12.00    | 5,200.00    | 62,400            |
| 1377  | Trust block  | EA   | 73.00    | 350.00      | 25,550            |
| 1448  | Cleaning, testing, trace wiring etc.   | LF   | 6,557.68 | 5.00        | 32,787            |
| 569   | Excavation and backfill (with site preparation)  | LF   | 6,557.68 |             | Incl.             |
|       | G3010 - Water Utilities  |      |          |             | 1,049,868         |
| G3020 | Sanitary Sewerage Utilities  |      |          |             |                   |
| 1391  | Connection to building sanitary service  | EA   | 22.00    | 500.00      | 11,000            |
| 1394  | Submersible sanitary pump c/w with piping and valves - allow                                 | EA   |          | 23,000.00   | 0                 |
| 1389  | Sewer pump station   | EA   |          | 140,000.00  | 0                 |
| 1390  | Sewer valve chamber structure  | EA   |          | 15,000.00   | 0                 |
| 1388  | SMH, Sanitary manhole  | EA   | 30.00    | 6,000.00    | 180,000           |
| 1941  | 6",sanitary sewer, cast iron   | LF   | 183.82   | 110.00      | 20,220            |
| 1387  | 6",sanitary sewer, PVC   | LF   | 1,110.82 | 85.00       | 94,419            |
| 1943  | 4",sanitary sewer, PVC   | LF   | 253.52   | 45.00       | 11,408            |
| 1392  | 6",sanitary sewer, PVC   | LF   | 427.45   | 75.00       | 32,059            |
| 1949  | 8",sanitary sewer, PVC   | LF   | 2,960.00 | 120.00      | 355,200           |
| 1393  | Thrust block   | EA   | 2.00     | 650.00      | 1,300             |
| 1964  | Replace existing sewer manhole with drop sewer<br>manhole and connect to existing sewer line | EA   | 1.00     | 7,500.00    | 7,500             |

### **60% CONSTRUCTION DOCUMENTS COST ESTIMATE -REVISION 4**



#### LOCATION DIVISIONS/ELEMENTS ITEM

#### **BD Base Design**

| 3 Sitework (continued) Rates Current At |   |      | January 2023 |             |                   |
|---|---|------|--------------|-------------|-------------------|
| Ref                                     | Description   | Unit | Qty          | Rate<br>USD | Total Cost<br>USD |
| 2318                                    | Cleaning, testing, trace wiring etc.                                  | LF   | 4,934.35     | 5.00        | 24,672            |
| 1963                                    | Clean and line existing 1550 LF of 8" sewer main                      | LF   | 1,550.00     |             | Excl.             |
| 577                                     | Excavation and backfill (with site preparation)                       | LF   | 4,934.35     |             | Incl.             |
| 2184                                    | Exterior grease trap(serving kitchen waste), 10,000<br>gal(allowance) | EA   | 1.00         | 75,000.00   | 75,000            |
| 2570                                    | Exterior grease trap(serving kitchen waste), 1000 gal<br>(allowance)  | EA   | 1.00         | 8,000.00    | 8,000             |
| 2589                                    | 6",sanitary sewer, PVC, forcemain                                     | LF   | -480.00      | 85.00       | -40,800           |
| 2590                                    | Excavation and backfill   | LF   | -480.00      | 50.00       | -24,000           |
|   | G3020 - Sanitary Sewerage Utilities                                   |      |              |             | 755,978           |
| G3030                                   | Storm Drainage Utilities  |      |              |             |                   |
| 1862                                    | 6", PVC underdrain  | LF   | 454.00       | 75.00       | 34,050            |
| 1863                                    | 8", PVC underdrain  | LF   | 63.00        | 120.00      | 7,560             |
| 1879                                    | 8", PVC   | LF   | 32.00        | 120.00      | 3,840             |
| 1858                                    | 4", HDPE underdrain for subsurface system 1 to 5                      | LF   | 324.00       | 20.00       | 6,480             |
| 1433                                    | 6", HDPE underdrain for subsurface system 1 to 5                      | LF   | 916.00       | 21.00       | 19,236            |
| 1910                                    | 12", perforated CPP, Corrugated HDPE storm drain pipe                 | LF   | 468.00       | 37.00       | 17,316            |
| 1411                                    | 6", HDPE storm drain pipe   | LF   | 261.00       | 21.00       | 5,481             |
| 1909                                    | 6", CPP, Underdrain, Corrugated HDPE storm drain pipe                 | LF   | 728.00       | 21.00       | 15,288            |
| 1861                                    | 6", CPP, Corrugated HDPE storm drain pipe                             | LF   | 157.00       | 21.00       | 3,297             |
| 1864                                    | 8", CPP, Corrugated HDPE storm drain pipe                             | LF   | 160.00       | 25.00       | 4,000             |
| 1409                                    | 10", CPP, Corrugated HDPE storm drain pipe                            | LF   | 187.00       | 31.00       | 5,797             |
| 1400                                    | 12", CPP, Corrugated HDPE storm drain pipe                            | LF   | 8,462.70     | 37.00       | 313,120           |
| 1403                                    | 15", CCP, Corrugated HDPE storm drain pipe                            | LF   | 298.00       | 54.00       | 16,092            |
| 1405                                    | 18", CCP, Corrugated HDPE storm drain pipe                            | LF   | 1,165.00     | 80.00       | 93,200            |
| 1406                                    | 24", CCP, Corrugated HDPE storm drain pipe                            | LF   | 1,240.00     | 120.00      | 148,800           |
| 1412                                    | Area drain  | EA   | 16.00        | 3,000.00    | 48,000            |
| 1413                                    | Catch basins  | EA   | 76.00        | 5,000.00    | 380,000           |
| 1414                                    | Curb inlet  | EA   | 5.00         | 6,500.00    | 32,500            |
| 1431                                    | 12", clean out  | EA   | 1.00         | 1,000.00    | 1,000             |
| 1415                                    | DMH - Drain manhole - 4'  | EA   | 67.00        | 6,500.00    | 435,500           |





#### LOCATION DIVISIONS/ELEMENTS ITEM

#### **BD Base Design**

| Sitework (continued) |  |      | F         | Rates Current At | January 2023      |
|----------------------|--|------|-----------|------------------|-------------------|
| Ref                  | Description  | Unit | Qty       | Rate<br>USD      | Total Cost<br>USD |
| 1416                 | DMH - Drain manhole - 5'   | EA   | 11.00     | 8,500.00         | 93,500            |
| 1417                 | DMH - Drain manhole - 6'   | EA   | 2.00      | 10,000.00        | 20,000            |
| 1422                 | Remove and replace existing DMH  | EA   | 1.00      | 10,000.00        | 10,000            |
| 1419                 | FES - Flared End Section   | EA   | 2.00      | 2,500.00         | 5,000             |
| 1420                 | Headwall   | EA   | 3.00      | 6,000.00         | 18,000            |
| 1421                 | OCS, Outlet control structure  | EA   | 5.00      | 6,000.00         | 30,000            |
| 1423                 | WQS, Water quality structure   | EA   | 19.00     | 15,000.00        | 285,000           |
| 1425                 | Trench drain   | LF   | 152.00    | 250.00           | 38,000            |
| 1424                 | Connection to building   | EA   | 17.00     | 1,000.00         | 17,000            |
| 1426                 | Connect to existing CB and convert the existing CB to DMH                    | EA   | 1.00      | 10,000.00        | 10,000            |
| 1427                 | Connect to existing manhole  | EA   | 2.00      | 2,500.00         | 5,000             |
| 1432                 | Precast concrete culvert - assumed 20'x3'                                    | LF   | 40.00     | 2,600.00         | 104,000           |
| 1434                 | Subsurface#1 - 210 MC-3500 c/w 14 c/w manifold                               | EA   | 1.00      | 265,500.00       | 265,500           |
| 1435                 | Subsurface#2 - 279 MC-3500 c/w manifold                                      | EA   | 1.00      | 343,800.00       | 343,800           |
| 1436                 | Subsurface#3 - 238 MC-3500 c/w manifold                                      | EA   | 1.00      | 294,950.00       | 294,950           |
| 1437                 | Subsurface#4 - 104 SC-740 c/w manifold                                       | EA   | 1.00      | 69,250.00        | 69,250            |
| 1438                 | Subsurface#5 - 16 SC-740 c/w outlet manifold                                 | EA   | 1.00      | 14,500.00        | 14,500            |
| 1854                 | Subsurface#1 - area  | SF   | 11,442.00 |                  | Incl.             |
| 1853                 | Subsurface#2 - area  | SF   | 14,193.00 |                  | Incl.             |
| 1852                 | Subsurface#3 - area  | SF   | 12,998.00 |                  | Incl.             |
| 1851                 | Subsurface#4 - area  | SF   | 3,999.00  |                  | Incl.             |
| 1855                 | Subsurface#5 - area  | SF   | 716.00    |                  | Incl.             |
| 1775                 | Inspection ports   | No   | 63.00     | 1,275.00         | 80,325            |
| 1774                 | Allowances for non-woven geotextile  | LS   | 1.00      | 20,000.00        | 20,000            |
| 602                  | Excavation and backfill (refer to site preparation)                          | LF   | 14,907.70 |                  | Incl.             |
| 1773                 | Excavation and backfill for subsurface system                                | CY   | 14,450.00 | 40.00            | 578,000           |
| 2319                 | Cleaning, testing, trace wiring etc.   | LF   | 14,907.70 | 5.00             | 74,538            |
| 611                  | Bioretention basin including piping, bedding, planting mix, excavation, etc. | SF   | 3,848.00  | 5.00             | 19,240            |



Rates Current At January 2023

## 60% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 4

#### LOCATION DIVISIONS/ELEMENTS ITEM

#### BD Base Design

| Ref     | Description  | Unit | Qty      | Rate<br>USD | Total Cost<br>USD |
|---------|--|------|----------|-------------|-------------------|
| 681     | Allowance for temporary retention basin including piping, etc.   |      | 1.00     | 350,000.00  | 350,000           |
|         | G3030 - Storm Drainage Utilities   |      |          |             | 4,336,160         |
| G3050   | Site Energy Distribution   |      |          |             |                   |
| 1958    | Proposed gas meter - install only - supply by others   | EA   | 1.00     | 3,000.00    | 3,000             |
| 1957    | Proposed natural gas piping - HDPE   | LF   | 1,511.00 |             | Excl.             |
| 1960    | Bend   | EA   | 20.00    |             | Excl.             |
| 1959    | Connection to building service   | EA   | 1.00     | 1,000.00    | 1,000             |
| 1966    | Connect to the main service  | EA   | 1.00     | 15,000.00   | 15,000            |
| 1965    | Excavation and backfill (with site preparation)  | LF   | 1,511.00 | 50.00       | 75,550            |
|         | G3050 - Site Energy Distribution   |      |          |             | 94,550            |
| G3090   | Liquid and Gas Site Utilities Supplementary<br>Components  |      |          |             |                   |
| 793     | Allowance for miscellaneous site utilities not yet designed  | LS   | 1.00     |             | Excl.             |
| 1798    | General requirements: supervision, shop drawings, as -built drawings, equipment rentals, fees, permits, etc. | Item |          |             | 453,555           |
|         | G3090 - Liquid and Gas Site Utilities Supplementary<br>Components  |      |          |             | 453,555           |
|         | 33 - UTILITIES   |      |          |             | 6,690,111         |
| SITEWOR | K  |      |          |             | 44,385,735        |

## PROJECT SCOPE & BUDGET UPDATED PROJECT BUDGET

Northeast Metropolitan Regional Vocational School District Northeast Metropolitan Regional Vocational High School

| Total Project Budget: All costs associated with the project are subject to 963 |                  |
|--|------------------|
| CMR 2.16(5)  | Estimated Budget |
| Feasibility Study Agreement  |                  |
| OPM Feasibility Study  | \$360,000        |
| A&E Feasibility Study  | \$1,075,000      |
| Environmental & Site   | \$350,000        |
| Other  | \$14,944         |
| Feasibility Study Agreement Subtotal   | \$1,799,944      |
| Administration   |                  |
| Legal Fees   | \$50,000         |
| Owner's Project Manager  |                  |
| Design Development   | \$250,000        |
| Construction Contract Documents  | \$850,055        |
| Bidding  | \$0              |
| Construction Contract Administration   | \$6,412,950      |
| Closeout   | \$650,000        |
| Extra Services   | \$1,000,000      |
| Reimbursable & Other Services  | \$1,500,000      |
| Cost Estimates   | \$100,000        |
| Advertising  | \$25,000         |
| Permitting   | \$600,000        |
| Owner's Insurance  | \$0              |
| Other Administrative Costs   | \$150,000        |
| Administration Subtotal  | \$11,588,005     |
| Architecture and Engineering   |                  |
| Basic Services   |                  |
| Design Development   | \$3,360,000      |
| Construction Contract Documents  | \$11,200,000     |
| Bidding  | \$1,120,000      |
| Construction Contract Administration   | \$5,264,000      |
| Closeout   | \$381,000        |
| Other Basic Services   | \$0              |
| Basic Services Subtotal  | \$21,325,000     |
| Reimbursable Services  |                  |
| Construction Testing   | \$1,000,000      |
| Printing (over minimum)  | \$50,000         |
| Other Reimbursable Costs   | \$1,500,000      |
| Hazardous Materials  | \$1,250,000      |
| Geotechnical & Geo-Environmental   | \$1,750,000      |
| Site Survey  | \$100,000        |
| Wetlands   | \$500,000        |
| Traffic Studies  | \$200,000        |
| Architectural/Engineering Subtotal   | \$27,675,000     |
| CM at Risk Preconstruction Services  |                  |
| Pre-Construction Services  | \$450,000        |
| Site Acquisition   |                  |
| Land / Building Purchase   | \$0              |

| Appraisal Fees  | \$0           |
|---|---------------|
| Recording fees  | \$0           |
| Site Acquisition Subtotal   | \$0           |
| Construction Costs  |               |
| SUBSTRUCTURE  |               |
| Foundations   | \$6,322,883   |
| Basement Construction   | \$779,661     |
| SHELL   |               |
| Super Structure   | \$22,922,963  |
| Exterior Closure  |               |
| Exterior Walls  | \$17,286,796  |
| Exterior Windows  | \$79,800      |
| Exterior Doors  | \$877,900     |
| Roofing   | \$5,882,540   |
| INTERIORS   |               |
| Interior Construction   | \$15,530,982  |
| Staircases  | \$132,295     |
| Interior Finishes   | \$12,048,735  |
| SERVICES  |               |
| Conveying Systems   | \$495,000     |
| Plumbing  | \$6,718,112   |
| HVAC  | \$22,233,115  |
| Fire Protection   | \$2,257,047   |
| Electrical  | \$17,784,727  |
| EQUIPMENT & FURNISHINGS   |               |
| Equipment   | \$3,515,600   |
| Furnishings   | \$644,450     |
| SPECIAL CONSTRUCTION & DEMOLITION                                   |               |
| Special Construction  | \$0           |
| Existing Building Demolition  | \$1,702,853   |
| In-Building Hazardous Material Abatement                            | \$1,686,000   |
| Asbestos Containing Floor Material Abatement                        | \$314,000     |
| Other Hazardous Material Abatement                                  | \$0           |
| BUILDING SITEWORK   |               |
| Site Preparation  | \$12,235,063  |
| Site Improvements   | \$12,583,194  |
| Site Civil / Mechanical Utilities                                   | \$8,046,500   |
| Site Electrical Utilities   | \$2,090,718   |
| Other Site Construction   | \$4,219,132   |
| Site Cost over Allowance  |               |
| Construction Trades Subtotal  | \$178,390,066 |
| Contingencies (Design and Pricing)                                  | \$14,779,255  |
| Sub-Contractor Bonds  | \$2,624,843   |
| D/B/B Insurance   | \$0           |
| General Conditions (& General Requirements)                         | \$16,731,565  |
| D/B/B Overhead & Profit   |               |
| GMP Insurance (General Liability, Builders Risk, Perf/Payment Bond) | \$4,626,775   |
| GMP Fee   | \$4,189,527   |
| GMP Contingency   | \$5,430,976   |
| Escalation to Mid-Point of Construction                             | \$18,218,085  |
|   |               |
| Construction Cost over Funding Cap                                  |               |
| Construction Budget   | \$244,991,092 |
| Alternates  |               |

| Ineligible Work Included in the Base Project      | \$0                      |
|---|--------------------------|
| Alternates Included in the Total Project Budget   | \$0                      |
| Alternates Excluded from the Total Project Budget | \$0                      |
| Subtotal to be Included in Total Project Budget   | \$0                      |
| Miscellaneous Project Costs                       |                          |
| Utility Company Fees                              | \$1,000,000              |
| Testing Services                                  | \$0                      |
| Swing Space / Modulars                            | \$0                      |
| Other Project Costs                               | \$850,000                |
| Misc. Project Costs Subtotal                      | \$1,850,000              |
| Furnishings and Equipment                         |                          |
| Furniture, Fixtures, and Equipment                | \$6,661,000              |
| Technology  | <mark>\$4,155,500</mark> |
| FF&E Subtotal                                     | \$10,816,500             |
| Saft Casta that avaged 200% of Construction Cast  |                          |
| Soli Cosis inal exceed 20% of Construction Cosi   |                          |
| Project Budget                                    | \$299,170,541            |

|  | · ·           |
|--|---------------|
| Total Project Budget                           | \$324,922,542 |
| Owner's Contingency                            | \$3,602,079   |
| Construction Contingency                       | \$14,650,000  |
| Third Party Funding (Ineligible)               | \$7,499,922   |
| Total Project Budget (excluding Contingencies) | \$299,170,541 |

## PROJECT SCOPE & BUDGET DESCRIPTION OF EARLY-BID PACKAGE

6B.2.3 - 06

### 6B.2.3-06 DESCRIPTION OF EARLY-BID PACKAGES

The Design Team anticipates two early bid packages:

1. Early Site Preparation

The bid package includes labor, materials, equipment, and services required to complete early site work and utilities work. This includes, but is not limited to, temporary construction fencing, dust control, soil erosion and sediment control, environmental protection, site clearing, asphalt removal, curb removal, ledge removal (blasting and/or mechanical means), earthwork, grading, structural support of excavations, excavation, backfilling and compaction, traffic control, foundation, and slab excavations, site drainage, site utilities, foundation and under-slab drainage, roadway stabilization course, selective bituminous pavement.

2. Early Structural (including Foundations and Steel)

Please refer to the attached Project Schedule for the anticipated dates of these early bids.

## PROJECT SCOPE & BUDGET VALUE ENGINEERING

68.2.3 - 07

### NEMTS (Northeast Metropolitan Technical School) Value Management Log

8/1/2022

|   | Current Sqft = 382,610  |   |    |               |                    |                 |
|---|-------------------------|---|----|---------------|--------------------|-----------------|
| Α | Construction Budget     | = | \$ | 244,922,412   | - includes utility | co distribution |
| В | Current Estimate        | = | \$ | 252,663,570   | Final Reconciled   | d Estimate Date |
| С | Recommended (#1) & Alts | = |    | (\$3,333,093) | -1.36%             |                 |
| D | Subtotal +Accepted      | = | \$ | 249,330,477   | \$ 651.66          |                 |
| Е | Variance                | = | \$ | 4,408,065     | 1.80%              |                 |
| F | Possible (No.2 below)   | = | \$ | (2,618,834)   | -1.07%             | (\$5,951,928)   |

| ltem<br># | Description   | Date<br>Identified | Current<br>Estimated Cost | Status | A<br>Alternates | No. 1<br>Recommended | No.2<br>Possible | No. 3<br>Reject |
|-----------|---|--------------------|---------------------------|--------|-----------------|----------------------|------------------|-----------------|
|           | Conoral Itoms / Multi dissipling  |                    |                           |        |                 |                      |                  |                 |
| G01       | Change Geometry of Media Center from round to rectangular / square & reduce height                          | 3-Jan-23           | N.A.                      | 3      | 0               | 0                    | 0                | N.A.            |
|           | Civil / Landcaping  |                    |                           |        |                 |                      |                  |                 |
| C01       | Raise dropped footing (info pending)  | 3-Jan-23           | (\$25,001)                | 1      | 0               | (25,001)             | 0                | 0               |
| C02       | Potential for CCB - Per Zoning Board Requirement  | 3-Jan-23           | (\$30,250)                | 3      | 0               | 0                    | 0                | (30,250)        |
| C03       | Videotape results of relining existing sewer line (verify if costs carried, potential contingency exposure) | 3-Jan-23           | TBD                       | 0      | 0               | 0                    | 0                | 0               |
| C04       | Delete Sewer line at Maintanence Bulding (force main and pump station) - See Also Plumbing for remaining \$ | 3-Jan-23           | (\$234,052)               | 1      | 0               | (234,052)            | 0                | 0               |
| L01       | Urethene track vs resilent  | 3-Jan-23           | (\$52,000)                | 2      | 0               | 0                    | (52,000)         | 0               |
| L02       | Reduce planting budget -target 15%  | 1-Aug-22           | (\$49,483)                | 2      | 0               | 0                    | (49,483)         | 0               |
| L03       | Reduce width of vehicular walkway to lower fields from 16' to 12'   | 10-Jan-23          | (\$18,414)                | 3      | 0               | 0                    | 0                | (18,414)        |
| L04       | Delete Boulder Seating (11 remain) make add alternate   | 3-Jan-23           | (\$55,000)                | 2      | 0               | 0                    | (55,000)         | 0               |
|           | Structural  |                    |                           |        |                 |                      |                  |                 |
| S01       | Use Fiber Mesh ILO Welded Wire Fabric at Slab on Grade  | 17-Jun-21          | (\$43,226)                | 2      | 0               | 0                    | (43,226)         | 0               |
| S01a      | - Reduction in Concrete Costs based on Sub Budget   | 9-Jan-23           | (\$250,000)               | 1      | 0               | (250,000)            | 0                | 0               |
| S02       | Some reduction of tonnage (verify per the model) - target .25# / sqft reduction                             | 3-Jan-23           | (\$268,125)               | 2      | 0               | 0                    | (268,125)        | 0               |
| S03       | - Reduction in Steel Cost per Ton based on Sub Budgets  | 9-Jan-23           | (\$500,000)               | 1      | 0               | (500,000)            | 0                | 0               |
| S04       | Review current sqft of Mezzanines based on current design progression                                       | 3-Jan-23           | (\$67,538)                | 1      | 0               | (67,538)             | 0                | 0               |
|           | Architectural   |                    |                           |        |                 |                      |                  |                 |
| A01       | Review Back-up Systems 8" Back-up CMU vs 12" CMU @ Gym / team rm (design progression)                       | 3-Jan-23           | (\$45,500)                | 1      | 0               | (45,500)             | 0                | 0               |
| A02       | Arriscraft ilo granite (Arriscraft is base, granite is add alternate)                                       | 3-Jan-23           | (\$298,125)               | 1      | 0               | (298,125)            | 0                | 0               |

ed 12-23-22

#### \$1,789,230

#### Comments

Major redesign, are the savings worth it?

Need Design Input / Info - all footings within 5' depth

Target 5%

Was deleted at last estimate pending videotaped results - prior value at DD was 1,550 lnft at \$180 / lnft or 279k - Nitsch reviewing, consider maintenance

Keep as possible

Was on prior list

Potential for repurposed wood working with Students

Estimate Adjustment

GBCo

Includs CMU changed to GWB at those walls supporting plank

~4500 sqft

| A03  | Different sound iso ceiling - kinectics (send DRA exact product name)   | 3-Jan-23  | (\$250,000)  | 1 | 0 | (250,000) | 0            | 0         |
|------|---|-----------|--------------|---|---|-----------|--------------|-----------|
| A04  | Review Flat-lock tile Unit \$ and Qty - Interior - change to tile   | 3-Jan-23  | (\$122,030)  | 1 | 0 | (122,030) | 0            | 0         |
| A05  | Review Flat-lock tile Unit \$ and Qty - exterior - change to alucabond or dri Design  | 3-Jan-23  | (\$174,160)  | 2 | 0 | 0         | (174,160)    | 0         |
| A06  | Use LVT everywhere - ILO of Sheet Vinyl, linoleum and rubber tile (add alternate)   | 11-Aug-22 | (\$417,770)  | 2 | 0 | 0         | (417,770)    | 0         |
| A06A | Use Linoleum ILO of Sheet Vinyl (cannot take w item above)  | 10-Jan-23 | (\$90,000)   | 0 | 0 | 0         | 0            | 0         |
| A07  | At upper level Events Lobby provide cable guardrail in leu of glass guardrail system  | 15-Aug-22 | Incorporated | 2 | 0 | 0         | Incorporated | 0         |
| A08  | Move Manual window shades to FF&E   | 16-Aug-22 | (\$352,219)  | 2 | 0 | 0         | (352,219)    | 0         |
| A09  | Reduce exterior cornices (overhang) - GBCo has ~\$2.2 mil. RLB has \$2 mil  | 3-Jan-23  | NA           | 3 | 0 | 0         | 0            | NA        |
| A10  | Reduce Cafeteria curtain walls? = 1 800 soft  | 3-Jan-23  | NA           | 3 | 0 | 0         | 0            | NA        |
| A11  | Reduce or remove Courtward curtain walls (CW31)? ~2 000 soft - target 25% changed to CMU  | 3-Jan-23  | (\$29,000)   | 2 | 0 | 0         | (29,000)     | 0         |
| A12  | Glazing Product Change - Check Unit Pricing   | 3-Jan-23  | (\$120,000)  | 3 | 0 | 0         | 0            | (120,000) |
| A13  | Remove curved folding partition at Lobby (A110)?  | 3-Jan-23  | (\$50,000)   | 3 | 0 | 0         | 0            | (50,000)  |
| A14  | Reduce dazed partitions 7 replace with CMI Lor GWB?   | 3-Jan-23  | reduced      | 0 | 0 | 0         | 0            | 0         |
| A15  | Reduce wall tiles (ceramic & norcelain)? - Target 10%?  | 3-Jan-23  | (\$80,326)   | 1 | 0 | (80,326)  | 0            | 0         |
| A16  | Reduce wait thes (ceramic & porcelain): - raiget 1070:  | 3-Jan-23  | TBD          | 0 | 0 | 0         | 0            | 0         |
| A17  | Change Interior Linear Matel Cailing W Weedlack to 2x6 togular  | 3-Jan-23  | (\$452,375)  | 2 | 0 | 0         | (452,375)    | 0         |
| A18  | Change Intend Linear Metal Centring W Woodlook to 2x6 tegular   | 3-Jan-23  | (\$134,480)  | 1 | 0 | (134,480) | 0            | 0         |
|      | Equipment   |           |              |   |   |           |              |           |
| EQ1  | Stainless Steel Netting - check unit pricing and qty (Div 10 and 11) - this can be taken as a double up in estimate. Unit pricing ~\$55 / Inft for remainnig item is ok | 3-Jan-23  | (\$93,664)   | 2 | 0 | 0         | (93,664)     | 0         |
|      | MEP   |           |              |   |   |           |              |           |
| P01  | Remove urinals and FD's from single occupancy toilet rooms. Current layout has a toilet and urinal in each single occupancy toilet room, requiring a floor drain.       | 1-Aug-22  | (\$85,000)   | 1 | 0 | (85,000)  | 0            | 0         |
| P02  | Delete toilet room at Maintenance Building (see also sanitary)  | 3-Jan-23  | (\$20,000)   | 1 | 0 | (20,000)  | 0            | 0         |
| P03  | Consider Point of use HW Heaters vs central system  | 1-Aug-22  | (\$20,000)   | 2 | 0 | 0         | (20,000)     | 0         |
| P04  | Local Point of Use Chip Tanks in lieu of central pH System Serving Science Classrooms   | 1-Aug-22  | (\$70,000)   | 2 | 0 | 0         | (70,000)     | 0         |
|      | Check to see if we included gas piping to labs?   |           |              |   |   |           |              |           |
| FP1  | Schedule 10 for larger pipe sizes?  | 3-Jan-23  | (\$225,000)  | 1 | 0 | (225,000) | 0            | 0         |
| M01  | Fabric Duct Sock @ Gym (previously rejected) - Was M08  | 1-Aug-22  | (\$37,340)   | 3 | 0 | 0         | 0            | (37,340)  |

Operational Concerns - at next round of estimaiting consider breaking out corridors vs classrooms, by level - keep possible for now

Was incorporated in the 60% CD Estimate, \$35k

RLB VE Suggestion

RLB VE Suggestion

RLB VE Suggestion

RLB VE Suggestion - GBCo Note - \$100 / sqft verified by Cheviot

RLB VE Suggestion

RLB VE Suggestion

RLB VE Suggestion

RLB VE Suggestion

Estimate Correction

Review cost, savings appear to be low. Bala 8/25/22:School would have to approve of the change knowing that it will be more difficult to maintain and to service these bathrooms with no urinals in them.

Remote toilet rooms only - not labs / shops

Check design intent and estimator assumption - is it limited to just chem labs?

Value adjusted to reflect the latest FP  $\ensuremath{\mathsf{Estimate}}$  , which was increased

| M02  | Reduce VAVs by grouping (1 side of school only)   | 3-Jan-23  | (\$116,510)  | 1 | 0 | (116,510)   | 0            | 0         | Bala 1/5/23: Provide one supply and exhaust VAV terminal unit per group<br>of classrooms (maximum of 3 classrooms per group) and a CO2 sensor<br>in each classroom. Supply and exhaust VAV will be size 12 for each grou<br>of 3 classrooms. This will result in a reduction of approximately 30 suppl<br>and 30 exhaust VAV terminal units.                                |
|------|---|-----------|--|---|---|-------------|--------------|-----------|---|
| M03  |   | 3-Jan-23  | \$0  | 0 | 0 | 0           | 0            | 0         |   |
| E01  | Adjust estimate based on Tech / Security Consultant Feedback  | 3-Jan-23  | (\$165,000)  | 1 | 0 | (165,000)   | 0            | 0         |   |
| E02  | Utilize Lightning Preventor System in lieu of Lightning Protection (was E14 at DD)  | 1-Aug-22  | (\$100,000)  | 1 | 0 | (100,000)   | 0            | 0         | Bala 1/5/23: District to review with insurance carrier to verify lighting preventor system is acceptable.   |
| E03  | Coordinate Stage Lighting Dimming   | 3-Jan-23  | (\$25,000)   | 1 | 0 | (25,000)    | 0            | 0         | Taking this would leave \$100k in estimate  |
| E04  | Have Single ended Switchboard would remove set of Secondaries and remove Secondary Duct Bank reduces redundancy (was VE 17)                           | 1-Aug-22  | (\$175,000)  | 1 | 0 | (175,000)   | 0            | 0         | Bala 1/5/23: The tie between the two switchboards was removed in the 60%CD cost estimate set.   |
| E05  | <b>VE06</b> Shorten Duct Bank Primary, Telcom and Generator to more in the range of to in the range of 500 If   | 3-Jan-23  | (\$200,000)  | 3 | 0 | 0           | 0            | (200,000) | Not Incorporated but not possible<br>VE08 incorporated but VE09 was not Bala 1/5/23: This following is Bala's   |
| E06  | <b>VE09</b> Utilize Aluminum MC Feeders for feeds 100 amps to 225 amps can be added to above  | 3-Jan-23  | (\$20,000)   | 3 | 0 | 0           | 0            | (20,000)  | response to this DD VM item, "Bala 8/25/22: This cannot be done because<br>of voltage drop considerations. Voltage drop will require unusual wire<br>sizing for phase and ground conductors, and MC cable only come in<br>standard sizes."  |
| E07  | VE11 Reduce Cord Reel Quantity in shops reduce by 10 overall - Coordinate Locations, assume some reduction  | 3-Jan-23  | (\$16,000)   | 1 | 0 | (16,000)    | 0            | 0         | Total of 253 currently in estimate  |
| E08  | - Further reduce Cord Reel (not only was VE not incorporated but qty close to tripled)  | 3-Jan-23  | See above  | 3 | 0 | 0           | 0            | See above |   |
| E09A | <b>VE18</b> Reduce Parking EV charging Stations conduit, wire ,panels transformer and charging station (delete 2 of the 4 interior stations)          | 3-Jan-23  | (\$15,864)   | 3 | 0 | 0           | 0            | (15,864)  | Keep the infrastructure for the EV, reject this for now and keep 4  |
| E09B | Adjust the estimate for the 5 site charging stations furnished by others  | 13-Jan-23 | (\$45,311)   | 1 | 0 | (45,311)    | 0            | 0         | Site Stations furnished by others   |
| E10  | <b>VE19</b> Re-evaluate conduit and Service going from Maintenance Building to Main Building(reduce spares and shorter conduits)                      | 3-Jan-23  | Incorporated   | 2 | 0 | 0           | Incorporated | 0         | Check w Rob to see if already incorporated  |
| E11  | <b>VE21</b> Revaluate Conduit and how site Lighting is powered for entrance near School Sign and power and communication for sign potentially wirless | 3-Jan-23  | (\$20,000)   | 1 | 0 | (20,000)    | 0            | 0         | Bala 1/5/23: 60% CD Cost estimate set revised site lighting at entrance to be fed from a local 208V service from the street.  |
| E12  | Optimize Camera Layout  | 3-Jan-23  | (\$40,000)   | 3 | 0 | 0           | 0            | (40,000)  | Slight Increase from prior estimate, design reflects the intent   |
| E13  | General Lighting Design Coordination - \$1 / sqft   | 3-Jan-23  | (\$280,000)  | 2 | 0 | 0           | (280,000)    | 0         | Lighting take-off and pricing per drawings, target not achieved Bala 1/5/23: Pe<br>Bala review of the 60%CD cost estimate the design team received a<br>fixture cost budget goal for the 60% CD Cost Estimate set of \$2,605,115.<br>Lighting was designed to align with this budget. Cost estimator to verify<br>the fixture costs align with the fixture budget provided. |
|      | Totals  | ·         | (\$5,978,763)  |   | 0 | (2,999,873) | (2,357,021)  | (531,868) |   |
|      | Design / Estimating Contingency   | 2.50%     |  | · | 0 | (74,997)    | (58,926)     | (13,297)  |   |
|      | Escalation  | 4.50%     |  |   | 0 | (138,369)   | (108,718)    | (24,532)  |   |
|      | Sub-contractor bonds  | 1.20%     |  |   | 0 | (38,559)    | (30,296)     | (6,836)   |   |
|      | CM Contingency  | 2.50%     |  |   | 0 | (81,295)    | (63,874)     | (14,413)  |   |
|      | Summary Factors (Contingencies& Escalation.)  | 10.70%    |  |   | 0 | (333,220)   | (261,813)    | (59,079)  |   |
|      | Tatal Casta   |           | (h.c. + 10.0 + 1 |   | 0 | (2,222,002) |              | (500.047) |   |
|      | 1 OTAL COSTS  |           | (\$6,618,490.16)   | ) | 0 | (3,333,093) | (2,618,834)  | (590,947) |   |

|              | Project information                    |                            |                          |                 |                |         |                               |                          |  |  |  |  |  |  |
|--------------|--|----------------------------|--------------------------|-----------------|----------------|---------|-------------------------------|--------------------------|--|--|--|--|--|--|
| MSBA ID      | Calendar<br>Year<br>of sub bid<br>date | District                   | School                   | ОРМ             | Designer       | CM\GC   | Procurement<br>Type (DBB/CMR) | PS&B<br>Executed<br>Date |  |  |  |  |  |  |
|              |  | Northeast Metropolitan     | Northeast Metropolitan   |                 |                |         |                               |                          |  |  |  |  |  |  |
|              |  | Regional Vocational School | Regional Vocational High |                 |                |         |                               |                          |  |  |  |  |  |  |
| 201708530605 | 2023                                   | District                   | School                   | PMA Consultants | DRA Architects | Gilbane | CMR                           | 12/15/2021               |  |  |  |  |  |  |
|              |  |                            |                          |                 |                |         |                               |                          |  |  |  |  |  |  |
|              |  |                            |                          |                 |                |         |                               |                          |  |  |  |  |  |  |
|              |  |                            |                          |                 |                |         |                               |                          |  |  |  |  |  |  |
|              |  |                            |                          |                 |                |         |                               |                          |  |  |  |  |  |  |

|                            |                  | SD Submittal                          |                 |                             |
|----------------------------|------------------|---------------------------------------|-----------------|-----------------------------|
| PSR Construction<br>Budget | PSR Total Budget | SD Construction<br>Budget             | SD Total Budget | Delta between PSR<br>and SD |
| \$ 243,514,418             | \$ 317,422,620   | \$ 244,041,092                        | \$ 317,422,620  | \$0                         |
|                            |                  | Includes \$450K in<br>Precon services |                 |                             |
|                            |                  |                                       |                 |                             |
|                            |                  |                                       |                 |                             |

|  |                                      | PFA or   | PSBA data                                       |  |                      |
|--|--------------------------------------|--|---|--|----------------------|
| PS&B/PFA<br>Construction Estimate<br>W\ Pre-Con & Alts - | Design & Pricing<br>Contingency (\$) | Design & Pricing<br>Contingency<br>(% of Construction<br>Budget) | Escalation to mid point<br>of construction (\$) | Escalation to mid point<br>of construction (%) | Total Project Budget |
| \$244,041,092  | \$244,041,092 \$13,379,255           |  | \$18,218,085                                    | 7.47%  | \$317,422,620        |
|  |                                      |  |   |  |                      |
|  |                                      |  |   |  |                      |

|                                   |                              |   |                                      |  | DI           | D   |  |   |           |  |  |
|-----------------------------------|------------------------------|---|--------------------------------------|--|--------------|---|--|---|-----------|--|--|
| Designer Current<br>Cost Estimate | CMR Current<br>Cost Estimate | CMR Reconciled<br>DD Estimate<br>after VE | Design & Pricing<br>Contingency (\$) | Design & Pricing<br>Contingency<br>(% of DD<br>Construction<br>Budget)<br>Escalation to mid<br>point of<br>construction (\$) |              | Escalation to mid<br>point of<br>construction (%) | Approved VE<br>at DD since<br>PFA (\$) | % OF approved<br>VE since PFA<br>(AD/P) | DD Date   | Comments   |  |
| \$244,203,870                     | \$278,095,765                | \$244,848,286                             | \$7,690,313                          | 3.14%  | \$11,297,073 | 4.61%   | \$33,766,980                           | 14%                                     | 8/19/2022 | All values from designers cost<br>estimator of record RLB (unless<br>specifically requested CMR) |  |
| Includes VE                       |                              |   |                                      |  |              |   |  |   |           |  |  |
|                                   |                              |   |                                      |  |              |   |  |   |           |  |  |
|                                   |                              |   |                                      |  |              |   |  |   |           |  |  |
|                                   |                              |   |                                      |  |              |   |  |   |           |  |  |

|                                   |                              |   |                                      |  |  | CI  | D60                         |                        |                               |  |                              |           |          |
|-----------------------------------|------------------------------|---|--------------------------------------|--|--|---|-----------------------------|------------------------|-------------------------------|--|------------------------------|-----------|----------|
| Designer Current<br>Cost Estimate | CMR Current<br>Cost Estimate | CMR Reconciled<br>CD60 Estimate<br>after VE | Design & Pricing<br>Contingency (\$) | Design & Pricing<br>Contingency<br>(% of CD60<br>Construction<br>Budget) | Escalation to mid<br>point of<br>construction (\$) | Escalation to mid<br>point of<br>construction (%) | Approved VE<br>at CD60 (\$) | % OF CD60<br>VE to PFA | Approved VE<br>since PFA (\$) | % of<br>approved<br>VE since<br>PFA (AR/P) | CD60 Total<br>Project Budget | CD60 Date | Comments |
|                                   |                              |   |                                      |  |  |   |                             |                        |                               |  |                              |           |          |
| \$249,224,736                     | \$252,647,733                | \$249,314,640                               | \$5,099,564                          | 2.05%  | \$9,408,691  | 4%  | \$3,333,093                 | 1%                     | \$37,100,073                  | 15%  | \$324,922,542                | 1/20/2023 |          |
| Includes VE                       |                              |   |                                      |  |  |   |                             |                        |                               |  |                              |           |          |
|                                   |                              |   |                                      |  |  |   |                             |                        |                               |  |                              |           |          |
|                                   |                              |   |                                      |  |  |   |                             |                        |                               |  |                              |           |          |
|                                   |                              |   |                                      |  |  |   |                             |                        |                               |  |                              |           |          |

Updated Work Plan 01 Basis of Design Narratives 02 02a Civil 02b Site **02c** Architectural **02d** Structural **02e** MEP-FP 02f Technology & Security Building Code Analysis 03 Proprietary Items 04 Interior Color Theory Statement 05 Structural Load Calculations 06 Structural Peer Review RFP 07 Energy Model Calculations 08 Life Cycle Cost Analysis – Energy & Water 09 HVAC Heat Gain & Loss Calculations 10 Total Electrical Load Calculations 11 Security & Visual Access Requirements 12 Facility & Maintenance Requirements 13 Quality Control Narratives 14

# **6B.3.1** GENERAL REQUIREMENTS

## GENERAL REQUIREMENTS UPDATED WORK PLAN

68.3.1 - **01** 

| NO.  | TASK   | START     | FINISH     | 2022<br>Sen | Oct | Nov | Dec | Jan | Feh         | Mar           | Apr            | May             | 20<br>.lun      | )23<br>.lul    | Αμα        | Sen | Oct |
|------|--|-----------|------------|-------------|-----|-----|-----|-----|-------------|---------------|----------------|-----------------|-----------------|----------------|------------|-----|-----|
|      |  | 9/5/2022  | 10/31/2023 | <b>♦</b>    | 000 | NOV | Dee |     | 100         |               |                |                 | oun             | our            | Aug        | 000 |     |
| 1    | Working Group Meetings as necessary                        | 3/6/2023  | 4/27/2023  |             |     |     |     |     |             |               |                | Working Gro     | up Meetings     | as necessary   |            |     |     |
| 2    | Student involvement on the Project Discussion              | 2/23/2023 | 6/16/2023  |             |     |     |     |     | s           | tudent involv | ement on th    | e Project Disc  | ussion          |                |            |     |     |
| 3    | Building Committee Meetings                                | 3/23/2023 | 5/11/2023  |             |     |     |     |     |             | -             |                | Buildir         | ng Committee    | e Meetings     |            |     |     |
| 3.1  | Building Committee Meeting If Required                     | 3/23/2023 | 3/23/2023  |             |     |     |     |     |             | •             | Building Co    | mmittee Meeti   | ing If Require  | d              |            |     |     |
| 3.2  | Building Committee Meeting If required                     | 4/13/2023 | 4/13/2023  |             |     |     |     |     |             |               | 🔶 Bui          | ilding Commit   | tee Meeting II  | f required     |            |     |     |
| 3.3  | Building Committee Meeting 60% CD Approval                 | 5/11/2023 | 5/11/2023  |             |     |     |     |     |             |               |                | 🔶 Build         | ing Committe    | ee Meeting 609 | % CD Appro | val |     |
| 4    | Structural Steel Early Bid Package                         | 2/6/2023  | 4/19/2023  |             |     |     |     |     |             |               | s              | tructural Steel | Early Bid Pao   | ckage          |            |     |     |
| 5    | Site Early Bid Package revised dates                       | 1/17/2023 | 3/17/2023  |             |     |     |     |     |             | Site          | e Early Bid Pa | ackage revise   | d dates         |                |            |     |     |
| 6    | Design Team Milestones                                     | 1/23/2023 | 6/15/2023  |             |     |     |     |     |             | Design Te     | am Mileston    | es              |                 |                |            |     |     |
| 6.1  | Constructibility Review with CM                            | 3/2/2023  | 5/5/2023   |             |     |     |     |     |             |               |                | Construc        | tibility Review | w with CM      |            |     |     |
| 6.2  | Geotechnical Investigation Baseball Field                  | 2/9/2023  | 3/8/2023   |             |     |     |     |     |             | Geotec        | hnical Invest  | tigation Baseb  | all Field       |                |            |     |     |
| 6.3  | Acoustical site background noise study                     | 3/3/2023  | 3/24/2023  |             |     |     |     |     |             |               | Acoustical si  | te background   | d noise study   |                |            |     |     |
| 6.4  | Design Team CD 90% scope (VE) coordination meeting         | 1/23/2023 | 1/23/2023  |             |     |     |     | •   | Design Tear | m CD 90% so   | ope (VE) co    | ordination me   | eting           |                |            |     |     |
| 6.5  | Design Team Coordination Meetings Weekly<br>including LEED | 1/26/2023 | 6/15/2023  |             |     |     |     | De  | sign Team ( | Coordination  | Meetings W     | eekly includin  | g LEEC          |                |            |     |     |
| 6.6  | 90% CD Cost Estimate Set                                   | 3/31/2023 | 3/31/2023  |             |     |     |     |     |             |               | 🔶 90% CD       | Cost Estimate   | e Set           |                |            |     |     |
| 6.7  | 90% CD Estimate  | 3/31/2023 | 4/21/2023  |             |     |     |     |     |             |               | 9              | 0% CD Estim     | ate             |                |            |     |     |
| 6.8  | 90% CD Cost Reconciliation                                 | 4/24/2023 | 5/11/2023  |             |     |     |     |     |             |               |                | 90% 0           | D Cost Reco     | nciliation     |            |     |     |
| 6.9  | Cost reconciliation meeting #1                             | 4/25/2023 | 4/25/2023  |             |     |     |     |     |             |               | •              | Cost recond     | iliation meeti  | ing #1         |            |     |     |
| 6.10 | Cost reconciliation meeting #2                             | 5/2/2023  | 5/2/2023   |             |     |     |     |     |             |               |                | ♦ Cost rec      | onciliation me  | eeting #2      |            |     |     |
| 6.11 | 60% CD Submission To MSBA                                  | 5/12/2023 | 5/12/2023  |             |     |     |     |     |             |               |                | <b>6</b> 0%     | CD Submissi     | ion To MSBA    |            |     |     |

### 6B.3.1-01 UPDATED WORK PLAN

| NO    | TACK   | STADT      | FINISH     | 2022 |       |               |               |            |                |               | 2023          |              |     |     |     |     |     |  |  |
|-------|--|------------|------------|------|-------|---------------|---------------|------------|----------------|---------------|---------------|--------------|-----|-----|-----|-----|-----|--|--|
| NO.   | TASK   | START      | FINISFI    | Sep  | Oct   | Nov           | Dec           | Jan        | Feb            | Mar           | Apr           | May          | Jun | Jul | Aug | Sep | Oct |  |  |
|       |  | 9/5/2022   | 10/31/2023 | •    |       |               |               | •          |                | •             | • • •         | • •          |     |     |     |     |     |  |  |
| 7     | NEMT meetings  | 2/1/2023   | 3/30/2023  |      |       |               |               |            | NEMT m         | neetings      |               |              |     |     |     |     |     |  |  |
| 8     | Regulatory Review  | 9/5/2022   | 10/31/2023 |      |       |               |               |            |                | Regulat       | ory Review    |              |     |     |     |     |     |  |  |
| 8.1   | Notice of intent NOI                                     | 9/5/2022   | 3/10/2023  |      |       | Notice o      | of intent NOI |            |                |               |               |              |     |     |     |     |     |  |  |
| 8.1.1 | NOI File   | 9/12/2022  | 9/12/2022  |      | File  |               |               |            |                |               |               |              |     |     |     |     |     |  |  |
| 8.1.2 | NOI process with hearings and peer review                | 9/5/2022   | 3/10/2023  |      | NOI p | rocess with h | earings and p | eer review |                |               |               |              |     |     |     |     |     |  |  |
| 8.2   | Wakefieled Departmental Review                           | 9/19/2022  | 10/31/2023 |      |       |               |               |            |                | Wakefieled    | Department    | al Review    |     |     |     |     |     |  |  |
| 8.3   | Wakefield Planing / Zoning Review                        | 12/8/2022  | 5/31/2023  |      |       |               |               | Wa         | kefield Planii | ng / Zoning F | Review        |              |     |     |     |     |     |  |  |
| 8.4   | Building Department - Gilbane to initiate pre-<br>permit | 11/22/2022 | 7/31/2023  |      |       |               |               | Bu         | ilding Depar   | tment – Gilba | ane to initia | e pre-permit |     |     |     |     |     |  |  |
| 8.5   | Wakefield Gas & Light                                    | 9/12/2022  | 8/2/2023   |      |       |               |               | W          | akefield Gas   | & Light       |               |              |     |     |     |     |     |  |  |

## GENERAL REQUIREMENTS BASIS OF DESIGN NARRATIVES

6B.3.1 - 02

**CIVIL** BASIS OF DESIGN

6B.3.1 – 02a



2 Center Plaza, Suite 430 Boston, MA 02108-1928 T: 617-338-0063 F: 617-338-6472

www.nitscheng.com

#### **MEMORANDUM**

**TO:** Vladimir Lyubetsky, Drumney Rosane Anderson, Inc.

FROM: David Conway, P.E., Nitsch Engineering

- DATE: December 13, 2022
- RE: Northeast Metropolitan Regional Vocational School Site Narrative

#### Stormwater

Storm drainage for the site will comply with Massachusetts Stormwater Management standards. Massachusetts Stormwater Management standards require that the rate of stormwater flows leaving the site not be increased in the developed conditions. The standards also require that the quality and quantity of stormwater be addressed by treating the stormwater to remove possible contaminants. Areas that experience vehicular traffic will have their stormwater quality addressed through mechanical means such as water quality structures or the implementation of other green infrastructure. Runoff from roofs and landscaped areas are considered clean and treatment prior to recharge or discharge is not required.

Stormwater flows from the parking, driveway, and roadway areas will be collected in deep sump catch basins routed to Stormceptor (or similar) water quality units to address stormwater quality. The catch basins and water quality structures are part of a new closed-drainage system that also consists of new drain manholes and non-infiltrating stormwater detention systems. Collected stormwater runoff from throughout the site will be directed to sub-surface detention systems located under a proposed parking lot, driveway, the proposed soccer field and the existing baseball field.

The stormwater management system located under the parking lot on the south side of the proposed school building, will consist of 238 MC-3500 chambers in a bed of crushed stone. Two systems located under the driveway in the vicinity of Farm Road will consist of 120 (total) SC-740 chambers with overflows directed to the wetlands to the north of the drive. Another of the systems will be installed underneath the existing baseball field and will include 279 MC-3500 chambers in a bed of crushed stone. The last of the three systems, located under the proposed soccer field, will consist of 210 MC-3500 chambers in a bed of crushed stone. The last of the three systems are designed as detention systems and will be enclosed in impervious barriers.

All the systems create subsurface storage volumes so that flows from the developed site can be detained and decreased to meet the pre-development conditions.

All stormwater pipes will be a minimum of 12" in diameter to meet the town guidelines for design.

#### Water

Water mains will need to be extended to the new school building. The extended water mains will be 8-inch ductile iron pipe and be connected to the existing system below the driveway entrance to the project site. Site fire hydrants will be connected to the extended main with 6-inch services and are scattered throughout the site to provide access to all corners of the building and parking lots. The new building will be served via a 6-inch domestic and an 8-inch fire services. The new water main will continue down the new school drive to Farm Road where it will continue down Farm Road and connect into the town system at the Farm Road/Old Nahant Road. The second connection to the town system will provide improved flow characteristics and redundancy to the school.

Name: Nitsch Project #13872 December 13, 2022 Page 2 of 2

#### Sanitary Sewer

A new sanitary sewer system consisting of PVC pipe will be constructed to collect sanitary flows from the new building. Two new exterior precast concrete grease traps will be required for flows from the cafeteria and the culinary arts area. Sewer service from the new maintenance building will be directed to the new sewer system via a pump station. The locker room building and concession building will both have gravity sewer services. The new sanitary sewer system will be connected to the town system through an existing manhole northeast of the existing school building. Existing portions of the sewer system that are to be reused will be video inspected and, if needed, spot repaired or slip-lined.

#### Permitting

*Utilities* - Permitting for the required utility improvements consists of review and approval for the utility improvements with the Town of Wakefield Department of Public Works. Review material would be submitted to the DPW for final review and comment during the Construction Documents Phase, with preliminary meetings and consultations at the start of Design Development. Review typically takes two weeks with an additional two weeks required to revise the drawings and address comments for a typical permitting time of one month from submission.

*Wetlands* -The Massachusetts Wetlands Protection Act grants local Conservation Commission jurisdiction over work within 100' of most wetland resources (within 200' of a river or perennial stream). Work in any jurisdictional areas will require the filing of a Notice of Intent (NOI) with the Wakefield Conservation Commission.

An Abbreviated Notice of Resource Area Delineation (ANRAD) was filed with and approved by the Town of Wakefield Conservation Commission in July of 2021. The ANRAD sets the wetland resource area lines for three years.

The Notice of Intent for the proposed work was submitted to the Town of Wakefield Conservation Commission in September of 2022. Public hearings for the project began in October of 2022 and are expected to continue into the early part of 2023. Peer reviews for the project have been completed by Town of Wakefield consultants, with the comment responses being incorporated into revised plans.

P:\10000-14999\13872 NEMT Study\Civil\Project Data\Narratives\13872\_NEMT Narrative-CD60.docx

**SITE** BASIS OF DESIGN

6B.3.1 – 02b



Northeast Metro Technical High School Wakefield, MA MSBA 60% Construction Documents Submission

#### SITE NARRATIVE – December 19, 2022

The Northeast Metro Technical High School (NEMT) site is located between Farm Street and Water Street, off of Hemlock Road in the Town of Wakefield MA. The Site is behind, to the east of the Wakefield Memorial High School. South of the existing school building lies an undeveloped area. To the east of the site, abutting the property is the Breakheart Reservation. Access to the Breakheart Reservation is provided through the school property.

The proposed site design and landscape character is inspired by the natural beauty found throughout the surrounding area and takes inspiration from the Breakheart Reservation Park aesthetics. The proposed site topography is influenced by the existing granite bedrock formation. Minimal disturbance to the surrounding areas is a focus of the overall site design. The new school and surrounding site improvements are designed to maximize the existing forest and topography of the site. This will anchor the school into the landscape and keep the character of the area.

The new vocational high school building is positioned on the high point of the property to the south of the existing school location. A new, secondary, site access point will be created off Farm Street to the west, and the current site access drive off Hemlock Road will be maintained. The new access driveway weaves its way through the site and follows the existing topography. The school building was positioned to minimize the amount of rock cut required for construction. The elevation of the building will provide commanding views of the surrounding area. A student parking lot will be constructed to the south of the new school building with separate bus loops for student drop-off and pickup. A larger parking lot will be located north of the new school building on the existing school site. A series of low-impact elevated boardwalks will provide an accessible path to the lower parking lot, along with a series of stairs for a more direct connection. The area where the current school building is located will become the athletic fields for the school. This new building location allows the existing school facility to remain in operation while the new high school building is being constructed and minimizes the need for temporary facilities and services in the process.

A 24-foot-wide service/emergency driveway loops around the new building, providing access to the high-bay shops, and service area. Supporting facilities such as auto repair and body shop

#### Northeast Metro Technical High School MSBA 60% Construction Documents Submission

SITE NARRATIVE December 19, 2022 Page 2 of 4

repair storage are located along the north side of the building. A separate maintenance structure is located south of the school at the school parking lot. The lower parking lot is for students and will be controlled by electronic access gates. On weekends and after school hours, this parking lot may be open to the general community. A separate parking lot dedicated for school vehicle use only will be located on the existing basketball courts, south of the existing running track/football field. A 12-stall parking lot is dedicated for users of the Breakheart Reservation and may be always open to community use.

All driveways and parking areas will be constructed of vehicular rate bituminous asphalt and be curbed. Radii on turns are designed to allow cars, buses, emergency, and service vehicles to navigate the site. Parking stall dimensions and access dive lanes are designed to conform to the Town of Wakefield's by-laws. Parking stalls are 9' wide and 18' deep, drive lanes are 24' wide for 2-way traffic.

The athletic fields are located on the existing school building area. A new running track with a football field will be installed. A 500-person grandstand structure will be installed on the west side of the track. A concession/restroom building (Add alternate) will be located to the south of the bleacher structure. The concession building will have a gathering plaza associated with the refreshment window and to provide the entry sequence to the bleacher structure. To the west of the track, an irrigated natural grass turf field will be installed. This field will host softball and soccer fields. Athletic sports lights will be installed for the track and football fields. The existing irrigated natural grass baseball field will be renovated and upgraded. The lower natural grass practice fields will be renovated, and a new JV softball field installed. Asphalt access drives will provide maintenance and emergency access to the sport fields. A satellite athletic support building is located at the base of the main access drive and will house changing rooms, offices, and additional support for the athletic complex. This support building will also provide an elevator for ADA access to the boardwalk system, which connects the new school building with the lower student parking lot.

The main school building configuration creates a main entrance plaza on the southern side of the school building. This area provides comfortable microclimates in the spring and fall. This outdoor space can be used for students gathering that maximize the days per year students can utilize the outdoors for their studies and lunch period. There is also a separate outdoor dining space for staff that is buffered by planting. Another outdoor plaza area will be provided on the

#### Northeast Metro Technical High School MSBA 60% Construction Documents Submission

SITE NARRATIVE December 19, 2022 Page 3 of 4

eastern side of the building and will support the culinary program. This culinary program provides food service open to the public and the outdoor dining terrace is prominently visible at the approach to the customer entrance to the school. Green roofs are proposed on portions of the school building cafeteria roof for sustainability and climate resiliency. There is open to the sky courtyard that will provide students the ability to utilize the outdoor environment during the school day. The roof courtyard surface utilizes unit pavers as walking surface material. An outdoor playground surface to support the Early Childhood Education program will be located on a roof adjacent to the childcare program area with complete safety fencing at the perimeter. The need for locating this on the roof was to provide the Pre-K students safe access away from the vehicular traffic and vocational shops.

Pedestrian movement through the site has been carefully designed to minimize driveway crossings while connecting to parking areas and athletic fields. Driveway approach angles are engineered to eliminate straight lines heading directly toward entry doors. Accessible parking stalls have been distributed into all the parking areas and all are located within 200' of a building entry or to the facility they are intended to support. These accessible parking stalls have associated curb ramps where necessary along with striped crosswalks. Each of the main entries of the school building has canopies or overhangs to protect the entrances and adjacent walkways from the elements. Students arriving at the school by bus are dropped off along the sidewalks on the eastern. They will enter the school at the main south entrance (adjacent to the High School Office) or the eastern customer and events entrances. Parent drop-off will be in the southern parking lot where the students will walk to the main entry along a paved sidewalk. This walkway in the southern parking lot has raised crosswalks to help slow vehicles and increase pedestrian safety. Students arriving in their own vehicles shall be able to park at the student lower parking lot. These students will then walk up along the pathway consisting of stairs and landings, or along an accessible route of elevated ramping boardwalks. During dismissal, buses will queue along the eastern drive and along the back of the building. Students will be dismissed from their last period class/shop and leave via the most convenient exit. Parents in cars who arrive early will wait to pick up students in the south parking lot. Students will exit the building via the south entrance to meet them. Students leaving in their own vehicles will leave via the lower-level entrance and walk back down the hill to the student parking lot. Accessible routes are provided to all site program areas. There is an accessible route from the lower parking lot to the main school building that utilizes a series of elevated boardwalk HC ramps. All the athletic fields, including the bleacher structure, will be fully accessible.

#### Northeast Metro Technical High School MSBA 60% Construction Documents Submission

SITE NARRATIVE December 19, 2022 Page 4 of 4

The planting scheme on the site intends to complement the surrounding forested area. Native species are proposed and laid out in an organic pattern to mimic the forest. Low points are strategically located to help direct stormwater into bioretention basins. Buffer plantings consisting of native species will be planted along the entry drive where the driveway is adjacent to wetlands. Irrigation of the site's planting areas are to be limited to the natural grass fields. The lower athletic practice fields will remain non-irrigated. Irrigation source is from the town water supply.

Site Lighting will be set on pole mounted fixtures. Drive lanes will be illuminated with 25' tall fixtures. Pedestrian light fixtures will be installed at a height of 14' to provide a more people-friendly lighting level. These site lighting fixtures will have LED lamps and are intended to meet the dark sky or similar guidelines. There will be lighting at the athletic fields for after-hour use. Illumination levels will conform to IES guidelines for site lighting levels. Security cameras will use light poles as needed to ensure site coverage as designed.

ARCHITECTURAL BASIS OF DESIGN

6B.3.1 – 02c



Northeast Metropolitan Regional Vocational High School Project – 60% Construction Document Architectural Narrative The purpose of the narrative is to establish the anticipated quality level of construction.

#### **General Notes:**

#### **Building Code:**

Occupancy Classification – Non Separated Uses Use Group E (Classrooms, Lab Areas, Band and Chorus Spaces) Use Group B (Administration and Guidance) Use Group A-1 (Auditorium) Use Group A-3 (Gymnasium) – for "non-school events" Assume – Type IB Construction (non-combustible, 2hr rating)

#### **Roofing:**

Assume TPO membrane roof with combination of the tapered insulation and sloped steel with tapered insulation crickets as required achieving proper drainage. Roofing system rigid insulation shall be mechanically fastened and the membrane fully adhered. The minimum depth of the rigid insulation shall be 5-1/2". <u>Minimum</u> slope for the roofing surface is 1/4" in 12". Minimum slope for the insulation crickets shall be ½" in 12". Roofing system shall meet the manufacturers' requirements for the 20 year warranty, cover board to remain as part of the roofing system.

Assume aluminum roof edge (8" tall minimum) perimeter of the roof at storefronts, curtain walls and metal panels.

Provide walkway pads as necessary for the rooftop equipment maintenance.

Provide roof expansion joints.

Provide hatches at roof access interior ladders with safety railing.

Elevator vents (if required), see Mechanical.

Vegetated roofs for the portions of the lower roofs as indicated on the drawings. See Landscape Drawings and specifications for information.

Roof patio pavers are required at courtyard.

Assume that PV panels shall be installed after completion of construction by a third party.

Provide roofing slip sheet at the PV panels – to be provided by the PV panel system installer (NIC)

#### Exterior Wall Construction Types Fenestration:

Refer to Exterior Elevations and Building Sections, for additional information. Exterior wall construction (shall be in compliance with NFPA 285) –

- LGMF back-up, 3" insulated metal panels. Paint GWB at the interior face of the exterior wall.
- Aluminum Composite Metal Panels (ACM) over LGMF framing with exterior sheathing, Air Vapor Barrier (AVB) and mineral wool insulation at exterior overhangs and other locations where insulated metal panels would not be an appropriate choice of material.
- Zink tile rain screen system over continuous insulation (mineral wool 3"), air water barrier, exterior sheathing or corrigated metal desk at the LGMF back-up walls.
- Large format exterior CMU veneer over mineral wool 3" continuous insulation, air and vapor barrier over CMU back-up walls.
- Split face exterior CMU veneer over mineral wool 3" continuous insulation, air and vapor barrier over LMF framing with exterior sheathing
- Brick (4" x 12" face dimension) veneer over mineral wool 3" continuous insulation, air and vapor barrier over LMF framing with exterior sheathing
- Stone (Granite) veneer over mineral wool 3" continuous insulation, air and vapor Barrier over exterior sheathing at the LGMF back-up walls.
- Cast Stone/Full Bed Stone (Arriscraft Shadow Stone) veneer over mineral wool 3" continuous insulation, air and vapor Barrier over exterior sheathing at the LGMF back-up walls.
- Waterrproofing is required at the exterior surface and/or "blind" side of all cast-in-place retaining walls at below grade occulied spaces.
- Waterproofing is required at the elevator pits

#### Fenestration:

- Thermally broken aluminum frames with insulated glazing panels shall be assumed for the exterior Curtain Walls, Storefront and Windows. U-Value to meet or exceed 0.25 (Winter) / 0.21 (Summer). Note that integrated aluminum projected sunshade is required at the locations as indicated on the exterior elevations.
- High Security glazing required at the main entrance, curtain wall and storefronts
- Insulated Translucent Wall Panels with operable insulated glass vision panels is planed for the openings located at the Vocational Shops as indicated on the Exterior Elevations. Exterior Louvers to be integrated into insulated translusent wall panel system.
- Exterior motorized overhead panel doors at the Vocatioonal Shop exterior walls shall have insulated glass to match the rest of the exterior glass on the project. Provide telescoping security gates at interior side of all overhead doors.


#### Interior partitions:

Refer to the floor plans and partition types.

- Corridor walls assume metal stud 6" (unless indicated as CMU on the drawings) with total of 3 layers of 5/8" GWB (to comply with acoustical performance requirements).
- Classroom demising walls assume metal stud 6" (unless indicated as CMU on the drawings) with total of 3 layers of 5/8" GWB (to comply with acoustical performance requirements). Administration Areas - assume GWB
- Toilet cores assume metal studs with concrete backer board and ceramic tile. Toilets in the high bay shops assume CMU, painted (epoxy paint)
- Gymnasium assume CMU, painted
- Locker Rooms assume CMU walls, painted (epoxy paint)
- Auditorium / Multipurpose Space assume GWB and CMU walls as indicated. Metal stud furring, millwork wall paneling and acoustical wall panels as indicated on Interior Elevations.
- Cafeteria assume metal studs and CMU walls with backer board, acoustical wall panels and Large Format Porcelain Tile in high visibility areas. Also, glazed aluminum storefront with safety glazing.
- Kitchen Areas assume CMU and 10'- FRP. Painted CMU walls, (epoxy paint)
- Library (Media Center) assume GWB over metal studs and Paneling as indicated, see interior elevations. Also, glazed aluminum curtain wall and interior storefront with safety glazing.
- High Bay Shop Areas assume painted CMU (epoxy paint 8' AFF)
- Shop Areas assume 6" metal studs with GWB, painted. Simmilar to classroom spaces, see above.

### Ceilings:

Refer to RCP's

- Corridors assume ACT 2x2 with GWB soffits at classroom entrances and key intersections.
- Classrooms, Science Labs assume ACT 2x2 High NRC in order to comply with acoustical performance requirements.
- Administration areas assume ACT 2x2 High NRC.
- Toilet cores assume Moisture resistant GWB
- Mechanical Areas assume exposed structure painted;
- Gymnasium assume painted exposed structure with structural metal cellular acoustical deck.
- Locker Rooms assume exposed structure painted and limited moisture resistant GWB, painted
- Auditorium Multipurpose Space assume combination of exposed structure painted and limited suspended acoustical specialty ceiling "cloud" to achieve acoustical performance goals. Also technical pipe grid as indicated on the drawings.



- Cafeteria assume specialty metal ceiling system to achieve acoustical performance as well as be visually appropriate for this highly visibility space.
- Kitchen assume ACT 2x2 washable as appropriate for the Foodservice Areas
- Library/Media Center large format ACT with high NRC and GWB soffits, and specialty fiberglass "clouds", Acoustical Preformed Ceiling Panels (ACPCP) at the rotunda space.
- Common Spaces Lobby's etc. assume specialty ceilings as appropriate for high profile spaces
- Vocational Shops (High Bay) Special acoustical separation ceiling shall be required to
  acoustically separate the Shop areas from the learning spaces above assume system
  consisting of two layers of GWB on hat channelks, on metal stud suspended from the floor
  structure above on the Spring Isolation hangers, Acoustical insulation (6") above GWB. The
  MEP and FP systems shall not be supported or penetrate this system. All MEP and FP systems
  in the areas of the acoustical separation ceilings shall be supported by the supplemental steel,
  unistrat etc., attached to the steel beams not deck. All exposed to viewe ceiling areas shall be
  painted.
- Vocatioal Shops assume ACT 2x2 high NRC
- Vocational Shops spaces located below the mezzanines assme ACT 2x2 high NRC
- Cullinary Arts Restaurant assume specialty ceiling as appropriate for the high profile spaces
- Cosmetology assume specialty ceilings as appropriate for the high profile spaces

#### Floors:

Refer to the Finish Floor Diagram drawings

- Corridors linoleum with resilient base. (unless noted othervise)
- Lobby at Main, and Lobby at the Events entrance assume porcelain tile pavers
- Classrooms assume linoleum sheet flooring with resilient base.
- Science Labs assume sheet vinyl with integral base
- Administration Areas assume carpet with resilient base
- Toilet cores assume Ceramic Mosaic Tile (CMT) and Ceramic Tile (CT) base
- Gymnasium assume Athletic Performance Wood Floor and vented rubber base
- Locker Rooms assume combination of poured epoxy floor and base and Ceramic Mosaic Tile (CMT)
- Auditorium assume sealed concrete.
- Kitchen assume pured epoxy floor and base
- Library/Media Center assume carpet and resilient base
- Stairs assume Rubber Treads and Risers
- Lockers and Toilet Areas located within the Shops assume pured epoxy floor and base
- Shops High Bay Assume sealed concrete
- Shops assume linoleum tile and resilient base

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- Cullinary Arts Kitchen Space assume poured epoxy floor and base
- Cullinary Arts restaurant assume sheet vinyl
- Cosmetology assume sheet vinyl with integral base

#### Special treatment for high visibility spaces:

- Lobby / Cafeteria assume phenolic paneling/large format porcelain tile at lower portion of walls. The Guardrail system at the second-floor openings as indicated on the drawings
- Gymnasium assume 6' tall gym pads at the exposed wall areas and 4' tall acoustical fiber panels full perimeter of the gym space. Stainless stell neting system at the glass areas.
- Library/Media Center Wood trim and paneling.
- Auditorium fabric wrapped acoustical panels.

#### **Specialty Wall Treatment:**

- Kitchens assume FRP (height as noted)
- Custodial Closets assume FRP
- Toilets in Admin Areas assume Ceramic Tile (4' high)

#### Lockers:

- Corridor lockers assume two tier 15 x 15 (on wood base). Assume 200 units (to accommodate 400 freshmen students)
- Athletic Locker Room lockers assume combination of multi-tier and single tier lockers on concrete base for PE; welded locker construction with antimicrobial treatment see plans
- Team lockers assume single tier appropriate size; welded locker construction with antimicrobial treatment (on concrete base) see plans
- Shop lockers assume 15" x 15" two tier locker on concrete base at the High Bay shops and on wood base elsewhere.

#### Doors and frames:

- Exterior doors assume thermally broken aluminum glazed storefront in aluminum frame at highly visible entrances and hollow metal insulated doors and frames elsewhere. Note that all exterior hollow metal frames shall be galvanized.
- Athletic areas and Mechanical (back of the house areas) assume hollow metal doors and frames

- High Bay Shops assume hollow metal doors and frames
- Shops assume wood doors in hollow metal frames
- Kitchen Areas assume hollow metal doors and frames; doors between the kitchen and the servery assume stainless steel doors in s.s. frames. Same for Cullinary Arts Kitchen and Restaurant areas.
- Everywhere else assume wood veneer doors (5 ply) s in hollow metal frames
- There also are several spaces that require borrowed lights with safety glass.
- Overhead exterior insulated door at the High Bay Vocatioal Shops shall be fully glazed with insulated safety glass
- Assume rolling grills at the foodservice server area
- Assume Stainless Steel rolling door at the dish returns

#### Manufactured Casework:

Refer to the Equipment Drawings and Outline Specifications:

- High Quality plastic laminate casework shall be assumed for the project.
- All Science Labs and Prep Rooms shall have standardized approach to the design, to make these spaces interchangeable. Assume chemical resistance countertops for the science spaces.
- The General Classroom spaces shall have a teacher's wardrobe and storage casework.
- Office Work Rooms and conference rooms shall have storage casework with base and wall cabinets and plastic laminate countertop assemblies

#### **Gymnasium Equipment:**

Refer to Equipment Drawings and Outline Specification

- Provide foldable basketball backstops for the main court and the practice courts.
- Provide motorized ceiling mounted Gymnasium Divider curtain
- Provide two scoreboards and shot clocks for the main court
- Provide volleyball standards inserts
- Provide ceiling mounted motorized batting cage
- Provide ceiling mounted matt lifter
- Provide electrically operated Gym Bleachers on both sides of the Gym.

#### Auditorium / Multipurpose Space:

• Provide Retractable Theatrical Seating as indicated on the drawings.

#### Window Treatments:

- Classrooms, Science Labs, Art rooms assume manual operated roller shades
- Administration Areas assume manual operated vertical blinds

- Library / Media Center assume electrically operated roller shades (exterior). Manual operated vertical blinds at interior storefronts.
- Provide manual roller shades at all classroom sidelights for security

#### Displays:

- Each educational space shall contain at least 20' of Tack Board surface (4' tall) and 8' of Marker Board surface. (Refer to drawings)
- Each Educational space shall contain an Interactive wall mounted Display wall mounted
- Auditorium assume 20' x 14' motorized Projection Screen
- Gymnasium motorized Projection Screen
- Cafeteria Commons assume large format digital information displays

#### Elevators:

• Elevator - assume traction elevator (two required for the main school building). One shall be oversized (<u>not</u> freight elevator) for large equipment delivery to the upper shops. Athletic Locker Room Building assume two stop elevator.

#### Fireproofing:

- All structural steel columns to receive spray fireproofing 2 hour rated.
- At highly visible locations where structural steel componenets are exposed to view (i.e. in front of exterior or interior glass etc.) assume intumescent paint. Visual quality of the steel surface preparation shall be increased for all areas to recive intumescent paint.
- Beams and kickers supporting elevated/structured floor to receive spray fireproofing 2 hour rated
- Beams, kickers and metal deck supporting roof to receive spray fireproofing 1 hour rated
- Spray fireproofing is not required at the structural members located more than 25' above the floor surface below, measured to the bottom of the structural component

#### Food Service Equipment:

Refer to the Equipment Drawings and Outline Specifications:

- New Equipment for Kitchen and Cullinary Arts Program
- Cooking equipment with convections ovens, combi ovens, 6 burner ranges.
- Storage will include dry storage for food and paper good and cooler and freezers.
- Two dishrooms, one for the main kitchen and another one for the Cullinary arts kitchen.
- Reuse existing dishwasher at the Main Cfeteria Kitchen
- The main kitchen will include a food court style servers.
- Prep stations and tray slides shall conform to the ADA code.

#### Furniture and Equipment:

Refer to the Equipment Drawings and Outline Specifications:



- Movable Furniture shall include student desks, chairs, teacher desks, media center furniture, cafeteria furniture, café tables, stack seating, lounge seating. These items shall be procured by the District and are not part of the Construction CM-R's scope of work.
- Furniture shall conform to ADA code.
- Specific Vocational Equipment for the shop spaces to be part of the FF&E scope of work (potentially may be included in the CM-R's scope to simplify coordination and constraction logistics Refer to Equipment Drawings, Schedules and Outline Specifications.
- Plumbing and HVAC training equipment specified as part o the MEP scope.
- CM-R shall coordinate ALL equipment (provided by the Owner and the CM-R), and provide all MEP & FP services and connections as part of the Construction scope of work.
- The school (students under instruictors supervision) is responsible for the installation and final connections for all services (MEP) to the training equipment in the HVAC and Plumbing shops.

STRUCTURAL BASIS OF DESIGN

6B.3.1 – 02d



Project Name:

# Northeast Metropolitan Regional Vocational High School

MSBA Module 6 Requirements:

MSBA 60% Construction Document – Structural Basis of Design Narrative

Prepared For: Drummey Rosane Anderson, Inc.

Prepared By: Alexander Auditore, B.S.E. – Engineers Design Group, Inc.

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| Engineers Design Group Inc. | Project  | Job Ref.       |            |
|-----------------------------|--|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School | 2019-091       |            |
|                             | Section  | Sheet no./rev. |            |
|                             | MSBA 60% Construction Document Submission              | 2              |            |
|                             | Date   | App'd by       | Date       |
|                             | 01/09/2023   | MD             | 12/19/2022 |

## 1. STRUCTURE

#### NEW CONSTRUCTION

**Structural:** Designed in accordance with the 9<sup>th</sup> Edition of The Massachusetts State Building Code and incorporating IBC 2015 with Massachusetts amendments.

The proposed scheme will consist of construction of the new school that would include a new, 4-story academic wing, auditorium, gymnasium, etc. located north of the existing high school; a standalone two story locker building, a single story concessions building, and a single story pre-engineered steel framed maintenance garage building.

#### SUBSTRUCTURE

#### **Foundations**

Based on the foundations of the existing school structure and preliminary recommendations from the Geotechnical Engineer of the soil conditions on the proposed site, the columns of the proposed structure would bear on reinforced concrete spread footings and the perimeter foundation walls would bear on continuous reinforced concrete strip footings extending at least 4 ft. -0 in. below grade. The walls around the spaces below grade will be cantilevered retaining buttressed walls supported on reinforced concrete footings. Interior isolated column footings and continuous exterior strip footings shown on the Structural Contract Drawings are designed based on the recommended bearing capacity of the soil of 5 tons/sq.-ft. and 2 tons/sq.-ft. in different areas of the site. The retaining walls that separate Areas A and B from Areas C and D, shall be 20 to 25 feet below the first floor level, and shall be 2 ft. -0 in. thick reinforced concrete full height buttress walls. The heel of the footing would be 10 ft. -0 in. wide and located towards the existing buildings. The buttress walls will be a minimum 10 ft. -0 in. long and spaced approximately 20 ft. -0 in. on center, in coordination with the architectural layout of devising walls at the lower ground level. Foundation drains will be installed around foundations of all structures below grade. Foundations will be founded on 12 in. of compacted sand gravel fill or 6 in. of crushed stone placed above compacted structural granular fill in wet conditions. Reinforced masonry shear walls will be supported by 8 in. or 12 in. reinforced concrete foundation walls and 2 ft. -6 in. wide by 12 in. thick continuous reinforced concrete footings.

#### Slabs-on-Grade

Based on the existing school construction and recommendations from the Geotechnical Engineer, the typical lowest level of the proposed structure would be a 4 in. thick concrete slab-on-grade, reinforced with welded wire reinforcing over a vapor barrier on 2 in. thick rigid insulation on 12 in. of compacted sand gravel structural fill. The slab on grade will be 6 in. thick, reinforced with welded wire reinforcing, in all the shop areas. Interior non-structural masonry walls will bear on continuous 14 in. thickened slabs.

#### SUPERSTRUCTURE

#### Floor Construction

#### **Typical Floor Construction**

Typical floor construction shall be 5 1/4 in. light-weight concrete composite metal deck slab, reinforced with welded wire reinforcing on wide-flange steel beams spanning between steel girders and columns, as shown on the Structural Contract Drawings. The weight of the structural steel is estimated to be 15 psf for the typical framing. The weight of structural steel at the second floor above the automotive and other shops is estimated to be 20 psf, (maximum span above this space is 45 feet). The weight of the

| Engineers Design Group Inc. | Project  | Job Ref.       |            |
|-----------------------------|--|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School | 2019-091       |            |
|                             | Section  | Sheet no./rev. |            |
|                             | MSBA 60% Construction Document Submission              | 3              |            |
|                             | Date   | App'd by       | Date       |
|                             | 01/09/2023   | MD             | 12/19/2022 |

steel for auditorium balcony framing is estimated to be 20 psf. The weight of structural steel is estimated to be 18 psf for framing supporting elevated courtyards or play areas. Note the floor above the second floor would be the typical floor construction.

#### **Roof Construction**

#### **Typical Roof Construction**

The roof construction shall be galvanized, corrugated 3 in. deep, Type 'N' metal roof deck on wide-flange steel beams spanning between steel girders and columns, as shown on the Structural Contract Drawings. The weight of the structural steel is estimated to be 14 psf. At locations of roof-supported mechanical equipment, a concrete slab will be provided similar to that of the typical floor construction.

#### Low Roof Construction

The portion of the low roof around the media center that serves as a patio and the main interior courtyard shall be a continuation of the adjacent floor, and shall be similar to the typical floor construction of 5 1/4 in. light-weight concrete composite metal deck slab, reinforced with welded wire reinforcing on wide-flange steel beams spanning between steel girders and columns. The remainder of the low roof in front of the classrooms would be typical roof construction. The mechanical units located on this roof would be protected by a screen comprised of structural steel posts and beams. The weight of the structural steel for the patio, the vegetated green roof, and portions of roof supporting mechanical equipment is estimated to be 18 psf. The weight of the structural steel of the portion of the roof that is typical roof construction is estimated to be 14 psf.

#### **Auditorium Roof Construction**

The roof construction shall be galvanized, corrugated 3 in. deep, Type 'N' metal roof deck, spanning between long-span steel joists. The weight of the steel joists and structural steel framing is estimated to be 13 psf.

#### **Gymnasium Roof Construction**

The roof construction shall be acoustic, galvanized, corrugated 3 in. deep, Type 'NA" metal roof deck, spanning between long-span steel joists. The weight of the steel joists and structural steel framing is estimated to be 13 psf.

#### Vertical Framing Elements

#### Columns

Structural columns shall be hollow structural sections, (HSS). Typical columns shall be square HSS12x12 and round HSS12 in the majority of the four-story spaces.

#### Lateral Load-Resisting System

The structure's lateral force resisting system shall mainly consist of ordinary concentric steel braced-frames, comprised of hollowstructural sections, (HSS). Reinforced concrete-masonry shear walls will be used throughout the building as well, mainly within the lower levels. The combined lateral force resisting system will be designed to resist the loads imparted on the structure from local wind and seismic forces, based on the applicable design codes noted on the Structural Contract Drawings.

#### **Expansion Joints**

The structure will have one expansion joint, between Area B and Areas C and D – separating the structure.

| Engineers Design Group Inc. | Project  | Job Ref.       |            |
|-----------------------------|--|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School | 2019-091       |            |
|                             | Section  | Sheet no./rev. |            |
|                             | MSBA 60% Construction Document Submission              | 4              |            |
|                             | Date   | App'd by       | Date       |
|                             | 01/09/2023   | MD             | 12/19/2022 |

#### Maintenance Garage

The pre-engineered superstructure shall be a steel-framed structure supported on reinforced concrete spread footings, and the perimeter foundation walls will bear on continuous reinforced concrete strip footings, extending at least 4 ft. -0 in. below grade. The interior and exterior foundations supporting the columns of the single story, pre-engineered steel structure shall be 5 ft. -0 in. x 5 ft. -0 in. x 2 ft. -0 in. deep. The structure would be comprised of steel bents with tapered columns and beams. The roof deck shall be a composite deck spanning between steel 'Z'-shaped purlins. The lateral loads shall be resisted by ordinary steel moment frames and ordinary concentric steel braced frames. The slab shall be the constructed as a 6 in. thick concrete slab-on-grade, reinforced with welded wire reinforcing over a vapor barrier on 2 in. thick rigid insulation on 12 in. of compacted sand gravel structural fill.

#### Locker Room Building

The building construction shall consist of steel beams bearing on reinforced masonry walls. Typical interior and exterior footings shall be 6 ft. -0 in. x 6 ft. -0 in. x 24 in. deep. Exterior masonry bearing walls shall be supported on continuous reinforced concrete foundation walls and 2 ft. wide strip footings, extending at least 4 ft. -0 in. below grade. The retaining wall at the back-side of the building will retain soil up to the second floor, and would be a 2 ft.-0 in. thick reinforced concrete wall supported on a 9 ft. -0 in. wide x 2 ft. -0 in. thick continuous reinforced concrete footing. The first floor slab shall be constructed as a 6 in. thick concrete slab-on-grade reinforced with welded wire reinforcing over a vapor barrier on 2 in. thick rigid insulation on 12 in. of compacted sand gravel structural fill. The second floor shall be constructed as a 5 1/4 in. light-weight concrete composite metal deck slab, reinforced with welded wire reinforcing on wide flange steel beams spanning between reinforced load-bearing masonry walls. The roof construction would be galvanized, corrugated 3 in. deep, Type 'N' metal roof deck spanning between wide flange steel beams and girders. The weight of the structural steel is estimated to be 15 psf for the typical framing at the second floor and roof levels The elevator shaft shall be constructed with full-height reinforced masonry, bearing on reinforced concrete foundation walls and a 3 ft. -0 in. deep mat footing.

#### **Concession Building**

The building construction would consist of pre-fabricated wood trusses, bearing on reinforced load-bearing masonry walls. Exterior masonry walls would be supported on continuous reinforced concrete foundation walls and 2 ft. -0 in. wide strip footings, extending at least 4 ft. -0 in. below grade. The first floor slab shall be constructed as a 6 in. thick concrete slab-on-grade reinforced with welded wire reinforcing over a vapor barrier on 2 in. thick rigid insulation on 12 in. of compacted sand gravel structural fill. The roof deck shall be 3/4 in. plywood sheathing, spanning between wood trusses. The weight of the wood structure is estimated to be 12 psf for the typical framing at the roof level.

MEP-FP BASIS OF DESIGN

6B.3.1 – 02e

# BALA

#### NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL

#### 60% CONSTRUCTION DOCUMENTS DESIGN NARRATIVE

#### I. FIRE PROTECTION

- A. General:
  - 1. All occupiable and accessible areas of the building will be protected with a complete combination standpipe and wet suppression sprinkler system.
  - 2. Work shall be performed using the "Method "B" Shared Design" process, from a "Fully Engineered" "design" set of documents which outlines the system and requires the Fire Protection Contractor to provide the "installation" set of documents, in conformance with the design criteria as set forth in the bid documents. Works shall be performed in accordance with the Building Code, NFPA, and the Local Authority.
- B. System Requirements and Criteria are as follows:
  - 1. Complete combination standpipe and hydraulically calculated, automatic overhead, wet suppression sprinkler systems, providing proper coverage to all areas of the new high school building. Dry pendents shall be provided for interior spaces that would be subject to an operating temperature less than 40 F such as the cooler, freezer, loading dock or for any similar areas.
  - 2. Eight inch dedicated/primary sprinkler water service which shall be extended from the site water main to all devices, equipment, and heads. (Note: All dedicated site water piping, fire hydrants, etc., are required by law to be installed by a licensed Sprinkler Contractor.).
  - 3. Double check type backflow preventor with supervised valves, repair kit, certified test, and DEP permit for each of the building service entries.
  - 4. Building fire department connections. Two shall be planned at this time based on the overall high school size and site configuration. Each fire department connection shall be located as to ensure access by the fire department and a fire hydrant located within 100 feet of each connection.
  - 5. Based on new water flow tests information obtained on 6/25/2021, preliminary hydraulic calculations have been completed to verify that a 1000 gpm fire pump system will be required to support the proposed fire suppression system.
  - 6. Alarm check valves, valves and all piping, hangers, sprinkler heads and accessories. Four (4) alarm check valves anticipated per sprinkler zone requirements for the main high school building.
  - 7. Based on the overall building area, each major building segment with an area not to exceed 52,000 SF per floor will be fed via a separate alarm check valve/system riser. Each of these risers are to supply a combination fire sandpipe and sprinkler system.



- 8. The fire standpipe system within a building segment will generally consist of a standpipe riser to be located in each required exit stairway and where otherwise required by code such as at the stage and at remote area of building segments that can't be reached with a 200 foot hose from a required hose valve connection. Each standpipe riser is to supply a hose valve per floor.
- 9. 2-1/2" fire department valves shall be provided on the main landing of each level within the interior stairways. Intermediate standpipes will be provided with a fire hose valve cabinet with a 2-1/2" connection on each level within the corridor. The sprinkler system within each building segment will start from one of the required fire standpipe risers with a control valve assembly for each floor.
- 10. Fire standpipe and sprinkler system zoning is to be consistent with the project phasing.
- 11. It is anticipated that the majority of the sprinkler floor control valves and of the fire department hose valves will need to be of the pressure reducing valve type and will need to be installed with the required drain assemblies and system to allow future testing.
- C. Specific Program requirements shall be provided in accordance with NFPA 13 as follows:
  - 1. In general, the building will be designed as a light hazard occupancy and therefore a sprinkler spacing not exceed approximately 225 SF for all academic, administration and common area type spaces.
  - 2. Shop type areas as the following spaces: Automotive, Automotive/Body, Metal Fabrication, Plumbing, Electrical, Carpentry, Electrical, HVAC, Robotics and Automation will need to be designed as ordinary hazard group 2 and therefore sprinkler spacing not to exceed 130 SF. The following building spaces: kitchen, mechanical and utility rooms, storage rooms and similar spaces will need to be designed as ordinary hazard group 1 and therefore the sprinkler spacing shall not exceed 130 SF.
  - 3. The paint spray booth will be designed as an extra hazard group 2 occupancy and therefore the sprinkler spacing shall not exceed approximately 100 SF. A separate zone control valve shall be provided for each paint spray booth to serve these sprinklers.
  - 4. The metal fabrication room will be designed as an extra hazard group 1 occupancy due to the presence of flammable gases within the space. Therefore, the sprinkler spacing shall not exceed approximately 100 SF with this space.
  - 5. Window sprinklers shall be installed in locations coordinated with the architect to provide passive fire protection for glass partitions. These sprinklers shall be installed within 2 in. of the glass partitions and shall be spaced not greater than 10 ft from each other. A separate zone control valve shall be provided for these sprinklers.
- D. Specific requirements for this option:
  - 1. Since the building is to consist of entirely new construction, it is anticipated that the project phasing should not affect the fire protection system. However, It will



be important to confirm that the existing fire protection water supply can be maintained for the existing high school building until the building structure can be demolished.

#### II. PLUMBING

- A. General:
  - 1. All work shall be performed in strict accordance with the State Building Code, the State Plumbing and Fuel Gas Codes, the plumbing inspector and all Local Codes and Ordinances.
  - 2. Sustainable Design Intent: Compliance with project requirements intended to achieve a certification and rating, measured and documented according to the LEED for Schools Green Building Rating System, of the US Green Building Council.
- B. System Requirements and Criteria are as Follows:
  - 1. Six inch primary domestic water service to 10 feet-0 inch outside building wall for the new high school building. Three inch domestic water service for the Amenities Building and the same for the Fitness Building. Based on new water flow test data (6/24/2021) and based on the proposed site configuration, a domestic booster pump system will be required for the main high school building.
  - 2. A new natural gas service is being coordinated to be brought to the site. For the new high school, a new natural gas system is to be provided for the kitchen and culinary arts equipment, as well as the plumbing vocation shop, with work beginning at the gas company meter. Each of the major gas system components shall be supplied with a dedicated gas system to be fed via a gas sub-meter that shall also be monitored via the building automation system. The intent of this measure is to help achieved a certain LEED rating.
  - 3. Internal storm water roof drainage systems from all flat roof areas, consisting of roof drains and all rainwater piping and accessories to points 10 feet outside of the building walls. It is to be assumed at this time that where building roof areas will need to be provided with a secondary roof drainage system that requirement will need to be addressed by the use of scuppers to be specified under the architectural scope. This will need to be verified based on input and coordination with the Architect.
  - 4. Complete sanitary, waste and vent system connecting to all fixtures and inlet connections and running to points 10 feet outside of the building walls.
  - 5. Dedicated special waste piping system serving Science Rooms and related areas susceptible to receive non-conventional waste and this system is to consist of:
    - a. Central pH neutralizing and monitoring system. The project goal is to confirm if a monitoring system will be adequate for a single classroom out of the (2) sets of stacked science classrooms. This will need to be verified with the school programmer and local plumbing inspector.
  - 6. Reduced pressure backflow preventers on hot and cold water supply to the Science Classrooms. This dedicated system is to also include a circulation system with an integral hot water maintenance system.



- 7. Dedicated "grease waste" piping system from the Kitchen area and from the Culinary area and the restaurant to 10 feet outside building wall, for continuation by Site/Civil from the site grease tank/interceptor. One central grease trap for the kitchen and a separate one for the Culinary area since these spaces are located apart. Refer to the Kitchen and Culinary areas for the extent of the plumbing work required to support the intended equipment. Provide allowance for three interior grease interceptors to support kitchen and Culinary arts. Provide allowance also for floor drains to support the intended equipment.
- 8. Domestic hot water shall be set up to be generated by electric fired hot water systems for the high school. Each set up shall have a mixing valve, all accessories and devices and a building pumped recirculation loop. Each Major building area will be supplied by a separate hot water system: At this time, (3) such systems are planned for the high school main building.
  - a. Plumbing fixtures that are located too far away from the hot water systems described above will need to be supplied by separate point-of-use water heaters wherever feasible.
  - b. Each satellite building is to also include their own system.
- 9. Compressed-Air Systems
  - a. Furnish and install an industrial grade compressed air system for each of the shop areas: One system to handle the shop areas of the academic wing and another system is to handle the Auto Shop areas.
  - b. Furnish and install a medical grade compressed air system to handle the dentistry area.
  - c. Each system shall consist of a separate receiver, air dryer, and all required pre and after filters.
- 10. Vacuum Systems
  - a. Furnish and install a medical grade system to handle the dentistry area.
  - b. Furnish and install an industrial grade system to handle the lab area.
  - c. System shall be a duplex system with separate receiver.
- 11. Piping distribution of oxygen and acetylene from storage cylinders to Metal Fabrication welding booths.
- 12. Complete interior sanitary, waste, vent, gas, cold water, 120°F hot water, 140°F hot water and recirculation piping systems.
- 13. Main water meter with monitoring via building automation system. A sub-meter for each major system including the following: Kitchen, domestic hot water system. This measure is to be implemented to help achieved a certain LEED rating.
- 14. Plumbing fixtures and trim, all new, commercial grade and high efficiency types for an anticipated approximately 40 percent water saving to help achieved a certain



LEED rating: 1.28/1.1 GPF dual flush water closets, 1/8 GPF urinals, 0.35 GPM lavatories, 1.5 GPM showers, 1.5 GPM Kitchen faucets, etc.

- 15. Freezeproof wall hydrants around the perimeter of all construction.
- 16. Drains, hose bibbs, valves, fittings, hangers, and all miscellaneous pipeline accessories, including seismic support requirements.
- 17. Cleaning and testing of all fixtures, equipment, and piping systems.
- 18. Disinfection of all domestic water piping systems.
- 19. Waste outlets to accept HVAC condensate and sprinkler waste discharges.
- 20. Insulation of all domestic water piping, roof drain bodies, storm water piping, water cooler drain piping and all exposed piping at handicapped fixtures.
- 21. All floor drains shall be provided with automatic trap primers.
- 22. Include allowance for floor drainage and hose bibbs in all mechanical type spaces and large toilet rooms (with two or more fixtures).
- 23. It is to be assumed that the following shops will be required to be provided, at a minimum, with a compressed air system to serve all required equipment and outlets. These shops will also require a handwashing sink, a service sink, and all other required plumbing connections: Carpentry, Electrical, Robotics, and Automation, Metal Fabrication, Automobile, Auto Body, Plumbing, and HVAC/R. Some of these shops might be able to be supported from a single system. This will need to be verified.
- 24. It is to be assumed that according to current state elevator code, elevator pits will be required to include a drainage system. The system is to consist of a pit floor drain to discharge via sump pump and is to be extended to the building sanitary system.
- 25. The Auto Body and the Automotive Shops will need to be provided with a dedicated floor drainage system that will need to be extended to a gas/oil separator system to be located outside the building. This requirement is to also apply to all other shop areas that are to allow entry of vehicles within the interior shop area, including the satellite Maintenance Building.
- 26. A dedicated tempered water system shall also be planned to serve each of the emergency shower/eyewash unit required in the various shops noted above.

#### III. HEATING, VENTILATING, AND AIR CONDITIONING

- A. General:
  - 1. Systems are based on all electric heating and cooling air-cooled variable refrigerant flow (VRF) systems.



- 2. Electric unit heaters will be provided at entrance vestibules, stairways, exit doors, loading dock, and utility spaces unless noted otherwise on the plans.
- 3. Air conditioning systems are all air-cooled.
- B. Air-Source VRF Heat Pump Systems:
  - 1. Units shall be variable refrigerant flow (FRF) air-source DX heat pump units serving all rooftop air handling units.
  - 2. Multiple system modules shall be provided to meet capacity.
  - 3. Units shall be capable of providing continuous heating down to -4 deg. F.
  - 4. Units shall be capable of providing a changeover between heating and cooling as needed.
- C. Piping:
  - 1. The following piping distributions shall be provided:
    - a. Refrigerant piping between outdoor units and associated indoor unit or DX coil.
    - b. Condensate drain piping from indoor air handling units to nearest condensate receptor and condensate drain piping from rooftop air handling units to nearest roof drain.
    - c. Condensate drain piping from indoor units to nearest condensate receptor.
  - 2. All main distribution piping 2-1/2" and larger shall be Schedule 40 carbon steel with welded joints or mechanical couplings equal to Victaulic. Piping 2" and less shall be Type L copper with mechanical coupling joints equal to Pro-Press. Refrigerant piping shall be Type L ACR hard drawn piping with brazed joints.
  - 3. Provide fiberglass pipe insulation with all service jacket on all piping to meet the MA energy code. Generally, 1-1/2" thickness required.
- D. Classrooms, Vocational Classrooms, and Athletics:
  - 1. Classrooms and support spaces shall be served by rooftop dedicated outside air ventilation supply air systems. Units shall be 100% outside air with total energy recovery wheels, MERV 8 and MERV 14 filters, and recirculation dampers. Cooling and primary heating shall be provided with a DX coil and remote VRF (variable refrigerant flow) heat pump condensing units. An electric preheat coil shall be provided for preheating of outside air under low ambient temperature conditions. Supply and exhaust fans shall be variable speed with variable frequency drives.
  - 2. Outside ventilation air shall be delivered to each classroom by connection to a VAV terminal unit. Ventilation air shall be ducted to ceiling diffusers or the inlet of each VRF fan coil unit.



- 3. Exhaust air shall be from a ceiling exhaust grille controlled by a VAV exhaust terminal.
- 4. Ventilation supply air to each classroom shall be controlled by a space carbon dioxide sensor.
- E. Administration Area and Media Center:
  - 1. Provide a new variable refrigerant flow (VRF) heating and cooling system with ceiling cassette or ducted fan coil units serving each zone as indicated on the floor plans. Locate heat recovery condensing unit on the roof and provide refrigerant piping distribution including branch selector boxes to serve each fan coil unit.
  - 2. Provide a roof mounted energy recovery ventilator with electric pre-heat coil for ventilation air to all administration spaces. Provide variable volume supply ductwork distribution connected to the fan coil unit return air duct. Exhaust air shall be connected to ceiling diffusers in each space.
- F. Cafeteria /Culinary Classroom and Cafe:
  - 1. Cafeteria and Culinary shall be provided with a variable air volume rooftop air handling unit with DX cooling coil, remote VRF condensing units, electric preheat coil, economizer damper section, MERV 8 and MERV 14 filters and supply and return fans with variable frequency drives. Cooling and primary heating shall be provided with a DX coil and remote VRF (variable refrigerant flow) heat pump condensing units. An electric preheat coil shall be provided for preheating of outside air under low ambient temperature conditions
- G. Kitchen/Culinary Kitchen:
  - 1. Main kitchen and culinary kitchen air handling units shall be 100% makeup air units interlocked with kitchen hood exhaust operation. Cooling and primary heating shall be provided with a DX coil and remote VRF (variable refrigerant flow) heat pump condensing units. An electric preheat coil shall be provided for preheating of outside air under low ambient temperature conditions. Supply fans shall be variable speed with variable frequency drives. Provide MERV 8 and MERV 14 filters.
  - 2. Provide kitchen hood exhaust fans for main kitchen and culinary kitchen. Fans shall be variable speed and interlocked with kitchen hood variable exhaust flow control system.
- H. Auditorium, Stage, and Gymnasium:
  - Provide separate single-zone variable air volume rooftop air handling units with DX cooling coil, remote VRF condensing units, electric heating coil, economizer damper section, MERV 8 and MERV 14 filters, energy recovery wheel, and supply and return fans with variable frequency drives. Cooling and primary heating shall be provided with a DX coil and remote VRF (variable refrigerant flow) heat pump condensing units. An electric preheat coil shall be provided for preheating of outside air under low ambient temperature conditions.
- I. Cosmetology and Auditorium/Gym Lobby (Events Entry):



- Provide separate multi-zone variable air volume air handling units with DX cooling coil, remote VRF condensing units, electric heating coil, economizer damper section, MERV 8 and MERV 14 filters, energy recovery wheel, and supply and return fans with variable frequency drives. Cooling and primary heating shall be provided with a DX coil and remote VRF (variable refrigerant flow) heat pump condensing units. An electric preheat coil shall be provided for preheating of outside air under low ambient temperature conditions.
- 2. Supply air shall be delivered to each zone by a VAV terminal unit ducted from the main supply duct to diffusers in each space for Cosmetology. Supply air shall be delivered to each zone by VAV dampers at the air handling unit for the Events Entry.
- 3. Return air shall be duct from the return main to return grilles in each space.
- J. Shops:
  - 1. Trade shops shall be provided separate single-zone variable air volume rooftop air handling units located in mezzanines. Each unit shall be provided with DX cooling coil, remote VRF condensing units, electric heating coil, economizer damper section, MERV 8 and MERV 14 filters, and supply and return fans with variable frequency drives. Cooling and primary heating shall be provided with a DX coil and remote VRF (variable refrigerant flow) heat pump condensing units. An electric preheat coil shall be provided for preheating of outside air under low ambient temperature conditions. Air handling unit outside air damper shall be interlocked with exhaust system operation wherever possible.
  - 2. Systems shall serve the following trade shops:
    - a. Electrical Technology
    - b. HVAC Technology
    - c. Metal Fabrication
    - d. Plumbing & Pipefitting
    - e. Carpentry
    - f. Auto Collision
    - g. Auto Technology
- K. Satellite Concessions Building and Maintenance Building (Add-Alternate):
  - 1. Provide energy recovery ventilator for Women's and Men's Rooms and concession space exhaust air and ventilation air. Unit shall be ducted for exhaust and outside air with connections to exterior louvers. Provide electric heating coil in the supply air for tempering.



- 2. Provide electric space heating units in each space: Women's, Men's, Concession, and Janitor's Closet.
- L. Satellite Athletics Building (Add-Alternate):
  - 1. Provide ducted energy recovery ventilator for Women's and Men's Team Rooms, toilet rooms and coach offices for exhaust air and ventilation air to each space. Unit shall be ducted for exhaust and outside air with connections to exterior louvers. Provide electric heating coil in the supply air duct for tempering.
  - 2. Provide electric space heating units in each space: team rooms, toilet rooms, coach offices, garage space, maintenance office and elevator vestibules.
  - 3. Provide ductless split heat pump system for elevator machine room
  - 4. Provide VRF condensing unit with indoor ceiling cassette fan coils for offices and locker rooms.
- M. Ductwork:
  - 1. Ductwork systems serving spaces for ventilation, air conditioning, or heating shall be provided for the following:
    - a. Classroom dedicated outside air systems with central supply and exhaust distribution to each zone.
    - b. Rooftop air handling units serving dedicated areas with supply and return ductwork.
    - c. Supply and exhaust systems for energy recovery ventilators.
    - d. Local zone supply and return air ductwork for VRF fan coil units.
    - e. Local supply and return air ductwork distribution for trade shops.
  - 2. All concealed supply ductwork shall be insulated with 2-inch duct wrap, R-6 minimum.
- N. Specialty Exhaust Systems:
  - 1. Provide separate dedicated exhaust systems including ductwork and exhaust fans to serve the following listed uses:
    - a. Laser cutter
    - b. CNC machines
    - c. Woodshop with outside dust collector. Dust collector from existing school shall be relocated and reused at new school.
    - d. Vehicle exhaust



- e. Paint spray, powder coating, and mixing booths with dedicated makeup air system
- f. Welding booths
- g. Welding benches
- h. Cosmetology stations
- O. Ductless Split heat pump Systems:
  - 1. Provide separate dedicated ductless split cooling and heating systems including indoor fan coil unit and roof-mounted heat pump condensing unit to serve the following listed uses:
    - a. MDF room
    - b. IDF rooms
    - c. Elevator machine rooms
    - d. Electric rooms with transformers
- P. Automatic Temperature Controls:
  - 1. Automatic temperature controls for building shall be direct digital DDC control building automation system (BAS) with web access interface. System shall be open protocol BACnet.
  - 2. Manufacturer's controls for air-source heat pumps shall be integrated with the BAS via BACnet interface.
  - 3. All VRF and ductless split system manufacturer's controls shall be integrated with the BAS through a BACnet interface.
  - 4. All air handling units shall be provided with a DDC controller by the automatic temperature controls (ATC) sub-contractor. All field devices for unit operation shall be provided by the ATC sub-contractor.
  - 5. Unitary controllers shall be provided for all terminal cooling and heating equipment including fan coil units, unit heaters, fin-tube radiation, fans, etc.
- Q. Sustainability:
  - 1. The HVAC systems will be designed to support the following LEED v4 prerequisites and credits:
    - a. WE Credit Cooling Tower Water Use, EA Prerequisite Minimum Energy Performance, EA Prerequisite Building-Level Energy Metering, EA Prerequisite Fundamental Refrigerant Management, EA Credit Optimize



Energy Performance, EA Credit Advanced Energy Metering, IEQ Prerequisite Minimum Indoor Air Quality Performance, IEQ Credit Enhanced Indoor Air Quality Strategies, and IEQ Credit Thermal Comfort

2. Refer to the LEED scorecard for quantity of points being pursued for each credit.

#### IV. ELECTRICAL

- A. Utility Service:
  - 1. Scope of work
    - a. New underground electric service from Wakefield Municipal Gas and Light Department (WMGLD) primary services.
    - b. Current existing utility primary service, transformation and secondary service to main switchboard including main switchboard will be maintained per phasing schedule.
    - c. New and existing panelboards feeders, mechanical equipment feeds, and branch circuits as required to maintain existing equipment per phasing schedule.
    - Primary service infrastructure from WMGLD will begin at the site's property line, in a new underground junction box. Primary service shall be extended from this junction box to the main electric utility pad-mounted transformers via (2) 4-inch concrete-encased PVC conduits with rigid steel conduit sweeps. Additional junction boxes will be provided approximately every 250ft on center.
    - e. A second concrete-encased duct bank with (2) 4-inch PVC conduits shall be provided from the site's energy park to the emergency main electric utility pad-mounted transformer, for emergency and standby loads within the building.
    - f. Three precast concrete electric utility pads shall be provided with 4-inch inch PVC conduits with rigid steel conduit sweeps for (2) 2,000 kVA pad mount transformers and one (1) 300kVA pad-mounted transformer provided by WMGLD at School Building.
    - g. New Athletic Building primary service shall extend underground from a local junction box via (2) 4-inch inch PVC conduits with rigid steel conduit sweeps to main electric utility pad.
    - h. A precast concrete electric utility pad shall be provided with (2) 4-inch PVC conduits with rigid steel conduit sweeps for a 300 kVA pad mount transformer provided by WMGLD at Athletic Building
    - i. Provide pre-formed concrete duct banks using PVC conduits with rigid steel conduit sweeps from electric utility pad to Main Electric Room for normal power supply. Run rigid conduit sweeps from electric utility pad to Generator Panel Room for emergency power supply.

60% CONSTRUCTION DOCUMENTS DESIGN NARRATIVE



- j. Secondary services at School Building will be run underground from new pad mounted transformers via PVC conduits with rigid steel conduit sweeps to double-ended switchboard with Kirk Key interlock, sized at 4000A, 480/277V, 3 phase, 4 wire, 200 kAIC
- k. Secondary services at new Athletic Building will be run underground from new pad mounted transformer via PVC conduits to main switchboard at 1200A, 480/277V, 3 phase, 4 wire, 65 kAIC.
- I. Secondary cold sequence utility metering will be provided at all electric service locations per WMGLD standards. A dedicated telephone line shall be provided for WMGLD metering.
- Provisions for measurement and verification of power will be provided via CT's and electronic sub-meters equal to submeter all circuits in the building. Meters shall be connected via BACnet communication to the building's BAS system for future load analysis.
- B. Normal Distribution System:
  - 1. Main double-ended switchboard will be provided with surge protection (SPD) and ground fault protection on main and feeder devices. Energy reduction maintenance switching shall be provided for all main and feeder circuit breakers that are rated or can be adjusted to 1200A or higher, as per NEC 240.87.
  - 2. Distribution system will consist of conduit and wire feeders run from switchboard to panelboards and larger mechanical equipment. Panelboards and dry type transformers will be located in electric closets throughout the building.
  - 3. Surge protection will be provided in all 120/208-volt receptacle panelboards.
  - 4. Provisions for a distribution system for future photovoltaic systems of 325kW capacity consisting of conduit and wire feeders will be provided. Space for inverters and conduits will be provided for PV systems.
  - 5. Provisions for a distribution system for future electrical vehicle service equipment (EVSE) consisting of 3-inch conduit via handholes to exterior service locations with precast concrete pads for exterior 75kVA transformers and panelboards mounted in NEMA 3R enclosures at each location, 2 inch conduits to serve future dualcharger charging stations each in a total of 5 EVSE chargers as indicated on site plan.
- C. Emergency Distribution System:
  - 1. A pad-mounted exterior transformer shall be provided by the utility and supplied by a UPS battery system and generator from the nearby future Energy Park. Upon power loss, the building's automatic transfer switches will switch from primary to continuously-energized secondary power, via the emergency transformer. The emergency transformer will supply power to the following loads upon primary loss:
    - a. Emergency/Life Safety: egress lighting and exit lighting in corridors, assembly areas, fire alarm system, and stairwells.



- b. Standby: Miscellaneous systems will include telephone system, security system, IT head-end, and IT cooling systems, elevator power, and elevator machine room cooling.
- Fire Pump C.
- d. Domestic Water Booster.
- 2. Separate automatic transfer switches will be provided for emergency and standby loads. Automatic transfer switches shall be ASCO 7000 series, Russelectric RMTD series.
- 3. Emergency feeders will utilize type MI (mineral-insulated) cables. All emergency branch distribution equipment will be located inside 2hr-rated electric rooms and closets.
- 4. Upon a prolonged power outage, the utility company will have the capability to switch the entire building's electric loads to backup power via the Energy Park. Automatic transfer switches will sense energization of primary power and switch back to the normal terminal.
- D. Lighting:
  - 1. Luminaires will be primarily light emitting diode (LED) with high efficiency drivers, with 0-10V control protocol. All luminaires will be suitable for respective utility rebate incentives.
  - 2. Selected luminaires in corridors, interior rooms, stairs, and places of assembly will be wired to emergency power to provide minimum code required light levels.
  - 3. Illuminated LED type exit signs will be wired to emergency power and located in all paths of egress and places of assembly.
  - 4. Luminaires will be primarily high efficiency LED source. Gymnasium lighting and high ceiling spaces will use dimmable LED source with local controls for glare control.
  - 5. Classroom luminaires will be pendant linear direct/indirect with high efficiency LED source.
  - 6. Selected luminaires in classrooms, corridors, interior rooms, stairs, and places of assembly will be wired to emergency panelboards. Generally, every third luminaire in the corridors will be wired to the emergency system.
  - 7. Outdoor egress lighting will be building mounted with LED source controlled by photocell and programmable lighting controls.
  - 8. Roadways and parking lots will have LED pole mounted luminaires in type II, III, IV light distributions mounted on aluminum poles. Luminaires will be high cutoff/dark sky friendly fixtures with no light spill at property lines. Pole mounted fixtures shall have integral photocells for control of fixtures.
  - 9. Luminaires will be enclosed and gasketed in Carpentry, Culinary Arts, Kitchen, and Gym Locker areas.



- 10. Provide theatrical lighting system with luminaires, blue dome system, distribution equipment and controls for Auditorium as per the theater consultant's requirements.
- 11. House lights shall be integrated with the building's main lighting control system. The theatrical lighting control system shall be fully separated and installed as per theater consultant's requirements.
- E. Lighting Controls:
  - 1. A networked low voltage lighting control system will be provided for common areas such as corridors, Cafeteria, Gymnasium, and other common areas. Local low voltage override switches will be provided to override the lighting control system. Manufacturers include Encellium, Lutron Vive, and Wattstopper.
  - 2. Local lighting controls connected to the overall lighting control system will be provided in spaces such as classrooms, conference rooms, etc.
  - 3. Local lighting controls that are not connected to the overall lighting control system will be employed in private offices, electrical and mechanical closets, storage rooms and closets, bathrooms, etc.
  - 4. Classrooms will have 2 zones of lighting control for enhanced educational atmosphere. Scenes will include general, focused, presentation and programmable additional scene.
  - 5. Daylight harvesting will be employed as per local energy code requirements.
- III. Controlled Receptacles:
  - A. The networked lighting control system shall include networked 120V relay control panels to switch plug load circuits on/off as per the owner's schedule requirements. 50% of all 120V, 20A receptacles in all private offices, conference rooms, rooms with copying/printing, break rooms, classrooms, and individual workstations will be controlled. Controlled receptacles will be permanently marked with the word CONTROLLED on them. Manufacturers include Encellium, Lutron Vive, and Wattstopper.
- III. Auditorium:
  - A. A professional theatrical lighting system will be provided as per the theater consultant's requirements. The theater lighting control system will be stand-alone and will not interface with the building's main lighting control system.
- III. LEED v4:
  - A. The Electrical systems will be designed to support the following LEED v4 pre-requisites and credits:
    - 1. Green Vehicles credit in the Location and Transportation category will be included.
    - 2. Light Pollution credit in the Sustainable Sites category will be included.
    - 3. Building Level Energy Metering credit in the Energy and Atmosphere category will be included.



- 4. Renewable Energy Production credit in the Energy and Atmosphere category will be included.
- 5. Interior Lighting credit in the Indoor Environmental Quality category will be included.
- III. Convenience Power:
  - A. Duplex receptacles will be provided throughout the building in quantities to suit space programming.
  - B. Receptacles will be provided in classrooms at teacher's desk, TV outlet, and for computers.
  - C. Duplex receptacles for cleaning will be provided in corridors at 50 feet on center and in other large spaces.
  - D. Single heavy-duty receptacles will be provided for special equipment.
  - E. Duplex receptacles equipped with USB ports shall be located in all assembly and student gathering spaces.
- IV. Fire Alarm
  - A. A non-proprietary manufacturer automatic, fully supervised, analog addressable, voice evacuation system will be provided with following:
    - 1. Manual pull stations at exit doors (with tamperproof covers).
    - 2. Audible/visual units in corridors, classrooms, and places of assembly (ADA approved).
    - 3. Visual units in conference rooms, meeting rooms, and small toilets.
    - 4. Speaker only appliances will be provided within interior stairwells and in each elevator lobby.
    - 5. Notification appliances within the gymnasium will be provided with a guard.
    - 6. Weatherproof combination speaker/strobes will be provided throughout the courtyard area.
    - 7. Smoke detector coverage will be provided in corridors, stairwells, Electric Rooms and Closets, Telephone/IT Rooms and closets.
    - 8. Smoke detectors will be provided in elevator lobbies and machine rooms for elevator recall.
    - 9. Carbon monoxide detector coverage will be provided in all locations with fossil-fuel fired appliance locations in childcare areas and automotive shop. Local annunciation shall be by sounder base at carbon monoxide detector location.



- 10. Carbon monoxide detector alarm strobes will be provided with green lens and located in central monitoring location, such as Admin areas for annunciation of alarms. Alarms shall provide a supervisory annunciation at fire alarm control panel and summon Fire Department.
- 11. Smoke duct detectors in HVAC units over 2,000 CFM, and within 5 feet of smoke dampers.
- 12. Connections to sprinkler water flow and valve supervisory switches.
- 13. Connections to smoke and fire dampers, and fire suppression systems in kitchen and culinary areas.
- 14. The system will utilize networked transponder panels as required in lieu of booster panels.
- 15. 60-hour battery back-up.
- 16. 24 VDC magnetic hold open devices at smoke doors.
- 17. The Maintenance building and the Concessions building will be provided with the following, an exterior beacon, fire alarm transponder cabinet, pull stations and 155 F rated fixed temperature heat detectors. A digital Alarm communication transmitter will be provided to transmit signals off-site.
- The locker room building will be provided with heat detectors, pull stations at exits and notification appliances. Weatherproof notification appliances will be provided in corrosive environments. A digital Alarm communication transmitter will be provided to transmit signals off-site.
- 19. Exterior beacons shall be located at front and rear entrance and at select exit doors per Wakefield Fire Department.
- 20. 25 percent spare capacity shall be provided in FACP for notification appliance circuits (NAC's).
- 21. Wiring will be run in minimum 3/4-inch EMT with red markings.
- 22. Connection to fire suppression systems.
- 23. Connections to the combustible gas systems located within Kitchen hoods.
- 24. Connections to the Ventilation Control system located in the Auto Collision and Auto Technology rooms.
- 25. Leased phone line connection to UL Central Station will be provided.



- 26. Knox boxes and exterior beacon will be provided at ground level exits.
- J. Two-Way Fire Department Communication System
  - 1. A Two-way fire department communication system master station will be provided in the main lobby.
  - 2. Call station for the A two-way fire department communication system will be provided in each elevator lobby.
- K. Antenna Systems
  - 1. A bi-directional amplifier and antenna system will be provided to serve Wakefield Fire Department and Police Department radios.
- L. Telephone/Cable TV Services:
  - 1. An underground conduit system with 4foot X 6foot manholes spaced every 200 feet will be provided for each service.
- M. Town Fiber Optic Service:
  - 1. An underground conduit system with 4foot X 6foot manholes spaced every 200 feet will be provided for service.
- N. Technology will be provided per Technology section.
  - 1. Four, 4-inch underground service conduits will be provided for Verizon service cables and CATV into MDF.
  - 2. Two, 4-inch conduits will be provided to each IDF from MDF with #6 ground wire in each conduit wired to ground bus in each IDF.
  - 3. Telephones, handsets, cables, outlets, and telecommunications equipment will be provided under separate contract.
  - 4. Empty conduits and outlet boxes will be provided for telephone and data system wiring and jacks.
  - 5. Eight NEMA 5-20R twist lock quads will be provided in each IDF on 20A circuits (dedicated) wired to generator standby power.
  - 6. Basket tray will be provided above corridor ceilings and ladder tray in all IDF and MDF spaces.
  - 7. Two 2-inch sleeves shall be provided through all walls from corridor into rooms within the school for Telecom wiring.
  - 8. A cable tray assembly shall be provided in all corridors, with perimeter ladder tray in all IDF and MDF spaces.



- O. Integrated Intrusion, Access Control, CCTV, and Alarm System:
  - 1. Addressable intrusion alarm system will include magnetic switches on perimeter doors, motion sensors in all perimeter rooms on first floor with susceptible access from grade and interior doors at high value locations. Motion sensors will be provided in first, second, third and fourth floor corridors. System will have secure-access zoning. Zoning will be provided to suit all proposed off hours usage including community programs. All required raceways, outlet boxes, and power shall be provided.
  - 2. CCTV coverage will be provided at main and secondary entries as well as other entries to be used by students, staff or for off hours community programs, including but not limited to parking lots, athletic fields, gymnasium, auditorium, and educational programs.
  - 3. CCTV coverage will be provided in cafeteria and all interior corridors.
  - 4. Exterior CCTV coverage will be provided to cover the entire perimeter of the building.
  - 5. Power for intrusion alarm system will include standby power to security system panels within the building.
  - 6. Access control via card access system with all raceways and outlet boxes will be provided at all exterior doors and MDF and IDF rooms.
  - 7. CCTV system will be IP based with minimum 30-day recording capacity. System will be web based to allow viewing by Wakefield Police Department and as manufactured by Honeywell NetAXS, Access Control; Exacqvision, Security Camera Software; Go2Blu, Emergency Alert System.
- P. Photovoltaics System
  - 1. Provisions for a roof mounted (fully ballasted) photovoltaic system, rated at 325 kW capacity.
  - 2. Photovoltaic system provisions will include enclosures and raceways for energy production metering.
- Q. Sustainable Features:
  - 1. Provisions for roof mounted (fully ballasted) photovoltaic system.
  - 2. Provisions for Electric Vehicle Service Equipment (EVSE) for charging of electric vehicles.
  - 3. Full cutoff LED site luminaires with networked wireless control with dimming capability to reduce energy consumption and light pollution on site and surrounding areas.
  - 4. Building Level Energy Metering to track building peak demand and to allow for trending of building operation to reduce energy demand charges.



- 5. Networked lighting control system for interior and exterior lighting to monitor lighting power consumption and adjust consumption levels based on time-of-day usage.
- 6. Networked controlled receptacles to meet energy code requirements and reduce power consumption overnight.
- R. Seismic Restraints:
  - 1. Electrical components and systems will be designed to resist seismic forces as determined in accordance with provision of 780 CMR 1612.7, Massachusetts State Building Code, Ninth Edition.
- S. Testing:
  - 1. Owner-selected independent testing company will provide acceptance testing of work of this Section.
- T. Demolition
  - 1. Project consists of phased construction and phased demolition. Refer to Architectural and Civil documents for phasing and enabling requirements.
- U. Work by Others:
  - 1. Following items will be provided under other Sections:
    - a. Concrete work.
    - b. Painting.
    - c. Cutting of masonry.
    - d. Scaffolding above eight feet.
    - e. Telephone equipment and cable.
    - f. Temperature control wiring.
    - g. Motors.
    - h. Flashing.
    - i. Excavation.
- V. Guarantee:
  - 1. Work of this Section will be guaranteed for period of one year.

END OF SECTION 26 00 00

**BASIS OF DESIGN** 

TECHNOLOGY & SECURITY

6B.3.1 – 02f



168 MAIN STREET SUITE 3 NORTHFIELD, MA 01360 V. 413.498.5001 F. 413-498-4386 www.3si.net



# Northeast Metropolitan Regional Vocational High School Technology Systems Narrative

# I. Overview

The technology and security scope of work for New Construction alternatives shall consist of the following systems.

- A. Tele/Data Infrastructure
- B. Wireless LAN
- C. Voice Infrastructure and Phone System
- D. PA/Intercom System
- E. Master Clock/Secondary Clock System
- F. Large Venue Live Sound Reinforcement Systems
- G. Large Venue Video Projection Systems
- H. Classroom Sound Field Systems
- I. Instructional Audiovisual Systems
- J. IPTV Video Distribution and Control System

Typical Room Design descriptions are presented in this document to provide details on Technology/Security systems and device quantities.

# A. Tele/Data Infrastructure

The Tel/Data infrastructure shall consist of Communications Equipment Rooms and two physically separate structured premises cabling systems. For security and logistical reasons, IP security and building system IP devices such as IP CCTV cameras, lighting control IP devices, and HVAC IP devices shall reside on a data network physically separate from the school Local Area Network

Communications Equipment Rooms will conform to BICSI standards.

Backbone and horizontal cabling shall be installed according to current EIA/TIA and BICSI industry standards.

# **Communications Equipment Rooms**

Communications Equipment Rooms included in the building design are designated as Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF).

The MDF shall be the Demarc location for voice, CATV, and Wide Area Network services from the street.

The MDF and IDF rooms shall be the intermediate wire closets for the termination of data and voice horizontal UTP cabling within 290 cable feet of their locations.

They shall contain the following network cabling equipment:

2-post equipment racks and cabinet equipment enclosures Ladder rack/cable tray Vertical wire managers Horizontal wire managers Patch panels Backboards (one 4' x 8" minimum) Punch down blocks (110 style)

The MDF and IDF rooms shall be environmentally controlled adequately for the quantity of active electronic equipment to reside in them.

All electrical receptacles shall be on an emergency/standby generator.

Cabling and passive equipment shall be included in the base contract.

Active equipment shall be purchased as part of the Technology FF&E equipment procurement process.



## **Cable Pathways**

Cable pathways and Work Area Outlets shall be as follows:

Interior Pathways

Ladder rack/cable tray in wire closets Multiple 2" sleeves from the corridors into rooms

J-Hooks installed from ladder rack/cable tray to within rooms for station cabling

4" sleeves between floors

Telecommunications Work Area Outlets (WAO)

Wall Outlets:

4" square or 2-gang back boxes with single-gang or dual-gang plaster rings as required

Back boxes shall have 1<sup>1</sup>/<sub>4</sub>" EMT conduit stubbed above the nearest accessible ceiling

Floor Boxes and Poke-Thru Devices:

Typical floor boxes shall be a flush combination, low voltage/electrical, Wiremold RFB series, or equal-sized as required.

Typical Poke-Thru devices shall be Wiremold Evolution series or equal shall be installed

The IDF closets shall be connected to the MDF via new 12-strand 50-micron OM4 multi-mode and 6-strand OS-2 single-mode fiber cables.

The fiber cabling between the IDF closets and the MDF shall be capable of 10GbE.

The IDF closets shall have open 2-post equipment racks with data switches sized according to the number of data drops served by the individual closets.

Category 6E cabling shall be installed in all instructional and office spaces. The Category 6E cabling will be run to the MDF or IDF locations and terminated on Category 6 Patch Panels.

Bandwidth from the IDF closets to the desktop shall be 10/100/1000 Mb/s.

Tel/Data cabling and associated wire closet termination equipment shall be included in the base contract.



Data switches and other active data equipment shall be purchased as part of the Technology FF&E equipment procurement process.

# **B. Wireless LAN**

The Tel/Data infrastructure will include Wireless LAN capabilities.

Access Point enclosures (wall and ceiling mounted) shall be installed in the Gymnasium, Multipurpose Room, Classrooms, and Vocational Shop areas as part of the base contract.

The school's existing newer 802.11ac Access points shall be re-used. Additional new Access Points shall be purchased to provide full wireless coverage in vocational shops, classrooms, and common spaces.

Required data cabling shall be included under the Tel/Data Infrastructure scope of work.

Access Points shall be procured as part of the Technology FF&E equipment procurement process.

# C. Voice Infrastructure and Voice System

For life safety purposes, phone handsets will be located at all administrative desks, in all classrooms, and in all common spaces to provide internal and external communications for all spaces.

The existing Vertical VoIP phone system shall be relocated to the new building and upgraded to the most current version. Additional VoIP handsets shall be procured for the additional phone locations.

Required data cabling shall be included under the Tel/Data Infrastructure scope of work.

VoIP equipment shall be purchased as part of the technology FF&E equipment procurement process.

# D. Public Address/Intercom System

An addressable Public Address system and cabling shall be installed. PA speakers shall be installed in all corridors, classrooms, offices, and common spaces for life safety and mass notification capabilities.

Speakers shall be lay-in speakers on the ceilings in corridors, classrooms, and offices. Recessed ceiling and wall speakers shall be installed in the common and remaining areas.

The PA system shall be zoned to allow announcements to be made to individual speakers and groups in specific areas.


The PA system shall be interfaced with the VoIP voice system to provide the capability for PA and emergency notification announcements from any phone handset.

The PA system shall be interfaced with the Fire Alarm system to interrupt PA announcements during a fire alarm.

The PA system shall be interfaced with all local sound systems so that local sound systems are interrupted during PA announcements and mass notifications.

The PA system equipment and wiring shall be included in the base contract.

#### E. Master Clock/Secondary Clock System

The clock system shall be a low-voltage wired clock system. The Master Clock/Transmitter shall be located in the MDF.

The Master Clock system shall be interfaced with the PA system to provide for scheduled bell tones to specific zones or throughout the building.

Secondary clocks in large areas (Student Commons, Gymnasium, and Learning Common) shall be 16" in diameter. Gymnasium clocks shall have protective wire grilles.

The Clock system equipment and wiring shall be included in the base contract.

#### F. Live Sound Reinforcement Systems

Live Sound Reinforcement systems shall be installed in the Multipurpose Room, Gymnasium, Student Commons, and the Learning Common.

Systems shall include:

- Equipment cabinet
- Mixers
- Processors
- Amplifiers
- Speakers
- CD / iPod player

Wired and wireless microphones



Audio level feedback sensing microphones Assistive listening transmitter and receivers Remote control touch panels Engraved wall plates Wiring All active sound system equipment shall be Dante capable.

Each Live Sound Reinforcement system shall be interfaced to the Fire Alarm and PA systems for an interruption during a fire alarm or PA announcement.

The Live Sound Reinforcement system racks, equipment, and wiring shall be included in the base bid.

#### G. Large Venue Video Projection Systems

Large Venue Video Projection Systems shall be installed in the Multipurpose Room and Student Commons.

Systems shall include: Equipment cabinet Audio/video Mixers Processors Blu-ray player Remote control touch panels Engraved wall plates Wiring

The systems shall be interfaced to its associated large venue Live Sound Reinforcement system.

#### H. Classroom Sound Field Systems

Classrooms shall include All-in-One speech/sound reinforcement systems to provide for enhancement and uniform distribution of speech and sound within the spaces to improve intelligibility for the students.

Each system shall consist of a 2x4 ceiling panel with an integrated amplifier, speakers, and wireless audio receiver/transmitter.

The All-in-One panels shall be hard-wired for 120V electrical service.

The systems shall be interfaced with the PA and FA systems to interrupt the systems for PA and FA activation.

The systems shall have wireless microphones for teachers and students.



The systems shall also include a wireless multimedia connector device located at the teacher's location to send audio from the teacher's computer to the ceiling panel. This device will also allow for the connection of a student personal hearing aid systems.

The Sound Field systems shall also be utilized as sound systems for the Interactive Flat Panel systems installed in these spaces

The Classroom Sound Field systems shall be included in the base bid.

#### I. Instructional Audiovisual Systems

All classrooms, conference rooms, and the learning commons/media center shall have Interactive Flat Panel systems provisions.

Each location shall have a "Low" (18" AFF.) A-V outlet and a "High" A-V Outlet.

The "High" A-V outlet shall be a 2-gang back box on the teaching wall.

Each "Low" A-V outlet shall have an HDMI, VGA, 3.5mm, and an RJ-45 connector cabled to the "High" A-V outlet.

The "High" A-V outlet shall have three Cat 6E data cables to provide networking capabilities for the Interactive Flat Panel, the computer interface, and the touch control.

Each A-V outlet location shall have an adjacent associated quad electrical receptacle.

The back boxes for the "Low" and "High" A-V outlets shall have 1  $\frac{1}{4}$ " conduits stubbed above the ceiling to provide pathways for the A-V cabling.

Interactive Flat Panel equipment shall include:

75-inch Interactive Flat Panels

**USB** Extender

There shall be in-wall audiovisual cabling between the teacher/presentation "Low" AV outlet and the "High" AV flat panel outlet.

The Low AV outlet shall include the following:

HDMI cable

3.5 mm Audio cable

Cat. 6E control cable

The High AV flat panel outlet shall include:

HDMI cable



3.5 mm Audio cableCat. 6E control cableTwo Cat. 6E data drops

The in-wall AV cabling shall be included in the base contract.

The Interactive Flat Panel, USB Extender, and A-V cabling shall be procured as part of the technology FF&E package.

#### J. IPTV Video Distribution and Control System

An IP/TV and Digital Signage system shall be installed for video distribution over the IP data network.

The system shall consist of CATV tuners, High Definition encoders and decoders, a live broadcasting cart with tripod and camera, a video server, and a management/scheduling system and shall allow for the following capabilities.

- TV distribution
- Video on Demand
- Digital Signage
- Origination broadcasting
- Control of all video devices

The IPTV system shall reside in a rack/enclosure located in the MDF/Head End Room. The equipment shall be interfaced with the CATV feeds and to the data IP network.

There will be large-screen TV monitors for digital signage.

The system shall include a High Definition decoder/controller at each video projector and TV monitor.

The IPTV Video Distribution and Control system shall be procured as part of the technology FF&E package.



#### **Typical Technology Designs**

#### **Typical Academic Classrooms**

Typical academic classrooms shall have the following design.

- Two data drops at the teacher location
- A Low A-V outlet at the teacher location
- A High A-V Outlet at the Interactive Projector location above the teaching wall marker board
- A-V cabling between the Low and High A-V outlets shall consist of HDMI, 3.5mm audio, and Cat. 6E
- The High A-V outlet shall also have two data drops
- There shall be two data drops above the ceiling for a Wireless Access Point
- A wireless classroom speech/sound reinforcement system on the ceiling hard-wired for 120 VAC electrical service
- A 75-inch interactive Flat Panel Display system
- A VoIP desk phone handset
- PA lay-in speaker panel on the ceiling
- A twelve-inch wireless analog secondary clock at 8'-0" AFF.

Data cabling, A-V cabling, classroom speech/sound system, and the interactive flat panel shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.

VoIP handsets, access points, and computer equipment shall be in the Technology FF&E package.

#### **Typical Science Classroom**

Typical science classrooms shall have the following design.

- Two data drops at the teacher's location
- A Low A-V outlet at the teacher's location
- A High Outlet at the Interactive Projector location above the teaching wall marker board
- A-V cabling between the Low and High A-V outlets shall consist of HDMI, 3.5mm audio, and Cat. 6E
- The High A-V outlet shall also have two data drops
- Two data drops above the ceiling for a Wireless Access Point
- Six dual data drop outlets at the above counter height at student work counters
- A wireless classroom speech/sound reinforcement system on the ceiling hard-wired for 120 VAC electrical service
- A 75-inch interactive Flat Panel system
- PA lay-in speaker panel on the ceiling
- A twelve-inch wireless analog secondary clock at 8'-0" AFF.

Data cabling, A-V cabling, classroom speech/sound system, and the interactive flat panel shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.

VoIP handset, access points, and computer equipment shall be in the Technology FF&E package.

#### **Typical Vocational Shops**

Typical Vocational Shops shall have the following design.

- Two Wireless Access points with two data drops each
- Two data drops for VoIP wall phones with handsets
- Data drops for specialized equipment such as CNC and auto shop diagnostic equipment systems
- Four PA horn speakers
- Two 16" wireless analog secondary clocks
- A Proximity / Card Reader at the exterior door
- Door contacts on the exterior door
- An Intrusion Detection keypad

Data cabling shall be included in the base contract.

PA speakers and secondary clocks shall be in the base contract.

Proximity / Card Reader, door contacts, and intrusion alarm keypad shall be in the base contract.

VoIP handsets, access points, and computer equipment shall be in the Technology FF&E package.

#### **Typical Vocational Theory/Computer Labs**

Theory Classrooms are laid out similarly to Academic Classrooms.

- Two data drops at the teacher's location
- A Low A-V outlet at the teacher's location
- A High Outlet at the Interactive Projector location above the teaching wall marker board
- A-V cabling between the Low and High A-V outlets shall consist of HDMI, 3.5mm audio, and Cat. 6E
- The High A-V outlet shall also have two data drops
- There shall be two data drops above the ceiling for a Wireless Access Point
- A wireless classroom speech/sound reinforcement system on the ceiling hard-wired for 120 VAC electrical service
- A 75-inch Interactive Flat Panel system
- A VoIP desk phone handset
- PA lay-in speaker panel on the ceiling.

• A twelve-inch wireless analog secondary clock at 8'-0" AFF.

Data cabling, A-V cabling, classroom speech/sound system, and the interactive flat panel shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.

VoIP handsets, access points, and computer equipment shall be in the Technology FF&E package.

Typical Vocational Shop Computer Labs shall have the following design.

- Two data drops at the teacher's location
- A Low A-V outlet at the teacher's location
- A High Outlet at the Interactive Flat Panel location on the teaching wall
- A-V cabling between the Low and High A-V outlets shall consist of HDMI, 3.5mm audio, and Cat. 6E
- The High A-V outlet shall also have two data drops
- Data drops for (20) student computer stations
- There shall be two data drops above the ceiling for a Wireless Access Point
- A wireless classroom speech/sound reinforcement system on the ceiling hard-wired for 120 VAC electrical service
- A 75-inch interactive flat panel system
- A VoIP desk phone handset
- PA lay-in speaker panel on the ceiling.
- A twelve-inch wireless analog secondary clock at 8'-0" AFF

Data cabling, A-V cabling, classroom speech/sound system, and the interactive flat panel shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.

VoIP handsets, access points, and computer equipment shall be in the Technology FF&E package.

#### Learning Common

The Learning Common shall have the following design.

- Four data drops at the circulation desk
- Eight data drops for lookup computer locations
- One data drop on a wall for a digital signage monitor
- There shall be four Wireless Access Point enclosures on walls with two data drops in each
- A VoIP desk phone handset at the circulation desk
- Seven to nine PA lay-in speaker panels on the ceiling.
- Two 16" inch wireless analog secondary clocks at 8'-0" AFF.
- Instructional Area



- Twenty data drops for computer locations
- A Low A-V outlet
- A High Outlet at the Interactive Projector location above a marker board
- A-V cabling between the Low and High A-V outlets shall consist of HDMI, 3.5mm audio, and Cat. 6E
- The High A-V outlet shall also have two data drops
- Data drops for (20) student computer stations
- A wireless classroom speech/sound reinforcement system on the ceiling hard-wired for 120 VAC electrical service
- An interactive flat panel system

Data cabling, A-V cabling, classroom speech/sound system, digital signage monitor, interactive flat panel, PA speakers, and secondary clocks shall be in the base contract.

VoIP handsets, access points, and computer equipment shall be in the Technology FF&E package.

# Common Areas – Multipurpose Room, Gymnasium, and /Student Commons Area

The Multipurpose Room shall have the following design.

- Four enclosures for Wireless Access Points with two data drops each
- One data drop for a VoIP wall phone
- Ceiling PA horn speakers
- Local sound speakers and Local Live Sound Reinforcement system equipment rack with sound system equipment
- Motorized projection screen
- Large Venue Video Projector system
- Recessed wall-mounted Audiovisual Control Panel
- Equipment rack for A-V control equipment
- Multiple Video Source Digital Transmitter Outlets

Data cabling and sound system cabling, sound rack, and equipment shall be included in the base contract.

The projector system and A-V rack with control equipment shall be in the base contract.

PA speakers shall be in the base contract.

VoIP handsets and access points shall be in the Technology FF&E package.

The Gymnasium shall have the following design.

 Four enclosures for Wireless Access Points with two data drops each

- One data drop for a VoIP wall phone
- Five recessed wall PA horn speakers
- Two 16" inch wireless analog secondary clocks with wire guards at 8'-0" AFF
- Local sound speakers and Local Live Sound Reinforcement system equipment rack

Data cabling and sound system cabling, sound rack, and equipment shall be included in the base contract.

PA speakers and secondary clocks shall be in the base contract.

VoIP handsets, access points, and computer equipment shall be in the Technology FF&E package.

The Student Commons Area shall have the following design.

- Four enclosures for Wireless Access Points with two data drops each
- One data drop for a VoIP wall phone
- Four data drops in two floor boxes for Point of Sales computer equipment
- Recessed wall PA horn speakers
- Two 16" inch wireless analog secondary clocks at 8'-0" AFF
- Local sound speakers and Local Live Sound Reinforcement system equipment rack with sound system equipment
- Motorized projection screen
- Large Venue Video Projector system
- Recessed wall-mounted Audiovisual Control Panel
- Equipment rack for A-V control equipment
- Three Video Source Digital Transmitter Outlets

Data cabling and sound system cabling, sound rack, and equipment shall be included in the base contract.

PA speakers and secondary clocks shall be in the base contract.

VoIP handset, access points, projector system, and A-V rack with control equipment shall be in the Technology FF&E package.

#### Typical Administrative, Guidance, Nurse, and Teacher/Instructor Offices

Typical offices shall have the following design.

- Two data drops at each desk location for VoIP desk phones and wired networked computer
- Two data drops above the ceiling for a Wireless Access Point
- A lay-in PA speaker on the ceiling
- A PA speaker volume control at the entry door



• A 12" wireless analog secondary clock at 8'-0" AFF.

Data cabling shall be in the base contract.

PA speakers, volume controls, and wiring shall be in the base contract. Clocks shall be in the base contract.

VoIP handsets, access points, and computer equipment shall be in the Technology FF&E package.

# GENERAL REQUIREMENTS BUILDING CODE ANALYSIS

68.3.1 - **03** 

# RW\$

#### Code

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### HVAC

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### Electrical

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### Plumbing

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## Fire Protection

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## Commissioning

# NE Metro Regional Vocational Technical School Wakefield, Massachusetts

# **Code Report**

## January 6, 2023

### Sullivan Code Group R.W. Sullivan Engineering

617.523.8227 www.rwsullivan.com Prepared By: Reviewed By: Samantha Sinapi Don E. Contois, P.E.

#### Table of Contents

| Int | roduc | tion1   |
|-----|-------|---|
|     | 1.    | Occupancy Classification:1                        |
|     | 2.    | Min. Construction Type:2                          |
|     | 3.    | Height and Area Limitations:2                     |
|     | 4.    | Fire Resistance Ratings:2                         |
|     | 5.    | Platform:4  |
|     | 6.    | Exterior Wall Openings & Fire Resistance Rating:4 |
|     | 7.    | Vertical Floor Openings4                          |
|     | 8.    | Finishes:4  |
|     | 9.    | Means of Egress:5                                 |
|     | 10.   | Required Fire Protection Systems:7                |
|     | 11.   | Energy Code Provisions8                           |
|     | 12.   | Accessibility for Persons with Disabilities8      |
| AP  | PENI  | DIX A: Egress Plans9                              |



#### Introduction

The Northeast Metro Regional Vocational Technical School project includes the construction of a new vocational high school in Wakefield, MA. The following is a list of applicable codes:

| Code Type              | Applicable Code<br>(Model Code Basis)   |
|------------------------|---|
| Building               | 780 CMR: Massachusetts State Building Code, 9th Edition   |
| Fire                   | (2015 International Building Code)<br>527 CMR: Massachusetts Fire Prevention Regulations<br>(2015 NFPA 1) |
| Prevention             | M.G.L. Chapter 148 Section 26G – Sprinkler Protection   |
| Accessibility          | 521 CMR: Massachusetts Architectural Access Board Regulations   |
| Electrical             | 527 CMR 12.00: Massachusetts Electrical Code  |
| Liooti ioai            | (2023 National Electrical Code)   |
| Elevators              | 524 CMR: Massachusetts Elevator Code<br>(2013 ASME A17.1)   |
| Mechanical             | 2015 International Mechanical Code (IMC)  |
| Plumbing               | 248 CMR: Massachusetts Plumbing Code  |
| Energy<br>Conservation | 2018 International Energy Conservation Code   |

#### 1. Occupancy Classification:

Non-Separated Mixed Uses:

- Use Group A-3 (Gymnasium)
- Use Group B (Offices)
- Use Group E (Educational)

The assembly spaces including the Cafeteria and Multi-purpose Room are considered part of the Use Group E occupancy. However, the Gymnasium has not been considered part of the Use Group E occupancy, since it could be used by the general public for outside events not directly associated with the school (780 CMR 303.1.3).

Also, the building will contain hazardous materials. The quantity of hazardous materials must be maintained below the exempt limits per control area in order to avoid a Use Group H classification (780 CMR 307.1 & 414). Since the building will be one control area, the total quantity of hazardous materials throughout the building cannot exceed 100% of the maximum allowable quantities (MAQ) contained in 780 CMR Table 307.1(1). In addition, each floor individually also cannot exceed the percentage of the MAQ shown in the following table (780 CMR Table 414.2.2).

| Floor                 | Percentage of the Maximum Allowable Quantity |
|-----------------------|--|
| Lower Level           | 75%  |
| 1 <sup>st</sup> Floor | 100%   |
| 2 <sup>nd</sup> Floor | 75%  |
| 3 <sup>rd</sup> Floor | 50%  |
| 4 <sup>th</sup> Floor | 50%  |

#### 2. Min. Construction Type:

Type IB Construction (noncombustible, 2-hr rated)

#### 3. Height and Area Limitations:

The following table summarizes the height and area limitations for the most restrictive use (Use Group E) based on Type IB construction:

| Code Reference          780 CMR Tables 504.3, 504.4 & 506.2:         Tabular Value         780 CMR Section 506.2         Frontage Increase | Use Group E    |                          |  |  |
|--|----------------|--------------------------|--|--|
|  | Height         | Area                     |  |  |
| 780 CMR Tables 504.3, 504.4 & 506.2:   | 6 St (180 ft)  | 111                      |  |  |
| Tabular Value  | 0 31. (100 11) | UL                       |  |  |
| 780 CMR Section 506.2  |                |                          |  |  |
| Frontage Increase  | -              | -                        |  |  |
| Allowed Height and Area  | 6 St. (180 ft) | UL                       |  |  |
| Actual Height and Area   | 5 St.          | ~127,000 ft <sup>2</sup> |  |  |

#### 4. Fire Resistance Ratings:

The following fire resistance ratings are required in accordance with 780 CMR Table 601 and various sections of the code.

| Building Element                      | Fire Resistance Rating (Hrs) |
|---------------------------------------|------------------------------|
| Primary Structural Frame <sup>A</sup> | 2 <sup>B,C</sup>             |
| Exterior Bearing Walls                | 2                            |
| Interior Bearing Walls                | 2 <sup>B,C</sup>             |
| Exterior Non-Bearing Walls            | Based on FSD                 |
| Interior Non-Bearing Walls            | 0                            |
| Floor Construction                    | 2 <sup>C</sup>               |
| Roof Construction                     | 1 <sup>D</sup>               |

Α. Includes beams, trusses, floor members, etc. having a direct connection to the columns (780 CMR 202).

В. Fire resistance ratings of structural frame and bearing walls are permitted to be reduced by one hour but not less than 1 hour rated where supporting a roof only. C.

Not less than the rating supported (780 CMR 707.5, 709.4. and 712.4).

D. Fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below.

| Building  | Element  | Fire Resistance<br>Rating (Hrs)                            | Opening<br>Protectives<br>(Hrs) |  |
|---|--|--|---------------------------------|--|
| Exit Access Corridors (7  | '80 CMR 1020.1)                                | 0  | 0                               |  |
| Stair Shafts (780 CMR 1   | 1023.2) <sup>A</sup>                           | 2  | 11⁄2                            |  |
| Other Shafts (780 CMR   | 713.4)   | 2  | 11⁄2                            |  |
| Elevator Machine Room   | (780 CMR 3005.4)                               | 2  | 11⁄2                            |  |
| Emergency Electrical Ro<br>700-10(D)(2))                                      | oom (527 CMR 12.00                             | 2 <sup>B</sup>   | 11⁄2                            |  |
| Emergency Generator Room – Level 1<br>Installation (NFPA 110 Section 7.2.1.1) |  | 2  | 11⁄2                            |  |
| Flastriant Classic  | With Sprinklers                                | 0  |                                 |  |
| Electrical Closets  | Without Sprinklers                             | 2  |                                 |  |
| Fuel Oil Storage > 660 g  | jallons  | 2 11/2   |                                 |  |
| Furnace room where an is over 400,000 Btu per                                 | y piece of equipment hour input                | Smoke re   | esistant <sup>C</sup>           |  |
| Rooms with boilers whe equipment is over 15 ps                                | re the largest piece of<br>i and 10 horsepower | Smoke resistant <sup>C</sup>                               |                                 |  |
| Paint shops   |  | 1 hour and provide automatic fire-<br>extinguishing system |                                 |  |
| Laboratories and vocation   | onal shops                                     | Smoke resistant <sup>C</sup>                               |                                 |  |
| Laundry rooms over 100  | ) square feet                                  | Smoke resistant <sup>c</sup>                               |                                 |  |
| Waste and linen collecti square feet  | on rooms over 100                              | Smoke re   | esistant <sup>C</sup>           |  |
| Fire pump room (780 Cl  | VR 913.2.1)                                    | 1 ho   | ur <sup>D</sup>                 |  |

<sup>A.</sup> If exterior walls expose the stair at an angle of less than 180 degrees either the stair wall or adjacent wall must be 1 hour rated with 3/4 hour opening protectives for a distance of 10 feet from the stair wall (780 CMR Section 1023.7).

- <sup>B.</sup> No rating is required for the room when fully sprinklered, however a 2-hr rating is still required for the emergency feeder-circuit wiring and rooms containing an emergency generator (NFPA 110 Section 7.2.1.1).
- C. Where smoke resistant construction and automatic fire-extinguishing system are permitted, accessory occupancies shall be separated from the remainder of the building by construction capable of resisting the passage of smoke and doors shall be self- or automatic-closing upon detection of smoke.
- <sup>D.</sup> Location and access to the fire pump room shall be pre-planned with the fire department. The room must be directly accessed from the exterior or through a 1 hour fire resistance rated passageway that connects to the exterior (NFPA 20 Section 5.12.1.1.3).

Fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions, or any other wall required to have protected openings or penetrations must be identified with signs or stenciling within accessible concealed spaces (i.e. floorceiling, attic spaces) at 30 ft. intervals (780 CMR 703.7).

#### 5. Platform:

The portable platform in the Multipurpose Room must comply with 780 CMR 410. A temporary platform installed for a period of not more than 30 days can be constructed of any approved material (780 CMR 410.4).

#### 6. Exterior Wall Openings & Fire Resistance Rating:

The exterior wall rating requirements and opening limitations are based on the fire separation distance for each wall. The fire separation distance is measured perpendicular to the exterior wall to the centerline of a public street, an interior lot line, or an imaginary lot line between two buildings on the same lot (780 CMR 702.0). Since the fire separation distance is more than 20 ft. for the entire perimeter of the building, the exterior walls are not required to be rated and the allowable area of openings is not limited (780 CMR Table 602 and Table 705.8).

#### 7. Vertical Floor Openings

Vertical openings are required to comply with 780 CMR 712. The building contains many floor openings that are enclosed in 2 hour fire resistance rated shafts including the exit stairs, elevators, and mechanical chases. The exit stair enclosures will contain glazing that must be fire resistance rated glazing that passes ASTM E119 unless an alternative design is approved that allows the use of sprinkler protected glazing (780 CMR Table 716.5 & 1023.4).

There will also be numerous unprotected floor openings that connect the 1<sup>st</sup> and 2<sup>nd</sup> Floor of the building, including the main Lobby, Cafeteria, and Auditorium that are allowed per 712.1.9.

An alternative design is also requested to allow for sprinkler protected glass, 2 hour rated fire barrier walls, or a combination thereof on the 3<sup>rd</sup> and 4<sup>th</sup> Floors to separate the upper levels from the floor openings that communicate to the lower floors, including the Gymnasium and Media Center. Since the floor openings will be completely separated from the upper 2 stories, the unprotected floor openings would be equivalent to an allowed two story floor opening that connects the 1<sup>st</sup> and 2<sup>nd</sup> Floors in accordance with 780 CMR 712.1.9.

#### 8. Finishes:

#### **Interior Finish**

The interior finish of walls and ceilings in exits and corridors must comply with the code for new construction as shown in the following table.

#### Walls & Ceilings (IBC Table 803.11)

| 0 (                             | /             |                 |
|---------------------------------|---------------|-----------------|
| Building Component              | Use Group A-3 | Use Group B & E |
| Exit Enclosures and Passageways | Class B       | Class B         |
| Corridors                       | Class B       | Class C         |
| Rooms & Enclosed Spaces         | Class C       | Class C         |

Note that where exit stairs and exit access corridors serve all use groups, the most restrictive interior finish is required.

#### New Floor Finishes

Since the building will be equipped with an automatic sprinkler system, traditional floor coverings such as wood, vinyl, and other resilient floor coverings as well as carpeting passing the DOC FF-1 pill test are allowed throughout the building, including all exits, exit passageways and exit access corridors (780 CMR Section 804.4.2).

#### **Exterior Finish**

Exterior wall finishes must fully comply with the requirements of 780 CMR 14. Combustible materials are permitted to be used as an exterior wall finish for this building in accordance with 780 CMR Section 1406.0; however, all exterior wall finishes and architectural trim located greater than 40 feet above grade plane must be constructed of approved noncombustible materials and must be secured to the wall with metal or other approved noncombustible brackets (780 CMR Section 1406.2.2). Additionally, combustible exterior wall finish is limited to 10% of the exterior wall surface area where the fire separation distance is 5 ft or less.

The use of foam plastic materials as part of the exterior wall assembly must comply with 780 CMR 26. The wall assembly must be tested in accordance with NFPA 285 (780 CMR 2603.5.5). Note that this test standard is a full scale assembly test. We recommend confirming with the manufacturer that the foam plastic insulation is part of an approved NFPA 285 assembly or complies with one of the alternative standards listed in 780 CMR Section 2604.1.

#### 9. Means of Egress:

The calculated occupant load for the proposed floor plans, the corresponding required number of exits, the provided number of exits, and the provided egress capacity are summarized below (780 CMR Table 1004.1.2, Table 1006.3.1, and 1005.3). See Appendix A of this report for detailed egress calculations.

| Floor           | Occupant Load | Number   | of Exits | Exit Capacity |  |
|-----------------|---------------|----------|----------|---------------|--|
| FIOOI           |               | Required | Provided | (persons)     |  |
| Lower Level     | 654           | 3        | 7        | 1,587         |  |
| 1 <sup>st</sup> | 3,015         | 4        | 19       | 7,800         |  |
| 2 <sup>nd</sup> | 2,376         | 4        | 6        | 2,390         |  |

#### Means of Egress

| 3 <sup>rd</sup> | 1,288 | 4 | 4 | 1,773 |
|-----------------|-------|---|---|-------|
| 4 <sup>th</sup> | 1,091 | 4 | 4 | 1,773 |

Where means of egress from floors above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the sum of the two floors (780 CMR 1005.6).

#### General Egress Requirements:

• The required maximum exit travel distances for a fully sprinklered building are listed below (780 CMR Table 1017.2, Table 1006.2.1, and 1020.4).

| Occupancy | Exit Travel Distance | Common Path of Travel | Dead-End |
|-----------|----------------------|-----------------------|----------|
| E         | 250 ft.              | 75 ft.                | 50 ft.   |
| A-3       | 250 ft.              | 75 ft.                | 20 ft.   |
| В         | 300 ft.              | 100 ft.               | 50 ft.   |

- Maximum dead-end corridor length cannot exceed the value above or 2.5 times the least width of space (780 CMR 1020.4).
- All rooms or spaces other than dwelling units with an occupant load greater than 49 people or a travel distance greater than the value in the table above must be provided with two egress doors swinging in the direction of egress and illuminated exit signs at each exit (780 CMR Table 1006.2.1 & Sections 1010.1.2.1 & 1013.1).
- Boiler rooms require two means of egress if the room is greater than 500 sqft. and includes individual fuel-fired equipment greater than 400,000 Btuh input capacity. Also one of the two required exit access doorways is permitted to be a fixed ladder or alternating tread device (780 CMR Section 1006.2.2.1).
- Exit access through an enclosed elevator lobby is permitted provided access to not less than one of the required exits shall be provided without travel through the enclosed elevator lobbies required by Section 3006 (780 CMR 1016.2).
- Doors serving more than 49 people in group E and A occupancies must swing in the direction of egress and be provided with panic hardware (780 CMR 1010.1.10).
- Main electrical rooms must be provided with 2 means of egress via doors that swing in the direction of egress with panic hardware when containing large equipment (rated 1200 amperes or more and over 6' wide) (NFPA 70 Section 110.26(C)(2 & 3)).
- All means of egress lighting and exit signs throughout the building must be provided with an emergency power supply to assure continued illumination



for not less than 1.5 hours in case of primary power loss (780 CMR 1008.2 & 1008.3.4).

- Remote means of egress must be separated by ½ of the diagonal dimension of the room or space they serve (780 CMR 1007.1.1). The distance between exits must be measured in a straight line between exit doors / paths.
- Roofs and penthouses containing elevator equipment that must be accessed for maintenance are required to be accessed by a stairway (780 CMR 1011.12.1). Permanent means of access to any roof containing mechanical equipment must be provided in accordance with the Mechanical Code.
- All exits must discharge to the exterior of the building except that a maximum of 50% of the number and capacity of the exit enclosures are allowed to exit through areas on the level of discharge if the exit enclosures discharge to a free and unobstructed path of travel to an exterior exit that is readily visible from the discharge of the exit enclosure; the entire area of the level of exit discharge is separated from areas below by construction consistent with the rating of the exit enclosure; and the egress path and all areas open to the egress path on the level of exit discharge must be fully sprinklered (780 CMR 1028.1).
- An approved barrier must be provided at the level of exit discharge where a stair enclosure continues below its level of exit discharge (780 CMR 1023.8).
- A two-way communication system is required at each elevator landing on accessible floors that are one or more stories above or below the level of exit discharge (780 CMR 1009.8).
- At least one passenger elevator must be sized to accommodate the loading and transportation of an ambulance gurney or stretcher sized 24" wide by 84" long with 5" radius corners (524 CMR 17.40(1)).

#### **10. Required Fire Protection Systems:**

- NFPA 13 sprinkler system (780 CMR Table 903.2 & M.G.L. c148 s26G)
- Fire alarm system with emergency voice/alarm communication capabilities (780 CMR 907.2.3)
- Emergency responder radio coverage (780 CMR 916)
- Carbon monoxide detection in accordance with 780 CMR 915 and 527 CMR 1 chapter 13.
- Fire extinguishers (780 CMR 906.1)

#### 11. Energy Code Provisions

The project is subject to the provisions of the 2018 International Energy Conservation Code or ANSI/ASHRAE/IESNA 90.1 with Massachusetts Amendments (Massachusetts Energy Code). The City of Boston has also adopted the Stretch Energy Code (780 CMR Appendix AA). The 9th Edition states that the Stretch Code applies to non-residential buildings over 100,000 sqft. (780 CMR AA103.2). Since the aggregate area of the building is over 100,000 sqft, the stretch code does apply. The Stretch Code requires the building demonstrate energy use per square foot at least 10% below the energy requirements of ANSI/ASHRAE/IESNA 90.1 APPENDIX G Performance Rating Method on either a site or source energy basis.

#### 12. Accessibility for Persons with Disabilities

#### Massachusetts Architectural Access Board Regulations

All areas open to the general public are required to comply with the requirements of the Massachusetts Architectural Access Board (521 CMR). This section includes the following major provisions:

- All public entrances must be accessible (521 CMR 25.1).
- All public and common use areas must be accessible and provided with an accessible route thereto (521 CMR Section 12.2.2 and 20.1).
- Accessible toilet rooms must be provided (521 CMR 30.1).
- Where tables, study carrels, computer workstations or fixed seating is provided at least 5% with a minimum of one of each item must be accessible (521 CMR Section 12.2.2).
- The auditorium and gymnasium must be provided with integral accessible seating in multiple locations as well as other features such as assistive listening in accordance with 521 CMR Chapter 14.
- An accessible route must be provided to the platform located in the Multipurpose Room (521 CMR 14.6).

#### American's with Disabilities Act

The ADA Guidelines are not enforced by the Commonwealth of Massachusetts, they can only be enforced through a civil lawsuit or complaint filed with the U.S. Department of Justice. All public and common use areas must be accessible.

Although the provisions of the MAAB do not apply to employee only areas, the ADAAG requires that employee only work spaces must be designed to allow employees to approach, enter, and exit the work area. However, the work areas are not required be provided with accessible features (i.e. shelves, etc.).



NE Metro Regional Vocational Technical School January 6, 2023 Page 9

#### **APPENDIX A: Egress Plans**





| Occupant Load Lower Level |                |                                       |               |  |  |  |  |
|---------------------------|----------------|---------------------------------------|---------------|--|--|--|--|
| Use                       | Floor Area     | Floor Area Per<br>Occupant (SF / OCC) | Occupant Load |  |  |  |  |
| Classroom                 | 2573 SF        | 20                                    | 128.7         |  |  |  |  |
| Lab / Vocational          | 23657 SF       | 50                                    | 473.1         |  |  |  |  |
| Office                    | 1283 SF        | 100                                   | 12.8          |  |  |  |  |
| Storage / Mechanical      | 5658 SF        | 300                                   | 18.9          |  |  |  |  |
| Weights                   | 991 SF         | 50                                    | 19.8          |  |  |  |  |
|                           | 34162 SF 653.3 |                                       |               |  |  |  |  |

| Exit Capacity Lower Level (780 CMR 1005.3) |                |  |                                |               |   |                               |                               |  |
|--|----------------|--|--------------------------------|---------------|---|-------------------------------|-------------------------------|--|
| Exit                                       | Stair<br>Width | Stair Exit<br>Allowance<br>(in / person) | Stair<br>Capacity<br>(persons) | Door<br>Width | Door Exit<br>Allowance<br>(in / person) | Door<br>Capacity<br>(persons) | Exit<br>Capacity<br>(persons) |  |
| Auto Collision Exit                        |                |  |                                | 34"           | 0.15                                    | 227                           | 227                           |  |
| Auto Tech Exit 1                           |                |  |                                | 34"           | 0.15                                    | 227                           | 227                           |  |
| Auto Tech Exit 2                           |                |  |                                | 34"           | 0.15                                    | 227                           | 227                           |  |
| Metal Fab Exit                             |                |  |                                | 34"           | 0.15                                    | 227                           | 227                           |  |
| Stair 3                                    | 60"            | 0.2                                      | 300                            | 34"           | 0.15                                    | 227                           | 227                           |  |
| Stair 6                                    |                |  |                                | 34"           | 0.15                                    | 227                           | 227                           |  |
| Stair 7                                    |                |  |                                | 34"           | 0.15                                    | 227                           | 227                           |  |

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| Drummey Rosane A<br>225 Oakland Road<br>Studio 205<br>South Windsor, CT<br>06074<br>Planning   Architect<br>Tel: 617.<br>www.dra | nderson, Inc.<br>260 Charles Street<br>Studio 300<br>Waltham, MA<br>02453<br>ture   Interior Design<br>964.1700<br>tws.com |
| METROF<br>REGIO<br>VOCAT<br>HIGH SO<br>100 HEML<br>WAKEFIELD   | POLITAN<br>ONAL<br>IONAL<br>CHOOL<br>OCK RD,<br>D, MA 01880  |
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| Volume   |  |

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| Occupant Load Densities (780 CMR TABLE 1004.1.2)                                 |  |  |  |  |
|--|--|--|--|--|
| Assembly with Fixed Seats  |  |  |  |  |
| Assembly without Fixed Seats - Concentrated (Chairs Only)                        |  |  |  |  |
| Assembly without Fixed Seats - Unconcentrated (Tables and Chairs)                |  |  |  |  |
| Classrooms   |  |  |  |  |
| Exercise and Fitness Areas; Locker Rooms<br>Educational - Shops and Laboratories |  |  |  |  |
| Office Areas   |  |  |  |  |
| Kitchen  |  |  |  |  |
| Storage / Mechanical   |  |  |  |  |
|  |  |  |  |  |



| First Floor                          |               |  |  |  |  |
|--------------------------------------|---------------|--|--|--|--|
| Floor Area Per<br>ccupant (SF / OCC) | Occupant Load |  |  |  |  |
| 100                                  | 5.2           |  |  |  |  |
| 15                                   | 528.6         |  |  |  |  |
| 20                                   | 351.6         |  |  |  |  |
| 15                                   | 48.0          |  |  |  |  |
| 15                                   | 32.2          |  |  |  |  |
| 50                                   | 30.6          |  |  |  |  |
| 200                                  | 15.7          |  |  |  |  |
| 50                                   | 873.7         |  |  |  |  |
| 50                                   | 129.7         |  |  |  |  |
| 7                                    | 585.0         |  |  |  |  |
| 100                                  | 69.5          |  |  |  |  |
| 15                                   | 76.9          |  |  |  |  |
| 50                                   | 44.3          |  |  |  |  |
| 15                                   | 93.9          |  |  |  |  |
| 15                                   | 42.4          |  |  |  |  |
| 15                                   | 42.5          |  |  |  |  |
| 300                                  | 39.1          |  |  |  |  |
| 60                                   | 5.8           |  |  |  |  |

| Exit Capacity First Floor (780 CMR 1005. |                |  |                                |               |   |   |
|--|----------------|--|--------------------------------|---------------|---|---|
| Exit                                     | Stair<br>Width | Stair Exit<br>Allowance<br>(in / person) | Stair<br>Capacity<br>(persons) | Door<br>Width | Door Exit<br>Allowance<br>(in / person) | ( |
| Cafeteria Exit                           |                |  |                                | 34"           | 0.15                                    |   |
| Cafeteria Exit                           |                |  |                                | 34"           | 0.15                                    |   |
| Cafeteria Exit                           |                |  |                                | 34"           | 0.15                                    |   |
| Cafeteria Exit                           |                |  |                                | 34"           | 0.15                                    |   |
| Carpentry Exit                           |                |  |                                | 34"           | 0.15                                    |   |
| Culinary Arts Exit                       |                |  |                                | 68"           | 0.15                                    |   |
| Electrical Exit                          |                |  |                                | 34"           | 0.15                                    |   |
| Exit 1                                   |                |  |                                | 160"          | 0.15                                    |   |
| Exit 2                                   |                |  |                                | 160"          | 0.15                                    |   |
| Exit 3                                   |                |  |                                | 68"           | 0.15                                    |   |
| Exit 5                                   |                |  |                                | 136"          | 0.15                                    |   |
| HVAC Exit                                |                |  |                                | 34"           | 0.15                                    |   |
| Plumbing Exit                            |                |  |                                | 34"           | 0.15                                    |   |
| Restaurant Exit                          |                |  |                                | 68"           | 0.15                                    |   |
| Stair 1                                  |                |  |                                | 68"           | 0.15                                    |   |
| Stair 2                                  | 56"            | 0.2                                      | 280                            | 34"           | 0.15                                    |   |
| Stair 5                                  |                |  |                                | 68"           | 0.15                                    |   |
| Stair 6                                  | 60"            | 0.2                                      | 300                            | 34"           | 0.15                                    |   |
| Stair 7                                  | 60"            | 0.2                                      | 300                            | 34"           | 0.15                                    |   |



|                  | Occupant Load Second Floor |                                       |               |  |  |  |  |
|------------------|----------------------------|---------------------------------------|---------------|--|--|--|--|
| Use              | Floor Area                 | Floor Area Per<br>Occupant (SF / OCC) | Occupant Load |  |  |  |  |
| n                | 15088 SF                   | 20                                    | 754.4         |  |  |  |  |
|                  | 914 SF                     | 20                                    | 45.7          |  |  |  |  |
| ce               | 258 SF                     | 15                                    | 17.2          |  |  |  |  |
| (Requested sted) | 8797 SF                    | 180                                   | 49.0          |  |  |  |  |
| ing              | 3141 SF                    |                                       | 684.0         |  |  |  |  |
| ım Floor         | 7020 SF                    | 50                                    | 140.4         |  |  |  |  |
| ational          | 15872 SF                   | 50                                    | 317.4         |  |  |  |  |
| nter             | 7886 SF                    | 50                                    | 157.7         |  |  |  |  |
| ose Seating      | 957 SF                     | 7                                     | 136.7         |  |  |  |  |
|                  | 3465 SF                    | 100                                   | 34.7          |  |  |  |  |
|                  | 455 SF                     | 100                                   | 4.5           |  |  |  |  |
| Mechanical       | 6471 SF                    | 300                                   | 21.6          |  |  |  |  |
| Planning         | 1236 SF                    | 100                                   | 12.4          |  |  |  |  |
|                  | 71561 SF                   | I                                     | 2375.8        |  |  |  |  |

| Exit Capacity Second Floor (780 CMR 1005.3) |                |  |                                |               |   |                               |                               |  |
|---|----------------|--|--------------------------------|---------------|---|-------------------------------|-------------------------------|--|
| Exit  | Stair<br>Width | Stair Exit<br>Allowance<br>(in / person) | Stair<br>Capacity<br>(persons) | Door<br>Width | Door Exit<br>Allowance<br>(in / person) | Door<br>Capacity<br>(persons) | Exit<br>Capacity<br>(persons) |  |
| Stair 1                                     | 120"           | 0.2                                      | 600                            | 73"           | 0.15                                    | 487                           | 487                           |  |
| Stair 2                                     | 58"            | 0.2                                      | 290                            | 68"           | 0.15                                    | 453                           | 290                           |  |
| Stair 3                                     | 120"           | 0.2                                      | 600                            | 80"           | 0.15                                    | 533                           | 533                           |  |
| Stair 4                                     | 96"            | 0.2                                      | 480                            | 72"           | 0.15                                    | 480                           | 480                           |  |
| Stair 5                                     | 60"            | 0.2                                      | 300                            | 68"           | 0.15                                    | 453                           | 300                           |  |
| Stair 6                                     | 60"            | 0.2                                      | 300                            | 68"           | 0.15                                    | 453                           | 300                           |  |



| Occupant Load Third Floor |            |                                       |               |  |  |  |
|---------------------------|------------|---------------------------------------|---------------|--|--|--|
| Use                       | Floor Area | Floor Area Per<br>Occupant (SF / OCC) | Occupant Load |  |  |  |
| Classroom                 | 15540 SF   | 20                                    | 777.0         |  |  |  |
| Collab                    | 916 SF     | 20                                    | 45.8          |  |  |  |
| _ab / Vocational          | 20554 SF   | 50                                    | 411.1         |  |  |  |
| Office                    | 1738 SF    | 100                                   | 17.4          |  |  |  |
| Prep                      | 1431 SF    | 100                                   | 14.3          |  |  |  |
| Storage / Mechanical      | 2927 SF    | 300                                   | 9.8           |  |  |  |
| Teacher Planning          | 1259 SF    | 100                                   | 12.6          |  |  |  |
|                           | 44365 SF   |                                       | 1287.9        |  |  |  |

| AB<br>AB<br>AB<br>AB<br>AB<br>AB<br>AB<br>AB<br>AB<br>AB  | Lab /<br>Vocational<br>4729 SF<br>50 SF / OCC<br>95 OCC<br>95 OCC<br>95 OCC<br>95 OCC<br>95 OCC<br>95 OCC<br>95 OCC | PT<br>Office<br>252 SF<br>100 SF / OCC<br>3 OCC<br>0 Office  | MEDICAL<br>MEDICAL<br>MEDICAL<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO22<br>BIO |
|---|---|--|--|
|   |   |  |  |
|   |   | Office<br>665 SF<br>9 OCC  | Classroom<br>343 SF<br>20 SF / OCC<br>42 OCC   |
| SCILAB<br>SCILAB<br>A320<br>Lab /<br>Vocational<br>1516 SF<br>50 SF / OCC<br>30 OCC   | Collab<br>916,SF<br>20 SF / OCC<br>46 OCC   |  | 20 SF / OCC<br>46 OCC<br>SPEC<br>SPEC<br>Classroom<br>850 SF<br>20 SF / OCC<br>20 SF / OCC   |
|   |   |  |  |
| Classroom<br>857 SF<br>20 SF / OCC<br>43 OCC<br>43 OCC<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLA | Classroom<br>851 SF<br>20 SF / OCC<br>43 OCC<br>13 OC   | her<br>ing<br>SF<br>OCC<br>CC<br>TRACHERS<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLANNING<br>PLA 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# Occupant Load Third Floor

|         | Exit Capacity Third Floor (780 CMR 1005.3) |  |                                |               |   |                               |                               |  |
|---------|--|--|--------------------------------|---------------|---|-------------------------------|-------------------------------|--|
| Exit    | Stair<br>Width                             | Stair Exit<br>Allowance<br>(in / person) | Stair<br>Capacity<br>(persons) | Door<br>Width | Door Exit<br>Allowance<br>(in / person) | Door<br>Capacity<br>(persons) | Exit<br>Capacity<br>(persons) |  |
| Stair 1 | 120"                                       | 0.2                                      | 600                            | 73"           | 0.15                                    | 487                           | 487                           |  |
| Stair 2 | 60"  | 0.2                                      | 300                            | 68"           | 0.15                                    | 453                           | 300                           |  |
| Stair 3 | 120"                                       | 0.2                                      | 600                            | 80"           | 0.15                                    | 533                           | 533                           |  |
| Stair 4 | 96"  | 0.2                                      | 480                            | 68"           | 0.15                                    | 453                           | 453                           |  |





Use Classroom Collab Conference Lab / Vocational Office Prep Storage / Mechanical Teacher Planning

| tab /<br>Vocational<br>4034 SF<br>50 SF / OCC<br>81 OCC<br>1 |   |
|---|---|
| Bit office       Lab /         Vocational       231 SF         50 SF / OCC       Storage /         Machanical       100 SF / OCC         100 SF / OCC       Storage /         0 OCC       OCC   | AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>AUTOMATION<br>CC B402B<br>F / OCC<br>CC B402A   |
| CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRICA<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>CORRIOR<br>COR  | Classroom<br>843 SF<br>20 SF / OCC<br>42 OCC<br>42 OCC<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM<br>CLASSROOM   |
|   | Classroom<br>852 SF<br>20 SF / OCC<br>43 OCC<br>21<br>SF / OCC<br>853 SF<br>20 SF / OCC<br>21<br>SF / OCC |

| Occupant Load Fourth Floor |                                       |               |  |  |  |  |  |
|----------------------------|---------------------------------------|---------------|--|--|--|--|--|
| Floor Area                 | Floor Area Per<br>Occupant (SF / OCC) | Occupant Load |  |  |  |  |  |
| 14127 SF                   | 20                                    | 706.3         |  |  |  |  |  |
| 917 SF                     | 20                                    | 45.8          |  |  |  |  |  |
| 216 SF                     | 15                                    | 14.4          |  |  |  |  |  |
| 12993 SF                   | 50                                    | 259.9         |  |  |  |  |  |
| 3771 SF                    | 100                                   | 37.7          |  |  |  |  |  |
| 449 SF                     | 100                                   | 4.5           |  |  |  |  |  |
| 2889 SF                    | 300                                   | 9.6           |  |  |  |  |  |
| 1253 SF                    | 100                                   | 12.5          |  |  |  |  |  |
| <br>36615 SF               |                                       | 1090.8        |  |  |  |  |  |

| Exit Capacity Fourth Floor (780 CMR 1005.3) |                |  |                                |               |   |                               |                               |  |
|---|----------------|--|--------------------------------|---------------|---|-------------------------------|-------------------------------|--|
| Exit  | Stair<br>Width | Stair Exit<br>Allowance<br>(in / person) | Stair<br>Capacity<br>(persons) | Door<br>Width | Door Exit<br>Allowance<br>(in / person) | Door<br>Capacity<br>(persons) | Exit<br>Capacity<br>(persons) |  |
| Stair 1                                     | 120"           | 0.2                                      | 600                            | 73"           | 0.15                                    | 487                           | 487                           |  |
| Stair 2                                     | 60"            | 0.2                                      | 300                            | 68"           | 0.15                                    | 453                           | 300                           |  |
| Stair 3                                     | 120"           | 0.2                                      | 600                            | 80"           | 0.15                                    | 533                           | 533                           |  |
| Stair 4                                     | 96"            | 0.2                                      | 480                            | 68"           | 0.15                                    | 453                           | 453                           |  |
|   | •              |  |                                | <u>.</u>      | ·                                       |                               | 1773                          |  |



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|--|---|--|
|  | C) COPYRIGHT 2022 DRUMMEY ROSANE ANDERSON, INC. |  |
| Occupant Load Densities (780 CMR TABLE 1004.1.2)           Fixed Senis         Assembly with Fixed Senis           Fixed Senis         Assembly with Fixed Senis           Thus F.F. / Occ.         Assembly with Fixed Senis           V 1 Net S.F. / Occ.         Assembly with Fixed Senis           V 0 Yours S.F. / Occ.         Assembly with Fixed Senis           V 0 Yours S.F. / Occ.         Seconome           V 0 Yours S.F. / Occ.         Educational - Shops and Laboratories           1 100 Yours S.F. / Occ.         Educational - Shops and Laboratories           1 100 Yours S.F. / Occ.         Educational - Shops and Laboratories           2 00 Gross S.F. / Occ.         Kitchani           2 00 Gross S.F. / Occ.         Kitchanical |   | <section-header>  PROGRESS SET   1/6/2023     Image: Construction of the state of t</section-header> |

# GENERAL REQUIREMENTS PROPRIETARY ITEMS

6B.3.1 - 04

## 6B.3.1-04 PROPIETARY ITEMS

The School District currently owns a Vape Detection and Gunshot Detection System that they are considering bringing over to the new school and expanding the system to meet the new school's needs.

Should they decide to expand these proprietary systems, a School Committee Vote will be taken.

# GENERAL REQUIREMENTS INTERIOR COLOR THEORY STATEMENT

## 6B.3.1-05 INTERIOR COLOR THEORY STATEMENT

The key design goal for the new Northeast Metropolitan Regional Vocational High School building is to accommodate 21<sup>st</sup> Century educational concepts, and to create spaces that will celebrate both Vocational and Academic Programs. The new school plan reflects the intent of integration of the Vocational and Academic Programs. The Schools' vision of a forward-looking imagery, informed the building exterior and interior design. There is consensus between the color committee group after reviewing the interior design approach on materials, patterns and colors presented that this is appropriate for the new building. The building is sited within a unique area that is well known for its natural beauty. The site is located adjacent to the Break heart Reservation one of the largest parks in the greater metropolitan area. The proposed building design is inspired by elements of nature. The building forms, materials, and colors are chosen to achieve this goal. Careful considerations to the environmental impact of the proposed materials are a natural part of the design process for all DRA projects.

The interior finish palette throughout the school integrates stone, metal, and glass materials used on the exterior. The neutral and warm (wood like) colors selected for the exterior materials, are taken into consideration while making the choices for the interior materials. The team spirited school colors are also included in the color palette of the public and sports areas throughout the building.

Porcelain tile and linoleum flooring will introduce a variety of colors, textures and patterns in the corridors and common spaces. The use of color patterning throughout will help provide wayfinding for the students, faculty, and guests. They will also reinforce the design concept of natural elements found in the area. The use of porcelain and painted finishes on interior walls support the design color theme concept of creating a horizontal and vertical banding throughout. All these interior colors and patterns are inspired by the natural scenes found on the site and Breakheart Reservation. The Design Team was inspired by rock formations, vegetation and the body of the forest meeting the skyline in the distance.

The building has three important points of arrival. Main, Customer, and Events Entrances all provided unique design experiences.

The Main lobby is where students and faculty arrive and gather. Another space that is located adjacent to the Main lobby is the Student Common/Cafeteria. This multiuse space provides flexibility for students and faculty to interact with each other. The space can be transformed from a dining area into an impromptu gathering space or can be used by the students to work on projects in small and/or large groups, along with access to the outside patio. This area may feature built-in benches, café style seating, and traditional student dining tables. The

Design Team and the Client agreed that porcelain and warm wood looking paneling in conjunction with glass shall provide appropriate durability, and ease of maintenance for this busy area. The acoustical treatment of the ceiling surface shall reduce the noise expected in this lively space.

The customer lobby is where the public will enter the Culinary Arts restaurant, Cosmetology salon, Branch Bank, and school store. Inviting and welcoming environment is the goal of the interior design for all these the spaces. Decorative wood looking metal ceiling visually connects the exterior to the interior. Wall and floor treatments consist of porcelain paver tile and metal paneling. Industry standard professional style furniture is envisioned for the spaces.

The Events lobby is a two-story space designed to accommodate large gatherings for the Auditorium and sporting events. The design for the space incorporates natural light and tree like design elements. A number of built-in displays and seating features will bring a sense of human scale into this monumental space. The history of the twelve diverse communities that are part of the school district will be celebrated throughout this area.

The Learning Common/Library is located on the second floor and connected by a monumental stair to the Main Lobby. The design for this space incorporates resilient carpet, wood inspired paneling and coffered ceiling. Special attention has been given to the lighting, acoustics, and technology of this space. Timeless flexible furniture and fabrics will be selected for this area to create adaptable learning environment.

The interior design goals for the academic and shop areas are to create a sustainable, durable, and an easily maintainable environment. The corridors and flex spaces throughout the building are designed for high traffic conditions, with the use of linoleum and soft resilient flooring. These spaces will have areas for small group project-based learning.

Classrooms and Upper Floor Shop spaces throughout the building will have linoleum or sheet vinyl flooring, which will provide a long-lasting sustainable floor.

The school colors that are projecting "school pride" concept, shall be featured throughout the Gymnasium space, and the Team spirited areas.

Preliminary color selections for the Building Interiors are illustrated on the attached color material board.



Carpets

Wood Finish





**Porcelain Paver** 

|--|--|

**Ceramic Mosaic Tile - Floor** 





LINOLIUM



ROUND RUBBER TILE

LOCKER

6B.3.1 - 06

# GENERAL REQUIREMENTS STRUCTURAL LOAD CALCULATIONS
|                             | Project J  |                  |          | Job Ref.       |          |            |
|-----------------------------|--|------------------|----------|----------------|----------|------------|
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Project Name:

### Northeast Metropolitan Regional Vocational High School

MSBA Module 6 Requirements:

## MSBA 60% Construction Documents – Structural Loading Calculations

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|                                  | Project         |                    |                 |                | Job Ref.       |            |
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|                                  | MS              | BA 60% Construct   | tion Document S | Submission     |                | 2          |
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|                                  | AA              | 07/20/2022         | MD              | 07/27/2022     | MD             | 12/19/2022 |
| Table of Contents                |                 |                    |                 |                |                |            |
| Project Synopsis                 |                 |                    |                 |                |                | 3          |
| Design Codes                     |                 |                    |                 |                |                | 4          |
| Geotechnical Recommendations for | or Foundation A | Analysis and Desi  | gn              |                |                | 4          |
| Project Materials and Strengths  |                 |                    |                 |                |                | 4          |
| Dead and Live Loading Criteria   |                 |                    |                 |                |                |            |
| Snow Loading Criteria            |                 |                    |                 |                |                |            |
| Wind Loading Criteria            |                 |                    |                 |                |                | 7          |
| Seismic Loading Calculations     |                 |                    |                 |                |                | 16         |



|                             | Project J  |            |          | Job Ref.       |          |            |
|-----------------------------|--|------------|----------|----------------|----------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          | 2019           | 9-091    |            |
|                             | Section S  |            |          | Sheet no./rev. |          |            |
| E i D i O                   | MSBA 60% Construction Document Submission              |            |          | ssion 3        |          |            |
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#### **Project Synopsis**

The project is located in Wakefield, Massachusetts. The main building to be constructed consists of a four-story vocational high school near the existing Northeast Metropolitan Regional Vocational High School. The main building is comprised of four wings, named Areas A - D on the project documents. Areas A consists of the cafeteria/kitchen and acedemic rooms, Area B is the main acedemic wing, Area C holds the auditorium, and Area D the gymnasium. Additional buildings to be constructed consist of a two-story locker building, a single story concessions building, and a single story pre-engineered maintainance garage building.

The majority of the structure will be steel-framed, supported by reinforced concrete foundations. The ground floor shall be constructed as a normal-weight concrete slab on grade. Each wing has a mezzanine level above the ground floor level that shall be constructed using precast concrete plank, supported by load-bearing concrete-masonry walls and reinforced concrete foundations. All suspsended floor systems above the mezzanine levels will be constructed as a light-weight concrete slab on steel deck, supported by structural steel beams and girders. The roof system in Areas A and B will consist of steel deck, supported by steel beams and girders; the main roof system in Areas C and D will consist of steel deck, supported by open-web steel joists.

The main structure's lateral force resisting system shall mainly consist of ordinary concentric steel braced frames, comprised of hollow-structural steel members. Reinforced concrete-masonry shear walls will be used throughout the building as well. The structure will have an expansion joint, separating Areas A and B from Areas C and D. The combined lateral force resisting system will be designed to resist the loads imparted on the structure from local wind and seismic forces per applicable design codes.

The two-story locker building structure will consist of structural steel beams, supported by load-bearing concrete-masonry walls and reinforced concrete foundations. The ground floor shall be constructed as a normal-weight concrete slab on grade. The second floor system will be constructed as a light-weight concrete slab on deck, supported by steel beams and girders. The roof system will consist of steel deck, supported by steel beams and girders.

The single-story concessions building will consist of pre-fabricated wood trusses, supported by load-bearing reinforced masonry walls and reinforced concrete foundations. The ground floor shall be constructed as a normal-weight concrete slab on grade. The roof system will consist of plywood sheathing, spanning over wood trusses and masonry walls on all sides.

The maintainance garage building will consist of a pre-engineered steel frame superstructure, supported on reinforced concrete foundations. The ground floor shall be constructed as a normal-weight concrete slab on grade. The roof system will consist of steel deck, supported by continuous steel 'Z'-shaped purlins, spanning between steel frames.

|                             | Project J  |            |          |   | Job Ref. |            |
|-----------------------------|--|------------|----------|---|----------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          | 2019  | 9-091    |            |
|                             | Section S  |            |          | Sheet no./rev.                              |          |            |
| E i D i C                   | MSBA 60% Construction Document Submission              |            |          | MSBA 60% Construction Document Submission 4 |          |            |
| Engineers Design Group Inc. | Calc. by   | Date       | Chk'd by | Date  | App'd by | Date       |
|                             | AA   | 07/20/2022 | MD       | 07/27/2022                                  | MD       | 12/19/2022 |

#### **Design Codes**

- 1. Massachusetts State Building Code, 9th Edition
- 2. International Building Code, 2015 Edition
- 3. ASCE 7-10: Minimum Design Loads for Buildings and Other Structures
- 4. ACI 318-14: Building Code Requirements for Structural Concrete
- 5. ACI 530-13: Building Code Requirements for Masonry Structures
- 6. AISC 360-10: Specification for Structural Steel Buildings
- 7. Other codes as required by the design codes listed above

#### Geotechnical Recommendations for Foundation Analysis and Design

The foundation design for this project shall be done with the recommendations from the soils investigations performed by Lahlaf Geotechnical Consulting, Inc from June, 2021. Their report recommended a maximum net allowable bearing pressure of 4,000 pounds per square-foot to be used for the design of the structure's foundations.

#### **Project Materials and Strengths**

Concrete:

|  | <ul><li>a. Foundations</li><li>b. Slab-on-Grade</li><li>c. Composite Slab-on-Steel Deck</li><li>d. Exterior Concrete</li></ul> | 4500 psi<br>4000 psi<br>4000 psi<br>5000 psi |
|--|--|--|
| Reinforcing Steel:                                   | ASTM A615, Grade 60<br>ASTM A185 for Welded Wire Reinforcing   |  |
| Structural Steel:                                    | ASTM A992, Grade 50  |  |
| Steel Channels:<br>Steel Plates, Bars, Angles, etc.: | ASTM A36<br>ASTM A36   |  |
| Hollow Structural Steel Sections:                    | ASTM A500, Grade B   |  |
| Structural Pipes:                                    | ASTM A53, Grade B or ASTM A501   |  |
| High-Strength Bolts:                                 | ASTM A325-N  |  |
| Steel Deck:  | ASTM A653 (Galvanized Deck)  |  |
| Concrete-Masonry Units:                              | ASTM C90, Grade N, Type I, 2000 psi  |  |
| Grout:   | ASTM C476, 2500 psi  |  |
| Mortar:  | ASTM C270, Type S, 1800 psi  |  |

|   | Project    |                    |                 |                | Job Ref.                       |                                       |  |
|---|------------|--------------------|-----------------|----------------|--------------------------------|---------------------------------------|--|
|   | Northea    | st Metropolitan Re | gional Vocation | al High School | 2019-091                       |                                       |  |
|   | Section    |                    |                 |                | Sheet no./rev.                 |                                       |  |
|   | MS         | BA 60% Construct   | tion Document S | Submission     |                                | 5                                     |  |
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|   | I          | I                  |                 | I              |                                | I                                     |  |
| Dead and Live Loading Cr                                    | iteria     |                    |                 |                |                                |                                       |  |
|   |            |                    |                 |                |                                |                                       |  |
| Design Dead Loads:  |            |                    |                 |                |                                |                                       |  |
|   | . D 1      |                    |                 |                |                                |                                       |  |
| 1 ypical Floor Loading on Compos                            | site Deck: |                    |                 |                |                                | 42  psf                               |  |
| 2" x 20-Gauge Composite Steel D                             | eck        |                    |                 |                |                                | $\frac{42}{3}$ psf                    |  |
| Mechanical/ Electrical/ Plumbing                            |            |                    |                 |                |                                | 10 psf                                |  |
| Miscellaneous   |            |                    |                 |                |                                | <u>5 psf</u>                          |  |
|   |            |                    |                 |                |                                | ∑60 psf                               |  |
|   | 1          |                    |                 |                |                                |                                       |  |
| I ypical Roof Loading on Steel De                           | CK:        |                    |                 |                |                                | 2 maf                                 |  |
| S X 20-Gauge Type NS of NSA S<br>Roofing and Insulation     | Deck       |                    |                 |                |                                | $\frac{5 \text{ psi}}{7 \text{ psf}}$ |  |
| Mechanical/ Electrical/ Plumbing                            |            |                    |                 |                |                                | 10  psf                               |  |
| Photovoltaic Panels   |            |                    |                 |                |                                | 15 psf                                |  |
| Miscellaneous   |            |                    |                 |                |                                | 5 psf                                 |  |
|   |            |                    |                 |                |                                | ∑35 psf                               |  |
|   | 0.0.1      |                    |                 |                |                                |                                       |  |
| Roof Loading on Mechanical Roo                              | f Pads:    |                    |                 |                |                                | 67 maf                                |  |
| 4 Normal-weight Concrete<br>3" x 20-Gauge Composite Steel D | eck        |                    |                 |                |                                | o/psi<br>3.psf                        |  |
| Mechanical/ Electrical/ Plumbing                            | CCK        |                    |                 |                |                                | 10 psf                                |  |
| Treenameas Electricas Tranionig                             |            |                    |                 |                |                                | $\sum 80 \text{ psf}$                 |  |
|   |            |                    |                 |                |                                |                                       |  |
|   |            |                    |                 |                |                                |                                       |  |
| Design Live Loads:  |            |                    |                 |                |                                |                                       |  |
| Classrooms with Partitions                                  |            |                    |                 | 40             | nsf + 15 nsf                   | (Reducible)                           |  |
| Reading Rooms   |            |                    |                 | 10             | 60 psf (                       | Reducible)                            |  |
| Corridors (First Floor)                                     |            |                    |                 |                | 100 psf (                      | Reducible)                            |  |
| Corridors (Above First Floor)                               |            |                    |                 |                | 80 psf (                       | Reducible)                            |  |
| Lobbies   |            |                    |                 |                | 100 psf (Non-                  | Reducible)                            |  |
| Assembly/Public Gathering Areas                             |            |                    |                 |                | 100 psf (Non-                  | Reducible)                            |  |
| Stairs  |            |                    |                 |                | 100  psf (Non-                 | Reducible)                            |  |
| Storage (Light)   |            |                    |                 |                | 123 psi (Non-<br>150 psf (Nor- | Reducible)                            |  |
| Roof (Live)   |            |                    |                 |                | 20 psf (Non-                   | Reducible)                            |  |
|   |            |                    |                 |                | 20 psi (1000-                  |                                       |  |
|   |            |                    |                 |                |                                |                                       |  |
|   |            |                    |                 |                |                                |                                       |  |
|   |            |                    |                 |                |                                |                                       |  |
|   |            |                    |                 |                |                                |                                       |  |
|   |            |                    |                 |                |                                |                                       |  |

|                             | Project J  |            |          |   | Job Ref. |            |
|-----------------------------|--|------------|----------|---|----------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          | 2019  | 9-091    |            |
|                             | Section  |            |          | Sheet no./rev.                              |          |            |
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### **Snow Loading Criteria**

|   | [In accordance with ASCE7-10]  |
|---|--|
| Building details                                |  |
| Roof type;                                      | Flat   |
| Width of roof;                                  | b = <b>640.00</b> ft   |
| Ground snow load                                |  |
| Ground snow load;                               | $P_{g} = 50.00 \text{ lb/ft}^{2}$  |
| Density of snow (Figure 7-1);                   | $\gamma = min(0.13 \times P_g / 1ft + 14lb/ft^3, 30lb/ft^3) = 20.50 lb/ft^3$                         |
| Terrain typeSect. 26.7;                         | В  |
| Exposure condition (Table 7-2);                 | Partially exposed  |
| Exposure factor (Table 7-2);                    | $C_{e} = 1.00$   |
| Thermal condition (Table 7-3);                  | All  |
| Thermal factor (Table 7-3);                     | $C_{t} = 1.00$   |
| Importance category (Table 1.5-1);              | III  |
| Importance factor (Table 1.5-2);                | $I_{s} = 1.10$   |
| Min snow load for low slope roofs (Sect 7.3.4); | $P_{f_{min}} = I_s \times 20 \ lb/ft^2 = 22.00 \ lb/ft^2$  |
| Flat roof snow load (Sect 7.3);                 | $P_{f} = 0.7 \times C_{e} \times C_{t} \times I_{s} \times P_{g} = \textbf{38.50} \text{ lb/ft}^{2}$ |

|                             | Project .  |            |          | Job Ref.       |          |            |
|-----------------------------|--|------------|----------|----------------|----------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          | 2019           | 9-091    |            |
|                             | Section  |            |          | Sheet no./rev. |          |            |
|                             | MSBA 60% Construction Document Submission              |            |          | 7              |          |            |
| Engineers Design Group Inc. | Calc. by   | Date       | Chk'd by | Date           | App'd by | Date       |
|                             | AA   | 07/20/2022 | MD       | 07/27/2022     | MD       | 12/19/2022 |

#### Wind Loading Criteria

Areas A and B

#### [In accordance with ASCE7-10]

#### \*Using the directional design method

| Building data       |                     |
|---------------------|---------------------|
| Type of roof;       | Flat                |
| Length of building; | $b = 470.00 \ ft$   |
| Width of building;  | d = 200.00  ft      |
| Height to eaves;    | H = <b>62.00</b> ft |
| Mean height;        | h = <b>62.00</b> ft |

#### General wind load requirements

| Basic wind speed;                               | V = <b>137.0</b> mph       |
|---|----------------------------|
| Risk category;                                  | III                        |
| Velocity pressure exponent coef (Table 26.6-1); | $K_d = 0.85$               |
| Exposure category (cl 26.7.3);                  | С                          |
| Enclosure classification (cl.26.10);            | Enclosed buildings         |
| Internal pressure coef +ve (Table 26.11-1);     | $GC_{pi_p} = 0.18$         |
| Internal pressure coef -ve (Table 26.11-1);     | $GC_{pi_n} = -0.18$        |
| Gust effect factor;                             | $G_{f} = 0.85$             |
| Minimum design wind loading (cl.27.4.7);        | $p_{min\_r} = 8 \ lb/ft^2$ |

#### Topography

| Topography factor not significant; | $K_{zt} = 1.0$   |
|------------------------------------|--|
| Velocity pressure equation;        | $q = 0.00256 \times K_z \times K_{zt} \times K_d \times V^2 \times 1 psf/mph^2;$ |

#### Velocity pressures table

| z (ft) | K <sub>z</sub> (Table 27.3-1) | qz (psf) |
|--------|-------------------------------|----------|
| 15.00  | 0.85                          | 34.72    |
| 30.00  | 0.98                          | 40.02    |
| 45.00  | 1.07                          | 43.50    |
| 62.00  | 1.14                          | 46.48    |

#### Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.);  $q_i = 46.48 \text{ psf}$ 

#### **Pressures and forces**

Net pressure;

 $p = q \times G_f \times C_{pe} - q_i \times GC_{pi};$ 

|                             | Project  |                  |                 |            | Job Ref.       |            |
|-----------------------------|--|------------------|-----------------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |                  |                 |            | 2019-091       |            |
|                             | Section  |                  |                 |            | Sheet no./rev. |            |
| E i D i G                   | MSBA   | A 60% Constructi | on Document Sub | omission   |                | 8          |
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|                             | AA   | 07/20/2022       | MD              | 07/27/2022 | MD             | 12/19/2022 |

Net force;

 $F_w = p \times A_{ref};$ 

### Roof load case 1 - Wind 0, $GC_{pi}$ 0.18, -c\_{pe}

| Zone    | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|---------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A (-ve) | 62.00                  | -0.90                                       | 46.48   | -43.92                     | 14570.00                                       | -639.93                               |
| B (-ve) | 62.00                  | -0.90                                       | 46.48   | -43.92                     | 14570.00                                       | -639.93                               |
| C (-ve) | 62.00                  | -0.50                                       | 46.48   | -28.12                     | 29140.00                                       | -819.38                               |
| D (-ve) | 62.00                  | -0.30                                       | 46.48   | -20.22                     | 35720.00                                       | -722.18                               |

Total vertical net force;

 $F_{w,v} = -2821.42 \text{ kips}$  $F_{w,h} = 0.00 \text{ kips}$ 

#### Total horizontal net force;

## Walls load case 1 - Wind 0, GC<sub>pi</sub> 0.18, -c<sub>pe</sub>

| Zone           | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A <sub>1</sub> | 15.00                  | 0.80  | 34.72   | 15.24                      | 7050.00  | 107.44                                |
| A <sub>2</sub> | 30.00                  | 0.80  | 40.02   | 18.85                      | 7050.00  | 132.90                                |
| A <sub>3</sub> | 45.00                  | 0.80  | 43.50   | 21.21                      | 7050.00  | 149.54                                |
| A <sub>4</sub> | 62.00                  | 0.80  | 46.48   | 23.24                      | 7990.00  | 185.68                                |
| В              | 62.00                  | -0.50                                       | 46.48   | -28.12                     | 29140.00                                       | -819.38                               |
| С              | 62.00                  | -0.70                                       | 46.48   | -36.02                     | 12400.00                                       | -446.65                               |
| D              | 62.00                  | -0.70                                       | 46.48   | -36.02                     | 12400.00                                       | -446.65                               |

#### **Overall loading**

| $A_{vert_w_0} = b \times H = 29140.00 \text{ ft}^2$   |
|---|
| $A_{vert_{-}0} = 0.00 ft^2$   |
| $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} = \textbf{466.24 kips}$ |
| $F_1 = F_{w,wB} = -819.4 \text{ kips}$  |
| $F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = $ <b>575.6</b> kips                                  |
| $F_{w,total} = max(F_w - F_l + F_{w,h}, F_{w,total\_min}) = 1394.9 \text{ kips}$                                |
|   |

#### Roof load case 2 - Wind 0, GC<sub>pi</sub> -0.18, -0c<sub>pe</sub>

| Zone    | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|---------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A (+ve) | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 14570.00                                       | 18.28                                 |

|                             | Project   |                  |                 |            | Job Ref.       |            |
|-----------------------------|-----------|------------------|-----------------|------------|----------------|------------|
|                             | Northeast | Metropolitan Reg | 2019-091        |            |                |            |
|                             | Section   |                  |                 |            | Sheet no./rev. |            |
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| Engineers Design Group Inc. | Calc. by  | Date             | Chk'd by        | Date       | App'd by       | Date       |
|                             | AA        | 07/20/2022       | MD              | 07/27/2022 | MD             | 12/19/2022 |

|    | Zone                      | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----|---------------------------|------------------------|---|---|----------------------------|--|---------------------------------------|
|    | B (+ve)                   | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 14570.00                                       | 18.28                                 |
|    | C (+ve)                   | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 29140.00                                       | 36.57                                 |
|    | D (+ve)                   | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 35720.00                                       | 44.82                                 |
| То | Total vertical net force; |                        |   | $F_{w,v} = 117.96$                                | kips                       |  |                                       |

Total horizontal net force;

 $F_{w,v} = 117.96 \text{ km}$  $F_{w,h} = 0.00 \text{ kips}$ 

### Walls load case 2 - Wind 0, $GC_{pi}$ -0.18, -0 $c_{pe}$

| Zone           | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A <sub>1</sub> | 15.00                  | 0.80  | 34.72   | 31.97                      | 7050.00  | 225.40                                |
| A <sub>2</sub> | 30.00                  | 0.80  | 40.02   | 35.58                      | 7050.00  | 250.86                                |
| A <sub>3</sub> | 45.00                  | 0.80  | 43.50   | 37.94                      | 7050.00  | 267.50                                |
| A <sub>4</sub> | 62.00                  | 0.80  | 46.48   | 39.97                      | 7990.00  | 319.37                                |
| В              | 62.00                  | -0.50                                       | 46.48   | -11.39                     | 29140.00                                       | -331.82                               |
| С              | 62.00                  | -0.70                                       | 46.48   | -19.29                     | 12400.00                                       | -239.17                               |
| D              | 62.00                  | -0.70                                       | 46.48   | -19.29                     | 12400.00                                       | -239.17                               |

#### **Overall loading**

| Projected vertical plan area of wall; | $A_{vert_w_0} = b \times H = 29140.00 \text{ ft}^2$   |
|---------------------------------------|---|
| Projected vertical area of roof;      | $A_{vert_{-0}} = 0.00 ft^2$   |
| Minimum overall horizontal loading;   | $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} = \textbf{466.24 kips}$ |
| Leeward net force;                    | $F_1 = F_{w,wB} = -331.8 \text{ kips}$  |
| Windward net force;                   | $F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = 1063.1 \text{ kips}$                                 |
| Overall horizontal loading;           | $F_{w,total} = max(F_w - F_l + F_{w,h}, F_{w,total\_min}) = 1394.9 \text{ kips}$                                |

|                           | Zone    | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|---------------------------|---------|------------------------|---|---|----------------------------|--|---------------------------------------|
|                           | A (-ve) | 62.00                  | -0.90                                       | 46.48   | -43.92                     | 6200.00  | -272.31                               |
|                           | B (-ve) | 62.00                  | -0.90                                       | 46.48   | -43.92                     | 6200.00  | -272.31                               |
|                           | C (-ve) | 62.00                  | -0.50                                       | 46.48   | -28.12                     | 12400.00                                       | -348.67                               |
|                           | D (-ve) | 62.00                  | -0.30                                       | 46.48   | -20.22                     | 69200.00                                       | -1399.06                              |
| Total vertical net force; |         |                        |   | $F_{w,v} = -2292.3$                               | 6 kips                     |  |                                       |

### Roof load case 3 - Wind 90, $GC_{pi}$ 0.18, - $c_{pe}$

|                             | Project     |                  |                 |            | Job Ref.       |            |
|-----------------------------|-------------|------------------|-----------------|------------|----------------|------------|
|                             | Northeast 1 | Metropolitan Reg | 2019-091        |            |                |            |
|                             | Section     |                  |                 |            | Sheet no./rev. |            |
| E i D i G                   | MSBA        | A 60% Constructi | on Document Sub | omission   |                | 10         |
| Engineers Design Group Inc. | Calc. by    | Date             | Chk'd by        | Date       | App'd by       | Date       |
|                             | AA          | 07/20/2022       | MD              | 07/27/2022 | MD             | 12/19/2022 |

| Total | horizontal | net | force; |
|-------|------------|-----|--------|
|       |            |     |        |

 $F_{w,h} = 0.00 \text{ kips}$ 

### Walls load case 3 - Wind 90, $GC_{pi}$ 0.18, $\mbox{-}c_{pe}$

| Zone           | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A <sub>1</sub> | 15.00                  | 0.80  | 34.72   | 15.24                      | 3000.00  | 45.72                                 |
| A <sub>2</sub> | 30.00                  | 0.80  | 40.02   | 18.85                      | 3000.00  | 56.55                                 |
| A <sub>3</sub> | 45.00                  | 0.80  | 43.50   | 21.21                      | 3000.00  | 63.63                                 |
| A <sub>4</sub> | 62.00                  | 0.80  | 46.48   | 23.24                      | 3400.00  | 79.01                                 |
| В              | 62.00                  | -0.28                                       | 46.48   | -19.53                     | 12400.00                                       | -242.13                               |
| С              | 62.00                  | -0.70                                       | 46.48   | -36.02                     | 29140.00                                       | -1049.62                              |
| D              | 62.00                  | -0.70                                       | 46.48   | -36.02                     | 29140.00                                       | -1049.62                              |

#### **Overall loading**

| Projected vertical plan area of wall; | $A_{vert_w_{90}} = d \times H = 12400.00 \text{ ft}^2$   |
|---------------------------------------|--|
| Projected vertical area of roof;      | $A_{vert_r_{90}} = 0.00 \text{ ft}^2$  |
| Minimum overall horizontal loading;   | $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} = 198.40 \text{ kips}$ |
| Leeward net force;                    | $F_1 = F_{w,wB} = -242.1 \text{ kips}$   |
| Windward net force;                   | $F_{w} = F_{w,wA_{-}1} + F_{w,wA_{-}2} + F_{w,wA_{-}3} + F_{w,wA_{-}4} = 244.9 \text{ kips}$                     |
| Overall horizontal loading;           | $F_{w,total} = max(F_w - F_l + F_{w,h}, F_{w,total\_min}) = 487.0 \text{ kips}$                                  |

### Roof load case 4 - Wind 90, $GC_{pi}$ -0.18, $+c_{pe}$

|                             | Zone             | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|-----------------------------|------------------|------------------------|---|---|----------------------------|--|---------------------------------------|
|                             | A (+ve)          | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 6200.00  | 7.78                                  |
|                             | B (+ve)          | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 6200.00  | 7.78                                  |
|                             | C (+ve)          | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 12400.00                                       | 15.56                                 |
|                             | D (+ve)          | 62.00                  | -0.18                                       | 46.48   | 1.25                       | 69200.00                                       | 86.84                                 |
| To                          | tal vertical net | force;                 |   | $F_{w,v} = 117.96$ k                              | tips                       |  |                                       |
| Total horizontal net force; |                  |                        | $F_{w,h} = 0.00 \text{ kip}$                | S   |                            |  |                                       |

#### Walls load case 4 - Wind 90, $GC_{pi}$ -0.18, $+c_{pe}$

| Zone  | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|-------|------------------------|---|---|----------------------------|--|---------------------------------------|
| $A_1$ | 15.00                  | 0.80  | 34.72   | 31.97                      | 3000.00  | 95.92                                 |

|                            | Project  |            |          |            | Job Ref.       |            |
|----------------------------|--|------------|----------|------------|----------------|------------|
|                            | Northeast Metropolitan Regional Vocational High School |            |          |            | 2019-091       |            |
|                            | Section  |            |          |            | Sheet no./rev. |            |
| 5 ·                        | MSBA 60% Construction Document Submission              |            |          |            | 11             |            |
| Engineers Design GroupInc. | Calc. by   | Date       | Chk'd by | Date       | App'd by       | Date       |
|                            | AA   | 07/20/2022 | MD       | 07/27/2022 | MD             | 12/19/2022 |

| Zone           | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A <sub>2</sub> | 30.00                  | 0.80  | 40.02   | 35.58                      | 3000.00  | 106.75                                |
| A <sub>3</sub> | 45.00                  | 0.80  | 43.50   | 37.94                      | 3000.00  | 113.83                                |
| $A_4$          | 62.00                  | 0.80  | 46.48   | 39.97                      | 3400.00  | 135.90                                |
| В              | 62.00                  | -0.28                                       | 46.48   | -2.79                      | 12400.00                                       | -34.65                                |
| С              | 62.00                  | -0.70                                       | 46.48   | -19.29                     | 29140.00                                       | -562.06                               |
| D              | 62.00                  | -0.70                                       | 46.48   | -19.29                     | 29140.00                                       | -562.06                               |

#### **Overall loading**

| Projected vertical plan area of wall; | $A_{vert\_w\_90} = d \times H = 12400.00 \text{ ft}^2$   |
|---------------------------------------|--|
| Projected vertical area of roof;      | $A_{vert_{-}90} = 0.00 ft^2$   |
| Minimum overall horizontal loading;   | $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} = 198.40 \text{ kips}$ |
| Leeward net force;                    | $F_1 = F_{w,wB} = -34.7 \text{ kips}$  |
| Windward net force;                   | $F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = 452.4 \text{ kips}$                                   |
| Overall horizontal loading;           | $F_{w,total} = max(F_w - F_l + F_{w,h}, F_{w,total\_min}) = 487.0 \text{ kips}$                                  |
|                                       |  |

Areas C and D

[In accordance with ASCE 7-10]

### \*Using the directional design method

#### **Building data**

| Type of roof;       | Flat                            |
|---------------------|---------------------------------|
| Length of building; | $b = 285.00 \ {\rm ft}$         |
| Width of building;  | $d=\textbf{200.00}~\mathrm{ft}$ |
| Height to eaves;    | H = <b>82.00</b> ft             |
| Mean height;        | h = 82.00  ft                   |
|                     |                                 |

#### General wind load requirements

| Basic wind speed;                               | V = <b>137.0</b> mph |
|---|----------------------|
| Risk category;                                  | III                  |
| Velocity pressure exponent coef (Table 26.6-1); | $K_d = 0.85$         |
| Exposure category (cl 26.7.3);                  | С                    |
| Enclosure classification (cl.26.10);            | Enclosed buildings   |
| Internal pressure coef +ve (Table 26.11-1);     | $GC_{pi_p} = 0.18$   |
| Internal pressure coef -ve (Table 26.11-1);     | $GC_{pi_n} = -0.18$  |
| Gust effect factor;                             | $G_{f} = 0.85$       |
|   |                      |

|                             | Project  |                  |                 |            | Job Ref.       |            |
|-----------------------------|--|------------------|-----------------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |                  |                 |            | 2019-091       |            |
|                             | Section  |                  |                 |            | Sheet no./rev. |            |
| E i D i O                   | MSBA   | A 60% Constructi | on Document Sub | omission   |                | 12         |
| Engineers Design Group Inc. | Calc. by   | Date             | Chk'd by        | Date       | App'd by       | Date       |
|                             | AA   | 07/20/2022       | MD              | 07/27/2022 | MD             | 12/19/2022 |

Minimum design wind loading (cl.27.4.7);  $p_{min r}$ 

 $p_{min_r} = \mathbf{8} lb/ft^2$ 

#### Topography

Topography factor not significant;

Velocity pressure equation;

$$\begin{split} K_{zt} &= 1.0 \\ q &= 0.00256 \times K_z \times K_{zt} \times K_d \times V^2 \times 1 \text{psf/mph}^2; \end{split}$$

#### Velocity pressures table

| z (ft) | K <sub>z</sub> (Table 27.3-1) | q <sub>z</sub> (psf) |
|--------|-------------------------------|----------------------|
| 15.00  | 0.85                          | 34.72                |
| 40.00  | 1.04                          | 42.47                |
| 60.00  | 1.13                          | 46.15                |
| 82.00  | 1.22                          | 49.66                |

#### Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.);  $q_i = 49.66 \text{ psf}$ 

#### **Pressures and forces**

Net pressure;

Net force;

# $$\begin{split} p &= q \times G_{f} \times C_{pe} \text{ - } q_{i} \times GC_{pi}\text{;} \\ F_{w} &= p \times A_{ref}\text{;} \end{split}$$

#### Roof load case 1 - Wind 0, $GC_{pi}$ 0.18, - $c_{pe}$

| Zone              | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|-------------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A (-ve)           | 82.00                  | -0.90                                       | 49.66   | -46.93                     | 11685.00                                       | -548.40                               |
| B (-ve)           | 82.00                  | -0.90                                       | 49.66   | -46.93                     | 11685.00                                       | -548.40                               |
| C (-ve)           | 82.00                  | -0.50                                       | 49.66   | -30.05                     | 23370.00                                       | -702.18                               |
| D (-ve)           | 82.00                  | -0.30                                       | 49.66   | -21.60                     | 10260.00                                       | -221.65                               |
| otal vertical net | force;                 |   | $F_{w,v} = -2020.62$                              | 2 kips                     | •  |                                       |

Total vertical net force; Total horizontal net force;

 $F_{w,h} = 0.00 \text{ kips}$ 

#### Walls load case 1 - Wind 0, GC<sub>pi</sub> 0.18, -c<sub>pe</sub>

| Zone           | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| $A_1$          | 15.00                  | 0.80  | 34.72   | 14.67                      | 4275.00  | 62.70                                 |
| A <sub>2</sub> | 40.00                  | 0.80  | 42.47   | 19.94                      | 7125.00  | 142.10                                |
| A <sub>3</sub> | 60.00                  | 0.80  | 46.15   | 22.44                      | 5700.00  | 127.93                                |
| A <sub>4</sub> | 82.00                  | 0.80  | 49.66   | 24.83                      | 6270.00  | 155.69                                |
| В              | 82.00                  | -0.50                                       | 49.66   | -30.05                     | 23370.00                                       | -702.18                               |

|                             | 1  |                  |                 |            | 1              |            |
|-----------------------------|--|------------------|-----------------|------------|----------------|------------|
|                             | Project  |                  |                 |            | Job Ref.       |            |
|                             | Northeast Metropolitan Regional Vocational High School |                  |                 |            | 2019-091       |            |
|                             | Section  |                  |                 |            | Sheet no./rev. |            |
| F : D : C                   | MSBA   | A 60% Constructi | on Document Sub | omission   |                | 13         |
| Engineers Design Group Inc. | Calc. by   | Date             | Chk'd by        | Date       | App'd by       | Date       |
|                             | AA   | 07/20/2022       | MD              | 07/27/2022 | MD             | 12/19/2022 |

| Zone | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|------|------------------------|---|---|----------------------------|--|---------------------------------------|
| С    | 82.00                  | -0.70                                       | 49.66   | -38.49                     | 16400.00                                       | -631.22                               |
| D    | 82.00                  | -0.70                                       | 49.66   | -38.49                     | 16400.00                                       | -631.22                               |

### **Overall loading**

| Projected vertical plan area of wall; | $A_{vert_w_0} = b \times H = 23370.00 \text{ ft}^2$  |
|---------------------------------------|--|
| Projected vertical area of roof;      | $A_{\text{vert } \underline{r}_{0}} = 0.00 \text{ ft}^{2}$   |
| Minimum overall horizontal loading;   | $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} = 373.92 \text{ kips}$ |
| Leeward net force;                    | $F_1 = F_{w,wB} = -702.2 \text{ kips}$   |
| Windward net force;                   | $F_{w} = F_{w,wA_{-}1} + F_{w,wA_{-}2} + F_{w,wA_{-}3} + F_{w,wA_{-}4} = 488.4 \text{ kips}$                   |
| Overall horizontal loading;           | $F_{w,total} = max(F_w - F_l + F_{w,h}, F_{w,total\_min}) = 1190.6 \text{ kips}$                               |
|                                       |  |

Roof load case 2 - Wind 0,  $GC_{pi}$  -0.18, -0 $c_{pe}$ 

|                           | Zone    | Ref.<br>height<br>(ft)             | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|---------------------------|---------|------------------------------------|---|---|----------------------------|--|---------------------------------------|
|                           | A (+ve) | 82.00                              | -0.18                                       | 49.66   | 1.34                       | 11685.00                                       | 15.67                                 |
|                           | B (+ve) | 82.00                              | -0.18                                       | 49.66   | 1.34                       | 11685.00                                       | 15.67                                 |
|                           | C (+ve) | 82.00                              | -0.18                                       | 49.66   | 1.34                       | 23370.00                                       | 31.34                                 |
|                           | D (+ve) | 82.00                              | -0.18                                       | 49.66   | 1.34                       | 10260.00                                       | 13.76                                 |
| Total vertical net force; |         | F <sub>w,v</sub> = <b>76.43</b> ki | ps  |   |                            |  |                                       |

Total horizontal net force;

 $F_{w,h} = 0.00 \text{ kips}$ 

### Walls load case 2 - Wind 0, $GC_{pi}$ -0.18, -0 $c_{pe}$

| Zone           | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A <sub>1</sub> | 15.00                  | 0.80  | 34.72   | 32.55                      | 4275.00  | 139.13                                |
| A <sub>2</sub> | 40.00                  | 0.80  | 42.47   | 37.82                      | 7125.00  | 269.48                                |
| A <sub>3</sub> | 60.00                  | 0.80  | 46.15   | 40.32                      | 5700.00  | 229.83                                |
| A4             | 82.00                  | 0.80  | 49.66   | 42.71                      | 6270.00  | 267.79                                |
| В              | 82.00                  | -0.50                                       | 49.66   | -12.17                     | 23370.00                                       | -284.35                               |
| С              | 82.00                  | -0.70                                       | 49.66   | -20.61                     | 16400.00                                       | -338.01                               |
| D              | 82.00                  | -0.70                                       | 49.66   | -20.61                     | 16400.00                                       | -338.01                               |

|                             | Project     |                  |                 |            | Job Ref. |            |
|-----------------------------|-------------|------------------|-----------------|------------|----------|------------|
|                             | Northeast 1 | Metropolitan Reg | 2019-091        |            |          |            |
|                             | Section     |                  | Sheet no./rev.  |            |          |            |
| E i D i C                   | MSBA        | A 60% Constructi | on Document Sub | omission   |          | 14         |
| Engineers Design Group Inc. | Calc. by    | Date             | Chk'd by        | Date       | App'd by | Date       |
|                             | AA          | 07/20/2022       | MD              | 07/27/2022 | MD       | 12/19/2022 |

#### **Overall loading**

| Projected vertical plan area of wall; | $A_{vert_w_0} = b \times H = 23370.00 \text{ ft}^2$  |
|---------------------------------------|--|
| Projected vertical area of roof;      | $A_{vert_{r_0}} = 0.00 ft^2$   |
| Minimum overall horizontal loading;   | $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} = 373.92 \text{ kips}$ |
| Leeward net force;                    | $F_1 = F_{w,wB} = -284.4 \text{ kips}$   |
| Windward net force;                   | $F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = 906.2 \text{ kips}$                                 |
| Overall horizontal loading;           | $F_{w,total} = max(F_w - F_l + F_{w,h}, F_{w,total\_min}) = 1190.6 \text{ kips}$                               |
|                                       |  |

#### Roof load case 3 - Wind 90, GC<sub>pi</sub> 0.18, -c<sub>pe</sub>

| Zone    | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|---------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A (-ve) | 82.00                  | -0.90                                       | 49.66   | -46.93                     | 8200.00  | -384.84                               |
| B (-ve) | 82.00                  | -0.90                                       | 49.66   | -46.93                     | 8200.00  | -384.84                               |
| C (-ve) | 82.00                  | -0.50                                       | 49.66   | -30.05                     | 16400.00                                       | -492.76                               |
| D (-ve) | 82.00                  | -0.30                                       | 49.66   | -21.60                     | 24200.00                                       | -522.80                               |

Total vertical net force;

Total horizontal net force;

 $F_{w,v} = -1785.24 \text{ kips}$  $F_{w,h} = 0.00 \text{ kips}$ 

| W | alls load case 3 | 3 - Wind 90,           | GC <sub>pi</sub> 0.18, -c <sub>pe</sub>     |   |                            |  |                                       |
|---|------------------|------------------------|---|---|----------------------------|--|---------------------------------------|
|   | Zone             | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|   | $A_1$            | 15.00                  | 0.80  | 34.72   | 14.67                      | 3000.00  | 44.00                                 |
|   | $A_2$            | 40.00                  | 0.80  | 42.47   | 19.94                      | 5000.00  | 99.72                                 |
|   | A <sub>3</sub>   | 60.00                  | 0.80  | 46.15   | 22.44                      | 4000.00  | 89.77                                 |
|   | $A_4$            | 82.00                  | 0.80  | 49.66   | 24.83                      | 4400.00  | 109.26                                |
|   | В                | 82.00                  | -0.41                                       | 49.66   | -26.46                     | 16400.00                                       | -433.91                               |
|   | С                | 82.00                  | -0.70                                       | 49.66   | -38.49                     | 23370.00                                       | -899.49                               |
|   | D                | 82.00                  | -0.70                                       | 49.66   | -38.49                     | 23370.00                                       | -899.49                               |

#### **Overall loading**

Projected vertical plan area of wall; Projected vertical area of roof; Minimum overall horizontal loading; Leeward net force; 
$$\begin{split} A_{vert\_w\_90} &= d \times H = \textbf{16400.00} \ ft^2 \\ A_{vert\_r\_90} &= \textbf{0.00} \ ft^2 \\ F_{w,total\_min} &= p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} = \textbf{262.40} \ kips \\ F_1 &= F_{w,wB} = \textbf{-433.9} \ kips \end{split}$$

|                             | Project     |                    |                 |            | Job Ref. |            |
|-----------------------------|-------------|--------------------|-----------------|------------|----------|------------|
|                             | Northeast 1 | 2019-091           |                 |            |          |            |
|                             | Section     | Sheet no./rev.     |                 |            |          |            |
| F : D : C                   | MSBA        | A 60% Construction | on Document Sub | omission   |          | 15         |
| Engineers Design Group Inc. | Calc. by    | Date               | Chk'd by        | Date       | App'd by | Date       |
|                             | AA          | 07/20/2022         | MD              | 07/27/2022 | MD       | 12/19/2022 |

| Windward net force;         | $F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = 342.8 \text{ kips}$      |
|-----------------------------|---|
| Overall horizontal loading: | $F_{w total} = \max(F_{w} - F_{l} + F_{w h}, F_{w total min}) = 776.7 \text{ kips}$ |

#### Roof load case 4 - Wind 90, GC<sub>pi</sub> -0.18, +c<sub>pe</sub>

| Zone    | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|---------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A (+ve) | 82.00                  | -0.18                                       | 49.66   | 1.34                       | 8200.00  | 11.00                                 |
| B (+ve) | 82.00                  | -0.18                                       | 49.66   | 1.34                       | 8200.00  | 11.00                                 |
| C (+ve) | 82.00                  | -0.18                                       | 49.66   | 1.34                       | 16400.00                                       | 21.99                                 |
| D (+ve) | 82.00                  | -0.18                                       | 49.66   | 1.34                       | 24200.00                                       | 32.45                                 |

Total vertical net force;

Total horizontal net force;

```
F_{w,v} = 76.43 kips
```

```
F_{w,h} = 0.00 \text{ kips}
```

#### Walls load case 4 - Wind 90, $GC_{pi}$ -0.18, $+c_{pe}$

| Zone           | Ref.<br>height<br>(ft) | Ext pressure<br>coefficient c <sub>pe</sub> | Peak velocity<br>pressure q <sub>p</sub><br>(psf) | Net pressure<br>p<br>(psf) | Area<br>A <sub>ref</sub><br>(ft <sup>2</sup> ) | Net force<br>F <sub>w</sub><br>(kips) |
|----------------|------------------------|---|---|----------------------------|--|---------------------------------------|
| A <sub>1</sub> | 15.00                  | 0.80  | 34.72   | 32.55                      | 3000.00  | 97.64                                 |
| A <sub>2</sub> | 40.00                  | 0.80  | 42.47   | 37.82                      | 5000.00  | 189.11                                |
| A <sub>3</sub> | 60.00                  | 0.80  | 46.15   | 40.32                      | 4000.00  | 161.29                                |
| A <sub>4</sub> | 82.00                  | 0.80  | 49.66   | 42.71                      | 4400.00  | 187.93                                |
| В              | 82.00                  | -0.41                                       | 49.66   | -8.58                      | 16400.00                                       | -140.70                               |
| С              | 82.00                  | -0.70                                       | 49.66   | -20.61                     | 23370.00                                       | -481.66                               |
| D              | 82.00                  | -0.70                                       | 49.66   | -20.61                     | 23370.00                                       | -481.66                               |

#### **Overall loading**

Projected vertical plan area of wall; Projected vertical area of roof; Minimum overall horizontal loading; Leeward net force; Windward net force; Overall horizontal loading; 
$$\begin{split} A_{vert\_w\_90} &= d \times H = \textbf{16400.00} \ \text{ft}^2 \\ A_{vert\_r\_90} &= \textbf{0.00} \ \text{ft}^2 \\ F_{w,total\_min} &= p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} = \textbf{262.40} \ \text{kips} \\ F_1 &= F_{w,wB} = \textbf{-140.7} \ \text{kips} \\ F_w &= F_{w,wA\_1} + F_{w,wA\_2} + F_{w,wA\_3} + F_{w,wA\_4} = \textbf{636.0} \ \text{kips} \\ F_{w,total} &= max(F_w - F_1 + F_{w,h}, F_{w,total\_min}) = \textbf{776.7} \ \text{kips} \end{split}$$

|  | roject  |   |                                |                 | Job Ref.      |            |  |  |  |
|--|---|---|--------------------------------|-----------------|---------------|------------|--|--|--|
|  | Northeast Metropolitan Regional Vocational High School 2019-091 |   |                                |                 | 9-091         |            |  |  |  |
| s s  | ection  |   | Sheet no./rev.                 |                 |               |            |  |  |  |
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|  | AA  | 07/20/2022  | MD                             | 07/27/2022      | MD            | 12/19/2022 |  |  |  |
| Seismic Loading Calculations               |   |   |                                |                 |               |            |  |  |  |
| Areas A and B                              |   |   |                                |                 |               |            |  |  |  |
|  |   |   |                                | IIn acc         | ordonoo with  | ASCE 7 101 |  |  |  |
| Site never store                           |   |   |                                |                 | or dance with | ASCE 7-10  |  |  |  |
| Site class:                                |   | Л   |                                |                 |               |            |  |  |  |
| Mannad acceleration parameters (See        | tion $11(11)$   | D   |                                |                 |               |            |  |  |  |
| at short period:                           | uon 11.4.1)   | S – 0 25  |                                |                 |               |            |  |  |  |
| at 1 sec period:                           |   | $S_{\rm S} = 0.23$  |                                |                 |               |            |  |  |  |
| Site coefficientat short period (Table     | 11 / 1),  | $S_1 = 0.08$<br>E = 1.600   |                                |                 |               |            |  |  |  |
| at 1 and married (Table 11.4.2):           | 11.4-1);  | $\Gamma_a = 1.000$<br>E = 2.400   |                                |                 |               |            |  |  |  |
| at 1 sec period (Table 11.4-2),            |   | $\Gamma_{\rm v} = 2.400$  |                                |                 |               |            |  |  |  |
| Spectral response acceleration para        | meters  |   | 0.400                          |                 |               |            |  |  |  |
| at short period (Eq. 11.4-1);              |   | $S_{MS} = F_a \times S_S = 0.400$   |                                |                 |               |            |  |  |  |
| at 1 sec period (Eq. 11.4-2);              |   | $\mathbf{S}_{\mathrm{M1}} = \mathbf{F}_{\mathrm{v}} \times \mathbf{S}_{\mathrm{1}} =$ | = 0.192                        |                 |               |            |  |  |  |
| Design spectral acceleration param         | eters (Sect   | 11.4.4)   |                                |                 |               |            |  |  |  |
| at short period (Eq. 11.4-3);              |   | $S_{DS} = 2/3 \times S_{DS}$  | $S_{MS} = 0.267$               |                 |               |            |  |  |  |
| at 1 sec period (Eq. 11.4-4);              |   | $S_{D1} = 2 / 3 \times S$   | $_{M1} = 0.128$                |                 |               |            |  |  |  |
| Seismic design category                    |   |   |                                |                 |               |            |  |  |  |
| Risk category (Table 1.5-1);               |   | III   |                                |                 |               |            |  |  |  |
| Seismic design category based on she       | ort period res  | sponse acceleratio  | on (Table 11 6-1               | )               |               |            |  |  |  |
| Seisine design edlegory bused on she       | it period fee   | B   |                                | )               |               |            |  |  |  |
| Seismic design category based on 1 se      | ec period res   | sponse acceleration   | on (Table 11.6-2               | 2)              |               |            |  |  |  |
|  | 1   | В   | × ·                            | ,               |               |            |  |  |  |
| Seismic design category;                   |   | В   |                                |                 |               |            |  |  |  |
| Annrovimate fundamental period             |   |   |                                |                 |               |            |  |  |  |
| Height above base to highest level of      | building.   | h = 62 ft   |                                |                 |               |            |  |  |  |
|  | ounding,  |   |                                |                 |               |            |  |  |  |
| From Table 12.8-2:                         |   |   |                                |                 |               |            |  |  |  |
| Structure type;                            |   | All other syste   | ems                            |                 |               |            |  |  |  |
| Building period parameter C <sub>t</sub> ; |   | $C_t = 0.02$  |                                |                 |               |            |  |  |  |
| Building period parameter x;               |   | x = 0.75  |                                |                 |               |            |  |  |  |
| Approvimate fundamental period (Ea         | 12 8-7).  | $T = C \times (h)^x$  | $\times 1 \sec / (1 ff)^{x} =$ | 0 442 sec       |               |            |  |  |  |
| Building fundamental period (Sect 12       | 8 2).   | T = T = 0 447   | sec                            |                 |               |            |  |  |  |
| Long-period transition period;             | ··,   | $T_L = 12 \text{ sec}$  |                                |                 |               |            |  |  |  |
| Seismic response coefficient               |   |   |                                |                 |               |            |  |  |  |
| Seismic force-resisting system (Table      | : 12.2-1):  | B BUILDING  | G FRAME SYS                    | STEMS           |               |            |  |  |  |
|  | ,,  | 3. Ordinary ste   | eel concentricall              | y braced frames |               |            |  |  |  |

|                                       | Project Job Ref.                                       |   |                                     |                       |                |              |  |
|---------------------------------------|--|---|-------------------------------------|-----------------------|----------------|--------------|--|
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|                                       | Section  |   |                                     |                       | Sheet no./rev. |              |  |
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|                                       | AA   | 07/20/2022  | MD                                  | 07/27/2022            | MD             | 12/19/2022   |  |
| Response modification factor (Tabl    | e 12.2-1);   | R = <b>3.25</b>   |                                     |                       |                |              |  |
| Seismic importance factor (Table 1    | .5-2);   | $I_e = 1.250$   |                                     |                       |                |              |  |
| Seismic response coefficient (Sect    | 12.8.1.1)  |   |                                     |                       |                |              |  |
| Calculated (Eq 12.8-2);               |  | $C_{s_{calc}} = S_{DS} / ($   | $(R / I_e) = 0.1026$                |                       |                |              |  |
| Maximum (Eq 12.8-3);                  |  | $C_{s_{max}} = S_{D1} / ($  | $(T / 1 \text{ sec}) \times (R$     | $(I_e)) = 0.1114$     |                |              |  |
| Minimum (Eq 12.8-5);                  |  | $C_{s_{min}} = max(0)$  | $0.044 \times S_{DS} \times I_{e},$ | 0.01) = <b>0.0147</b> |                |              |  |
| Seismic response coefficient;         |  | $C_s = 0.1026$  |                                     |                       |                |              |  |
| Seismic base shear (Sect 12.8.1)      |  |   |                                     |                       |                |              |  |
| Effective seismic weight of the stru  | cture;   | W = <b>19660.0</b> k  | cips                                |                       |                |              |  |
| Seismic response coefficient;         |  | $C_s = 0.1026$  |                                     |                       |                |              |  |
| Seismic base shear (Eq 12.8-1);       |  | $V = C_s \times W = 2$  | <b>2016.4</b> kips                  |                       |                |              |  |
|                                       |  |   |                                     |                       |                |              |  |
| Areas C and D                         |  |   |                                     |                       |                |              |  |
| Areas C ana D                         |  |   |                                     |                       |                |              |  |
|                                       |  |   |                                     | [In acc               | cordance with  | n ASCE 7-10] |  |
| Site parameters                       |  |   |                                     |                       |                |              |  |
| Site class;                           |  | D   |                                     |                       |                |              |  |
| Mapped acceleration parameters (S     | ection 11.4.1)   |   |                                     |                       |                |              |  |
| at short period;                      |  | $S_{S} = 0.25$  |                                     |                       |                |              |  |
| at 1 sec period;                      |  | $S_1 = 0.08$  |                                     |                       |                |              |  |
| Site coefficientat short period (Tabl | e 11.4-1);   | $F_a = 1.600$   |                                     |                       |                |              |  |
| at 1 sec period (Table 11.4-2);       |  | $F_v = 2.400$   |                                     |                       |                |              |  |
| Spectral response acceleration pa     | rameters   |   |                                     |                       |                |              |  |
| at short period (Eq. 11.4-1);         |  | $\mathbf{S}_{\mathrm{MS}} = \mathbf{F}_{\mathrm{a}} \times \mathbf{S}_{\mathrm{S}}$   | = 0.400                             |                       |                |              |  |
| at 1 sec period (Eq. 11.4-2);         |  | $\mathbf{S}_{\mathrm{M1}} = \mathbf{F}_{\mathrm{v}} \times \mathbf{S}_{\mathrm{1}}$ = | = 0.192                             |                       |                |              |  |
| Design spectral acceleration para     | meters (Sect 1   | 1.4.4)  |                                     |                       |                |              |  |
| at short period (Eq. 11.4-3);         |  | $S_{DS} = 2/3 \times S_{DS}$  | $S_{MS} = 0.267$                    |                       |                |              |  |
| at 1 sec period (Eq. 11.4-4);         |  | $S_{D1} = 2 / 3 \times S_{M1} = 0.128$  |                                     |                       |                |              |  |
| Seismic design category               |  |   |                                     |                       |                |              |  |
| Risk category (Table 1.5-1);          |  | III   |                                     |                       |                |              |  |
|                                       |  |   |                                     |                       |                |              |  |
| Seismic design category based on s    | hort period res  | ponse acceleratio   | on (Table 11.6-1)                   | )                     |                |              |  |
|                                       |  | В   |                                     |                       |                |              |  |
| Seismic design category based on 1    | sec period resp  | ponse acceleratio   | on (Table 11.6-2                    | )                     |                |              |  |
|                                       |  | В   |                                     |                       |                |              |  |
| Seismic design category;              |  | В   |                                     |                       |                |              |  |
| Approximate fundamental period        | I  |   |                                     |                       |                |              |  |
| Height above base to highest level    | of building;   | $h_n = 82 ft$   |                                     |                       |                |              |  |
| 2 2                                   | U/   |   |                                     |                       |                |              |  |

|                                     | Project  |   |                 |                   | Job Ref.       |            |  |  |
|-------------------------------------|--|---|-----------------|-------------------|----------------|------------|--|--|
|                                     | Northeast Metropolitan Regional Vocational High School |   |                 | 20                | 19-091         |            |  |  |
|                                     | Section  |   |                 |                   | Sheet no./rev. |            |  |  |
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| From Table 12.8-2:                  |  |   |                 |                   |                |            |  |  |
| Structure type;                     |  | All other syste   | ms              |                   |                |            |  |  |
| Building period parameter Ct;       |  | $C_t = 0.02$  |                 |                   |                |            |  |  |
| Building period parameter x;        |  | x = 0.75  |                 |                   |                |            |  |  |
| Approximate fundamental period      | (Eq 12.8-7);   | $T_a = C_t \times (h_n)^x \times \Box \ 1 \text{sec} \ / \ (1 \text{ft})^x = 0.545 \text{ sec}$ |                 |                   |                |            |  |  |
| Building fundamental period (Sec    | t 12.8.2);   | $T = T_a = 0.545 \text{ sec}$   |                 |                   |                |            |  |  |
| Long-period transition period;      |  | $T_L = 12 \text{ sec}$  |                 |                   |                |            |  |  |
| Seismic response coefficient        |  |   |                 |                   |                |            |  |  |
| Seismic force-resisting system (Ta  | able 12.2-1);  | B_BUILDING_FRAME_SYSTEMS  |                 |                   |                |            |  |  |
|                                     |  | 3. Ordinary sto   | el concentrical | lly braced frames |                |            |  |  |
| Response modification factor (Tal   | ole 12.2-1);   | R = <b>3.25</b>   |                 |                   |                |            |  |  |
| Seismic importance factor (Table    | 1.5-2);  | $I_e = 1.250$   |                 |                   |                |            |  |  |
| Seismic response coefficient (Sect  | 12.8.1.1)  |   |                 |                   |                |            |  |  |
| Calculated (Eq 12.8-2);             |  | $C_{s_{calc}} = S_{DS} / (R / I_e) = 0.1026$  |                 |                   |                |            |  |  |
| Maximum (Eq 12.8-3);                |  | $C_{s_{max}} = S_{D1} / ((T / 1 \text{ sec}) \times (R / I_e)) = 0.0903$                        |                 |                   |                |            |  |  |
| Minimum (Eq 12.8-5);                |  | $C_{s\_min} = max(0.044 \times S_{DS} \times I_e, 0.01) = 0.0147$                               |                 |                   |                |            |  |  |
| Seismic response coefficient;       | $C_{\rm s} = 0.0903$                                   |   |                 |                   |                |            |  |  |
| Seismic base shear (Sect 12.8.1)    |  |   |                 |                   |                |            |  |  |
| Effective seismic weight of the str | ucture;  | W = <b>9390.0</b> kips  |                 |                   |                |            |  |  |
| Seismic response coefficient;       |  | $C_{s} = 0.0903$  |                 |                   |                |            |  |  |
| Seismic base shear (Eq 12.8-1);     |  | $V = C_s \times W = 848.2 \text{ kips}$   |                 |                   |                |            |  |  |

|                             | Project  |                  |          |            | Job Ref.       |            |
|-----------------------------|--|------------------|----------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |                  |          |            | 2019-091       |            |
|                             | Section  |                  |          |            | Sheet no./rev. |            |
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### Sample Gravity Analysis and Design Calculations

1. Sample Steel Roof Beam

[In accordance with AISC360-16 using the LRFD method]

| Support conditions                               |  |                                 |
|--|--|---------------------------------|
| Support A  | Vertically restrained                  |                                 |
|  | Rotationally free                      |                                 |
| Support B  | Vertically restrained                  |                                 |
|  | Rotationally free                      |                                 |
| Applied loading                                  |  |                                 |
| Beam loads                                       | Dead self weight of beam $\times 1$    |                                 |
|  | Dead full UDL 0.35 kips/ft             |                                 |
|  | Snow full UDL 0.4 kips/ft              |                                 |
|  | Roof Live full UDL 0.2 kips/ft         |                                 |
| Load combinations                                |  |                                 |
| Load combination 1 - Full                        | Support A                              | Dead $\times$ 1.20              |
|  |  | Live × 1.60                     |
|  |  | Snow $\times$ 1.60              |
|  |  | Roof Live × 1.60                |
|  |  | $Dead \times 1.20$              |
|  |  | Live $\times$ 1.60              |
|  |  | Snow $\times$ 1.60              |
|  |  | Roof Live × 1.60                |
|  | Support B                              | $Dead \times 1.20$              |
|  |  | Live $\times$ 1.60              |
|  |  | Snow $\times$ 1.60              |
|  |  | Roof Live $\times$ 1.60         |
| Analysis results                                 |  |                                 |
| Maximum moment;                                  | $M_{max} = 234.3 \text{ kips_ft};$     | $M_{min} = 0$ kips_ft           |
| Maximum shear;                                   | $V_{max} = 26$ kips;                   | $V_{min} = -26$ kips            |
| Deflection;                                      | $\delta_{\max} = 1$ in;                | $\delta_{\min} = 0$ in          |
| Maximum reaction at support A;                   | $R_{A_{max}} = 26$ kips;               | $R_{A_{min}} = 26 \text{ kips}$ |
| Unfactored dead load reaction at support A;      | $R_{A\_Dead} = 7.3 \text{ kips}$       |                                 |
| Unfactored snow load reaction at support A;      | $R_{A\_Snow} = 7.2 \text{ kips}$       |                                 |
| Unfactored roof live load reaction at support A; | $R_{A_{Roof Live}} = 3.6 \text{ kips}$ |                                 |
| Maximum reaction at support B;                   | $R_{B_{max}} = 26$ kips;               | $R_{B_{min}} = 26 \text{ kips}$ |
| Unfactored dead load reaction at support B;      | $R_{B_{Dead}} = 7.3 \text{ kips}$      |                                 |
| Unfactored snow load reaction at support B;      | $R_{B_{Snow}} = 7.2 \text{ kips}$      |                                 |

|                                      | Project Job Ref.      |  |                                    |                           |                  |              |  |  |
|--------------------------------------|-----------------------|--|------------------------------------|---------------------------|------------------|--------------|--|--|
|                                      | ast Metropolitan Reg  | 2019-091   |                                    |                           |                  |              |  |  |
|                                      | Section               |  |                                    |                           | Sheet no./rev.   |              |  |  |
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| Unfactored roof live load reaction   | at support B;         | $R_{B_{Roof Live}} = 3$  | <b>.6</b> kips                     |                           |                  |              |  |  |
| Section details                      |                       |  |                                    |                           |                  |              |  |  |
| Section type;                        |                       | W 24x55 (AIS   | SC 15th Edn (vi                    | 15.0))                    |                  |              |  |  |
| ASTM steel designation;              |                       | A992   |                                    |                           |                  |              |  |  |
| Steel yield stress;                  |                       | $F_y = 50$ ksi   |                                    |                           |                  |              |  |  |
| Steel tensile stress;                |                       | $F_u = 65$ ksi   |                                    |                           |                  |              |  |  |
| Modulus of elasticity;               |                       | E = <b>29000</b> ksi   |                                    |                           |                  |              |  |  |
| Resistance factors                   |                       |  |                                    |                           |                  |              |  |  |
| Resistance factor for tensile vieldi | ng                    | $\phi_{tv} = 0.90$   |                                    |                           |                  |              |  |  |
| Resistance factor for tensile ruptur | e                     | $\phi_{\rm tr} = 0.75$   |                                    |                           |                  |              |  |  |
| Resistance factor for compression    |                       | $\phi_{\rm tr} = 0.90$   |                                    |                           |                  |              |  |  |
| Resistance factor for flexure        |                       | $\phi_c = 0.90$  |                                    |                           |                  |              |  |  |
| Lateral bracing                      |                       | 10   |                                    |                           |                  |              |  |  |
| Later ar bracing                     |                       | Span 1 has cor   | ntinuous lateral l                 | bracing                   |                  |              |  |  |
| Classification of sections for loca  | al buckling - S       | ection B4.1  |                                    | 0                         |                  |              |  |  |
| Classification of flanges in flexu   | re - Table B4.        | 1b (case 10)   |                                    |                           |                  |              |  |  |
| Width to thickness ratio;            |                       | $\mathbf{b}_{\mathrm{f}} / (2 \times \mathbf{t}_{\mathrm{f}}) = 6$               | .94                                |                           |                  |              |  |  |
| Limiting ratio for compact section   | ;                     | $\lambda_{\mathrm{pff}} = 0.38 \times \sqrt{[\mathrm{E} / \mathrm{F_y}]} = 9.15$ |                                    |                           |                  |              |  |  |
| Limiting ratio for non-compact see   | ction;                | $\lambda_{\rm rff} = 1.0 \times \sqrt{[{ m H}]}$                                 | $E / F_y] = 24.08;$                | Compact                   |                  |              |  |  |
| Classification of web in flexure -   | Table B4.1b           | (case 15)  |                                    |                           |                  |              |  |  |
| Width to thickness ratio;            |                       | $(d - 2 \times k) / t_w$   | = 54.63                            |                           |                  |              |  |  |
| Limiting ratio for compact section   | ;                     | $\lambda_{\rm pwf} = 3.76 \times \gamma$   | $[E / F_v] = 90.55$                | 5                         |                  |              |  |  |
| Limiting ratio for non-compact see   | ction;                | $\lambda_{\rm rwf} = 5.70 \times \sqrt{10}$                                      | $[E / F_y] = 137.2$                | 7; Compact                |                  |              |  |  |
|                                      |                       |  |                                    | S                         | ection is com    | pact in flex |  |  |
| Design of members for shear - C      | Chapter G             |  |                                    |                           |                  |              |  |  |
| Required shear strength              |                       | $V_r = max(abs($   | $V_{max}$ ), abs( $V_{min}$ )      | ) = <b>26.031</b> kips    |                  |              |  |  |
| Web area                             |                       | $A_w = d \times t_w = g$   | <b>9.322</b> in <sup>2</sup>       |                           |                  |              |  |  |
| Web plate buckling coefficient       |                       | $k_{\rm v} = 5.34$   |                                    |                           |                  |              |  |  |
| Web shear coefficient - eq G2-3      |                       | $C_{v1} = 1$   |                                    |                           |                  |              |  |  |
| Nominal shear strength - eq G6-1     |                       | $V_n = 0.6 \times F_y$   | $\times A_{w} \times C_{v1} = 279$ | 9.660 kips                |                  |              |  |  |
| Resistance factor for shear          | $\phi_{\rm v} = 0.90$ |  |                                    |                           |                  |              |  |  |
| Design shear strength                |                       | $V_c = \phi_v \times V_n =$  | <b>251.694</b> kips                |                           |                  |              |  |  |
|                                      |                       | PA   | SS - Design she                    | ar strength exce          | eds required     | shear stren  |  |  |
| Design of members for flexure in     | n the major ax        | xis - Chapter F  |                                    |                           |                  |              |  |  |
| Required flexural strength;          |                       | $M_r = max(abs($   | $(M_{s1_max})$ , abs $(M$          | $(s_{1_{min}})) = 234.27$ | <b>6</b> kips_ft |              |  |  |

|                             | Project  |                  |                 |            | Job Ref.       |            |
|-----------------------------|--|------------------|-----------------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |                  |                 |            | 2019           | 9-091      |
|                             | Section  |                  |                 |            | Sheet no./rev. |            |
|                             | MSBA   | A 60% Constructi | on Document Sub | mission    | Ĺ              | 21         |
| Engineers Design Group Inc. | Calc. by   | Date             | Chk'd by        | Date       | App'd by       | Date       |
|                             | AA   | 07/20/2022       | MD              | 07/27/2022 | MD             | 12/19/2022 |

| Yielding - Section F2.1                           |  |
|---|--|
| Nominal flexural strength for yielding - eq F2-1; | $M_{nyld} = M_p = F_y \times Z_x = 558.333 \text{ kips_ft}$        |
| Nominal flexural strength;                        | $M_n = M_{nyld} = 558.333 \text{ kips_ft}$                         |
| Design flexural strength;                         | $M_c = \phi_b \times M_n = $ <b>502.500</b> kips_ft                |
|   | PASS - Design flexural strength exceeds required flexural strength |

#### Design of members for vertical deflection

Consider deflection due to dead, live, snow and roof live loads

| Limiting deflection;       | $\delta_{\text{lim}} = \min(1.5 \text{ in}, L_{s1} / 360) = 1.2 \text{ in}$ |
|----------------------------|---|
| Maximum deflection span 1; | $\delta = \max(abs(\delta_{max}), abs(\delta_{min})) = 0.97$ in             |
|                            | PASS - Maximum deflection does not exceed deflection limit                  |

#### 2. Sample Composite Steel Floor Beam

#### [In accordance with AISC 360-16 using the load and resistance factor design method]

#### **Design summary**

| Overall design status;      | Pass  |
|-----------------------------|-------|
| Overall design utilisation; | 0.847 |

| Description        | Unit     | Provided | Required | Utilization | Result |
|--------------------|----------|----------|----------|-------------|--------|
| Moment, constr     | (kip_ft) | 502.5    | 157.8    | 0.314       | PASS   |
| Shear, constr      | (kips)   | 251.69   | 17.53    | 0.070       | PASS   |
| Moment, comp       | (kip_ft) | 786.81   | 387.17   | 0.492       | PASS   |
| Shear, comp        | (kips)   | 251.69   | 43.02    | 0.171       | PASS   |
| Deflection, constr | (in)     | 1.5      | 0.72     | 0.479       | PASS   |
| Deflection, comp   | (in)     | 1.5      | 1.27     | 0.847       | PASS   |

#### **Basic dimensions**

| Beam span;   | L = <b>36.000</b> ft              |
|--|-----------------------------------|
| Beam spacing on one side;                            | $b_1 = 10.000 \text{ ft}$         |
| Beam spacing on other side;                          | b <sub>2</sub> = <b>10.000</b> ft |
| Deck orientation;                                    | Deck ribs perpendicular to beam   |
| Profiles are assumed to meet all dimensional criteri | a in AISC 360-16                  |
| Overall depth of slab;                               | t = <b>5.250</b> in               |
| Height of ribs;                                      | $h_r = 2.000$ in                  |
| Centers of ribs;                                     | $rib_{ccs} = 12.000$ in           |
| Average width of rib;                                | $w_r = 7.000$ in                  |

|   | Project  |   |  |                                     | Job Ref.             |                  |  |  |
|---|--|---|--|-------------------------------------|----------------------|------------------|--|--|
|   | Northeast Metropolitan Regional Vocational High School |   |  |                                     | 201                  | 9-091            |  |  |
|   | Section  |   | Sheet no./rev.                             |                                     |                      |                  |  |  |
| Fasing on Design Count  | MSB  | A 60% Construct   | 22   |                                     |                      |                  |  |  |
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|   | AA   | 07/20/2022  | MD   | 07/27/2022                          | MD                   | 12/19/2022       |  |  |
| Material properties   |  |   |  |                                     |                      |                  |  |  |
| Concrete  |  |   |  |                                     |                      |                  |  |  |
| Specified compressive strength of co  | oncrete;   | f' <sub>c</sub> = <b>4.00</b> ksi   |  |                                     |                      |                  |  |  |
| Wet density of concrete;  |  | $w_{cw} = 125 \text{ lb/ft}$  | 3  |                                     |                      |                  |  |  |
| Dry density of concrete;  |  | $w_{cd} = 115 \text{ lb/ft}^3$  | 3  |                                     |                      |                  |  |  |
| Modulus of elasticity of concrete;  |  | $E_c = w_{cd}^{1.5} \times \sqrt{6}$  | $(f_{c}^{*} \times 1 \text{ ksi}) / (11)$  | $b/ft^3)^{1.5} = 2466 ks^3$         | si                   |                  |  |  |
| Steel   |  |   |  |                                     |                      |                  |  |  |
| Specified minimum yield stress of s   | teel;  | $F_{v} = 50 \text{ ksi}$  |  |                                     |                      |                  |  |  |
| Modulus of elasticity of steel;   |  | E <sub>s</sub> = <b>29000</b> ksi   |  |                                     |                      |                  |  |  |
| Loading – secondary beam  |  |   |  |                                     |                      |                  |  |  |
| Weight of slab construction stage:  |  | $\mathbf{W}_{\text{-l-h}} = \mathbf{f} \mathbf{t}$  | - h. × (1 – w. / ri                        | $(h_{m}) = 46$                      | 5.007 psf            |                  |  |  |
| Weight of slab composite stage:   |  | $\mathbf{w}_{11} = [\mathbf{t}_{-1}]$   | $h_r \times (1 - w / ril)$                 | $(b_{ccs}) = 10$                    | 326 nsf              |                  |  |  |
| Weight of steel deck:   |  | $w_{slab\_comp} = [\iota = u_r \land (\iota = w_r / \Pi \sigma_{ccs})] \land w_{cd} = 42.320 \text{ psi}$<br>$w_{cd} = 3.000 \text{ psf}$ |  |                                     |                      |                  |  |  |
| Additional dead load:   |  | $w_{deck} = 0.000$  | nsf  |                                     |                      |                  |  |  |
| Weight of steel beam:   |  | $w_1 = 55\ 000\ \text{b/ft}$  |  |                                     |                      |                  |  |  |
| Weight of construction live load:   |  | $w_{\text{beam}} = 20000\text{nsf}$   |  |                                     |                      |                  |  |  |
| Superimposed dead load  |  | $w_{\text{serv}} = 15.000 \text{ psf}$  |  |                                     |                      |                  |  |  |
| Weight of wall parallel to span:  |  | $W_{w par} = 0.000 \text{ lb/ft}$   |  |                                     |                      |                  |  |  |
| Weight of wall perpendicular to spa   | n;   | $W_{w_{w_{perp}}} = 0.000 \text{ lb/ft}$ ; assumed to be at mid-span.   |  |                                     |                      |                  |  |  |
| Floor live load;  | ,  | $w_{imp} = 100.000 \text{ psf}$   |  |                                     |                      |                  |  |  |
| Lightweight partition load;   |  | $w_{part} = 0.000 \text{ psf}$  |  |                                     |                      |                  |  |  |
| Total construction stage dead load;   |  | $w_{constr_{D}} = [(w_{slab\_constr} + w_{deck} + w_{d\_add}) \times ((b_1 + b_2)/2)] + w_{beam\_s} = 545.069 \text{ lb/ft}$              |  |                                     |                      |                  |  |  |
| Total construction stage live load;   |  | $w_{constr_L} = w_{constr} \times (b_1 + b_2) / 2 = 200.000 \text{ lb/ft}$  |  |                                     |                      |                  |  |  |
| Total composite stage dead load(exc   | cluding walls);  | $w_{comp_D} = [(w_{slab\_comp} + w_{deck} + w_{d\_add} + w_{serv}) \times (b_1 + b_2)/2] + w_{beam\_s} = 658.264$                         |  |                                     |                      |                  |  |  |
| lb/ft   |  |   |  |                                     |                      |                  |  |  |
| Total composite stage live load;  |  | $w_{comp_L} = (w_{imp})$  | $(b_1 + w_{part}) \times (b_1 + w_{part})$ | $b_2)/2 = 1000.000$                 | ) lb/ft;             |                  |  |  |
| Design forces – secondary beam  |  |   |  |                                     |                      |                  |  |  |
| Max ultimate moment at construction   | on stage;  | $M_{\text{constr} u} = (1.2)$   | $2 \times W_{\text{constr} D} + 1.6$       | $5 \times W_{constr L}) \times L^2$ | / 8 = <b>157.801</b> | kips_ft          |  |  |
| Max ultimate shear at construction s  | stage;   | $V_{\text{constr} II} = (1.2 \times W_{\text{constr} II}) + 1.6 \times W_{\text{constr} II}) \times L / 2 = 17.534 \text{ kips}$          |  |                                     |                      |                  |  |  |
| Maximum ultimate moment at comp   | oosite stage;  | _   | _  | _                                   |                      |                  |  |  |
| $M_{\text{comp u}} = (1.2 \times W_{\text{comp D}} + 1.6 \times W_{\text{comp u}})$ | $_{\rm omp\ L}$ ) × L <sup>2</sup> /8 +                | $1.2 \times w_{w par} \times I$   | $L^{2}/8 + 1.2 \times W_{w}$               | $p_{erp} \times (b_1 + b_2)/2 >$    | × L/4= <b>387.16</b> | <b>6</b> kips_ft |  |  |
| Maximum ultimate shear at compos  | ite stage;   | -   | -  |                                     |                      |                  |  |  |
| $V_{\text{comp u}} = (1.2 \times W_{\text{comp D}} + 1.6 \times W_{\text{co}})$     | <sub>mp L</sub> )×L/2+                                 | $1.2 \times w_{w par} \times L$   | $/2 + 1.2 \times w_{w_{1}}$                | $b_{erp} \times (b_1 + b_2)/2 >$    | × 1/2= <b>43.019</b> | kips             |  |  |
| Point of max. B.M. from nearest sur   | oport;   | $L_{BM_{near}} = L/2$   | = <b>18.00</b> ft                          |                                     |                      |                  |  |  |
| Steel section check   |  |   |  |                                     |                      |                  |  |  |
| Trial steel section;  |  | W24X55  |  |                                     |                      |                  |  |  |
| Plastic modulus of steel section;   |  | $Z_x = 134.00 \text{ in}^3$   |  |                                     |                      |                  |  |  |
| Elastic modulus of steel section;   |  | $S_x = 114.00 \text{ in}^3$   |  |                                     |                      |                  |  |  |
| Width to thickness ratio  |  | $\lambda_{s} = h_{s} / (2 \times t_{s}) = 6.941$  |  |                                     |                      |                  |  |  |

|  | Project Job Ref.                                       |   |                                      |                       |                |                |  |
|--|--|---|--------------------------------------|-----------------------|----------------|----------------|--|
|  | Northeast Metropolitan Regional Vocational High School |   |                                      |                       | 20             | 19-091         |  |
|  | Section  | Section   |                                      |                       |                |                |  |
| Engineers Design Crouples                  | MS   | MSBA 60% Construction Document Submission   |                                      |                       |                | 23             |  |
| Engineers Design Group Inc.                | Calc. by   | Date  | Chk'd by                             | Date                  | App'd by       | Date           |  |
|  | AA   | 07/20/2022  | MD                                   | 07/27/2022            | MD             | 12/19/2022     |  |
| Limiting width to thickness ratio (c       | omnact):   | $\lambda_{c} = 0.38 \times \sqrt{0}$  | $E_{c} / F ) = 9.152$                | )                     |                |                |  |
| Limiting width to thickness ratio (e       | oncompact).  | $\lambda_{\rm pl} = \sqrt{(E_{\rm pl}/E)}$  | = 24.083                             |                       |                |                |  |
| Emitting width to the Kiess fatto (if      | oncompact),  | $\lambda_{\rm rf} = V(E_{\rm S} / F_{\rm y})$   | - 24.005                             |                       | Fla            | ngo is compact |  |
| Depth to thickness ratio $(h/t_{\rm w})$ : |  | $\lambda_{m} = 54.600$  |                                      |                       | 1 1 1 1        | ige is compaci |  |
| Limiting depth to thickness ratio (a       | omnact).   | $\lambda = 3.76 \times \sqrt{0}$  | $E_{c} / F$ ) = 90 55                | 33                    |                |                |  |
| Limiting depth to thickness ratio (n       | oncompact):  | $\lambda_{pw} = 5.70 \times \sqrt{E}$   | $E_{\rm S} / F_{\rm y} = 137.2'$     | 74                    |                |                |  |
| Emitting depth to the kness ratio (in      | Silcompact),   | $N_{\rm rw} = 5.70 \times 101$  | $L_{\rm S} / \Gamma_{\rm y} = 137.2$ | / 4                   | L.             | Vab is compact |  |
|  |  |   |                                      |                       | VI             | ved is compact |  |
| Strength check at construction sta         | age for flexur   | e   |                                      |                       |                |                |  |
| Check for flexure                          |  |   |                                      |                       |                |                |  |
| Plastic moment for steel section;          |  | $M_p = F_y \times Z_x =$  | 558.333 kip_f                        | t                     |                |                |  |
| Resistance factor for flexure;             |  | $\phi_b = \boldsymbol{0.90}$  |                                      |                       |                |                |  |
| Design flexural strength of steel sec      | tion alone;  | $M_{constr_n} = \phi_b \times$  | $M_p = 502.500$                      | kip_ft                |                |                |  |
| Required flexural strength;                |  | $M_{constr_u} = 157$  | . <b>801</b> kip_ft                  |                       |                |                |  |
|  |  |   | PASS -                               | Beam bending at       | construction   | stage loading  |  |
| Strength check at construction st          | age for shear  |   |                                      |                       |                |                |  |
| Web area:                                  | -ge 101 0  | $A_w = d \times t_w = 0$  | <b>9.322</b> in <sup>2</sup>         |                       |                |                |  |
| Web plate buckling coefficient:            |  | $k_{y} = 5.34$  |                                      |                       |                |                |  |
| Depth to thickness ratio (h/t):            |  | $\lambda_{\rm av} = 54.600$   |                                      |                       |                |                |  |
| Web shear coefficient:                     |  | $C_{v1} = 1.00$   |                                      |                       |                |                |  |
| Resistant factor for shear:                |  | $\phi_{1} = 0.9$  |                                      |                       |                |                |  |
| Design shear strength:                     |  | $V_{\text{current}} = \phi_{\text{cu}} \times (0.6 \times F_{\text{cu}} \times A_{\text{cu}} \times C_{\text{cut}}) = 251.694 \text{ kins}$ |                                      |                       |                |                |  |
| Required shear strength:                   |  | $V_{\text{series}} = 17.534 \text{ kins}$   |                                      |                       |                |                |  |
| Required shear strength,                   |  | v constr_u  | расо<br>РАСО                         | S - Ream shear at     | construction   | staae loadina  |  |
|  |  |   | 17156                                | - Deam shear ai       | construction   | suge touting   |  |
| Design of steel anchors                    |  |   |                                      |                       |                |                |  |
| Note - for non-uniform stud layouts        | a higher conc  | entration of stude  | s should be loca                     | ited towards the end  | nds of the bea | am             |  |
| Effective slab width of composite s        | ection;  | b = min(L/8, b)   | $_{1}/2) + \min(L/8,$                | $b_2/2) = 108.000$ ir | 1              |                |  |
| Effective area of concrete flange;         |  | $A_c = b \times (t - h_r) = 351.00 \text{ in}^2$  |                                      |                       |                |                |  |
| Diameter of stud anchor;                   |  | dia = <b>0.750</b> in   |                                      |                       |                |                |  |
| Length of stud anchor after weld;          |  | $H_{s} = 3.50$ in   |                                      |                       |                |                |  |
| Specified tensile strength of stud an      | chor;  | $F_u = 65 \text{ ksi}$  |                                      |                       |                |                |  |
| Cross section area of one stud anche       | or;  | $A_{sa} = \pi \times dia^2 / 4 = 0.442 in^2$  |                                      |                       |                |                |  |
| Maximum diameter permitted;                |  | $dia_{max} = 2.5 \times t_f = 1.263$ in   |                                      |                       |                |                |  |
|  |  |   | PAS                                  | SS - Diameter of s    | stud anchor p  | provided is OK |  |
| Point of max. B.M. from nearest su         | pport;   | $L_{BM_near} = 18.0$  | <b>0</b> ft                          |                       |                |                |  |
| No. of ribs from points of zero to m       | ax moment;   | $rib_{numbers} = int($  | $L_{BM_near} / rib_{ccs}$ -          | -1) = <b>17</b>       |                |                |  |
| No. of ribs with 1 stud per rib;           |  | $N_{r1} = 17$   |                                      |                       |                |                |  |
| No. of ribs with 2 studs per rib;          |  | $N_{r2} = 0$  |                                      |                       |                |                |  |
| No. of ribs with 3 studs per rib;          |  | $N_{r3} = 0$  | $N_{r3} = 0$                         |                       |                |                |  |
| Total number of studs;                     |  | $N_{prov} = N_{r1} + 2$   | $\times N_{r2} + 3 \times N_{r3} =$  | 17                    |                |                |  |
|  |  |   |                                      |                       |                |                |  |

|                             | Project  |            |          |            | Job Ref.       |            |
|-----------------------------|--|------------|----------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          |            | 2019           | 9-091      |
|                             | Section  |            |          |            | Sheet no./rev. |            |
| E i D i G                   | MSBA 60% Construction Document Submission              |            |          |            | 24             |            |
| Engineers Design Group Inc. | Calc. by   | Date       | Chk'd by | Date       | App'd by       | Date       |
|                             | AA   | 07/20/2022 | MD       | 07/27/2022 | MD             | 12/19/2022 |

| Group effect factor for 1 stud per rib;              | $R_{g1} = 1.00$   |
|--|---|
| Group effect factor for 2 studs per rib;             | $R_{g2} = 0.85$   |
| Group effect factor for 3 studs per rib;             | $R_{g3} = 0.70$   |
| Value of $e_{mid-ht}$ is less than 2 in (51 mm)      |   |
| Position effect factor for deck perpendicular;       | $R_{p} = 0.60$  |
| Nom. strength of one stud with 1 stud per rib;       | $Q_{n1} = min(0.5 \times A_{sa} \times \sqrt{(f'_c \times E_c)}, R_{g1} \times R_p \times A_{sa} \times F_u) = 17.230 \text{ kips}$     |
| Nom. strength of one stud with 2 studs per rib;      | $Q_{n2} = min(0.5 \times A_{sa} \times \sqrt{(f'_c \times E_c)} , R_{g2} \times R_p \times A_{sa} \times F_u ) = 14.645 \text{ kips}$   |
| Nom. strength of one stud with 3 studs per rib;      | $Q_{n3} = min(0.5 \times A_{sa} \times \sqrt{(f'_c \times E_c)} , R_{g3} \times R_p \times A_{sa} \times F_u ) = 12.061 \text{ kips}$   |
| Total strength of provided steel anchors;            | $S_{sc} = N_{r1} \times Q_{n1} + 2 \times N_{r2} \times Q_{n2} + 3 \times N_{r3} \times Q_{n3} = 292.90 \text{ kips}$                   |
| Resistance of concrete flange;                       | $C_{cf} = 0.85 \times f_{c}^{*} \times A_{c} = 1193.400 \text{ kips}$   |
| Resistance of steel beam;                            | $T_{sb} = A \times F_y = $ <b>810.000</b> kips  |
| Beam/slab interface shear force;                     | $C = min(C_{cf}, T_{sb}) = 810.000 kips$  |
| Strength of studs is less than max                   | ximum interface shear force therefore partial composite action takes place  |
| Strength check at partial composite action           |   |
| Actual net tensile force ;                           | $V_{h} = C = 810.000 \text{ kips}$  |
| Assuming plastic neutral axis at the bottom of the s | teel beam flange.   |
| Resultant compressive force at flange bottom;        | $P_{yf} = b_f \times t_f \times F_y = 177.003 \text{ kips}$   |
| Net force at steel and concrete interface;           | $C_{net} = T_{sb} - 2 \times P_{yf} = 455.995 \text{ kips}$   |
|  | PNA is in the web of the I Section  |
| Shear connection force;                              | $\mathbf{F}_{\text{shear}} = \mathbf{S}_{\text{sc}} = 292.90 \text{ kips}$  |
| Total depth of concrete at full stress;              | $d_{c} = F_{shear} / (0.85 \times f_{c}^{*} \times b) = 0.798$ in   |
| Depth of compression from top of the steel flange;   | $t' = A / (2 \times t_w) - b_f \times t_f / t_w - 0.85 \times f'_c / F_y \times b \times d_c / (2 \times t_w) + t_f = 4.634 \text{ in}$ |
| Tension  |   |
| Bottom flange component;                             | $F_{bf} = F_y \times b_f \times t_f = 177.003 \text{ kips}$   |
| Moment capacity of bottom flange;                    | $M_{bf} = F_{bf} \times (d - (t_f/2) - t') = 276.030 \text{ kip}_ft$  |
| Web component;                                       | $F_{web_t} = F_y \times (A - (2 \times b_f \times t_f) - (t' - t_f) \times t_w) = 374.450 \text{ kips}$                                 |
| Moment capacity of web;                              | $M_{web_t} = F_{web_t} \times (d - t' - t_f)/2 = 288.032 \text{ kip_ft}$  |
| Compression  |   |
| Web component;                                       | $F_{web_c} = F_y \times (t'-t_f) \times t_w = 81.545 \text{ kips}$  |
| Moment capacity of web;                              | $M_{web_c} = F_{web_c} \times (t' - t_f)/2 = 14.029 \text{ kip_ft}$   |
| Top flange component;                                | $F_{tf} = F_y \times b_f \times t_f = 177.003 \text{ kips}$   |
| Moment capacity of top flange;                       | $M_{tf} = F_{tf} \times (t' - t_{f'}/2) = 64.626 \text{ kip_ft}$  |
| Concrete flange component;                           | $F_{cf} = 0.85 \times f_c^* \times b \times d_c = 292.904 \text{ kips}$   |
| Moment capacity of concrete flange;                  | $M_{cf} = F_{cf} \times (t - d_c/2 + t') = 231.518 \text{ kip_ft}$  |
| Design flexural strength of beam;                    | $M_{comp_n} = \phi_b \times (M_{bf} + M_{web_t} + M_{web_c} + M_{tf} + M_{cf}) = 786.811 \text{ kip_ft}$                                |
| Required flexural strength;                          | M <sub>comp_u</sub> = <b>387.166</b> kip_ft   |
|  | PASS - Beam bending at partial composite stage  |
| Check for shear                                      |   |
| Design shear strength;                               | $V_{comp_n} = V_{constr_n} = 251.694 \text{ kips}$  |
|  |   |

|  | Project Job Ref.  |   |   |  |                            |                 |  |  |  |
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|  | Section   |   | Sheet no./rev.  |  |                            |                 |  |  |  |
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|  | AA  | 07/20/2022  | MD  | 07/27/2022   | MD                         | 12/19/2022      |  |  |  |
| Required shear strength:   |   | $V_{comp, u} = 43.0$  | <b>19</b> kips  |  |                            |                 |  |  |  |
| 1 8,   |   | comp_u  | PASS - E  | Beam shear at part   | tial composit              | e stage loading |  |  |  |
| Check for deflection (Commenter  | (a)   |   |   | Ĩ  | 1                          | 0 0             |  |  |  |
| Calculation of immediate constructi  | on stage defle  | ection:   |   |  |                            |                 |  |  |  |
| Deflection due to dead load:   | on stuge dent   | $\Lambda_{1}$ , $\rho = 5 \times x$   | $V \rightarrow X L^4/I$   | $(384 \times E_{c} \times I) = 0$  | 5262 in                    |                 |  |  |  |
| Amount of beam camber:   |   | $\Delta = 0.000$  | in  |  |                            |                 |  |  |  |
|  |   | PASS - The can  | ,<br>nher is less tha   | in the construction  | n stage dead               | load deflection |  |  |  |
| Deflection due to construction live  | oad.  | $\Lambda_2 = 5 \times W$  | $_{1} \times L^{4} / (384)$   | $\times$ E <sub>c</sub> $\times$ I ) = 0 193   | i sauge acua<br>1 in       | iouu uejieeiion |  |  |  |
| Net total construction stage deflecti  | on.   | $\Delta_2 = \int dv \cos \theta$  | $+ \Lambda_2 - \Lambda_{\text{control}}$                                    | = 0.719 in   |                            |                 |  |  |  |
| For short term loading:-   | 511,  | $\Delta_{\text{short}} \Delta_{\text{short}}$   | $\Delta_2 \Delta_{\text{camber}}$   | <b>0.71</b> 7 III  |                            |                 |  |  |  |
| Short term modular ratio:  |   | $n = F_{\alpha}/F = 1$  | 11.8  |  |                            |                 |  |  |  |
| Depth of neutral axis from top of co   | ncrete:   | $n_s L_s / L_c$   | 11.0  |  |                            |                 |  |  |  |
| $y = [b \times (t-b)/n \times (t-b)/2 + A \times (t+d)/2 +$ | /2)] / [b× (t-h   | )/n + A]  |   |  |                            |                 |  |  |  |
| $f_{\rm S}$ [0 ( $n_{\rm r}$ ), $n_{\rm S}$ ( $n_{\rm r}$ ), $2$ ( $n_{\rm r}$ )   | (11)  | $v_{r} = 7.051$ in  |   |  |                            |                 |  |  |  |
| Moment of inertia of fully composit  | e section:  | <i>y</i> s <i>noci</i> m  |   |  |                            |                 |  |  |  |
| $I_{c} = I_{x} + A \times (d/2 + t - v_{c})^{2} + b \times (t - h_{c})^{3}$  | $/(12 \times n_s) + b \times$   | $(t - h_r)/n_s \times (v_s - 0)$  | $(t-h_{r})/2)^{2}$  |  |                            |                 |  |  |  |
|  | (   | $I_s = 3875 \text{ in}^4$   | (1))  |  |                            |                 |  |  |  |
| Effective mt of inertia for partially  | composite;  | $I_{s eff} = 0.75 \times [I_x + \sqrt{(F_{shear} / C)} \times (I_s - I_x)] = ;2151.2; in^4$   |   |  |                            |                 |  |  |  |
| Proportion of live load which is sho   | rt term;  | $r_{L s} = 67 \%$   |   |  |                            |                 |  |  |  |
| Deflection due to short term live loa  | ıd;   | $\Delta_{\rm L} = 5 \times r_{\rm L} \times w_{\rm comp} + 1 \times L^4 / (384 \times E_{\rm S} \times I_{\rm s, eff}) = 0.4059$ in   |   |  |                            |                 |  |  |  |
| For long term loading:-  | ,   |   | comp_D  |  | ,                          |                 |  |  |  |
| Long term concrete modulus as % of   | of short term;  | $r_{E   l} = 50 \%$   |   |  |                            |                 |  |  |  |
| Long term modular ratio;   |   | $n_{\rm I} = E_{\rm S} / (E_{\rm c} \times r_{\rm E_{\rm I}}) = 23.5$   |   |  |                            |                 |  |  |  |
| Depth of neutral axis from top of co   | ncrete;   | 、 -   |   |  |                            |                 |  |  |  |
| $y_l = [b \times (t-h_r)/n_l \times (t-h_r)/2 + A \times (t+d_r)/2$  | /2)] / [b× (t-h <sub>r</sub>  | $)/n_l+A]$  |   |  |                            |                 |  |  |  |
|  |   | y <sub>l</sub> = <b>9.653</b> in  |   |  |                            |                 |  |  |  |
| Moment of inertia of fully composit  | e section;  |   |   |  |                            |                 |  |  |  |
| $I_l = I_x + A \times (d/2 + t - y_l)^2 + b \times (t - h_r)^3$  | $(12 \times n_l) + b \times$  | $(t - h_r)/n_l \times (y_l - (t - h_r))/n_l \times (y_l - (t - $ | $(t-h_r)/2)^2$  |  |                            |                 |  |  |  |
|  |   | $I_l = 3212 \text{ in}^4$   |   |  |                            |                 |  |  |  |
| Effective mt of inertia for partially of   | composite;  | $I_{l\_eff} = 0.75 \times [$  | $I_x + \sqrt{F_{\text{shear}}} / C$   | $\mathbf{C}) \times (\mathbf{I}_{\mathrm{l}} - \mathbf{I}_{\mathrm{x}})] = 185$  | <b>2.1</b> in <sup>4</sup> |                 |  |  |  |
| Proportion of live load which is lon   | g term;   | $r_{L_l} = 1 - r_{L_s} =$   | = <b>33</b> %   |  |                            |                 |  |  |  |
| Deflection due to long term live loa   | Deflection due to long term live load;  |   |   | $\Delta_{L_{-}l} = 5 \times r_{L_{-}l} \times w_{comp\_L} \times L^4 / (384 \times E_S \times I_{l_{-}eff}) = 0.2322 \text{ in}$ |                            |                 |  |  |  |
| Dead load due to parallel wall & su  | perimp. dead;   | ; $w_{D part} = w_{w par} + (w_{serv} \times (b_1 + b_2) / 2) = 150.0000 \text{ lb/ft}$   |   |  |                            |                 |  |  |  |
| Long term deflection due to superin  | posed dead l  | oad (after concret  | te has cured):-   |  |                            |                 |  |  |  |
| Wall parallel to span and superimpo  | sed dead;   | $\Delta_4 = 5 \times (w_{D part}) \times L^4 / (384 \times E_S \times I_{l eff}) = 0.1055$ in   |   |  |                            |                 |  |  |  |
| Wall perpendicular to span;  | $\Delta_5 = (w_{w\_perp} \times (b_1 + b_2) / 2) \times L^3 / (48 \times E_S \times I_{l\_eff}) = 0.0000$ in  |   |   |  |                            |                 |  |  |  |
| Combined deflections   |   |   |   | _  |                            |                 |  |  |  |
| Net total construction stage deflection  | on;   | $\Delta_{\text{short}} = \Delta_{\text{short}}$   | $+\Delta_2 - \Delta_{combar}$   | = <b>0.719</b> in  |                            |                 |  |  |  |
| Net total long term deflection:  | 7   | $\Delta_{\text{long}} = \Delta_{\text{short}} D$  | $+\Delta_{\rm L_{\circ}} + \Delta_{\rm T_{\circ}} + \Delta_{\rm T_{\circ}}$ | $+\Delta_4 + \Delta_5 - \Delta_{combox} =$   | = <b>1.270</b> in          |                 |  |  |  |
| 6,   | $-i \operatorname{ong} - \operatorname{sin}(\underline{-}) - \underline{-}_{3} - \underline{-}_{1} - \underline{-}_{4} - \underline{-}_{5} - \operatorname{canoci} - \underline{-}_{5} - \underline{-}_{1}$ |   |   |  |                            |                 |  |  |  |

|                             | Project  |            |          |            | Job Ref.       |            |
|-----------------------------|--|------------|----------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          |            | 2019-091       |            |
|                             | Section S  |            |          |            | Sheet no./rev. |            |
| E i D i C                   | MSBA   | 26         |          |            |                |            |
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|                             | AA   | 07/20/2022 | MD       | 07/27/2022 | MD             | 12/19/2022 |

| Combined short and long term live load deflectn; | $\Delta_{\text{live}} = \Delta_{\text{L}_{s}} + \Delta_{\text{L}_{l}} = 0.638 \text{ in}$                   |
|--|---|
| Net long term dead and super imposed dead defln; | $\Delta_{\text{dead}} = \Delta_{\text{short}\_D} + \Delta_4 + \Delta_5 - \Delta_{\text{camber}} = 0.632$ in |
| Post composite deflection;                       | $\Delta_{\text{comp}} = \Delta_{\text{L}_s} + \Delta_{\text{L}_l} + \Delta_4 + \Delta_5 = 0.744 \text{ in}$ |
| Allowable max deflection;                        | $\Delta_{\text{Allow}} = 1.500 \text{ in}$  |

PASS - Deflection less than allowable

#### Arrangement of steel anchor

Note - for non-uniform stud layouts a higher concentration of studs should be located towards the ends of the beam;

3. Sample Steel Column

#### Column and loading details

| Column details                          |  |
|---|--|
| Column section;                         | HSS 12x12x3/8  |
| Design loading                          |  |
| Required axial strength;                | $P_r = 250$ kips; (Compression)                              |
| Moment about x axis at end 1;           | $M_{x1} = 0.0 \text{ kips_ft}$                               |
| Moment about x axis at end 2;           | $M_{x2} = 0.0 \text{ kips_ft}$                               |
| Maximum moment about x axis;            | $M_x = max(abs(M_{x1}), abs(M_{x2})) = 0.0 kips_ft$          |
| Moment about y axis at end 1;           | $M_{y1} = 0.0 \text{ kips_ft}$                               |
| Moment about y axis at end 2;           | $M_{y2} = 0.0 \text{ kips_ft}$                               |
| Maximum moment about y axis;            | $M_v = \max(abs(M_{v1}), abs(M_{v2})) = 0.0 \text{ kips ft}$ |
| Maximum shear force parallel to y axis; | $V_{ry} = 0.0$ kips  |
| Maximum shear force parallel to x axis; | $V_{rx} = 0.0$ kips  |
| Material details                        |  |
| Steel grade;                            | A500 Gr. C   |
| Yield strength;                         | $F_y = 50 \text{ ksi}$                                       |
| Ultimate strength;                      | $F_u = 62 \text{ ksi}$                                       |
| Modulus of elasticity;                  | E = <b>29000</b> ksi   |
| Shear modulus of elasticity;            | G = <b>11200</b> ksi   |
| Unbraced lengths                        |  |
| For buckling about x axis;              | $L_x = 240$ in   |
| For buckling about y axis;              | $L_y = 240$ in   |
| For torsional buckling;                 | $L_z = 240$ in   |

|  | Project                              |  |                                  |                            | Job Ref      |                |  |  |
|--|--------------------------------------|--|----------------------------------|----------------------------|--------------|----------------|--|--|
|  | Northeast                            | 2019-091   |                                  |                            |              |                |  |  |
| <b>D</b> ART                             | Section Shee                         |  |                                  |                            |              |                |  |  |
|  | MSB                                  | BA 60% Construction Document Submission 27                     |                                  |                            |              |                |  |  |
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|  | AA                                   | 07/20/2022   | MD                               | 07/27/2022                 | MD           | 12/19/2022     |  |  |
| Effective length factors                 |                                      |  |                                  |                            |              |                |  |  |
| For buckling about x axis;               |                                      | $K_x = 1.00$   |                                  |                            |              |                |  |  |
| For buckling about y axis;               |                                      | $K_{y} = 1.00$   |                                  |                            |              |                |  |  |
| For torsional buckling;                  | For torsional buckling; $K_z = 1.00$ |  |                                  |                            |              |                |  |  |
| Section classification                   |                                      |  |                                  |                            |              |                |  |  |
| Section classification for local by      | ickling (cl. B4)                     |  |                                  |                            |              |                |  |  |
| Critical flange width:                   |                                      | $\mathbf{b} = \mathbf{b}_{\mathrm{f}} - 3 \times \mathbf{t} =$ | 10.953 in                        |                            |              |                |  |  |
| Critical web width:                      |                                      | $h = d - 3 \times t =$   | 10.953 in                        |                            |              |                |  |  |
| Width to thickness ratio of flange       | (compression):                       | $\lambda_{fc} = b / t = 3$                                     | .384                             |                            |              |                |  |  |
| Width to thickness ratio of web (co      | ompression);                         | $\lambda_{\rm w,c} = h / t = 3$                                | 1.384                            |                            |              |                |  |  |
| Width to thickness ratio of flange       | (major flexure);                     | $\lambda_{f fx} = b / t = 3$                                   | 1.384                            |                            |              |                |  |  |
| Width to thickness ratio of web (m       | ajor flexure);                       | $\lambda_{w fx} = h / t = 3$                                   | 31.384                           |                            |              |                |  |  |
| Width to thickness ratio of flange       | (minor flexure);                     | $\lambda_{f_{f_y}} = h / t = 3$                                | 1.384                            |                            |              |                |  |  |
| Width to thickness ratio of web (m       | inor flexure);                       | $\lambda_{w_{fy}} = b / t = 3$                                 | 31.384                           |                            |              |                |  |  |
| Compression                              |                                      |  |                                  |                            |              |                |  |  |
| Limit for nonslender section;            |                                      | $\lambda_{r_c} = 1.40 \times \sqrt{100}$                       | $(E / F_y) = 33.7$               | /16                        |              |                |  |  |
|  |                                      |  |                                  | The section is             | nonslender i | in compression |  |  |
| Slenderness                              |                                      |  |                                  |                            |              |                |  |  |
| Member slenderness                       |                                      |  |                                  |                            |              |                |  |  |
| Slenderness ratio about x axis;          |                                      | $SR_x = K_x \times L_x$  | / r <sub>x</sub> = <b>50.7</b>   |                            |              |                |  |  |
| Slenderness ratio about y axis;          |                                      | $SR_y = K_y \times L_y / r_y = 50.7$                           |                                  |                            |              |                |  |  |
|  |                                      |  | 2                                |                            |              |                |  |  |
| <b>Reduction factor for slender eler</b> | nents                                |  |                                  |                            |              |                |  |  |
| Reduction factor for slender eler        | nents (E7)                           |  |                                  |                            |              |                |  |  |
| The section does not contain any s       | lender elements                      | therefore:-  |                                  |                            |              |                |  |  |
| Slender element reduction factor;        |                                      | Q = <b>1.0</b>   |                                  |                            |              |                |  |  |
| <b>Compressive strength</b>              |                                      |  |                                  |                            |              |                |  |  |
| Flexural buckling about x axis (         | el. E3)                              |  |                                  |                            |              |                |  |  |
| Elastic critical buckling stress;        | ,                                    | $F_{ex} = (\pi^2 \times E)$                                    | $(SR_x)^2 = 111$                 | <b>.2</b> ksi              |              |                |  |  |
| Reduction factor;                        |                                      | $Q_x = Q = 1.00$   | 0                                |                            |              |                |  |  |
| Flexural buckling stress about x ax      | xis;                                 | $F_{crx} = Q_x \times (0.4)$                                   | $558^{Qx \times Fy/Fex}) \times$ | $F_y = 41.4 ksi$           |              |                |  |  |
| Nominal flexural buckling strengtl       | 1;                                   | $P_{nx} = F_{crx} \times A_g$                                  | = <b>662.7</b> kips              |                            |              |                |  |  |
| Flexural buckling about v axis (         | el. E3)                              |  |                                  |                            |              |                |  |  |
| Elastic critical buckling stress:        | ,                                    | $F_{ev} = (\pi^2 \times E)$                                    | $(SR_v)^2 = 111$                 | <b>.2</b> ksi              |              |                |  |  |
| Reduction factor;                        |                                      | $Q_y = Q = 1.00$   | 0                                |                            |              |                |  |  |
| Flexural buckling stress about y ax      | xis;                                 | $F_{\rm cry} = Q_{\rm v} \times (0.1)$                         | 658 <sup>Qy×Fy/Fey</sup> ) ×     | $F_{y} = 41.4 \text{ ksi}$ |              |                |  |  |
| - *                                      |                                      |  | <i>,</i>                         |                            |              |                |  |  |

|                             | Project   |            | Job Ref. |  |                |            |  |
|-----------------------------|---|------------|----------|--|----------------|------------|--|
|                             | Northeast Metropolitan Regional Vocational High School 2019-091 |            |          | Northeast Metropolitan Regional Vocational High School |                |            |  |
|                             | Section   |            |          |  | Sheet no./rev. |            |  |
|                             | MSBA 60% Construction Document Submission                       |            |          |  | 28             |            |  |
| Engineers Design Group Inc. | Calc. by  | Date       | Chk'd by | Date   | App'd by       | Date       |  |
|                             | AA  | 07/20/2022 | MD       | 07/27/2022   | MD             | 12/19/2022 |  |

Nominal flexural buckling strength;

 $P_{ny} = F_{cry} \times A_g = 662.7$  kips

Design compressive strength (cl.E1)

Resistance factor for compression; Design compressive strength;  $\phi_{\rm c} = 0.90$ 

 $P_c = \phi_c \times min(P_{nx}, P_{ny}) = 596.5 \text{ kips}$ 

PASS - The design compressive strength exceeds the required compressive strength

4. Sample Isolated Reinforced Concrete Column Footing

#### **Footing Analysis**

#### [In accordance with ACI318-19]

#### Summary results

Density of concrete;

| Description                          | Unit            | Applied                            | Resisting | FoS         | Result |  |  |
|--------------------------------------|-----------------|------------------------------------|-----------|-------------|--------|--|--|
| Uplift verification                  | kips            | 243.4                              |           |             | Pass   |  |  |
| Description                          | Unit            | Applied                            | Resisting | Utilization | Result |  |  |
| Soil bearing                         | ksf             | 3.803                              | 4         | 0.951       | Pass   |  |  |
| Description                          | Unit            | Provided                           | Required  | Utilization | Result |  |  |
| Moment, positive, x-direction        | kip_ft          | 173.7                              | 487.6     | 0.356       | Pass   |  |  |
| Moment, positive, y-direction        | kip_ft          | 173.7                              | 466.3     | 0.372       | Pass   |  |  |
| Shear, one-way, x-direction          | kips            | 52.9                               | 104.8     | 0.505       | Pass   |  |  |
| Shear, one-way, y-direction          | kips            | 52.9                               | 101.8     | 0.520       | Pass   |  |  |
| Shear, two-way, Col 1                | psi             | 73.546                             | 189.737   | 0.388       | Pass   |  |  |
| Min.area of reinf, bot., x-direction | in <sup>2</sup> | 4.147                              | 5.400     |             | Pass   |  |  |
| Max.reinf.spacing, bot, x-direction  | in              | 18.0                               | 11.1      |             | Pass   |  |  |
| Min.area of reinf, bot., y-direction | in <sup>2</sup> | 4.147                              | 5.400     |             | Pass   |  |  |
| Max.reinf.spacing, bot, y-direction  | in              | 18.0                               | 11.1      |             | Pass   |  |  |
| Pad footing details                  | I               | -                                  |           |             |        |  |  |
| Length of footing;                   | $L_x = 8$       | l ft                               |           |             |        |  |  |
| Width of footing;                    | $L_y = 8$       | l ft                               |           |             |        |  |  |
| Footing area;                        | A = L           | $L_x \times L_y = 64 \text{ ft}^2$ | !         |             |        |  |  |
| Depth of footing;                    | h = <b>2</b> 4  | h = 24 in                          |           |             |        |  |  |
| Depth of soil over footing;          | $h_{soil} =$    | <b>18</b> in                       |           |             |        |  |  |

 $\gamma_{conc}=150.0~lb/ft^3$ 

| Northeast Metropolitan Regional Vocational High School2019-091SectionStatt motive:MSBA 60% Construction Document Submission29Calc. byDateChild byDateApplet byAA07/20/2022MD07/27/2022MD12/Column no.1 detailsLength of column; $L_{11} = 16.00$ inwidth of column; $L_{11} = 16.00$ inposition in x-axis; $x_1 = 48.00$ inposition in y-axis; $y_1 = 48.00$ inSold PropertiesGross allowable bearing pressure;quitow_Gross = 4 ksf;Density of soil; $\gamma_{soil} = 120.0$ lb/ft³Angle of internal friction; $\phi_b = 30.0$ degCoefficient of base friction angle; $\delta_{0b} = 15.0$ degPassive pressure coefficient (Coulomb); $K_{F} = sin(90 - \phi_{F})^2 / (sin(90 + \delta_{0}) \times [1 - \sqrt{[sin(\phi_b + \delta_{0})} \times sin(\phi_b) / (sin \delta_{0})]]^2 - 49.77Dead surcharge load;F_{barr} = 25 psfLive surcharge load;F_{barl} = 75.0 kipsLive surcharge load;F_{barl} = 75.0 kipsDead load in z;F_{barl} = 75.0 kipsSoll woight;F_{barl} = 75.0 kipsDead load in z;F_{scil} = 75.0 kipsFooting analysis for soil and stabilityLad combinations per ASCE 7-101.0D (0.419)1.0D (0.419)<$  |                                      | Project                                      |  | Job Ref.  |  |                                     |                            |  |  |  |
|---|--------------------------------------|--|--|---|--|-------------------------------------|----------------------------|--|--|--|
| SectionSheat no./rev.MSBA 60% Construction Document Submission29Column no.1 detailsColumn no.1 detailsLength of column;I,1 = 16.00 inDateApp'd byDateposition in x-axis;x,1 = 46.00 inposition in x-axis;x,1 = 48.00 inposition in x-axis;y,1 = 48.00 inSoil PropertiesGross allowable bearing pressure; $q_{atlew_c.coss} = 4 \text{ ksf}$ ;Density of soil; $\gamma_{sul} = 120.0 \text{ lb/fl}^3$ Angle of internal friction; $\phi_b = 30.0 \text{ deg}$ Design base friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_F = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt[4]{sin}(\phi_b + \delta_b) \times \sin(\phi_b) / (sin to b_b)]]f) = 4377$ Dead surcharge load; $F_{ture} = 100 \text{ psf}$ Self weight; $F_{set} = h \times \gamma_{cont} = 300 \text{ psf}$ Soil weight; $F_{set} = h \times \gamma_{cont} = 180 \text{ psf}$ Column no.1 loads $F_{Dat} = 75.0 \text{ kips}$ Dead load in z; $F_{Dat} = 75.0 \text{ kips}$ Footing analysis for soil and stabilityLoad combinations per ASCE 7-101.00 (0.419)1.00 + 1.01 (0.855)  |                                      | Northeast                                    | t Metropolitan Reg   | 2019-091  |  |                                     |                            |  |  |  |
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| Lightees besign of outputCalc. by<br>AADate<br>07/20/2022Date<br>MDDate<br>07/27/2022Apple by<br>MDDate<br>I2/Column no.1 detailsLength of column;<br>Width of column; $I_{x1} = 16.00$ in<br>$I_{y1} = 16.00$ in<br>position in x-axis;<br>$Y_1 = 48.00$ in<br>position in y-axis;Image: Image and Image a | Engineers Design Grouples            | MSBA 60% Construction Document Submission 29 |  | SBA 60% Construction Document Submission                        |  |                                     |                            |  |  |  |
| Column no.1 detailsLength of column; $l_{x1} = 16.00$ inWidth of column; $l_{y1} = 16.00$ inposition in x-axis; $x_1 = 48.00$ inposition in y-axis; $y_1 = 16.00$ inSoil PropertiesGross allowable bearing pressure; $q_{allow_cGross} = 4 ksf;$ Density of soil; $\gamma_{sal} = 120.0 lb/ft^3$ Angle of internal friction; $\phi_0 = 30.0 deg$ Design base friction angle; $\delta_{b0} = 15.0 deg$ Coefficient of base friction; $tan(\delta_{bb}) = 0.577$ Design wall friction angle; $\delta_b = 15.0 deg$ Passive pressure coefficient (Coulomb); $K_S = sin(90 - \phi_b)^2 / (sin(90 + \delta_b) \times [1 - \sqrt{[sin(\phi_b + \delta_b) \times sin(\phi_b) / (sin \delta_b)]]^2) = 4.977$ Dead surcharge load; $F_{basr} = 100 psf$ Live surcharge load; $F_{basr} = 100 psf$ Soil weight; $F_{sart} = h_{wall} \times \gamma_{cone} = 300 psf$ Soil weight; $F_{basr} = 75.0 kips$ Live load in z; $F_{basr} = 75.0 kips$ Footing analysis for soil and stabilityLoad combinations per ASCE 7-10 $1.00 (0.419)$ $1.00 + 10 (0.835)$   | Ludineers pesidir oronhie            | Calc. by                                     | Date   | Chk'd by  | Date 07/27/2022                            | App'd by                            | Date $12/10/2022$          |  |  |  |
| Column no.1 details         Length of column; $l_{x1} = 16.00$ in         position in x-axis; $l_{y1} = 16.00$ in         position in x-axis; $l_{y1} = 48.00$ in         position in y-axis; $y_1 = 48.00$ in         Soil Properties       Gross allowable bearing pressure;         Gross allowable bearing pressure; $q_{allow_cGross} = 4 \text{ ksf};$ Density of soil; $\gamma_{soil} = 120.0 \text{ lb/fh}^3$ Angle of internal friction; $\varphi_b = 30.0 \text{ deg}$ Design base friction angle; $\delta_{bb} = 30.0 \text{ deg}$ Coefficient of base friction; $tan(\delta_{0b}) = 0.577$ Design wall friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_P = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times (1 - \sqrt{[sin(\phi_b + \delta_b) \times sin(\phi_b) / (sin \delta_b)]]]^2} = 4.977$ Dead surcharge load; $F_{Law} = 100 \text{ psf}$ Live surcharge load; $F_{sarl} = h \times \gamma_{coac} = 300 \text{ psf}$ Soil weight; $F_{sarl} = h \times \gamma_{coal} = 180 \text{ psf}$ Column no.1 loads       Ive load in z;         Dead load in z; $F_{Lar} = 100.0 \text{ kips}$ Snow load in z; $F_{scl} = 75.0 \text{ kips}$ Live load in z; $F_{scl} = 75.0 \text{ kips}$ Foting analysis for soil and stability   |                                      | AA   | 07/20/2022   | MD  | 07/27/2022                                 | MD                                  | 12/19/2022                 |  |  |  |
| Column no.1 detailsLength of column; $l_{x1} = 16.00$ inWidth of column; $l_{y1} = 16.00$ inposition in x-axis; $x_1 = 48.00$ inposition in y-axis; $y_1 = 48.00$ inSoil PropertiesGross allowable bearing pressure;Gross allowable bearing pressure; $q_{allew_Gross} = 4 \text{ ksf}$ ;Density of soil; $\gamma_{soil} = 120.0 \text{ lb/ft}^3$ Angle of internal friction; $\phi_b = 30.0 \text{ deg}$ Design base friction angle; $\delta_{bb} = 0.577$ Design vall friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_P = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt{[\sin(\phi_b + \delta_b) \times \sin(\phi_b) / (\sin \delta_b)]]^2) = 4.977$ Dead surcharge load; $F_{Law} = 100 \text{ psf}$ Self weight; $F_{soil} = 75.0 \text{ kips}$ Soil weight; $F_{basil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loadsDead load in z;Dead load in z; $F_{Lax} = 100.0 \text{ kips}$ Snow load in z; $F_{Lax} = 75.0 \text{ kips}$ Live load in z; $F_{Lax} = 75.0 \text{ kips}$ Live load in z; $F_{Lax} = 75.0 \text{ kips}$ Load combinations per ASCE 7-10 $1.00 (0.419)$ $1.0D \downarrow 1.0D \downarrow 1.0D (0.419)$ $1.0D \downarrow 1.0D \downarrow 1.0D \downarrow 1.0D + 0.0550$  |                                      |  |  |   |  |                                     |                            |  |  |  |
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| Soil PropertiesGross allowable bearing pressure; $q_{allow_cGross} = 4 \text{ ksf}$ ;Density of soil; $\gamma_{soil} = 120.0 \text{ lb/ft}^3$ Angle of internal friction; $\phi_b = 30.0 \text{ deg}$ Design base friction angle; $\delta_{bb} = 30.0 \text{ deg}$ Coefficient of base friction; $\tan(\delta_{bb}) = 0.577$ Design wall friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_P = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt{[sin(\phi_b + \delta_b) \times sin(\phi_b) / (sin \delta_b)]]^2} = 4.977$ Dead surcharge load; $F_{Dsur} = 25 \text{ psf}$ Live surcharge load; $F_{Lsur} = 100 \text{ psf}$ Soil weight; $F_{ocil} = h_{soil} \times \gamma_{coinc} = 300 \text{ psf}$ Soil weight; $F_{Dz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Load combinations per ASCE 7-10 $1.0D(0.419)$ $1.0D (0.419)$ $1.0D (0.835)$  | position in y-axis;                  |  | $y_1 = 48.00$ in   |   |  |                                     |                            |  |  |  |
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| Angle of internal friction; $\phi_b = 30.0 \text{ deg}$ Design base friction angle; $\delta_{bb} = 30.0 \text{ deg}$ Coefficient of base friction; $\tan(\delta_{bb}) = 0.577$ Design wall friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_P = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt{[sin(\phi_b + \delta_b) \times sin(\phi_b) / (sin \delta_b))]]^2}) = 4.977$ Dead surcharge load; $F_{Daur} = 25 \text{ psf}$ Live surcharge load; $F_{Laur} = 100 \text{ psf}$ Self weight; $F_{swt} = h \times \gamma_{conc} = 300 \text{ psf}$ Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dzl} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Szl} = 75.0 \text{ kips}$ Live combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D (0.419)$ $1.0U + (0.835)$   | Density of soil;                     |  | $\gamma_{soil} = 120.0$ lb/  | /ft <sup>3</sup>  |  |                                     |                            |  |  |  |
| Design base friction angle; $\delta_{bb} = 30.0 \text{ deg}$ Coefficient of base friction; $\tan(\delta_{bb}) = 0.577$ Design wall friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_P = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt{[\sin(\phi_b + \delta_b) \times \sin(\phi_b) / (\sin \delta_b)]]^2}) = 4.977$ Dead surcharge load; $F_{Dsur} = 25 \text{ psf}$ Live surcharge load; $F_{Lsur} = 100 \text{ psf}$ Self weight; $F_{surt} = h \times \gamma_{conc} = 300 \text{ psf}$ Soil weight; $F_{soil} = n_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Dead load in z; $F_{Lzl} = 75.0 \text{ kips}$ Live load in z; $F_{Lzl} = 75.0 \text{ kips}$ Snow load in z; $F_{szl} = 75.0 \text{ kips}$ Loud combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D (0.419)$ $1.0L (0.835)$   | Angle of internal friction;          |  | $\phi_b = \textbf{30.0} \text{ deg}$                               |   |  |                                     |                            |  |  |  |
| Coefficient of base friction; $tan(\delta_{bb}) = 0.577$ Design wall friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_P = sin(90 - \phi_b)^2 / (sin(90 + \delta_b) \times [1 - \sqrt{[sin(\phi_b + \delta_b) \times sin(\phi_b) / (sin \delta_b))]]^2}) = 4.977$ Dead surcharge load; $F_{Dsur} = 25 \text{ psf}$ Live surcharge load; $F_{Lsur} = 100 \text{ psf}$ Self weight; $F_{swt} = h \times \gamma_{conc} = 300 \text{ psf}$ Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Load combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D + 1.0L (0.835)$ $0.857$   | Design base friction angle;          |  | $\delta_{bb} = 30.0 \text{ deg}$                                   |   |  |                                     |                            |  |  |  |
| Design wall friction angle; $\delta_b = 15.0 \text{ deg}$ Passive pressure coefficient (Coulomb); $K_P = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt{[\sin(\phi_b + \delta_b) \times \sin(\phi_b) / (\sin \delta_b))]]^2}) = 4.977$ Dead surcharge load; $F_{Dsur} = 25 \text{ psf}$ Live surcharge load; $F_{Lsur} = 100 \text{ psf}$ Self weight; $F_{svt} = h \times \gamma_{cone} = 300 \text{ psf}$ Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Footing analysis for soil and stability $F_{Sz1} = 75.0 \text{ kips}$ Load combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D \pm 1.0L (0.835)$ $0.835$   | Coefficient of base friction;        |  | $\tan(\delta_{bb}) = 0.577$  |   |  |                                     |                            |  |  |  |
| Passive pressure coefficient (Coulomb); $K_P = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt{[\sin(\phi_b + \delta_b) \times \sin(\phi_b) / (\sin \delta_b))]]^2} = 4.977$ Dead surcharge load; $F_{Dsur} = 25 \text{ psf}$ Live surcharge load; $F_{Lsur} = 100 \text{ psf}$ Self weight; $F_{swt} = h \times \gamma_{conc} = 300 \text{ psf}$ Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Load combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D + 1.0L (0.835)$ $0.00 \text{ kips}$  | Design wall friction angle;          |  | $\delta_b = 15.0 \text{ deg}$                                      |   |  |                                     |                            |  |  |  |
| Dead surcharge load; $F_{Dsur} = 25 \text{ psf}$ Live surcharge load; $F_{Lsur} = 100 \text{ psf}$ Self weight; $F_{swt} = h \times \gamma_{cone} = 300 \text{ psf}$ Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dz1} = 75.0 \text{ kips}$ Dead load in z; $F_{Dz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Footing analysis for soil and stabilityLoad combinations per ASCE 7-101.0D (0.419) $10D \pm 1.0U (0.835)$   | Passive pressure coefficient (Coulon | ıb);   | $K_{\rm P} = \sin(90 - \phi \delta_{\rm C}))^{12} = 4.977$         | $(\sin(90 + \delta_{\rm P})^2) / (\sin(90 + \delta_{\rm P})^2)$ | $(b) \times [1 - \sqrt{\sin(\phi_b)}]$     | $(+ \delta_b) \times \sin(\phi_b)$  | / (sin(90 +                |  |  |  |
| Deal birthinge rotal,T but T 20 porLive surcharge load; $F_{Lsur} = 100 \text{ psf}$ Self weight; $F_{swt} = h \times \gamma_{conc} = 300 \text{ psf}$ Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dz1} = 75.0 \text{ kips}$ Dead load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Footing analysis for soil and stabilityLoad combinations per ASCE 7-101.0D (0.419) $10D \pm 1.0U (0.835)$   | Dead surcharge load                  |  | $F_{\rm D} = 25  \rm nsf$  |   |  |                                     |                            |  |  |  |
| Self weight; $F_{swt} = h \times \gamma_{conc} = 300 \text{ psf}$ Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dz1} = 75.0 \text{ kips}$ Dead load in z; $F_{Dz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Footing analysis for soil and stabilityLoad combinations per ASCE 7-101.0D (0.419)1.0D + 1.0L (0.835)  | Live surcharge load:                 |  | $F_{\rm I sur} = 100 \text{ psf}$                                  |   |  |                                     |                            |  |  |  |
| Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180 \text{ psf}$ Column no.1 loads $F_{Dz1} = 75.0 \text{ kips}$ Dead load in z; $F_{Dz1} = 75.0 \text{ kips}$ Live load in z; $F_{Lz1} = 100.0 \text{ kips}$ Snow load in z; $F_{Sz1} = 75.0 \text{ kips}$ Footing analysis for soil and stabilityLoad combinations per ASCE 7-101.0D (0.419)1.0D + 1.0L (0.835)  | Self weight;                         |  | $F_{swt} = h \times \gamma_{conc} = 300 \text{ psf}$               |   |  |                                     |                            |  |  |  |
| Column no.1 loads $F_{Dz1} = 75.0$ kips         Dead load in z; $F_{Dz1} = 75.0$ kips         Live load in z; $F_{Lz1} = 100.0$ kips         Snow load in z; $F_{Sz1} = 75.0$ kips         Footing analysis for soil and stability $F_{Sz1} = 75.0$ kips         Load combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D + 1.0U (0.835)$ $1.0D + 1.0U (0.835)$   | Soil weight;                         |  | $F_{soil} = h_{soil} \times \gamma_{sol}$                          | $_{oil} = 180 \text{ psf}$                                      |  |                                     |                            |  |  |  |
| Dead load in z; $F_{Dz1} = 75.0$ kips         Live load in z; $F_{Lz1} = 100.0$ kips         Snow load in z; $F_{Sz1} = 75.0$ kips         Footing analysis for soil and stability       Load combinations per ASCE 7-10         1.0D (0.419)       1.0D + 1.0U (0.835)   | Column no.1 loads                    |  |  |   |  |                                     |                            |  |  |  |
| Live load in z; $F_{Lz1} = 100.0$ kipsSnow load in z; $F_{Sz1} = 75.0$ kipsFooting analysis for soil and stabilityLoad combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D + 1.0U (0.835)$  | Dead load in z;                      |  | F <sub>Dz1</sub> = <b>75.0</b> kip                                 | )S  |  |                                     |                            |  |  |  |
| Snow load in z; $F_{Sz1} = 75.0$ kipsFooting analysis for soil and stabilityLoad combinations per ASCE 7-10 $1.0D (0.419)$ $1.0D + 1.0U (0.835)$  | Live load in z;                      |  | F <sub>Lz1</sub> = <b>100.0</b> kips                               |   |  |                                     |                            |  |  |  |
| Footing analysis for soil and stability<br>Load combinations per ASCE 7-10<br>1.0D (0.419)<br>1.0D + 1.0L (0.835)   | Snow load in z; $F_{Sz1} = 75$ .     |  |  | $F_{Sz1} = 75.0 \text{ kips}$                                   |  |                                     |                            |  |  |  |
| Load combinations per ASCE 7-10<br>1.0D (0.419)<br>1.0D + 1.0L (0.835)  | Footing analysis for soil and stabil | ity  |  |   |  |                                     |                            |  |  |  |
| 1.0D(0.419)<br>1.0D + 1.0L(0.835)   | Load combinations per ASCE 7-10      | )  |  |   |  |                                     |                            |  |  |  |
| $1.0D + 1.0I_{(0)}(0.835)$  | 1.0D (0.419)                         |  |  |   |  |                                     |                            |  |  |  |
| 1.02 + 1.02 (0.055)   | 1.0D + 1.0L (0.835)                  |  |  |   |  |                                     |                            |  |  |  |
| 1.0D + 1.0S(0.712)  | 1.0D + 1.0S(0.712)                   |  |  |   |  |                                     |                            |  |  |  |
| 1.0D + 0.75L + 0.75S (0.951)  | 1.0D + 0.75L + 0.75S (0.951)         |  |  |   |  |                                     |                            |  |  |  |
| Combination 7 results: 1.0D + 0.75L + 0.75S   | Combination 7 results: 1.0D + 0.75   | 5L + 0.75S                                   |  |   |  |                                     |                            |  |  |  |
| Forces on footing   | Forces on footing                    |  |  |   |  |                                     |                            |  |  |  |
| Force in z-axis;<br>$F_{dz} = \gamma_D \times A \times (F_{swt} + F_{soil} + F_{Dsur}) + \gamma_L \times A \times F_{Lsur} + \gamma_D \times F_{Dz1} + \gamma_L + \gamma_S \times F_{Sz1} = 243.4 \text{ kips}$   | Force in z-axis;                     |  | $F_{dz} = \gamma_D \times A \times + \gamma_S \times F_{Sz1} = 24$ | $(F_{swt} + F_{soil} + F_{E}$<br>43.4 kips                      | $(D_{Sur}) + \gamma_L \times A \times F_1$ | $L_{sur} + \gamma_D \times F_{Dz1}$ | $+\gamma_L \times F_{Lz1}$ |  |  |  |

|  | Project   | Job Ref.   |  |  |  |                               |
|--|-----------|--|--|--|--|-------------------------------|
|  | Northeast | east Metropolitan Regional Vocational High School 2019-091   |  |  |  |                               |
|  | Section   | Sheet no./rev.   |  |  |  |                               |
|  | MSB       | 3A 60% Construction Document Submission 30   |  |  |  |                               |
| Engineers Design Group Inc.            | Calc. by  | Date   | Chk'd by   | Date   | App'd by   | Date                          |
|  | AA        | 07/20/2022   | MD   | 07/27/2022   | MD   | 12/19/2022                    |
| Moments on feeting                     |           |  |  |  |  |                               |
| Moment in x-axis about x is 0:         |           | $M_{-} = \gamma_{-} \times (\Lambda)$  | $\times (F + F + 1)$   | $(F_{-}) \times I / 2) + $   | ν- × Λ × F-  | $\times I / 2 + \gamma_{-}$   |
|  |           | $W_{dx} = \gamma D \times (A + A)$   | $\sim (\Gamma_{\text{swt}} + \Gamma_{\text{soil}} + \Gamma_{\text{soil}})$ | $(D_{sur}) \wedge (L_X / Z)$   | $\gamma_{\rm L} \sim \Lambda \sim \Gamma_{\rm Lsur}$ | $\sim L_{\rm X}/2 + \gamma D$ |
| Moment in v avia shout v is 0.         |           | $(\Gamma_{Dz1} \land X_1) +$   | $\gamma_L \wedge (\Gamma_{Lz1} \wedge X_1)$                                | $+\gamma_{\rm S} \wedge (\Gamma_{\rm Sz1} \wedge {\bf x}_1)$           | ) — 97 <b>3.</b> 5 кip_i                             | <br>v T / D   w               |
| Moment in y-axis, about y is 0,        |           | $M_{dy} = \gamma_D \wedge (A + A)$   | $(\Gamma_{\text{swt}} + \Gamma_{\text{soil}} + \Gamma)$                    | $(D_{sur}) \wedge L_y / 2) + (E_y / 2)$                                | $\gamma_L \wedge A \wedge \Gamma_{Lsur}$             | $\sim L_y / 2 + \gamma_D$     |
|  |           | $(\mathbf{r}_{\mathrm{Dz1}} \times \mathbf{y}_{1}) +$  | $\gamma_{\rm L} \wedge (\Gamma_{\rm Lz1} \wedge y_1)$                      | $+\gamma_{\rm S}$ $\wedge$ ( $\Gamma_{\rm Sz1}$ $\wedge$ $y_{\rm 1}$ ) | ) – 97 <b>3.5</b> kip_i                              | l                             |
| Uplift verification                    |           |  |  |  |  |                               |
| Vertical force;                        |           | F <sub>dz</sub> = <b>243.37</b> ki   | ps   |  |  |                               |
|  |           |  |  | PASS - Foo   | oting is not su                                      | bject to uplift               |
| Bearing resistance                     |           |  |  |  |  |                               |
| Eccentricity of base reaction          |           |  |  |  |  |                               |
| Eccentricity of base reaction in x-axi | c.        | $e_1 = M_1 / F_1$  | -1 / 2 = 0 in  |  |  |                               |
| Eccentricity of base reaction in x-axi |           | $e_{dx} = M_{1dx} / F_{dz}$  | $L_x / 2 = 0$ in   |  |  |                               |
|  | ,         | $\mathbf{e}_{dy} = \mathbf{W}_{dy} / \mathbf{\Gamma}_{dz} - \mathbf{L}_{y} / 2 = 0  \mathbf{m}$                  |  |  |  |                               |
| Pad base pressures                     |           |  |  |  |  | •                             |
|  |           | $q_1 = F_{dz} \times (1 - 6 \times e_{dx} / L_x - 6 \times e_{dy} / L_y) / (L_x \times L_y) = 3.803$             |  |  | $L_y$ ) = <b>3.803</b> ks                            | t                             |
|  |           | $q_2 = F_{dz} \times (1 - 6 \times e_{dx} / L_x + 6 \times e_{dy} / L_y) / (L_x \times L_y) = 3.803 \text{ ksf}$ |  |  |  |                               |
|  |           | $\mathbf{q}_3 = \mathbf{F}_{\mathrm{dz}} \times (1 +$  | $6 \times e_{dx} / L_x - 6 \times$   | $\langle e_{dy} / L_y \rangle / (L_x \times$                           | $L_y) = 3.803 \text{ ks}$                            | f                             |
|  |           | $\mathbf{q}_4 = \mathbf{F}_{\mathrm{dz}} \times (1 +$  | $6 \times e_{dx} / L_x + 6$  | $\times e_{dy} / L_y) / (L_x \times$                                   | $L_y$ ) = <b>3.803</b> k                             | sf                            |
| Minimum base pressure;                 |           | $q_{\min} = \min(q_1, q_2)$  | $_{2},q_{3},q_{4}) = 3.803$  | ksf  |  |                               |
| Maximum base pressure;                 |           | $q_{\max} = \max(q_1, q_2)$  | $(q_2, q_3, q_4) = 3.803$  | ksf  |  |                               |
| Allowable Bearing Capacity             |           |  |  |  |  |                               |
| Allowable bearing capacity;            |           | $q_{allow} = q_{allow\_Gr}$  | $_{\rm oss}$ = 4 ksf   |  |  |                               |
|  |           | $q_{max} / q_{allow} = 0$  | .951   |  |  |                               |
|  |           | PASS   | - Allowable bea  | ring capacity ex   | ceeds design l                                       | base pressure                 |
| Footing Design                         |           |  |  |  |  |                               |
|  |           |  |  | [In acc  | cordance with  | ACI318-19]                    |
| Material details                       |           |  |  |  |  |                               |
| Compressive strength of concrete;      |           | f' <sub>c</sub> = <b>4000</b> psi  |  |  |  |                               |
| Yield strength of reinforcement;       |           | $f_y = 60000 \text{ psi}$  |  |  |  |                               |
| Compression-controlled strain limit    | (21.2.2); | $\epsilon_{ty} = 0.00200$  |  |  |  |                               |
| Cover to top of footing;               |           | $\mathbf{c}_{\mathrm{nom}_{t}} = 3$ in   |  |  |  |                               |
| Cover to side of footing;              |           | $\mathbf{c}_{\mathrm{nom}\_s} = 3$ in  |  |  |  |                               |
| Cover to bottom of footing;            |           | $c_{nom_b} = 3$ in   |  |  |  |                               |
| Concrete type;                         |           | Normal weight  |  |  |  |                               |
| Concrete modification factor;          |           | $\lambda = 1.00$   |  |  |  |                               |
| Column type;                           |           | Concrete   |  |  |  |                               |
|  |           |  |  |  |  |                               |

|  | Project   |   |  |  |                                     | Job Ref.                                      |  |  |
|--|---|---|--|--|-------------------------------------|---|--|--|
|  | Northea   | 2019-091  |  |  |                                     |   |  |  |
|  | Section Sheet no./rev.                                |   |  |  |                                     |   |  |  |
| Fastances Design County  | MS  | BA 60% Construct  | ion Document Su  | bmission                                   |                                     | 31  |  |  |
| Engineers Design Group Inc.  | Calc. by  | Date  | Chk'd by   | Date                                       | App'd by                            | Date  |  |  |
|  | AA  | 07/20/2022  | MD   | 07/27/2022                                 | MD                                  | 12/19/2022                                    |  |  |
| Analysis and design of concrete fo   | oting   |   |  |  |                                     |   |  |  |
| Load combinations per ASCE 7-1   | 0   |   |  |  |                                     |   |  |  |
| 1.4D (0.212)   | •   |   |  |  |                                     |   |  |  |
| 1.2D + 1.6L + 0.5Lr (0.520)  |   |   |  |  |                                     |   |  |  |
| Combination 2 results: 1 2D + 1 6  | L + 0.5Lr   |   |  |  |                                     |   |  |  |
| Equals on fasting  |   |   |  |  |                                     |   |  |  |
| Forces on looting  |   | E   | (E + E + E   |  |                                     |   |  |  |
| Olumate force in z-axis;   |   | $F_{uz} = \gamma_D \times A \times$   | $(\mathbf{F}_{\text{swt}} + \mathbf{F}_{\text{soil}} + \mathbf{F}_{\text{I}})$ | $(D_{sur}) + \gamma_L \times A \times F_1$ | $L_{sur} + \gamma_D \times F_{Dz}$  | $_{\rm I}$ + $\gamma_{\rm L}$ × $F_{\rm Lz1}$ |  |  |
|  |   | = <b>299.0</b> kips   |  |  |                                     |   |  |  |
| Moments on footing   |   |   |  |  |                                     |   |  |  |
| Ultimate moment in x-axis, about x   | is 0;   | $M_{ux} = \gamma_D \times (A$   | $\times$ (F <sub>swt</sub> + F <sub>soil</sub> +                               | $F_{Dsur}$ × $L_x$ / 2) +                  | $\gamma_L \times A \times F_{Lsur}$ | $\times L_x / 2 + \gamma_D$                   |  |  |
|  | •   | $\times$ (F <sub>Dz1</sub> $\times$ x <sub>1</sub> ) +  | $\gamma_{\rm L} \times (F_{\rm Lz1} \times {\rm x_1})$                         | = <b>1196.1</b> kıp_ft                     |                                     | T ( 0 )                                       |  |  |
| Ultimate moment in y-axis, about y   | 15 0;   | $M_{uy} = \gamma_D \times (A \times (F_{swt} + F_{soil} + F_{Dsur}) \times L_y / 2) + \gamma_L \times A \times F_{Lsur} \times L_y / 2 + \gamma_D$  |  |  |                                     |   |  |  |
|  |   | $\times (\mathbf{F}_{\mathrm{Dz1}} \times \mathbf{y}_{1}) + \gamma_{\mathrm{L}} \times (\mathbf{F}_{\mathrm{Lz1}} \times \mathbf{y}_{1}) = 1196.1 \mathrm{ kip}_{\mathrm{L}} \mathrm{ft}$ |  |  |                                     |   |  |  |
| Eccentricity of base reaction  |   |   |  |  |                                     |   |  |  |
| Eccentricity of base reaction in x-ax  | is;   | $e_{ux} = M_{ux} / F_{uz} - L_x / 2 = 0$ in   |  |  |                                     |   |  |  |
| Eccentricity of base reaction in y-ax  | is;   | $e_{uy} = M_{uy} / F_{uz}$  | $-L_y/2 = 0$ in  |  |                                     |   |  |  |
| Pad base pressures   |   |   |  |  |                                     |   |  |  |
|  |   | $q_{u1} = F_{uz} \times (1 - $  | $6 \times e_{ux} / L_x - 6$  | $\times e_{uy} / L_y) / (L_x \times$       | $L_y) = 4.672 \text{ k}$            | sf  |  |  |
|  |   | $q_{u2} = F_{uz} \times (1 - $  | $6 \times e_{ux} / L_x + 6$  | $\times e_{uy} / L_y) / (L_x \times$       | $L_y) = 4.672 k$                    | sf  |  |  |
|  |   | $q_{u3} = F_{uz} \times (1 -$   | $+6 \times e_{ux} / L_x - 6$   | $\times e_{uy} / L_y) / (L_x \times$       | $L_y) = 4.672 k$                    | sf  |  |  |
|  |   | $q_{u4} = F_{uz} \times (1 - $  | $+6 \times e_{ux} / L_x + 6$   | $6 \times e_{uy} / L_y) / (L_x \approx$    | $(L_y) = 4.672$                     | ksf   |  |  |
| Minimum ultimate base pressure;  |   | $q_{\text{umin}} = \min(q_{u1}, q_{u2}, q_{u3}, q_{u4}) = 4.672 \text{ ksf}$  |  |  |                                     |   |  |  |
| Maximum ultimate base pressure;  |   | $q_{umax} = max(q_u)$   | $(1,q_{u2},q_{u3},q_{u4}) = 4$   | .672 kst                                   |                                     |   |  |  |
| Moment design, x direction, positi   | ive moment  |   |  |  |                                     |   |  |  |
| Ultimate bending moment;   |   | $M_{ux max} = 173.$   | <b>679</b> kip ft  |  |                                     |   |  |  |
| Tension reinforcement provided;  |   | 9 No.7 bottom bars (11.1 in $c/c$ )   |  |  |                                     |   |  |  |
| Area of tension reinforcement provi  | ded;  | $A_{sx,bot,prov} = 5.4$   | in <sup>2</sup>  | ,  |                                     |   |  |  |
| Minimum area of reinforcement (8.0   | 5.1.1);   | $A_{s \min} = 0.0018 \times L_v \times h = 4.147 \text{ in}^2$  |  |  |                                     |   |  |  |
|  | PASS - Area of reinforcement provided exceeds minimur |   |  |  |                                     |   |  |  |
| Maximum spacing of reinforcement   | $s_{max} = min(2 \times h, 18 in) = 18 in$            |   |  |  |                                     |   |  |  |
|  | 1   | PASS - Maximum  | ı permissible rei  | inforcement spac                           | ing exceeds a                       | ctual spacing                                 |  |  |
| Depth to tension reinforcement;  |   | $d = h - c_{nom_b} - c_{nom_b}$   | $\phi_{x.bot}  /  2 = \textbf{20.50}$  | 6 <b>2</b> in                              |                                     |   |  |  |
| Depth of compression block; $a = A_{sx.bc}$  |   |   | $< f_y / (0.85 \times f_c)$  | $(L_y) = 0.993$ in                         |                                     |   |  |  |
| Neutral axis factor; $\beta_1 = 0.85$  |   |   |  |  |                                     |   |  |  |
| Depth to neutral axis;   | l axis; $c = a / \beta_1 = 1.168$ in                  |   |  |  |                                     |   |  |  |
| Strain in tensile reinforcement; $\epsilon_t = 0.003 \times d / c - 0.003 = 0.04982$ |   |   |  |  |                                     |   |  |  |
| Minimum tensile strain(8.3.3.1);   |   | $\epsilon_{min} = \epsilon_{ty} + 0.0$  | 03 = <b>0.00500</b>  |  |                                     |   |  |  |
|  |   |   | PASS   | - Tensile strain                           | exceeds minin                       | num required                                  |  |  |

|  | Project  |  |   |  | Job Ref.                           |   |  |  |  |
|--|--|--|---|--|------------------------------------|---|--|--|--|
|  | Northea  | ist Metropolitan Re  | 2   | 019-091  |                                    |   |  |  |  |
|  | Section  | SBA 60% Construct  | tion Document   | Submission   | Sheet no./rev.                     | 32  |  |  |  |
| Engineers Design Group Inc.  | Calc. by   | Date   | Chk'd by  | Date   | App'd by                           | Date  |  |  |  |
|  | AA   | 07/20/2022   | MD  | 07/27/2022   | MD                                 | 12/19/2022  |  |  |  |
| Nominal moment capacity;   |  | M <sub>n</sub> = A <sub>sx.bot.pro</sub>                     | $_{v} \times f_{y} \times (d - a /$                         | 2) = <b>541.787</b> kip_                                       | ft                                 |   |  |  |  |
| Flexural strength reduction factor   | ;  | $\phi_{\rm f} = \min(\max($                                  | $(0.65 + 0.25 \times$                                       | $(\epsilon_{t} - \epsilon_{ty}) / (0.003),$                    | 0.65), 0.9) =                      | 0.900   |  |  |  |
| Design moment capacity;  |  | $\phi M_n = \phi_f \times M_n$                               | n = <b>487.608</b> kip                                      | p_ft   |                                    |   |  |  |  |
|  |  | $M_{u.x.max}  /  \phi M_n$                                   | = 0.356   |  |                                    |   |  |  |  |
|  |  | PAS  | SS - Design mo  | oment capacity ex  | ceeds ultima                       | te moment load  |  |  |  |
| One-way shear design, x direction  | on   |  |   |  |                                    |   |  |  |  |
| Ultimate shear force;  |  | $V_{u.x} = 52.918$   | kips  |  |                                    |   |  |  |  |
| Depth to reinforcement;  |  | $d_v = h - c_{nom_b}$  | $-\phi_{x.bot} / 2 = 20$                                    | <b>.562</b> in   |                                    |   |  |  |  |
| Size effect factor (22.5.5.1.3);   |  | $\lambda_{\rm s}~=1$   |   |  |                                    |   |  |  |  |
| Ratio of longitudinal reinforceme  | nt;  | $\rho_w = A_{sx.bot.prov}$                                   | $(L_y \Box d_v) = 0$  | 0.00274  |                                    |   |  |  |  |
| Shear strength reduction factor;   |  | $\phi_{\rm v}=0.75$  |   |  |                                    |   |  |  |  |
| Nominal shear capacity (Eq. 22.5)  | .5.1);   | $V_n = min(8 \times 2)$                                      | $\lambda_{\rm s} 	imes \lambda 	imes ( ho_{\rm w})^{1/3}$   | $\times \sqrt{(\mathbf{f}_{c} \times 1 \text{ psi})} \times 1$ | $L_v \times d_v, 5 \times \lambda$ | $\lambda \times \sqrt{\mathbf{f}_{c} \times 1 \text{ psi}}$ |  |  |  |
|  |  | $\times L_{y} \times d_{v} = 1$                              | <b>39.685</b> kips  |  |                                    |   |  |  |  |
| Design shear capacity;   |  | $\phi V_n = \phi_v \times V_n = 104.764 \text{ kips}$        |   |  |                                    |   |  |  |  |
|  |  | $V_{u.x} / \phi V_n = 0.505$                                 |   |  |                                    |   |  |  |  |
|  |  |  | PASS - Desig  | gn shear capacity  | exceeds ultii                      | nate shear load   |  |  |  |
| Moment design, y direction, pos  | sitive moment  |  |   |  |                                    |   |  |  |  |
| Ultimate bending moment;   |  | $M_{u.y.max} = 173$  | <b>.679</b> kip_ft  |  |                                    |   |  |  |  |
| Tension reinforcement provided;  |  | 9 No.7 bottom  | h bars (11.1 in   | c/c)   |                                    |   |  |  |  |
| Area of tension reinforcement pro  | ovided;  | $A_{sy.bot.prov} = 5.4$                                      | <b>4</b> in <sup>2</sup>                                    |  |                                    |   |  |  |  |
| Minimum area of reinforcement (  | 8.6.1.1);  | $A_{s.min} = 0.0018$   | $8 \times L_x \times h = 4.$                                | <b>147</b> in <sup>2</sup>                                     |                                    |   |  |  |  |
|  |  |  | PASS - Area   | of reinforcement   | provided ex                        | ceeds minimum   |  |  |  |
| Maximum spacing of reinforceme   | ent (8.7.2.2);   | $s_{max} = min(2 \times 10^{-3})$                            | (h, 18 in) = <b>18</b>                                      | in   |                                    |   |  |  |  |
|  |  | PASS - Maximun   | n permissible 1   | reinforcement spa  | cing exceeds                       | actual spacing  |  |  |  |
| Depth to tension reinforcement;  |  | $d = h - c_{nom_b} - c_{nom_b}$                              | $\phi_{x.bot} - \phi_{y.bot} / 2$                           | 2 = <b>19.687</b> in   |                                    |   |  |  |  |
| Depth of compression block;  |  | $a = A_{sy.bot.prov}$  | $\times f_{y} / (0.85 \times f)$                            | $_{\rm c} \times L_{\rm x}) = 0.993$ in                        |                                    |   |  |  |  |
| Neutral axis factor;   |  | $\beta_1 = 0.85$   |   |  |                                    |   |  |  |  |
| Depth to neutral axis;   |  | $\mathbf{c} = \mathbf{a} / \beta_1 = 1.$                     | 168 in  |  |                                    |   |  |  |  |
| Strain in tensile reinforcement;   |  | $\varepsilon_{\rm t} = 0.003 \times d / c - 0.003 = 0.04757$ |   |  |                                    |   |  |  |  |
| Minimum tensile strain(8.3.3.1);   |  | $\varepsilon_{\rm min} = \varepsilon_{\rm ty} + 0.0$         | 003 = 0.00500   |  |                                    |   |  |  |  |
| Nominal moment conscitu  |  | $M = \Lambda$  | PAS   | 5S - Iensule strain  | exceeds min                        | umum required   |  |  |  |
| Nominal moment capacity;   |  | $M_n = A_{sy,bot,pro}$                                       | $v_{\rm v} \times 1_{\rm y} \times (0.25 \times 1_{\rm y})$ | $(2) = 518.102 \text{ km}_{-}$                                 | $\frac{11}{0.65}$ 0.0) -           | 0.000   |  |  |  |
| Design moment canacity:  | $\phi_{\rm t} = \phi_{\rm c} \times M = 466 \ 346 \ \text{kin ft}$ |  |   |  |                                    | 0.200   |  |  |  |
| Design moment capacity, $\psi_{1}v_{1} - \psi_{1} \wedge 1v_{1} - 400.340 \text{ Klp}_{1}$<br>M = /4NA - 0.379 |  |  |   |  |                                    |   |  |  |  |
|  |  | $\mu_{u.y.max} / \psi_1 v_{l_n}$                             | 0.572<br>SS - Design mi                                     | oment canacity or  | ceeds ultima                       | te moment load  |  |  |  |
|  |  |  | Design me   | επι εαραείη ελ   | cecus nutitul                      | moment tout   |  |  |  |
| Une-way snear design, y directi  | on   | 17 50.010  | 1-1   |  |                                    |   |  |  |  |
| Unimate snear force;   |  | $v_{u,y} = 52.918$   | кıps  |  |                                    |   |  |  |  |

| EDC                                 | Project<br>Northeas | t Metropolitan Reg  | gional Vocational  | High School   | Job Ref.                           | 019-091   |  |
|-------------------------------------|---------------------|---|--|---|------------------------------------|---|--|
| <b>P</b> <i>A</i> <b>F</b>          | Section             | 1 5 5   |  |   |                                    |   |  |
|                                     | MSE                 | BA 60% Construct  | ion Document Su  | Ibmission   | 33                                 |   |  |
| Engineers Design Group Inc.         | Calc. by            | Date  | Chk'd by   | Date  | App'd by                           | Date  |  |
|                                     | AA                  | 07/20/2022  | MD   | 07/27/2022  | MD                                 | 12/19/2   |  |
| Depth to reinforcement;             |                     | $d_v = h - c_{nom_b}$   | - φ <sub>x.bot</sub> - φ <sub>y.bot</sub> / 2                  | 2 = <b>19.687</b> in  |                                    |   |  |
| Size effect factor (22.5.5.1.3);    |                     | $\lambda_{s} = 1$   |  |   |                                    |   |  |
| Ratio of longitudinal reinforceme   | nt;                 | $\rho_w = A_{sy.bot.prov}$  | $/(L_x \times d_v) = 0.0$                                      | 00286   |                                    |   |  |
| Shear strength reduction factor;    |                     | $\phi_{\rm v} = 0.75$   |  |   |                                    |   |  |
| Nominal shear capacity (Eq. 22.5    | 5.1);               | $V_n = min(8 \times \lambda)$   | $\lambda_{\rm s} \times \lambda \times (\rho_{\rm w})^{1/3} >$ | $<\sqrt{(\mathbf{f}_{c} \times 1 \text{ psi})} \times \mathbf{I}$ | $L_x \times d_v, 5 \times \lambda$ | $\lambda \times \sqrt{\mathbf{f}_{c} \times 1}$ |  |
|                                     |                     | $\times$ L <sub>x</sub> $\times$ d <sub>v</sub> ) = 13  | <b>5.694</b> kips  |   |                                    |   |  |
| Design shear capacity;              |                     | $\phi V_n = \phi_v \times V_n$  | = <b>101.77</b> kips   |   |                                    |   |  |
|                                     |                     | $V_{u.y} / \phi V_n = 0.4$  | 520  |   |                                    |   |  |
|                                     |                     |   | PASS - Design  | n shear capacity  | exceeds ultir                      | nate shear                                      |  |
| Two-way shear design at colum       | n 1                 |   |  |   |                                    |   |  |
| Depth to reinforcement;             |                     | $d_{v2} = 20.125$ in  | 1  |   |                                    |   |  |
| Shear perimeter length (22.6.4);    |                     | $l_{xp} = 36.125$ in  |  |   |                                    |   |  |
| Shear perimeter width (22.6.4);     |                     | $l_{yp} = 36.125$ in  |  |   |                                    |   |  |
| Shear perimeter (22.6.4);           |                     | $b_o = 2 \times (l_{x1} + $   | $d_{v2}$ ) + 2 × ( $l_{y1}$ +                                  | $d_{v2}$ ) = <b>144.500</b> in                                    | 1                                  |   |  |
| Shear area;                         |                     | $A_p = l_{x,perim} \times l_y$  | y,perim = <b>1305.01</b>                                       | <b>6</b> in <sup>2</sup>  |                                    |   |  |
| Surcharge loaded area;              |                     | $A_{sur} = A_p - l_{x1}$  | $\times$ l <sub>y1</sub> = <b>1049.016</b>                     | 5 in <sup>2</sup>   |                                    |   |  |
| Ultimate bearing pressure at center | er of shear area;   | $q_{up.avg} = 4.672$  | ksf  |   |                                    |   |  |
| Ultimate shear load;                |                     | $F_{up} = \gamma_D \times F_{Dz1} + \gamma_L \times F_{Lz1} + \gamma_D \times A_p \times F_{swt} + \gamma_D \times A_{sur} \times F_{soil} + \gamma_D \times F_{soil} + \gamma_D$ |  |   |                                    |   |  |
|                                     |                     | $F_{Dsur} + \gamma_L \times A_{sr}$   | $_{\rm ur} 	imes F_{\rm Lsur}$ - $q_{\rm up.av}$               | $_{g} \times A_{p} = 213.877$                                     | kips                               |   |  |
| Ultimate shear stress from vertica  | l load;             | $v_{ug} = max(F_{up})$  | / (b <sub>o</sub> $\square$ d <sub>v2</sub> ),0 ps             | si) = <b>73.546</b> psi   |                                    |   |  |
| Column geometry factor (Table 2     | 2.6.5.2);           | $\beta = l_{y1} / l_{x1} = 1$   | .00  |   |                                    |   |  |
| Column location factor (22.6.5.3)   | ;                   | $\alpha_s = 40$   |  |   |                                    |   |  |
| Size effect factor (22.5.5.1.3);    |                     | $\lambda_{\rm s}~=1$  |  |   |                                    |   |  |
| Concrete shear strength (22.6.5.2)  | ;                   | $v_{cpa} = (2 + 4 / 1)$   | $\beta) \times \lambda_{\rm s} \times \lambda \times \sqrt{1}$ | $f_{c} \times 1 \text{ psi} = 379.$                               | <b>473</b> psi                     |   |  |
|                                     |                     | $v_{cpb} = (\alpha_s \times d_{v2})$  | $(b_{o} + 2) \times \lambda_{s} \times$                        | $\lambda \times \sqrt{(\mathbf{f}_{c} \times 1 \text{ psi})}$     | ) = <b>478.828</b> ]               | osi   |  |
|                                     |                     | $v_{cpc} = 4 \times \lambda_s \times \lambda_s$   | $\lambda \times \sqrt{\mathbf{f}_{c} \times 1} \text{ ps}$     | si) = <b>252.982</b> psi  |                                    |   |  |
|                                     |                     | $v_{cp} = min(v_{cpa}, v_{cpa})$  | $v_{cpb}, v_{cpc}) = 252.$                                     | <b>982</b> psi  |                                    |   |  |
| Shear strength reduction factor;    |                     | $\phi_{\rm v} = 0.75$   |  |   |                                    |   |  |
| Nominal shear stress capacity (Eq   | . 22.6.1.2);        | $v_n = v_{cp} = 252.$   | <b>982</b> psi   |   |                                    |   |  |
| Design shear stress capacity (8.5.  | l.1(d));            | $\phi \mathbf{v}_n = \dot{\phi}_v \times \mathbf{v}_n =$  | = <b>189.737</b> psi   |   |                                    |   |  |
|                                     |                     | $v_{ug} / \phi v_n = 0.38$  | 88   |   |                                    |   |  |
|                                     |                     | PASS - Des  | ign shear stres  | s capacity exceed   | ls ultimate sl                     | hear stress                                     |  |

|                             | Project   |            | Job Ref. |  |                |            |  |
|-----------------------------|---|------------|----------|--|----------------|------------|--|
|                             | Northeast Metropolitan Regional Vocational High School 2019-091 |            |          | Northeast Metropolitan Regional Vocational High School |                |            |  |
|                             | Section   |            |          |  | Sheet no./rev. |            |  |
|                             | MSBA 60% Construction Document Submission                       |            |          |  | 34             |            |  |
| Engineers Design Group Inc. | Calc. by  | Date       | Chk'd by | Date   | App'd by       | Date       |  |
|                             | AA  | 07/20/2022 | MD       | 07/27/2022   | MD             | 12/19/2022 |  |

#### 5. Sample Continuous Reinforced Concrete Strip Footing

#### **Footing Analysis**

#### [In accordance with ACI318-19]

#### Summary results

| Description                          | Unit            | Applied  | Resisting | FoS         | Result |
|--------------------------------------|-----------------|----------|-----------|-------------|--------|
| Uplift verification                  | kips            | 6.9      |           |             | Pass   |
| Description                          | Unit            | Applied  | Resisting | Utilization | Result |
| Soil bearing                         | ksf             | 3.435    | 4         | 0.859       | Pass   |
| Description                          | Unit            | Provided | Required  | Utilization | Result |
| Moment, positive, y-direction        | kip_ft          | 0.6      | 11.8      | 0.052       | Pass   |
| Min.area of reinf, bot., y-direction | in <sup>2</sup> | 0.259    | 0.310     |             | Pass   |
| Max.reinf.spacing, bot, y-direction  | in              | 18.0     | 12.0      |             | Pass   |

#### Strip footing details - considering a one meter strip

| $L_x = 1$ ft  |
|---|
| $L_y = 2$ ft  |
| $\mathbf{A} = \mathbf{L}_{\mathbf{x}} \times \mathbf{L}_{\mathbf{y}} = 2 \ \mathrm{ft}^2$ |
| h = <b>12</b> in  |
| $h_{soil} = 3.5$ in   |
| $\gamma_{conc}=150.0~lb/ft^3$   |
|   |

#### Wall no.1 details

| Width of wall;      | $l_{y1} = 12$ in |
|---------------------|------------------|
| position in y-axis; | $y_1 = 12$ in    |

#### **Soil Properties**

| Gross allowable bearing pressure; | $q_{allow\_Gross} = 4 \text{ ksf};$   |
|-----------------------------------|---|
| Density of soil;                  | $\gamma_{soil}=\textbf{120.0}~lb/ft^3$  |
| Angle of internal friction;       | $\phi_b = \textbf{30.0} \text{ deg}$  |
| Design base friction angle;       | $\delta_{bb} = \textbf{30.0} \text{ deg}$   |
| Coefficient of base friction;     | $\tan(\delta_{bb}) = 0.577$   |
| Self weight;<br>Soil weight;      | $\begin{split} F_{swt} &= h \times \gamma_{conc} = \textbf{150} \ psf \\ F_{soil} &= h_{soil} \times \gamma_{soil} = \textbf{35} \ psf \end{split}$ |

|                                      | Project<br>Northeast Metropolitan Regional Vocational High School |   |   | Job Ref.  |                                    |                        |
|--------------------------------------|---|---|---|---|------------------------------------|------------------------|
|                                      |   |   |   | 2019-091  |                                    |                        |
|                                      | Section   | tion  |   |   | Sheet no./rev.                     |                        |
| Engineers Design Groupler            | MSI   | BA 60% Construct  | 0% Construction Document Submission                               |   |                                    | 35                     |
| Ludineers nesidii ninnhiir:          | Calc. by  | Date  | Chk'd by  | Date  | App'd by                           | Date $12/10/2022$      |
|                                      | AA  | 07/20/2022  | MD  | 07/27/2022  | MD                                 | 12/19/2022             |
| Wall no.1 loads per linear foot      |   |   |   |   |                                    |                        |
| Dead load in z;                      |   | $F_{Dz1} = 2.0$ kips  |   |   |                                    |                        |
| Live load in z;                      | $F_{Lz1} = 4.0$ kips  |   |   |   |                                    |                        |
| Snow load in z;                      |   | $F_{Sz1} = 2.0 \text{ kips}$  |   |   |                                    |                        |
| Footing analysis for soil and stab   | ility   |   |   |   |                                    |                        |
| Load combinations per ASCE 7-        | 10  |   |   |   |                                    |                        |
| 1.0D (0.296)                         |   |   |   |   |                                    |                        |
| 1.0D + 1.0L (0.796)                  |   |   |   |   |                                    |                        |
| 1.0D + 1.0Lr (0.296)                 |   |   |   |   |                                    |                        |
| 1.0D + 1.0S (0.546)                  |   |   |   |   |                                    |                        |
| 1.0D + 1.0R (0.296)                  |   |   |   |   |                                    |                        |
| 1.0D + 0.75L + 0.75Lr (0.671)        |   |   |   |   |                                    |                        |
| 1.0D + 0.75L + 0.75S (0.859)         |   |   |   |   |                                    |                        |
| 1.0D + 0.75L + 0.75R (0.671)         |   |   |   |   |                                    |                        |
| Combination 7 results: 1.0D + 0.     | 75L + 0.75S   |   |   |   |                                    |                        |
| Forces on footing per linear foot    |   |   |   |   |                                    |                        |
| Force in z-axis;                     |   | $F_{dz} = \gamma_D \times A \times$   | $(F_{swt} + F_{soil}) + \gamma_I$                                 | $_{\rm D} \times F_{\rm Dz1} + \gamma_{\rm L} \times F_{\rm L}$ | $L_{z1} + \gamma_S \times F_{Sz1}$ | = <b>6.9</b> kips      |
| Moments on footing per linear fo     | oot   |   |   |   |                                    |                        |
| Moment in y-axis, about y is 0;      |   | $M_{dy} = \gamma_D \times (A + \gamma_S \times (F_{Sz1} \times y))$                               | $\times (F_{swt} + F_{soil}) \times (F_{1}) = 6.9 \text{ kip_ft}$ | $L_y / 2) + \gamma_D \times (F_1)$                              | $_{Dz1} \times y_1) + \gamma_L >$  | $(F_{Lz1} \times y_1)$ |
| Uplift verification                  |   |   |   |   |                                    |                        |
| Vertical force;                      |   | F <sub>dz</sub> = <b>6.87</b> kips  |   |   |                                    |                        |
|                                      |   |   |   | PASS - Foo  | oting is not su                    | bject to uplift        |
| Stability against sliding            |   |   |   |   |                                    |                        |
| Resistance due to base friction;     |   | $F_{RFriction} = max(F_{dz}, 0 \text{ kN}) \times tan(\delta_{bb}) = 3.966 \text{ kips}$          |   |   |                                    |                        |
| Bearing resistance                   |   |   |   |   |                                    |                        |
| Eccentricity of base reaction        |   |   |   |   |                                    |                        |
| Eccentricity of base reaction in y-a | xis;  | $e_{dy} = M_{dy} / F_{dz}$  | - $L_y / 2 = 0.000$   | in  |                                    |                        |
| Strip base pressures                 |   |   |   |   |                                    |                        |
|                                      |   | $\mathbf{q}_1 = \mathbf{F}_{\mathrm{dz}} \times (1 - \mathbf{q}_{\mathrm{dz}})$                   | $6 \times e_{dy} / L_y) / (L_y)$                                  | $y \times 1$ ft) = <b>3.435</b> l                               | ksf                                |                        |
|                                      |   | $q_2 = F_{dz} \times (1 + 6 \times e_{dy} / L_y) / (L_y \times 1 \text{ ft}) = 3.435 \text{ ksf}$ |   |   |                                    |                        |
| Minimum base pressure;               |   | $q_{\min} = \min(q_1, q_2) = 3.435 \text{ ksf}$   |   |   |                                    |                        |
| Maximum base pressure;               |   | $q_{\max} = \max(q_1,$  | $q_2$ ) = <b>3.435</b> ksf  |   |                                    |                        |
| Allowable bearing capacity           |   |   |   |   |                                    |                        |
| Allowable bearing capacity;          |   | $q_{allow} = q_{allow_G}$   | $r_{\rm ross} = 4  \rm ksf$                                       |   |                                    |                        |
|                                      |   | $q_{max} / q_{allow} = 0$   | .859  |   |                                    |                        |
|                                      |   |   |   |   |                                    |                        |

|                             | Project  |            |          | Job Ref.   |                |            |
|-----------------------------|--|------------|----------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          |            | 2019-091       |            |
|                             | Section  |            |          |            | Sheet no./rev. |            |
| E i D i O                   | MSBA 60% Construction Document Submission              |            |          |            | 36             |            |
| Engineers Design Group Inc. | Calc. by   | Date       | Chk'd by | Date       | App'd by       | Date       |
|                             | AA   | 07/20/2022 | MD       | 07/27/2022 | MD             | 12/19/2022 |

PASS - Allowable bearing capacity exceeds design base pressure

#### **Footing Design**

**Material details** 

#### [In accordance with ACI318-19]

| Compressive strength of concrete;             | f' <sub>c</sub> = <b>4000</b> psi                   |
|---|---|
| Yield strength of reinforcement;              | f <sub>y</sub> = <b>60000</b> psi                   |
| Compression-controlled strain limit (21.2.2); | $\boldsymbol{\epsilon}_{ty} = \boldsymbol{0.00200}$ |
| Cover to top of footing;                      | $\mathbf{c}_{nom_t} = 3$ in                         |
| Cover to side of footing;                     | $c_{nom_s} = 3$ in                                  |
| Cover to bottom of footing;                   | $c_{nom\_b} = 3$ in                                 |
| Concrete type;                                | Normal weight                                       |
| Concrete modification factor;                 | $\lambda = 1.00$                                    |
| Wall type;                                    | Concrete  |

#### Analysis and design of concrete footing

#### Load combinations per ASCE 7-10

| 1.4D (0.015)                |
|-----------------------------|
| 1.2D + 1.6L + 0.5Lr (0.047) |
| 1.2D + 1.6L + 0.5S (0.052)  |
| 1.2D + 1.6L + 0.5R (0.047)  |
| 1.2D + 1.0L + 1.6Lr (0.034) |
| 1.2D + 1.0L + 1.6S(0.051)   |
| 1.2D + 1.0L + 1.6R(0.034)   |

#### Combination 3 results: 1.2D + 1.6L + 0.5S

#### Forces on footing per linear foot

Ultimate force in z-axis;

#### Moments on footing per linear foot

| Ultimate | moment in | v-axis.  | about y | <i>z</i> is 0: |
|----------|-----------|----------|---------|----------------|
| Ontinute | moment m  | y units, | uoout   | , 15 0,        |

#### Eccentricity of base reaction

Eccentricity of base reaction in y-axis;

Strip base pressures

Minimum ultimate base pressure; Maximum ultimate base pressure; 
$$\begin{split} F_{uz} = \gamma_D \times A \times (F_{swt} + F_{soil}) + \Box_D \times F_{Dz1} + \Box_L \times F_{Lz1} + \Box_S \times F_{Sz1} = \textbf{10.2} \\ kips \end{split}$$

$$\begin{split} M_{uy} &= \gamma_D \times (A \times (F_{swt} + F_{soil}) \times L_y / 2) + \gamma_D \times (F_{Dz1} \times y_1) + \gamma_L \times (F_{Lz1} \times y_1) \\ &+ \gamma_S \times (F_{Sz1} \times y_1) = \textbf{10.2 kip_ft} \end{split}$$

 $e_{uy} = M_{uy} / F_{uz} - L_y / 2 = 0.000$  in

$$\begin{split} q_{u1} &= F_{uz} \times (1 - 6 \times e_{uy} / L_y) / (L_y \times 1 \text{ ft}) = \textbf{5.122 ksf} \\ q_{u2} &= F_{uz} \times (1 + 6 \times e_{uy} / L_y) / (L_y \times 1 \text{ ft}) = \textbf{5.122 ksf} \\ q_{umin} &= \min(q_{u1}, q_{u2}) = \textbf{5.122 ksf} \\ q_{umax} &= \max(q_{u1}, q_{u2}) = \textbf{5.122 ksf} \end{split}$$
|                             | Project  |            |          |            | Job Ref.       |            |
|-----------------------------|--|------------|----------|------------|----------------|------------|
|                             | Northeast Metropolitan Regional Vocational High School |            |          |            | 2019-091       |            |
|                             | Section  |            |          |            | Sheet no./rev. |            |
| E i D i G                   | MSBA 60% Construction Document Submission              |            |          |            | 37             |            |
| Engineers Design Group Inc. | Calc. by   | Date       | Chk'd by | Date       | App'd by       | Date       |
|                             | AA   | 07/20/2022 | MD       | 07/27/2022 | MD             | 12/19/2022 |

| Moment design, y direction, positive moment |   |
|---|---|
| Ultimate bending moment;                    | $M_{u.y.max} = 0.612 \text{ kip_ft}$  |
| Tension reinforcement provided;             | No.5 bars at 12.0 in c/c bottom   |
| Area of tension reinforcement provided;     | $A_{sy,bot,prov} = 0.31 \text{ in}^2$   |
| Minimum area of reinforcement (7.6.1.1);    | $A_{s.min} = 0.0018 \times L_x \times h = 0.259 \text{ in}^2$   |
|   | PASS - Area of reinforcement provided exceeds minimum   |
| Maximum spacing of reinforcement (7.7.2.3); | $s_{max} = min(3 \times h, 18 in) = 18 in$  |
| 1   | PASS - Maximum permissible reinforcement spacing exceeds actual spacing   |
| Depth to tension reinforcement;             | $d = h - c_{nom_b} - \phi_{y,bot} / 2 = 8.688$ in   |
| Depth of compression block;                 | $a = A_{sy,bot,prov} \times f_y / (0.85 \times f_c \times L_x) = 0.456$ in  |
| Neutral axis factor;                        | $\beta_1 = 0.85$  |
| Depth to neutral axis;                      | $c = a / \beta_1 = 0.536$ in  |
| Strain in tensile reinforcement;            | $\epsilon_t = 0.003 \times d / c - 0.003 = 0.04559$   |
| Minimum tensile strain(7.3.3.1);            | $\varepsilon_{\min} = \varepsilon_{ty} + 0.003 = 0.00500$   |
|   | PASS - Tensile strain exceeds minimum required  |
| Nominal moment capacity;                    | $M_n = A_{sy.bot.prov} \times f_y \times (d - a / 2) = 13.112 \text{ kip_ft}$                                       |
| Flexural strength reduction factor;         | $\phi_{\rm f} = \min(\max(0.65 + 0.25 \times (\epsilon_{\rm t} - \epsilon_{\rm ty}) / (0.003), 0.65), 0.9) = 0.900$ |
| Design moment capacity;                     | $\phi M_n = \phi_f \times M_n = 11.801 \text{ kip_ft}$  |
|   | $M_{u.y.max} / \phi M_n = 0.052$  |
|   | PASS - Design moment capacity exceeds ultimate moment load  |

## One-way shear design, y direction

One-way shear design does not apply. Shear failure plane fall outside extents of foundation.

## GENERAL REQUIREMENTS STRUCTURAL PEER REVIEW RFP

6B.3.1 - 07



PMA Consultants

January 09, 2023

Lee Deveau Project Manager Massachusetts School Building Authority 40 Broad Street, Suite 500 Boston, MA 02109

Structural Peer Reviewer Procurement

Dear Mr. Deveau,

On behalf of the Northeast Metropolitan Regional Vocational School District (NEMT), PMA Consultants procured DM Berg Consultants, P.C., to be the structural peer review firm for the NEMT project.

The process began on November 8<sup>th</sup>, 2022, when PMA reached out to seven (7) different firms that either PMA or DRA have worked with in the past to perform the structural peer review for the project. As part of the reach out process, PMA provided each bidder PMA's standard form of sub consultant agreement, the most recent structural drawings of the building to help understand the project scale/scope, as well as the review timeline required for the firm to perform the structural peer review for the project if selected.

PMA indicated to each firm that proposals were to be submitted no later than 5:00 P.M. on November 29<sup>th</sup> 2022. By November 29<sup>th</sup> 5:00 P.M., PMA received six (6) different proposals for the opportunity to be the structural peer reviewer for the project. After a review of each bidder's proposal along with the pricing for each firm, PMA ultimately determined that DM Berg Consultants, P.C. to be the firm to be selected to perform the structural peer review for the NEMT project.

Please let us know if you have any questions.

Sincerely,

Anthony LoPresti, Associate

Unthony Lotrate

PMA Consultants, LLC | Owner's Project Manager

|                           | 08                                    |
|---------------------------|---------------------------------------|
|                           | 1 - I                                 |
| GENERAL REQUIREMENTS      | 3.1                                   |
| ENERGY MODEL CALCULATIONS | e e e e e e e e e e e e e e e e e e e |
|                           | 9                                     |



## Northeast Metropolitan Vocational High School (Wakefield, MA.)

## Building Energy Modeling for LEED v4 Compliance Modeling Guidelines, Inputs, and Results

January 13, 2022

## 60%CD Energy model Summary:

Bala has developed the 60% CD energy model to evaluate the energy consumption and cost savings of the new Northeast Metropolitan Vocational High School against an ASHRAE 90.1-2010 Appendix G baseline building. Results from Trane Trace energy model demonstrate that the proposed new building will have more than 27% reduction in energy consumption and 35% reduction in cost compared to ASHRAE 90.1 - 2010. The purpose of this analysis is to demonstrate energy use performance in excess of the minimum requirements of LEED v4 Energy & Atmosphere Prerequisite. These results reflect the 60%CD status. Results might defer once the CD design is completed(100%), and final inputs are integrated as design values where the assumptions are used.



The energy model for the building's new 353,800 net square feet of school design includes the following space types;

- Level 0: Vocational Shops, Classrooms, Custodial Spaces
- Level 1: Admin Area (Principal, Conference, Reception), Vocational Shops, Weight Room, Locker/Shower, Nurses Suite, Auditorium, Early Childhood Education, Cafeteria, Kitchen
- Level 2: Classrooms, Vocational Classrooms, Science Labs, Media Center, Gymnasium, Offices
- Level 3: Classrooms, Vocational Classrooms, Science Labs, Offices
- Level 4: Classrooms, Vocational Classrooms, Science Labs, Offices



Unoccupied setback: 80F

Unoccupied setback: 65F

The energy model was conducted utilizing Trane TRACE 700 version 6.3.2.2.S. Trane TRACE is certified in compliance with ASHRAE 140-2014. The model assumptions are based on building information available at the 60% CD phase.

Hereinafter are our basic assumptions, inputs, and results.

## HVAC & Energy Assumptions:

## **Energy Costs:**

• Electricity \$0.17 / kWh (MA EIA 2020 March COMM.)

Electricity and gas rates for commercial customers are published on a monthly basis for each state by the U.S. Energy Information Administration of the U.S. Department of Energy and used as the energy cost basis of both the Proposed and Baseline models in accordance with ASHRAE 90.1-2010 section G2.4.

## Indoor Conditions:

School:

- Summer 75°F / 50% RH
- Winter 70°F / No humidification

## Weather:

- Boston, MA TMY3
- Summer 87.6 DB / 71.7 WB (1%)
- Winter 7.7 DB (99.6%)

## Schedules:

- School 10Months:
  - ASHRAE 90.1 default schedules are utilized for building occupants, lighting, and receptacles. Schedules are identical for both the Proposed and Baseline models. For 10 months school schedules, custom modifications were made and schedules were adjusted for 10 months school calendar and 2 months holiday season.
- Adult Education:
  - Sept. June: 5 pm-9:30 pm 4 days per week
  - Sept. June: Saturdays 8 am 3pm
- Administration:
  - Office Staff: 260 days per year 8 am 3 pm.
  - Maintenance Staff: 260 days per year 7 am 11pm
- Summer Programs:
  - July: Weekdays 8 am 12 pm

## Envelope - Proposed:

All U-values listed below represent assembly values. These are given to Bala for CD analysis. For 90% CD model, we will revise the inputs as specific envelope information for all the walls and window types.

- Walls: U-0.047
- Windows: U<sub>assembly</sub>: U-0.33 SHGC: 0.30
- Roof: R-34 / U-0.029
- Glass Area
  - o **34.5%**



## Envelope – 90.1-2010 Baseline

- ASHRAE Standard 90.1-2010 Table 5.5-5 for climate zone 5A
- Walls Steel-Framed, U-0.064
- Windows Metal framing fixed, U<sub>assembly</sub>=0.45, SHGC=0.4
- Roof Insulation Above Deck, U-0.048
- Exposed Overhangs; U-0.038
- Glass Area 34.5% window to wall ratio

## Internal Loads:

- Proposed model Internal Loads such as Lighting power density, plug loads and occupancy for the space were defined and will be finalized in the future and Baseline model inputs were referred to ASHRAE 90.1-2010
  - Lighting Power Density, Building Area Method
    - Proposed Model 0.75 w/sf (Assumption)
    - Baseline Model : 0.99 W/SF
  - Plug Loads (Once the equipment loads are defined. Inputs for the plug loads and equipment loads might change in occupant spaces.)
    - Admin Suite: 1 W/SF
    - Auditorium: 1.5 W/SF
    - Cafeteria:0.75 W/SF
    - Classroom:0.75 W/SF
    - Conference:0.75 W/SF
    - Corridors: 0.2 W/SF
    - Gymnasium:1 W/SF
    - Lockers: 0.5 W/SF
    - Multipurpose: 0.75 W/SF
    - Office Space:1.5 W/SF
    - Storage Space: 0.2W/SF
    - Restrooms: 0.1 W/SF
    - IT/IDF: 5 W/SF
    - Electrical Rm: 5 W/SF
    - Media Center: 1.5 W/SF
    - Vocational Classrooms: 0.75 W/SF
    - Workshops: 5 W/SF
  - Occupancy
    - Interior/Furniture plans were used for occupancy inputs

## $B\Lambda L\Lambda$

## **Proposed System:**

The proposed building HVAC systems shall be as follows (based on 60%CD Set):

• Airside/Waterside:

Variable Refrigerant Flow (VRF) Heating/Cooling System

- 1. Central Heating and Cooling System:
  - Heating and cooling shall be accomplished via multiple air cooled heat recovery, simultaneous heating and cooling, VRF systems with air-cooled condensing units COP Range 3.73 – 4.14
- 2. Heating and Cooling for Classrooms, Locker/Shower, Offices, Media Center and Vocational Classrooms:
  - Space heating and cooling shall be accomplished via VRF fan coil units. The VRF fan coil units will be horizontal ducted type.
  - Ventilation air serving each classroom shall be provided with a variable air volume terminal unit connected to the return air duct or directly to a ceiling diffuser.
- 3. Classrooms, Locker/Shower, Vocational Classrooms, and Interior Ventilation Systems:
  - Outside ventilation air for classrooms and interior spaces will be provided by roof mounted dedicated outside air systems (HRUs/ERVs).
  - The HRU will be variable air volume and will include supply and exhaust fans with variable frequency drives, and total energy recovery wheel. The units will be provided with a DX coil connected to a dedicated VRF heat pump unit capable of heating and cooling.
  - Variable supply air will be based on demand from classrooms and interior spaces. Return/exhaust air shall be controlled by air flow measurement and tracking of the supply air with variable volume control terminals in the exhaust air system.
  - > Corridors will be provided with ventilation air from the HRU system.
- 4. Gymnasium, Auditorium, Events Entry, Cafeteria, Culinary, Cosmetology, Vocational Shops:
  - Will be served by rooftop or indoor heating and cooling air handling units (RTU/AHU). RTU-COP: 3.73
  - The Gymnasium unit will be single zone with a variable frequency drive to modulate the supply air during periods of low demand and occupancy.
- 5. Offices, Media Center, and Early Childhood Ed. Ventilation and Exhaust System:
  - The Locker Rooms and support spaces will be served by a variable volume roof mounted energy recovery ventilator (ERV).



- The unit will be multi zone with variable volume terminal units for supply and exhaust to each zone. Supply air will be based on demand from spaces. Return/exhaust air shall be constant volume in the locker/shower spaces and shall be controlled by air flow measurement and tracking of the supply air for the support spaces.
- Electric Unit Heater
  - Vestibules, Storages etc.
- AC Units
- COP 3.73 IDF, Electrical Rms, Network Telecom, Stairs

## **Baseline HVAC Equipment:**

ASHRAE 90.1 Appendix G System 8 – Floor by floor chilled water AHU's supplying VAV with Parallel fan-powered boxes equipped with hot water reheat.

- PFP with electric heat on perimeter / Shut-off VAV terminal units in interior
- Airside economizers required per section G3.1.2.6.

2 Equally sized, >600 tons water cooled centrifugal chillers at 0.570 kW/ton full load (Path A) equipped with variable speed chilled water and condenser water pumps.

 Chilled water pumps (Primary and Secondary) operate at 22 W/gpm; condenser water pumps operate at 19 W/gpm.

No boilers. Electric Resistance Heating system.

Cooling only spaces will be assigned with System-4 Packed single zone HP units. Heating only spaces will be assigned with Sytstem-10 Heating and ventilation units.

## **EXCLUSIONS:**

- Façade lighting or site lighting
- Domestic hot water heating
- Elevators



| Energy Consumption Results            |                  |             |  |  |  |
|---------------------------------------|------------------|-------------|--|--|--|
| Energy Consumption                    | ASHRAE 90.1 2010 | Proposed    |  |  |  |
| (MPTU-10A6btu///r)                    | Energy           | Energy      |  |  |  |
|                                       | Consumption      | Consumption |  |  |  |
|                                       | (MBTU)           | (MBTU)      |  |  |  |
| Lighting                              | 3,660            | 2,773       |  |  |  |
| Space Heating (Electric)              | 5,314            | 1,646       |  |  |  |
| Space Heating (Gas)                   | 1,004            | 1,679       |  |  |  |
| Space Cooling                         | 1,004            | 1,679       |  |  |  |
| Pumps                                 | 136              | 0           |  |  |  |
| Heat Rejection                        | 1,116            | 2           |  |  |  |
| Fans                                  | 2,789            | 2,532       |  |  |  |
| Receptacles                           | 5,682            | 5,682       |  |  |  |
| Total Energy (MBtu)                   | 19,702           | 14,314      |  |  |  |
| <b>Total Energy Reduction (%)</b>     |                  | 27%         |  |  |  |
| EUI (kbtu/sf)                         | 54 39            |             |  |  |  |
| Energy Consumption / Off-set Breakdow | vn               |             |  |  |  |
| Electricity (kWh)                     | 5,433,153        | 3,947,365   |  |  |  |
| Electricity Renewable (kWh) (+)       | 0                | 417,453     |  |  |  |
| Energy Cost Summary                   |                  |             |  |  |  |
| Electricity                           | \$ 923,636       | \$ 671,052  |  |  |  |
| Electricity (Renewable) Off-set (+)   | \$-              | \$ 70,967   |  |  |  |
| Total Cost                            | \$ 923,636       | \$ 600,085  |  |  |  |
| Total Energy Cost Reduction (%)       |                  | 35%         |  |  |  |

## GENERAL REQUIREMENTS LIFE CYCLE COST ANALYSIS – ENERGY & WATER

6B.3.1 - 09



## Northeast Metropolitan Regional Vocational High School Life-Cycle Cost Estimate Executive Summary

Included herein is a life cycle cost estimate for the proposed new Northeast Metropolitan Regional Vocational High School in accordance with the requirements of MGL Chapter 149 Section 44M and per MSBA design development guidelines. This estimate is provided for the HVAC and Plumbing systems.

## STUDY INPUTS

- It is assumed that the District's initial cost will be paid in the form of a municipal bond over a period of 30 years. The interest rate used to determine annual payments is based on 3.5% for the initial municipal bond and 3.5% for the future partial system replacement. The actual rates may differ.
- The study length is based on 30 years, which is consistent with the finance period.
- The discount rate for the cost of money is set at 3.5%.
- The cost for a partial system replacement in year 20 is based on 20% of the initial system cost.
- The initial cost to the district for the HVAC and Plumbing systems is \$17,488,178 after 50% MSBA reimbursement based on cost estimates. This cost is included in the overall bond financing for the project. This study does not include the total finance costs for the overall construction, only the HVAC and Plumbing portion.
- The estimated annual energy cost is \$579,000 (\$1.50 per SF) for the total electric utility cost including energy offsets from the projected electricity production from the utility company provide photovoltaic array. Actual costs may vary based on actual utility rates, building use, operation and climatic factors. An escalation rate of 3.5% is applied annually.
- Estimated annual maintenance costs are based on an estimated cost for an annual service contract by a local maintenance and service provider. Costs are based on \$118,087 (\$0.30 per SF) with a 3.25% annual escalation rate. Actual cost will depend on a final negotiated annual maintenance and service contract with a third party following the completion of construction.
- Salaries for maintenance and operations, supplies, or residual values have not been included.

#### STUDY RESULTS

- Cash flow details for principal and interest are provided based on equal payments. These payments are included in the general construction loan.
- The actual total life-cycle cash flow value for the 30-year period is \$73,913,889 with a total present worth life cycle cost of \$41,786,784.
- The portion of the life cycle cost related only to operating cost is \$36,977,015 with a present worth value of \$20,783,021 over the 30-year period.

Prepared by: Bala Consulting Engineers

Sean P. Sullivan, P.E. Associate, Senior Mechanical Engineer

> BALA CONSULTING ENGINEERS 52 TEMPLE PLACE BOSTON, MA 02111

617 357 6060 617 357 5188 FAX WWW.BALA.COM

## Lifecycle Summary

#### 01/13/2023

#### NE Metro High School- LCCE for HVAC and Plumbing 30 year life-cycle cost estimate for HVAC system finance and operating costs

| JU year me-cycle cost estimate for TVA | o system indrice and operating costs. |     |
|--|---------------------------------------|-----|
| Type of Analysis                       | Public Sector Lifecycle Analysis      |     |
| Type of Design Alternatives            | Independent                           |     |
| Length of Analysis                     |                                       | yrs |
| Discount Rate                          |                                       | %   |
|  |                                       |     |



## **Table 1. Executive Summary**

| Economic Criteria            | Best Design Case for Each Criteria             | Value (\$)   |
|------------------------------|--|--------------|
| Lowest Total Present Worth   | Life Cycle Cost Estimate for HVAC and Plumbing | \$41,786,784 |
| Lowest Annual Operating Cost | Life Cycle Cost Estimate for HVAC and Plumbing | \$697,087    |
| Lowest First Cost            | Life Cycle Cost Estimate for HVAC and Plumbing | \$17,488,178 |

## Table 2. Design Cases Ranked by Total Present Worth

| Design Case Name                               | Design Case<br>Short Name | Total Present<br>Worth (\$) | Annual Operating<br>Cost (\$/yr) | First Cost (\$) |
|--|---------------------------|-----------------------------|----------------------------------|-----------------|
| Life Cycle Cost Estimate for HVAC and Plumbing |                           | \$41,786,784                | \$697,087                        | \$17,488,178    |

## **Cash Flow Details**

## NE Metro High School- LCCE for HVAC and Plumbing

|    | 30 year life-cycle cost estimate for HVAC system finance and operating costs. |                                  |     |  |  |
|----|---|----------------------------------|-----|--|--|
| Ту | pe of Analysis  | Public Sector Lifecycle Analysis |     |  |  |
| Тy | pe of Design Alternatives   | Independent                      |     |  |  |
| Le | ngth of Analysis  |                                  | yrs |  |  |
| Di | scount Rate   |                                  | %   |  |  |



1A. Component Cash Flows [Life Cycle Cost Estimate for HVAC and Plumbing], Actual Value

| Year | Date    | Cash            | Loan           | Loan Interest | Total      | Annual    | Non-Annual | Total     | Total Cash |
|------|---------|-----------------|----------------|---------------|------------|-----------|------------|-----------|------------|
|      |         | Investment (\$) | Principal (\$) | (\$)          | Investment | Operating | Operating  | Operating | Flow (\$)  |
|      |         |                 |                |               | Cost (\$)  | Cost (\$) | Cost (\$)  | Cost (\$) |            |
| 0    | Initial | 0               | 0              | 0             | 0          | 0         | 0          | 0         | 0          |
| 1    | 2022    | 0               | 338,769        | 612,086       | 950,856    | 721,190   | 0          | 721,190   | 1,672,045  |
| 2    | 2023    | 0               | 350,626        | 600,229       | 950,856    | 746,127   | 0          | 746,127   | 1,696,982  |
| 3    | 2024    | 0               | 362,898        | 587,957       | 950,856    | 771,926   | 0          | 771,926   | 1,722,782  |
| 4    | 2025    | 0               | 375,600        | 575,256       | 950,856    | 798,619   | 0          | 798,619   | 1,749,474  |
| 5    | 2026    | 0               | 388,746        | 562,110       | 950,856    | 826,235   | 0          | 826,235   | 1,777,091  |
| 6    | 2027    | 0               | 402,352        | 548,504       | 950,856    | 854,807   | 0          | 854,807   | 1,805,662  |

Project: NEMT 60%CD Prepared By: BALA

| Year   | Date | Cash            | Loan           | Loan Interest | Total      | Annual     | Non-Annual | Total      | Total Cash |
|--------|------|-----------------|----------------|---------------|------------|------------|------------|------------|------------|
|        |      | Investment (\$) | Principal (\$) | (\$)          | Investment | Operating  | Operating  | Operating  | Flow (\$)  |
|        |      |                 |                |               | Cost (\$)  | Cost (\$)  | Cost (\$)  | Cost (\$)  |            |
| 7      | 2028 | 0               | 416,434        | 534,422       | 950,856    | 884,367    | 0          | 884,367    | 1,835,223  |
| 8      | 2029 | 0               | 431,009        | 519,846       | 950,856    | 914,951    | 0          | 914,951    | 1,865,806  |
| 9      | 2030 | 0               | 446,094        | 504,761       | 950,856    | 946,593    | 0          | 946,593    | 1,897,448  |
| 10     | 2031 | 0               | 461,708        | 489,148       | 950,856    | 979,330    | 0          | 979,330    | 1,930,186  |
| 11     | 2032 | 0               | 477,868        | 472,988       | 950,856    | 1,013,200  | 0          | 1,013,200  | 1,964,056  |
| 12     | 2033 | 0               | 494,593        | 456,263       | 950,856    | 1,048,242  | 0          | 1,048,242  | 1,999,098  |
| 13     | 2034 | 0               | 511,904        | 438,952       | 950,856    | 1,084,498  | 0          | 1,084,498  | 2,035,353  |
| 14     | 2035 | 0               | 529,820        | 421,035       | 950,856    | 1,122,008  | 0          | 1,122,008  | 2,072,863  |
| 15     | 2036 | 0               | 548,364        | 402,492       | 950,856    | 1,160,816  | 0          | 1,160,816  | 2,111,671  |
| 16     | 2037 | 0               | 567,557        | 383,299       | 950,856    | 1,200,967  | 0          | 1,200,967  | 2,151,823  |
| 17     | 2038 | 0               | 587,421        | 363,434       | 950,856    | 1,242,509  | 0          | 1,242,509  | 2,193,364  |
| 18     | 2039 | 0               | 607,981        | 342,875       | 950,856    | 1,285,488  | 0          | 1,285,488  | 2,236,344  |
| 19     | 2040 | 0               | 629,260        | 321,595       | 950,856    | 1,329,955  | 0          | 1,329,955  | 2,280,811  |
| 20     | 2041 | 0               | 651,284        | 299,571       | 950,856    | 1,375,962  | 0          | 1,375,962  | 2,326,817  |
| 21     | 2042 | 0               | 1,270,366      | 521,611       | 1,791,976  | 1,423,561  | 0          | 1,423,561  | 3,215,537  |
| 22     | 2043 | 0               | 1,314,829      | 477,148       | 1,791,976  | 1,472,807  | 0          | 1,472,807  | 3,264,784  |
| 23     | 2044 | 0               | 1,360,848      | 431,129       | 1,791,976  | 1,523,759  | 0          | 1,523,759  | 3,315,735  |
| 24     | 2045 | 0               | 1,408,477      | 383,499       | 1,791,976  | 1,576,474  | 0          | 1,576,474  | 3,368,451  |
| 25     | 2046 | 0               | 1,457,774      | 334,202       | 1,791,976  | 1,631,015  | 0          | 1,631,015  | 3,422,991  |
| 26     | 2047 | 0               | 1,508,796      | 283,180       | 1,791,976  | 1,687,444  | 0          | 1,687,444  | 3,479,420  |
| 27     | 2048 | 0               | 1,561,604      | 230,373       | 1,791,976  | 1,745,826  | 0          | 1,745,826  | 3,537,803  |
| 28     | 2049 | 0               | 1,616,260      | 175,716       | 1,791,976  | 1,806,230  | 0          | 1,806,230  | 3,598,206  |
| 29     | 2050 | 0               | 1,672,829      | 119,147       | 1,791,976  | 1,868,725  | 0          | 1,868,725  | 3,660,702  |
| 30     | 2051 | 0               | 1,731,378      | 60,598        | 1,791,976  | 1,933,384  | 0          | 1,933,384  | 3,725,361  |
| Totals |      | 0               | 24,483,449     | 12,453,426    | 36,936,880 | 36,977,015 | 0          | 36,977,015 | 73,913,889 |

## 1B. Present Worth Cash Flows [Life Cycle Cost Estimate for HVAC and Plumbing]

| Year | Date    | <b>Total Investment Cost</b> | <b>Total Operating Cost</b> | Total Present Worth |
|------|---------|------------------------------|-----------------------------|---------------------|
|      |         | (\$)                         | (\$)                        | (\$)                |
| 0    | Initial | 0                            | 0                           | 0                   |
| 1    | 2022    | 918,701                      | 696,802                     | 1,615,503           |
| 2    | 2023    | 887,634                      | 696,517                     | 1,584,151           |
| 3    | 2024    | 857,617                      | 696,233                     | 1,553,851           |
| 4    | 2025    | 828,616                      | 695,950                     | 1,524,566           |
| 5    | 2026    | 800,595                      | 695,668                     | 1,496,263           |
| 6    | 2027    | 773,522                      | 695,386                     | 1,468,907           |
| 7    | 2028    | 747,364                      | 695,105                     | 1,442,469           |

## Project: NEMT 60%CD Prepared By: BALA

| Year   | Date | <b>Total Investment Cost</b> | <b>Total Operating Cost</b> | Total Present Worth |
|--------|------|------------------------------|-----------------------------|---------------------|
|        |      | (\$)                         | (\$)                        | (\$)                |
| 8      | 2029 | 722,091                      | 694,824                     | 1,416,915           |
| 9      | 2030 | 697,672                      | 694,545                     | 1,392,217           |
| 10     | 2031 | 674,079                      | 694,265                     | 1,368,345           |
| 11     | 2032 | 651,284                      | 693,987                     | 1,345,271           |
| 12     | 2033 | 629,260                      | 693,709                     | 1,322,970           |
| 13     | 2034 | 607,981                      | 693,432                     | 1,301,413           |
| 14     | 2035 | 587,421                      | 693,156                     | 1,280,577           |
| 15     | 2036 | 567,557                      | 692,880                     | 1,260,437           |
| 16     | 2037 | 548,364                      | 692,605                     | 1,240,969           |
| 17     | 2038 | 529,820                      | 692,331                     | 1,222,151           |
| 18     | 2039 | 511,904                      | 692,057                     | 1,203,961           |
| 19     | 2040 | 494,593                      | 691,784                     | 1,186,377           |
| 20     | 2041 | 477,868                      | 691,511                     | 1,169,379           |
| 21     | 2042 | 870,132                      | 691,240                     | 1,561,371           |
| 22     | 2043 | 840,707                      | 690,968                     | 1,531,675           |
| 23     | 2044 | 812,277                      | 690,698                     | 1,502,975           |
| 24     | 2045 | 784,809                      | 690,428                     | 1,475,237           |
| 25     | 2046 | 758,269                      | 690,159                     | 1,448,429           |
| 26     | 2047 | 732,627                      | 689,891                     | 1,422,518           |
| 27     | 2048 | 707,853                      | 689,623                     | 1,397,475           |
| 28     | 2049 | 683,916                      | 689,355                     | 1,373,271           |
| 29     | 2050 | 660,788                      | 689,089                     | 1,349,877           |
| 30     | 2051 | 638,443                      | 688,823                     | 1,327,266           |
| Totals |      | 21,003,764                   | 20,783,021                  | 41,786,786          |

## **Design Case Inputs**

| Type of Analysis   |                |     |
|--------------------|----------------|-----|
| Length of Analysis |                | yrs |
| Income Taxes       | Not Considered | ,   |

## **General Information :**

Design Case Name ..... Life Cycle Cost Estimate for HVAC and Plumbing Design Case Short Name ....

Description :

30 year life-cycle cost estimate for HVAC system finance and operating costs.

## Investment Costs :

| Cost Item                         | Cost (\$)    | Year Incurred | Esc Rate | Salvage Value | Useful Life |
|-----------------------------------|--------------|---------------|----------|---------------|-------------|
|                                   |              |               | (%/yr)   | (\$)          | (yrs)       |
| Proposed Mech System Initial Cost | \$ 9,000,000 | 0             | 0.00     | \$ 0          | 30          |
| Proposed Mech System Initial Cost | \$ 8,488,178 | 0             | 0.00     | \$ 0          | 30          |
| Mech System Replacement Cost      | \$ 6,995,271 | 20            | 0.00     | \$ 0          | 10          |

#### Loans :

| Loan Item                            | Start Year | Investment<br>In Start Year<br>(\$) | Percent<br>Financed | Term Of<br>Loan (Years) | Interest Rate<br>(%/yr) | Payment Method |
|--------------------------------------|------------|-------------------------------------|---------------------|-------------------------|-------------------------|----------------|
| Municipal Bond Financing<br>for HVAC | 0          | \$ 24,483,449                       | 100                 | 30                      | 3.50                    | Equal Payments |
| Replacement Cost<br>Financing        | 20         | \$ 24,483,449                       | 100                 | 10                      | 3.50                    | Equal Payments |

## **Annual Operating Costs :**

| Cost Item                | Cost (\$)  | Start Year | Number Of Years | Esc Rate (%/yr) |
|--------------------------|------------|------------|-----------------|-----------------|
| Annual Energy Costs      | \$ 579,000 | 1          | 30              | 3.50            |
| Annual Maintenance Costs | \$ 118,087 | 1          | 30              | 3.25            |

There are no non-annual operating cost inputs

| Study Title      | NE Metro High School- LCCE for HVAC and Plumbing               |
|------------------|--|
| 30 yea<br>costs. | life-cycle cost estimate for HVAC system finance and operating |
| Type of Analysi  | Public Sector Lifecvcle Analysis                               |

|                             | C Decitor Ellecycle Analysis |     |
|-----------------------------|------------------------------|-----|
| Type of Design Alternatives | Independent                  |     |
| Base Year                   |                              |     |
| Currency Symbol             | \$                           |     |
| Length of Analysis          |                              | vrs |
| Discount Rate               | 3.50                         | %   |
|                             |                              |     |

68.3.1 - **10** 

# GENERAL REQUIREMENTS HVAC HEAT GAIN & LOSS CALCULATIONS

Air System Sizing Summary for AHU-1 (Metal Fab) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | AHU-1 (Meta | al Fab) |
|-----------------|-------------|---------|
| Equipment Class | SPL         | T AHÚ   |
| Air System Type | 8           | SZCAV   |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | 24.5  | Tons |
|---------------------------|-------|------|
| Total coil load           | 293.6 | MBH  |
| Sensible coil load        | 293.6 | MBH  |
| Coil CFM at Jul 1400      | 20000 | CFM  |
| Max block CFM             | 20000 | CFM  |
| Sum of peak zone CFM      | 20000 | CFM  |
| Sensible heat ratio       | 1.000 |      |
| CFM/Ton                   | 817.4 |      |
| ft²/Ton                   | 252.5 |      |
| BTU/(hr·ft <sup>2</sup> ) | 47.5  |      |
| Water flow @ 12.0 °F rise | . N/A |      |
|                           |       |      |

## **Central Heating Coil Sizing Data**

| Max coil load             | 1383.6 | MBH |
|---------------------------|--------|-----|
| Coil CFM at Des Htg       | 20000  | CFM |
| Max coil CFM              | 20000  | CFM |
| Water flow @ 30.0 °F drop | N/A    |     |

## **Supply Fan Sizing Data**

| Actual max CFM                 | 20000 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 19978 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 3.24  | CFM/ft <sup>2</sup> |

## **Return Fan Sizing Data**

0

| Actual max CFM         2000           Standard CFM         1997           Actual max CFM/ft²         3.2 | 00 CFM<br>78 CFM<br>24 CFM/ft <sup>2</sup> |  |
|--|--|--|
| utdoor Ventilation Air Data  |  |  |
| Design airflow CFM 2000  | 0 CFM                                      |  |
| CFM/ft <sup>2</sup> 3.2  | 24 CFM/ft <sup>2</sup>                     |  |

| Number of zones |                | 1       |     |
|-----------------|----------------|---------|-----|
| Floor Area      |                | 6178.2  | ft² |
| Location        | Boston, Massac | husetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| _oad occurs at Jul 1400            |    |
|------------------------------------|----|
| DA DB / WB                         | °F |
| Entering DB / WB 87.0 / 74.0       | °F |
| _eaving DB / WB 73.4 / 70.1        | °F |
| Coil ADP 71.9                      | °F |
| Bypass Factor 0.100                |    |
| Resulting RH 70                    | %  |
| Design supply temp 55.0            | °F |
| Zone T-stat Check 1 of 1           | OK |
| Max zone temperature deviation 0.0 | °F |

| Load occurs at Des Htg          |    |
|---------------------------------|----|
| BTU/(hr·ft <sup>2</sup> ) 224.0 |    |
| Ent. DB / Lvg DB 7.0 / 71.1     | °F |

| Fan motor BHP | 27.51  | BHP   |
|---------------|--------|-------|
| Fan motor kW  | 21.83  | kW    |
| Fan static    | . 4.00 | in wg |

| Fan motor BHP         13           Fan motor kW         10           Fan static         2 | 8.76<br>9.91<br>2.00 | BHP<br>kW<br>in wg |
|---|----------------------|--------------------|
| CFM/person  | 6.65                 | CFM/person         |

| Air System Name AHU-1 (Metal Fab) | Number of zones 1                 |
|-----------------------------------|-----------------------------------|
| Equipment Class SPLT AHU          | Floor Area 6178.2 ft <sup>2</sup> |
| Air System Type SZCAV             | Location Boston, Massachusetts    |

## Sizing Calculation Information

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Ċoil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 20000   | 20000   | 3.24                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 48.2     | Jul 1400      | 52.3    | 6178.2 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| C004 METAL FABRICATION    | 1     | 49.3                         | Jul 1400                            | 19505                | 46.2                     | 5716.6                 | 3.41             |
| C004A - OFF               | 1     | 2.7                          | Jul 1100                            | 200                  | 2.1                      | 127.6                  | 1.57             |
| C004D TOOL CRIB           | 1     | 0.0                          | Jan 0000                            | 75                   | 0.6                      | 81.3                   | 0.92             |
| C004E STORAGE             | 1     | 0.0                          | Jan 0000                            | 220                  | 3.2                      | 252.7                  | 0.87             |

Air System Sizing Summary for AHU-2 (Auto Collision) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | AHU-2 (Auto Collision) |
|-----------------|------------------------|
| Equipment Class | SPLT AHU               |
| Air System Type | SZCAV                  |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | 23.1  | Tons |
|---------------------------|-------|------|
| Total coil load 2         | 277.6 | MBH  |
| Sensible coil load 2      | 277.6 | MBH  |
| Coil CFM at Aug 1400 2    | 0003  | CFM  |
| Max block CFM 2           | 0003  | CFM  |
| Sum of peak zone CFM 2    | 0003  | CFM  |
| Sensible heat ratio 1     | .000  |      |
| CFM/Ton 8                 | 364.5 |      |
| ft²/Ton                   | 800.9 |      |
| BTU/(hr·ft <sup>2</sup> ) | 39.9  |      |
| Water flow @ 12.0 °F rise | N/A   |      |
|                           |       |      |

## **Central Heating Coil Sizing Data**

| Max coil load             | 1366.7 | MBH |
|---------------------------|--------|-----|
| Coil CFM at Des Htg       | 20003  | CFM |
| Max coil CFM              | 20003  | CFM |
| Water flow @ 30.0 °F drop | N/A    |     |

## **Supply Fan Sizing Data**

| Actual max CFM                 | 20003 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 19981 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 2.87  | CFM/ft <sup>2</sup> |

## **Return Fan Sizing Data**

0

| Actual max CFM         2000           Standard CFM         1998           Actual max CFM/ft²         2.8 | <ul> <li>3 CFM</li> <li>1 CFM</li> <li>37 CFM/ft<sup>2</sup></li> </ul> |
|--|---|
| utdoor Ventilation Air Data  |   |
| Design airflow CFM 2000  | O CFM   |
| CFM/ft <sup>2</sup> 2.8  | 7 CFM/ft <sup>2</sup>   |

| Number of zones |                | 1       |     |
|-----------------|----------------|---------|-----|
| Floor Area      |                | 6960.9  | ft² |
| Location        | Boston, Massac | husetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Aug 1400            |    |
|------------------------------------|----|
| OA DB / WB                         | °F |
| Entering DB / WB 87.0 / 74.0       | °F |
| Leaving DB / WB 74.1 / 70.3        | °F |
| Coil ADP                           | °F |
| Bypass Factor 0.100                |    |
| Resulting RH 69                    | %  |
| Design supply temp 55.0            | °F |
| Zone T-stat Check 1 of 1           | OK |
| Max zone temperature deviation 0.0 | °F |

| Load occurs at Des Htg          |    |
|---------------------------------|----|
| BTU/(hr·ft <sup>2</sup> ) 196.3 |    |
| Ent. DB / Lvg DB 7.0 / 70.3     | °F |

| Fan motor BHP | 27.52  | BHP   |
|---------------|--------|-------|
| Fan motor kW  | 21.83  | kW    |
| Fan static    | . 4.00 | in wg |

| Fan motor BHP         13.7           Fan motor kW         10.9           Fan static         2.0 | 6 BHP<br>1 kW<br>0 in wg |
|---|--------------------------|
| CFM/person 490.2  | 0 CFM/person             |

Zone Sizing Summary for AHU-2 (Auto Collision) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

## **Air System Information**

| Air System Name AHU-2 (Auto Collision) | Number of zones 1                 |
|--|-----------------------------------|
| Equipment Class SPLT AHÚ               | Floor Area 6960.9 ft <sup>2</sup> |
| Air System Type SZCAV                  | Location Boston, Massachusetts    |

## **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## **Zone Terminal Sizing Data**

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Ċoil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 20003   | 20003   | 2.87                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 43.8     | Jul 1100      | 36.4    | 6960.9 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| C022 Auto Collision       | 1     | 36.4                         | Jul 1100                            | 19235                | 33.1                     | 6339.8                 | 3.03             |
| C022A Service             | 1     | 1.7                          | Jul 1400                            | 208                  | 3.4                      | 96.2                   | 2.16             |
| C022B Tool Crib           | 1     | 2.7                          | Jan 1100                            | 110                  | 0.0                      | 134.9                  | 0.82             |
| C022E OFF                 | 1     | 2.8                          | Jan 1100                            | 250                  | 0.0                      | 179.0                  | 1.40             |
| C022F STOR                | 1     | 0.4                          | Jan 1100                            | 200                  | 0.0                      | 211.0                  | 0.95             |

Air System Sizing Summary for AHU-3 (Auto Tech) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

## **Air System Information**

| Air System Name | AHU-3 (Auto Tech) |
|-----------------|-------------------|
| Equipment Class | SPLT AHU          |
| Air System Type | SZCAV             |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | . 26.4 | Tons |
|---------------------------|--------|------|
| Total coil load           | 316.8  | MBH  |
| Sensible coil load        | 290.9  | MBH  |
| Coil CFM at Aug 1400      | 15745  | CFM  |
| Max block CFM             | 15745  | CFM  |
| Sum of peak zone CFM      | 15745  | CFM  |
| Sensible heat ratio       | 0.918  |      |
| CFM/Ton                   | 596.3  |      |
| ft²/Ton                   | 426.7  |      |
| BTU/(hr·ft <sup>2</sup> ) | . 28.1 |      |
| Water flow @ 12.0 °F rise | N/A    |      |
|                           |        |      |

## **Central Heating Coil Sizing Data**

| Max coil load             | 1146.0 | MBH |
|---------------------------|--------|-----|
| Coil CFM at Des Htg       | 15745  | CFM |
| Max coil CFM              | 15745  | CFM |
| Water flow @ 30.0 °F drop | N/A    |     |

## **Supply Fan Sizing Data**

| Actual max CFM                 | 15745 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 15728 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 1.40  | CFM/ft <sup>2</sup> |

## **Return Fan Sizing Data**

| Actual max CFM 1574                | 5 CFM                 |
|------------------------------------|-----------------------|
| Standard CFM 1572                  | 28 CFM                |
| Actual max CFM/ft <sup>2</sup> 1.4 | O CFM/ft <sup>2</sup> |
|                                    |                       |
|                                    |                       |

## **Outdoor Ventilation Air Data**

| Design airflow CFM 1 | 5745 | CFM                 |
|----------------------|------|---------------------|
| CFM/ft <sup>2</sup>  | 1.40 | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      | 11267.0               | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| _oad occurs at Aug 1400            |    |
|------------------------------------|----|
| DA DB / WB                         | °F |
| Entering DB / WB 87.0 / 74.0       | °F |
| _eaving DB / WB 69.9 / 68.6        | °F |
| Coil ADP 68.0                      | °F |
| Bypass Factor 0.100                |    |
| Resulting RH 68                    | %  |
| Design supply temp 55.0            | °F |
| Zone T-stat Check 1 of 1           | OK |
| Max zone temperature deviation 0.0 | °F |

| Load occurs at Des Htg                 |    |
|--|----|
| BTU/(hr·ft <sup>2</sup> ) <b>101.7</b> |    |
| Ent. DB / Lvg DB 7.0 / 74.5            | °F |

| Fan motor BHP | 21.66 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 17.18 | kW    |
| Fan static    | 4.00  | in wg |

| Fan motor BHP         10.83           Fan motor kW         8.59           Fan static         2.00 | BHP<br>kW<br>in wg |
|---|--------------------|
| CFM/person 190.16   | CFM/person         |

| Air System Name AHU-3 (Auto Tech) | Number of zones 1                  |
|-----------------------------------|------------------------------------|
| Equipment Class SPLT AHU          | Floor Area 11267.0 ft <sup>2</sup> |
| Air System Type SZCAV             | Location Boston, Massachusetts     |

### Sizing Calculation Information

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Coil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 15745   | 15745   | 1.40                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone    |
|-----------|----------|---------------|---------|---------|
|           | Cooling  | Time of       | Heating | Floor   |
|           | Sensible | Peak Sensible | Load    | Area    |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)   |
| Zone 1    | 95.0     | Jul 1100      | 106.8   | 11267.0 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| D003 AUTO TECHNOLOGY      | 1     | 83.8                         | Jul 1100                            | 13625                | 96.7                     | 9245.1                 | 1.47             |
| D003A OFF                 | 1     | 2.5                          | Jan 1400                            | 100                  | 0.0                      | 164.4                  | 0.61             |
| D003F - TOOL CRIB         | 1     | 0.5                          | Jan 1100                            | 70                   | 0.0                      | 267.3                  | 0.26             |
| D003G Stor                | 1     | 0.6                          | Jan 1100                            | 75                   | 0.9                      | 283.6                  | 0.26             |
| D003H Small Engines       | 1     | 7.9                          | Jan 1400                            | 1625                 | 5.2                      | 1200.1                 | 1.35             |
| D003J STOR                | 1     | 0.5                          | Jul 1500                            | 250                  | 4.0                      | 106.5                  | 2.35             |

| Air System Name | AHU-4 (Electrical Tech) |
|-----------------|-------------------------|
| Equipment Class | SPLT AHU                |
| Air System Type | SZCAV                   |

## **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | . 17.6 | Tons |
|---------------------------|--------|------|
| Total coil load           | 211.8  | MBH  |
| Sensible coil load        | 179.4  | MBH  |
| Coil CFM at Aug 1400      | 9405   | CFM  |
| Max block CFM             | 9405   | CFM  |
| Sum of peak zone CFM      | 9405   | CFM  |
| Sensible heat ratio       | 0.847  |      |
| CFM/Ton                   | 532.9  |      |
| ft²/Ton                   | 593.6  |      |
| BTU/(hr·ft <sup>2</sup> ) | . 20.2 |      |
| Water flow @ 12.0 °F rise | N/A    |      |
|                           |        |      |

## **Central Heating Coil Sizing Data**

| Max coil load             | 136.1 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 9405  | CFM |
| Max coil CFM              | 9405  | CFM |
| Water flow @ 30.0 °F drop | N/A   |     |

## **Supply Fan Sizing Data**

| Actual max CFM                 | 9405 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 9395 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.90 | CFM/ft <sup>2</sup> |

## **Return Fan Sizing Data**

| Actual max CFM<br>Standard CFM<br>Actual max CFM/ft²                      |              | CFM<br>CFM<br>CFM/ft <sup>2</sup> |
|---|--------------|-----------------------------------|
| Outdoor Ventilation Air Data<br>Design airflow CFM<br>CFM/ft <sup>2</sup> | 1960<br>0.19 | CFM<br>CFM/ft²                    |

| Number of zones | 1                     |     |
|-----------------|-----------------------|-----|
| Floor Area      | 10477.0               | ft² |
| _ocation        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| °F |
|----|
| °F |
| °F |
| °F |
|    |
| %  |
| °F |
| OK |
| °F |
|    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| BTU/(hr·ft²) 13.0            |    |
| Ent. DB / Lvg DB 59.5 / 72.9 | °F |

| Fan motor BHP | 12.94 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 10.26 | kW    |
| Fan static    | 4.00  | in wg |

| Fan motor BHP | 6.47  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 5.13  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 25.33 | CFM/person |

| Air System Name AHU-4 (Electrical Tech) | Number of zones 1                         |
|---|---|
| Equipment Class SPLT AHU                | Floor Area <b>10477.0</b> ft <sup>2</sup> |
| Air System Type SZCAV                   | Location Boston, Massachusetts            |

## **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## **Zone Terminal Sizing Data**

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Ċoil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 9405    | 9405    | 0.90                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone    |
|-----------|----------|---------------|---------|---------|
|           | Cooling  | Time of       | Heating | Floor   |
|           | Sensible | Peak Sensible | Load    | Area    |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)   |
| Zone 1    | 95.1     | Jul 1400      | 51.1    | 10477.0 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| B104 ELECTRICAL TECH      | 1     | 90.3                         | Jul 1400                            | 8914                 | 51.1                     | 9325.1                 | 0.96             |
| B104C TOOL CRIB           | 1     | 1.2                          | Jan 1100                            | 121                  | 0.0                      | 608.3                  | 0.20             |
| B104D TOOL CRIB           | 1     | 0.7                          | Jan 1100                            | 65                   | 0.0                      | 327.5                  | 0.20             |
| B104H OFF                 | 1     | 3.1                          | Jan 1100                            | 304                  | 0.0                      | 216.1                  | 1.41             |

| Air System Name | AHU-5 (HVAC Tech) |
|-----------------|-------------------|
| Equipment Class | SPLT AHÚ          |
| Air System Type | SZCAV             |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | 15.8  | Tons |
|---------------------------|-------|------|
| Total coil load           | 189.8 | MBH  |
| Sensible coil load        | 152.5 | MBH  |
| Coil CFM at Aug 1400      | 7275  | CFM  |
| Max block CFM             | 7275  | CFM  |
| Sum of peak zone CFM      | 7275  | CFM  |
| Sensible heat ratio       | 0.803 |      |
| CFM/Ton                   | 459.9 |      |
| ft²/Ton                   | 496.1 |      |
| BTU/(hr·ft <sup>2</sup> ) | 24.2  |      |
| Water flow @ 12.0 °F rise | . N/A |      |
|                           |       |      |

## **Central Heating Coil Sizing Data**

| Max coil load             | 163.6 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 7275  | CFM |
| Max coil CFM              | 7275  | CFM |
| Water flow @ 30.0 °F drop | N/A   |     |

## **Supply Fan Sizing Data**

| Actual max CFM                 | 7275 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 7267 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.93 | CFM/ft <sup>2</sup> |

## **Return Fan Sizing Data**

| Actual max CFM  | 7275         | CFM                 |
|---|--------------|---------------------|
| Standard CFM  | 7267         | CFM                 |
| Actual max CFM/ft²  | 0.93         | CFM/ft <sup>2</sup> |
| Outdoor Ventilation Air Data<br>Design airflow CFM<br>CFM/ft <sup>2</sup> | 2091<br>0.27 | CFM<br>CFM/ft²      |

| Number of zones         | 1       |     |
|-------------------------|---------|-----|
| Floor Area              | 7847.1  | ft² |
| Location Boston, Massac | husetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| _oad occurs at Aug 1400            |    |
|------------------------------------|----|
| DA DB / WB                         | °F |
| Entering DB / WB 83.6 / 70.6       | °F |
| _eaving DB / WB 64.2 / 63.0        | °F |
| Coil ADP 62.1                      | °F |
| Bypass Factor 0.100                |    |
| Resulting RH 55                    | %  |
| Design supply temp 55.0            | °F |
| Zone T-stat Check 1 of 1           | OK |
| Max zone temperature deviation 0.0 | °F |

| Load occurs at     | Des Htg    |    |
|--------------------|------------|----|
| BTU/(hr·ft²)       | 20.9       |    |
| Ent. DB / Lvg DB 5 | 4.4 / 75.2 | °F |

| Fan motor BHP | 10.01 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 7.94  | kW    |
| Fan static    | 4.00  | in wg |

| Fan motor BHP | 5.00  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 3.97  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 31.40 | CFM/person |

| Air System Name AHU-5 (HVAC Tech) | Number of zones 1                        |
|-----------------------------------|--|
| Equipment Class SPLT AHU          | Floor Area <b>7847.1</b> ft <sup>2</sup> |
| Air System Type SZCAV             | Location Boston, Massachusetts           |

## **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## **Zone Terminal Sizing Data**

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Coil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 7275    | 7275    | 0.93                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 82.7     | Aug 1400      | 52.5    | 7847.1 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| 20110 1                   |       |                              |                                     |                      |                          |                        |                  |
| B103 HVAC TECHNOLOGY      | 1     | 78.1                         | Aug 1400                            | 6893                 | 52.0                     | 7203.3                 | 0.96             |
| B103F TOOL CRIB           | 1     | 1.0                          | Jul 1100                            | 80                   | 0.3                      | 150.0                  | 0.54             |
| B103G TOOL CRIB           | 1     | 0.3                          | Jul 1400                            | 28                   | 0.2                      | 150.0                  | 0.19             |
| B103H TOOL CRIB           | 1     | 0.3                          | Jan 1100                            | 26                   | 0.0                      | 163.9                  | 0.16             |
| B103I OFF                 | 1     | 3.1                          | Jan 1100                            | 247                  | 0.0                      | 179.9                  | 1.37             |

| Air System Name | AHU-6 (Plumbing and Pipefitting) |
|-----------------|----------------------------------|
| Equipment Class | SPLT AHU                         |
| Air System Type | SZCAV                            |

## **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load 15           | .7 Tons |
|------------------------------|---------|
| Total coil load 188          | .8 MBH  |
| Sensible coil load 146       | .3 MBH  |
| Coil CFM at Jul 1400 657     | 0 CFM   |
| Max block CFM 657            | 70 CFM  |
| Sum of peak zone CFM 657     | 0 CFM   |
| Sensible heat ratio 0.77     | 75      |
| CFM/Ton 417                  | .5      |
| ft²/Ton 465                  | .4      |
| BTU/(hr·ft <sup>2</sup> ) 25 | .8      |
| Water flow @ 12.0 °F rise N/ | Α       |
|                              |         |

## **Central Heating Coil Sizing Data**

| Max coil load             | 160.2 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 6570  | CFM |
| Max coil CFM              | 6570  | CFM |
| Water flow @ 30.0 °F drop | N/A   |     |

## **Supply Fan Sizing Data**

| Actual max CFM                 | 6570 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 6563 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.90 | CFM/ft <sup>2</sup> |

## **Return Fan Sizing Data**

| Actual max CFM  | 6570         | CFM                 |
|---|--------------|---------------------|
| Standard CFM  | 6563         | CFM                 |
| Actual max CFM/ft²  | 0.90         | CFM/ft <sup>2</sup> |
| Outdoor Ventilation Air Data<br>Design airflow CFM<br>CFM/ft <sup>2</sup> | 2110<br>0.29 | CFM<br>CFM/ft²      |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| _oad occurs at                 | Jul 1400    |    |
|--------------------------------|-------------|----|
| DA DB / WB                     | 87.0 / 74.0 | °F |
| Entering DB / WB 8             | 84.0 / 70.6 | °F |
| _eaving DB / WB 6              | 3.3 / 62.1  | °F |
| Coil ADP                       | 61.0        | °F |
| Bypass Factor                  | 0.100       |    |
| Resulting RH                   | 54          | %  |
| Design supply temp.            | 58.0        | °F |
| Zone T-stat Check              | 1 of 1      | OK |
| Max zone temperature deviation | <b>0.0</b>  | °F |
|                                |             |    |

| Load occurs at Des Htg         |    |
|--------------------------------|----|
| BTU/(hr·ft <sup>2</sup> ) 21.9 |    |
| Ent. DB / Lvg DB 52.0 / 74.6   | °F |

| Fan motor BHP | 9.04 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 7.17 | kW    |
| Fan static    | 4.00 | in wg |

| Fan motor BHP | 4.52  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 3.59  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 26.34 | CFM/person |

| Air System Name AHU-6 (Plumbing and Pipefitting) | Number of zones 1                 |
|--|-----------------------------------|
| Equipment Class SPLT AHU                         | Floor Area 7324.5 ft <sup>2</sup> |
| Air System Type SZCAV                            | Location Boston, Massachusetts    |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Ċoil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 6570    | 6570    | 0.90                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 76.8     | Jul 1400      | 46.4    | 7324.5 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft <sup>2</sup> |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                              |
| B101 PLUMBING - PIPEFITT  | 1     | 72.5                         | Jul 1400                            | 6192                 | 46.4                     | 6421.4                 | 0.96                         |
| B101F OFF                 | 1     | 3.0                          | Jan 1100                            | 253                  | 0.0                      | 180.1                  | 1.41                         |
| B101G TOOL CRIB           | 1     | 0.8                          | Jan 1100                            | 69                   | 0.0                      | 398.8                  | 0.17                         |
| B101H TOOL CRIB           | 1     | 0.7                          | Jan 1100                            | 56                   | 0.0                      | 324.3                  | 0.17                         |

Air System Sizing Summary for AHU-7 Carpentry Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

## **Air System Information**

| Air System Name | <br>AHU-7 Carpentry |
|-----------------|---------------------|
| Equipment Class | <br>SPLT AHU        |
| Air System Type | <br>SZCAV           |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | . 16.3 | Tons |
|---------------------------|--------|------|
| Total coil load           | 195.7  | MBH  |
| Sensible coil load        | 160.7  | MBH  |
| Coil CFM at Aug 1400      | 8265   | CFM  |
| Max block CFM             | 8265   | CFM  |
| Sum of peak zone CFM      | 8265   | CFM  |
| Sensible heat ratio       | 0.821  |      |
| CFM/Ton                   | 506.9  |      |
| ft²/Ton                   | 564.5  |      |
| BTU/(hr·ft <sup>2</sup> ) | . 21.3 |      |
| Water flow @ 12.0 °F rise | N/A    |      |
|                           |        |      |

## **Central Heating Coil Sizing Data**

| Max coil load             | 165.0 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 8265  | CFM |
| Max coil CFM              | 8265  | CFM |
| Water flow @ 30.0 °F drop | N/A   |     |

## **Supply Fan Sizing Data**

| Actual max CFM                 | 8265 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 8256 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.90 | CFM/ft <sup>2</sup> |

## **Return Fan Sizing Data**

| Actual max CFM  | 8265         | CFM                 |
|---|--------------|---------------------|
| Standard CFM  | 8256         | CFM                 |
| Actual max CFM/ft²  | 0.90         | CFM/ft <sup>2</sup> |
| Outdoor Ventilation Air Data<br>Design airflow CFM<br>CFM/ft <sup>2</sup> | 2400<br>0.26 | CFM<br>CFM/ft²      |

| Number of zones |                | 1       |     |
|-----------------|----------------|---------|-----|
| Floor Area      |                | 9205.5  | ft² |
| _ocation        | Boston, Massac | husetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| _oad occurs at Aug 1400        |    |
|--------------------------------|----|
| DA DB / WB                     | °F |
| Entering DB / WB 83.5 / 71.1   | °F |
| _eaving DB / WB 65.5 / 64.3    | °F |
| Coil ADP 63.5                  | °F |
| Bypass Factor 0.100            |    |
| Resulting RH 58                | %  |
| Design supply temp 55.0        | °F |
| Zone T-stat Check 1 of 1       | OK |
| Max zone temperature deviation | °F |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| BTU/(hr·ft²) 17.9            |    |
| Ent. DB / Lvg DB 54.1 / 72.6 | °F |

| Fan motor BHP | 11.37 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 9.02  | kW    |
| Fan static    | 4.00  | in wg |

| Fan motor BHP | 5.69  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 4.51  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 36.04 | CFM/person |

| Air System Name AHU-7 Carpentry | Number of zones 1                 |  |
|---------------------------------|-----------------------------------|--|
| Equipment Class SPLT AHU        | Floor Area 9205.5 ft <sup>2</sup> |  |
| Air System Type SZCAV           | Location Boston, Massachusetts    |  |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Ċoil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 8265    | 8265    | 0.90                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 83.3     | Jul 1400      | 40.8    | 9205.5 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| A141 CARPENTRY            | 1     | 77.9                         | Jul 1400                            | 7713                 | 40.8                     | 8103.8                 | 0.95             |
| A141E STOR                | 1     | 0.7                          | Jan 1100                            | 69                   | 0.0                      | 342.7                  | 0.20             |
| A141F OFF                 | 1     | 3.9                          | Jan 1100                            | 391                  | 0.0                      | 300.2                  | 1.30             |
| A141G TOOL CRIB           | 1     | 0.9                          | Jan 1100                            | 92                   | 0.0                      | 458.8                  | 0.20             |

Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | AHU-8 | (Cafeteria) |
|-----------------|-------|-------------|
| Equipment Class |       | SPLT AHU    |
| Air System Type |       | VAV         |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | 37.2  | Tons |
|---------------------------|-------|------|
| Total coil load           | 446.8 | MBH  |
| Sensible coil load        | 323.8 | MBH  |
| Coil CFM at Jul 1400      | 10831 | CFM  |
| Max block CFM at Jul 1400 | 11460 | CFM  |
| Sum of peak zone CFM      | 11609 | CFM  |
| Sensible heat ratio       | 0.725 |      |
| CFM/Ton                   | 290.9 |      |
| ft²/Ton                   | 296.2 |      |
| BTU/(hr·ft <sup>2</sup> ) | 40.5  |      |
| Water flow @ 12.0 °F rise | N/A   |      |
| -                         |       |      |

Preheat Coil Sizing Data No heating coil loads occurred during this calculation.

## **Supply Fan Sizing Data**

| Actual max CFM at Jul 1400     | 11460 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 11448 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 1.04  | CFM/ft <sup>2</sup> |

#### **Return Fan Sizing Data**

| Actual max CFM at Jul 1400     | 11460 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 11448 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 1.04  | CFM/ft <sup>2</sup> |

## **Outdoor Ventilation Air Data**

| Design airflow CFM  | 7025 | CFM                 |
|---------------------|------|---------------------|
| CFM/ft <sup>2</sup> | 0.64 | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| )           |
|-------------|
| )°F         |
| <b>3</b> °F |
| 2°F         |
| <b>3</b> °F |
| )           |
| 5 %         |
| )°F         |
| OK          |
| 7°F         |
|             |

| Fan motor BHP | 17.74 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 14.07 | kW    |
| Fan static    | 4.50  | in wg |

| Fan motor BHP | 7.88  | BHP        |  |
|---------------|-------|------------|--|
| Fan motor kW  | 6.25  | kW         |  |
| Fan static    | 2.00  | in wg      |  |
| CFM/person    | 13.79 | CFM/person |  |

| Air System Name AHU-8 | (Cafeteria) | Number of zones 7              |     |
|-----------------------|-------------|--------------------------------|-----|
| Equipment Class       | SPLT AHÚ    | Floor Area 11030.2 f           | ft² |
| Air System Type       | VAV         | Location Boston, Massachusetts |     |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

## Zone Terminal Sizing Data

| Zone Name | Design<br>Supply<br>Airflow<br>(CFM) | Minimum<br>Supply<br>Airflow<br>(CFM) | Zone<br>CFM/ft² | Reheat<br>Coil<br>Load<br>(MBH) | Reheat<br>Coil<br>Water<br>gpm<br>@ 30.0 °F | Zone<br>Htg Unit<br>Coil<br>Load<br>(MBH) | Zone<br>Htg Unit<br>Water<br>gpm<br>@ 30.0 °F | Mixing<br>Box Fan<br>Airflow<br>(CFM) |
|-----------|--------------------------------------|---------------------------------------|-----------------|---------------------------------|---|---|---|---------------------------------------|
| Zone 1    | 3212                                 | 1285                                  | 1.91            | 103.2                           | -   | 0.0                                       | -   | 3212                                  |
| Zone 2    | 5886                                 | 5297                                  | 0.91            | 228.6                           | -   | 0.0                                       | -   | 0                                     |
| Zone 3    | 894                                  | 268                                   | 1.45            | 27.1                            | -   | 0.0                                       | -   | 894                                   |
| Zone 4    | 140                                  | 28                                    | 0.98            | 4.0                             | -   | 0.0                                       | -   | 140                                   |
| Zone 5    | 751                                  | 300                                   | 0.69            | 13.0                            | -   | 0.0                                       | -   | 0                                     |
| Zone 6    | 263                                  | 88                                    | 0.59            | 8.2                             | -   | 0.0                                       | -   | 263                                   |
| Zone 7    | 116                                  | 116                                   | 0.20            | 5.0                             | -   | 0.0                                       | -   | 0                                     |

## Zone Peak Sensible Loads

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 54.8     | Jul 1400      | 79.7    | 1679.8 |
| Zone 2    | 127.0    | Sep 1400      | 28.1    | 6469.6 |
| Zone 3    | 13.8     | Jul 1400      | 22.2    | 616.9  |
| Zone 4    | 1.9      | Jul 1400      | 3.5     | 143.0  |
| Zone 5    | 16.2     | Jul 1100      | 1.2     | 1091.8 |
| Zone 6    | 3.8      | Jul 1400      | 6.5     | 449.8  |
| Zone 7    | 1.2      | Jan 1100      | 0.0     | 579.3  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| A114 CAFE EXT             | 1     | 54.8                         | Jul 1400                            | 3152                 | 79.7                     | 1679.8                 | 1.88             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| A114 CAFETERIA            | 1     | 127.0                        | Sep 1400                            | 5886                 | 28.1                     | 6469.6                 | 0.91             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| A111 STAFF LUNCH RM       | 1     | 13.8                         | Jul 1400                            | 877                  | 22.2                     | 616.9                  | 1.42             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| A104 OFF                  | 1     | 1.9                          | Jul 1400                            | 137                  | 3.5                      | 143.0                  | 0.96             |
| Zone 5                    |       |                              |                                     |                      |                          |                        |                  |
| A112 SERVERY              | 1     | 16.2                         | Jul 1100                            | 751                  | 1.2                      | 1091.8                 | 0.69             |
| Zone 6                    |       |                              |                                     |                      |                          |                        |                  |
| A110 RECEIVING            | 1     | 3.8                          | Jul 1400                            | 259                  | 6.5                      | 449.8                  | 0.57             |
| Zone 7                    |       |                              |                                     |                      |                          |                        |                  |
| A117 CHAIR STORAGE        | 1     | 1.2                          | Jan 1100                            | 116                  | 0.0                      | 579.3                  | 0.20             |

| Air System Name | AHU-9 Prefunction Corridor |
|-----------------|----------------------------|
| Equipment Class | SPLT AHU                   |
| Air System Type | SZCAV                      |

### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

## **Central Cooling Coil Sizing Data**

| Total coil load           | 18.7  | Tons |
|---------------------------|-------|------|
| Total coil load           | 224.1 | MBH  |
| Sensible coil load        | 166.9 | MBH  |
| Coil CFM at Jul 1400      | 6581  | CFM  |
| Max block CFM             | 6581  | CFM  |
| Sum of peak zone CFM      | 6581  | CFM  |
| Sensible heat ratio       | 0.745 |      |
| CFM/Ton                   | 352.5 |      |
| ft²/Ton                   | 682.1 |      |
| BTU/(hr·ft <sup>2</sup> ) | 17.6  |      |
| Water flow @ 12.0 °F rise | . N/A |      |
|                           |       |      |

## **Central Heating Coil Sizing Data**

| Max coil load 4.6             | MBH |
|-------------------------------|-----|
| Coil CFM at Des Htg 6581      | CFM |
| Max coil CFM                  | CFM |
| Water flow @ 30.0 °F drop N/A |     |

#### **Preheat Coil Sizing Data**

No heating coil loads occurred during this calculation.

## **Supply Fan Sizing Data**

| Actual max CFM                 | 6581 | CFM     |
|--------------------------------|------|---------|
| Standard CFM                   | 6574 | CFM     |
| Actual max CFM/ft <sup>2</sup> | 0.52 | CFM/ft² |

#### **Return Fan Sizing Data**

| Actual max CFM  | 6581<br>6574<br>0.52 | CFM<br>CFM<br>CFM/ft <sup>2</sup> |
|---|----------------------|-----------------------------------|
| Outdoor Ventilation Air Data<br>Design airflow CFM<br>CFM/ft <sup>2</sup> | 932<br>0.07          | CFM<br>CFM/ft <sup>2</sup>        |

| Number of zones | 1                     |     |
|-----------------|-----------------------|-----|
| Floor Area      | 12735.8               | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Jul 1400            |    |
|------------------------------------|----|
| OA DB / WB                         | °F |
| Entering DB / WB 78.1 / 65.1       | °F |
| Leaving DB / WB 54.5 / 53.4        | °F |
| Coil ADP 51.9                      | °F |
| Bypass Factor 0.100                |    |
| Resulting RH 52                    | %  |
| Design supply temp 58.0            | °F |
| Zone T-stat Check 0 of 1           | OK |
| Max zone temperature deviation 0.2 | °F |

| Load occurs at     | Des Htg    |    |
|--------------------|------------|----|
| BTU/(hr·ft²)       | 0.4        |    |
| Ent. DB / Lvg DB 7 | 0.9 / 71.5 | °F |

| Fan motor BHP | 9.05 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 7.18 | kW    |
| Fan static    | 4.00 | in wg |
|               |      |       |

| Fan motor BHP | 4.53 | BHP   |  |
|---------------|------|-------|--|
| Fan motor kW  | 3.59 | kW    |  |
| Fan static    | 2.00 | in wg |  |
|               |      |       |  |

CFM/person ..... 2.07 CFM/person
# **Air System Information**

| Air System Name AHU-9 Prefunction Corridor | Number of zones 1                         |
|--|---|
| Equipment Class SPLT AHU                   | Floor Area <b>12735.8</b> ft <sup>2</sup> |
| Air System Type SZCAV                      | Location Boston, Massachusetts            |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

# **Zone Terminal Sizing Data**

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Coil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 6384    | 6384    | 0.50                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone    |
|-----------|----------|---------------|---------|---------|
|           | Cooling  | Time of       | Heating | Floor   |
|           | Sensible | Peak Sensible | Load    | Area    |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)   |
| Zone 1    | 108.6    | Jul 1400      | 21.2    | 12735.8 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft <sup>2</sup> |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                              |
| C105 CORRIDOR South       | 1     | 35.4                         | Jan 1400                            | 1933                 | 0.0                      | 2591.1                 | 0.75                         |
| C201 CORRIDOR South       | 1     | 13.1                         | Jul 1400                            | 781                  | 12.6                     | 2263.4                 | 0.35                         |
| C206 CORRIDOR             | 1     | 3.0                          | Jul 1100                            | 361                  | 1.4                      | 1442.1                 | 0.25                         |
| D201 CORRIDOR             | 1     | 11.9                         | Jan 1400                            | 649                  | 0.0                      | 1303.4                 | 0.50                         |
| C105 CORRIDOR North       | 1     | 35.8                         | Jul 1400                            | 1951                 | 0.6                      | 2682.2                 | 0.73                         |
| C204 PHYS ED STOR         | 1     | 0.1                          | Jul 1500                            | 28                   | 0.2                      | 112.8                  | 0.25                         |
| C205 PHYS ED STOR         | 1     | 0.3                          | Jul 1700                            | 151                  | 2.4                      | 222.5                  | 0.68                         |
| C201 CORRIDOR North       | 1     | 9.0                          | Jul 1400                            | 530                  | 4.0                      | 2118.3                 | 0.25                         |

Air System Sizing Summary for AHU-10 (Multi Use Space) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | AHU-10 (Multi Use Space) |
|-----------------|--------------------------|
| Equipment Class | SPLT AHU                 |
| Air System Type | SZCAV                    |

# **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Central Cooling Coil Sizing Data**

| Total coil load           | . 40.9 | Tons |
|---------------------------|--------|------|
| Total coil load           | 490.7  | MBH  |
| Sensible coil load        | 360.8  | MBH  |
| Coil CFM at Jul 1400      | 9894   | CFM  |
| Max block CFM             | 9894   | CFM  |
| Sum of peak zone CFM      | 9894   | CFM  |
| Sensible heat ratio       | 0.735  |      |
| CFM/Ton                   | 241.9  |      |
| ft²/Ton                   | 253.5  |      |
| BTU/(hr·ft <sup>2</sup> ) | . 47.3 |      |
| Water flow @ 12.0 °F rise | N/A    |      |
|                           |        |      |

### **Central Heating Coil Sizing Data**

| Max coil load             | 218.4 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 9894  | CFM |
| Max coil CFM              | 9894  | CFM |
| Water flow @ 30.0 °F drop | N/A   |     |

#### **Preheat Coil Sizing Data**

No heating coil loads occurred during this calculation.

#### **Supply Fan Sizing Data**

| Actual max CFM  | 9894         | CFM            |
|---|--------------|----------------|
| Standard CFM  | 9883         | CFM            |
| Actual max CFM/ft²  | 0.95         | CFM/ft²        |
| Return Fan Sizing Data  |              |                |
| Actual max CFM  | 9894         | CFM            |
| Standard CFM  | 9883         | CFM            |
| Actual max CFM/ft²  | 0.95         | CFM/ft²        |
| Outdoor Ventilation Air Data<br>Design airflow CFM<br>CFM/ft <sup>2</sup> | 6622<br>0.64 | CFM<br>CFM/ft² |

| Number of zones | 1                     |     |
|-----------------|-----------------------|-----|
| Floor Area      | 10366.3               | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Jul 1400            |    |
|------------------------------------|----|
| OA DB / WB                         | °F |
| Entering DB / WB                   | °F |
| Leaving DB / WB 51.5 / 50.1        | °F |
| Coil ADP 47.8                      | °F |
| Bypass Factor                      |    |
| Resulting RH 47                    | %  |
| Design supply temp 55.0            | °F |
| Zone T-stat Check 0 of 1           | OK |
| Max zone temperature deviation 0.2 | °F |

| Load occurs at     | Des Htg    |    |
|--------------------|------------|----|
| BTU/(hr·ft²)       | 21.1       |    |
| Ent. DB / Lvg DB 6 | 1.3 / 81.8 | °F |

| Fan motor BHP | 13.61 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 10.80 | kW    |
| Fan static    | 4.00  | in wg |

| Fan motor BHP | 6.81 | BHP   |  |
|---------------|------|-------|--|
| Fan motor kW  | 5.40 | kW    |  |
| Fan static    | 2.00 | in wg |  |
|               |      |       |  |

CFM/person ...... 9.20 CFM/person

#### **Air System Information**

| Air System Name AHU-10 (Multi Use Space) | Number of zones 1                  |
|--|------------------------------------|
| Equipment Class SPLT AHU                 | Floor Area 10366.3 ft <sup>2</sup> |
| Air System Type SZCAV                    | Location Boston, Massachusetts     |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

# Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Coil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 9894    | 9894    | 0.95                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone    |
|-----------|----------|---------------|---------|---------|
|           | Cooling  | Time of       | Heating | Floor   |
|           | Sensible | Peak Sensible | Load    | Area    |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)   |
| Zone 1    | 203.5    | Jul 1400      | 153.4   | 10366.3 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| C117 MULTIPURPOSE ROOM    | 1     | 202.6                        | Jul 1400                            | 9388                 | 145.2                    | 10053.0                | 0.93             |
| C117C STORAGE             | 1     | 0.5                          | Jul 2100                            | 297                  | 4.8                      | 127.2                  | 2.33             |
| C117D STORAGE             | 1     | 0.5                          | Jul 1400                            | 209                  | 3.4                      | 186.1                  | 1.12             |

# Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-1 (Admin Area A) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | ERU-1 (Admin Area A) |
|-----------------|----------------------|
| Equipment Class | TERM                 |
| Air System Type | VRF                  |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| Total coil load 0.           | 5 Tons    |
|------------------------------|-----------|
| Total coil load 5.           | 8 MBH     |
| Total coil load 1429.        | 2 CFM/Ton |
| Sensible coil load 5.        | 8 MBH     |
| Coil CFM at Aug 1400 69      | 5 CFM     |
| Max coil CFM 69              | 5 CFM     |
| Sensible heat ratio 1.00     | 0         |
| Water flow @ 10.0 °F rise N/ | <b>م</b>  |

#### Heating Coil Sizing Data

| Max coil load             | 9.7 | MBH |
|---------------------------|-----|-----|
| Coil CFM at Des Htg       | 695 | CFM |
| Max coil CFM              | 695 | CFM |
| Water flow @ 20.0 °F drop | N/A |     |

# **Ventilation Fan Sizing Data**

| Actual max CFM                 | 695  | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 694  | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.10 | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 695  | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 694  | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.10 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |      |                     |
|------------------------------|------|---------------------|
| Design airflow CFM           | 695  | CFM                 |
| CFM/ft <sup>2</sup>          | 0.10 | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Aug 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 80.2 / 72.1 | °F |
| Leaving DB / WB 72.4 / 69.8  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.5 / 67.4 | °F |

| Fan motor BHP | 0.72 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 0.57 | kW    |
| Fan static    | 3.00 | in wg |

| Fan motor BHP | 0.48  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 0.38  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 14.30 | CFM/person |

#### **Air System Information**

| Air System Name ERU-1 (Admin Area A) | Number of zones 15                |  |
|--------------------------------------|-----------------------------------|--|
| Equipment Class TERM                 | Floor Area 7133.3 ft <sup>2</sup> |  |
| Air System Type VRF                  | Location Boston, Massachusetts    |  |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | . Sum of space airflow rates |
|--------------------|------------|------------------|------------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads  |

# **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 14.5  | 14.5  | 75.3 / 65.4 | 62.2 / 61.0 | -         | Sep 1600  | 2.01                |
| Zone 2    | 9.5   | 4.6   | 75.5 / 69.5 | 55.0 / 54.7 | -         | Aug 1000  | 0.09                |
| Zone 3    | 18.5  | 15.1  | 75.5 / 64.9 | 58.5 / 57.5 | -         | Jul 1500  | 0.91                |
| Zone 4    | 7.0   | 4.1   | 75.6 / 66.9 | 55.0 / 54.3 | -         | Jul 1200  | 0.46                |
| Zone 5    | 7.8   | 5.9   | 75.5 / 66.3 | 60.4 / 59.5 | -         | Jul 0900  | 1.22                |
| Zone 6    | 2.9   | 2.6   | 75.4 / 65.4 | 60.3 / 59.3 | -         | Aug 1500  | 1.26                |
| Zone 7    | 3.0   | 2.7   | 75.4 / 65.0 | 59.8 / 58.8 | -         | Sep 1500  | 1.27                |
| Zone 8    | 5.4   | 4.9   | 75.7 / 65.5 | 60.8 / 59.8 | -         | Sep 1500  | 1.19                |
| Zone 9    | 3.3   | 2.9   | 75.7 / 65.4 | 60.2 / 59.2 | -         | Sep 1200  | 1.22                |
| Zone 10   | 3.2   | 2.8   | 75.7 / 65.1 | 59.8 / 58.8 | -         | Sep 1300  | 1.25                |
| Zone 11   | 6.5   | 5.8   | 75.6 / 64.4 | 58.5 / 57.4 | -         | Sep 1100  | 1.15                |
| Zone 12   | 7.7   | 6.4   | 75.5 / 63.8 | 56.5 / 55.4 | -         | Aug 1000  | 1.02                |
| Zone 13   | 9.8   | 6.6   | 76.0 / 65.5 | 55.0 / 54.1 | -         | Aug 1000  | 0.29                |
| Zone 14   | 2.2   | 1.2   | 76.1 / 67.3 | 55.0 / 54.3 | -         | Aug 1000  | 0.19                |
| Zone 15   | 4.5   | 4.0   | 75.4 / 65.0 | 59.9 / 58.9 | -         | Jul 0900  | 1.61                |

# Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 18.7    | 69.3 / 86.2 | -        | 1028    | 0.000 | 0.000 | 0       |
| Zone 2    | 0.0     | 0.0 / 0.0   | 0.00     | 207     | 0.000 | 0.000 | 150     |
| Zone 3    | 11.6    | 69.3 / 82.3 | -        | 824     | 0.000 | 0.000 | 120     |
| Zone 4    | 0.7     | 69.8 / 73.3 | -        | 186     | 0.000 | 0.000 | 90      |
| Zone 5    | 6.6     | 69.2 / 86.1 | -        | 364     | 0.000 | 0.000 | 75      |
| Zone 6    | 2.8     | 68.9 / 85.5 | -        | 156     | 0.000 | 0.000 | 15      |
| Zone 7    | 2.8     | 68.9 / 85.5 | -        | 158     | 0.000 | 0.000 | 15      |
| Zone 8    | 5.5     | 68.9 / 85.5 | -        | 307     | 0.000 | 0.000 | 20      |
| Zone 9    | 3.1     | 69.1 / 86.1 | -        | 172     | 0.000 | 0.000 | 15      |
| Zone 10   | 2.9     | 68.9 / 85.5 | -        | 164     | 0.000 | 0.000 | 15      |
| Zone 11   | 5.6     | 69.1 / 85.9 | -        | 312     | 0.000 | 0.000 | 25      |
| Zone 12   | 5.6     | 69.0 / 85.7 | -        | 313     | 0.000 | 0.000 | 35      |
| Zone 13   | 0.0     | 0.0 / 0.0   | 0.00     | 292     | 0.000 | 0.000 | 80      |
| Zone 14   | 0.0     | 0.0 / 0.0   | 0.00     | 55      | 0.000 | 0.000 | 25      |
| Zone 15   | 4.3     | 69.1 / 85.8 | -        | 239     | 0.000 | 0.000 | 15      |

#### **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 75.1             | 6.3               | 70.4             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |

| Total Required ODU Capacity | 75.1 | 6.3 | 70.4 |
|-----------------------------|------|-----|------|

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 13.9     | Sep 1600      | 18.9    | 510.7  |
| Zone 2    | 4.5      | j Jan 1100    | 0.0     | 2203.1 |
| Zone 3    | 12.5     | 6 Aug 1500    | 11.9    | 908.8  |
| Zone 4    | 4.0      | ) Jul 1400    | 0.8     | 407.7  |
| Zone 5    | 5.2      | 2 Jul 1400    | 6.7     | 299.0  |
| Zone 6    | 2.5      | 5 Sep 1500    | 2.9     | 123.7  |
| Zone 7    | 2.5      | 5 Sep 1500    | 2.9     | 125.0  |
| Zone 8    | 4.7      | ' Sep 1500    | 5.6     | 258.8  |
| Zone 9    | 2.7      | ' Sep 1300    | 3.1     | 141.2  |
| Zone 10   | 2.6      | Sep 1300      | 3.0     | 131.3  |
| Zone 11   | 5.0      | ) Sep 1100    | 5.7     | 270.2  |
| Zone 12   | 5.3      | Jul 1100      | 5.7     | 307.4  |
| Zone 13   | 6.3      | Jan 1100      | 0.0     | 1015.1 |
| Zone 14   | 1.2      | 2 Jan 1400    | 0.0     | 282.7  |
| Zone 15   | 3.4      | Jul 1000      | 4.4     | 148.6  |

|                          |       | Cooling  | Time of  | ٨٠٣   | Heating | Floor  |                     |
|--------------------------|-------|----------|----------|-------|---------|--------|---------------------|
| Zone Name /              |       | Sensible | Sensible | Flow  | Load    | Area   | Space               |
| Space Name               | Mult. | (MBH)    | Load     | (CFM) | (MBH)   | (ft²)  | CFM/ft <sup>2</sup> |
| Zone 1                   |       |          |          |       |         |        |                     |
| A118 VEST                | 1     | 13.9     | Sep 1600 | 1028  | 18.9    | 510.7  | 2.01                |
| Zone 2                   |       |          |          |       |         |        |                     |
| A119 LOBBY               | 1     | 4.5      | Jan 1100 | 207   | 0.0     | 2203.1 | 0.09                |
| Zone 3                   |       |          |          |       |         |        |                     |
| A120 WAITING             | 1     | 1.4      | Jul 1400 | 67    | 0.3     | 193.0  | 0.35                |
| A121 RECEPTION           | 1     | 2.8      | Jul 1400 | 128   | 0.2     | 196.0  | 0.66                |
| A122 ATTENDANCE          | 1     | 1.8      | Sep 1600 | 171   | 3.1     | 105.6  | 1.62                |
| A123 SECRETARY           | 1     | 4.4      | Jul 1700 | 268   | 4.9     | 166.1  | 1.61                |
| A124 OFFICE-MAIN         | 1     | 2.9      | Aug 1700 | 178   | 3.3     | 138.1  | 1.29                |
| A139 MAIL                | 1     | 0.3      | Jul 1400 | 12    | 0.1     | 110.0  | 0.11                |
| Zone 4                   |       |          |          |       |         |        |                     |
| A140 CONF                | 1     | 4.0      | Jul 1400 | 186   | 0.8     | 407.7  | 0.46                |
| Zone 5                   |       |          |          |       |         |        |                     |
| A138 SPED CONF           | 1     | 5.2      | Jul 1400 | 364   | 6.7     | 299.0  | 1.22                |
| Zone 6                   |       |          |          |       |         |        |                     |
| A126 SRO                 | 1     | 2.5      | Sep 1500 | 156   | 2.9     | 123.7  | 1.26                |
| Zone 7                   |       |          |          |       |         |        |                     |
| A127 PRINCIPALS SECRETAR | 1     | 2.5      | Sep 1500 | 158   | 2.9     | 125.0  | 1.27                |
| Zone 8                   |       |          |          |       |         |        |                     |
| A128 PRIN OFF            | 1     | 4.7      | Sep 1500 | 307   | 5.6     | 258.8  | 1.19                |
| Zone 9                   |       |          |          |       |         |        |                     |
| A129 COOP COORD          | 1     | 2.7      | Sep 1300 | 172   | 3.1     | 141.2  | 1.22                |
| Zone 10                  |       |          |          |       |         |        |                     |
| A129a - COOP COORD       | 1     | 2.6      | Sep 1300 | 164   | 3.0     | 131.3  | 1.25                |
| Zone 11                  |       |          |          |       |         |        |                     |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| A130 ADULT ED             | 1     | 5.0                          | Sep 1100                            | 312                  | 5.7                      | 270.2                  | 1.15             |
| Zone 12                   |       |                              |                                     |                      |                          |                        |                  |
| A135 SPED OFF             | 1     | 2.7                          | Aug 1100                            | 149                  | 2.7                      | 161.3                  | 0.92             |
| A136 SPED OFF             | 1     | 2.6                          | Jul 1100                            | 164                  | 3.0                      | 146.1                  | 1.12             |
| Zone 13                   |       |                              |                                     |                      |                          |                        |                  |
| A131 DUPLICATING          | 1     | 4.8                          | Jan 1100                            | 221                  | 0.0                      | 265.0                  | 0.83             |
| A125 CORRIDOR             | 1     | 1.5                          | Jan 1100                            | 70                   | 0.0                      | 750.1                  | 0.09             |
| Zone 14                   |       |                              |                                     |                      |                          |                        |                  |
| A132 RECORDS              | 1     | 1.2                          | Jan 1400                            | 55                   | 0.0                      | 282.7                  | 0.19             |
| Zone 15                   |       |                              |                                     |                      |                          |                        |                  |
| A137 SPED DIR             | 1     | 3.4                          | Jul 1000                            | 239                  | 4.4                      | 148.6                  | 1.61             |

# Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-2 (Dept Staff) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | <br>ERU-2 (Dept Staff) |
|-----------------|------------------------|
| Equipment Class | <br>TERM               |
| Air System Type | <br>VRF                |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| Total coil load 0.           | 2 Tons    |
|------------------------------|-----------|
| Total coil load 2.           | 5 MBH     |
| Total coil load 1367.        | 3 CFM/Ton |
| Sensible coil load 2.        | 5 MBH     |
| Coil CFM at Jul 1400 28      | 5 CFM     |
| Max coil CFM 28              | 5 CFM     |
| Sensible heat ratio 1.00     | 0         |
| Water flow @ 10.0 °F rise N/ | <b>A</b>  |

#### **Heating Coil Sizing Data**

| Max coil load             | 3.8 | MBH |
|---------------------------|-----|-----|
| Coil CFM at Des Htg       | 285 | CFM |
| Max coil CFM              | 285 | CFM |
| Water flow @ 20.0 °F drop | N/A |     |

# Ventilation Fan Sizing Data

| Actual max CFM                 | 285  | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 285  | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.14 | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 285  | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 285  | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.14 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |      |                     |
|------------------------------|------|---------------------|
| Design airflow CFM           | 285  | CFM                 |
| CFM/ft <sup>2</sup>          | 0.14 | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

Zone CFM Sizing ...... Sum of space airflow rates Space CFM Sizing ...... Individual peak space loads

| Load occurs at Jul 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 80.5 / 72.2 | °F |
| Leaving DB / WB 72.4 / 69.8  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.9 / 67.4 | °F |

| Fan motor BHP | 0.29 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 0.23 | kW    |
| Fan static    | 3.00 | in wg |

| Fan motor BHP | 0.20  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 0.16  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 16.67 | CFM/person |

#### **Air System Information**

| Air System Name ERU-2 (Dept Staff) | Number of zones 5                 |
|------------------------------------|-----------------------------------|
| Equipment Class TERM               | Floor Area 2091.2 ft <sup>2</sup> |
| Air System Type VRF                | Location Boston, Massachusetts    |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 2.7   | 1.8   | 76.5 / 65.7 | 55.0 / 54.1 | -         | Jul 1000  | 0.53                |
| Zone 2    | 2.7   | 1.9   | 76.5 / 65.7 | 55.0 / 54.1 | -         | Jul 1000  | 0.52                |
| Zone 3    | 15.6  | 10.5  | 76.4 / 65.7 | 55.0 / 54.1 | -         | Jul 1000  | 0.35                |
| Zone 4    | 1.7   | 0.8   | 75.0 / 70.6 | 57.4 / 57.2 | -         | Jul 0900  | 0.18                |
| Zone 5    | 4.7   | 2.6   | 76.0 / 67.7 | 55.0 / 54.4 | -         | Jul 1000  | 0.45                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

| Zone Name | Heating<br>Coil<br>Load<br>(MBH) | Heating<br>Coil<br>Ent/Lvg<br>DB<br>(°F) | Htg Coil<br>Water<br>Flow<br>@20.0 °F<br>(gpm) | Fan<br>Design<br>Airflow<br>(CFM) | Fan<br>Motor<br>(BHP) | Fan<br>Motor<br>(kW) | OA Vent<br>Design<br>Airflow<br>(CFM) |
|-----------|----------------------------------|--|--|-----------------------------------|-----------------------|----------------------|---------------------------------------|
| Zone 1    | 0.0                              | 0.0 / 0.0                                | 0.00   | 79                                | 0.000                 | 0.000                | 25                                    |
| Zone 2    | 0.0                              | 0.0 / 0.0                                | 0.00   | 80                                | 0.000                 | 0.000                | 25                                    |
| Zone 3    | 0.0                              | 0.0 / 0.0                                | 0.00   | 453                               | 0.000                 | 0.000                | 130                                   |
| Zone 4    | 0.0                              | 0.0 / 0.0                                | 0.00   | 40                                | 0.000                 | 0.000                | 40                                    |
| Zone 5    | 0.0                              | 0.0 / 0.0                                | 0.00   | 116                               | 0.000                 | 0.000                | 65                                    |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 17.5             | 1.5               | 0.0              |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 17.5             | 1.5               | 0.0              |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 1.7                                  | Jan 1100                                 | 0.0                              | 150.1                          |
| Zone 2    | 1.7                                  | Jan 1100                                 | 0.0                              | 152.3                          |
| Zone 3    | 9.8                                  | Jan 1100                                 | 0.0                              | 1301.8                         |
| Zone 4    | 0.6                                  | Jan 1400                                 | 0.0                              | 227.0                          |
| Zone 5    | 2.5                                  | Jan 1400                                 | 0.0                              | 259.9                          |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| B219 ACAD PROG            | 1     | 1.7                          | Jan 1100                            | 79                   | 0.0                      | 150.1                  | 0.53             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| B226 AP1                  | 1     | 1.7                          | Jan 1100                            | 80                   | 0.0                      | 152.3                  | 0.52             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| B218G DEPART HEADS        | 1     | 9.8                          | Jan 1100                            | 453                  | 0.0                      | 1301.8                 | 0.35             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| B227 RECORDS              | 1     | 0.6                          | Jan 1400                            | 40                   | 0.0                      | 227.0                  | 0.18             |
| Zone 5                    |       |                              |                                     |                      |                          |                        |                  |
| B229 CONF                 | 1     | 2.5                          | Jan 1400                            | 116                  | 0.0                      | 259.9                  | 0.45             |

# Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-3 (Child Dev) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | ERU-3 (Child Dev) |
|-----------------|-------------------|
| Equipment Class | TERM              |
| Air System Type | VRF               |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| Total coil load 0.7           | Tons    |
|-------------------------------|---------|
| Total coil load 8.8           | MBH     |
| Total coil load 1453.9        | CFM/Ton |
| Sensible coil load 8.8        | MBH     |
| Coil CFM at Jul 1400 1065     | CFM     |
| Max coil CFM 1065             | CFM     |
| Sensible heat ratio 1.000     |         |
| Water flow @ 10.0 °F rise N/A |         |

#### Heating Coil Sizing Data

| Max coil load             | 15.1 | MBH |
|---------------------------|------|-----|
| Coil CFM at Des Htg       | 1065 | CFM |
| Max coil CFM              | 1065 | CFM |
| Water flow @ 20.0 °F drop | N/A  |     |

# Ventilation Fan Sizing Data

| Actual max CFM                 | 1065 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 1064 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.29 | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 1065 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 1064 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.29 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |      |                     |
|------------------------------|------|---------------------|
| Design airflow CFM           | 1065 | CFM                 |
| CFM/ft <sup>2</sup>          | 0.29 | CFM/ft <sup>2</sup> |

| Number of zones |                 | 7      |     |
|-----------------|-----------------|--------|-----|
| Floor Area      |                 | 3644.5 | ft² |
| Location        | Boston, Massach | usetts |     |

Zone CFM Sizing ...... Sum of space airflow rates Space CFM Sizing ...... Individual peak space loads

| Load occurs at Jul 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 80.1 / 72.1 | °F |
| Leaving DB / WB 72.4 / 69.8  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.2 / 67.4 | °F |

| Fan motor BHP | 1.10 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 0.87 | kW    |
| Fan static    | 3.00 | in wg |

| Fan motor BHP | 0.73  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 0.58  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 14.61 | CFM/person |

Air System Information

| Air System Name ERU-3 (Child Dev) | Number of zones                   |
|-----------------------------------|-----------------------------------|
| Equipment Class TERM              | Floor Area 3644.5 ft <sup>2</sup> |
| Air System Type VRF               | Location Boston, Massachusetts    |

#### Sizing Calculation Information

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

# **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 4.7   | 3.6   | 75.6 / 64.2 | 55.9 / 54.9 | -         | Aug 1400  | 1.39                |
| Zone 2    | 20.7  | 13.8  | 75.1 / 68.7 | 63.9 / 63.3 | -         | Jul 0800  | 1.36                |
| Zone 3    | 1.3   | 0.6   | 75.0 / 70.6 | 57.0 / 56.8 | -         | Jul 1400  | 0.16                |
| Zone 4    | 19.2  | 9.9   | 75.3 / 68.4 | 55.0 / 54.5 | -         | Aug 1400  | 0.81                |
| Zone 5    | 7.9   | 5.1   | 75.4 / 66.2 | 56.6 / 55.8 | -         | Jul 1300  | 1.06                |
| Zone 6    | 7.6   | 6.6   | 75.2 / 69.8 | 67.6 / 67.1 | -         | Aug 1400  | 3.35                |
| Zone 7    | 10.2  | 5.1   | 75.4 / 70.2 | 62.0 / 61.6 | -         | Jul 1000  | 0.24                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 2.9     | 69.3 / 85.0 | -        | 171     | 0.000 | 0.000 | 25      |
| Zone 2    | 19.9    | 69.3 / 85.5 | -        | 1141    | 0.000 | 0.000 | 425     |
| Zone 3    | 0.4     | 70.0 / 81.9 | -        | 30      | 0.000 | 0.000 | 30      |
| Zone 4    | 6.2     | 69.8 / 82.5 | -        | 453     | 0.000 | 0.000 | 300     |
| Zone 5    | 4.5     | 69.4 / 86.1 | -        | 250     | 0.000 | 0.000 | 85      |
| Zone 6    | 14.7    | 69.3 / 86.2 | -        | 811     | 0.000 | 0.000 | 85      |
| Zone 7    | 6.2     | 69.3 / 85.7 | -        | 354     | 0.000 | 0.000 | 115     |

### **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 43.4             | 3.6               | 54.9             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 43.4             | 3.6               | 54.9             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### **Zone Peak Sensible Loads**

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 3.7                                  | Sep 1500                                 | 2.9                              | 123.3                          |
| Zone 2    | 12.8                                 | Jul 1400                                 | 20.9                             | 836.2                          |
| Zone 3    | 0.6                                  | Jul 1400                                 | 0.3                              | 188.7                          |
| Zone 4    | 9.8                                  | Sep 1400                                 | 6.2                              | 559.0                          |

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 5    | 4.8      | Jul 1400      | 4.6     | 235.6  |
| Zone 6    | 6.6      | Jul 1400      | 14.9    | 242.1  |
| Zone 7    | 4.5      | Jul 1400      | 6.5     | 1459.6 |

|                           |       | Cooling           | Time of<br>Peak  | Air           | Heating       | Floor         |                              |
|---------------------------|-------|-------------------|------------------|---------------|---------------|---------------|------------------------------|
| Zone Name /<br>Space Name | Mult. | Sensible<br>(MBH) | Sensible<br>Load | Flow<br>(CFM) | Load<br>(MBH) | Area<br>(ft²) | Space<br>CFM/ft <sup>2</sup> |
| Zone 1                    |       |                   |                  |               |               |               |                              |
| C106F KITCHEN             | 1     | 3.7               | Sep 1500         | 171           | 2.9           | 123.3         | 1.39                         |
| Zone 2                    |       |                   |                  |               |               |               |                              |
| C106 EARLY CHILDHOOD EDU  | 1     | 12.8              | Jul 1400         | 1141          | 20.9          | 836.2         | 1.36                         |
| Zone 3                    |       |                   |                  |               |               |               |                              |
| C106A CUBBIES             | 1     | 0.6               | Jul 1400         | 30            | 0.3           | 188.7         | 0.16                         |
| Zone 4                    |       |                   |                  |               |               |               |                              |
| C106B RELATED CR          | 1     | 9.8               | Sep 1400         | 453           | 6.2           | 559.0         | 0.81                         |
| Zone 5                    |       |                   |                  |               |               |               |                              |
| C109 DRESSING             | 1     | 4.8               | Jul 1400         | 250           | 4.6           | 235.6         | 1.06                         |
| Zone 6                    |       |                   |                  |               |               |               |                              |
| C110 DRESSING             | 1     | 6.6               | Jul 1400         | 811           | 14.9          | 242.1         | 3.35                         |
| Zone 7                    |       |                   |                  |               |               |               |                              |
| C111 CORRIDOR             | 1     | 4.5               | Jul 1400         | 354           | 6.5           | 1459.6        | 0.24                         |

# Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-4 (Media Center) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

**Air System Information** 

| Air System Name | ERU-4 (Media Center) |
|-----------------|----------------------|
| Equipment Class | TERM                 |
| Air System Type | VRF                  |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| 6 Tons    |
|-----------|
| B MBH     |
| 1 CFM/Ton |
| B MBH     |
| 4 CFM     |
| 4 CFM     |
| D         |
| 4         |
|           |

#### Heating Coil Sizing Data

| Max coil load             | 31.1 | MBH |
|---------------------------|------|-----|
| Coil CFM at Des Htg       | 2224 | CFM |
| Max coil CFM              | 2224 | CFM |
| Water flow @ 20.0 °F drop | N/A  |     |

### **Ventilation Fan Sizing Data**

| Actual max CFM                 | 2224 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 2221 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.33 | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 2224 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 2221 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.33 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |      |     |
|------------------------------|------|-----|
| Design airflow CFM           | 2224 | CFM |

|                     | <br>     |                     |
|---------------------|----------|---------------------|
| CFM/ft <sup>2</sup> | <br>0.33 | CFM/ft <sup>2</sup> |
|                     |          |                     |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Jul 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 80.2 / 72.1 | °F |
| Leaving DB / WB 72.4 / 69.8  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.4 / 67.4 | °F |

| Fan motor BHP | 2.29 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 1.82 | kW    |
| Fan static    | 3.00 | in wg |

| Fan motor BHP | 1.53  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 1.21  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 15.84 | CFM/person |

Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name ERU-4 (Media Center) | Number of zones 10                |
|--------------------------------------|-----------------------------------|
| Equipment Class TERM                 | Floor Area 6710.6 ft <sup>2</sup> |
| Air System Type VRF                  | Location Boston, Massachusetts    |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

# **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 147.4 | 113.5 | 75.7 / 65.8 | 59.2 / 58.3 | -         | Aug 1400  | 2.05                |
| Zone 2    | 29.5  | 14.2  | 75.2 / 69.2 | 55.0 / 54.7 | -         | Jul 1200  | 0.62                |
| Zone 3    | 4.9   | 2.5   | 75.3 / 68.5 | 55.0 / 54.6 | -         | Aug 1200  | 0.85                |
| Zone 4    | 3.0   | 2.2   | 75.6 / 66.7 | 60.3 / 59.5 | -         | Jul 1400  | 1.26                |
| Zone 5    | 3.0   | 2.2   | 75.4 / 66.7 | 60.3 / 59.5 | -         | Jul 1300  | 1.24                |
| Zone 6    | 2.0   | 1.2   | 76.4 / 66.9 | 55.0 / 54.3 | -         | Aug 1000  | 0.35                |
| Zone 7    | 4.5   | 2.5   | 76.2 / 67.8 | 55.0 / 54.4 | -         | Aug 1000  | 0.32                |
| Zone 8    | 18.3  | 10.6  | 75.9 / 67.2 | 55.0 / 54.3 | -         | Jul 1000  | 0.49                |
| Zone 9    | 1.2   | 0.5   | 75.3 / 70.8 | 55.0 / 54.9 | -         | Aug 1000  | 0.09                |
| Zone 10   | 13.4  | 9.3   | 76.3 / 65.3 | 55.0 / 54.1 | -         | Aug 1000  | 0.83                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

| Zone Name | Heating<br>Coil<br>Load<br>(MBH) | Heating<br>Coil<br>Ent/Lvg<br>DB<br>(°F) | Htg Coil<br>Water<br>Flow<br>@20.0 °F<br>(gpm) | Fan<br>Design<br>Airflow<br>(CFM) | Fan<br>Motor<br>(BHP) | Fan<br>Motor<br>(kW) | OA Vent<br>Design<br>Airflow<br>(CFM) |
|-----------|----------------------------------|--|--|-----------------------------------|-----------------------|----------------------|---------------------------------------|
| Zone 1    | 115.2                            | 69.5 / 86.3                              | -  | 6368                              | 0.000                 | 0.000                | 1189                                  |
| Zone 2    | 11.4                             | 69.8 / 86.0                              | -  | 652                               | 0.000                 | 0.000                | 504                                   |
| Zone 3    | 0.0                              | 0.0 / 0.0                                | 0.00   | 116                               | 0.000                 | 0.000                | 78                                    |
| Zone 4    | 2.4                              | 69.3 / 86.1                              | -  | 133                               | 0.000                 | 0.000                | 30                                    |
| Zone 5    | 2.4                              | 69.4 / 86.3                              | -  | 133                               | 0.000                 | 0.000                | 31                                    |
| Zone 6    | 0.0                              | 0.0 / 0.0                                | 0.00   | 53                                | 0.000                 | 0.000                | 17                                    |
| Zone 7    | 0.0                              | 0.0 / 0.0                                | 0.00   | 110                               | 0.000                 | 0.000                | 48                                    |
| Zone 8    | 5.2                              | 69.6 / 79.8                              | -  | 473                               | 0.000                 | 0.000                | 207                                   |
| Zone 9    | 0.0                              | 0.0 / 0.0                                | 0.00   | 24                                | 0.000                 | 0.000                | 19                                    |
| Zone 10   | 0.0                              | 0.0 / 0.0                                | 0.00   | 403                               | 0.000                 | 0.000                | 101                                   |

#### **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 158.5            | 13.2              | 136.7            |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 158.5            | 13.2              | 136.7            |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### **Zone Peak Sensible Loads**

| Zone    |         | Zone    | Zone  |
|---------|---------|---------|-------|
| Cooling | Time of | Heating | Floor |

| Zone Name | Sensible<br>(MBH) | Peak Sensible<br>Cooling Load | Load<br>(MBH) | Area<br>(ft²) |
|-----------|-------------------|-------------------------------|---------------|---------------|
| Zone 1    | 112.4             | Aug 1400                      | 116.8         | 3106.7        |
| Zone 2    | 14.1              | Jul 1400                      | 11.9          | 1048.4        |
| Zone 3    | 2.5               | Jan 1400                      | 0.0           | 136.6         |
| Zone 4    | 2.2               | Nov 1400                      | 2.4           | 105.6         |
| Zone 5    | 2.2               | Nov 1400                      | 2.4           | 107.9         |
| Zone 6    | 1.1               | Jan 1100                      | 0.0           | 150.4         |
| Zone 7    | 2.4               | Jan 1400                      | 0.0           | 350.1         |
| Zone 8    | 10.2              | Jul 1400                      | 5.5           | 959.8         |
| Zone 9    | 0.5               | Jan 1100                      | 0.0           | 259.0         |
| Zone 10   | 8.7               | Jan 1100                      | 0.0           | 486.1         |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| A221 MEDIA CENTER         | 1     | 112.4                        | Aug 1400                            | 6368                 | 116.8                    | 3106.7                 | 2.05             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| A221a MEDIA CENTER        | 1     | 14.1                         | Jul 1400                            | 652                  | 11.9                     | 1048.4                 | 0.62             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| A219 MC Small Group       | 1     | 2.5                          | Jan 1400                            | 116                  | 0.0                      | 136.6                  | 0.85             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| A220 Small Group          | 1     | 2.2                          | Nov 1400                            | 133                  | 2.4                      | 105.6                  | 1.26             |
| Zone 5                    |       |                              |                                     |                      |                          |                        |                  |
| A217 Small Group          | 1     | 2.2                          | Nov 1400                            | 133                  | 2.4                      | 107.9                  | 1.24             |
| Zone 6                    |       |                              |                                     |                      |                          |                        |                  |
| A222 MC Office            | 1     | 1.1                          | Jan 1100                            | 53                   | 0.0                      | 150.4                  | 0.35             |
| Zone 7                    |       |                              |                                     |                      |                          |                        |                  |
| A216 MC Workroom          | 1     | 2.4                          | Jan 1400                            | 110                  | 0.0                      | 350.1                  | 0.32             |
| Zone 8                    |       |                              |                                     |                      |                          |                        |                  |
| A214 Career Center        | 1     | 10.2                         | Jul 1400                            | 473                  | 5.5                      | 959.8                  | 0.49             |
| Zone 9                    |       |                              |                                     |                      |                          |                        |                  |
| A218 CORRIDOR             | 1     | 0.5                          | Jan 1100                            | 24                   | 0.0                      | 259.0                  | 0.09             |
| Zone 10                   |       |                              |                                     |                      |                          |                        |                  |
| A215 TV Studio            | 1     | 8.7                          | Jan 1100                            | 403                  | 0.0                      | 486.1                  | 0.83             |

# Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-7 (Admin Area A4) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | ERU-7 (Admin Area A4) |
|-----------------|-----------------------|
| Equipment Class | TERM                  |
| Air System Type | VRF                   |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| Total coil load           | 0.2  | Tons    |
|---------------------------|------|---------|
| Total coil load           | 2.1  | MBH     |
| Total coil load 14        | 60.8 | CFM/Ton |
| Sensible coil load        | 2.1  | MBH     |
| Coil CFM at Jul 1400      | 250  | CFM     |
| Max coil CFM              | 250  | CFM     |
| Sensible heat ratio 1     | .000 |         |
| Water flow @ 10.0 °F rise | N/A  |         |

#### **Heating Coil Sizing Data**

| Max coil load             | 3.6 | MBH |
|---------------------------|-----|-----|
| Coil CFM at Des Htg       | 250 | CFM |
| Max coil CFM              | 250 | CFM |
| Water flow @ 20.0 °F drop | N/A |     |

# **Ventilation Fan Sizing Data**

| Actual max CFM                 | 250  | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 250  | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.12 | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 250  | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 250  | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.12 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |      |                     |
|------------------------------|------|---------------------|
| Design airflow CFM           | 250  | CFM                 |
| CFM/ft <sup>2</sup>          | 0.12 | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

Zone CFM Sizing ..... Sum of space airflow rates Space CFM Sizing ..... Individual peak space loads

| Load occurs at Jul 1400     |    |
|-----------------------------|----|
| OA DB / WB                  | °F |
| Entering DB / WB            | °F |
| Leaving DB / WB 72.4 / 69.8 | °F |
| Bypass Factor 0.100         |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.2 / 67.4 | °F |

| Fan motor BHP | 0.26 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 0.20 | kW    |
| Fan static    | 3.00 | in wg |

| Fan motor BHP | 0.17  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 0.14  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 12.08 | CFM/person |

Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name ERU-7 (Admin Area A4) | Number of zones10                 |  |
|---------------------------------------|-----------------------------------|--|
| Equipment Class TERM                  | Floor Area 2062.8 ft <sup>2</sup> |  |
| Air System Type VRF                   | Location Boston, Massachusetts    |  |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

# **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 2.5   | 2.1   | 75.4 / 67.3 | 63.2 / 62.4 | -         | Jul 1400  | 1.01                |
| Zone 2    | 2.3   | 1.2   | 75.5 / 68.2 | 55.0 / 54.5 | -         | Jul 1200  | 0.14                |
| Zone 3    | 5.6   | 4.1   | 76.0 / 64.5 | 55.0 / 54.0 | -         | Jul 1000  | 0.61                |
| Zone 4    | 2.5   | 2.0   | 75.5 / 66.4 | 61.3 / 60.4 | -         | Jul 1400  | 1.02                |
| Zone 5    | 2.7   | 2.2   | 75.5 / 66.0 | 60.5 / 59.6 | -         | Jul 1400  | 0.91                |
| Zone 6    | 2.7   | 2.1   | 75.4 / 66.0 | 60.5 / 59.6 | -         | Jul 1300  | 0.91                |
| Zone 7    | 2.7   | 2.1   | 75.4 / 66.0 | 60.5 / 59.6 | -         | Jul 1300  | 0.91                |
| Zone 8    | 6.2   | 4.5   | 75.4 / 65.6 | 58.2 / 57.3 | -         | Aug 1400  | 0.97                |
| Zone 9    | 2.5   | 2.0   | 75.3 / 66.3 | 61.3 / 60.4 | -         | Jul 1300  | 1.08                |
| Zone 10   | 5.2   | 3.6   | 75.6 / 65.3 | 55.6 / 54.7 | -         | Jul 1400  | 0.64                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

| Zone Name | Heating<br>Coil<br>Load<br>(MBH) | Heating<br>Coil<br>Ent/Lvg<br>DB<br>(°F) | Htg Coil<br>Water<br>Flow<br>@20.0 °F<br>(gpm) | Fan<br>Design<br>Airflow<br>(CFM) | Fan<br>Motor<br>(BHP) | Fan<br>Motor<br>(kW) | OA Vent<br>Design<br>Airflow<br>(CFM) |
|-----------|----------------------------------|--|--|-----------------------------------|-----------------------|----------------------|---------------------------------------|
| Zone 1    | 2.9                              | 69.0 / 85.7                              | -  | 159                               | 0.000                 | 0.000                | 15                                    |
| Zone 2    | 0.7                              | 69.6 / 81.5                              | -  | 54                                | 0.000                 | 0.000                | 25                                    |
| Zone 3    | 3.3                              | 69.4 / 86.0                              | -  | 182                               | 0.000                 | 0.000                | 35                                    |
| Zone 4    | 2.4                              | 69.0 / 85.7                              | -  | 133                               | 0.000                 | 0.000                | 15                                    |
| Zone 5    | 2.5                              | 69.2 / 86.2                              | -  | 134                               | 0.000                 | 0.000                | 15                                    |
| Zone 6    | 2.5                              | 69.2 / 86.2                              | -  | 134                               | 0.000                 | 0.000                | 15                                    |
| Zone 7    | 2.5                              | 69.2 / 86.2                              | -  | 134                               | 0.000                 | 0.000                | 15                                    |
| Zone 8    | 4.3                              | 69.1 / 85.7                              | -  | 243                               | 0.000                 | 0.000                | 55                                    |
| Zone 9    | 2.4                              | 69.1 / 85.4                              | -  | 133                               | 0.000                 | 0.000                | 15                                    |
| Zone 10   | 3.0                              | 69.4 / 86.1                              | -  | 165                               | 0.000                 | 0.000                | 45                                    |

#### **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 25.7             | 2.1               | 26.3             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 25.7             | 2.1               | 26.3             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### **Zone Peak Sensible Loads**

| Zone    |         | Zone    | Zone  |
|---------|---------|---------|-------|
| Cooling | Time of | Heating | Floor |

|           | Sensible | Peak Sensible | Load  | Area  |
|-----------|----------|---------------|-------|-------|
| Zone Name | (MBH)    | Cooling Load  | (MBH) | (ft²) |
| Zone 1    | 1.8      | Jul 1400      | 2.9   | 158.0 |
| Zone 2    | 1.2      | Jul 1400      | 0.7   | 400.7 |
| Zone 3    | 3.8      | Jul 1400      | 3.3   | 298.0 |
| Zone 4    | 1.8      | Jul 1400      | 2.4   | 129.9 |
| Zone 5    | 1.9      | Jul 1400      | 2.5   | 146.8 |
| Zone 6    | 1.9      | Jul 1400      | 2.5   | 146.8 |
| Zone 7    | 1.9      | Jul 1400      | 2.5   | 146.8 |
| Zone 8    | 4.1      | Jul 1400      | 4.5   | 252.2 |
| Zone 9    | 1.8      | Jul 1400      | 2.4   | 123.3 |
| Zone 10   | 3.2      | Jul 1400      | 3.0   | 260.2 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft <sup>2</sup> |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                              |
| A404 SUPT ASSIST          | 1     | 1.8                          | Jul 1400                            | 159                  | 2.9                      | 158.0                  | 1.01                         |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                              |
| A404A CORRIDOR            | 1     | 0.1                          | Jul 1400                            | 6                    | 0.1                      | 47.6                   | 0.14                         |
| A411 CORRIDOR             | 1     | 0.6                          | Jul 1400                            | 26                   | 0.4                      | 195.4                  | 0.14                         |
| A415 CORRIDOR             | 1     | 0.5                          | Jul 1400                            | 21                   | 0.3                      | 157.7                  | 0.14                         |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                              |
| A404C ACCT INTERN         | 1     | 3.8                          | Jul 1400                            | 182                  | 3.3                      | 298.0                  | 0.61                         |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                              |
| A407 ACCT REC             | 1     | 1.8                          | Jul 1400                            | 133                  | 2.4                      | 129.9                  | 1.02                         |
| Zone 5                    |       |                              |                                     |                      |                          |                        |                              |
| A408 TREAS OFF            | 1     | 1.9                          | Jul 1400                            | 134                  | 2.5                      | 146.8                  | 0.91                         |
| Zone 6                    |       |                              |                                     |                      |                          |                        |                              |
| A409 HR OFF               | 1     | 1.9                          | Jul 1400                            | 134                  | 2.5                      | 146.8                  | 0.91                         |
| Zone 7                    |       |                              |                                     |                      |                          |                        |                              |
| A410 BUS MGR OFF          | 1     | 1.9                          | Jul 1400                            | 134                  | 2.5                      | 146.8                  | 0.91                         |
| Zone 8                    |       |                              |                                     |                      |                          |                        |                              |
| A412 CONF                 | 1     | 4.1                          | Jul 1400                            | 243                  | 4.5                      | 252.2                  | 0.97                         |
| Zone 9                    |       |                              |                                     |                      |                          |                        |                              |
| A413 SUPT ASSIST          | 1     | 1.8                          | Jul 1400                            | 133                  | 2.4                      | 123.3                  | 1.08                         |
| Zone 10                   |       |                              |                                     |                      |                          |                        |                              |
| A414 SUPT OFF             | 1     | 3.2                          | Jul 1400                            | 165                  | 3.0                      | 260.2                  | 0.64                         |

# Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-1 Classrooms A/B Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | HRU-1 Classrooms A/B |
|-----------------|----------------------|
| Equipment Class | TERM                 |
| Air System Type | VRF                  |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| Tons    |
|---------|
| MBH     |
| CFM/Ton |
| MBH     |
| CFM     |
| CFM     |
|         |
|         |
|         |

#### **Heating Coil Sizing Data**

| Max coil load             | 273.8 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 19660 | CFM |
| Max coil CFM              | 19660 | CFM |
| Water flow @ 20.0 °F drop | N/A   |     |

# **Ventilation Fan Sizing Data**

| Actual max CFM                 | 19660 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 19639 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.46  | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 19660 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 19639 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.46  | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |       |                     |
|------------------------------|-------|---------------------|
| Design airflow CFM           | 19660 | CFM                 |
| CFM/ft <sup>2</sup>          | 0.46  | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

Zone CFM Sizing ..... Sum of space airflow rates Space CFM Sizing ..... Individual peak space loads

| Load occurs at Jul 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 80.0 / 72.0 | °F |
| Leaving DB / WB 72.4 / 69.8  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.5 / 67.4 | °F |

| Fan motor BHP | 20.28 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 16.09 | kW    |
| Fan static    | 3.00  | in wg |

| Fan motor BHP | 13.52 | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 10.73 | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 33.45 | CFM/person |

### **Air System Information**

| Air System Name HRU-1 Classrooms A/B | Number of zones            | 38                          |
|--------------------------------------|----------------------------|-----------------------------|
| Equipment Class TERM                 | Floor Area 4284            | <b>48.0</b> ft <sup>2</sup> |
| Air System Type VRF                  | Location Boston, Massachus | etts                        |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

# **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 10.8  | 6.0   | 75.0 / 70.6 | 66.1 / 65.7 | -         | Jul 0700  | 0.54                |
| Zone 2    | 15.4  | 9.0   | 75.8 / 67.1 | 55.0 / 54.3 | -         | Jul 1000  | 0.46                |
| Zone 3    | 29.9  | 17.9  | 75.6 / 66.8 | 55.6 / 54.9 | -         | Jul 1300  | 0.81                |
| Zone 4    | 4.1   | 2.0   | 75.5 / 69.7 | 55.0 / 54.7 | -         | Jul 1000  | 0.11                |
| Zone 5    | 3.5   | 2.1   | 76.0 / 66.7 | 55.0 / 54.3 | -         | Aug 1000  | 0.29                |
| Zone 6    | 10.0  | 7.7   | 75.0 / 69.8 | 67.1 / 66.6 | -         | Jul 1100  | 1.49                |
| Zone 7    | 18.3  | 8.0   | 75.0 / 70.6 | 55.0 / 54.9 | -         | Aug 1200  | 0.40                |
| Zone 8    | 39.2  | 18.6  | 75.0 / 70.6 | 62.9 / 62.6 | -         | Jul 0900  | 0.96                |
| Zone 9    | 15.2  | 6.7   | 75.0 / 70.6 | 58.6 / 58.4 | -         | Jul 0900  | 1.03                |
| Zone 10   | 37.7  | 18.1  | 75.0 / 70.6 | 63.3 / 62.9 | -         | Jul 0900  | 0.96                |
| Zone 11   | 10.1  | 4.5   | 75.2 / 70.5 | 55.0 / 54.8 | -         | Aug 1200  | 0.10                |
| Zone 12   | 26.6  | 15.1  | 75.9 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.78                |
| Zone 13   | 26.5  | 14.9  | 75.8 / 67.5 | 55.0 / 54.4 | -         | Aug 1000  | 0.78                |
| Zone 14   | 26.5  | 15.0  | 75.9 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.78                |
| Zone 15   | 20.3  | 11.3  | 75.3 / 68.3 | 58.9 / 58.3 | -         | Jul 1400  | 0.73                |
| Zone 16   | 55.8  | 33.1  | 76.5 / 67.2 | 55.0 / 54.3 | -         | Jul 1000  | 0.19                |
| Zone 17   | 19.0  | 8.9   | 75.2 / 69.7 | 55.0 / 54.7 | -         | Jul 1200  | 0.55                |
| Zone 18   | 10.7  | 5.8   | 75.6 / 67.9 | 55.0 / 54.5 | -         | Jul 1000  | 0.49                |
| Zone 19   | 11.6  | 6.4   | 75.8 / 67.7 | 55.0 / 54.4 | -         | Jul 1000  | 0.44                |
| Zone 20   | 20.3  | 10.1  | 75.3 / 68.9 | 55.5 / 55.1 | -         | Jul 0900  | 0.60                |
| Zone 21   | 20.9  | 11.5  | 75.0 / 70.6 | 66.0 / 65.6 | -         | Jul 0800  | 0.47                |
| Zone 22   | 26.9  | 15.4  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Aug 1000  | 0.79                |
| Zone 23   | 2.5   | 1.4   | 76.2 / 67.5 | 55.0 / 54.4 | -         | Aug 1000  | 0.41                |
| Zone 24   | 39.2  | 18.6  | 75.0 / 70.6 | 62.9 / 62.6 | -         | Jul 0900  | 0.96                |
| Zone 25   | 11.2  | 5.3   | 75.0 / 70.6 | 63.0 / 62.7 | -         | Jul 1100  | 1.00                |
| Zone 26   | 39.2  | 18.6  | 75.0 / 70.6 | 62.9 / 62.6 | -         | Jul 0900  | 0.96                |
| Zone 27   | 26.6  | 15.1  | 75.9 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.77                |
| Zone 28   | 26.8  | 15.2  | 75.9 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.75                |
| Zone 29   | 26.5  | 15.0  | 75.9 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.77                |
| Zone 30   | 10.3  | 7.1   | 75.2 / 68.1 | 63.1 / 62.4 | -         | Jul 1200  | 1.11                |
| Zone 31   | 42.0  | 20.5  | 75.1 / 70.3 | 62.5 / 62.1 | -         | Jul 1400  | 0.59                |
| Zone 32   | 2.7   | 1.5   | 75.8 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.46                |
| Zone 33   | 4.0   | 1.8   | 75.0 / 70.6 | 58.6 / 58.4 | -         | Jul 1400  | 0.20                |
| Zone 34   | 40.1  | 19.0  | 75.0 / 70.6 | 62.9 / 62.5 | -         | Jul 1000  | 0.97                |
| Zone 35   | 10.9  | 5.1   | 75.0 / 70.6 | 62.3 / 62.0 | -         | Jul 1100  | 1.00                |
| Zone 36   | 40.8  | 19.3  | 75.0 / 70.6 | 62.7 / 62.3 | -         | Jul 0900  | 0.97                |
| Zone 37   | 27.0  | 15.5  | 75.8 / 67.3 | 55.0 / 54.4 | -         | Jul 1000  | 0.80                |
| Zone 38   | 26.9  | 15.3  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Jul 1000  | 0.80                |

# Terminal Unit Sizing Data - Heating, Fan, Ventilation

|   |        | Heating | Htg Coil |        |     |     |         |
|---|--------|---------|----------|--------|-----|-----|---------|
| H | eating | Coil    | Water    | Fan    |     |     | OA Vent |
|   | Coil   | Ent/Lvg | Flow     | Design | Fan | Fan | Design  |

Prepared by: Bala Consulting Engineers, Inc.

|           | Load  | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
|-----------|-------|-------------|----------|---------|-------|-------|---------|
| Zone Name | (MBH) | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 2.2   | 70.0 / 73.3 | -        | 625     | 0.000 | 0.000 | 625     |
| Zone 2    | 1.8   | 69.9 / 74.0 | -        | 401     | 0.000 | 0.000 | 180     |
| Zone 3    | 8.5   | 69.7 / 79.2 | -        | 832     | 0.000 | 0.000 | 375     |
| Zone 4    | 0.7   | 69.8 / 77.4 | -        | 88      | 0.000 | 0.000 | 50      |
| Zone 5    | 0.0   | 0.0 / 0.0   | 0.00     | 94      | 0.000 | 0.000 | 30      |
| Zone 6    | 15.8  | 69.3 / 85.5 | -        | 905     | 0.000 | 0.000 | 270     |
| Zone 7    | 0.0   | 0.0 / 0.0   | 0.00     | 369     | 0.000 | 0.000 | 360     |
| Zone 8    | 16.1  | 70.0 / 80.4 | -        | 1430    | 0.000 | 0.000 | 1430    |
| Zone 9    | 0.0   | 0.0 / 0.0   | 0.00     | 380     | 0.000 | 0.000 | 380     |
| Zone 10   | 14.8  | 70.0 / 79.6 | -        | 1430    | 0.000 | 0.000 | 1430    |
| Zone 11   | 0.0   | 0.0 / 0.0   | 0.00     | 204     | 0.000 | 0.000 | 180     |
| Zone 12   | 7.6   | 69.7 / 80.2 | -        | 670     | 0.000 | 0.000 | 360     |
| Zone 13   | 6.5   | 69.7 / 78.8 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 14   | 6.7   | 69.8 / 79.1 | -        | 666     | 0.000 | 0.000 | 360     |
| Zone 15   | 11.1  | 69.6 / 85.7 | -        | 634     | 0.000 | 0.000 | 360     |
| Zone 16   | 4.2   | 69.8 / 72.6 | -        | 1426    | 0.000 | 0.000 | 340     |
| Zone 17   | 4.4   | 69.9 / 80.0 | -        | 407     | 0.000 | 0.000 | 340     |
| Zone 18   | 4.6   | 69.6 / 86.1 | -        | 260     | 0.000 | 0.000 | 150     |
| Zone 19   | 4.5   | 69.5 / 84.2 | -        | 286     | 0.000 | 0.000 | 150     |
| Zone 20   | 7.3   | 69.7 / 84.0 | -        | 476     | 0.000 | 0.000 | 345     |
| Zone 21   | 0.0   | 0.0 / 0.0   | 0.00     | 1190    | 0.000 | 0.000 | 1190    |
| Zone 22   | 8.1   | 69.7 / 80.6 | -        | 685     | 0.000 | 0.000 | 360     |
| Zone 23   | 0.0   | 0.0 / 0.0   | 0.00     | 62      | 0.000 | 0.000 | 30      |
| Zone 24   | 16.1  | 70.0 / 80.4 | -        | 1430    | 0.000 | 0.000 | 1430    |
| Zone 25   | 0.0   | 0.0 / 0.0   | 0.00     | 410     | 0.000 | 0.000 | 410     |
| Zone 26   | 15.8  | 70.0 / 80.2 | -        | 1430    | 0.000 | 0.000 | 1430    |
| Zone 27   | 7.6   | 69.7 / 80.1 | -        | 671     | 0.000 | 0.000 | 360     |
| Zone 28   | 6.6   | 69.8 / 78.9 | -        | 673     | 0.000 | 0.000 | 360     |
| Zone 29   | 6.7   | 69.8 / 79.2 | -        | 667     | 0.000 | 0.000 | 360     |
| Zone 30   | 9.8   | 69.4 / 86.0 | -        | 546     | 0.000 | 0.000 | 160     |
| Zone 31   | 13.9  | 70.0 / 78.5 | -        | 1510    | 0.000 | 0.000 | 1370    |
| Zone 32   | 0.3   | 69.9 / 73.5 | -        | 69      | 0.000 | 0.000 | 35      |
| Zone 33   | 1.1   | 70.0 / 80.2 | -        | 100     | 0.000 | 0.000 | 100     |
| Zone 34   | 24.4  | 70.0 / 85.6 | -        | 1450    | 0.000 | 0.000 | 1450    |
| Zone 35   | 1.3   | 70.0 / 73.2 | -        | 370     | 0.000 | 0.000 | 370     |
| Zone 36   | 25.2  | 70.0 / 86.1 | -        | 1450    | 0.000 | 0.000 | 1450    |
| Zone 37   | 9.2   | 69.6 / 82.0 | -        | 688     | 0.000 | 0.000 | 360     |
| Zone 38   | 8.0   | 69.6 / 80.5 | -        | 683     | 0.000 | 0.000 | 360     |

# **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 432.1            | 36.0              | 270.9            |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 432.1            | 36.0              | 270.9            |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone  |
|-----------|----------|---------------|---------|-------|
|           | Cooling  | Time of       | Heating | Floor |
|           | Sensible | Peak Sensible | Load    | Area  |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²) |

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 2.5      | Jul 1400      | 0.4     | 1167.2 |
| Zone 2    | 8.6      | Jul 1400      | 1.6     | 870.0  |
| Zone 3    | 17.9     | Jul 1400      | 8.6     | 1031.8 |
| Zone 4    | 1.9      | Jul 1400      | 0.8     | 769.3  |
| Zone 5    | 2.0      | Jan 1400      | 0.0     | 326.7  |
| Zone 6    | 6.4      | Jul 1400      | 16.6    | 608.8  |
| Zone 7    | 8.0      | Jan 1400      | 0.0     | 918.5  |
| Zone 8    | 11.8     | Jul 1400      | 6.5     | 1490.2 |
| Zone 9    | 5.7      | Jan 1400      | 0.0     | 367.4  |
| Zone 10   | 11.1     | Jul 1400      | 5.7     | 1490.2 |
| Zone 11   | 4.4      | Jan 1100      | 0.0     | 1965.6 |
| Zone 12   | 14.5     | Aug 1100      | 7.9     | 862.2  |
| Zone 13   | 14.3     | Aug 1100      | 6.8     | 849.4  |
| Zone 14   | 14.4     | Aug 1100      | 6.8     | 859.6  |
| Zone 15   | 10.3     | Jul 1400      | 11.6    | 864.7  |
| Zone 16   | 30.8     | Jul 1100      | 4.9     | 7322.8 |
| Zone 17   | 8.8      | Jul 1400      | 4.9     | 741.1  |
| Zone 18   | 5.6      | Jul 1400      | 4.8     | 531.6  |
| Zone 19   | 6.2      | Jul 1400      | 4.8     | 656.1  |
| Zone 20   | 10.3     | Nov 1400      | 7.9     | 790.3  |
| Zone 21   | 5.6      | Jan 1100      | 0.0     | 2539.3 |
| Zone 22   | 14.8     | Aug 1100      | 8.5     | 862.1  |
| Zone 23   | 1.3      | Jan 1400      | 0.0     | 149.9  |
| Zone 24   | 11.8     | Jul 1400      | 6.5     | 1490.3 |
| Zone 25   | 3.6      | Jan 1100      | 0.0     | 410.2  |
| Zone 26   | 11.8     | Jul 1400      | 6.5     | 1490.2 |
| Zone 27   | 14.5     | Aug 1100      | 7.9     | 866.7  |
| Zone 28   | 14.5     | Aug 1100      | 6.8     | 901.3  |
| Zone 29   | 14.4     | Aug 1100      | 6.8     | 864.1  |
| Zone 30   | 6.5      | Jul 1400      | 10.0    | 493.5  |
| Zone 31   | 15.0     | Jul 1400      | 7.2     | 2570.1 |
| Zone 32   | 1.5      | Jul 1400      | 0.3     | 149.9  |
| Zone 33   | 1.6      | Jul 1400      | 0.9     | 496.8  |
| Zone 34   | 13.2     | Jul 1400      | 11.4    | 1496.5 |
| Zone 35   | 3.7      | Jul 1400      | 0.7     | 370.3  |
| Zone 36   | 13.2     | Jul 1400      | 11.5    | 1496.5 |
| Zone 37   | 14.8     | Aug 1100      | 9.6     | 864.7  |
| Zone 38   | 14.7     | Aug 1100      | 8.5     | 852.0  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| A146 CORRIDOR             | 1     | 2.5                          | Jul 1400                            | 625                  | 0.4                      | 1167.2                 | 0.54             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| A141C RELATED CR          | 1     | 8.6                          | Jul 1400                            | 401                  | 1.6                      | 870.0                  | 0.46             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| B101E RELATED CR          | 1     | 17.9                         | Jul 1400                            | 832                  | 8.6                      | 1031.8                 | 0.81             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| B111A CORRIDOR            | 1     | 1.9                          | Jul 1400                            | 88                   | 0.8                      | 769.3                  | 0.11             |
| Zone 5                    |       |                              |                                     |                      |                          |                        |                  |
| B115 SCHOOL STORE         | 1     | 2.0                          | Jan 1400                            | 94                   | 0.0                      | 326.7                  | 0.29             |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft <sup>2</sup> |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------------------|
| Zone 6                    |       | (                            |                                     | (01)                 | ()                       | ()                     | 01 11010                     |
| B114 CORRIDOR             | 1     | 6.4                          | Jul 1400                            | 905                  | 16.6                     | 608.8                  | 1.49                         |
| Zone 7                    |       |                              |                                     |                      |                          |                        |                              |
| A208 LANGUAGE LEARNING    | 1     | 8.0                          | Jan 1400                            | 369                  | 0.0                      | 918.5                  | 0.40                         |
| Zone 8                    |       |                              |                                     |                      |                          |                        |                              |
| A209 SCI LAB              | 1     | 11.8                         | Jul 1400                            | 1430                 | 6.5                      | 1490.2                 | 0.96                         |
| Zone 9                    |       |                              |                                     |                      |                          |                        |                              |
| A210 SCI PREP             | 1     | 5.7                          | Jan 1400                            | 380                  | 0.0                      | 367 4                  | 1 03                         |
| Zone 10                   |       |                              |                                     |                      |                          |                        |                              |
| A211 SCLLAB               | 1     | 11.1                         | Jul 1400                            | 1430                 | 57                       | 1490.2                 | 0.96                         |
| Zone 11                   |       |                              |                                     |                      |                          |                        |                              |
| A212 CORRIDOR             | 1     | 4 4                          | Jan 1100                            | 204                  | 0.0                      | 1965 6                 | 0.10                         |
| Zone 12                   |       |                              | 00.11100                            |                      | 0.0                      |                        | 00                           |
| A224 CR                   | 1     | 14.5                         | Aug 1100                            | 670                  | 7 9                      | 862.2                  | 0.78                         |
| Zone 13                   |       | 11.0                         | 7 tag 1100                          | 010                  | 1.0                      | 002.2                  | 0.10                         |
| A225 CB                   | 1     | 14.3                         | Aug 1100                            | 665                  | 6.8                      | 849.4                  | 0.78                         |
| Zone 14                   |       | 14.0                         | 7 tag 1100                          |                      | 0.0                      | 040.4                  | 0.70                         |
| A226 CR                   | 1     | 14 4                         | Aug 1100                            | 666                  | 6.8                      | 859.6                  | 0.78                         |
| Zone 15                   | 1     |                              | Aug 1100                            | 000                  | 0.0                      | 000.0                  | 0.70                         |
| A301 SPED LEARNING CENTE  | 1     | 10.3                         | lul 1400                            | 634                  | 11.6                     | 864 7                  | 0.73                         |
| Zone 16                   | 1     | 10.0                         | 001 1400                            |                      | 11.0                     | 004.7                  | 0.75                         |
|                           | 1     | 30.8                         | Jul 1100                            | 1426                 | 4 9                      | 7322.8                 | 0.19                         |
| Zone 17                   | 1     | 50.0                         | 0011100                             | 1420                 | 4.0                      | 1022.0                 | 0.15                         |
|                           | 1     | 8.8                          | Jul 1400                            | 407                  | 1 9                      | 7/1 1                  | 0.55                         |
| Zono 18                   | 1     | 0.0                          | Jul 1400                            | 407                  | 4.5                      | 741.1                  | 0.55                         |
|                           | 1     | 5.6                          | Jul 1400                            | 260                  | 1 9                      | 531.6                  | 0.40                         |
| ASUG SPED SMALL GROUP     | 1     | 5.0                          | Jul 1400                            | 200                  | 4.0                      | 551.0                  | 0.49                         |
|                           | 1     | 6.2                          | Jul 1400                            | 206                  | 1 0                      | 656 1                  | 0.44                         |
| ASUT SPED SMALL GROUP     | I     | 0.2                          | Jul 1400                            | 200                  | 4.0                      | 030.1                  | 0.44                         |
|                           | 1     | 10.2                         | Nov 1400                            | 476                  | 7.0                      | 700.2                  | 0.60                         |
| AS08 DIGITAL LEARNING     | 1     | 10.5                         | 1107 1400                           | 470                  | 7.9                      | 790.3                  | 0.00                         |
|                           | 1     | 5.6                          | lon 1100                            | 1100                 | 0.0                      | 2520.2                 | 0.47                         |
| ASUS CORRIDOR             | 1     | 5.0                          | Jan 1100                            | 1190                 | 0.0                      | 2559.5                 | 0.47                         |
|                           | 1     | 11 0                         | Aug 1100                            | 695                  | <u>٥</u>                 | 962.1                  | 0.70                         |
| Zono 22                   | 1     | 14.0                         | Aug 1100                            | 000                  | 0.0                      | 002.1                  | 0.79                         |
|                           | 1     | 1.0                          | lan 1400                            | 60                   | 0.0                      | 140.0                  | 0.41                         |
| AST/ SPED RESOURCE        | 1     | 1.5                          | Jan 1400                            | 02                   | 0.0                      | 149.9                  | 0.41                         |
|                           | 1     | 11.0                         | Jul 1400                            | 1420                 | 6.5                      | 1400.2                 | 0.06                         |
| AS TO SCI LAB             | 1     | 11.0                         | Jul 1400                            | 1430                 | 6.0                      | 1490.3                 | 0.90                         |
|                           | 1     | 2.0                          | lan 1100                            | 440                  | 0.0                      | 440.0                  | 1.00                         |
| AS 19 SCI PREP            | 1     | 3.0                          | Jan 1100                            | 410                  | 0.0                      | 410.2                  | 1.00                         |
|                           | 1     | 11.0                         | Int 1400                            | 1420                 | 6.5                      | 1400.0                 | 0.06                         |
| AS20 SCI LAB              | 1     | 11.0                         | Jul 1400                            | 1430                 | 0.0                      | 1490.2                 | 0.90                         |
|                           | 1     | 44 5                         | Aug 1100                            | 074                  | 7.0                      | 000 7                  | 0.77                         |
| A322 CR                   | 1     | 14.5                         | Aug 1100                            | 671                  | 7.9                      | 800.7                  | 0.77                         |
|                           | 1     | 14 5                         | Aug 1100                            | 672                  | 6.9                      | 001.2                  | 0.75                         |
|                           | 1     | 14.5                         | Aug 1100                            | 0/3                  | 0.8                      | 901.3                  | 0.75                         |
| 20ne 29                   | 4     |                              | A                                   | 007                  | 0.0                      | 004.4                  | 0.77                         |
| A324 UK                   | 1     | 14.4                         | Aug 1100                            | 667                  | 6.8                      | 864.1                  | 0.77                         |
|                           |       | ~ -                          |                                     |                      | 10.0                     | 100 -                  |                              |
| A401 SPED SMALL GROUP     | 1     | 6.5                          | Jul 1400                            | 546                  | 10.0                     | 493.5                  | 1.11                         |
|                           |       |                              |                                     | 1055                 |                          | (000 -                 |                              |
|                           | 1     | 9.8                          | Jul 1400                            | 1200                 | 2.5                      | 1398.5                 | 0.86                         |
| A416a CORRIDOR Ext        | 1     | 2.0                          | Jul 1400                            | 160                  | 2.9                      | 249.6                  | 0.64                         |
| A416b CORRIDOR            | 1     | 3.2                          | Jul 1400                            | 150                  | 1.7                      | 922.0                  | 0.16                         |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 32                   |       |                              |                                     |                      |                          |                        |                  |
| A424 SPED RESOURCE        | 1     | 1.5                          | Jul 1400                            | 69                   | 0.3                      | 149.9                  | 0.46             |
| Zone 33                   |       |                              |                                     |                      |                          |                        |                  |
| A421 STOR                 | 1     | 1.6                          | Jul 1400                            | 100                  | 0.9                      | 496.8                  | 0.20             |
| Zone 34                   |       |                              |                                     |                      |                          |                        |                  |
| A425 SCI LAB              | 1     | 13.2                         | Jul 1400                            | 1450                 | 11.4                     | 1496.5                 | 0.97             |
| Zone 35                   |       |                              |                                     |                      |                          |                        |                  |
| A426 SCI PREP             | 1     | 3.7                          | Jul 1400                            | 370                  | 0.7                      | 370.3                  | 1.00             |
| Zone 36                   |       |                              |                                     |                      |                          |                        |                  |
| A427 SCI LAB              | 1     | 13.2                         | Jul 1400                            | 1450                 | 11.5                     | 1496.5                 | 0.97             |
| Zone 37                   |       |                              |                                     |                      |                          |                        |                  |
| A429 CR                   | 1     | 14.8                         | Aug 1100                            | 688                  | 9.6                      | 864.7                  | 0.80             |
| Zone 38                   |       |                              |                                     |                      |                          |                        |                  |
| A430 CR                   | 1     | 14.7                         | Aug 1100                            | 683                  | 8.5                      | 852.0                  | 0.80             |

# Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-2 Classrooms B Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | HRU-2 Classrooms B |
|-----------------|--------------------|
| Equipment Class | TERM               |
| Air System Type | VRF                |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| Tons    |
|---------|
| MBH     |
| CFM/Ton |
| MBH     |
| CFM     |
| CFM     |
|         |
|         |
|         |

#### **Heating Coil Sizing Data**

| Max coil load             | 266.1 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 19108 | CFM |
| Max coil CFM              | 19108 | CFM |
| Water flow @ 20.0 °F drop | N/A   |     |

# **Ventilation Fan Sizing Data**

| Actual max CFM                 | 19108 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 19087 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.33  | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 19108 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 19087 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.33  | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |       |                     |
|------------------------------|-------|---------------------|
| Design airflow CFM           | 19108 | CFM                 |
| CFM/ft <sup>2</sup>          | 0.33  | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location E      | Boston, Massachusetts |     |

Zone CFM Sizing ..... Sum of space airflow rates Space CFM Sizing ..... Individual peak space loads

| Load occurs at Jul 1400     |    |
|-----------------------------|----|
| OA DB / WB                  | °F |
| Entering DB / WB            | °F |
| Leaving DB / WB 72.4 / 69.8 | °F |
| Bypass Factor 0.100         |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.5 / 67.4 | °F |

| Fan motor BHP | 19.72 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 15.64 | kW    |
| Fan static    | 3.00  | in wg |

| Fan motor BHP | 13.14 | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 10.43 | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 19.88 | CFM/person |

# **Air System Information**

| Air System Name | HRU-2 Classrooms B | Number of zones |                       |     |
|-----------------|--------------------|-----------------|-----------------------|-----|
| Equipment Class | TERM               | Floor Area      | 58585.8               | ft² |
| Air System Type | VRF                | Location        | Boston, Massachusetts |     |

# **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | . Sum of space airflow rates |
|--------------------|------------|------------------|------------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads  |

# **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 20.1  | 9.3   | 75.2 / 69.9 | 55.0 / 54.8 | -         | Jul 1200  | 0.44                |
| Zone 2    | 0.9   | 0.4   | 75.5 / 69.3 | 55.0 / 54.7 | -         | Jul 1300  | 0.14                |
| Zone 3    | 9.4   | 4.1   | 75.1 / 70.6 | 55.0 / 54.9 | -         | Jul 1200  | 0.11                |
| Zone 4    | 5.3   | 3.0   | 76.0 / 67.5 | 55.0 / 54.4 | -         | Aug 1000  | 0.33                |
| Zone 5    | 1.7   | 0.9   | 75.8 / 68.3 | 55.0 / 54.5 | -         | Aug 1000  | 0.50                |
| Zone 6    | 2.5   | 1.1   | 75.5 / 70.1 | 55.0 / 54.8 | -         | Jul 1000  | 0.13                |
| Zone 7    | 24.6  | 12.9  | 75.5 / 68.2 | 55.0 / 54.5 | -         | Aug 1000  | 0.60                |
| Zone 8    | 20.5  | 9.1   | 75.1 / 70.3 | 55.0 / 54.8 | -         | Aug 1200  | 0.34                |
| Zone 9    | 26.5  | 15.0  | 75.9 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.78                |
| Zone 10   | 41.3  | 37.0  | 75.4 / 64.5 | 59.1 / 58.0 | -         | Jul 1800  | 2.05                |
| Zone 11   | 26.6  | 15.0  | 75.8 / 67.6 | 55.0 / 54.4 | -         | Aug 1000  | 0.78                |
| Zone 12   | 11.3  | 5.5   | 75.0 / 70.6 | 63.8 / 63.5 | -         | Jul 0900  | 0.51                |
| Zone 13   | 8.3   | 3.8   | 75.3 / 70.0 | 55.0 / 54.8 | -         | Aug 1200  | 0.35                |
| Zone 14   | 7.0   | 3.0   | 75.1 / 70.5 | 55.0 / 54.9 | -         | Aug 1200  | 0.41                |
| Zone 15   | 22.1  | 11.4  | 75.3 / 68.5 | 55.9 / 55.5 | -         | Aug 1400  | 0.65                |
| Zone 16   | 27.3  | 19.3  | 76.3 / 65.1 | 55.0 / 54.0 | -         | Aug 1000  | 0.84                |
| Zone 17   | 31.2  | 13.6  | 75.0 / 70.6 | 56.2 / 56.0 | -         | Jul 0900  | 0.18                |
| Zone 18   | 22.9  | 11.9  | 75.4 / 68.4 | 55.5 / 55.1 | -         | Aug 1400  | 0.62                |
| Zone 19   | 19.2  | 11.8  | 75.6 / 66.5 | 55.6 / 54.8 | -         | Aug 1400  | 0.65                |
| Zone 20   | 26.9  | 15.2  | 75.8 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.81                |
| Zone 21   | 26.6  | 15.0  | 75.9 / 67.6 | 55.0 / 54.4 | -         | Aug 1000  | 0.78                |
| Zone 22   | 26.6  | 15.0  | 75.9 / 67.6 | 55.0 / 54.4 | -         | Aug 1000  | 0.78                |
| Zone 23   | 26.6  | 15.0  | 75.9 / 67.6 | 55.0 / 54.4 | -         | Aug 1000  | 0.78                |
| Zone 24   | 26.9  | 15.2  | 75.9 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.79                |
| Zone 25   | 2.5   | 1.4   | 76.2 / 67.7 | 55.0 / 54.4 | -         | Aug 1000  | 0.42                |
| Zone 26   | 26.0  | 11.7  | 75.2 / 70.2 | 55.0 / 54.8 | -         | Jul 0900  | 0.13                |
| Zone 27   | 13.7  | 6.2   | 75.7 / 70.4 | 55.0 / 54.8 | -         | Jul 1000  | 0.11                |
| Zone 28   | 39.2  | 34.1  | 75.6 / 63.1 | 55.7 / 54.6 | -         | Jul 1800  | 2.39                |
| Zone 29   | 26.7  | 15.0  | 75.9 / 67.6 | 55.0 / 54.4 | -         | Jul 1000  | 0.78                |
| Zone 30   | 26.7  | 15.0  | 75.8 / 67.6 | 55.0 / 54.4 | -         | Jul 1000  | 0.78                |
| Zone 31   | 22.1  | 11.5  | 75.4 / 68.5 | 55.9 / 55.4 | -         | Aug 1400  | 0.65                |
| Zone 32   | 22.9  | 11.9  | 75.4 / 68.4 | 55.5 / 55.0 | -         | Aug 1400  | 0.62                |
| Zone 33   | 22.2  | 11.5  | 75.4 / 68.5 | 55.9 / 55.4 | -         | Aug 1400  | 0.65                |
| Zone 34   | 35.3  | 17.3  | 75.0 / 70.6 | 63.8 / 63.4 | -         | Jul 1400  | 0.92                |
| Zone 35   | 12.8  | 6.2   | 75.0 / 70.6 | 63.5 / 63.1 | -         | Jul 1100  | 1.07                |
| Zone 36   | 2.8   | 1.2   | 75.0 / 70.7 | 59.6 / 59.4 | -         | Jul 1300  | 0.24                |
| Zone 37   | 34.8  | 17.1  | 75.0 / 70.6 | 63.9 / 63.6 | -         | Jul 1100  | 0.92                |
| Zone 38   | 27.0  | 18.8  | 75.9 / 65.1 | 55.0 / 54.1 | -         | Jul 1000  | 0.84                |
| Zone 39   | 2.5   | 1.4   | 76.2 / 67.7 | 55.0 / 54.4 | -         | Aug 1000  | 0.42                |
| Zone 40   | 26.7  | 15.0  | 75.9 / 67.6 | 55.0 / 54.4 | -         | Jul 1000  | 0.78                |
| Zone 41   | 26.6  | 15.0  | 75.9 / 67.6 | 55.0 / 54.4 | -         | Aug 1000  | 0.78                |
| Zone 42   | 26.6  | 15.0  | 75.9 / 67.6 | 55.0 / 54.4 | -         | Aug 1000  | 0.78                |
| Zone 43   | 27.4  | 15.6  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Aug 1000  | 0.82                |

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 44   | 26.6  | 14.9  | 75.8 / 67.6 | 55.0 / 54.4 | -         | Aug 1000  | 0.79                |
| Zone 45   | 27.1  | 15.3  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Jul 1000  | 0.80                |
| Zone 46   | 48.6  | 31.9  | 75.5 / 68.1 | 61.9 / 61.3 | -         | Jul 1400  | 0.41                |
| Zone 47   | 43.0  | 34.7  | 75.7 / 63.8 | 55.7 / 54.7 | -         | Jun 1800  | 2.45                |
| Zone 48   | 27.0  | 15.5  | 75.9 / 67.3 | 55.0 / 54.4 | -         | Jul 1000  | 0.81                |
| Zone 49   | 26.2  | 19.8  | 76.3 / 64.4 | 55.0 / 53.9 | -         | Jul 1000  | 0.86                |
| Zone 50   | 2.6   | 1.5   | 76.0 / 67.2 | 55.0 / 54.3 | -         | Jul 1000  | 0.46                |
| Zone 51   | 27.1  | 15.4  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Jul 1000  | 0.80                |
| Zone 52   | 27.1  | 15.3  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Jul 1000  | 0.80                |
| Zone 53   | 27.1  | 15.3  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Jul 1000  | 0.80                |
| Zone 54   | 27.2  | 15.4  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Jul 1000  | 0.81                |
| Zone 55   | 27.3  | 15.5  | 75.8 / 67.4 | 55.0 / 54.4 | -         | Jul 1000  | 0.83                |
| Zone 56   | 23.6  | 12.3  | 75.4 / 68.2 | 55.0 / 54.5 | -         | Aug 1400  | 0.66                |
| Zone 57   | 23.9  | 12.6  | 75.4 / 68.2 | 55.0 / 54.5 | -         | Aug 1400  | 0.63                |
| Zone 58   | 23.5  | 12.3  | 75.4 / 68.2 | 55.0 / 54.5 | -         | Aug 1400  | 0.67                |

# Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 1.7     | 70.0 / 73.7 | -        | 425     | 0.000 | 0.000 | 365     |
| Zone 2    | 0.3     | 69.7 / 81.9 | -        | 20      | 0.000 | 0.000 | 10      |
| Zone 3    | 0.8     | 70.0 / 73.9 | -        | 188     | 0.000 | 0.000 | 178     |
| Zone 4    | 0.0     | 0.0 / 0.0   | 0.00     | 133     | 0.000 | 0.000 | 55      |
| Zone 5    | 0.0     | 0.0 / 0.0   | 0.00     | 41      | 0.000 | 0.000 | 25      |
| Zone 6    | 0.0     | 0.0 / 0.0   | 0.00     | 51      | 0.000 | 0.000 | 35      |
| Zone 7    | 10.4    | 69.7 / 86.2 | -        | 585     | 0.000 | 0.000 | 365     |
| Zone 8    | 0.0     | 0.0 / 0.0   | 0.00     | 419     | 0.000 | 0.000 | 390     |
| Zone 9    | 9.8     | 69.7 / 83.4 | -        | 666     | 0.000 | 0.000 | 352     |
| Zone 10   | 38.3    | 69.4 / 86.3 | -        | 2103    | 0.000 | 0.000 | 160     |
| Zone 11   | 6.5     | 69.7 / 78.8 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 12   | 7.6     | 70.0 / 85.3 | -        | 460     | 0.000 | 0.000 | 460     |
| Zone 13   | 0.0     | 0.0 / 0.0   | 0.00     | 175     | 0.000 | 0.000 | 150     |
| Zone 14   | 0.0     | 0.0 / 0.0   | 0.00     | 141     | 0.000 | 0.000 | 135     |
| Zone 15   | 5.0     | 69.8 / 78.3 | -        | 547     | 0.000 | 0.000 | 360     |
| Zone 16   | 11.2    | 69.4 / 81.7 | -        | 837     | 0.000 | 0.000 | 195     |
| Zone 17   | 9.3     | 70.0 / 82.9 | -        | 670     | 0.000 | 0.000 | 670     |
| Zone 18   | 4.7     | 69.8 / 77.7 | -        | 557     | 0.000 | 0.000 | 360     |
| Zone 19   | 4.9     | 69.7 / 78.0 | -        | 548     | 0.000 | 0.000 | 210     |
| Zone 20   | 9.3     | 69.6 / 82.4 | -        | 674     | 0.000 | 0.000 | 360     |
| Zone 21   | 6.7     | 69.8 / 79.1 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 22   | 6.7     | 69.8 / 79.1 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 23   | 6.7     | 69.8 / 79.1 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 24   | 7.9     | 69.7 / 80.5 | -        | 675     | 0.000 | 0.000 | 360     |
| Zone 25   | 0.0     | 0.0 / 0.0   | 0.00     | 61      | 0.000 | 0.000 | 30      |
| Zone 26   | 5.6     | 69.9 / 79.6 | -        | 537     | 0.000 | 0.000 | 416     |
| Zone 27   | 3.4     | 69.8 / 81.3 | -        | 278     | 0.000 | 0.000 | 195     |
| Zone 28   | 27.5    | 69.4 / 85.4 | -        | 1594    | 0.000 | 0.000 | 160     |
| Zone 29   | 6.7     | 69.8 / 79.1 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 30   | 7.2     | 69.7 / 79.7 | -        | 666     | 0.000 | 0.000 | 360     |
| Zone 31   | 4.6     | 69.8 / 77.6 | -        | 546     | 0.000 | 0.000 | 360     |

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 32   | 5.1     | 69.9 / 78.3 | -        | 557     | 0.000 | 0.000 | 360     |
| Zone 33   | 4.9     | 69.9 / 78.1 | -        | 548     | 0.000 | 0.000 | 360     |
| Zone 34   | 7.2     | 70.0 / 74.7 | -        | 1430    | 0.000 | 0.000 | 1430    |
| Zone 35   | 1.7     | 70.0 / 73.2 | -        | 500     | 0.000 | 0.000 | 500     |
| Zone 36   | 0.8     | 70.0 / 80.2 | -        | 75      | 0.000 | 0.000 | 75      |
| Zone 37   | 6.4     | 70.0 / 74.1 | -        | 1430    | 0.000 | 0.000 | 1430    |
| Zone 38   | 15.2    | 69.4 / 86.3 | -        | 834     | 0.000 | 0.000 | 200     |
| Zone 39   | 0.0     | 0.0 / 0.0   | 0.00     | 61      | 0.000 | 0.000 | 30      |
| Zone 40   | 7.1     | 69.7 / 79.6 | -        | 668     | 0.000 | 0.000 | 360     |
| Zone 41   | 6.7     | 69.8 / 79.1 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 42   | 6.7     | 69.8 / 79.1 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 43   | 8.1     | 69.6 / 80.4 | -        | 696     | 0.000 | 0.000 | 360     |
| Zone 44   | 8.0     | 69.7 / 80.8 | -        | 665     | 0.000 | 0.000 | 360     |
| Zone 45   | 8.3     | 69.7 / 81.0 | -        | 683     | 0.000 | 0.000 | 360     |
| Zone 46   | 39.2    | 69.2 / 85.8 | -        | 2183    | 0.000 | 0.000 | 330     |
| Zone 47   | 28.9    | 69.5 / 86.1 | -        | 1618    | 0.000 | 0.000 | 320     |
| Zone 48   | 9.5     | 69.7 / 82.5 | -        | 688     | 0.000 | 0.000 | 352     |
| Zone 49   | 12.9    | 69.2 / 83.2 | -        | 858     | 0.000 | 0.000 | 135     |
| Zone 50   | 0.3     | 70.0 / 74.3 | -        | 68      | 0.000 | 0.000 | 30      |
| Zone 51   | 8.8     | 69.7 / 81.5 | -        | 685     | 0.000 | 0.000 | 360     |
| Zone 52   | 8.1     | 69.7 / 80.7 | -        | 683     | 0.000 | 0.000 | 360     |
| Zone 53   | 8.1     | 69.7 / 80.7 | -        | 683     | 0.000 | 0.000 | 360     |
| Zone 54   | 10.8    | 69.7 / 84.2 | -        | 687     | 0.000 | 0.000 | 360     |
| Zone 55   | 9.4     | 69.6 / 82.1 | -        | 691     | 0.000 | 0.000 | 360     |
| Zone 56   | 6.6     | 69.8 / 80.7 | -        | 562     | 0.000 | 0.000 | 360     |
| Zone 57   | 6.8     | 69.8 / 80.8 | -        | 572     | 0.000 | 0.000 | 360     |
| Zone 58   | 6.2     | 69.8 / 80.1 | -        | 560     | 0.000 | 0.000 | 360     |

# **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 686.2            | 57.2              | 444.4            |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 686.2            | 57.2              | 444.4            |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### **Zone Peak Sensible Loads**

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 9.2                                  | Jul 1400                                 | 1.8                              | 964.7                          |
| Zone 2    | 0.4                                  | Jul 1400                                 | 0.3                              | 148.8                          |
| Zone 3    | 3.9                                  | Jul 1400                                 | 0.8                              | 1750.1                         |
| Zone 4    | 2.9                                  | Jan 1100                                 | 0.0                              | 400.3                          |
| Zone 5    | 0.9                                  | Jan 1100                                 | 0.0                              | 82.1                           |
| Zone 6    | 1.1                                  | Jan 1400                                 | 0.0                              | 400.3                          |
| Zone 7    | 11.5                                 | Jul 1400                                 | 10.7                             | 981.4                          |
| Zone 8    | 9.0                                  | Jan 1400                                 | 0.0                              | 1239.8                         |

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 9    | 14.4     | Aug 1100      | 9.8     | 850.1  |
| Zone 10   | 36.4     | Jun 1800      | 38.6    | 1027.0 |
| Zone 11   | 14.3     | Aug 1100      | 6.8     | 848.5  |
| Zone 12   | 2.9      | Jul 1400      | 4.5     | 907.7  |
| Zone 13   | 3.8      | Jan 1400      | 0.0     | 500.2  |
| Zone 14   | 3.0      | Jan 1400      | 0.0     | 341.3  |
| Zone 15   | 11.8     | Oct 1400      | 5.4     | 837.7  |
| Zone 16   | 18.1     | Aug 1100      | 11.6    | 991.5  |
| Zone 17   | 10.3     | Jul 1500      | 7.6     | 3660.9 |
| Zone 18   | 12.0     | Oct 1400      | 5.2     | 904.5  |
| Zone 19   | 11.8     | Oct 1400      | 5.2     | 844.9  |
| Zone 20   | 14.5     | Aug 1100      | 9.7     | 836.8  |
| Zone 21   | 14.4     | Aug 1100      | 6.8     | 852.5  |
| Zone 22   | 14.4     | Aug 1100      | 6.8     | 852.5  |
| Zone 23   | 14.4     | Aug 1100      | 6.8     | 852.5  |
| Zone 24   | 14.6     | Aug 1100      | 8.3     | 858.4  |
| Zone 25   | 1.3      | Jan 1400      | 0.0     | 144.1  |
| Zone 26   | 9.7      | Jul 1100      | 5.0     | 4120.7 |
| Zone 27   | 6.0      | Jul 1100      | 3.6     | 2432.8 |
| Zone 28   | 34.4     | Jun 1800      | 27.7    | 665.8  |
| Zone 29   | 14.4     | Aug 1100      | 6.8     | 853.0  |
| Zone 30   | 14.4     | Aug 1100      | 7.6     | 850.1  |
| Zone 31   | 11.8     | Oct 1400      | 4.9     | 837.7  |
| Zone 32   | 12.0     | Oct 1400      | 5.1     | 904.5  |
| Zone 33   | 11.8     | Oct 1400      | 5.0     | 846.8  |
| Zone 34   | 11.2     | Jul 1400      | 2.8     | 1549.7 |
| Zone 35   | 4.2      | Jul 1400      | 0.9     | 468.8  |
| Zone 36   | 1.1      | Jul 1400      | 0.6     | 310.7  |
| Zone 37   | 11.0     | Jul 1400      | 2.4     | 1549.7 |
| Zone 38   | 16.8     | Aug 1100      | 15.3    | 993.4  |
| Zone 39   | 1.3      | Jan 1400      | 0.0     | 146.4  |
| Zone 40   | 14.4     | Aug 1100      | 7.5     | 858.4  |
| Zone 41   | 14.4     | Aug 1100      | 6.8     | 852.5  |
| Zone 42   | 14.4     | Aug 1100      | 6.8     | 852.5  |
| Zone 43   | 15.0     | Aug 1100      | 8.6     | 852.5  |
| Zone 44   | 14.3     | Aug 1100      | 8.1     | 836.8  |
| Zone 45   | 14.7     | Aug 1100      | 8.5     | 853.0  |
| Zone 46   | 25.9     | Jul 1400      | 39.5    | 5380.7 |
| Zone 47   | 34.9     | Jun 1800      | 29.3    | 659.1  |
| Zone 48   | 14.9     | Aug 1100      | 9.4     | 850.1  |
| Zone 49   | 18.5     | Aug 1100      | 13.6    | 993.2  |
| Zone 50   | 1.5      | Jul 1400      | 0.3     | 146.4  |
| Zone 51   | 14.8     | Aug 1100      | 9.2     | 858.4  |
| Zone 52   | 14.7     | Aug 1100      | 8.5     | 852.5  |
| Zone 53   | 14.7     | Aug 1100      | 8.5     | 852.5  |
| Zone 54   | 14.8     | Aug 1100      | 10.8    | 852.5  |
| Zone 55   | 14.9     | Aug 1100      | 9.9     | 836.8  |
| Zone 56   | 12.1     | Sep 1400      | 6.7     | 846.8  |
| Zone 57   | 12.4     | Sep 1400      | 6.9     | 904.8  |
| Zone 58   | 12.1     | Sep 1400      | 6.6     | 837.7  |

|                          |       | Cooling  | Time of<br>Peak | Air   | Heating | Floor  |                     |
|--------------------------|-------|----------|-----------------|-------|---------|--------|---------------------|
| Zone Name /              |       | Sensible | Sensible        | Flow  | Load    | Area   | Space               |
| Space Name               | Mult. | (MBH)    | Load            | (CFM) | (MBH)   | (ft²)  | CFM/ft <sup>2</sup> |
| Zone 1                   |       |          |                 |       |         |        |                     |
| B103E RELATED CR         | 1     | 9.2      | Jul 1400        | 425   | 1.8     | 964.7  | 0.44                |
| Zone 2                   |       |          |                 |       |         |        |                     |
| B103D STOR               | 1     | 0.4      | Jul 1400        | 20    | 0.3     | 148.8  | 0.14                |
| Zone 3                   |       |          |                 |       |         |        |                     |
| B111 CORRIDOR            | 1     | 3.3      | Jul 1400        | 160   | 0.8     | 1452.1 | 0.11                |
| B112 CORRIDOR            | 1     | 0.6      | Jan 1100        | 28    | 0.0     | 298.0  | 0.09                |
| Zone 4                   |       |          |                 |       |         |        |                     |
| B118 BANK                | 1     | 2.9      | Jan 1100        | 133   | 0.0     | 400.3  | 0.33                |
| Zone 5                   |       |          |                 |       |         |        |                     |
| B1 -2 Room - Bank Office | 1     | 0.9      | Jan 1100        | 41    | 0.0     | 82.1   | 0.50                |
| Zone 6                   |       |          |                 |       |         |        |                     |
| B121D STOR               | 1     | 0.6      | Jan 1400        | 28    | 0.0     | 220.6  | 0.13                |
| B121F WIG STOR           | 1     | 0.5      | Jan 1400        | 24    | 0.0     | 179.7  | 0.13                |
| Zone 7                   |       |          |                 |       |         |        |                     |
| B121E THEORY CR          | 1     | 11.5     | Jul 1400        | 585   | 10.7    | 981.4  | 0.60                |
| Zone 8                   |       |          |                 |       |         |        |                     |
| B104G RELATED CR         | 1     | 9.0      | Jan 1400        | 419   | 0.0     | 1239.8 | 0.34                |
| Zone 9                   |       |          |                 |       |         |        |                     |
| B233 CR                  | 1     | 14.4     | Aug 1100        | 666   | 9.8     | 850.1  | 0.78                |
| Zone 10                  |       |          |                 |       |         |        |                     |
| B230 COLLAB              | 1     | 36.4     | Jun 1800        | 2103  | 38.6    | 1027.0 | 2.05                |
| Zone 11                  |       |          |                 |       |         |        |                     |
| A227 CR                  | 1     | 14.3     | Aug 1100        | 665   | 6.8     | 848.5  | 0.78                |
| Zone 12                  |       |          |                 |       |         |        |                     |
| A223 CORRIDOR            | 1     | 2.9      | Jul 1400        | 460   | 4.5     | 907.7  | 0.51                |
| Zone 13                  |       |          |                 |       |         |        |                     |
| B215 SPED SMALL GROUP    | 1     | 3.8      | Jan 1400        | 175   | 0.0     | 500.2  | 0.35                |
| Zone 14                  |       |          |                 |       |         |        |                     |
| B216 IN-HOUSE SUSPENSION | 1     | 3.0      | Jan 1400        | 141   | 0.0     | 341.3  | 0.41                |
| Zone 15                  |       |          |                 |       |         |        |                     |
| B211 CR                  | 1     | 11.8     | Oct 1400        | 547   | 5.4     | 837.7  | 0.65                |
| Zone 16                  |       |          |                 |       |         |        |                     |
| B234 TEACHERS PLANNING   | 1     | 18.1     | Aug 1100        | 837   | 11.6    | 991.5  | 0.84                |
| Zone 17                  |       |          |                 |       |         |        |                     |
| B214 CORRIDOR            | 1     | 2.3      | Jan 1400        | 210   | 0.0     | 922.2  | 0.23                |
| B231 CORRIDOR            | 1     | 8.5      | Jul 1700        | 460   | 7.6     | 2738.7 | 0.17                |
| Zone 18                  |       |          |                 |       |         |        |                     |
| B212 CR                  | 1     | 12.0     | Oct 1400        | 557   | 5.2     | 904.5  | 0.62                |
| Zone 19                  |       |          |                 |       |         |        |                     |
| B213 SPED LEARNING CENTE | 1     | 11.8     | Oct 1400        | 548   | 5.2     | 844.9  | 0.65                |
| Zone 20                  |       |          |                 |       |         |        |                     |
| B239 CR                  | 1     | 14.5     | Aug 1100        | 674   | 9.7     | 836.8  | 0.81                |
| Zone 21                  |       |          |                 |       |         |        |                     |
| B238 CR                  | 1     | 14.4     | Aug 1100        | 665   | 6.8     | 852.5  | 0.78                |
| Zone 22                  |       |          |                 |       |         |        |                     |
| B237 CR                  | 1     | 14.4     | Aug 1100        | 665   | 6.8     | 852.5  | 0.78                |
| Zone 23                  |       |          |                 |       |         |        |                     |
| B236 CR                  | 1     | 14.4     | Aug 1100        | 665   | 6.8     | 852.5  | 0.78                |
| Zone 24                  |       |          |                 |       |         |        |                     |
| B235 CR                  | 1     | 14.6     | Aug 1100        | 675   | 8.3     | 858.4  | 0.79                |
| Zone 25                  |       |          |                 |       |         |        |                     |
| B234B HUDDLE             | 1     | 1.3      | Jan 1400        | 61    | 0.0     | 144.1  | 0.42                |

| Zone Name /              |       | Cooling<br>Sensible | Time of<br>Peak<br>Sensible | Air<br>Flow | Heating<br>Load | Floor<br>Area | Space               |
|--------------------------|-------|---------------------|-----------------------------|-------------|-----------------|---------------|---------------------|
| Space Name               | Mult. | (MBH)               | Load                        | (CFM)       | (MBH)           | (ft²)         | CFM/ft <sup>2</sup> |
|                          | 4     | 1.0                 | 1                           |             |                 | 400.0         | 0.40                |
|                          | 1     | 1.2                 | Jan 1400                    | 55          | 0.0             | 438.3         | 0.13                |
| B324 CORRIDOR            | 1     | 0.2                 | Jui 1100                    | 207         | 5.0             | 2760.2        | 0.10                |
| B312 CORRIDOR            | 1     | 2.3                 | Jan 1400                    | 195         | 0.0             | 922.2         | 0.21                |
|                          | 1     | 6.0                 | Iul 1100                    | 079         | 2.6             | 2422.9        | 0.11                |
| A321 CORRIDOR            | 1     | 0.0                 | Jui 1100                    | 210         | 3.0             | 2432.0        | 0.11                |
|                          | 1     | 24.4                | lun 1900                    | 1504        | 07.7            | CCE 9         | 2.20                |
| B323 COLLAD              | 1     | 34.4                | Jun 1600                    | 1594        | 21.1            | 0.000         | 2.39                |
| Rade CP                  | 1     | 14.4                | Aug 1100                    | 665         | 6.9             | 853.0         | 0.78                |
| Zono 20                  | 1     | 14.4                | Aug 1100                    | 003         | 0.0             | 000.0         | 0.70                |
| B327 CR                  | 1     | 14.4                | Aug 1100                    | 666         | 7.6             | 850.1         | 0.78                |
| 70no 21                  | 1     | 14.4                | Aug 1100                    | 000         | 7.0             | 000.1         | 0.78                |
| B300 CP                  | 1     | 11.9                | Oct 1400                    | 546         | 4.0             | 937 7         | 0.65                |
| Zone 32                  | 1     | 11.0                | 001 1400                    | 540         | 4.9             | 037.7         | 0.05                |
| B310 CR                  | 1     | 12.0                | Oct 1400                    | 557         | 5 1             | 904 5         | 0.62                |
| Zone 33                  | 1     | 12.0                | 001 1400                    |             | 5.1             | 904.5         | 0.02                |
| B311 SPED LEARNING CENTE | 1     | 11.8                | Oct 1400                    | 5/18        | 5.0             | 846.8         | 0.65                |
|                          | 1     | 11.0                | 001 1400                    | 540         | 5.0             | 040.0         | 0.05                |
| B315 SCU AB              | 1     | 11.2                | lul 1400                    | 1430        | 2.8             | 1549 7        | 0.92                |
| Zone 35                  | 1     | 11.2                | 001 1400                    | 1400        | 2.0             | 1040.7        | 0.02                |
| B316 SCI PREP            | 1     | 4 2                 | Jul 1400                    | 500         | 0.9             | 468.8         | 1 07                |
| Zone 36                  |       | 7.2                 | 001 1400                    | 000         | 0.0             | 400.0         | 1.07                |
| B317 STOR                | 1     | 1 1                 | Jul 1400                    | 75          | 0.6             | 310.7         | 0.24                |
| Zone 37                  |       |                     | 001 1400                    | 10          | 0.0             | 010.1         | 0.24                |
| B322 SCLLAB              | 1     | 11.0                | .lul 1400                   | 1430        | 24              | 1549 7        | 0.92                |
| Zone 38                  |       | 11.0                | 0011100                     | 1100        |                 | 101011        | 0.02                |
| B328 TEACHERS PLANNING   | 1     | 16.8                | Aug 1100                    | 834         | 15.3            | 993 4         | 0.84                |
| Zone 39                  |       |                     | ,                           |             |                 |               | 0.01                |
| B328B HUDDLE             | 1     | 1.3                 | Jan 1400                    | 61          | 0.0             | 146.4         | 0.42                |
| Zone 40                  |       |                     |                             |             |                 |               |                     |
| B329 CR                  | 1     | 14.4                | Aug 1100                    | 668         | 7.5             | 858.4         | 0.78                |
| Zone 41                  |       |                     | <u>J</u>                    |             |                 |               |                     |
| B330 CR                  | 1     | 14.4                | Aug 1100                    | 665         | 6.8             | 852.5         | 0.78                |
| Zone 42                  |       |                     | 0                           |             |                 |               |                     |
| B331 CR                  | 1     | 14.4                | Aug 1100                    | 665         | 6.8             | 852.5         | 0.78                |
| Zone 43                  |       |                     | -                           |             |                 |               |                     |
| B332 CR                  | 1     | 15.0                | Aug 1100                    | 696         | 8.6             | 852.5         | 0.82                |
| Zone 44                  |       |                     | -                           |             |                 |               |                     |
| B333 CR                  | 1     | 14.3                | Aug 1100                    | 665         | 8.1             | 836.8         | 0.79                |
| Zone 45                  |       |                     | -                           |             |                 |               |                     |
| A432 CR                  | 1     | 14.7                | Aug 1100                    | 683         | 8.5             | 853.0         | 0.80                |
| Zone 46                  |       |                     |                             |             |                 |               |                     |
| A428 CORRIDOR            | 1     | 3.8                 | Jul 1400                    | 292         | 5.4             | 901.3         | 0.32                |
| B420 CORRIDOR            | 1     | 11.3                | Jul 1400                    | 804         | 14.7            | 3084.2        | 0.26                |
| B421 CORRIDOR            | 1     | 2.1                 | Jul 1400                    | 95          | 1.2             | 647.4         | 0.15                |
| B412 CORRIDOR            | 1     | 8.7                 | Jul 1400                    | 992         | 18.2            | 747.8         | 1.33                |
| Zone 47                  |       |                     |                             |             |                 |               |                     |
| B419 COLLAB              | 1     | 34.9                | Jun 1800                    | 1618        | 29.3            | 659.1         | 2.45                |
| Zone 48                  |       |                     |                             |             |                 |               |                     |
| B422 CR                  | 1     | 14.9                | Aug 1100                    | 688         | 9.4             | 850.1         | 0.81                |
| Zone 49                  |       |                     |                             |             |                 |               |                     |
| B423 TEACHERS PLANNING   | 1     | 18.5                | Aug 1100                    | 858         | 13.6            | 993.2         | 0.86                |
| Zone 50                  |       |                     |                             |             |                 |               |                     |

| Zone Name /              |       | Cooling<br>Sensible | Time of<br>Peak<br>Sensible | Air<br>Flow | Heating<br>Load | Floor<br>Area | Space               |
|--------------------------|-------|---------------------|-----------------------------|-------------|-----------------|---------------|---------------------|
| Space Name               | Mult. | (MBH)               | Load                        | (CFM)       | (MBH)           | (ft²)         | CFM/ft <sup>2</sup> |
| B423B HUDDLE             | 1     | 1.5                 | Jul 1400                    | 68          | 0.3             | 146.4         | 0.46                |
| Zone 51                  |       |                     |                             |             |                 |               |                     |
| B424 CR                  | 1     | 14.8                | Aug 1100                    | 685         | 9.2             | 858.4         | 0.80                |
| Zone 52                  |       |                     |                             |             |                 |               |                     |
| B425 CR                  | 1     | 14.7                | Aug 1100                    | 683         | 8.5             | 852.5         | 0.80                |
| Zone 53                  |       |                     |                             |             |                 |               |                     |
| B426 CR                  | 1     | 14.7                | Aug 1100                    | 683         | 8.5             | 852.5         | 0.80                |
| Zone 54                  |       |                     |                             |             |                 |               |                     |
| B427 CR                  | 1     | 14.8                | Aug 1100                    | 687         | 10.8            | 852.5         | 0.81                |
| Zone 55                  |       |                     |                             |             |                 |               |                     |
| B428 CR                  | 1     | 14.9                | Aug 1100                    | 691         | 9.9             | 836.8         | 0.83                |
| Zone 56                  |       |                     |                             |             |                 |               |                     |
| B411 SPED LEARNING CENTE | 1     | 12.1                | Sep 1400                    | 562         | 6.7             | 846.8         | 0.66                |
| Zone 57                  |       |                     |                             |             |                 |               |                     |
| B410 CR                  | 1     | 12.4                | Sep 1400                    | 572         | 6.9             | 904.8         | 0.63                |
| Zone 58                  |       |                     |                             |             |                 |               |                     |
| B409 CR                  | 1     | 12.1                | Sep 1400                    | 560         | 6.6             | 837.7         | 0.67                |

### **Air System Information**

| Air System Name | HRU-3 Classrooms Plan North |
|-----------------|-----------------------------|
| Equipment Class | TERM                        |
| Air System Type | VRF                         |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

# **Cooling Coil Sizing Data**

| Total coil load 15.3          | Tons    |
|-------------------------------|---------|
| Total coil load 183.8         | MBH     |
| Total coil load 1421.8        | CFM/Ton |
| Sensible coil load 183.8      | MBH     |
| Coil CFM at Jul 1400 21782    | CFM     |
| Max coil CFM 21782            | CFM     |
| Sensible heat ratio 1.000     |         |
| Water flow @ 10.0 °F rise N/A |         |

#### **Heating Coil Sizing Data**

| Max coil load             | 302.7 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 21782 | CFM |
| Max coil CFM              | 21782 | CFM |
| Water flow @ 20.0 °F drop | N/A   |     |

### **Ventilation Fan Sizing Data**

| Actual max CFM 21782                | CFM                   |
|-------------------------------------|-----------------------|
| Standard CFM 21759                  | CFM                   |
| Actual max CFM/ft <sup>2</sup> 0.38 | B CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM 21782                | CFM                 |
|-------------------------------------|---------------------|
| Standard CFM 21759                  | CFM                 |
| Actual max CFM/ft <sup>2</sup> 0.38 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |    |
|------------------------------|----|
| Design airflow CEM           | 2. |

| Design airflow CFM 21782 | CFM                 |
|--------------------------|---------------------|
| CFM/ft <sup>2</sup> 0.38 | CFM/ft <sup>2</sup> |

| Number of zones |                       |   |
|-----------------|-----------------------|---|
| Floor Area      | <b>57878.7</b> ft     | ť |
| Location        | Boston, Massachusetts |   |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Jul 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 80.2 / 72.1 | °F |
| Leaving DB / WB 72.4 / 69.8  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| Ent. DB / Lvg DB 54.5 / 67.4 | °F |

| Fan motor BHP | 22.47 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 17.83 | kW    |
| Fan static    | 3.00  | in wg |

| Fan motor BHP | 14.98 | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 11.89 | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 27.27 | CFM/person |

# **Air System Information**

| Air System Name HRU-3 Classrooms Plan No | th Number of zones |                                |  |
|--|--------------------|--------------------------------|--|
| Equipment Class TER                      | M Floor Area       | <b>57878.7</b> ft <sup>2</sup> |  |
| Air System Type V                        | RF Location        | Boston, Massachusetts          |  |

# **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

# **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 33.2  | 20.8  | 76.0 / 66.3 | 55.0 / 54.2 | -         | Jul 1000  | 0.94                |
| Zone 2    | 4.3   | 1.8   | 75.0 / 70.7 | 55.0 / 54.9 | -         | Jul 1200  | 0.30                |
| Zone 3    | 4.3   | 3.1   | 76.4 / 64.9 | 55.0 / 54.0 | -         | Jul 1000  | 0.91                |
| Zone 4    | 41.0  | 23.9  | 76.3 / 67.3 | 55.0 / 54.3 | -         | Jul 1000  | 0.51                |
| Zone 5    | 16.5  | 7.1   | 75.0 / 70.7 | 55.0 / 54.9 | -         | Jul 1200  | 0.50                |
| Zone 6    | 34.5  | 21.7  | 76.1 / 66.3 | 55.0 / 54.2 | -         | Jul 1000  | 0.88                |
| Zone 7    | 39.7  | 19.8  | 75.4 / 68.9 | 55.0 / 54.6 | -         | Jul 1000  | 0.36                |
| Zone 8    | 16.5  | 7.1   | 75.0 / 70.7 | 55.0 / 54.9 | -         | Jul 1200  | 0.50                |
| Zone 9    | 16.5  | 7.1   | 75.0 / 70.7 | 55.0 / 54.9 | -         | Jul 1200  | 0.55                |
| Zone 10   | 31.9  | 19.5  | 76.0 / 66.6 | 55.0 / 54.3 | -         | Jul 1000  | 0.85                |
| Zone 11   | 5.5   | 4.8   | 75.7 / 64.8 | 59.1 / 58.1 | -         | Aug 1000  | 1.78                |
| Zone 12   | 6.3   | 5.5   | 76.1 / 62.9 | 55.0 / 53.8 | -         | Aug 1000  | 1.52                |
| Zone 13   | 52.5  | 27.8  | 75.7 / 68.2 | 55.0 / 54.5 | -         | Jul 1000  | 0.79                |
| Zone 14   | 4.3   | 3.1   | 76.4 / 64.9 | 55.0 / 54.0 | -         | Jul 1000  | 0.93                |
| Zone 15   | 3.2   | 1.6   | 75.9 / 69.0 | 55.0 / 54.6 | -         | Aug 1000  | 0.13                |
| Zone 16   | 33.3  | 20.8  | 76.1 / 66.4 | 55.0 / 54.2 | -         | Jul 1000  | 0.91                |
| Zone 17   | 19.9  | 12.3  | 75.4 / 66.2 | 55.0 / 54.2 | -         | Jul 1200  | 0.78                |
| Zone 18   | 18.7  | 11.2  | 76.1 / 66.8 | 55.0 / 54.3 | -         | Jul 1000  | 0.68                |
| Zone 19   | 3.5   | 2.5   | 76.6 / 65.2 | 55.0 / 54.0 | -         | Aug 1000  | 0.71                |
| Zone 20   | 9.3   | 6.1   | 76.6 / 66.1 | 55.0 / 54.1 | -         | Aug 1000  | 0.51                |
| Zone 21   | 16.0  | 6.9   | 75.0 / 70.7 | 55.0 / 54.9 | -         | Jul 1200  | 0.57                |
| Zone 22   | 3.5   | 2.5   | 76.6 / 65.2 | 55.0 / 54.0 | -         | Aug 1000  | 0.71                |
| Zone 23   | 18.7  | 11.2  | 76.0 / 66.8 | 55.0 / 54.3 | -         | Jul 1000  | 0.69                |
| Zone 24   | 18.7  | 11.3  | 76.0 / 66.8 | 55.0 / 54.3 | -         | Jul 1000  | 0.72                |
| Zone 25   | 7.8   | 3.6   | 75.3 / 69.8 | 55.0 / 54.8 | -         | Aug 1200  | 0.34                |
| Zone 26   | 15.3  | 6.6   | 75.0 / 70.7 | 55.0 / 54.9 | -         | Jul 1200  | 0.60                |
| Zone 27   | 27.7  | 16.5  | 76.2 / 67.1 | 55.0 / 54.3 | -         | Jul 1000  | 0.49                |
| Zone 28   | 6.3   | 5.6   | 75.6 / 64.3 | 58.4 / 57.3 | -         | Jul 1000  | 1.99                |
| Zone 29   | 5.6   | 4.8   | 75.9 / 63.3 | 55.6 / 54.4 | -         | Aug 1000  | 1.35                |
| Zone 30   | 6.3   | 5.5   | 76.1 / 62.9 | 55.0 / 53.8 | -         | Aug 1000  | 1.52                |
| Zone 31   | 1.2   | 0.6   | 75.9 / 69.4 | 55.0 / 54.6 | -         | Aug 1000  | 0.13                |
| Zone 32   | 47.2  | 21.6  | 75.0 / 70.6 | 61.5 / 61.2 | -         | Jul 0800  | 1.00                |
| Zone 33   | 4.3   | 2.0   | 75.0 / 70.6 | 62.6 / 62.3 | -         | Jul 1000  | 1.00                |
| Zone 34   | 13.2  | 5.7   | 75.0 / 70.6 | 56.4 / 56.2 | -         | Jul 1100  | 1.05                |
| Zone 35   | 12.1  | 5.4   | 75.0 / 70.6 | 59.8 / 59.6 | -         | Jul 1000  | 1.15                |
| Zone 36   | 4.1   | 3.2   | 76.6 / 64.2 | 55.0 / 53.9 | -         | Aug 1000  | 0.87                |
| Zone 37   | 3.6   | 1.8   | 75.7 / 69.0 | 55.0 / 54.6 | -         | Aug 1000  | 0.15                |
| Zone 38   | 46.8  | 22.2  | 75.0 / 70.6 | 62.9 / 62.6 | -         | Jul 1100  | 1.16                |
| Zone 39   | 35.6  | 21.4  | 75.6 / 66.6 | 55.0 / 54.3 | -         | Jul 1000  | 0.44                |
| Zone 40   | 5.5   | 4.8   | 75.7 / 64.8 | 59.1 / 58.0 | -         | Jul 1000  | 1.77                |
| Zone 41   | 3.4   | 2.9   | 75.4 / 67.0 | 62.8 / 62.0 | -         | Jul 1300  | 1.37                |
| Zone 42   | 2.8   | 2.4   | 75.6 / 63.3 | 55.2 / 54.1 | -         | Jul 1800  | 1.11                |
| Zone 43   | 3.8   | 2.8   | 75.4 / 66.2 | 59.2 / 58.4 | -         | Jul 1700  | 0.83                |

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 44   | 9.7   | 5.7   | 76.2 / 67.1 | 55.0 / 54.3 | -         | Aug 1000  | 0.55                |
| Zone 45   | 5.3   | 4.0   | 76.6 / 64.5 | 55.0 / 53.9 | -         | Aug 1000  | 0.85                |
| Zone 46   | 26.6  | 13.0  | 75.5 / 69.2 | 55.0 / 54.7 | -         | Jul 1200  | 0.39                |
| Zone 47   | 26.3  | 12.5  | 75.4 / 69.5 | 55.0 / 54.7 | -         | Jul 1200  | 0.39                |
| Zone 48   | 2.1   | 1.1   | 75.9 / 69.0 | 55.0 / 54.6 | -         | Aug 1000  | 0.13                |
| Zone 49   | 2.1   | 0.9   | 75.1 / 70.4 | 55.0 / 54.8 | -         | Aug 1200  | 0.24                |
| Zone 50   | 6.1   | 6.1   | 75.0 / 69.7 | 71.1 / 68.5 | -         | Sep 1100  | 4.20                |
| Zone 51   | 3.4   | 2.4   | 76.9 / 65.3 | 55.0 / 54.0 | -         | Aug 1000  | 0.49                |
| Zone 52   | 3.0   | 2.0   | 76.6 / 66.1 | 55.0 / 54.1 | -         | Aug 1000  | 0.47                |
| Zone 53   | 18.6  | 8.2   | 75.0 / 70.6 | 58.3 / 58.1 | -         | Jul 1800  | 0.88                |
| Zone 54   | 22.0  | 10.8  | 75.5 / 69.1 | 55.0 / 54.6 | -         | Jul 1200  | 0.42                |
| Zone 55   | 35.8  | 20.6  | 75.5 / 67.3 | 55.7 / 55.1 | -         | Jul 0900  | 0.57                |
| Zone 56   | 25.6  | 17.0  | 76.6 / 66.0 | 55.0 / 54.1 | -         | Jul 1000  | 0.48                |
| Zone 57   | 3.4   | 2.9   | 75.5 / 67.1 | 63.0 / 62.2 | -         | Jul 1300  | 1.35                |
| Zone 58   | 5.5   | 4.7   | 76.2 / 63.1 | 55.0 / 53.8 | -         | Aug 1000  | 1.27                |
| Zone 59   | 6.4   | 5.7   | 75.5 / 63.7 | 57.3 / 56.2 | -         | Aug 1000  | 1.91                |
| Zone 60   | 22.0  | 10.9  | 75.4 / 68.9 | 55.0 / 54.6 | -         | Jul 1200  | 0.51                |
| Zone 61   | 5.7   | 2.7   | 75.3 / 69.6 | 55.0 / 54.7 | -         | Jul 1200  | 0.43                |
| Zone 62   | 7.0   | 3.0   | 75.0 / 70.6 | 56.2 / 56.0 | -         | Aug 1000  | 1.05                |
| Zone 63   | 38.0  | 17.2  | 75.1 / 70.1 | 55.0 / 54.8 | -         | Jul 1200  | 0.50                |
| Zone 64   | 37.5  | 17.1  | 75.1 / 70.0 | 55.0 / 54.8 | -         | Jul 1200  | 0.50                |
| Zone 65   | 2.8   | 1.6   | 75.4 / 67.6 | 57.4 / 56.8 | -         | Jul 0900  | 0.39                |
| Zone 66   | 4.8   | 3.5   | 76.4 / 64.8 | 55.0 / 54.0 | -         | Jul 1000  | 0.75                |
| Zone 67   | 4.8   | 2.2   | 75.0 / 70.6 | 61.5 / 61.1 | -         | Jul 1000  | 0.83                |
| Zone 68   | 1.0   | 0.5   | 75.5 / 68.8 | 55.0 / 54.6 | -         | Jul 1000  | 0.26                |
| Zone 69   | 38.5  | 21.2  | 75.6 / 67.7 | 55.0 / 54.4 | -         | Jul 1000  | 0.46                |
| Zone 70   | 5.4   | 4.9   | 75.4 / 67.1 | 63.7 / 62.9 | -         | Aug 1000  | 2.58                |
| Zone 71   | 6.3   | 5.6   | 75.8 / 64.2 | 58.2 / 57.1 | -         | Aug 1100  | 1.88                |
| Zone 72   | 21.3  | 10.4  | 75.3 / 69.1 | 55.0 / 54.7 | -         | Jul 1200  | 0.54                |
| Zone 73   | 4.4   | 2.3   | 75.6 / 68.5 | 55.0 / 54.5 | -         | Jul 1000  | 0.46                |
| Zone 74   | 7.7   | 3.7   | 75.4 / 69.2 | 55.0 / 54.7 | -         | Jul 1300  | 0.16                |
| Zone 75   | 35.2  | 20.4  | 75.8 / 67.1 | 55.0 / 54.3 | -         | Jul 1000  | 0.69                |
| Zone 76   | 33.2  | 17.6  | 75.4 / 68.1 | 55.0 / 54.5 | -         | Jul 0900  | 0.59                |
| Zone 77   | 35.0  | 19.6  | 75.7 / 67.5 | 55.0 / 54.4 | -         | Jul 1000  | 0.70                |
| Zone 78   | 3.4   | 2.5   | 76.2 / 64.9 | 55.0 / 54.0 | -         | Jul 1000  | 0.88                |
| Zone 79   | 21.2  | 12.0  | 75.3 / 68.2 | 59.1 / 58.5 | -         | Aug 1000  | 0.72                |
| Zone 80   | 41.2  | 31.4  | 75.7 / 64.9 | 57.0 / 56.1 | -         | Jul 1000  | 1.08                |
| Zone 81   | 6.3   | 5.5   | 76.0 / 62.9 | 55.0 / 53.8 | -         | Aug 1000  | 1.53                |
| Zone 82   | 5.6   | 4.8   | 75.9 / 63.2 | 55.5 / 54.4 | -         | Aug 1000  | 1.36                |
| Zone 83   | 6.5   | 5.6   | 75.6 / 64.6 | 58.7 / 57.7 | -         | Jul 1100  | 2.05                |
| Zone 84   | 3.6   | 1.6   | 75.0 / 70.6 | 60.2 / 59.9 | -         | Jul 0900  | 0.20                |
| Zone 85   | 30.0  | 15.4  | 75.7 / 68.7 | 55.0 / 54.6 | -         | Jul 1000  | 0.41                |
| Zone 86   | 5.1   | 2.3   | 75.0 / 70.6 | 60.8 / 60.5 | -         | Jul 1400  | 1.05                |
| Zone 87   | 20.6  | 11.5  | 75.4 / 67.4 | 55.0 / 54.4 | -         | Jul 1500  | 0.93                |

# Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 6.0     | 70.0 / 76.1 | -        | 915     | 0.000 | 0.000 | 370     |
| Zone 2    | 0.0     | 0.0 / 0.0   | 0.00     | 85      | 0.000 | 0.000 | 85      |
|           |         | Heating     | Htg Coil | -       |                |          | <b></b>       |
|-----------|---------|-------------|----------|---------|----------------|----------|---------------|
|           | Heating |             | Water    | Fan     | <b>F</b>       | <b>F</b> | OA Vent       |
|           | Coll    | Ent/Lvg     | Flow     | Design  | Fan            | Fan      | Design        |
| Zono Nomo |         | DB          | @20.0 °F | AITTIOW | Motor<br>(BUD) | Motor    | AITTIOW       |
|           |         | (F)         | (gpm)    |         | (впР)          | (KVV)    | (CFIVI)<br>20 |
|           | 0.0     | 0.070.0     | 0.00     | 1042    | 0.000          | 0.000    | 30            |
|           | 10.3    | 09.7778.9   | -        | 1043    | 0.000          | 0.000    | 490           |
|           | 0.0     | 0.070.0     | 0.00     | 330     | 0.000          | 0.000    | 330           |
|           | 10.3    | 60.9 / 92.9 | -        | 955     | 0.000          | 0.000    | 500<br>625    |
|           | 12.0    | 09.0702.0   | -        | 330     | 0.000          | 0.000    | 330           |
|           | 0.0     | 0.0/0.0     | 0.00     | 330     | 0.000          | 0.000    | 330           |
| Zone 10   | 7.4     | 69.8 / 77.7 | 0.00     | 862     | 0.000          | 0.000    | 371           |
| Zone 11   | 4 9     | 69.4 / 86.2 |          | 268     | 0.000          | 0.000    | 15            |
| Zone 12   | 3.9     | 69.3 / 84.5 | -        | 200     | 0.000          | 0.000    | 15            |
| Zone 12   | 6.7     | 699/749     | -        | 1247    | 0.000          | 0.000    | 800           |
| Zone 14   | 0.0     | 0 0 / 0 0   | 0.00     | 133     | 0.000          | 0.000    | 30            |
| Zone 15   | 0.0     | 0.0 / 0.0   | 0.00     | 73      | 0.000          | 0.000    | 30            |
| Zone 16   | 5.6     | 70.0 / 75.6 | -        | 917     | 0.000          | 0.000    | 370           |
| Zone 17   | 5.4     | 69.7 / 78.7 | -        | 560     | 0.000          | 0.000    | 220           |
| Zone 18   | 5.6     | 69.7 / 80.2 | -        | 495     | 0.000          | 0.000    | 220           |
| Zone 19   | 0.0     | 0.0 / 0.0   | 0.00     | 107     | 0.000          | 0.000    | 25            |
| Zone 20   | 0.0     | 0.0 / 0.0   | 0.00     | 260     | 0.000          | 0.000    | 81            |
| Zone 21   | 0.0     | 0.0 / 0.0   | 0.00     | 320     | 0.000          | 0.000    | 320           |
| Zone 22   | 0.0     | 0.0 / 0.0   | 0.00     | 107     | 0.000          | 0.000    | 25            |
| Zone 23   | 5.4     | 69.6 / 79.8 | -        | 495     | 0.000          | 0.000    | 220           |
| Zone 24   | 7.5     | 69.6 / 83.6 | -        | 498     | 0.000          | 0.000    | 220           |
| Zone 25   | 0.0     | 0.0 / 0.0   | 0.00     | 166     | 0.000          | 0.000    | 140           |
| Zone 26   | 0.0     | 0.0 / 0.0   | 0.00     | 305     | 0.000          | 0.000    | 305           |
| Zone 27   | 10.6    | 69.5 / 83.1 | -        | 718     | 0.000          | 0.000    | 315           |
| Zone 28   | 5.5     | 69.4 / 86.3 | -        | 300     | 0.000          | 0.000    | 15            |
| Zone 29   | 3.9     | 69.0 / 85.6 | -        | 217     | 0.000          | 0.000    | 15            |
| Zone 30   | 4.0     | 69.0 / 84.2 | -        | 240     | 0.000          | 0.000    | 15            |
| Zone 31   | 0.0     | 0.0 / 0.0   | 0.00     | 27      | 0.000          | 0.000    | 13            |
| Zone 32   | 18.1    | 70.0 / 81.3 | -        | 1485    | 0.000          | 0.000    | 1485          |
| Zone 33   | 0.0     | 0.0/0.0     | 0.00     | 150     | 0.000          | 0.000    | 150           |
| Zone 34   | 3.5     | 70.0781.3   | -        | 285     | 0.000          | 0.000    | 285           |
| Zone 35   | 0.0     | 0.0/0.0     | 0.00     | 330     | 0.000          | 0.000    | 330           |
|           | 0.0     | 0.0/0.0     | 0.00     | 130     | 0.000          | 0.000    | 20            |
| Zone 38   | 20.3    | 70.0/81.1   | 0.00     | 1705    | 0.000          | 0.000    | 1705          |
| Zone 39   | 10.4    | 697/797     |          | 961     | 0.000          | 0.000    | 375           |
| Zone 40   | 4 9     | 69.4 / 86.2 | -        | 268     | 0.000          | 0.000    | 15            |
| Zone 41   | 3.9     | 69.0 / 85.6 | -        | 216     | 0.000          | 0.000    | 15            |
| Zone 42   | 1.9     | 69.3 / 86.2 | -        | 107     | 0.000          | 0.000    | 15            |
| Zone 43   | 2.8     | 69.4 / 86.2 | -        | 158     | 0.000          | 0.000    | 45            |
| Zone 44   | 0.0     | 0.0 / 0.0   | 0.00     | 250     | 0.000          | 0.000    | 115           |
| Zone 45   | 0.0     | 0.0 / 0.0   | 0.00     | 170     | 0.000          | 0.000    | 30            |
| Zone 46   | 7.6     | 69.8 / 81.8 | -        | 588     | 0.000          | 0.000    | 440           |
| Zone 47   | 7.4     | 69.8 / 81.8 | -        | 570     | 0.000          | 0.000    | 450           |
| Zone 48   | 0.0     | 0.0 / 0.0   | 0.00     | 47      | 0.000          | 0.000    | 20            |
| Zone 49   | 0.0     | 0.0 / 0.0   | 0.00     | 43      | 0.000          | 0.000    | 40            |
| Zone 50   | 0.0     | 0.0 / 0.0   | 0.00     | 1441    | 0.000          | 0.000    | 1420          |
| Zone 51   | 0.0     | 0.0 / 0.0   | 0.00     | 101     | 0.000          | 0.000    | 20            |
| Zone 52   | 0.0     | 0.0 / 0.0   | 0.00     | 84      | 0.000          | 0.000    | 25            |
| Zone 53   | 6.3     | 70.0 / 82.8 | -        | 455     | 0.000          | 0.000    | 455           |
| Zone 54   | 7.0     | 69.8 / 83.1 | -        | 491     | 0.000          | 0.000    | 360           |
| Zone 55   | 14.4    | 69.6 / 83.4 | -        | 966     | 0.000          | 0.000    | 465           |

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 56   | 10.3    | 69.5 / 82.6 | -        | 728     | 0.000 | 0.000 | 205     |
| Zone 57   | 3.9     | 69.0 / 85.6 | -        | 214     | 0.000 | 0.000 | 15      |
| Zone 58   | 3.6     | 69.1 / 85.6 | -        | 205     | 0.000 | 0.000 | 15      |
| Zone 59   | 5.2     | 69.4 / 86.2 | -        | 288     | 0.000 | 0.000 | 15      |
| Zone 60   | 6.6     | 69.8 / 82.2 | -        | 496     | 0.000 | 0.000 | 360     |
| Zone 61   | 0.5     | 70.0 / 73.8 | -        | 122     | 0.000 | 0.000 | 100     |
| Zone 62   | 0.5     | 70.0 / 73.1 | -        | 150     | 0.000 | 0.000 | 150     |
| Zone 63   | 12.6    | 69.9 / 84.7 | -        | 793     | 0.000 | 0.000 | 710     |
| Zone 64   | 12.0    | 69.9 / 84.0 | -        | 787     | 0.000 | 0.000 | 695     |
| Zone 65   | 1.5     | 69.4 / 86.0 | -        | 84      | 0.000 | 0.000 | 36      |
| Zone 66   | 0.4     | 70.1 / 72.5 | -        | 151     | 0.000 | 0.000 | 30      |
| Zone 67   | 0.5     | 70.0 / 73.4 | -        | 150     | 0.000 | 0.000 | 150     |
| Zone 68   | 0.2     | 69.9 / 75.9 | -        | 24      | 0.000 | 0.000 | 15      |
| Zone 69   | 13.8    | 69.7 / 83.1 | -        | 953     | 0.000 | 0.000 | 516     |
| Zone 70   | 7.1     | 69.3 / 86.3 | -        | 388     | 0.000 | 0.000 | 15      |
| Zone 71   | 5.4     | 69.4 / 86.3 | -        | 295     | 0.000 | 0.000 | 15      |
| Zone 72   | 6.7     | 69.8 / 83.0 | -        | 474     | 0.000 | 0.000 | 360     |
| Zone 73   | 0.4     | 70.0 / 74.0 | -        | 102     | 0.000 | 0.000 | 67      |
| Zone 74   | 1.8     | 69.8 / 79.7 | -        | 170     | 0.000 | 0.000 | 110     |
| Zone 75   | 10.4    | 69.7 / 80.3 | -        | 911     | 0.000 | 0.000 | 445     |
| Zone 76   | 14.1    | 69.7 / 86.1 | -        | 798     | 0.000 | 0.000 | 495     |
| Zone 77   | 9.9     | 69.7 / 80.1 | -        | 880     | 0.000 | 0.000 | 475     |
| Zone 78   | 0.2     | 69.8 / 71.3 | -        | 108     | 0.000 | 0.000 | 25      |
| Zone 79   | 12.2    | 69.6 / 86.0 | -        | 690     | 0.000 | 0.000 | 360     |
| Zone 80   | 27.5    | 69.1 / 85.4 | -        | 1562    | 0.000 | 0.000 | 260     |
| Zone 81   | 4.1     | 68.9 / 84.7 | -        | 243     | 0.000 | 0.000 | 15      |
| Zone 82   | 3.9     | 69.0 / 85.6 | -        | 218     | 0.000 | 0.000 | 15      |
| Zone 83   | 5.6     | 69.4 / 86.2 | -        | 309     | 0.000 | 0.000 | 24      |
| Zone 84   | 0.0     | 0.0 / 0.0   | 0.00     | 100     | 0.000 | 0.000 | 100     |
| Zone 85   | 8.3     | 69.8 / 81.1 | -        | 687     | 0.000 | 0.000 | 460     |
| Zone 86   | 0.5     | 70.0 / 73.0 | -        | 150     | 0.000 | 0.000 | 150     |
| Zone 87   | 5.8     | 69.6 / 80.0 | -        | 524     | 0.000 | 0.000 | 300     |

#### **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 765.0            | 63.7              | 419.4            |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 765.0            | 63.7              | 419.4            |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

|           | Zone     |               | Zone    | Zone  |
|-----------|----------|---------------|---------|-------|
|           | Cooling  | Time of       | Heating | Floor |
|           | Sensible | Peak Sensible | Load    | Area  |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²) |
| Zone 1    | 19.7     | Jul 1100      | 6.0     | 978.4 |
| Zone 2    | 1.7      | Jan 1400      | 0.0     | 278.9 |
| Zone 3    | 2.9      | Jan 1100      | 0.0     | 148.0 |

|           | Zone<br>Cooling<br>Sensible | Time of<br>Peak Sensible | Zone<br>Heating<br>Load | Zone<br>Floor<br>Area |
|-----------|-----------------------------|--------------------------|-------------------------|-----------------------|
| Zone Name | (MBH)                       | Cooling Load             | (MBH)                   | (ft <sup>2</sup> )    |
| Zone 4    | 22.5                        | Jul 1100                 | 10.8                    | 2058.3                |
| Zone 5    | 6.8                         | Jan 1400                 | 0.0                     | 659.3                 |
| Zone 6    | 20.6                        | Jul 1400                 | 10.8                    | 1082.5                |
| Zone 7    | 17.6                        | Aug 1100                 | 12.1                    | 2459.7                |
| Zone 8    | 6.8                         | Jan 1400                 | 0.0                     | 659.3                 |
| Zone 9    | 6.6                         | Jan 1400                 | 0.0                     | 601.1                 |
| Zone 10   | 18.6                        | Jul 1400                 | 7.4                     | 1009.1                |
| Zone 11   | 4.4                         | Aug 1100                 | 4.9                     | 150.5                 |
| Zone 12   | 5.2                         | Aug 1100                 | 4.0                     | 157.3                 |
| Zone 13   | 26.9                        | Jul 1100                 | 6.5                     | 1572.3                |
| Zone 14   | 2.9                         | Jan 1100                 | 0.0                     | 143.7                 |
| Zone 15   | 1.6                         | Jan 1400                 | 0.0                     | 550.9                 |
| Zone 16   | 19.8                        | Jul 1100                 | 5.6                     | 1007.7                |
| Zone 17   | 12.1                        | Jul 1600                 | 5.7                     | 713.4                 |
| Zone 18   | 10.7                        | Jul 1400                 | 5.7                     | 727.3                 |
| Zone 19   | 2.3                         | Jan 1100                 | 0.0                     | 151.0                 |
| Zone 20   | 5.6                         | Jan 1100                 | 0.0                     | 510.5                 |
| Zone 21   | 6.5                         | Jan 1400                 | 0.0                     | 560.7                 |
| Zone 22   | 2.3                         | Jan 1100                 | 0.0                     | 151.0                 |
| Zone 23   | 10.7                        | Jul 1400                 | 5.7                     | 721.7                 |
| Zone 24   | 10.8                        | Jul 1400                 | 7.7                     | 696.6                 |
| Zone 25   | 3.6                         | Jan 1100                 | 0.0                     | 490.1                 |
| Zone 26   | 6.3                         | Jan 1400                 | 0.0                     | 509.6                 |
| Zone 27   | 15.5                        | Aug 1100                 | 11.3                    | 1452.8                |
| Zone 28   | 5.2                         | Aug 1100                 | 5.5                     | 150.5                 |
| Zone 29   | 4.4                         | Aug 1100                 | 4.0                     | 160.7                 |
| Zone 30   | 5.2                         | Aug 1100                 | 4.1                     | 158.7                 |
| Zone 31   | 0.6                         | Jan 1400                 | 0.0                     | 216.0                 |
| Zone 32   | 13.9                        | Jul 1400                 | 8.5                     | 1483.6                |
| Zone 33   | 1.4                         | Jan 1400                 | 0.0                     | 150.1                 |
| Zone 34   | 5.6                         | Jul 1500                 | 3.6                     | 270.2                 |
| Zone 35   | 4.8                         | Jan 1100                 | 0.0                     | 287.9                 |
| Zone 36   | 2.9                         | Jan 1100                 | 0.0                     | 156.5                 |
| Zone 37   | 1.7                         | Jan 1400                 | 0.0                     | 554.6                 |
| Zone 38   | 13.8                        | Jul 1400                 | 7.8                     | 1466.3                |
| Zone 39   | 17.6                        | Aug 1100                 | 9.1                     | 2197.9                |
| Zone 40   | 4.4                         | Aug 1100                 | 4.9                     | 151.3                 |
| Zone 41   | 2.7                         | Jul 1400                 | 4.0                     | 157.2                 |
| Zone 42   | 2.3                         | Jun 1800                 | 2.0                     | 96.4                  |
| Zone 43   | 2.1                         | Jun 1800                 | 2.9                     | 189.2                 |
| Zone 44   | 5.4                         | Jan 1100                 | 0.0                     | 452.1                 |
|           | 3.7                         | Jan 1100                 | 0.0                     | 199.9                 |
|           | 12.7                        | Jul 1400                 | 0.3                     | 1301.1                |
|           | 12.3                        | Jul 1400                 | 7.7                     | 1470.5                |
|           | 1.0                         | Jan 1400                 | 0.0                     | 101 1                 |
| Zone 50   | 1.9                         | Jail 1400                | 0.0                     | 101.1<br>2/12 F       |
| Zone 50   | 1.Z<br>2.2                  | Jan 1100                 | 0.0                     | 243.5<br>205.2        |
| Zone 52   | ۲.۲<br>۲ ۹                  | Jan 1100                 | 0.0                     | 200.0<br>120 2        |
| Zone 53   | 1.0<br>8 1                  | Jun 1800                 | 5.5                     | 514 8                 |
| Zone 54   | 10.6                        | Jul 1400                 | 5.5<br>7.2              | 1159 5                |
| Zone 55   | 20.8                        | .lun 1700                | 14 7                    | 1701 6                |
| Zone 56   | 15.7                        | Aug 1100                 | 10.7                    | 1502 1                |
| Zone 57   | 2.7                         | Jul 1400                 | 3.9                     | 158.7                 |

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 58   | 4.4      | Aug 1100      | 3.6     | 160.7  |
| Zone 59   | 5.2      | Aug 1100      | 5.3     | 150.5  |
| Zone 60   | 10.7     | Jul 1400      | 7.3     | 981.9  |
| Zone 61   | 2.6      | Jul 1400      | 0.5     | 285.3  |
| Zone 62   | 3.0      | Jul 1400      | 0.3     | 142.9  |
| Zone 63   | 17.1     | Jul 1400      | 12.7    | 1584.5 |
| Zone 64   | 17.0     | Jul 1400      | 12.9    | 1558.1 |
| Zone 65   | 1.3      | Jul 1400      | 1.5     | 214.7  |
| Zone 66   | 3.3      | Jul 1100      | 0.4     | 200.9  |
| Zone 67   | 1.6      | Jul 1400      | 0.3     | 180.5  |
| Zone 68   | 0.5      | Jul 1400      | 0.2     | 90.5   |
| Zone 69   | 18.8     | Aug 1100      | 13.2    | 2085.2 |
| Zone 70   | 4.5      | Aug 1100      | 7.1     | 150.5  |
| Zone 71   | 5.2      | Aug 1100      | 5.4     | 157.2  |
| Zone 72   | 10.2     | Jul 1400      | 7.0     | 870.5  |
| Zone 73   | 2.2      | Jul 1400      | 0.4     | 223.8  |
| Zone 74   | 3.7      | Jul 1400      | 1.9     | 1059.4 |
| Zone 75   | 19.7     | Jul 1400      | 10.6    | 1327.5 |
| Zone 76   | 14.9     | Jul 1400      | 14.6    | 1360.5 |
| Zone 77   | 19.0     | Jul 1400      | 10.3    | 1258.4 |
| Zone 78   | 2.3      | Jul 1100      | 0.2     | 123.1  |
| Zone 79   | 11.0     | Jul 1400      | 12.6    | 961.2  |
| Zone 80   | 27.7     | Aug 1100      | 28.6    | 1440.4 |
| Zone 81   | 5.3      | Aug 1100      | 4.3     | 158.7  |
| Zone 82   | 4.5      | Aug 1100      | 4.0     | 160.7  |
| Zone 83   | 5.3      | Aug 1100      | 5.7     | 150.5  |
| Zone 84   | 1.1      | Jan 1100      | 0.0     | 496.8  |
| Zone 85   | 14.8     | Jul 1400      | 8.6     | 1668.3 |
| Zone 86   | 2.1      | Jul 1400      | 0.3     | 142.7  |
| Zone 87   | 11.3     | Jul 1600      | 6.3     | 563.4  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| A206F COMPUTER LAB        | 1     | 19.7                         | Jul 1100                            | 915                  | 6.0                      | 978.4                  | 0.94             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| a206e photo stor          | 1     | 1.7                          | Jan 1400                            | 85                   | 0.0                      | 278.9                  | 0.30             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| A148M (2nd flr. Voc. CR)  | 1     | 2.9                          | Jan 1100                            | 135                  | 0.0                      | 148.0                  | 0.91             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| A206 DES. AND VIS. COMM.  | 1     | 22.5                         | Jul 1100                            | 1043                 | 10.8                     | 2058.3                 | 0.51             |
| Zone 5                    |       |                              |                                     |                      |                          |                        |                  |
| A206A RELATED CR          | 1     | 6.8                          | Jan 1400                            | 330                  | 0.0                      | 659.3                  | 0.50             |
| Zone 6                    |       |                              |                                     |                      |                          |                        |                  |
| A206B COMPUTER LAB        | 1     | 20.6                         | Jul 1400                            | 953                  | 10.8                     | 1082.5                 | 0.88             |
| Zone 7                    |       |                              |                                     |                      |                          |                        |                  |
| A207A CORRIDOR            | 1     | 14.6                         | Aug 1100                            | 677                  | 12.1                     | 1170.7                 | 0.58             |
| A207 CORRIDOR             | 1     | 3.0                          | Jan 1100                            | 220                  | 0.0                      | 1289.0                 | 0.17             |
| Zone 8                    |       |                              |                                     |                      |                          |                        |                  |
| A206A RELATED CR          | 1     | 6.8                          | Jan 1400                            | 330                  | 0.0                      | 659.3                  | 0.50             |
| Zone 9                    |       |                              |                                     |                      |                          |                        |                  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| B201F RELATED CR          | 1     | 6.6                          | Jan 1400                            | 330                  | 0.0                      | 601.1                  | 0.55             |
| Zone 10                   |       |                              |                                     |                      |                          |                        |                  |
| B201G COMPUTER LAB        | 1     | 18.6                         | Jul 1400                            | 862                  | 7.4                      | 1009.1                 | 0.85             |
| Zone 11                   |       |                              |                                     |                      |                          |                        |                  |
| B206 GUID OFF             | 1     | 4.4                          | Aug 1100                            | 268                  | 4.9                      | 150.5                  | 1.78             |
| Zone 12                   |       |                              | 0                                   |                      |                          |                        |                  |
| B207 GUID OFF             | 1     | 5.2                          | Aug 1100                            | 240                  | 4.0                      | 157.3                  | 1.52             |
| Zone 13                   |       |                              | Ŭ                                   |                      |                          |                        |                  |
| B201 DRAFTING - DESIGN    | 1     | 26.9                         | Jul 1100                            | 1247                 | 6.5                      | 1572.3                 | 0.79             |
| Zone 14                   |       |                              |                                     |                      |                          |                        |                  |
| B201E OFF                 | 1     | 2.9                          | Jan 1100                            | 133                  | 0.0                      | 143.7                  | 0.93             |
| Zone 15                   |       |                              |                                     |                      |                          |                        |                  |
| B201B STOR                | 1     | 0.6                          | Jan 1400                            | 28                   | 0.0                      | 225.3                  | 0.12             |
| B202E STOR                | 1     | 0.5                          | Jan 1400                            | 22                   | 0.0                      | 162.5                  | 0.14             |
| B203A STORAGE             | 1     | 0.5                          | Jan 1400                            | 22                   | 0.0                      | 163.1                  | 0.14             |
| Zone 16                   |       |                              |                                     |                      |                          |                        |                  |
| B201D COMPUTER LAB        | 1     | 19.8                         | Jul 1100                            | 917                  | 5.6                      | 1007.7                 | 0.91             |
| Zone 17                   |       |                              |                                     |                      |                          |                        |                  |
| B202C COMPUTER LAB        | 1     | 12.1                         | Jul 1600                            | 560                  | 5.7                      | 713.4                  | 0.78             |
| Zone 18                   |       |                              |                                     |                      |                          |                        |                  |
| B202B COMPUTER LAB        | 1     | 10.7                         | Jul 1400                            | 495                  | 5.7                      | 727.3                  | 0.68             |
| Zone 19                   |       |                              |                                     |                      |                          |                        |                  |
| B202D OFF                 | 1     | 2.3                          | Jan 1100                            | 107                  | 0.0                      | 151.0                  | 0.71             |
| Zone 20                   |       |                              |                                     |                      |                          |                        |                  |
| B202 BUSINESS OFFICE TEC  | 1     | 5.6                          | Jan 1100                            | 260                  | 0.0                      | 510.5                  | 0.51             |
| Zone 21                   |       |                              |                                     |                      |                          |                        |                  |
| B202A RELATED CR          | 1     | 6.5                          | Jan 1400                            | 320                  | 0.0                      | 560.7                  | 0.57             |
| Zone 22                   |       |                              | 1 1100                              | 107                  |                          | 454.0                  | 0.71             |
| B203E OFF                 | 1     | 2.3                          | Jan 1100                            | 107                  | 0.0                      | 151.0                  | 0.71             |
|                           | 4     | 10.7                         | Int 1100                            | 405                  | F 7                      | 704 7                  | 0.00             |
| B203D COMPUTER LAB        | 1     | 10.7                         | Jul 1400                            | 495                  | 5.7                      | 721.7                  | 0.69             |
| B203C COMPLITER LAB       | 1     | 10.8                         | Jul 1400                            | 108                  | 77                       | 606.6                  | 0.72             |
|                           | I     | 10.8                         | Jul 1400                            | 490                  | 1.1                      | 090.0                  | 0.72             |
| B203 MARKETING            | 1     | 3.6                          | lan 1100                            | 166                  | 0.0                      | 490.1                  | 0.34             |
| Zone 26                   |       | 0.0                          | 54111100                            | 100                  | 0.0                      | 430.1                  | 0.04             |
| B203B RELATED CR          | 1     | 6.3                          | .lan 1400                           | 305                  | 0.0                      | 509.6                  | 0.60             |
| Zone 27                   |       | 0.0                          | our rico                            | 000                  | 0.0                      | 000.0                  | 0.00             |
| B204 CORRIDOR             | 1     | 15.5                         | Aug 1100                            | 718                  | 11.3                     | 1452.8                 | 0.49             |
| Zone 28                   |       |                              | <b>J</b>                            |                      |                          |                        |                  |
| B210 SPED RESOURCE        | 1     | 5.2                          | Aug 1100                            | 300                  | 5.5                      | 150.5                  | 1.99             |
| Zone 29                   |       |                              | 0                                   |                      |                          |                        |                  |
| B209 VOC DEAN             | 1     | 4.4                          | Aug 1100                            | 217                  | 4.0                      | 160.7                  | 1.35             |
| Zone 30                   |       |                              | _                                   |                      |                          |                        |                  |
| B208 GUID OFF             | 1     | 5.2                          | Aug 1100                            | 240                  | 4.1                      | 158.7                  | 1.52             |
| Zone 31                   |       |                              |                                     |                      |                          |                        |                  |
| C301 CORRIDOR             | 1     | 0.6                          | Jan 1400                            | 27                   | 0.0                      | 216.0                  | 0.13             |
| Zone 32                   |       |                              |                                     |                      |                          |                        |                  |
| A303-1 BIOTECHNOLOGY-1    | 1     | 13.9                         | Jul 1400                            | 1485                 | 8.5                      | 1483.6                 | 1.00             |
| Zone 33                   |       |                              |                                     |                      |                          |                        |                  |
| A303A PREP                | 1     | 1.4                          | Jan 1400                            | 150                  | 0.0                      | 150.1                  | 1.00             |
| Zone 34                   |       |                              |                                     |                      |                          |                        |                  |
| A303H LAB                 | 1     | 5.6                          | Jul 1500                            | 285                  | 3.6                      | 270.2                  | 1.05             |
| Zone 35                   |       |                              |                                     |                      |                          |                        |                  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| A303J TISSUE CULTURE LAB  | 1     | 4.8                          | Jan 1100                            | 330                  | 0.0                      | 287.9                  | 1.15             |
| Zone 36                   |       |                              |                                     |                      |                          |                        |                  |
| A303D OFF                 | 1     | 2.9                          | Jan 1100                            | 136                  | 0.0                      | 156.5                  | 0.87             |
| Zone 37                   |       |                              |                                     |                      |                          |                        |                  |
| A303C STOR                | 1     | 0.5                          | Jan 1400                            | 22                   | 0.0                      | 157.7                  | 0.14             |
| B301A STOR                | 1     | 0.4                          | Jan 1400                            | 20                   | 0.0                      | 136.9                  | 0.15             |
| B301B STOR                | 1     | 0.5                          | Jan 1400                            | 21                   | 0.0                      | 151.4                  | 0.14             |
| B301C STOR                | 1     | 0.4                          | Jan 1400                            | 17                   | 0.0                      | 108.6                  | 0.16             |
| Zone 38                   |       |                              |                                     |                      |                          |                        |                  |
| A303-3 BIOTECHNOLOGY-2    | 1     | 13.8                         | Jul 1400                            | 1705                 | 7.8                      | 1466.3                 | 1.16             |
| Zone 39                   |       |                              |                                     |                      |                          |                        |                  |
| A304 CORRIDOR             | 1     | 2.1                          | Jan 1100                            | 245                  | 0.0                      | 922.1                  | 0.27             |
| A303L CORRIDOR            | 1     | 0.3                          | Jan 1100                            | 12                   | 0.0                      | 127.5                  | 0.09             |
| B303-1 CORRIDOR           | 1     | 15.2                         | Aug 1100                            | 704                  | 9.1                      | 1148.3                 | 0.61             |
| Zone 40                   |       |                              |                                     |                      |                          |                        |                  |
| B304 ADJUST CNSLR         | 1     | 4.4                          | Aug 1100                            | 268                  | 4.9                      | 151.3                  | 1.77             |
| Zone 41                   |       |                              |                                     |                      |                          |                        |                  |
| B305 GUID OFF             | 1     | 2.7                          | Jul 1400                            | 216                  | 4.0                      | 157.2                  | 1.37             |
| Zone 42                   |       |                              |                                     |                      |                          |                        |                  |
| B301J Observ              | 1     | 2.3                          | Jun 1800                            | 107                  | 2.0                      | 96.4                   | 1.11             |
| Zone 43                   |       |                              |                                     |                      |                          |                        |                  |
| B301H SIM                 | 1     | 2.7                          | Jun 1800                            | 158                  | 2.9                      | 189.2                  | 0.83             |
| Zone 44                   |       |                              |                                     |                      |                          |                        |                  |
| B301G MOCK APT            | 1     | 5.4                          | Jan 1100                            | 250                  | 0.0                      | 452.1                  | 0.55             |
| Zone 45                   |       |                              |                                     |                      |                          |                        |                  |
| B301D OFF                 | 1     | 3.7                          | Jan 1100                            | 170                  | 0.0                      | 199.9                  | 0.85             |
| Zone 46                   |       |                              |                                     |                      |                          |                        |                  |
| B302-1 MEDICAL ASSISTING  | 1     | 12.7                         | Jul 1400                            | 588                  | 8.3                      | 1501.1                 | 0.39             |
| Zone 47                   |       |                              |                                     |                      |                          |                        |                  |
| B302-2 MEDICAL ASSISTING  | 1     | 12.3                         | Jul 1400                            | 570                  | 7.7                      | 1470.5                 | 0.39             |
| Zone 48                   |       |                              |                                     |                      |                          |                        |                  |
| B301K CORRIDOR            | 1     | 0.5                          | Jan 1400                            | 21                   | 0.0                      | 147.9                  | 0.14             |
| B302L CORRIDOR            | 1     | 0.6                          | Jan 1400                            | 26                   | 0.0                      | 202.0                  | 0.13             |
| Zone 49                   |       |                              |                                     |                      |                          |                        |                  |
| B302A OBSERV / STOR       | 1     | 0.9                          | Jan 1400                            | 43                   | 0.0                      | 181.1                  | 0.24             |
| Zone 50                   |       |                              |                                     |                      |                          |                        |                  |
| B302C STOR                | 1     | 0.4                          | Jan 1400                            | 17                   | 0.0                      | 108.0                  | 0.16             |
| B302G CLEAN               | 1     | 0.3                          | Jan 1400                            | 1400                 | 0.0                      | 56.0                   | 25.00            |
| B302K STOR                | 1     | 0.5                          | Jan 1400                            | 24                   | 0.0                      | 179.5                  | 0.13             |
| Zone 51                   |       |                              |                                     |                      |                          |                        |                  |
| B302D OFF                 | 1     | 2.2                          | Jan 1100                            | 101                  | 0.0                      | 205.3                  | 0.49             |
| Zone 52                   |       |                              |                                     |                      |                          |                        |                  |
| B302N OFF                 | 1     | 1.8                          | Jan 1100                            | 84                   | 0.0                      | 180.8                  | 0.47             |
| Zone 53                   |       |                              |                                     |                      |                          |                        |                  |
| B302H LAB                 | 1     | 8.1                          | Jun 1800                            | 455                  | 5.5                      | 514.8                  | 0.88             |
| Zone 54                   |       |                              |                                     |                      |                          |                        |                  |
| B302J RELATED CR          | 1     | 10.6                         | Jul 1400                            | 491                  | 7.2                      | 1159.5                 | 0.42             |
| Zone 55                   |       |                              |                                     |                      |                          |                        |                  |
| B301-3 HEALTH ASSISTING-  | 1     | 20.8                         | Jun 1700                            | 966                  | 14.7                     | 1701.6                 | 0.57             |
| Zone 56                   |       |                              |                                     |                      |                          |                        |                  |
| B303 - CORRIDOR           | 1     | 15.7                         | Aug 1100                            | 728                  | 10.7                     | 1502.1                 | 0.48             |
| Zone 57                   |       |                              |                                     |                      |                          |                        |                  |
| B306 GUID OFF             | 1     | 2.7                          | Jul 1400                            | 214                  | 3.9                      | 158.7                  | 1.35             |
| Zone 58                   |       |                              |                                     |                      |                          |                        |                  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| B307 DEAN OFF             | 1     | 4.4                          | Aug 1100                            | 205                  | 3.6                      | 160.7                  | 1.27             |
| Zone 59                   |       |                              | 0                                   |                      |                          |                        |                  |
| B308 SPED RESOURCE        | 1     | 5.2                          | Aug 1100                            | 288                  | 5.3                      | 150.5                  | 1.91             |
| Zone 60                   |       |                              | 0                                   |                      |                          |                        |                  |
| A402A THEORY              | 1     | 10.7                         | Jul 1400                            | 496                  | 7.3                      | 981.9                  | 0.51             |
| Zone 61                   |       |                              |                                     |                      |                          |                        |                  |
| A402B MODEL MAKING        | 1     | 2.6                          | Jul 1400                            | 122                  | 0.5                      | 285.3                  | 0.43             |
| Zone 62                   |       |                              |                                     |                      |                          |                        |                  |
| A402D STERILIZATION       | 1     | 3.0                          | Jul 1400                            | 150                  | 0.3                      | 142.9                  | 1.05             |
| Zone 63                   |       |                              |                                     |                      |                          |                        |                  |
| A402-1 DENTAL ASSISTING   | 1     | 17.1                         | Jul 1400                            | 793                  | 12.7                     | 1584.5                 | 0.50             |
| Zone 64                   |       |                              |                                     |                      |                          |                        |                  |
| A402-2 DENTAL ASSISTING   | 1     | 17.0                         | Jul 1400                            | 787                  | 12.9                     | 1558.1                 | 0.50             |
| Zone 65                   |       |                              |                                     |                      |                          |                        |                  |
| A402H STORAGE             | 1     | 1.3                          | Jul 1400                            | 84                   | 1.5                      | 214.7                  | 0.39             |
| Zone 66                   |       |                              |                                     |                      |                          |                        |                  |
| A402G OFFICE              | 1     | 3.3                          | Jul 1100                            | 151                  | 0.4                      | 200.9                  | 0.75             |
| Zone 67                   | -     |                              |                                     |                      |                          |                        |                  |
| A402J X-RAY               | 1     | 1.6                          | Jul 1400                            | 150                  | 0.3                      | 180 5                  | 0.83             |
| Zone 68                   |       |                              | 00.1100                             |                      | 0.0                      |                        | 0.00             |
|                           | 1     | 0.5                          | Jul 1400                            | 24                   | 0.2                      | 90.5                   | 0.26             |
| Zone 69                   |       | 0.0                          | 0011100                             |                      | 0.2                      | 00.0                   | 0.20             |
| A403 CORRIDOR             | 1     | 3.1                          | .lul 1400                           | 205                  | 17                       | 905.2                  | 0.23             |
| A403a COBRIDOR            | 1     | 16.1                         | Aug 1100                            | 748                  | 11.6                     | 1180.0                 | 0.20             |
| Zone 70                   |       | 10.1                         | , tag 1100                          |                      | 11.0                     | 1100.0                 | 0.00             |
| B404 ADJUST CNSLR         | 1     | 4 5                          | Aug 1100                            | 388                  | 7 1                      | 150.5                  | 2 58             |
| Zone 71                   |       |                              | , tag 1100                          |                      | ,                        | 100.0                  | 2.00             |
| B405 GUID OFF             | 1     | 52                           | Aug 1100                            | 295                  | 54                       | 157.2                  | 1 88             |
| Zone 72                   |       | 0.2                          | , tug 1100                          | 200                  | 0.1                      | 101.2                  | 1.00             |
|                           | 1     | 10.2                         | Jul 1400                            | 474                  | 7.0                      | 870.5                  | 0.54             |
| Zone 73                   |       |                              | 00.1100                             |                      |                          | 0.00                   | 0.01             |
|                           | 1     | 22                           | .lul 1400                           | 102                  | 0.4                      | 223.8                  | 0.46             |
| Zone 74                   |       | 2.2                          | 0011100                             | 102                  | 0.1                      | 220.0                  | 0.10             |
| B401A STOR                | 1     | 0.2                          | Jul 1400                            | 11                   | 0.2                      | 84.0                   | 0 14             |
| B402A STOR                | 1     | 0.5                          | Jul 1400                            | 23                   | 0.3                      | 168.3                  | 0.14             |
| B402G STORAGE             | 1     | 0.8                          | Jul 1400                            | 36                   | 0.0                      | 200.4                  | 0.14             |
| B4021 STORAGE             | 1     | 1.0                          | Jul 1400                            | 48                   | 0.4                      | 200.4                  | 0.10             |
| B402L COBBIDOR            | 1     | 0.6                          | Jul 1400                            | 29                   | 0.0                      | 200.0                  | 0.17             |
| B402 Storage              | 1     | 0.0                          | Jul 1500                            | 23                   | 0.4                      | 100.2                  | 0.14             |
| Zone 75                   |       | 0.0                          | 001 1000                            |                      | 0.2                      | 100.2                  | 0.22             |
| B402-1 ROBOTICS & AUTOMA  | 1     | 19.7                         | Jul 1400                            | 911                  | 10.6                     | 1327 5                 | 0.69             |
| Zone 76                   |       | 10.1                         | 0011100                             | 011                  | 10.0                     | 102110                 | 0.00             |
| B401 PLTW / ENGINEERING   | 1     | 14 9                         | Jul 1400                            | 798                  | 14.6                     | 1360 5                 | 0 59             |
|                           |       | 14.5                         | 001 1400                            | 700                  | 14.0                     | 1000.0                 | 0.00             |
| B402-2 ROBOTICS & AUTMA   | 1     | 19.0                         | Jul 1400                            | 880                  | 10.3                     | 1258.4                 | 0.70             |
| Zone 78                   |       | 10.0                         | 001 1400                            | 000                  | 10.0                     | 1200.4                 | 0.70             |
| B402C OFFICE              | 1     | 23                           | Jul 1100                            | 108                  | 0.2                      | 123.1                  | 0.88             |
| Zone 79                   | 1     | 2.0                          | 0011100                             | 100                  | 0.2                      | 120.1                  | 0.00             |
|                           | 1     | 11 0                         | Jul 1/100                           | 600                  | 12.6                     | 061 2                  | 0.70             |
|                           | 1     | 11.0                         | Jui 1400                            | 090                  | 12.0                     | JU1.Z                  | 0.12             |
| B403 CORRIDOR             | 1     | 07 T                         | Διια 1100                           | 1560                 | 28 G                     | 1110 1                 | 1 09             |
| Zono 81                   | 1     | 21.1                         | Aug 1100                            | 1302                 | 20.0                     | 1440.4                 | 1.00             |
| B406 GUID OFF             | 1     | <b>۲</b> ס                   | Δυα 1100                            | 040                  | د ۸                      | 150 7                  | 1 50             |
| Zone 82                   | 1     | 5.5                          | Aug 1100                            | 243                  | 4.3                      | 130.7                  | 1.55             |
| 2010.02                   |       |                              |                                     |                      |                          |                        |                  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| B407 GUID OFF             | 1     | 4.5                          | Aug 1100                            | 218                  | 4.0                      | 160.7                  | 1.36             |
| Zone 83                   |       |                              |                                     |                      |                          |                        |                  |
| B408 DEAN OFF             | 1     | 5.3                          | Aug 1100                            | 309                  | 5.7                      | 150.5                  | 2.05             |
| Zone 84                   |       |                              |                                     |                      |                          |                        |                  |
| A314 STOR                 | 1     | 1.1                          | Jan 1100                            | 100                  | 0.0                      | 496.8                  | 0.20             |
| Zone 85                   |       |                              |                                     |                      |                          |                        |                  |
| B301-1 HEALTH ASSISTING-  | 1     | 14.8                         | Jul 1400                            | 687                  | 8.6                      | 1668.3                 | 0.41             |
| Zone 86                   |       |                              |                                     |                      |                          |                        |                  |
| A402M STERILIZATION       | 1     | 2.1                          | Jul 1400                            | 150                  | 0.3                      | 142.7                  | 1.05             |
| Zone 87                   |       |                              |                                     |                      |                          |                        |                  |
| B402D FABRICATION LAB     | 1     | 11.3                         | Jul 1600                            | 524                  | 6.3                      | 563.4                  | 0.93             |

## Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-4 (B+1 C/D) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | <br>HRU-4 (B+1 C/D) |
|-----------------|---------------------|
| Equipment Class | <br>TERM            |
| Air System Type | <br>VRF             |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

### **Cooling Coil Sizing Data**

| Total coil load 5.6           | Tons    |
|-------------------------------|---------|
| Total coil load               | MBH     |
| Total coil load 1467.3        | CFM/Ton |
| Sensible coil load 66.7       | MBH     |
| Coil CFM at Jul 1400 8151     | CFM     |
| Max coil CFM                  | CFM     |
| Sensible heat ratio 1.000     |         |
| Water flow @ 10.0 °F rise N/A |         |

#### Heating Coil Sizing Data

| Max coil load             | 111.7 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 8151  | CFM |
| Max coil CFM              | 8151  | CFM |
| Water flow @ 20.0 °F drop | N/A   |     |

#### **Ventilation Fan Sizing Data**

| Actual max CFM                 | 8151 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 8142 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.39 | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 8151 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 8142 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.39 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |      |                     |
|------------------------------|------|---------------------|
| Design airflow CFM           | 8151 | CFM                 |
| CFM/ft <sup>2</sup>          | 0.39 | CFM/ft <sup>2</sup> |

| Number of zones |                     |     |
|-----------------|---------------------|-----|
| Floor Area      |                     | ft² |
| Location Bo     | ston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Jul 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 80.0 / 72.0 | °F |
| Leaving DB / WB 72.4 / 69.8  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Des Htg |    |
|------------------------|----|
| Ent. DB / Lvg DB 67.4  | °F |

| Fan motor BHP | 8.41 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 6.67 | kW    |
| Fan static    | 3.00 | in wg |

| Fan motor BHP | 5.61  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 4.45  | kW         |
| Fan static    | 2.00  | in wg      |
| CFM/person    | 17.68 | CFM/person |

| Air System Name | HRU-4 (B+1 C/D) | Number of zones |                       |     |
|-----------------|-----------------|-----------------|-----------------------|-----|
| Equipment Class | TERM            | Floor Area      |                       | ft² |
| Air System Type | VRF             | Location        | Boston, Massachusetts |     |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | . Sum of space airflow rates |
|--------------------|------------|------------------|------------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads  |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 1.4   | 0.6   | 75.0 / 70.6 | 58.6 / 58.4 | -         | Jul 0900  | 0.15                |
| Zone 2    | 33.7  | 17.4  | 75.0 / 70.6 | 65.1 / 64.7 | -         | Jul 1100  | 0.37                |
| Zone 3    | 1.7   | 0.9   | 75.4 / 69.2 | 59.9 / 59.4 | -         | Jul 1400  | 0.39                |
| Zone 4    | 17.8  | 8.0   | 75.2 / 70.2 | 55.0 / 54.8 | -         | Aug 1200  | 0.42                |
| Zone 5    | 3.5   | 1.4   | 75.6 / 72.5 | 55.0 / 55.0 | -         | Jul 1000  | 0.09                |
| Zone 6    | 6.5   | 3.7   | 76.0 / 67.4 | 55.2 / 54.6 | -         | Aug 1000  | 0.35                |
| Zone 7    | 0.0   | 0.0   | 0.0 / 0.0   | 0.0 / 0.0   | 0.00      | Des 0000  | 0.80                |
| Zone 8    | 2.0   | 1.1   | 75.9 / 68.5 | 55.0 / 54.5 | -         | Aug 1000  | 0.43                |
| Zone 9    | 2.0   | 1.1   | 75.9 / 68.5 | 55.0 / 54.5 | -         | Aug 1000  | 0.43                |
| Zone 10   | 17.0  | 7.4   | 75.1 / 70.5 | 55.0 / 54.9 | -         | Aug 1200  | 0.47                |
| Zone 11   | 20.3  | 9.2   | 75.2 / 70.1 | 55.0 / 54.8 | -         | Jul 1200  | 0.35                |
| Zone 12   | 0.0   | 0.0   | 0.0 / 0.0   | 0.0 / 0.0   | 0.00      | Des 0000  | 0.35                |
| Zone 13   | 4.3   | 1.9   | 75.4 / 71.2 | 61.5 / 61.2 | -         | Aug 0900  | 0.22                |
| Zone 14   | 3.2   | 1.8   | 76.4 / 67.8 | 55.0 / 54.4 | -         | Aug 1000  | 0.42                |
| Zone 15   | 2.4   | 1.3   | 76.3 / 68.2 | 55.0 / 54.4 | -         | Aug 1000  | 0.32                |
| Zone 16   | 1.6   | 0.8   | 75.8 / 69.3 | 55.0 / 54.6 | -         | Aug 1000  | 0.28                |
| Zone 17   | 2.5   | 1.3   | 76.3 / 68.2 | 55.0 / 54.4 | -         | Aug 1000  | 0.31                |
| Zone 18   | 1.6   | 0.8   | 75.8 / 69.3 | 55.0 / 54.6 | -         | Aug 1000  | 0.28                |
| Zone 19   | 1.5   | 0.7   | 75.7 / 69.4 | 55.0 / 54.6 | -         | Jul 1000  | 0.29                |
| Zone 20   | 5.7   | 3.2   | 75.7 / 67.7 | 55.0 / 54.4 | -         | Aug 1000  | 0.37                |
| Zone 21   | 17.0  | 7.3   | 75.0 / 70.7 | 55.0 / 54.9 | -         | Jul 1200  | 0.46                |
| Zone 22   | 0.9   | 0.4   | 75.0 / 70.7 | 57.1 / 57.0 | -         | Jul 1300  | 0.30                |
| Zone 23   | 59.0  | 40.7  | 75.8 / 65.3 | 55.5 / 54.6 | -         | Sep 1400  | 1.35                |
| Zone 24   | 7.6   | 3.9   | 75.0 / 70.6 | 65.0 / 64.6 | -         | Jul 0700  | 0.38                |
| Zone 25   | 2.1   | 1.1   | 75.8 / 69.1 | 55.0 / 54.6 | -         | Aug 1000  | 0.40                |
| Zone 26   | 2.9   | 1.3   | 75.0 / 70.6 | 59.0 / 58.7 | -         | Jul 0900  | 0.74                |
| Zone 27   | 43.9  | 19.5  | 75.0 / 70.6 | 59.2 / 59.0 | -         | Jul 1000  | 1.17                |
| Zone 28   | 13.2  | 7.1   | 75.4 / 67.8 | 55.0 / 54.5 | -         | Aug 1300  | 0.95                |
| Zone 29   | 8.7   | 5.1   | 75.6 / 66.8 | 55.0 / 54.3 | -         | Jul 1000  | 0.83                |
| Zone 30   | 4.2   | 2.7   | 75.9 / 66.1 | 55.0 / 54.2 | -         | Aug 1000  | 0.60                |
| Zone 31   | 8.7   | 5.2   | 75.7 / 66.9 | 55.0 / 54.3 | -         | Jul 1000  | 0.81                |
| Zone 32   | 13.2  | 7.1   | 75.4 / 67.8 | 55.0 / 54.5 | -         | Aug 1300  | 0.94                |
| Zone 33   | 45.3  | 20.0  | 75.0 / 70.6 | 58.8 / 58.5 | -         | Aug 1000  | 1.07                |
| Zone 34   | 2.9   | 1.3   | 75.0 / 70.6 | 59.2 / 58.9 | -         | Jul 0900  | 0.74                |
| Zone 35   | 1.7   | 1.0   | 76.2 / 68.0 | 55.0 / 54.4 | -         | Aug 1000  | 0.48                |
| Zone 36   | 8.5   | 6.6   | 76.2 / 64.0 | 55.0 / 53.9 | -         | Dec 1400  | 0.60                |
| Zone 37   | 53.7  | 33.8  | 75.4 / 66.4 | 56.7 / 55.9 | -         | Jul 0900  | 1.04                |
| Zone 38   | 3.3   | 2.3   | 75.8 / 65.3 | 55.9 / 54.9 | -         | Aug 1000  | 0.60                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|   |        | Heating | Htg Coil |        |     |     |         |
|---|--------|---------|----------|--------|-----|-----|---------|
| H | eating | Coil    | Water    | Fan    |     |     | OA Vent |
|   | Coil   | Ent/Lvg | Flow     | Design | Fan | Fan | Design  |

|           | Load  | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
|-----------|-------|-------------|----------|---------|-------|-------|---------|
| Zone Name | (MBH) | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 0.0   | 0.0 / 0.0   | 0.00     | 35      | 0.000 | 0.000 | 35      |
| Zone 2    | 7.8   | 70.0 / 74.4 | -        | 1630    | 0.000 | 0.000 | 1630    |
| Zone 3    | 0.8   | 69.5 / 83.5 | -        | 54      | 0.000 | 0.000 | 25      |
| Zone 4    | 0.0   | 0.0 / 0.0   | 0.00     | 367     | 0.000 | 0.000 | 330     |
| Zone 5    | 0.0   | 0.0 / 0.0   | 0.00     | 61      | 0.000 | 0.000 | 40      |
| Zone 6    | 0.0   | 0.0 / 0.0   | 0.00     | 166     | 0.000 | 0.000 | 40      |
| Zone 7    | 4.5   | 69.2 / 85.5 | -        | 259     | 0.000 | 0.000 | 50      |
| Zone 8    | 0.0   | 0.0 / 0.0   | 0.00     | 47      | 0.000 | 0.000 | 25      |
| Zone 9    | 0.0   | 0.0 / 0.0   | 0.00     | 47      | 0.000 | 0.000 | 25      |
| Zone 10   | 0.0   | 0.0 / 0.0   | 0.00     | 344     | 0.000 | 0.000 | 330     |
| Zone 11   | 0.0   | 0.0 / 0.0   | 0.00     | 422     | 0.000 | 0.000 | 360     |
| Zone 12   | 1.9   | 70.0 / 85.3 | -        | 115     | 0.000 | 0.000 | 115     |
| Zone 13   | 2.3   | 69.3 / 85.9 | -        | 128     | 0.000 | 0.000 | 35      |
| Zone 14   | 0.0   | 0.0 / 0.0   | 0.00     | 78      | 0.000 | 0.000 | 30      |
| Zone 15   | 0.0   | 0.0 / 0.0   | 0.00     | 58      | 0.000 | 0.000 | 20      |
| Zone 16   | 0.0   | 0.0 / 0.0   | 0.00     | 34      | 0.000 | 0.000 | 20      |
| Zone 17   | 0.0   | 0.0 / 0.0   | 0.00     | 59      | 0.000 | 0.000 | 20      |
| Zone 18   | 0.0   | 0.0 / 0.0   | 0.00     | 35      | 0.000 | 0.000 | 20      |
| Zone 19   | 0.0   | 0.0 / 0.0   | 0.00     | 33      | 0.000 | 0.000 | 20      |
| Zone 20   | 0.0   | 0.0 / 0.0   | 0.00     | 141     | 0.000 | 0.000 | 50      |
| Zone 21   | 0.0   | 0.0 / 0.0   | 0.00     | 340     | 0.000 | 0.000 | 340     |
| Zone 22   | 0.0   | 0.0 / 0.0   | 0.00     | 20      | 0.000 | 0.000 | 20      |
| Zone 23   | 26.7  | 69.6 / 82.9 | -        | 1859    | 0.000 | 0.000 | 560     |
| Zone 24   | 0.0   | 0.0 / 0.0   | 0.00     | 365     | 0.000 | 0.000 | 365     |
| Zone 25   | 0.0   | 0.0 / 0.0   | 0.00     | 47      | 0.000 | 0.000 | 30      |
| Zone 26   | 0.0   | 0.0 / 0.0   | 0.00     | 75      | 0.000 | 0.000 | 75      |
| Zone 27   | 6.6   | 70.0 / 75.4 | -        | 1145    | 0.000 | 0.000 | 1145    |
| Zone 28   | 0.0   | 0.0 / 0.0   | 0.00     | 323     | 0.000 | 0.000 | 185     |
| Zone 29   | 3.3   | 69.6 / 83.0 | -        | 230     | 0.000 | 0.000 | 95      |
| Zone 30   | 0.0   | 0.0 / 0.0   | 0.00     | 119     | 0.000 | 0.000 | 30      |
| Zone 31   | 3.2   | 69.5 / 82.4 | -        | 231     | 0.000 | 0.000 | 95      |
| Zone 32   | 0.0   | 0.0 / 0.0   | 0.00     | 324     | 0.000 | 0.000 | 185     |
| Zone 33   | 5.9   | 70.0 / 74.8 | -        | 1145    | 0.000 | 0.000 | 1145    |
| Zone 34   | 0.0   | 0.0 / 0.0   | 0.00     | 75      | 0.000 | 0.000 | 75      |
| Zone 35   | 0.0   | 0.0 / 0.0   | 0.00     | 42      | 0.000 | 0.000 | 20      |
| Zone 36   | 0.0   | 0.0 / 0.0   | 0.00     | 288     | 0.000 | 0.000 | 0       |
| Zone 37   | 30.4  | 69.4 / 86.3 | -        | 1676    | 0.000 | 0.000 | 555     |
| Zone 38   | 0.0   | 0.0 / 0.0   | 0.00     | 107     | 0.000 | 0.000 | 11      |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 218.0            | 18.2              | 93.5             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 218.0            | 18.2              | 93.5             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

|           | Zone     |               | Zone    | Zone  |
|-----------|----------|---------------|---------|-------|
|           | Cooling  | Time of       | Heating | Floor |
|           | Sensible | Peak Sensible | Load    | Area  |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²) |

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 0.5      | Jan 1100      | 0.0     | 226.7  |
| Zone 2    | 9.1      | Jul 1100      | 2.1     | 4430.8 |
| Zone 3    | 1.2      | Jan 1100      | 0.9     | 141.4  |
| Zone 4    | 7.9      | Jan 1400      | 0.0     | 872.0  |
| Zone 5    | 1.3      | Jan 1100      | 0.0     | 654.1  |
| Zone 6    | 3.6      | Jan 1400      | 0.0     | 474.1  |
| Zone 7    | 0.0      | Des Htg       | 4.8     | 325.5  |
| Zone 8    | 1.0      | Jan 1100      | 0.0     | 108.6  |
| Zone 9    | 1.0      | Jan 1100      | 0.0     | 108.6  |
| Zone 10   | 7.4      | Jan 1400      | 0.0     | 732.3  |
| Zone 11   | 9.1      | Jan 1400      | 0.0     | 1200.6 |
| Zone 12   | 0.0      | Des Htg       | 1.5     | 332.7  |
| Zone 13   | 1.4      | Jul 1400      | 2.4     | 578.4  |
| Zone 14   | 1.7      | Jan 1400      | 0.0     | 186.1  |
| Zone 15   | 1.2      | Jan 1100      | 0.0     | 181.3  |
| Zone 16   | 0.7      | Jan 1400      | 0.0     | 122.2  |
| Zone 17   | 1.3      | Jan 1100      | 0.0     | 186.2  |
| Zone 18   | 0.8      | Jan 1400      | 0.0     | 124.1  |
| Zone 19   | 0.7      | Jan 1400      | 0.0     | 110.8  |
| Zone 20   | 3.0      | Jan 1400      | 0.0     | 381.3  |
| Zone 21   | 7.3      | Jan 1400      | 0.0     | 739.5  |
| Zone 22   | 0.4      | Jan 1500      | 0.0     | 66.7   |
| Zone 23   | 40.1     | Sep 1400      | 26.6    | 1372.5 |
| Zone 24   | 2.0      | Jan 1100      | 0.0     | 972.3  |
| Zone 25   | 1.0      | Jan 1100      | 0.0     | 119.4  |
| Zone 26   | 1.0      | Jan 1100      | 0.0     | 101.4  |
| Zone 27   | 17.1     | Jul 1400      | 4.5     | 977.6  |
| Zone 28   | 7.0      | Jan 1400      | 0.0     | 340.5  |
| Zone 29   | 5.0      | Jul 1400      | 3.4     | 278.6  |
| Zone 30   | 2.6      | Jan 1100      | 0.0     | 197.8  |
| Zone 31   | 5.0      | Jul 1400      | 3.4     | 286.9  |
| Zone 32   | 7.0      | Jan 1400      | 0.0     | 344.0  |
| Zone 33   | 17.2     | Jul 1400      | 4.2     | 1068.9 |
| Zone 34   | 1.0      | Jan 1100      | 0.0     | 101.2  |
| Zone 35   | 0.9      | Jan 1100      | 0.0     | 86.7   |
| Zone 36   | 6.2      | Jan 1600      | 0.0     | 476.9  |
| Zone 37   | 29.1     | Jul 1100      | 30.7    | 1608.6 |
| Zone 38   | 2.3      | Jan 1100      | 0.0     | 176.6  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| C004B - STOR              | 1     | 0.5                          | Jan 1100                            | 35                   | 0.0                      | 226.7                  | 0.15             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| C010 CORRIDOR             | 1     | 3.1                          | Jan 1100                            | 540                  | 0.0                      | 1525.6                 | 0.35             |
| C017 CORRIDOR             | 1     | 2.1                          | Jan 1100                            | 540                  | 0.0                      | 1020.3                 | 0.53             |
| D002 CORRIDOR             | 1     | 4.0                          | Jul 1100                            | 550                  | 2.1                      | 1884.9                 | 0.29             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| C013 CUST OFF             | 1     | 1.2                          | Jan 1100                            | 54                   | 0.9                      | 141.4                  | 0.39             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| C018 METAL FAB RELATED C  | 1     | 7.9                          | Jan 1400                            | 367                  | 0.0                      | 872.0                  | 0.42             |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft <sup>2</sup> |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------------------|
| Zone 5                    |       | ()                           |                                     | (01)                 | (                        | ()                     | 01 10010                     |
| C019 GENERAL SUPPLY       | 1     | 1.3                          | Jan 1100                            | 61                   | 0.0                      | 654.1                  | 0.09                         |
| Zone 6                    |       |                              |                                     |                      |                          |                        |                              |
| C020 Cust Workshop        | 1     | 3.6                          | Jan 1400                            | 166                  | 0.0                      | 474.1                  | 0.35                         |
| Zone 7                    |       |                              |                                     |                      |                          |                        |                              |
| C015 GENERAL SUPPLY       | 1     | 0.0                          | Jan 0000                            | 259                  | 4.8                      | 325.5                  | 0.80                         |
| Zone 8                    |       |                              |                                     |                      |                          |                        |                              |
| C024 COACH OFF            | 1     | 1.0                          | Jan 1100                            | 47                   | 0.0                      | 108.6                  | 0.43                         |
| Zone 9                    |       |                              |                                     |                      |                          |                        |                              |
| C026 COACH OFF            | 1     | 1.0                          | Jan 1100                            | 47                   | 0.0                      | 108.6                  | 0.43                         |
| Zone 10                   |       |                              |                                     |                      |                          |                        |                              |
| C022D RELATED CR          | 1     | 7.4                          | Jan 1400                            | 344                  | 0.0                      | 732.3                  | 0.47                         |
| Zone 11                   |       |                              |                                     |                      |                          |                        |                              |
| D003D RELATED CR          | 1     | 9.1                          | Jan 1400                            | 422                  | 0.0                      | 1200.6                 | 0.35                         |
| Zone 12                   |       |                              |                                     |                      |                          |                        |                              |
| C011 CORRIDOR             | 1     | 0.0                          | Jan 0000                            | 115                  | 1.5                      | 332.7                  | 0.35                         |
| Zone 13                   |       |                              |                                     |                      |                          |                        |                              |
| C120 CORRIDOR             | 1     | 1.4                          | Jul 1400                            | 128                  | 2.4                      | 578.4                  | 0.22                         |
| Zone 14                   |       |                              |                                     |                      |                          |                        |                              |
| D102 NURSE WAIT           | 1     | 1.7                          | Jan 1400                            | 78                   | 0.0                      | 186.1                  | 0.42                         |
| Zone 15                   |       |                              |                                     |                      |                          |                        |                              |
| D103 NURSE OFF            | 1     | 1.2                          | Jan 1100                            | 58                   | 0.0                      | 181.3                  | 0.32                         |
| Zone 16                   |       |                              |                                     |                      |                          |                        |                              |
| D106 EXAM                 | 1     | 0.7                          | Jan 1400                            | 34                   | 0.0                      | 122.2                  | 0.28                         |
| Zone 17                   |       |                              |                                     |                      |                          |                        |                              |
| D104 NURSE OFF            | 1     | 1.3                          | Jan 1100                            | 59                   | 0.0                      | 186.2                  | 0.31                         |
| Zone 18                   |       |                              |                                     |                      |                          |                        |                              |
| D109 EXAM                 | 1     | 0.8                          | Jan 1400                            | 35                   | 0.0                      | 124.1                  | 0.28                         |
| Zone 19                   |       |                              |                                     |                      |                          |                        |                              |
| D110 EXAM                 | 1     | 0.7                          | Jan 1400                            | 33                   | 0.0                      | 110.8                  | 0.29                         |
| Zone 20                   |       |                              |                                     |                      |                          |                        |                              |
| D105 RESTING              | 1     | 2.8                          | Jan 1400                            | 130                  | 0.0                      | 258.1                  | 0.50                         |
| D102A - CORRIDOR          | 1     | 0.2                          | Jan 1100                            | 12                   | 0.0                      | 123.2                  | 0.09                         |
| Zone 21                   |       |                              |                                     |                      |                          |                        |                              |
| D111 HEALTH CR            | 1     | 7.3                          | Jan 1400                            | 340                  | 0.0                      | 739.5                  | 0.46                         |
| Zone 22                   |       |                              |                                     |                      |                          |                        |                              |
| D113B FITNESS             | 1     | 0.4                          | Jan 1500                            | 20                   | 0.0                      | 66.7                   | 0.30                         |
| Zone 23                   |       |                              |                                     |                      |                          |                        |                              |
| D113 FITNESS              | 1     | 40.1                         | Sep 1400                            | 1859                 | 26.6                     | 1372.5                 | 1.35                         |
| Zone 24                   |       |                              |                                     |                      |                          |                        |                              |
| D114 CORRIDOR             | 1     | 2.0                          | Jan 1100                            | 365                  | 0.0                      | 972.3                  | 0.38                         |
| Zone 25                   |       |                              |                                     |                      |                          |                        |                              |
| D116 ATH DIR OFF          | 1     | 1.0                          | Jan 1100                            | 47                   | 0.0                      | 119.4                  | 0.40                         |
| Zone 26                   |       |                              |                                     |                      |                          |                        |                              |
| D117D PE INSTR OFF        | 1     | 1.0                          | Jan 1100                            | 75                   | 0.0                      | 101.4                  | 0.74                         |
| Zone 27                   |       |                              |                                     |                      |                          |                        |                              |
| D117 BOYS LOCKER          | 1     | 17.1                         | Jul 1400                            | 1145                 | 4.5                      | 977.6                  | 1.17                         |
| Zone 28                   |       |                              |                                     |                      |                          |                        |                              |
| D117B TEAM LOCKER         | 1     | 7.0                          | Jan 1400                            | 323                  | 0.0                      | 340.5                  | 0.95                         |
| Zone 29                   |       |                              |                                     |                      |                          | · ·                    |                              |
| D11/C IEAM LOCKER         | 1     | 5.0                          | Jul 1400                            | 230                  | 3.4                      | 278.6                  | 0.83                         |
|                           |       |                              | 1                                   |                      |                          | 107.0                  |                              |
| D119 IRAINER              | 1     | 2.6                          | Jan 1100                            | 119                  | 0.0                      | 197.8                  | 0.60                         |
| Zone 31                   |       |                              |                                     |                      |                          |                        |                              |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| D122C TEAM LOCKER         | 1     | 5.0                          | Jul 1400                            | 231                  | 3.4                      | 286.9                  | 0.81             |
| Zone 32                   |       |                              |                                     |                      |                          |                        |                  |
| D122B TEAM LOCKER         | 1     | 7.0                          | Jan 1400                            | 324                  | 0.0                      | 344.0                  | 0.94             |
| Zone 33                   |       |                              |                                     |                      |                          |                        |                  |
| D122 GIRLS LOCKER         | 1     | 17.2                         | Jul 1400                            | 1145                 | 4.2                      | 1068.9                 | 1.07             |
| Zone 34                   |       |                              |                                     |                      |                          |                        |                  |
| D122D PE INST OFF         | 1     | 1.0                          | Jan 1100                            | 75                   | 0.0                      | 101.2                  | 0.74             |
| Zone 35                   |       |                              |                                     |                      |                          |                        |                  |
| D123 OFFICIALS            | 1     | 0.9                          | Jan 1100                            | 42                   | 0.0                      | 86.7                   | 0.48             |
| Zone 36                   |       |                              |                                     |                      |                          |                        |                  |
| C023 TEAM LOCKER          | 1     | 6.2                          | Jan 1600                            | 288                  | 0.0                      | 476.9                  | 0.60             |
| Zone 37                   |       |                              |                                     |                      |                          |                        |                  |
| D115 WEIGHTS              | 1     | 29.1                         | Jul 1100                            | 1676                 | 30.7                     | 1608.6                 | 1.04             |
| Zone 38                   |       |                              |                                     |                      |                          |                        |                  |
| D120 PE STOR              | 1     | 2.3                          | Jan 1100                            | 107                  | 0.0                      | 176.6                  | 0.60             |

## Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-5 (Cosmetology) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

**Air System Information** 

| Air System Name | HRU-5 (Cosmetology) |
|-----------------|---------------------|
| Equipment Class | TERM                |
| Air System Type | VRF                 |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

### **Cooling Coil Sizing Data**

| Total coil load 10.7          | Tons    |
|-------------------------------|---------|
| Total coil load 127.9         | MBH     |
| Total coil load 258.9         | CFM/Ton |
| Sensible coil load 88.9       | MBH     |
| Coil CFM at Aug 1400 2759     | CFM     |
| Max coil CFM                  | CFM     |
| Sensible heat ratio 0.695     |         |
| Water flow @ 10.0 °F rise N/A |         |

#### Heating Coil Sizing Data

| Max coil load 4             | 4.6 | MBH |
|-----------------------------|-----|-----|
| Coil CFM at Jan 0700 27     | 759 | CFM |
| Max coil CFM 27             | 759 | CFM |
| Water flow @ 20.0 °F drop N | A/A |     |

#### **Ventilation Fan Sizing Data**

| Actual max CFM                 | 2759 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 2756 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.62 | CFM/ft <sup>2</sup> |

#### **Exhaust Fan Sizing Data**

| Actual max CFM                 | 2759 | CFM                 |
|--------------------------------|------|---------------------|
| Standard CFM                   | 2756 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 0.62 | CFM/ft <sup>2</sup> |

| Outdoor Ventilation Air Data |      |                     |
|------------------------------|------|---------------------|
| Design airflow CFM           | 2759 | CFM                 |
| CFM/ft <sup>2</sup>          | 0.62 | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Aug 1400      |    |
|------------------------------|----|
| OA DB / WB                   | °F |
| Entering DB / WB 81.4 / 66.5 | °F |
| Leaving DB / WB 51.5 / 50.4  | °F |
| Bypass Factor 0.100          |    |

| Load occurs at Jan 0700      |    |
|------------------------------|----|
| Ent. DB / Lvg DB 51.5 / 66.5 | °F |

| Fan motor BHP | 3.80 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 3.01 | kW    |
| Fan static    | 4.00 | in wg |

| Fan motor BHP | 2.85  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 2.26  | kW         |
| Fan static    | 3.00  | in wg      |
| CFM/person    | 30.96 | CFM/person |

Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name HRU-5 (Cosmetology) | Number of zones 6                 |
|-------------------------------------|-----------------------------------|
| Equipment Class TERM                | Floor Area 4455.6 ft <sup>2</sup> |
| Air System Type VRF                 | Location Boston, Massachusetts    |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 29.5  | 29.5  | 72.3 / 59.4 | 58.0 / 53.8 | -         | Jul 1400  | 0.95                |
| Zone 2    | 1.9   | 1.7   | 75.8 / 64.1 | 58.0 / 56.9 | -         | Apr 1000  | 0.72                |
| Zone 3    | 0.9   | 0.9   | 70.0 / 58.1 | 61.3 / 54.7 | -         | Jul 0900  | 0.61                |
| Zone 4    | 21.9  | 21.9  | 71.7 / 59.1 | 58.2 / 53.8 | -         | Aug 1200  | 0.82                |
| Zone 5    | 1.8   | 1.6   | 75.7 / 63.9 | 58.0 / 56.9 | -         | Apr 1000  | 0.81                |
| Zone 6    | 0.4   | 0.4   | 70.0 / 58.1 | 68.8 / 57.6 | -         | Jul 1000  | 1.51                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

| Zone Name | Heating<br>Coil<br>Load<br>(MBH) | Heating<br>Coil<br>Ent/Lvg<br>DB<br>(°F) | Htg Coil<br>Water<br>Flow<br>@20.0 °F<br>(gpm) | Fan<br>Design<br>Airflow<br>(CFM) | Fan<br>Motor<br>(BHP) | Fan<br>Motor<br>(kW) | OA Vent<br>Design<br>Airflow<br>(CFM) |
|-----------|----------------------------------|--|--|-----------------------------------|-----------------------|----------------------|---------------------------------------|
| Zone 1    | 35.2                             | 69.6 / 86.6                              | - (01  | 1918                              | 0.000                 | 0.000                | 1220                                  |
| Zone 2    | 0.0                              | 0.0 / 0.0                                | 0.00   | 89                                | 0.000                 | 0.000                | 17                                    |
| Zone 3    | 0.2                              | 70.0 / 71.8                              | -  | 100                               | 0.000                 | 0.000                | 100                                   |
| Zone 4    | 23.7                             | 69.7 / 84.3                              | -  | 1509                              | 0.000                 | 0.000                | 1100                                  |
| Zone 5    | 0.0                              | 0.0 / 0.0                                | 0.00   | 86                                | 0.000                 | 0.000                | 16                                    |
| Zone 6    | 0.6                              | 70.0 / 71.7                              | -  | 305                               | 0.000                 | 0.000                | 305                                   |

#### **VRF Outdoor Unit Sizing Data**

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 54.7             | 4.6               | 59.6             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 54.7             | 4.6               | 59.6             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 35.2     | Jul 1400      | 36.8    | 2028.5 |
| Zone 2    | 1.6      | Jan 1100      | 0.0     | 123.8  |
| Zone 3    | 1.3      | Jul 1400      | 0.2     | 164.9  |
| Zone 4    | 27.7     | Aug 1400      | 25.2    | 1831.2 |
| Zone 5    | 1.6      | Jan 1100      | 0.0     | 105.6  |
| Zone 6    | 0.9      | Jul 1400      | 0.1     | 201.5  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| B120 COSMETOLOGY          | 1     | 35.2                         | Jul 1400                            | 1918                 | 36.8                     | 2028.5                 | 0.95             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| B120A OFF                 | 1     | 1.6                          | Jan 1100                            | 89                   | 0.0                      | 123.8                  | 0.72             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| B120C FACIAL              | 1     | 1.3                          | Jul 1400                            | 100                  | 0.2                      | 164.9                  | 0.61             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| B121 COSMETOLOGY          | 1     | 27.7                         | Aug 1400                            | 1509                 | 25.2                     | 1831.2                 | 0.82             |
| Zone 5                    |       |                              |                                     |                      |                          |                        |                  |
| B121C OFF                 | 1     | 1.6                          | Jan 1100                            | 86                   | 0.0                      | 105.6                  | 0.81             |
| Zone 6                    |       |                              |                                     |                      |                          |                        |                  |
| B120B DISP                | 1     | 0.9                          | Jul 1400                            | 305                  | 0.1                      | 201.5                  | 1.51             |

Air System Sizing Summary for MAU-1 (Kitchen) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | <br>MAU-1 (Kitchen) |
|-----------------|---------------------|
| Equipment Class | <br>SPLT AHU        |
| Air System Type | <br>SZCAV           |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

#### **Central Cooling Coil Sizing Data**

| Total coil load 10           | ) <b>.3</b> T | Γons |
|------------------------------|---------------|------|
| Total coil load 123          | .4 N          | MBH  |
| Sensible coil load 116       | 5.4 N         | MBH  |
| Coil CFM at Jul 1600 65      | 10 (          | CFM  |
| Max block CFM 65'            | 10 (          | CFM  |
| Sum of peak zone CFM 65'     | 10 (          | CFM  |
| Sensible heat ratio 0.94     | 43            |      |
| CFM/Ton 633                  | .0            |      |
| ft²/Ton 162                  | .9            |      |
| BTU/(hr·ft <sup>2</sup> ) 73 | .6            |      |
| Water flow @ 12.0 °F rise N  | / <b>A</b>    |      |
|                              |               |      |

#### **Central Heating Coil Sizing Data**

| Max coil load             | 141.7 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Feb 1100      | 6510  | CFM |
| Max coil CFM              | 6510  | CFM |
| Water flow @ 30.0 °F drop | N/A   |     |

#### **Preheat Coil Sizing Data**

| Max coil load             | 288.2 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 6510  | CFM |
| Max coil CFM              | 6510  | CFM |
| Water flow @ 30.0 °F drop | N/A   |     |

#### **Supply Fan Sizing Data**

| Actual max CFM  | 6510         | CFM                        |
|---|--------------|----------------------------|
| Standard CFM  | 6503         | CFM                        |
| Actual max CFM/ft²  | 3.88         | CFM/ft²                    |
| Outdoor Ventilation Air Data<br>Design airflow CFM<br>CFM/ft <sup>2</sup> | 6315<br>3.77 | CFM<br>CFM/ft <sup>2</sup> |

| Number of zones       | 1         |     |
|-----------------------|-----------|-----|
| Floor Area            | 1675.8    | ft² |
| Location Boston, Mass | achusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| _oad occurs at Jul 1600  |    |
|--|----|
| OA DB / WB   | °F |
| Entering DB / WB 86.6 / 73.9   | °F |
| _eaving DB / WB 70.1 / 68.8  | °F |
| Coil ADP   | °F |
| Bypass Factor 0.100  |    |
| Resulting RH 80  | %  |
| DA DB / WB       87.0 / 74.0         intering DB / WB       86.6 / 73.9         eaving DB / WB       70.1 / 68.8         coil ADP       68.2         ypass Factor       0.100         lessign supply temp.       55.0         one T-stat Check       1 of 1         fax zone temperature deviation       0.0                           |    |
| A DB / WB       87.0 / 74.0         Intering DB / WB       86.6 / 73.9         eaving DB / WB       70.1 / 68.6         oil ADP       68.2         ypass Factor       0.100         esulting RH       80.6         esign supply temp.       55.0         one T-stat Check       1 of 1         ax zone temperature deviation       0.0 |    |
| Max zone temperature deviation 0.0   | °F |
|  |    |

| Load occurs at Feb 1100        |    |
|--------------------------------|----|
| BTU/(hr·ft <sup>2</sup> ) 84.5 |    |
| Ent. DB / Lvg DB 50.0 / 70.2   | °F |

| Load occurs at   | Des Htg    |    |
|------------------|------------|----|
| Ent. DB / Lvg DB | 9.0 / 50.0 | °F |

| Fan motor BHP | 8.96  | BHP        |
|---------------|-------|------------|
| Fan motor kW  | 7.11  | kW         |
| Fan static    | 4.00  | in wg      |
| CFM/person63  | 37.88 | CFM/person |

| Air System Name MAU-1 (Kitchen) | Number of zones 1                 |
|---------------------------------|-----------------------------------|
| Equipment Class SPLT AHU        | Floor Area 1675.8 ft <sup>2</sup> |
| Air System Type SZCAV           | Location Boston, Massachusetts    |

#### Sizing Calculation Information

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Coil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 30.0 °F | (MBH)    | @ 30.0 °F | (CFM)   |
| Zone 1    | 6315    | 6315    | 3.77                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 8.0      | Jul 1400      | 2.1     | 1675.8 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| A108 KITCHEN              | 1     | 7.1                          | Jul 1400                            | 5715                 | 2.1                      | 1441.3                 | 3.97             |
| A108A DISH WASHING        | 1     | 0.9                          | Jan 1400                            | 600                  | 0.0                      | 234.5                  | 2.56             |

Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | <br>MAU-2 (Culinary Arts) |
|-----------------|---------------------------|
| Equipment Class | <br>                      |
| Air System Type | <br>VAV                   |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

#### **Central Cooling Coil Sizing Data**

| Total coil load       1053.0       MBH         Sensible coil load       556.5       MBH         Coil CFM at Jul 1600       15144       CFM         Max block CFM at Jul 1400       15144       CFM         Sum of peak zone CFM       15717       CFM         Sensible heat ratio       0.528       CFM/Ton         CFM/Ton       172.6       ft²/Ton         BTU/(hr·ft²)       248.8       Water flow @ 10.0 °F rise | Total coil load             | 87.7 | Tons |
|--|-----------------------------|------|------|
| Sensible coil load         556.5         MBH           Coil CFM at Jul 1600         15144         CFM           Max block CFM at Jul 1400         15144         CFM           Sum of peak zone CFM         15717         CFM           Sensible heat ratio         0.528         CFM/Ton           CFM/Ton         172.6         ft²/Ton           BTU/(hr·ft²)         248.8         Water flow @ 10.0 °F rise        | Total coil load 10          | 53.0 | MBH  |
| Coil CFM at Jul 1600         15144         CFM           Max block CFM at Jul 1400         15144         CFM           Sum of peak zone CFM         15717         CFM           Sensible heat ratio         0.528         CFM/Ton           CFM/Ton         172.6         ft²/Ton           BTU/(hr·ft²)         248.8         Water flow @ 10.0 °F rise   | Sensible coil load 5        | 56.5 | MBH  |
| Max block CFM at Jul 1400         15144         CFM           Sum of peak zone CFM         15717         CFM           Sensible heat ratio         0.528         CFM/Ton         172.6           ft²/Ton         48.2         BTU/(hr·ft²)         248.8           Water flow @ 10.0 °F rise         N/A         N/A   | Coil CFM at Jul 1600 1      | 5144 | CFM  |
| Sum of peak zone CFM         15717         CFM           Sensible heat ratio         0.528         0.528           CFM/Ton         172.6         172.6           ft²/Ton         48.2         8TU/(hr·ft²)         248.8           Water flow @ 10.0 °F rise         N/A         N/A   | Max block CFM at Jul 1400 1 | 5144 | CFM  |
| Sensible heat ratio         0.528           CFM/Ton         172.6           ft²/Ton         48.2           BTU/(hr·ft²)         248.8           Water flow @ 10.0 °F rise         N/A  | Sum of peak zone CFM 1      | 5717 | CFM  |
| CFM/Ton         172.6           ft²/Ton         48.2           BTU/(hr·ft²)         248.8           Water flow @ 10.0 °F rise         N/A  | Sensible heat ratio 0       | .528 |      |
| ft²/Ton         48.2           BTU/(hr·ft²)         248.8           Water flow @ 10.0 °F rise         N/A  | CFM/Ton 1                   | 72.6 |      |
| BTU/(hr·ft²)   | ft²/Ton                     | 48.2 |      |
| Water flow @ 10.0 °F rise N/A  | BTU/(hr·ft <sup>2</sup> ) 2 | 48.8 |      |
|  | Water flow @ 10.0 °F rise   | N/A  |      |

#### **Preheat Coil Sizing Data**

| Max coil load 702           | .5 №       | ЛВН |
|-----------------------------|------------|-----|
| Coil CFM at Des Htg 151     | 44 C       | CFM |
| Max coil CFM 1514           | 44 C       | CFM |
| Water flow @ 20.0 °F drop N | / <b>A</b> |     |

#### **Supply Fan Sizing Data**

| Actual max CFM at Jul 1400     | 15144 | CFM                 |
|--------------------------------|-------|---------------------|
| Standard CFM                   | 15127 | CFM                 |
| Actual max CFM/ft <sup>2</sup> | 3.58  | CFM/ft <sup>2</sup> |

#### **Outdoor Ventilation Air Data**

| Design airflow CFM  | 15144 | CFM                 |
|---------------------|-------|---------------------|
| CFM/ft <sup>2</sup> | 3.58  | CFM/ft <sup>2</sup> |

| Number of zones |                | 4       |     |
|-----------------|----------------|---------|-----|
| Floor Area      |                | 4231.8  | ft² |
| Location        | Boston, Massac | husetts |     |

Zone CFM Sizing ..... Peak zone sensible load Space CFM Sizing ...... Individual peak space loads

| °F |
|----|
| °F |
| °F |
| °F |
|    |
| %  |
| °F |
| OK |
| °F |
|    |

| Load occurs at   | Des Htg    |    |
|------------------|------------|----|
| Ent. DB / Lvg DB | 7.0 / 50.0 | °F |

| Fan motor BHP         12.44           Fan motor kW         9.87           Fan static         3.00 | BHP<br>kW<br>in wg |
|---|--------------------|
| CFM/person 164.21   | CFM/person         |

| Air System Name MAU-2 (Culinary Arts) | Number of zones 4                 |
|---------------------------------------|-----------------------------------|
| Equipment Class SPLT AHU              | Floor Area 4231.8 ft <sup>2</sup> |
| Air System Type VAV                   | Location Boston, Massachusetts    |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing    | Peak zone sensible load    |
|--------------------|------------|--------------------|----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing I | ndividual peak space loads |

#### **Zone Terminal Sizing Data**

| Zone Name | Design<br>Supply<br>Airflow<br>(CFM) | Minimum<br>Supply<br>Airflow<br>(CFM) | Zone<br>CFM/ft² | Reheat<br>Coil<br>Load<br>(MBH) | Reheat<br>Coil<br>Water<br>gpm<br>@ 20.0 °F | Zone<br>Htg Unit<br>Coil<br>Load<br>(MBH) | Zone<br>Htg Unit<br>Water<br>gpm<br>@ 20.0 °F | Mixing<br>Box Fan<br>Airflow<br>(CFM) |
|-----------|--------------------------------------|---------------------------------------|-----------------|---------------------------------|---|---|---|---------------------------------------|
| Zone 1    | 12655                                | 12655                                 | 4.48            | 546.1                           | -   | 0.0                                       | -   | 0                                     |
| Zone 2    | 146                                  | 44                                    | 0.30            | 1.9                             | -   | 0.0                                       | -   | 0                                     |
| Zone 3    | 1845                                 | 1845                                  | 2.66            | 79.6                            | -   | 0.0                                       | -   | 0                                     |
| Zone 4    | 600                                  | 600                                   | 2.55            | 25.9                            | -   | 0.0                                       | -   | 0                                     |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 28.1     | Jul 1400      | 17.9    | 2823.9 |
| Zone 2    | 3.1      | Jul 1100      | 0.1     | 478.1  |
| Zone 3    | 10.4     | Aug 1400      | 8.2     | 694.5  |
| Zone 4    | 2.6      | Jan 1100      | 0.0     | 235.3  |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| A148 CULINARY ARTS        | 1     | 28.1                         | Jul 1400                            | 12655                | 17.9                     | 2823.9                 | 4.48             |
| Zone 2                    |       |                              |                                     |                      |                          |                        |                  |
| A148C OFF                 | 1     | 0.9                          | Jan 1100                            | 43                   | 0.0                      | 90.9                   | 0.47             |
| A148G OFF                 | 1     | 1.7                          | Jan 1100                            | 80                   | 0.0                      | 147.8                  | 0.54             |
| A148H DRY STOR            | 1     | 0.5                          | Jul 1100                            | 23                   | 0.1                      | 239.4                  | 0.10             |
| Zone 3                    |       |                              |                                     |                      |                          |                        |                  |
| A148D THEORY CR           | 1     | 10.4                         | Aug 1400                            | 1845                 | 8.2                      | 694.5                  | 2.66             |
| Zone 4                    |       |                              |                                     |                      |                          |                        |                  |
| A148K DISH                | 1     | 2.6                          | Jan 1100                            | 600                  | 0.0                      | 235.3                  | 2.55             |

Air System Sizing Summary for RTU-1 (Restaurant) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | RTU-1 (Restaurant) |
|-----------------|--------------------|
| Equipment Class | SPLT AHU           |
| Air System Type | SZCAV              |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

#### **Central Cooling Coil Sizing Data**

| Total coil load       41.3       MB         Sensible coil load       31.7       MB         Coil CFM at Jul 1400       1263       CFI         Max block CFM       1263       CFI         Sum of peak zone CFM       1263       CFI         Sensible heat ratio       0.768       CFM/Ton         CF//Ton       367.0       ft²/Ton       406.7         BTU/(hr·ft²)       29.5       Water flow @ 10.0 °F rise       N/A | Total coil load 3.4            | Tons |
|---|--------------------------------|------|
| Sensible coil load         31.7         MB           Coil CFM at Jul 1400         1263         CFI           Max block CFM         1263         CFI           Sum of peak zone CFM         1263         CFI           Sensible heat ratio         0.768         CFI           CFM/Ton         367.0         ft²/Ton         406.7           BTU/(hr·ft²)         29.5         Water flow @ 10.0 °F rise         N/A     | Total coil load 41.3           | MBH  |
| Coil CFM at Jul 1400         1263         CFI           Max block CFM         1263         CFI           Sum of peak zone CFM         1263         CFI           Sensible heat ratio         0.768         CFI/           CFM/Ton         367.0         ft²/Ton           ft²/Ton         406.7         BTU/(hr·ft²)           Water flow @ 10.0 °F rise         N/A  | Sensible coil load 31.7        | MBH  |
| Max block CFM         1263         CFI           Sum of peak zone CFM         1263         CFI           Sensible heat ratio         0.768         CFI           CFM/Ton         367.0         ft²/Ton         406.7           BTU/(hr·ft²)         29.5         Water flow @ 10.0 °F rise         N/A  | Coil CFM at Jul 1400 1263      | CFM  |
| Sum of peak zone CFM         1263         CFI           Sensible heat ratio         0.768         0.768           CFM/Ton         367.0         1127           ft²/Ton         406.7         1129           BTU/(hr·ft²)         29.5         129.5           Water flow @ 10.0 °F rise         N/A   | Max block CFM 1263             | CFM  |
| Sensible heat ratio         0.768           CFM/Ton         367.0           ft²/Ton         406.7           BTU/(hr ft²)         29.5           Water flow @ 10.0 °F rise         N/A   | Sum of peak zone CFM 1263      | CFM  |
| CFM/Ton         367.0           ft²/Ton         406.7           BTU/(hr·ft²)         29.5           Water flow @ 10.0 °F rise         N/A   | Sensible heat ratio 0.768      |      |
| ft²/Ton         406.7           BTU/(hr·ft²)         29.5           Water flow @ 10.0 °F rise         N/A   | CFM/Ton                        |      |
| BTU/(hr·ft <sup>2</sup> )   | ft²/Ton 406.7                  |      |
| Water flow @ 10.0 °F rise N/A   | BTU/(hr·ft <sup>2</sup> ) 29.5 |      |
|   | Water flow @ 10.0 °F rise N/A  |      |

#### **Central Heating Coil Sizing Data**

| Max coil load             | 31.5 | MBH |
|---------------------------|------|-----|
| Coil CFM at Des Htg       | 1263 | CFM |
| Max coil CFM              | 1263 | CFM |
| Water flow @ 20.0 °F drop | N/A  |     |

Preheat Coil Sizing Data No heating coil loads occurred during this calculation.

#### **Supply Fan Sizing Data**

| Actual max CFM         1263           Standard CFM         1262           Actual max CFM/ft²         0.90 | CFM<br>CFM<br>CFM/ft² |
|---|-----------------------|
| Return Fan Sizing Data  |                       |
| Actual max CFM         1263           Standard CFM         1262           Actual max CFM/ft²         0.90 | CFM<br>CFM<br>CFM/ft² |
| Outdoor Ventilation Air Data<br>Design airflow CFM  | CFM<br>CFM/ft²        |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Jul 1400            |    |
|------------------------------------|----|
| OA DB / WB                         | °F |
| Entering DB / WB 78.7 / 65.3       | °F |
| Leaving DB / WB 55.4 / 54.2        | °F |
| Coil ADP 52.8                      | °F |
| Bypass Factor 0.100                |    |
| Resulting RH 49                    | %  |
| Design supply temp 58.0            | °F |
| Zone T-stat Check 0 of 1           | OK |
| Max zone temperature deviation 0.2 | °F |

| Load occurs at     | Des Htg    |    |
|--------------------|------------|----|
| BTU/(hr·ft²)       | 22.5       |    |
| Ent. DB / Lvg DB 6 | 2.7 / 85.8 | °F |

| Fan motor BHP | 1.30 | BHP   |
|---------------|------|-------|
| Fan motor kW  | 1.03 | kW    |
| Fan static    | 3.00 | in wg |

| Fan motor BHP | 0.87 | BHP   |  |
|---------------|------|-------|--|
| Fan motor kW  | 0.69 | kW    |  |
| Fan static    | 2.00 | in wg |  |
|               |      |       |  |

CFM/person ..... 17.51 CFM/person

| Air System Name RTU-1 (Resteraunt) | Number of zones 1              |    |
|------------------------------------|--------------------------------|----|
| Equipment Class SPLT AHU           | Floor Area 1400.0 ft           | t² |
| Air System Type SZCAV              | Location Boston, Massachusetts |    |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Coil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 20.0 °F | (MBH)    | @ 20.0 °F | (CFM)   |
| Zone 1    | 1225    | 1225    | 0.88                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone   |
|-----------|----------|---------------|---------|--------|
|           | Cooling  | Time of       | Heating | Floor  |
|           | Sensible | Peak Sensible | Load    | Area   |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)  |
| Zone 1    | 22.5     | Jul 1400      | 24.9    | 1400.0 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| B113 RESTAURANT           | 1     | 22.5                         | Jul 1400                            | 1225                 | 24.9                     | 1400.0                 | 0.88             |

Air System Sizing Summary for RTU-2 (Gym) Project Name: Northeastern Metropolitan Regional Vocational High School Prepared by: Bala Consulting Engineers, Inc.

#### **Air System Information**

| Air System Name | RTU-2 (Gym) |
|-----------------|-------------|
| Equipment Class | SPLT AHU    |
| Air System Type | SZCAV       |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec |
|--------------------|------------|
| Sizing Data        | Calculated |

#### **Central Cooling Coil Sizing Data**

| Total coil load           | 35.2  | Tons |
|---------------------------|-------|------|
| Total coil load           | 422.4 | MBH  |
| Sensible coil load        | 286.7 | MBH  |
| Coil CFM at Jul 1400 1    | 1622  | CFM  |
| Max block CFM 1           | 1622  | CFM  |
| Sum of peak zone CFM 1    | 1622  | CFM  |
| Sensible heat ratio       | 0.679 |      |
| CFM/Ton                   | 330.2 |      |
| ft²/Ton                   | 353.2 |      |
| BTU/(hr·ft <sup>2</sup> ) | 34.0  |      |
| Water flow @ 10.0 °F rise | N/A   |      |
|                           |       |      |

#### **Central Heating Coil Sizing Data**

| Max coil load             | 182.3 | MBH |
|---------------------------|-------|-----|
| Coil CFM at Des Htg       | 11622 | CFM |
| Max coil CFM              | 11622 | CFM |
| Water flow @ 20.0 °F drop | N/A   |     |

Preheat Coil Sizing Data No heating coil loads occurred during this calculation.

#### **Supply Fan Sizing Data**

| Actual max CFM<br>Standard CFM<br>Actual max CFM/ft <sup>2</sup> | <br>CFM<br>CFM<br>CFM/ft <sup>2</sup> |
|--|---------------------------------------|
| Return Fan Sizing Data   |                                       |

| Actual max CFM               | 11622 | CFM                 |
|------------------------------|-------|---------------------|
| Standard CFM                 | 11610 | CFM                 |
| Actual max CFM/ft²           | 0.93  | CFM/ft <sup>2</sup> |
| Outdoor Ventilation Air Data |       |                     |

| Design airflow CFM  | 4047 | CFM                 |
|---------------------|------|---------------------|
| CFM/ft <sup>2</sup> | 0.33 | CFM/ft <sup>2</sup> |

| Number of zones |                       |     |
|-----------------|-----------------------|-----|
| Floor Area      |                       | ft² |
| Location        | Boston, Massachusetts |     |

| Zone CFM Sizing  | Sum of space airflow rates  |
|------------------|-----------------------------|
| Space CFM Sizing | Individual peak space loads |

| Load occurs at Jul 1400            |    |
|------------------------------------|----|
| OA DB / WB                         | °F |
| Entering DB / WB 78.3 / 66.5       | °F |
| Leaving DB / WB 55.4 / 54.4        | °F |
| Coil ADP 52.9                      | °F |
| Bypass Factor                      |    |
| Resulting RH 57                    | %  |
| Design supply temp 58.0            | °F |
| Zone T-stat Check 0 of 1           | OK |
| Max zone temperature deviation 0.2 | °F |

| Load occurs at Des Htg       |    |
|------------------------------|----|
| BTU/(hr·ft²) 14.7            |    |
| Ent. DB / Lvg DB 65.5 / 80.1 | °F |

| Fan motor BHP | 11.99 | BHP   |
|---------------|-------|-------|
| Fan motor kW  | 9.51  | kW    |
| Fan static    | 3.00  | in wg |
|               |       |       |

| Fan motor BHP | 7.99 | BHP   |  |
|---------------|------|-------|--|
| Fan motor kW  | 6.34 | kW    |  |
| Fan static    | 2.00 | in wg |  |
|               |      |       |  |

CFM/person ..... 14.99 CFM/person

| Air System Name | RTU-2 (Gym) | Number of zones | 1                              |
|-----------------|-------------|-----------------|--------------------------------|
| Equipment Class | SPLT AHÚ    | Floor Area      | <b>12434.6</b> ft <sup>2</sup> |
| Air System Type | SZCAV       | Location        | Boston, Massachusetts          |

#### Sizing Calculation Information

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### Zone Terminal Sizing Data

|           |         |         |                     |        | Reheat    | Zone     | Zone      |         |
|-----------|---------|---------|---------------------|--------|-----------|----------|-----------|---------|
|           | Design  | Minimum |                     | Reheat | Coil      | Htg Unit | Htg Unit  | Mixing  |
|           | Supply  | Supply  |                     | Coil   | Water     | Coil     | Water     | Box Fan |
|           | Airflow | Airflow | Zone                | Load   | gpm       | Load     | gpm       | Airflow |
| Zone Name | (CFM)   | (CFM)   | CFM/ft <sup>2</sup> | (MBH)  | @ 20.0 °F | (MBH)    | @ 20.0 °F | (CFM)   |
| Zone 1    | 11274   | 11274   | 0.91                | 0.0    | -         | 0.0      | -         | 0       |

#### **Zone Peak Sensible Loads**

|           | Zone     |               | Zone    | Zone    |
|-----------|----------|---------------|---------|---------|
|           | Cooling  | Time of       | Heating | Floor   |
|           | Sensible | Peak Sensible | Load    | Area    |
| Zone Name | (MBH)    | Cooling Load  | (MBH)   | (ft²)   |
| Zone 1    | 203.9    | Jul 1400      | 169.7   | 12434.6 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| D202 GYMNASIUM            | 1     | 194.2                        | Jul 1400                            | 10590                | 151.3                    | 12009.8                | 0.88             |
| D204 GYM STOR             | 1     | 10.4                         | Aug 1700                            | 683                  | 18.4                     | 424.8                  | 1.61             |

| Air System Name | WRF - Stair 1 | Number of zones            | 1        |
|-----------------|---------------|----------------------------|----------|
| Equipment Class |               | Floor Area 8               | 97.9 ft² |
| Air System Type | VRF           | Location Boston, Massachus | etts     |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 29.6  | 29.6  | 80.1 / 48.3 | 72.5 / 44.7 | -         | Aug 1100  | 4.05                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 66.9    | 69.2 / 86.2 | -        | 3634    | 0.000 | 0.000 | 0       |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 29.6             | 2.5               | 66.9             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 29.6             | 2.5               | 66.9             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 29.4                                 | Aug 1100                                 | 66.7                             | 897.9                          |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| S1 STAIR 1                | 1     | 29.4                         | Aug 1100                            | 3634                 | 66.7                     | 897.9                  | 4.05             |

| Air System Name VRF - Stair | r 2 | Number of zones |                       |     |
|-----------------------------|-----|-----------------|-----------------------|-----|
| Equipment Class TER         | RM  | Floor Area      |                       | ft² |
| Air System Type VI          | RF  | Location        | Boston, Massachusetts |     |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 13.6  | 13.6  | 80.5 / 48.5 | 71.5 / 44.2 | -         | Aug 1800  | 3.91                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 25.4    | 68.6 / 85.4 | -        | 1405    | 0.000 | 0.000 | 0       |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 13.6             | 1.1               | 25.4             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 13.6             | 1.1               | 25.4             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 13.8                                 | Aug 1800                                 | 25.6                             | 359.2                          |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| S2 STAIR 2                | 1     | 13.7                         | Aug 1800                            | 1398                 | 25.6                     | 269.6                  | 5.18             |
| S2 STAIR 2 - Interior     | 1     | 0.2                          | Jan 1100                            | 8                    | 0.0                      | 89.6                   | 0.09             |

| Air System Name VRF - Stair 3 | Number of zones            | 1                            |
|-------------------------------|----------------------------|------------------------------|
| Equipment Class TERM          | Floor Area 12              | 7 <b>1.2</b> ft <sup>2</sup> |
| Air System Type VRF           | Location Boston, Massachus | etts                         |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 23.4  | 23.4  | 80.3 / 48.4 | 71.8 / 44.4 | -         | Sep 1200  | 2.01                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 45.9    | 68.4 / 85.1 | -        | 2549    | 0.000 | 0.000 | 0       |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 23.4             | 2.0               | 45.9             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 23.4             | 2.0               | 45.9             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

| Zona Nama | Zone<br>Cooling<br>Sensible | Time of<br>Peak Sensible | Zone<br>Heating<br>Load | Zone<br>Floor<br>Area |
|-----------|-----------------------------|--------------------------|-------------------------|-----------------------|
| Zone Name | (ІМВН)                      | Cooling Load             | (INIBH)                 | (π-)                  |
| Zone 1    | 23.6                        | Sep 1200                 | 46.4                    | 1271.2                |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| S3 STAIR 3                | 1     | 23.2                         | Sep 1200                            | 2531                 | 46.4                     | 1053.2                 | 2.40             |
| S3 STAIR 3 BASEMENT       | 1     | 0.4                          | Jan 1100                            | 19                   | 0.0                      | 218.0                  | 0.09             |

| Air System Name VRF - Sta | air 4 | Number of zones | 1                     |     |
|---------------------------|-------|-----------------|-----------------------|-----|
| Equipment Class TE        | ERM   | Floor Area      |                       | ft² |
| Air System Type           | VRF   | Location        | Boston, Massachusetts |     |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | . Sum of space airflow rates |
|--------------------|------------|------------------|------------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads  |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 44.0  | 44.0  | 80.3 / 48.4 | 68.1 / 42.5 | -         | Jun 1800  | 5.76                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 60.8    | 69.2 / 86.1 | -        | 3334    | 0.000 | 0.000 | 0       |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 44.0             | 3.7               | 60.8             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 44.0             | 3.7               | 60.8             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

|           | Zone<br>Cooling<br>Sensible | Time of<br>Peak Sensible | Zone<br>Heating | Zone<br>Floor<br>Area |
|-----------|-----------------------------|--------------------------|-----------------|-----------------------|
| Zone Name | (MBH)                       | Cooling Load             | (MBH)           | (ft²)                 |
| Zone 1    | 44.1                        | Jun 1800                 | 61.1            | 578.4                 |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| S4 STAIR 4                | 1     | 44.1                         | Jun 1800                            | 3334                 | 61.1                     | 578.4                  | 5.76             |

| Air System Name VRF - S | Stair 5 | Number of zones | 1                     |     |
|-------------------------|---------|-----------------|-----------------------|-----|
| Equipment Class         | TERM    | Floor Area      |                       | ft² |
| Air System Type         | VRF     | Location        | Boston, Massachusetts |     |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 6.7   | 6.7   | 80.0 / 48.3 | 76.3 / 46.5 | -         | Jul 1400  | 4.85                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 31.2    | 69.1 / 86.0 | -        | 1703    | 0.000 | 0.000 | 0       |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 6.7              | 0.6               | 31.2             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 6.7              | 0.6               | 31.2             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 6.6                                  | Jul 1500                                 | 31.2                             | 350.9                          |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| S5 STAIR 5                | 1     | 6.6                          | Jul 1500                            | 1703                 | 31.2                     | 350.9                  | 4.85             |

| Air System Name | VRF - Stair 6 | Number of zones | 1                     |
|-----------------|---------------|-----------------|-----------------------|
| Equipment Class | TERM          | Floor Area      |                       |
| Air System Type | VRF           | Location        | Boston, Massachusetts |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 15.3  | 15.3  | 80.0 / 48.2 | 76.6 / 46.7 | -         | Jul 1500  | 12.73               |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 76.3    | 69.0 / 85.9 | -        | 4176    | 0.000 | 0.000 | 0       |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 15.3             | 1.3               | 76.3             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 15.3             | 1.3               | 76.3             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 15.0                                 | Jul 1500                                 | 76.6                             | 328.0                          |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| S6 STAIR 6                | 1     | 15.0                         | Jul 1500                            | 4176                 | 76.6                     | 328.0                  | 12.73            |

| Air System Name VRF - Stair | 7 Number of | of zones 1            |    |
|-----------------------------|-------------|-----------------------|----|
| Equipment Class TER         | M Floor Are | a                     | t² |
| Air System Type VR          | F Location  | Boston, Massachusetts |    |

#### **Sizing Calculation Information**

| Calculation Months | Jan to Dec | Zone CFM Sizing  | Sum of space airflow rates  |
|--------------------|------------|------------------|-----------------------------|
| Sizing Data        | Calculated | Space CFM Sizing | Individual peak space loads |

#### **Terminal Unit Sizing Data - Cooling**

|           | Total | Sens  | Coil        | Coil        | Water     | Time      |                     |
|-----------|-------|-------|-------------|-------------|-----------|-----------|---------------------|
|           | Coil  | Coil  | Entering    | Leaving     | Flow      | of        |                     |
|           | Load  | Load  | DB / WB     | DB / WB     | @ 10.0 °F | Peak Coil | Zone                |
| Zone Name | (MBH) | (MBH) | (°F)        | (°F)        | (gpm)     | Load      | CFM/ft <sup>2</sup> |
| Zone 1    | 7.6   | 7.6   | 80.2 / 48.3 | 75.4 / 46.1 | -         | Jul 1500  | 4.60                |

#### Terminal Unit Sizing Data - Heating, Fan, Ventilation

|           |         | Heating     | Htg Coil |         |       |       |         |
|-----------|---------|-------------|----------|---------|-------|-------|---------|
|           | Heating | Coil        | Water    | Fan     |       |       | OA Vent |
|           | Coil    | Ent/Lvg     | Flow     | Design  | Fan   | Fan   | Design  |
|           | Load    | DB          | @20.0 °F | Airflow | Motor | Motor | Airflow |
| Zone Name | (MBH)   | (°F)        | (gpm)    | (CFM)   | (BHP) | (kW)  | (CFM)   |
| Zone 1    | 34.9    | 63.4 / 85.1 | -        | 1491    | 0.000 | 0.000 | 0       |

#### VRF Outdoor Unit Sizing Data

|                                   | Cooling<br>[MBH] | Cooling<br>[Tons] | Heating<br>[MBH] |
|-----------------------------------|------------------|-------------------|------------------|
| Peak Coincident Indoor Unit Loads | 7.6              | 0.6               | 34.9             |
| Estimated Piping / Line Losses    | 0.0              | 0.0               | 0.0              |
|                                   |                  |                   |                  |
| Total Required ODU Capacity       | 7.6              | 0.6               | 34.9             |

Note: VRF piping / line losses are based on typical loss factors for this class of equipment. Actual line loss varies widely from one product to another. Therefore, when selecting equipment it is critical to consult manufacturer's guidance to utilize actual line loss data.

#### Zone Peak Sensible Loads

| Zone Name | Zone<br>Cooling<br>Sensible<br>(MBH) | Time of<br>Peak Sensible<br>Cooling Load | Zone<br>Heating<br>Load<br>(MBH) | Zone<br>Floor<br>Area<br>(ft²) |
|-----------|--------------------------------------|--|----------------------------------|--------------------------------|
| Zone 1    | 7.6                                  | Jul 1500                                 | 35.4                             | 324.1                          |

| Zone Name /<br>Space Name | Mult. | Cooling<br>Sensible<br>(MBH) | Time of<br>Peak<br>Sensible<br>Load | Air<br>Flow<br>(CFM) | Heating<br>Load<br>(MBH) | Floor<br>Area<br>(ft²) | Space<br>CFM/ft² |
|---------------------------|-------|------------------------------|-------------------------------------|----------------------|--------------------------|------------------------|------------------|
| Zone 1                    |       |                              |                                     |                      |                          |                        |                  |
| S7 STAIR 7                | 1     | 7.6                          | Jul 1500                            | 1491                 | 35.4                     | 324.1                  | 4.60             |

# GENERAL REQUIREMENTS TOTAL ELECTRICAL LOAD CALCULATIONS

# $B\Lambda L\Lambda$

December 20, 2022

Mr. Vladimir Lyubetsky DRA Architects 260 Charles Street, Suite 300 Waltham, MA 02453

#### RE: Northeast Metro Technical High School Project: 60-20-409

Dear Vladimir,

This is to acknowledge that we sent to WMGL&D a work order application, load letter, and site plan locating their utility feeders, junction boxes, and pad mounted transformers for the new electric service for Northeast Metro Technical High School. They have acknowledged receipt of this information and have also acknowledged that there will be a new service for this project. Attached at the end of this load letter is our most recent e-mail correspondence regarding the loads.

Very truly yours,

Dino D. Buro, P.E.

BALA CONSULTING ENGINEERS



## Projected Preliminary Electrical Connected Loads

| Lightin<br>(lightin<br>site ligl | <b>1g</b><br>g load at 0.81W/sf (energy code X 125% continuous load as per N<br>nting, 100 kW )   | EC, roughly 3<br>492       | 365kW, plus<br>kW          |
|----------------------------------|---|----------------------------|----------------------------|
| Receptacles (3 watt / SF)        |   | 1161                       | kW                         |
| Mecha<br>∙                       | <b>nical:</b><br>Miscellaneous Electric Heat<br>FTUs and EUHs   | 210                        | kW                         |
| •                                | Energy Recovery Ventilators (ERVs)  | 77                         | kW                         |
| •                                | VRF Fan Coil Units  | 625                        | kW                         |
| •                                | VRF Condensing Units  | 445                        | kW                         |
| •                                | Rooftop Units<br>RTUs (2) and HRUs (5)  | 500                        | kW                         |
| •                                | Miscellaneous Electric Heat<br>FTUs and EUHs  | 210                        | kW                         |
| •                                | Makeup Air Units (2)  | 63                         | kW                         |
| •                                | Indoor Air Handling Units (11)  | 792                        | kW                         |
| •                                | Exhaust Fans<br>Largest 20hp  | 61                         | kW                         |
| •                                | Air Cooled Condensing Units (ACCUs)   | 127                        | kW                         |
| •                                | Miscellaneous AC Split Systems  | 61                         | kW                         |
| •                                | VRF Condensing Units (VCUs)   | 965                        | kW                         |
| Plumb                            | ing:  |                            |                            |
| • • • •                          | Electric Hot Water Heaters (2 @ 108, 2 @ 90kW each)<br>Miscellaneous Circ Pumps (Fractional hp)<br>Miscellaneous Pumps<br>Air Compressor (1 @ 40hp, 1 @ 20hp, 5 @ 15hp)<br>Domestic Water Booster Triplex Pump (3 @ 20hp) | 396<br>5<br>5<br>135<br>60 | kW<br>kW<br>kW<br>kW<br>kW |
| Elevat                           | <b>ors</b> (two at 60 hp)   | 120                        | kW                         |

**Miscellaneous Power** 



| (Appliances, Copiers, Elec Heat Trace,<br>Art Rm equipment, Field House Equipment, etc.) | 100            | kW |
|--|----------------|----|
| Kitchen (Gas)  | 300            | kW |
| Miscellaneous Equipment  | 45             | kW |
|  | Total: 6,955kW |    |

7,321kVA

#### Projected Preliminary Electrical Connected Loads with code applied Demand Factor:

| First 1,161kVA at 100% | 1,161kVA |
|------------------------|----------|
| Plus                   |          |
| Next 6,160kVA at 75%   | 4,620kVA |

Demand Total: 5,781kVA

Based on projected connected loads with code applied demand, calculated estimated demand load is 6,953Amps at 480Volts, 3-phase.

Proposed secondary service will be sufficient to serve this calculated ampacity. Final utility transformer quantity and size to be determined by Utility Co. Two 2500kVA normal power transformers and one 300kVA emergency transformer are requested. Additionally, we are requesting a 300kVA transformer and 480V service to supply site power to the football field area (750kVA if the locker room building and concession building are constructed [currently add-alternates]). Lastly, we are requesting a 112.5kVA, 480V service to the new school message board area near Farm Road.

(NOTE, This does not include any PV generation)

Project will be supported by a utility-supplied standby generator that will provide a dedicated emergency service to the building.
## GENERAL REQUIREMENTS SECURITY & VISUAL ACCESS REQUIREMENTS

SECURITY & VISUAL ACCESS REQUIREMENTS

SECURITY NARRATIVE

6B.3.1 – 12a



168 MAIN STREET SUITE 3 NORTHFIELD, MA 01360 V. 413.498.5001 F. 413-498-4386 www.3si.net



#### NORTHEAST METROPOLITAN REGIONAL VOCATIONAL HIGH SCHOOL

#### SECURITY AND VISUAL ACCESS DESIGN

Multiple meetings were held to review and discuss the Security and Visual Access design for the new school building. In attendance were representatives from the Wakefield Police and Fire departments, the School Resource Officer, the School's Security Department, the Building Committee, the Superintendent, and the Owner's Project Manager.

The following security design incorporates the comments and suggestions made by the stakeholders.

Vehicle Control and Routing

The site design includes three separate vehicle areas. Bus drop-off is on the plan south side of the School. Bus pickup is on the plan north, and the parent drop-off/visitor entrance is on the plan west at the main entry. Access to the staff parking lots is separate from the bus and parent drop-off drives.

Electronically controlled lift barriers will be located at the entrances and exits of the student parking lot. Entry lift barriers are activated with proximity cards or fobs. Exit barriers are activated when the barrier senses a vehicle approaching

All entrance lift barriers and sliding gates include a siren sensor or Opticom device to allow automatic activation for emergency vehicles.

The School is considering installing gates to limit vehicle access to on-grade shop areas. The gates would have a video intercom to call the main office to have the gate open for entry. The gate/barrier, if provided, will be electronically controlled and have remote release capability from the administration reception area.

#### Visual Access

The building design incorporates the placement of windows to provide visibility of entry doors and all approaches to the building.

All entry doors will be storefront glass doors, and delivery doors will have windows to provide visibility of visitors at the doors.

The building design includes "School Guard Glass" products at the main entrance, and vestibule. Laminated glass will be utilized at the remaining entries.

#### Visitor Control and Routing

There are five main entrances to the School, the main entry parent drop-off/visitor entrance at the administration, a customer entrance for public access to the cosmetology area, restaurant, and the bank, an event entrance at the auditorium/gymnasium wing, a preschool program entrance, and an entrance at the physical education wing for access to and from the lower parking lots and playing fields.

The main entry, customer, and preschool program entrances will have audio/video intercoms. The vestibules are designed as sally ports. All visitors at the main entry, customer, and preschool doors will be challenged before being allowed entry into the vestibule and verified while in the sally port before being allowed into the School.

The main entry door will be the one location where school visitors will be allowed to enter the building during school hours. The vestibule and main office transaction window will be glass to provide full visibility of the exterior and vestibule doors. Visitors would interact with School administrative staff at a transaction window. Visitors allowed into the building would be issued a visitor's badge and access the main lobby by entering through the main office or staff releasing the interior vestibule door. The door between the main vestibule and the main office reception area will be electronically controlled.

Administrative office staff would utilize the School's existing Visitor Management system relocated to the new building to ensure a visitor does not have any criminal history before being allowed to enter the School's main lobby. The visitor will be required to present a driver's license photo ID, and the system will check national registries/databases before a visitor pass with a photo is issued.

Delivery doors will have IP-based "door phone intercoms" (hands-free speakerphones) on the exterior wall adjacent to the delivery door, which will be included in the phone system design. Following best practices, the receiving doors will not have remote release capabilities. Deliveries will require physical verification and manual release of the doors. The door phone intercoms will allow for notification of deliveries by being programmed to call a specific phone location. If there is no answer, the call will roll over to other phones in the order programmed until the call is answered.

#### **Electronic Building Security Systems**

Building security will include the following electronic security systems.

Intrusion Detection (perimeter and interior monitoring)

- Access Control
- Video Surveillance
- An Existing Vape Detection to be relocated
- An Existing Gunshot Detection to be relocated

The Intrusion Detection, Access Control, and Video Surveillance systems shall be integrated to perform in consort with each other. For example, if a door is breached, the Video Surveillance system will display the image from the CCTV camera at the door to the CCTV monitor screens at the SRO desk, and in the main office, a call to first responders



would be initiated, on-premises alarms would be activated, and electronic release of latches at doors with card readers would be disabled. The incident will be linked to and searchable in any of the three security system databases.

All security devices and headend equipment will reside on a secure physical data network. This network will be separate from the School's production data network.

#### Intrusion Detection System

An addressable IP-based Intrusion Detection system will be installed. The system shall have door contacts on all exterior doors and motion sensors in all on-grade spaces with exterior doors or windows. Motion sensors will be located in stairwells and corridors so that an intruder moving through the building can be tracked in real time.

The Intrusion Detection system will include keypad locations for arming and disarming the entire building or specific portions of the building. The Intrusion Detection system will include an automatic dialer for notification to an alarm monitoring service company,

The system will include interior sirens and strobes and beacon/strobes installed on the building exterior walls at locations affording line of sight from the street.

#### Access Control System

All doors shall be locked during school hours. Building entry will be limited to designated doors. Student entry at arrival time will be via the entrances close to bus and parent drop-off locations. General school visitor entry will be limited to one door at the main entry.

An addressable IP-based door audio/video call station will be installed at the exterior visitor entry door. Master stations for remote door release after visitors are challenged will be located at the main office reception counter. Master stations will also be installed in designated offices, such as the school resource officer's desk, secretary areas, and the principal's office, to provide the ability to release the visitor door after school hours remotely.

Customers entering the cosmetology shop, restaurant, or bank shall be limited to the customer entry door. Door release shall be controlled by Master stations located in each area. Interior doors in the restaurant and cosmetology that allow entry to the school building corridors will have card readers on both sides, limiting visitors to specific areas. School personnel with proper credentials will be able to pass into and out of the areas.

An addressable IP-based door audio/video call station will be installed at the preschool exterior entry door and the interior entrance to the preschool area. The preschool instructors shall control public access to the daycare program.

The main administrative office shall control the gates for public access to deliver and pick up vehicles at the automotive shops and or access to the rest of the on grade vocational areas.

Proximity/Card Readers will be installed at designated doors, including the main entry, custodial entry door, and staff entry doors, including the vocational shop exterior personnel doors.

Proximity/Card Readers will be installed at sally port vestibule interior doors allowing authorized staff card holders to pass directly through into the School.

Proximity / Card readers will be located at doors used for re-entry from the student parking lot and playing fields.

The Access Control system will notify administrators if any door is propped open.

Proximity / Card readers will also be located at technology closet doors for tracking access to sensitive technology and electronic security equipment.

An IP-based door phone intercom (hands-free speakerphone) will be installed at the Culinary and general receiving doors. Delivery persons will press the "call" button, and the system will call the first phone programmed. The call will roll over to other phones in the order programmed if there is no answer. According to best practices, school personnel will not be able to release the receiving door lock/latch remotely but will be required to verify the delivery before manually opening the door physically

The School's existing Visitor Management system will be installed at the transaction window counter in the main office reception area. Visitors will be issued photo ID passes which will automatically expire after four to six hours. The visitor management system will provide the ability to scan a visitor's photo ID, check the visitor's identity against national registries, and print a pass with a photo. The system will allow visitors to check out electronically, automatically updating the Visitor Management system's database.

CCTV Video Surveillance System

Multi-sensor 360-degree High-Resolution IP Video Surveillance cameras will be installed on various site lighting poles to provide coverage of parking lots, vehicle approaches, driveway entrances and exits, walkways, and playing fields. License Plate Recognition (LPR) CCTV cameras will be installed at driveway entrances.

High-Resolution IP Video Surveillance cameras will be located on the building's exterior and interior. Cameras will be placed at strategic exterior wall locations to monitor all entry/exit doors, bus drop-off, and loading areas. Cameras will provide coverage of all corridors and potential problem areas, such as the gymnasium, cafeteria, stairwells, and gang toilet entrances.

Live feed from all CCTV cameras will be viewable at large screen monitors installed in designated offices and authorized computer stations. Live feed from all CCTV cameras will also be viewable by the police department.

Recorded images shall be assessable via the system console and from authorized computer stations.

The system's Network Video Recorder shall provide a minimum of thirty days of image retention.

#### Vape Detection System

The current school building has an existing IP-based Power over Ethernet Vape detection system. Vape detectors are installed in vocational shop locker rooms, toilets, and gang toilets. The existing detection devices will be relocated to the new building, and additional detectors shall be installed to provide coverage in all locker rooms and gang toilets, including those in the Maintenance, Locker Room, and Concession outbuildings.

#### **Gunshot Detection System**

The existing school building has an IP-based Power over Ethernet Gunshot Detection system. The School is currently evaluating whether to procure PoE wired or wireless Gunshot Detection sensors. The existing gunshot detection devices will be relocated to the new building. The system shall be expanded with additional detectors to cover the larger new building and outbuildings.

#### **Duress Alert System**

The School is evaluating installing a Duress Alert system to comply with Alyssa's Law regulation. Evaluation includes what level of integration a Duress Alert system can provide between building systems, such as the overhead PA and IPTV video, with the electronic security systems, including the Gunshot Detection, Fire Alarm, and handheld radio systems.

The School is interested in the possibility of real-time two-way communications between the School and First Responders during an incident.

#### Additional Security-Related Items

#### **Exterior Building Identifiers**

First Responders requested the ability to identify physical building information from the exterior of the building. The following identifiers will be installed.

- Each wing shall have large Identifiers on the exterior such as A, B, C, D, etc.
- All doors, including exit-only doors, will have identifying number decals on their exterior and interior sides.
- All classrooms and vocational shops will have identifying room number decals installed on windows.

#### **Knox Boxes**

• The building design includes Knox Boxes for door keys and high-priority proximity cards/fobs for first responder agencies.

#### **Building Zoning**

- The addressable Intrusion Detection system shall provide building zoning so that specific areas can be unarmed while others are armed, allowing the School to have public events during off-school hours.
- The building design includes security doors to separate building areas for flexible after-hours use. The security doors / movable partitions would normally be held open by magnetic hold-open devices or other electronic devices as appropriate for each product. Individual security doors can be closed and locked electronically to isolate specific sections of the building.

#### Classroom Security

- All classroom doors will have locks with intruder-prevention features. The door locks will be keyed on the outside and the inside. The doors can be locked from the outside with a key to lock the outside trim. The inside keyway will also lock the outside trim from the inside allowing the doors to be secured without someone having to go outside the safety of the classroom. The doors will always allow for free egress out.
- Classroom doors will have safety glass sidelights for visibility from corridors yet allow students and staff to shelter in a corner and not be visible from the corridors.
- The sidelights will have pull shades inside to block all visibility into the classroom from the corridor.
- The sidelight frame will be divided into sections by horizontal bars, making it difficult for an intruder to enter a classroom through a sidelight if the safety glass is broken out.

#### Vocational Shop Security

- Overhead doors in on-grade vocational shops will be equipped with security grates/gates, allowing overhead doors to remain open for airflow but preventing an intruder from entering.
- The School is evaluating the feasibility of installing door chimes on the vocational shop corridor doors to notify instructors when someone enters the shop during class.



SECURITY & VISUAL ACCESS REQUIREMENTS

FIRE DEPART. MEETING NOTES

6B.3.1 – 12b

## BALA

#### **MEETING MINUTES**

| PROJECT:      | Northeast Metro Tech High  | School | PROJECT NO.: 60-20-409  |
|---------------|--|--------|---|
| MEETING NO .: | 02   |        | MEETING DATE: August 29, 2022   |
| LOCATION:     | Teams  |        |   |
| ATTENDEES:    | Chief Michael Sullivan<br>Marissa Valentino<br>Vladimir Lyubetsky<br>Joseph Desantis<br>Donald Contois<br>Sean Sullivan<br>KiJana Haney<br>Gilbert Castera |        | Wakefield Fire Department<br>Nitsch Engineering<br>DRA<br>PMA Consultants<br>R.W. Sullivan<br>Bala Consulting Engineers<br>Bala Consulting Engineers<br>Bala Consulting Engineers |
| DISTRIBUTION: | All Attendees<br>David Conway<br>Richard D. Rivera<br>Sean Sullivan<br>Dino D. Boro<br>Zachary Barrett   | -      | Nitsch Engineering<br>Bala Consulting Engineers<br>Bala Consulting Engineers<br>Bala Consulting Engineers<br>Bala Consulting Engineers  |

PURPOSE: Review of Proposed FP and FA Systems and Code Analysis

DATE ISSUED: August 2022

Minutes of the meeting are as follows:

#### New Business:

- 1.1 Fire department connections will be coordinated with the locations of fire hydrants to ensure that fire department connections are provided less than 100 feet from the nearest fire hydrant.
- 12 Chief Sullivan noted desire to have improve fire department access to the roof by providing other means of access in lieu of ladders.
- 1.3 Chiefs wants the annunciator to have the function to silence and reset the Fire Alarm system as needed.
- 1.4 Roof hydrants will be provided a minimum of 10'-0" away from the roof edge.
- 1.5 Fire Department connections shall have a cap and chain.
- 1.6 Weatherproof combination speaker/strobes will be provided within the courtyard.



- 1.7 Fire Hose Valve Cabinets (FHVC) will be provided for hose connections for each of the two (2) intermediate standpipes on each level within the vocational school building.
- 1.8 Chief Sullivan noted a desire to have a means of ventilation from the top of the events entry. Some ideas suggest were to use a smoke hatch or to use the ventilation system to exhaust air from this area.
- 1.9 Each "out" building will be provided with a separate fire alarm system thus, the duct bank from the vocational high school building FACP to the "out" buildings will not be provided.
  - a. The concessions building and the maintenance building will be provided with the following:
    - Fixed heat detectors set at 155 F.
    - Manual Pull Stations.
    - Fire Alarm Control Panel. This panel is permitted to not have voice capability.
    - Digital Alarm Communication Transmitter to transmit signals offsite.
  - b. The locker room building will be provided with fully supervised, analog addressable, voice evacuation system with the following:
    - Manual pull stations at exit doors (with tamperproof covers)
    - Visual units in small toilets and meeting rooms.
    - Audible/visual units in corridors, locker rooms, large restrooms, and kitchen area.
    - Smoke detector coverage in LULA lobby and machine room for elevator recall.
    - Smoke detector coverage will be provided within electrical type utility rooms.
    - Digital Alarm Communication Transmitter to transmit signals offsite.
    - Connections to sprinkler water flow and supervisory switches.
    - Knox boxes and exterior beacon will be provided.

We believe these minutes accurately represent what transpired at the meeting. If you take exception to any items, have any concern, or would like to add to the record, notify the writer within ten (10) calendar days of the date of these minutes. If no changes are requested, these minutes will then stand as the final record of this meeting.

Respectfully submitted,

BALA CONSULTING ENGINEERS, INC.

6B.3.1 - 13

# GENERAL REQUIREMENTS FACILITY & MAINTENANCE REQUIREMENTS

## BALA

#### NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL

#### FACILITY AND MAINTENANCE REQUIREMENTS

The Design Team has been aware of the facility and maintenance requirements for the new Northeast Metropolitan Vocational High School throughout the planning and design process. Meetings with the school and districts maintenance staff were held to discuss specific building maintenance needs. The following are the maintenance related items particular to the project

- A. General Custodial Requirements:
  - 1. The design team reviewed proposed floor materials, custodial office, closet, and storage locations with persons responsible for maintenance.
- B. Training Hours and Scheduling:
  - MSBA Project Advisory 65 Training Programs for School Construction Projects

     Best Practice guidelines were reviewed with the persons responsible for maintenance.
  - 2. The persons responsible for maintenance agreed that the training schedule and hours and method of delivery will be coordinated toward the end of the construction document phase.
  - 3. Additional reviews with the school and persons responsible for maintenance will be scheduled during the Construction Documents phase.
- C. HVAC Systems
  - 1. The building HVAC systems are proposed to be high efficiency all electric systems to reduce the building greenhouse gas emissions. Refer to HVAC and Electrical narratives for equipment requiring maintenance.
- D. Building Management Systems
  - 1. The building management system is proposed to be a direct digital control system. Refer to the HVAC and Electrical narratives for descriptions.
  - 2. The persons responsible for maintenance were informed that the ATC subcontractor will provide pre-occupancy and post-occupancy training.



- E. Roof Access
  - 1. Rooftop mechanical equipment requiring access by service technicians are located on five (5) different roof areas. Access to each area is per the following:
    - a) Gymnasium Roof: Access is from roof ladders that originate from either the Auditorium Roof or the 3<sup>rd</sup> Floor courtyard roof.
    - b) Auditorium Roof: Access is direct from the 3<sup>rd</sup> floor mechanical room through a man door.
    - c) Main Academic Roof: Can be Accessed either from a roof ladder that originates at the gymnasium roof level or a roof hatch (w/ ladder) located in a fourth-floor storage closet.
    - d) Cafeteria Roof: Accessed directly from a 2<sup>nd</sup> floor mechanical room through a man door.
    - e) Early Education Roof: Accessed through a roof hatch (w/ ladder) located within a first-floor storage closet.
- F. Mechanical Room Access
  - 1. Mechanical rooms are provided access that meets or exceeds the requirements of IMC 2018 Section 306 Access and Service Space.

P:\60-20-409\ADMIN - Northeast Metro Tech\REPORTS-NARRATIVES\2023.01.13\_60%CD Facility Maintenance Narrative\NE Metro Tech 60%CD Facility and Maintenance Narrative.docx

| GENERAL REQUIREMENTS      |  |
|---------------------------|--|
| QUALITY CONTROL NARRATIVE |  |

The 60 % Construction Documents (CD) have been reviewed by both the OPM's and the CM's staff. Recommendations and information were exchanged during the meetings and pre-bid requests for information (RFI'). CM-R is utilizing Procore site to communicate information between the Project Team members. The CM-R's recommendations, that were based on their knowledge of the construction means and methods, have been included as part of this 60% Construction Documents submission. The documents went through an in-house Quality Control Review.

#### **Ceiling Clearances**

The Design Team had regular coordination meetings during the Construction Documents phase of the Project, to review systems. BIM models were used as a tool for 3d conceptual coordination during these meetings. Ceiling clearance requirements for key MEP systems components, such as air handling units (located on mechanical mezzanines), major ductwork supply and return lines, sprinkler mains and recessed lighting fixtures were coordinated with structural steel depth and the finish ceiling heights. Interdisciplinary Document Coordination IDC was performed by the CM-R and the findings shared with the Design Team. This information was documented on the Building Sections and Reflective Ceiling Plans.

#### **Mechanical Room & Shaft Sizes**

All major pieces of MEP equipment and associated distribution components were placed within the Mechanical Rooms and on the Roof to confirm the room clearances, as well as the structural roof load requirements. The major shaft sizes and location requirements were reviewed and coordinated with all Design Team members.

#### **Coordinate Specifications & Drawings**

Drawings and Specifications were reviewed and updated by the Design Team. Additional comments received from the OPM and the CM-R, following their review of the earlier draft of the specifications and the progress set of drawings, were incorporated in the 60% CD submission.

#### **Filed Sub-Bid Work**

Further progress was made on defining the Filed Sub-Bid (Trade Bid) scope of work and incorporating it into the specifications and drawings.

#### Scheduling

The construction schedule and phasing approach was reviewed and confirmed during several progress meetings with the School District Administration, CM-R, OPM, and Architect. Specific emphasis was given to the site entry during construction to provide proper separation between the existing high school and construction activities. Ledge removal by blasting activities and site utilities coordination continued to be the focus of the CM-R planning of the early site package. The planning was guided by the goal of minimal disturbance to the adjacent resource areas and properties. CM-R consulted with the blasting experts as part of the construction activities planning. The Project Team discussed the advantages and challenges of the early site and structural steel enabling packages. Further development of the site utilization diagrams by the CM-R was significant effort as part of the Early Site Enabling Bid Package documentation.

**Equipment & Power** 

Major equipment power requirements were reviewed and coordinated between the design team members. More detail will be added prior to completion of the Construction Documents phase.

Base utilities for Vocational Equipment have been incorporated into the 60% CD Submission. As final equipment selections are made, utility requirements will be confirmed.

During coordination meetings with the Career Tech Staff and the School District Administration, locations for convenience utilities for mobile and benchtop equipment were reviewed. Locations for fume extraction arms, compressed air, 208V-3-phase power to accommodate portable MIG welders, pneumatic hand tools and mobile powered equipment were incorporated into the drawings.

**Existing & New Construction** 

The Project does not include renovation of the existing school.

#### Phasing

Phasing diagrams are being refined by the CM-R. The Project Team continued working on the Early Bid Packages: Site Enabling, Foundations and Structural steel early bid packages.

Phasing / Site utilization Diagrams, prepared by CM-R, can be found at the end of this section, 6B.3.1-14.









Updated Space Summary 01 Space Measurement Analysis w/ Designer Certification 02 Comparison of Current Design w/ Final Educational Program 03 DESE Approved SPED Spaces 04 DESE Approved Public Day Education 05 DESE Approved Chapter 74 Spaces 06 Confirmation of Scheduled DESE Meeting 07 Comparison of Current Design w/ DESE Approved Chapter 74 Program Spaces 08



## SPACE SUMMARY UPDATED SPACE SUMMARY

|   |                          |               |             |                          |              |                                       |                          | PROPOSE  |
|---|--------------------------|---------------|-------------|--------------------------|--------------|---------------------------------------|--------------------------|----------|
| Northeast Metro Tech                              | Ex                       | isting Condit | ions        | Existing                 | to Remain/Re | enovated                              |                          | New      |
| ROOM TYPE   | ROOM<br>NFA <sup>1</sup> | # OF RMS      | area totals | ROOM<br>NFA <sup>1</sup> | # OF RMS     | area totals                           | ROOM<br>NFA <sup>1</sup> | # OF RMS |
|   |                          |               | 29 600      |                          |              | 0                                     |                          |          |
| (List classrooms of different sizes separately)   |                          |               | 23,000      |                          |              | v                                     |                          |          |
| Classroom - General                               | 707                      | 26            | 20.710      |                          |              | 0                                     | 855                      | 36       |
| Teacher Planning/ Workrooms 136, 136A, 210        | 253                      | 3             | 760         |                          |              | 0                                     | 1 197                    | 3        |
| Small Group Seminar/ Collaborative Space          | 200                      |               | 100         |                          |              | 0                                     | 663                      | 3        |
| Science Classroom / Lab                           | 1 340                    | 1             | 1 340       |                          |              | 0                                     | 1 505                    | 8        |
| Prep Room   | 280                      | 1             | 280         |                          |              | 0                                     | 426                      | 4        |
| Science Classrooms incl STEM                      | 814                      | 8             | 6.510       |                          |              | 0                                     |                          |          |
| Central Chemical Storage Rm                       | 0                        | 0             | 0           |                          |              |                                       | 210                      | 1        |
| Health CR/ Team Meeting Room                      | Ū                        |               | Ŭ           |                          |              | -                                     | 740                      | 1        |
| Language Lab/ Distance Learning                   | 0                        | 0             | 0           |                          |              |                                       | 920                      | 1        |
| SPECIAL EDUCATION                                 |                          |               | 2.900       |                          |              | 0                                     | 020                      |          |
| (List classrooms of different sizes separately)   |                          |               | _,          |                          |              |                                       |                          |          |
| Self-Contained SPED                               |                          |               |             |                          |              | 0                                     | 950                      | 0        |
| Self-Contained SPED Toilet                        |                          |               |             |                          |              | 0                                     | 930<br>60                | 0        |
| Baseuree Beem 124E 127C Learning Center           | 115                      | 2             | 220         |                          |              | 0                                     | 850                      | 4        |
| Small Group Room - 124D Academic Support          | 115                      | 2             | 230         |                          |              | 0                                     | 850                      | 4        |
| Reading, Speech, ELL                              | 160                      | 1             | 160         |                          |              | 0                                     | 500                      | 4        |
| Tutorial/Assessment Psychologist                  | 100                      |               | 100         |                          |              |                                       | 150                      | 4        |
| Adjustment Counselors                             |                          |               |             |                          |              | -                                     | 150                      | 2        |
| SnEd Office - 124A 124B 124C 126B 127B Dir+2 asst | 206                      | 5             | 1 030       |                          |              | -                                     | 150                      | 3        |
| SpEd Conference Boom                              | 200                      | 5             | 1,000       |                          |              | -                                     | 320                      | 1        |
| SpEd Classroome, 1264 1274                        | 740                      | 2             | 1 490       |                          |              | -                                     | 320                      |          |
| Sped Classrooms - 126A, 127A                      | 740                      | 2             | 1,480       |                          |              |                                       |                          |          |
|   |                          |               | 0           |                          |              | 0                                     |                          |          |
| Art Classroom 25 soats                            |                          |               | U           |                          |              | 0                                     |                          | 0        |
| Art Workroom w/ Storage & kiln                    |                          |               |             |                          |              | 0                                     |                          | 0        |
| Ait Workloom w/ Storage & Kim                     |                          |               |             |                          |              | 0                                     |                          | 0        |
| Ballu - 50 - 100 seats                            |                          |               |             |                          |              | 0                                     |                          | 0        |
| Chorus - 50 - 100 seals                           |                          |               |             |                          |              | 0                                     |                          | 0        |
| Elisellible                                       |                          |               |             |                          |              | 0                                     |                          | 0        |
| Music Flactice                                    |                          |               |             |                          |              | 0                                     |                          | 0        |
| Music Storage                                     |                          |               |             |                          |              | 0                                     |                          | 0        |
| OCATIONS & TECHNOLOGY                             |                          |               | 94 540      |                          |              | 0                                     |                          |          |
|   |                          |               | 0-1,0-10    |                          |              | , , , , , , , , , , , , , , , , , , , |                          |          |
| Technology/Engineering Rooms- PLTW                |                          |               |             |                          |              | 0                                     | 1,430                    | 1        |
| Automotive Collision Repair (incl. Rel CR, typ.)  |                          |               | 9,190       |                          |              |                                       | 7,500                    | 1        |
| Automotive Technology                             |                          |               | 10,090      |                          |              |                                       | 12,500                   | 1        |
| Business Office Technology (2200sf min; incl Ba   | nk)                      |               | 4,240       |                          |              |                                       | 3,205                    | 1        |
| Carpentry   |                          |               | 8,520       |                          |              |                                       | 10,130                   | 1        |
| Cosmetology                                       |                          |               | 3,920       |                          |              |                                       | 5,890                    | 1        |
| Culinary Arts                                     |                          |               | 5,120       |                          |              |                                       | 6,005                    | 1        |
| Dental Assisting                                  |                          |               | 1,620       |                          |              |                                       | 6,450                    | 1        |
| Design & Visual Communications                    |                          |               | 7,170       |                          |              |                                       | 5,215                    | 1        |
| Drafting & Design                                 |                          |               | 4,460       |                          |              |                                       | 4,575                    | 1        |
| Early Childhood Education (1500sf min)            |                          |               | 2,800       |                          |              |                                       | 2,080                    | 1        |
| Electrical Technology                             |                          |               | 7,790       |                          |              |                                       | 12,225                   | 1        |
| Health Assisting                                  |                          |               | 4,160       |                          |              |                                       | 5,750                    | 1        |
| HVAC Technology                                   |                          |               | 6,120       |                          |              |                                       | 9,105                    | 1        |
| Metal Fabrication                                 |                          |               | 7,120       |                          |              |                                       | 7,400                    | 1        |
| Plumbing & Pipefitting                            |                          |               | 8,160       |                          |              |                                       | 8,630                    | 1        |
| Robotics & Automation                             |                          |               | 4,060       |                          |              |                                       | 5,170                    | 1        |
| new-Biotechnology                                 |                          |               |             |                          |              |                                       | 5,105                    | 1        |
| new-Marketing (2200sf min; incl Store)            |                          |               |             |                          |              |                                       | 3.000                    | 1        |
| new-Medical Assisting                             |                          |               |             |                          |              |                                       | 5,800                    | 1        |
|   |                          |               | <u> </u>    |                          |              |                                       | 5,000                    |          |
| EALTH & PHYSICAL EDUCATION                        |                          |               | 14,150      |                          |              | 0                                     |                          |          |
| Gymnasium - 174                                   | 8 110                    | 1             | 8 110       |                          |              | <b>_</b>                              | 12 210                   | 1        |
| PF Alternatives - 171 Fitness Center & Weights    | 1 140                    | 1             | 1 140       |                          |              | 0                                     | 1 573                    | 2        |
| Gvm Storeroom - 1700                              | 120                      | 1             | 1,140       |                          |              | 0                                     | 1,515                    |          |
| Gym Storeroom - 1700                              | 120                      | 1             | 120         | I                        |              | 0                                     | 4/0                      | <u> </u> |

| ROOM | # OF RMS   | area total |
|------|------------|------------|
| NFA1 | # 01 11110 | alea total |
|      |            | 5 310      |
|      |            | 3,310      |
|      | 3          | 2,735      |
|      | -30        | 290        |
|      | -1         | (10        |
|      | -4         | 105        |
|      | 0          | -          |
|      | 0          | 10         |
|      | 1          | 740        |
|      | 1          | -1.990     |
|      |            |            |
|      | -6         | (5,700     |
|      | -6         | (360       |
|      | 1          | 1,900      |
|      | 1          | 500        |
|      |            |            |
|      |            |            |
|      |            |            |
|      |            |            |
|      |            | -6 700     |
|      | -2         | (2,400     |
|      | -2         | (300       |
|      | -1         | (1,500     |
|      | -1         | (1,500     |
|      | -1         | (200       |
|      | -4         | (500       |
|      |            | (          |
|      |            | -455       |
|      | 0          | (10        |
|      | 0          | (20        |
|      | 0          | (150       |
|      | 0          | (220       |
|      | 0          | 140        |
|      | 0          | 255        |
|      | 0          | (50        |
|      | 0          | (65        |
|      | 0          | 55         |
|      | 0          | (150       |
|      | 0          | (125       |
|      | 0          | (95        |
|      | 0          | - 80       |
|      | 0          | -          |
|      | 0          | (65        |
|      | 0          | 70         |
|      | 0          | (75        |
|      |            | 590        |
|      | 0          | 210        |
|      | 1          | 145        |
|      | 0          | 175        |

Total

area totals

51,980

30,785

3,590

1,990

12,040

1,705

210 740

920

7,070

3,400

2,000

600 300

450 320

0

127,165

1,430 7,500

12,500

3,205

10,130

5,890

6,005

6,450

5,215

4,575

2,080

5,750

9,105

7,400

8,630

5,170

5,105

3,000

5,800

25,750

12,210

3,145

475

12,225

# OF RMS

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2

1

ROOM NFA<sup>1</sup>

area totals

51,980

30,785

3,590

1,990

12,040

1,705

210 740 920

7,070

3,400

2,000

0

127,165

1,430

7,500

12,500

3,205

10,130

5,890

6,005

6,450

5,215

4,575

2,080

12,225

5,750

9,105

7,400

8,630

5,170

5,105

3,000

5,800

25,750

12,210

3,145

475

#### Rev. January 13, 2023 - 60% Construction Documents

1,600 Students

|                          | Date:         | 2/12/2021                       | Schematic Design                                       |
|--------------------------|---------------|---------------------------------|--|
| (re                      | fer to MSBA I | MSBA Gui<br>Educational Program | delines<br>n & Space Standard Guidelines)              |
| see als                  | so accompan   | ying Notes to Space             | Summary for highlighted revisions                      |
| ROOM<br>NFA <sup>1</sup> | # OF RMS      | area totals                     | Comments   |
|                          |               |                                 |  |
|                          |               | 46,670                          |  |
| 950                      | 22            | 28.050                          |  |
| 100                      | 33            | 3,300                           | 625 SP 1111 - 950 SP 1112                              |
| 500                      | 4             | 2,000                           |  |
| 1,440                    | 8             | 11,520                          | 3 x85% ut=20 Seats-1 per /day/student                  |
| 200                      | 8             | 1,600                           |  |
| 200                      | 1             | 200                             |  |
|                          |               |                                 |  |
|                          |               |                                 |  |
|                          |               | 9,060                           |  |
| 950                      | 6             | 5 700                           | 825.050 SE equal to surrounding classrooms             |
| 60                       | 6             | 3,700                           |  |
| 500                      | 3             | 1,500                           | 1/2 size Genl. Clrm.                                   |
| 500                      | 0             | 4 500                           |  |
| 500                      | 3             | 1,500                           | 1/2 size Genl. Clrm.                                   |
|                          |               |                                 |  |
|                          |               |                                 |  |
| -                        |               |                                 |  |
|                          |               |                                 |  |
|                          |               | 6 700                           |  |
| 1,200                    | 2             | 2,400                           | Assumed use - 25% Population - 5 times/week            |
| 150                      | 2             | 300                             |  |
| 1,500                    | 1             | 1,500                           | Assumed use - 25% Population - 5 times/week            |
| 1,500                    | 1             | 1,500                           |  |
| 200                      | 4             | 300                             |  |
| 500                      | 1             | 500                             |  |
|                          |               |                                 |  |
|                          |               | 127,620                         | Assumed use - 100% Population - 5 times/week: 825 SE - |
| 1,440                    | 1             | 1,440                           | 2,000 SF   |
| 7,520                    | 1             | 7,520                           |  |
| 12,650                   | 1             | 12,650                          |  |
| 10.350                   | 1             | 10.350                          |  |
| 5,750                    | 1             | 5,750                           |  |
| 5,750                    | 1             | 5,750                           |  |
| 6,500                    | 1             | 6,500                           |  |
| 5,280                    | 1             | 5,280                           |  |
| 4,020                    | 1             | 4,020                           |  |
| 12,375                   | 1             | 12,375                          |  |
| 5,875                    | 1             | 5,875                           |  |
| 9,200                    | 1             | 9,200                           |  |
| 7,400                    | 1             | 7,400                           |  |
| 8,550<br>5,170           | 1             | 8,550                           |  |
| 5,170                    | 1             | 5,170                           |  |
| 2,930                    | 1             | 2,930                           |  |
| 5,875                    | 1             | 5,875                           |  |
|                          |               |                                 |  |
| 12 000                   | 1             | 25,160                          | EXCESSIFE Spaces Policy                                |
| 3,000                    | 1             | 3,000                           |  |
| 300                      | 1             | 300                             |  |
|                          |               |                                 | -  |

|     | Northeast Metro Tech   | Exi                      | sting Conditi | ions        |
|-----|--|--------------------------|---------------|-------------|
|     | ROOM TYPE  | ROOM<br>NFA <sup>1</sup> | # OF RMS      | area totals |
| 9   | Locker Rooms - Boys / Girls w/ Toilets   | 3.940                    | 1             | 3.940       |
| 5   | Satelite Locker Rooms  | 0,010                    | •             | 0,010       |
| 1   | Phys. Ed. Storage & Closets - 172G,172H, 172N,   | 115                      | 2             | 230         |
| 2   | Athletic Director's Office - 172C  | 140                      | 1             | 140         |
| 3   | Officials/ Trans Locker Rm w/ Shower & Toilet  |                          |               |             |
| 4   | PE Instructor & Coach Offices w/ Shower & Toile  | 115                      | 2             | 230         |
| 5   | Health CR/ Team Mtg. Rm (see Core Academic)  |                          |               |             |
| 6   | Trainer 172I   | 240                      | 1             | 240         |
| A   | Auxilary PE  |                          |               |             |
| 7   | MEDIA CENTER   |                          |               | 2,910       |
| 3   | Media Center / Reading Room 174A   | 2,150                    | 1             | 2,150       |
| э   | Workroom 174C  | 400                      | 1             | 400         |
| C   | Office, Conf.,printer- 174B,174D, 174E   | 120                      | 3             | 360         |
| 1   | Small Group Rooms  |                          |               |             |
| 2   | Project Room/ <b>TV studio</b> / Storage   |                          |               |             |
| 3   | AUDITORIUM / DRAMA   |                          |               | 1,630       |
| 4   | (Auditorium) Presentation/ Performance Space   |                          |               |             |
| 5   | Stage - 119B   | 1,510                    | 1             | 1,510       |
| 6   | Auditorium Storage - 119T  | 120                      | 1             | 120         |
| 7   | Make-up / Dressing/ Green Rooms  | -                        |               |             |
| 3   | Controls / Lighting / Projection   |                          |               |             |
| 9   |  |                          |               |             |
| C   | DINING & FOOD SERVICE  |                          |               | 12,280      |
| 1   | Cafeteria / Student Lounge / Break-out - 119A  | 7,440                    | 1             | 7,440       |
| 2   | Chair / Table Storage - 119S,119U, 119V  | 300                      | 1             | 300         |
| 3   | Scramble Serving Area - 119P   | 420                      | 1             | 420         |
| 4   | Satelite Serving Area  |                          |               |             |
| 5   | Kitchen - 119C, 119D, 119E, 119F, 119G, 119H,  | 4,120                    | 1             | 4,120       |
| 6   | Satelite Kitchen   |                          | •             |             |
| 7   | Staff Lunch Room   |                          | 0             | 000         |
| 5   | Medical Suite Taileta 179D 179E  | 45                       | 2             | 800         |
| 9   | Nurses' Office / Waiting Room 1784, 178B   | 45                       | 2             | 90          |
| 5   | Nurses Station   | 650                      | 1             | 650         |
| 1   | Interview/ Exam Room   | 0                        | 0             | 0           |
| 2   | Resting  | 30                       | 2             | 60          |
| 3   |  |                          |               |             |
| 4   | ADMINISTRATION & GUIDANCE  |                          |               | 7,410       |
| 5   | General Office / Waiting / Tlt 175,175A,175H, 129  | 870                      | 1             | 870         |
| 6   | Teachers' Mail and Time Room 175K ??   | 240                      | 1             | 240         |
| 7   | Duplicating Room   |                          |               |             |
| 3   | Records Room (Vault) 175E  | 190                      | 1             | 190         |
| э   | Principal's Office w/ Conf. Area & Tlt - 175F, 1750  | 360                      | 1             | 360         |
| 0   | Principal's Secretary / Waiting - 175M   | 70                       | 1             | 70          |
| 1   | Assistant Principal's Office - AP1 - 101,101B  | 470                      | 1             | 470         |
| 2   | Assistant Principal's Offices - Voc.Deans,<br>Academic Prog. Coordinator, Co-Op 175R,        | 123                      | 3             | 370         |
| 3   | Supervisory & Paraprofessional Offices; incl:<br>Attendance, Reception 175B, 175C, 175D, 183 | 155                      | 4             | 620         |
| 4   | Department Head Offices 163B, 187A, 187B, 187C,188, 189, 201A                                | 134                      | 7             | 940         |
| 5   | Safety Resource Officer  | 100                      | 1             | 100         |
| 6   | In-House Suspension 139  | 340                      | 1             | 340         |
| 7   | Conference Rooms - 175N, 180   | 440                      | 2             | 880         |
| 8   | Guidance/ Adj, Diversity Offices - 1750,175Q,175   | 126                      | 8             | 1,010       |
| 6   | Guidance vvalting Room - 1/5P  | 280                      | 1             | 280         |
| 1   | Guiuance Storeroom 112   | 670                      | 1             | 670         |
| 2   | Records Room   | 010                      |               | 070         |
| 3   | Teachers' Work Rm, Dig.Lrn'g Mgr <i>(w/ Media Ctr</i> )                                      |                          |               |             |
| - 1 | ,  |                          |               | ÷           |

|                          |                |             |                          | PROPOSE  | U           |                          |          |             |                               |          |             |  |  |
|--------------------------|----------------|-------------|--------------------------|----------|-------------|--------------------------|----------|-------------|-------------------------------|----------|-------------|--|--|
| Existing                 | g to Remain/Re | enovated    |                          | New      |             |                          | Total    |             | Difference to MSBA Guidelines |          |             |  |  |
| ROOM<br>NFA <sup>1</sup> | # OF RMS       | area totals | ROOM<br>NFA <sup>1</sup> | # OF RMS | area totals | ROOM<br>NFA <sup>1</sup> | # OF RMS | area totals | ROOM<br>NFA1                  | # OF RMS | area totals |  |  |
|                          |                | 0           | 2,408                    | 2        | 4,815       |                          | 2        | 4,815       |                               | 1        | (4,145      |  |  |
|                          |                |             | 1,355                    | 2        | 2,710       |                          | 2        | 2,710       |                               |          |             |  |  |
|                          |                | 0           | 75                       | 4        | 300         |                          | 4        | 300         |                               | 3        | (200        |  |  |
|                          |                | 0           | 185                      | 1        | 185         |                          | 1        | 185         |                               | 0        | 35          |  |  |
|                          |                | 0           | 90<br>169                | 4        | 90<br>675   |                          | 4        | 90<br>675   |                               | 3        | 90<br>425   |  |  |
|                          |                |             |                          |          |             |                          |          |             |                               | -        |             |  |  |
|                          |                | 0           | 215                      | 1        | 215         |                          | 1        | 215         |                               |          |             |  |  |
|                          |                | 0           | 000                      | -        | 5 450       |                          | 1        | 5 450       |                               |          | 250         |  |  |
|                          |                | 0           | 4 105                    | 1        | 4 105       |                          | 1        | 4 105       |                               | 0        | (1.095      |  |  |
|                          |                | 0           | 355                      | 1        | 355         |                          |          | 355         |                               | C        | 355         |  |  |
|                          |                |             | 155                      | 1        | 155         |                          | 1        | 155         |                               | 1        | 155         |  |  |
|                          |                |             | 117                      | 3        | 350         |                          | 3        | 350         |                               | 3        | 350         |  |  |
|                          |                |             | 485                      | 1        | 485         |                          | 1        | 485         |                               | 1        | 485         |  |  |
|                          |                | 0           |                          |          | 10,935      |                          |          | 10,935      |                               |          | 535         |  |  |
|                          |                | 0           | 9,365                    | 1        | 9,365       |                          | 1        | 9,365       |                               | 0        | 1,865       |  |  |
|                          |                | 0           |                          | 0        | 0           |                          | 0        | 0           |                               | -1       | (1,600      |  |  |
|                          |                | 0           | 580                      | 1        | 580         |                          | 1        | 580         |                               | 0        | 80          |  |  |
|                          |                | 0           | 308                      | 2        | 615         |                          | 2        | 615         |                               | 0        | 15          |  |  |
|                          |                | 0           | 188                      | 2        | 375         |                          | 2        | 375         |                               | 1        | 175         |  |  |
|                          |                | 0           |                          |          | 13 175      |                          |          | 13 175      |                               |          | 475         |  |  |
|                          |                | 0           | 8,000                    | 1        | 8,000       |                          | 1        | 8,000       |                               | 0        | -           |  |  |
|                          |                | 0           | 450                      | 1        | 450         |                          | 1        | 450         |                               | 0        | (100        |  |  |
|                          |                | 0           | 1,090                    | 1        | 1,090       |                          | 1        | 1,090       |                               | 0        | 490         |  |  |
|                          |                |             | 300                      | 0        | 0           |                          | 0        | 0           |                               | 0        | - (         |  |  |
|                          |                | 0           | 3,015                    | 1        | 3,015       |                          | 1        | 3,015       |                               | 0        | 115         |  |  |
|                          |                |             | 600                      | 0        | 0           |                          | 0        | 0           |                               | 0        | -           |  |  |
|                          |                | 0           | 620                      | 1        | 620         |                          | 1        | 620         |                               | 0        | (30         |  |  |
|                          |                | 0           |                          | -        | 1,340       |                          |          | 1,340       |                               |          | -70         |  |  |
|                          |                | 0           | 68                       | 2        | 135         |                          | 2        | 135         |                               | 1        | 75          |  |  |
|                          |                | 0           | 145                      | 4        | 580         |                          | 4        | 580         |                               | 3        | 330         |  |  |
|                          |                | 0           | 118                      | 3        | 355         |                          | 3        | 355         |                               | -1       | (45         |  |  |
|                          |                | 0           | 270                      | 1        | 270         |                          | 1        | 270         |                               | -6       | (430        |  |  |
|                          |                |             |                          |          |             |                          |          |             |                               |          |             |  |  |
|                          |                | 0           | .=.                      |          | 8,682       |                          |          | 8,682       |                               |          | 2,887       |  |  |
|                          |                | 0           | 1/4                      | 4        | 695         |                          | 4        | 695         |                               | 3        | (105        |  |  |
|                          |                | 0           | 102                      | 1        | 102         |                          | 1        | 102         |                               | 0        | 2           |  |  |
|                          |                | 0           | 200                      | 1        | 203         |                          | 1        | 205         |                               | 0        | 76          |  |  |
|                          |                | 0           | 2/0                      | 1        | 2/0         |                          | 1        | 270         |                               | 0        | (129        |  |  |
|                          |                | 0           | 124                      | 1        | 124         |                          | 1        | 124         |                               | 0        | (120        |  |  |
|                          |                |             | 454                      | _        |             |                          | _        | 0.07        |                               |          | 457         |  |  |
|                          |                | 0           | 154                      | 2        | 307         |                          | 2        | 307         |                               | 1        | 157         |  |  |
|                          |                | 0           | 154                      | 4        | 617         |                          | 4        | 617         |                               | 2        | 317         |  |  |
|                          |                | 0           | 121                      | 1        | 183         |                          | 4        | 483         |                               | 3        | 363         |  |  |
|                          |                | 0           | 121                      | 4        | 403         |                          | -        | 403         |                               |          | 505         |  |  |
|                          |                | 0           | 119                      | 7        | 836         |                          | 7        | 836         |                               | 7        | 836         |  |  |
|                          |                | 0           | 123<br>342               | 1        | 123<br>342  |                          | 1        | 123<br>342  |                               | 1        | 123         |  |  |
|                          |                | 0           | 298                      | 3        | 542<br>803  |                          | 3        | 542<br>803  |                               | 1        | 042<br>142  |  |  |
|                          |                | 0           | 160                      | 8        | 1.282       |                          | 8        | 1.282       |                               | 0        | 82          |  |  |
|                          |                | 0           | 100                      | 0        | 0           |                          | 0        | 0           |                               | -1       | (100        |  |  |
|                          |                | 0           | 99                       | 1        | 99          |                          | 1        | 99          |                               | 0        | (1          |  |  |
|                          |                |             | 977                      | 1        | 977         |                          | 1        | 977         |                               | 0        | 427         |  |  |
|                          |                | 4           | 227                      | 1        | 227         |                          | 1        | 227         |                               | 0        | 2           |  |  |
|                          |                |             | 181                      | 1        | /8/         |                          | 1        | 787         | I                             | 0        | (13         |  |  |

#### Rev. January 13, 2023 - 60% Construction Documents

Students 1,600

(4,145)

(200) 35

> 475 -(100) 490

115 -

(30) **-70** 75

330 (45) (430)

**2,887** (105) 2 65 76 (128) (1)

|                          | Date:          | 2/12/2021                       | Schematic Design                            |
|--------------------------|----------------|---------------------------------|---|
| (re                      | efer to MSBA F | MSBA Gui<br>Educational Program | delines<br>n & Space Standard Guidelines)   |
| see ai                   | so accompany   | ying Notes to Space             | Summary for highlighted revisions           |
| ROOM<br>NFA <sup>1</sup> | # OF RMS       | area totals                     | Comments                                    |
| 8,960                    | 1              | 8,960                           | 5.6 sf/student total                        |
|                          | ļ              | 500                             |   |
| 500<br>150               | 1              | 500                             |   |
| 100                      | +              | 100                             |   |
| 250                      | 1              | 250                             |   |
| <b></b>                  | Ţ              |                                 |   |
|                          |                |                                 |   |
|                          |                | 5,200                           |   |
| 5,200                    | 1              | 5,200                           |   |
|                          |                |                                 |   |
|                          |                | 10.400                          | Excess Auditorium Spaces Policy             |
| 7,500                    | 1              | 7,500                           | 2/3 Enrollment @ 10 SF/Seat - 750 seats MAX |
| 1,600                    | 1              | 1,600                           | -   |
| 500                      | 1              | 500                             |   |
| 300                      | 2              | 600                             |   |
| 200                      | 1              | 200                             |   |
|                          |                | 12,700                          |   |
| 8,000                    | 1              | 8,000                           | 3 seatings - 15SF per seat                  |
| 550                      | 1              | 550                             |   |
| 600                      | 1              | 600                             |   |
| 2.900                    | 1              | 2,900                           | 1600 SF for first 300 + 1 SF/student Add'l  |
| -,                       | <u> </u>       | · · ·                           |   |
| 650                      | 1              | 650                             | 20 SF/Occupant                              |
|                          |                | 1,410                           |   |
| 60                       | 1              | 00                              |   |
| 250                      | 1              | 250                             |   |
| 100                      | 4              | 400                             |   |
| 100                      | 7              | 700                             |   |
|                          |                | 5.795                           |   |
| 800                      | 1              | 800                             |   |
| 100                      | 1              | 100                             |   |
| 200                      | 1              | 200                             |   |
| 200                      | 1              | 200                             |   |
| 125                      | 1              | 125                             |   |
| 150                      |                | 150                             |   |
| 150                      |                | 100                             |   |
| 150                      | 2              | 300                             |   |
| 120                      | 1              | 120                             |   |
|                          |                |                                 |   |
| 450                      | 1              | 450                             |   |
| 100                      | δ<br>1         | 1,200                           |   |
| 100                      | 1              | 100                             |   |
| 550                      | 1              | 550                             |   |
| 225                      | 1              | 225                             |   |
| 000                      | I              | 000                             |   |

|            |  |                          |                   |                     |                          |                    |                   |                          | PROPOSEI        | D                |                          |                 |                      |            |             |                      |          |
|------------|--|--------------------------|-------------------|---------------------|--------------------------|--------------------|-------------------|--------------------------|-----------------|------------------|--------------------------|-----------------|----------------------|------------|-------------|----------------------|----------|
|            | Northeast Metro Tech   | Ex                       | isting Conditi    | ons                 | Exist                    | ing to Remain/Re   | enovated          |                          | New             |                  |                          | Total           |                      | Di         | ifferenc    | e to MSBA Guidelines | s        |
|            | ROOM TYPE  | ROOM<br>NFA <sup>1</sup> | # OF RMS          | area totals         | ROOM<br>NFA <sup>1</sup> | # OF RMS           | area totals       | ROOM<br>NFA <sup>1</sup> | # OF RMS        | area totals      | ROOM<br>NFA <sup>1</sup> | # OF RMS        | area totals          | R          | OOM<br>NFA1 | #OF RMS area total   | Is       |
| 14         |  |                          |                   |                     |                          |                    | _                 |                          |                 |                  |                          |                 |                      |            |             |                      | ]        |
| 15         |  |                          |                   |                     |                          |                    | _                 |                          |                 |                  |                          |                 |                      |            |             |                      | _        |
| 17         |  |                          |                   |                     |                          |                    | _                 |                          |                 |                  |                          |                 |                      |            |             |                      | -        |
| 18         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 19         | Custodian's Office 127C 010EP  | 220                      | 2                 | 9,950               |                          |                    | 0                 | 140                      | 1               | 4,335            |                          | 1               | 4,335                |            |             | 1,510                |          |
| 20         | Custodian's Onice - 137G, 019FB<br>Custodian's Workshop & Toilet - 137, 137G | 2,240                    | 1                 | 2,240               |                          |                    | 0                 | 475                      | 1               | 475              |                          | 1               | 475                  |            |             | 0 225                | 5        |
| 22         | Custodian's Storage - 194A,194B,194C,192C,192                                | 35                       | 12                | 420                 |                          |                    | 0                 | 420                      | 1               | 420              |                          | 1               | 420                  |            |             | 0 45                 | 5        |
| 23         | Recycling Room / Trash - 1190  | 80                       | 1                 | 80                  |                          |                    | 0                 | 183                      | 2               | 365              |                          | 2               | 365                  |            |             | 1 (35                | 5)       |
| 24         | Receiving and General Supply - 137A, 137E                                    | 725                      | 2                 | 1,450               |                          |                    | 0                 | 344                      | 4               | 1,375            |                          | 4               | 1,375                |            |             | 3 825                | 5        |
| 25         | Storeroom - 13/B, 13/C, 13/D, 13/E, 13/F, 011                                | 164<br>216               | /<br>5            | 1,150               |                          |                    | 0                 | 435                      | 3               | 1,305            |                          | 3               | 1,305                |            |             | 2 405                | 5        |
| 27         | Maintenance Storage & Staff Lunch / Lounge - 18                              | 439                      | 7                 | 3,070               |                          |                    | 0                 | 0                        | 0               | 0                |                          |                 | 200                  |            |             | 0 00                 | -        |
| 28         | DTHER  |                          |                   | 9,980               |                          |                    | 0                 |                          |                 | 1,880            |                          |                 | 1,880                |            |             | 1,880                | )        |
| 29         | Other (specify): Bank 192G (Bus. Tech)                                       | 80                       | 1                 | 80                  |                          |                    | 0                 | 600                      | 0               | 0                |                          | 0               | 0                    |            |             | 0 -                  | _        |
| 30         | Adult Ed Offices & Storage 185, 185A, 186, 186A                              | 90                       | 5                 | 450                 |                          |                    | _                 | 415                      | 1               | 415              |                          | 1               | 415                  |            |             | 1 415                | 5        |
| 32         | Superintendent's Office & Tlt - 178A   | 470                      | 1                 | 470                 |                          |                    | _                 | 265                      | 1               | 265              |                          | 1               | 265                  |            |             | 1 265                | 5        |
| 33         | Superintendent's Assistant   |                          | _                 | 1.0.00              |                          |                    | _                 | 125                      | 1               | 125              |                          | 1               | 125                  |            |             | 1 125                | 5        |
| 34         | Business Office suite, HR 175AA,175BB,175CC,1                                | 150                      | 7                 | 1,050               |                          |                    |                   | 154                      | 7               | 1,075            |                          | 7               | 1,075                |            |             | 7 1,075              | 5        |
| 36         | Maintenance Garage (out-building)  |                          |                   |                     |                          |                    |                   | 1,800                    | 0               | 0                |                          | 0               | 0                    |            |             | 0 -                  | -        |
| 37         | Field Maint. Garage & Stor.(Sat.Locker Rm.)(out-t                            | oldg)                    |                   |                     |                          |                    |                   | 2,710                    | 0               | 0                |                          | 0               | 0                    |            |             | 0 -                  |          |
| 38         | Concession/ Public Toilets (out-building)                                    | 7 0 2 0                  | 1                 | 7 020               |                          |                    |                   | 1,400                    | 0               | 0                |                          | 0               | 0                    |            |             | 0 -                  | _        |
| 40         | Pool, Office, Storage, & Mechanical  | 7,930                    | I                 | 7,930               |                          |                    |                   | 0                        | 0               | 0                |                          | 0               | 0                    |            |             | - 0                  | -        |
| 41         | Total Building Net Floor Area (NFA)  |                          |                   | 186,150             |                          |                    | 0                 |                          |                 | 257,762          |                          |                 | 257,762              |            |             | 4,22                 | 22       |
| 42         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 43         | Proposed Student Capacity / Enrollment                                       |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             | Ful                  | Il-Time- |
| 44         | Proposed Student Capacity / Enrollment                                       |                          |                   |                     |                          |                    |                   |                          |                 | _                |                          |                 |                      |            |             |                      | -        |
| 46         | ION-PROGRAMMED SPACES  |                          |                   |                     |                          | % of GFA           | 0                 |                          | % of GFA        | 128,868          |                          | % of GFA        | 128,868              |            |             |                      |          |
| 47         | Other Occupied Rooms (list separately)                                       |                          |                   |                     |                          | #DIV/0!            |                   |                          | 0%              |                  |                          | 0%              | 0                    |            |             |                      |          |
| 48         | Custodial Closets  |                          |                   |                     |                          | #DIV/0!            |                   |                          | 0%              | 690              |                          | 0%              | 690                  |            |             |                      |          |
| 49         | Vocational Offices (non Ch.74 space)   | -                        |                   |                     |                          | #DIV/0!            |                   | -                        | 1%              | 3,195            | -                        | 1%              | 3,195                |            |             |                      | -        |
| 50         | Linoccupied MEP/EP Spaces  |                          |                   |                     | -                        | #DIV/0!            |                   |                          | 2%              | 1,060            |                          | 2%              | 1,060                |            |             |                      | -        |
| -          | Unoccupied Closets, Supply Rooms & Storage                                   |                          |                   |                     |                          | #01070:            |                   |                          | 270             | 0,100            |                          | 270             | 0,100                |            |             |                      |          |
| 52         | Rooms  |                          |                   |                     |                          | #DIV/0!            |                   |                          | 0%              | 680              |                          | 0%              | 680                  |            |             |                      |          |
| 53         | Toilet Rooms   |                          |                   |                     |                          | #DIV/0!            |                   |                          | 1%              | 4,480            |                          | 1%              | 4,480                |            |             |                      |          |
| 54         | Circulation (corridors, stairs, ramps & elevators)                           |                          |                   |                     |                          | #DIV/0!            |                   |                          | 18%             | 67 850           |                          | 18%             | 67,850               |            |             |                      |          |
| 55         | Remaining <sup>3</sup>   |                          |                   |                     |                          | #DIV/0!            | 0                 |                          | 11%             | 42,763           |                          | 11%             | 42,763               |            |             |                      |          |
| 56         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 57         | Total Building Gross Floor Area (GFA) <sup>2</sup>                           |                          |                   | 239,444             |                          |                    | 0                 |                          |                 | 386,630          |                          |                 | 386,630              | 242        |             | 6,32                 | 20       |
| 58         | (excluding outbuildings)   |                          |                   | 4.00                |                          |                    |                   |                          |                 | 4 50             |                          |                 | 4 50                 |            |             |                      | _        |
| 159<br>160 | Grossing lactor (GFA/NFA)  |                          |                   | 1.29                |                          |                    | -                 |                          |                 | 1.50             |                          |                 | 1.50                 |            |             |                      | -        |
| 61         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      | L          |             |                      |          |
| 62         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 63         | Individual Room Net Floor Area (NFA)   | net square               |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 64<br>65   |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 166        | <sup>2</sup> Total Building Gross Floor Area (GFA)                           | Includes the e           | entire building   | aross square foo    | tage measured t          | rom the outside fa | ace of exterior w | alls                     |                 |                  |                          |                 |                      |            |             |                      |          |
| 67         |  |                          | Sinti o Building  | groop oquaro roc    | lago modourou i          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 68         | <sup>3</sup> Remaining   | Includes exte            | rior walls, inter | ior partitions, cha | ises, and other a        | reas not listed ab | ove. Do not cal   | culate this area         | , it is assumed | d to equal the d | ifference betw           | een the Total E | Building Gross Floor | Area and a | rea not a   | accounted for above. |          |
| 69         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 70         | Architect Certification  | l hereby                 |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 72         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |
| 73         |  |                          |                   |                     |                          | _                  | _                 | _                        |                 |                  |                          |                 |                      |            |             |                      |          |
| 74         |  |                          | Nam               | e of Architect F    | irm:                     | Drummey            | Rosane And        | lerson, Inc.             |                 |                  |                          |                 |                      |            |             |                      |          |
| 15         |  |                          |                   |                     |                          |                    |                   |                          |                 |                  |                          |                 |                      |            |             |                      |          |

#### Rev. January 13, 2023 - 60% Construction Documents

1,600 Students

| -    |                          | Date:                          | 2/12/2021  | Schematic Design   |
|------|--------------------------|--------------------------------|--|--|
|      | (ro<br>see al            | efer to MSBA E<br>so accompany | MSBA Gui<br>Educational Program<br>ying Notes to Space | delines<br>n & Space Standard Guidelines)<br>e Summary for highlighted revisions |
|      | ROOM<br>NFA <sup>1</sup> | # OF RMS                       | area totals  | Comments   |
|      |                          |                                |  |  |
|      |                          |                                |  |  |
|      |                          |                                | 2.025  |  |
| -    | 150                      | 1                              | 2,825  |  |
| -    | 250                      | 1                              | 250  |  |
| -    | 375                      | 1                              | 375  |  |
| -    | 400                      | 1                              | 400  |  |
| -    | 550                      | 1                              | 550  |  |
| -    | 900                      | 1                              | 900  |  |
| -    | 200                      | 1                              | 200  |  |
|      |                          |                                |  |  |
|      |                          |                                | 0  |  |
| -    |                          |                                |  |  |
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|      |                          |                                |  |  |
| ŀ    |                          |                                |  |  |
| -    |                          |                                | 253 540  |  |
| -    |                          |                                | 233,340  |  |
| -Eau | ivalent Acad             | emic students:                 | 848  | 162  |
| Ī    |                          | Total students                 | 1,600  | 225  |
| -    |                          |                                | · · · · ·  |  |
| ſ    |                          |                                |  |  |
| ſ    |                          |                                |  | Non-Programmed space areas are   |
| ſ    |                          |                                |  | required to be included in the   |
| ſ    |                          |                                |  | following submittals:  |
| ſ    |                          |                                |  | Schematic Design Submittal   |
| Ī    |                          |                                |  | Design Development Submittal   |
| Ī    |                          |                                |  |  |
|      |                          |                                |  | 60% Construction Documents   |
| ļ    |                          |                                |  | 90% Construction Documents   |
|      |                          |                                |  | Final Construction Documents   |
| ļ    |                          |                                |  |  |
| ļ    |                          |                                |  |  |
|      |                          |                                | 380,310  | 360,000  |
| ļ    |                          |                                |  |  |
| ļ    |                          |                                | 1.50   | 1.50   |
| L    |                          |                                |  |  |

|                          |                      |                          |                 |                  |                  |                          |               |             |                          | PROPOSE  | D           |                          |          |             |              |           |   |
|--------------------------|----------------------|--------------------------|-----------------|------------------|------------------|--------------------------|---------------|-------------|--------------------------|----------|-------------|--------------------------|----------|-------------|--------------|-----------|---|
|                          | Northeast Metro Tech | E                        | Existing Condit | ions             |                  | Existing                 | g to Remain/R | enovated    |                          | New      |             |                          | Total    |             | Differenc    | e to MSBA | Guidelines                              |
|                          | ROOM TYPE            | ROOM<br>NFA <sup>1</sup> | # OF RMS        | area totals      |                  | ROOM<br>NFA <sup>1</sup> | # OF RMS      | area totals | ROOM<br>NFA <sup>1</sup> | # OF RMS | area totals | ROOM<br>NFA <sup>1</sup> | # OF RMS | area totals | ROOM<br>NFA1 | # OF RMS  | area totals                             |
| 177<br>178<br>179<br>180 |                      |                          | Signature of    | f Principal Arcl | nitect:<br>Date: |                          | 1/20/2023     | 3           |                          | ·        |             |                          | ·        |             | <br>         |           | ••••••••••••••••••••••••••••••••••••••• |

#### Rev. January 13, 2023 - 60% Construction Documents

|                          | Dute.                          | MSBA G                                | uidelines   |
|--------------------------|--------------------------------|---------------------------------------|---|
| (re<br>see al            | efer to MSBA E<br>so accompany | ducational Progr<br>ring Notes to Spa | am & Space Standard Guidelines)<br>ce Summary for highlighted revisions |
| ROOM<br>NFA <sup>1</sup> | # OF RMS                       | area totals                           | Comments  |

SPACE SUMMARY
SPACE MEASUREMENT ANALYSIS w/ designer certification

6B.3.2 - 02

### **6B.3.2-02** SPACE MEASUREMENT ANALYSIS W/ DESIGNER CERTIFICATION

DRA has completed a space measurement analysis of the 60% Construction Document drawings relative to the proposed square footages shown on the Schematic Design Space Summary.

The program areas have slight variances from MSBA Schematic Design Submission. Refer to the "Comparison of Current Design w/ Final Educational Program," included within this submission, for a narrative regarding these variances.

| Program Area            | Schematic Design SF | 60 % Construction Document SF |
|-------------------------|---------------------|-------------------------------|
| Core Academic Spaces    | 51,990              | 51,980                        |
| Special Education       | 7,070               | 7,070                         |
| Art & Music             | 0                   | 0                             |
| Vocational & Technology | 127,755             | 127,165                       |
| Health & Physical       | 25,750              | 25,750                        |
| Education               |                     |                               |
| Media Center            | 5,455               | 5,450                         |
| Auditorium / Drama      | 10,505              | 10,935                        |
| Dining & Food Services  | 13,180              | 13,175                        |
| Medical                 | 1,340               | 1,340                         |
| Administration &        | 8,655               | 8,682                         |
| Guidance                |                     |                               |
| Custodial & Maintenance | 4,150               | 4,335                         |
| Other                   | 1,900               | 1,880                         |
| Total Net SF            | 257,750             | 257,762                       |
| Total Gross SF          | 386,630             | 386,630                       |

The following table communicates designed square footages relative to the proposed program.

#### **Designer Certification**

I hereby certify that the sum of all programmed floor areas plus all other floor areas equal the gross floor area of the Final Design Program.

DRUMMEY ROSANE ANDERSON, INC.

Carl Franceschi, AIA

Principal

## SPACE SUMMARY COMPARISON OF CURRENT DESIGN W/ FINAL EDUCATIONAL PROGRAM

03

.3.2

**6B**.

### **6B.3.2-03** COMPARISION OF CURRENT DESIGN W/ FINAL EDUCATIONAL PROGRAM

The following provides rational for square footage deviations between the Schematic Design and 60% Construction Document "Final Design Program." Deviations (greater than 2%) are highlighted in grey in the Space Summary.

The overall Gross Floor Area (GFA) has remained the same: 386,630 SF.

#### **Department of Elementary and Secondary Education (DESE) Submittal**

The size and location of DESE spaces has remained unchanged from the approved, August 2<sup>nd</sup>, 2021 submission.

#### **Educational Space Summary**

#### **Core Academic Spaces**

• Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 60% Construction Documents.

#### **Art and Music**

• The project does not have any programs under this category.

#### Vocational & Technology

- Layouts within the shop spaces have been revised to reflect instructor input.
- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 60% Construction Documents.

#### Auditorium / Drama

- Given the unique nature of a Career and Technical High School programs, the Auditorium has been reenvisioned as a **Multipurpose Room**. Fixed seating has been replaced with telescopic seating. This arrangement will allow greater flexibility within the space. With the seating retracted a large "level" space can be created. When the Auditorium is not in performance or lecture mode the space can now be used for event such as Robotics competitions, DECA events and Job Fairs.
- With the reimagining of the space the concept of a formal **Stage** is no longer needed. Telescoping seating has a steeper incline, which provides for better sight lines. To support the multipurpose nature of the space a portable stage with ramping is proposed. The 1,600 square feet that was previously allocated for the stage has been redirected to the **Presentation/Performance Space** line item within the Space Summary.

#### **Health & Physical Education**

- Deviations in square footage for the overall Health & Physical Education category is less than 1%.
- **Gymnasium** square footage has decreased by 160 square feet. This square footage has been reassigned to the **Weight** room.
- **Physical Education Storage** has been divided into four rooms and redistributed near the Weight/Fitness, lower-level locker rooms and Auxiliary PE space.
- The square footage of the Trainer's Room has increased to accommodate space needs.
- The **Weight Room** was relocated from the Lower Level to the First Floor. New location is adjacent to the Fitness room for better proximity of related spaces.
- **Team Lockers** related to athletics were relocated to the Lower Level where the Weight room was previously located.
- Locker room square footage has decreased by 895 SF. Locker counts meet the Physical Education Department requirements.
- With the re-imagining of the concept of the Auditorium as a Multipurpose space that can be used for multiple activities, 930 square feet (plus 260 SF of storage from **Physical Education Storage**) of program space has been assigned to **Auxiliary** PE.

A benefit of this plan is the Auditorium/Multipurpose space can be utilized more hours of the day. The space design adds the opportunity for additional flexibility for the Athletics & Physical Education Departments to schedule the space for programs such as Cheerleading and Wrestling when other programs are utilizing the gymnasium. The wrestling mat storage lift will be installed in the ceiling of the Auditorium/Multipurpose room to accommodate the multipurpose use of the space.

#### **Media Center**

- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 60% Construction Documents.
- Office square footage was rebalanced to give more space to the Workroom.

#### **Dining & Food Service**

- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 60% Construction Documents.
- After further development of the layouts for the **Kitchen** and **Servery**, square footage from the Kitchen was given to the Servery to provide better circulation during the lunch hour rush.
- **Chair Storage** has been reduced to accommodate the schools need for two single stall toilets located within the cafeteria proper. School protocol is that students are not to leave the cafeteria during their lunch hour.

#### Medical

- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 60% Construction Documents.
- Nurse's Offices have been reduced to accommodate nurse's station off of the corridor. This allows for quick access to administer daily medications to students. A new space, Nurse's Station, was added to the Nurses' Offices/Waiting Room Category.
- Square footage of **Resting** increase slightly to add additional space around each bed.

#### Administration & Guidance

- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 60% Construction Documents.
- The refining of circulation/corridors at the main office have allowed additional square footage to be added to **Duplicating** and **Records**.
- Square footages for **Principal's Office** and **Principal's Secretary** are just below the two-percent threshold.

#### **Custodial & Maintenance**

- **Custodial Storage** has increased by 90 SF to incorporate otherwise inaccessible area created by shifted foundation wall.
- **General Supply** has increased by 90 SF to incorporate "land locked" square footage.

#### Other

- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 60% Construction Documents.
- Adult Education Office square footage was reduced by 40 SF.

## SPACE SUMMARY DESE APPROVED SPED SPACES

6B.3.2 - 04



## Massachusetts Department of Elementary and Secondary Education

75 Pleasant Street, Malden, Massachusetts 02148-4906

Telephone: (781) 338-3000 TTY: N.E.T. Relay 1-800-439-2370

Jeffrey C. Riley Commissioner

August 13, 2021

Mary Pichetti Director of Capital Planning Massachusetts School Building Authority 40 Broad Street, Suite 500 Boston, MA 02109

Dear Ms. Pichetti:

We have reviewed the documentation that was submitted by the Northeast Metropolitan Regional Vocational School District on August 2, 2021 for the construction project at Northeast Metropolitan Regional Vocational High School. We have done so in accordance with M.G.L. chapter 70B, section 6(6), which instructs us to certify "...that adequate provisions have been made in the school project for children with disabilities, as defined in section 1 of chapter 71B...".

We are satisfied with the district's proposed special education plan and believe it will provide the community with an opportunity to serve its special education students well. The Massachusetts Department of Elementary and Secondary Education therefore certifies that this school project has been planned to adequately provide appropriate space to serve the programs and school populations referenced in M.G.L. chapter 70B, section 6(6) noted above.

Sincerely,

Matthew J. Deninger DESE designee on the MSBA Board of Directors

Cc: Vani Rastogi-Kelly, Director, Public School Monitoring, DESE Amy Paulin, Assistant Director, Public School Monitoring, DESE Michelle Poulin, Supervisor, Public School Monitoring, DESE Katie DeCristofaro, Capital Program Manager, MSBA Allison Sullivan, Senior Project Coordinator, MSBA Brittany Gomes, Senior Project Coordinator, MSBA Elena Seiti, Senior Project Coordinator, MSBA Fenton Bradley, Project Manager, MSBA

## SPACE SUMMARY DESE APPROVED PUBLIC DAY EDUCATION

### **6B.3.2-05** DESE APPROVAL OF PUBLIC DAY EDUCATION

The District currently does not have any Public Day Education Programs.
## SPACE SUMMARY DESE APPROVED CHAPTER 74 SPACES

#### 7/2/2021

Ms. Mary Pichetti Director of Capital Planning Massachusetts School Building Authority 40 Broad Street, Suite 500 Boston, Massachusetts 02109

Dear Ms. Pichetti:

The Northeast Metropolitan Regional Vocational School District (the "District") has notified the Department of Elementary and Secondary Education ("DESE") of its intent to offer Chapter 74 Career/Vocational Technical Education ("CTE") Programs at the Northeast Metropolitan Regional Vocational High School project, which is the subject of a feasibility study being conducted in collaboration with the Massachusetts School Building Authority as part of its school construction grant program. This letter supersedes the August 19, 2020 letter previously issued in response to their original Chapter 74 Vocational Technical Education Viability Documentation on June 5, 2020 which proposed three new programs.

DESE staff members have reviewed the District's revised Chapter 74 Vocational Technical Education Viability Documentation received from the MSBA on May 6, 2021. Based on completion of the preferred schematic, the District is proceeding with the three new proposed programs. The District's submission aligns with the enrollment proposed as part of their preferred schematic.

Based on our review and evidence of the completed components required of the Chapter 74 Vocational Technical Education Viability Documentation including items required for new and expanding programs, we are satisfied that the planning for the CTE program offerings the District is proposing for this school project has been thorough, the programs themselves are viable and the number of student's per program are reasonable. The proposed programming and program capacities are as follows:

| Chapter 74 Program Offerings   | Current<br>Enrollment | Proposed<br>Capacity | Comment*   |
|--------------------------------|-----------------------|----------------------|--|
| Auto Body                      | 33                    | 37.                  | Existing: current space limits enrollment                              |
| Auto Technology                | 66                    | 69                   | Existing: current space limits enrollment                              |
| Business Technology            | 53                    | 36                   | Existing: decrease due to cross training with new Marketing program    |
| Carpentry                      | 60                    | 69                   | Existing: current space limits enrollment                              |
| Cosmetology                    | 59                    | 69                   | Existing: current space limits enrollment                              |
| Culinary Arts                  | 35                    | 69                   | Existing: current space limits enrollment                              |
| Dental Assisting               | 83                    | 78                   | Existing   |
| Design & Visual Communications | 61                    | 72                   | Existing: current space limits enrollment                              |
| Drafting & Design              | 63                    | 62                   | Existing   |
| Early Childhood Education      | 32                    | 33                   | Existing   |
| Electricity                    | 87                    | 82                   | Existing   |
| Health Assisting               | 87                    | 70                   | Existing: decrease due to addition of<br>new Medical Assisting program |
| HVAC&R                         | 60                    | 69                   | Existing: current space limits enrollment                              |
| Metal Fabrication              | 42                    | 55                   | Existing: current space limits enrollment                              |

| Chapter 74 Program Offerings | Current<br>Enrollment | Proposed<br>Capacity | Comment*   |
|------------------------------|-----------------------|----------------------|--|
| Plumbing & Pipe Fitting      | 77                    | 85                   | Existing: current space limits enrollment                                  |
| Robotics                     | 24                    | 70                   | Existing:  |
| Exploratory – Grade 9        | 330                   | 400                  | Existing: increased capacity of shops allows admission of 70 more students |
| Marketing                    | 0                     | 35                   | New Program: will cross train with Business Tech.                          |
| Biotechnology                | 0                     | 70                   | New Program  |
| Medical Assisting            | 0                     | 70                   | New Program  |
| Total                        | 1,252                 | 1,600                |  |

Note that the purpose of this letter is not to grant formal approval for these Chapter 74 programs, but to certify that the District has completed the required steps listed in the Chapter 74 Vocational Technical Education Viability Documentation, submitted to the MSBA for Board approval of its preferred schematic and that we are in general agreement with the proposals proceeding into the schematic design phase of the project with an anticipated grant approval on or about August 25, 2021.

Sincerely,

Elizabeth &. Bennett

Elizabeth L. Bennett Associate Commissioner of College, Career and Technical Education, DESE

Cc: Matthew Deninger, DESE Commissioner's Designee, MSBA Board of Directors Cliff Chuang, Senior Associate Commissioner, Educational Options, DESE Diane Sullivan, Director of Program Management, MSBA John Jumpe, Director of Project Management, MSBA Allison Sullivan, Senior Project Coordinator, MSBA

# SPACE SUMMARY CONFIRMATION OF SCHEDULED DESE MEETING

### 6B.3.2-07 CONFIRMATION OF SCHEDULED DESE MEETING

Northeast Metro Tech has a scheduled meeting with MSBA and DESE on January 26<sup>th</sup>, 2023 to review floor plan layouts for Chapter 74 programs.

### SPACE SUMMARY COMPARISON OF CURRENT DESIGN W/ DESE APPROVED CHAPTER 74 PROGRAM SPACES

#### COMPARISON OF CURRENT DESIGN W/ DESE APPROVED CHAPTER 74 PROGRAM SPACES

DRA has completed a space measurement analysis of the 60% Construction Document drawings relative to the proposed square footages for Chapter 74 Programs shown on the Schematic Design Space Summary.

The program areas have slight variances from MSBA Schematic Design Submission. Refer to the "Comparison of Current Design w/ Final Educational Program," included within this submission, for a narrative regarding these variances.

Enrollment in each of the Chapter 74 programs remains unchanged from the approved DESE Chapter 74 Submission.

The following table communicates designed square footages relative to the proposed program. Deviations in square footage from Schematic Design to 60% Construction Documents are less than 1.5% for each of the Chapter 74 programs.

| Chapter 74 Program          | Schematic Design Space | 60% Construction    |
|-----------------------------|------------------------|---------------------|
| Offering                    | Summary                | Document Sq. Ft.    |
| Automotive Collision Repair | 7,580                  | 7,500               |
| Automotive Technology       | 12,615                 | 12,500              |
| Business Office Technology  | 3,180                  | 3,205               |
| Carpentry                   | 10,280                 | 10,130              |
| Cosmetology                 | 5,890                  | 5,890               |
| Culinary Arts               | 6,000                  | 6,005               |
| Dental Assisting            | 6,500                  | 6,450               |
| Design & Visual             | 5,240                  | 5,215               |
| Communications              |                        |                     |
| Drafting & Design           | 4,580                  | 4,575               |
| Early Childhood Education   | 2,060                  | 2,080               |
| Electrical Technology       | 12,335                 | 12,225              |
| Health Assisting            | 5,790                  | 5,750               |
| HVAC Technology             | 9,140                  | 9,105               |
| Metal Fabrication           | 7,400                  | 7,400               |
| Plumbing & Pipefitting      | 8,665                  | 8,630               |
| Robotics & Automation       | 5,175                  | 5,170               |
| Exploratory (freshmen)      | 0                      | 0                   |
| Biotechnology               | 5,135                  | 5,105               |
| Marketing                   | 2,975                  | 3,000               |
| Medical Assisting           | 5,780                  | 5,800               |
| Totals                      | 126,320 Square Feet    | 125,735 Square Feet |

Project Approvals Narrative **01** Utility Company Narrative **02** 

## **6B.3.3** PROJECT APPROVALS

|                             | 0        |
|-----------------------------|----------|
|                             | - I.     |
| PROJECT APPROVALS           | <b>m</b> |
|                             | <b>m</b> |
| PROJECT APPROVALS NARRATIVE | m        |
|                             | 9        |
|                             |          |

-

#### Massachusetts Department of Elementary & Secondary Education (DESE) – Special Education

Special Education spaces proposed for this project were approved by DESE via correspondence dated August 13, 2021. Refer to section 6B.3.2-04 within this submission for copy of the letter from DESE.

#### **Massachusetts Historical Commission (MHC)**

Project Notification Form was submitted to the Massachusetts Historical Commission on 6/25/2020 in compliance with 950 CMR 71.00. No written response was received within 30 days (950 CMR 71.07 (2.)(f)) The project does not exceed relevant thresholds.

#### Office of the Inspector General (OIG) – CM-R

The Office of the Inspector General has approved the application to use the Construction Management At-Risk delivery method for Northeast Metro Tech. A copy of the approval letter from the OIG (dated March 23, 2021) can be found in section 6A.3.3-01a of the MSBA Design Development Submittal.

Massachusetts Environmental Policy Act Office (MEPA)

MEPA review determined that no further action is required.

#### **Environmental Notification Form (ENF)**

The Massachusetts Environmental Policy Act (MEPA) thresholds, as included in 301 CMR 11.03 were reviewed by the design team for this project. The project does not meet any of the thresholds required to submit an Environmental Notification Form.

#### **Environmental Impact Report (EIR)**

The project does not meet any of the threshold required to submit an Environmental Notification Form (ENF). The Secretary of Energy & Environmental Affairs makes the determination if an Environmental Impact Report is required after review of an ENF (which is not required for this project).

**Article 97 Land Disposition Policy** 

No Article 97 land so agency review not required.

Massachusetts Department of Environmental Protection (MASSDEP)

No agency review or action required.

Massachusetts Department of Transportation (MASSDOT)

No agency review or action required; the project is not adjacent to any state highway layout.

Massachusetts Department of Public Health (DPH)

Not applicable.

Environmental Protection Agency (EPA) - National Pollutant Discharge Elimination System (NPDES)

The proposed project will disturb more than one acre of land and is therefore subject to the requirements of the NPDES program. A Notice of Intent (NOI) will need to be filed with EPA New England by the owner and contractor 14 days prior to the start of site construction. In conjunction with the EPA NOI filing, a Stormwater Pollution Prevention Plan (SWPPP) that specifies the means and methods that will be used for erosion and stormwater runoff control during construction was prepared by the Construction Manager.

#### **Massachusetts Architectural Access Board (AAB)**

Currently, the project does not have any unique circumstances that require a variance from the Access Board.

#### Town of Wakefield - Fire Department

The project design coordination with the Fire Department, is ongoing. The Construction Manager will be working with the fire department on obtaining a blasting permit prior to the start of construction.

#### Town of Wakefield - Wetlands Permitting

Abbreviated Notice of Resource Area Delineation (ANRAD) fixing the limits of the wetland resource areas was issued in July of 2021. A copy of Form WPA 4B can be found in section 6A.3.3-01b of the MSBA Design Development Submittal.

A Notice of Intent (NOI) for the proposed work was filed in September of 2022 with public hearings beginning in October of 2022. It is expected that the public hearing will be closed and the Order of Conditions issued in February of 2023.

#### Town of Wakefield - Utility Connections (Sewer & Water)

Final configuration of water and sewer connections to be reviewed by the Town of Wakefield DPW prior to the start of construction. Review and issuance of the connection permits to be completed by the Construction Manager prior to the start of construction.

#### Town of Wakefield - Traffic Advisory Committee (TAC)

The team will meet next with the Town of Wakefield TAC in early 2023 regarding creation of an intersection.

Town of Wakefield - Local Zoning

An analysis of the proposed project design as it relates to local zoning has been performed by the Design Team.

The project Team provided a design update to Wakefield town departments, including the Building Department. The School District is working with their attorney to complete the application to the Zoning Board of Appeals as advised by the Building Department.

## PROJECT APPROVALS UTILITY COMPANY NARRATIVE

6B.3.3 - 02

## $B\Lambda L\Lambda$

December 20, 2022

Mr. Vladimir Lyubetsky DRA Architects 260 Charles Street, Suite 300 Waltham, MA 02453

#### RE: Northeast Metro Technical High School Project: 60-20-409

Dear Vladimir,

This is to acknowledge that we sent to WMGL&D a work order application, load letter, and site plan locating their utility feeders, junction boxes, and pad mounted transformers for the new electric service for Northeast Metro Technical High School. They have acknowledged receipt of this information and have also acknowledged that there will be a new service for this project. Attached at the end of this load letter is our most recent e-mail correspondence regarding the loads.

Very truly yours,

Dino D. Buro, P.E.

BALA CONSULTING ENGINEERS



#### Projected Preliminary Electrical Connected Loads

| Lightin<br>(lightin<br>site ligl | <b>1g</b><br>g load at 0.81W/sf (energy code X 125% continuous load as per N<br>nting, 100 kW )   | EC, roughly 3<br>492       | 365kW, plus<br>kW          |
|----------------------------------|---|----------------------------|----------------------------|
| Recep                            | tacles (3 watt / SF)  | 1161                       | kW                         |
| Mecha<br>∙                       | n <b>ical:</b><br>Miscellaneous Electric Heat<br>FTUs and EUHs  | 210                        | kW                         |
| •                                | Energy Recovery Ventilators (ERVs)  | 77                         | kW                         |
| •                                | VRF Fan Coil Units  | 625                        | kW                         |
| •                                | VRF Condensing Units  | 445                        | kW                         |
| •                                | Rooftop Units<br>RTUs (2) and HRUs (5)  | 500                        | kW                         |
| •                                | Miscellaneous Electric Heat<br>FTUs and EUHs  | 210                        | kW                         |
| •                                | Makeup Air Units (2)  | 63                         | kW                         |
| •                                | Indoor Air Handling Units (11)  | 792                        | kW                         |
| •                                | Exhaust Fans<br>Largest 20hp  | 61                         | kW                         |
| •                                | Air Cooled Condensing Units (ACCUs)   | 127                        | kW                         |
| •                                | Miscellaneous AC Split Systems  | 61                         | kW                         |
| •                                | VRF Condensing Units (VCUs)   | 965                        | kW                         |
| Plumb                            | ing:  |                            |                            |
| • • • •                          | Electric Hot Water Heaters (2 @ 108, 2 @ 90kW each)<br>Miscellaneous Circ Pumps (Fractional hp)<br>Miscellaneous Pumps<br>Air Compressor (1 @ 40hp, 1 @ 20hp, 5 @ 15hp)<br>Domestic Water Booster Triplex Pump (3 @ 20hp) | 396<br>5<br>5<br>135<br>60 | kW<br>kW<br>kW<br>kW<br>kW |
| Elevat                           | <b>ors</b> (two at 60 hp)   | 120                        | kW                         |

**Miscellaneous Power** 



| (Appliances, Copiers, Elec Heat Trace,<br>Art Rm equipment, Field House Equipment, etc.) | 100           | kW |
|--|---------------|----|
| Kitchen (Gas)  | 300           | kW |
| Miscellaneous Equipment  | 45            | kW |
|  | Total: 6,955k | W  |

7,321kVA

#### Projected Preliminary Electrical Connected Loads with code applied Demand Factor:

| First 1,161kVA at 100% | 1,161kVA |
|------------------------|----------|
| Plus                   |          |
| Next 6,160kVA at 75%   | 4,620kVA |

Demand Total: 5,781kVA

Based on projected connected loads with code applied demand, calculated estimated demand load is 6,953Amps at 480Volts, 3-phase.

Proposed secondary service will be sufficient to serve this calculated ampacity. Final utility transformer quantity and size to be determined by Utility Co. Two 2500kVA normal power transformers and one 300kVA emergency transformer are requested. Additionally, we are requesting a 300kVA transformer and 480V service to supply site power to the football field area (750kVA if the locker room building and concession building are constructed [currently add-alternates]). Lastly, we are requesting a 112.5kVA, 480V service to the new school message board area near Farm Road.

(NOTE, This does not include any PV generation)

Project will be supported by a utility-supplied standby generator that will provide a dedicated emergency service to the building.

NE Metro Tech HS Bala Project #60-20-409 January 12, 2023 Page 1

January 12, 2023



Mr. Jimmy Brown Wakefield Municipal Gas & Light Department (WMGLD) 480 North Avenue Wakefield, MA 01880

Re: Northeast Metrotech Regional High School Gas Service Availability & Coordination Bala Project No. 60-20-409

Dear Mr. Brown:

The following is written to update the gas company on the gas requirements for the project. The previous load letter was dated 7/29/2022, and was responded to by WMGLD on 8/26/2022. This letter is to update the previous gas load and meter location.

Modifications to the gas load are as follows, shown in **bold**:

| Estimated Plumbing Shop Water Heater Loads | 1,600 |
|--|-------|
| Estimated Paint Spray Booth Heating Loads  | 3,600 |
| Estimated Culinary Arts Cooking Loads      | 2,150 |
| Estimated Cafeteria Cooking Loads          | 850   |

Preliminary/Anticipated Total Connected Load 8,200 CFH

At this time, we would like to request that the gas company confirm of the following:

- 1. Confirm that the gas company will still be able to extend the gas main for this new service, as stated in previous correspondence.
- 2. Confirm that the proposed gas routing is acceptable, with the understanding that WMGLD will confirm final routing once a contractor is selected, as stated in previous correspondence.
- 3. Provide an updated cost for this scope of work, based on the revised location of the gas service. Please refer to the attached site plan as needed.
- 4. Confirm that the total connected load of 8,200 CFH be available to supply the new school. Previous correspondence confirmed a connected load of 20,950 CFH.
- 5. Confirm if vehicle access is required for the gas meter.
- 6. Confirm size of the meter assembly based on the total connected load. Provide cut sheets of meter assembly for coordination.

NE Metro Tech HS Bala Project #60-20-409 January 12, 2023 Page 2



7. Confirm the size of the gas pipe to be provided at the gas meter inlet.

Sincerely,

BALA CONSULTING ENGINEERS, INC.

Richard Rivera, EIT Plumbing & Fire Protection Designer

Cc: Raven Fournier – WMGLD Vladimir Lubetsky – DRA SPS, GC, DDB, Bala



Drawing List **01** 

# **60% CONSTRUCTION DOCUMENT DRAWINGS**

## 60% CONSTRUCTION DOCUMENT DRAWINGS

#### SECTION 00 01 15

#### LIST OF DRAWINGS

#### VOLUME 1 OF 4

#### COVER SHEET – VOLUME 1 OF 4

#### **DRAWING LIST**

01 – INFO DRAWING LIST

#### <u>CIVIL</u>

| EX-1<br>EX-2<br>EX-3<br>EX-4<br>EX-5<br>EX-6<br>EX-7<br>EX-8<br>EX-7<br>EX-8<br>EX-9<br>EX-10<br>EX-11<br>EX-12<br>EX-13<br>EX-14 | TOPOGRAPHIC SURVEY<br>TOPOGRAPHIC SURVEY |
|---|--|
| C-000   | CIVIL NOTES, LEGENDS, AND ABBREVIATIONS  |
| C-100   | KEY PLAN   |
| C-200   | UTILITY DEMOLITION PLAN I  |
| C-201   | UTILITY DEMOLITION PLAN II   |
| C-202   | UTILITY DEMOLITION PLAN III  |
| C-203   | UTILITY DEMOLITION PLAN IV   |
| C-204   | UTILITY DEMOLITION PLAN V  |
| C-205   | UTILITY DEMOLITION PLAN VI   |
| C-300   | SEDIMENTATION AND EROSION CONTROL PLAN I   |
| C-301   | SEDIMENTATION AND EROSION CONTROL PLAN II  |
| C-302   | SEDIMENTATION AND EROSION CONTROL PLAN III   |
| C-303   | SEDIMENTATION AND EROSION CONTROL PLAN IV  |
| C-304   | SEDIMENTATION AND EROSION CONTROL PLAN V   |
| C-305   | SEDIMENTATION AND EROSION CONTROL PLAN VI  |
| C-400   | DRAINAGE PLAN I  |
| C-401   | DRAINAGE PLAN II   |
| C-402   | DRAINAGE PLAN III  |
| C-403   | DRAINAGE PLAN IV   |
| C-404   | DRAINAGE PLAN V  |
| C-405   | DRAINAGE PLAN VI   |
| C-406   | DRAINAGE TABLE   |
| C-500   | UTILITY SITE PLAN I  |

| C-501 | UTILITY SITE PLAN II                 |
|-------|--------------------------------------|
| C-502 | UTILITY SITE PLAN III                |
| C-503 | UTILITY SITE PLAN IV                 |
| C-504 | UTILITY SITE PLAN V                  |
| C-505 | UTILITY SITE PLAN VI                 |
| C-600 | DRIVEWAY LAYOUT AND GRADING PLAN I   |
| C-601 | DRIVEWAY LAYOUT AND GRADING PLAN II  |
| C-602 | DRIVEWAY LAYOUT AND GRADING PLAN III |
| C-603 | DRIVEWAY LAYOUT AND GRADING PLAN IV  |
| C-604 | DRIVEWAY PROFILE                     |
| C-700 | CIVIL SITE DETAILS I                 |
| C-701 | CIVIL SITE DETAILS II                |
| C-702 | CIVIL SITE DETAILS III               |
| C-703 | CIVIL SITE DETAILS IV                |
| C-704 | CIVIL SITE DETAILS V                 |
| C-705 | CIVIL SITE DETAILS VI                |
|       |                                      |

#### TRAFFIC

| TR-100 | TRAFFIC SIGNAL PLAN               |
|--------|-----------------------------------|
| TR-101 | TRAFFIC SIGNAL SCHEDULE           |
| TR-200 | PAVEMENT MARKING AND SIGNAGE PLAN |
| TR-201 | SIGN SUMMARY                      |

#### LANDSCAPE

| L000 | OVERALL SITE PLAN                  |
|------|------------------------------------|
| L101 | DEMO AND SITE PREPARATION PLAN - 1 |
| L102 | DEMO AND SITE PREPARATION PLAN - 2 |
| L103 | DEMO AND SITE PREPARATION PLAN - 3 |
| L104 | DEMO AND SITE PREPARATION PLAN - 4 |
| L105 | DEMO AND SITE PREPARATION PLAN - 5 |
| L201 | LAYOUT PLAN – 1                    |
| L202 | LAYOUT PLAN - 2                    |
| L203 | LAYOUT PLAN - 3                    |
| L204 | LAYOUT PLAN - 4                    |
| L205 | LAYOUT PLAN - 5                    |
| L301 | MATERIALS PLAN - 1                 |
| L302 | MATERIALS PLAN - 2                 |
| L303 | MATERIALS PLAN - 3                 |
| L304 | MATERIALS PLAN - 4                 |
| L305 | MATERIALS PLAN - 5                 |
| L401 | GRADING PLAN - 1                   |
| L402 | GRADING PLAN - 2                   |
| L403 | GRADING PLAN - 3                   |
| L404 | GRADING PLAN - 4                   |
| L405 | GRADING PLAN - 5                   |
| L501 | PLANTING PLAN - 1                  |
| L502 | PLANTING PLAN - 2                  |
| L503 | PLANTING PLAN - 3                  |
| L504 | PLANTING PLAN - 4                  |
| L505 | PLANTING PLAN - 5                  |
| L601 | LANDSCAPE DETAILS - 1              |
| L602 | LANDSCAPE DETAILS - 2              |

| L603 | LANDSCAPE DETAILS - 3 |
|------|-----------------------|
| L604 | LANDSCAPE DETAILS - 4 |
| L605 | LANDSCAPE DETAILS - 5 |
| L606 | LANDSCAPE DETAILS - 6 |
| L701 | ADD ALTERNATES        |
|      |                       |

#### VOLUME 2 OF 4

#### COVER SHEET – VOLUME 2 OF 4

#### DRAWING LIST

01 – INFO DRAWING LIST

#### **STRUCTURAL**

| S0-0-1   | GENERAL NOTES                         |
|----------|---------------------------------------|
| S0-0-2   | TYPICAL DETAILS                       |
| S0-0-3   | TYPICAL DETAILS                       |
| S0-0-4   | TYPICAL DETAILS                       |
| S0-0-5   | TYPICAL DETAILS                       |
| S0-0-6   | TYPICAL DETAILS                       |
| S0-0-7   | TYPICAL DETAILS                       |
| S0-0-8   | TYPICAL DETAILS                       |
| S1-1-0C  | LOWER LEVEL FOUNDATION PLAN – AREA C  |
| S1-1-0D  | LOWER LEVEL FOUNDATION PLAN – AREA D  |
| S1-1-0MC | MEZZANINE FLOOR FRAMING PLAN – AREA C |
| S1-1-0MD | MEZZANINE FLOOR FRAMING PLAN – AREA D |
| S1-1-1A  | FIRST FLOOR FOUNDATION PLAN – AREA A  |
| S1-1-1B  | FIRST FLOOR FOUNDATION PLAN – AREA B  |
| S1-1-1C  | FIRST FLOOR FOUNDATION PLAN – AREA C  |
| S1-1-1D  | FIRST FLOOR FOUNDATION PLAN – AREA D  |
| S1-1-1MA | MEZZANINE FLOOR FRAMING PLAN – AREA A |
| S1-1-1MB | MEZZANINE FLOOR FRAMING PLAN – AREA B |
| S1-1-2A  | SECOND FLOOR FRAMING PLAN – AREA A    |
| S1-1-2B  | SECOND FLOOR FRAMING PLAN – AREA B    |
| S1-1-2C  | SECOND FLOOR FRAMING PLAN – AREA C    |
| S1-1-2D  | SECOND FLOOR FRAMING PLAN – AREA D    |
| S1-1-3A  | THIRD FLOOR FRAMING PLAN – AREA A     |
| S1-1-3B  | THIRD FLOOR FRAMING PLAN – AREA B     |
| S1-1-3C  | THIRD FLOOR FRAMING PLAN – AREA C     |
| S1-1-3D  | THIRD FLOOR FRAMING PLAN – AREA D     |
| S1-1-4A  | FOURTH FLOOR FRAMING PLAN – AREA A    |
| S1-1-4B  | FOURTH FLOOR FRAMING PLAN – AREA B    |
| S1-1-4C  | FOURTH FLOOR FRAMING PLAN – AREA C    |
| S1-1-4D  | FOURTH FLOOR FRAMING PLAN – AREA D    |
| S1-1-5A  | ROOF FRAMING PLAN – AREA A            |
| S1-1-5B  | ROOF FRAMING PLAN – AREA B            |
| S1-1-5C  | ROOF FRAMING PLAN – AREA C            |
| S1-1-5D  | ROOF FRAMING PLAN – AREA D            |
| S1-1-6   | ROOF DUNNAGE FRAMING PARTS            |
| S2-0-1   | SECTIONS                              |
| S2-0-2   | SECTIONS                              |

| S2-0-3 | SECTIONS                            |
|--------|-------------------------------------|
| S2-0-4 | SECTIONS                            |
| S3-0-1 | SECTIONS                            |
| S3-0-2 | SECTIONS                            |
| S3-0-3 | SECTIONS                            |
| S3-0-4 | SECTIONS                            |
| S3-0-5 | SECTIONS                            |
| S4-0-1 | BRACE FRAME ELEVATIONS – AREA A     |
| S4-0-2 | BRACE FRAME ELEVATIONS – AREA A + B |
| S4-0-3 | BRACE FRAME ELEVATIONS – AREA B     |
| S4-0-4 | BRACE FRAME ELEVATIONS – AREA C + D |
| S4-0-5 | SHEAR WALLS                         |
| S4-0-6 | SHEAR WALLS                         |
| S4-0-7 | SHEAR WALLS                         |
| S4-0-8 | BRACED FRAME DETAILS                |
| S5-0-1 | JOIST LOADING DIAGRAMS              |
| S5-0-2 | JOIST LOADING DIAGRAMS              |
| SC-1-1 | CONCESSION BUILDING PLANS           |
| SC-2-1 | CONCESSION BUILDING SECTIONS        |
| SL-1-1 | LOCKER BUILDING PLANS               |
| SL-2-1 | LOCKER ROOM BUILDING SECTIONS       |
| SL-3-1 | LOCKER ROOM BUILDING SHEAR WALLS    |
| SM-1-1 | MAINTENANCE BUILDING PLANS          |

#### **VOLUME 3 OF 4**

#### COVER SHEET - VOLUME 3 OF 4

#### **DRAWING LIST**

01 – INFO DRAWING LIST

#### CODE ANALYSIS

| CD1-1 | CODE ANALYSIS LOWER LEVEL |
|-------|---------------------------|
|-------|---------------------------|

- CD1-2 CODE ANALYSIS FIRST FLOOR
- CD1-3 CODE ANALYSIS FIRST FLOOR MEZZ
- CD1-4 CODE ANALYSIS SECOND FLOOR
- CD1-5 CODE ANALYSIS THIRD FLOOR
- CD1-6 CODE ANALYSIS FOURTH FLOOR

#### ARCHITECTURAL

- A1-0-0 PARTITION TYPES
- A1-0-1 OVERALL LOWER LEVEL & FIRST FLOOR PLANS
- A1-0-2 OVERALL LOWER LEVEL AND FIRST FLOOR MEZZ. PLANS
- A1-0-3 OVERALL SECOND FLOOR PLAN
- A1-0-4 OVERALL THIRD FLOOR PLAN
- A1-0-5 OVERALL FOURTH FLOOR PLAN
- A1-0-6 OVERALL ROOF PLAN
- A1-0-8 LOWER & FIRST FLOOR NET AREA PLANS
- A1-0-9 SECOND & THIRD FLOOR NET AREA PLANS

| A1 0 10            | FOURTH FLOOD & SATELLITE LOCKEDS NET AREA DLANS |
|--------------------|---|
| A1-0-10            | FOURTH FLOUR & SATELLITE LOURERS NET AREA FLANS |
| AI-0-11            | LOWER LEVEL BUILDING LAYOUT & EDGE OF SLAB PLAN |
| A1-0-12            | FIRST FLOOR BUILDING LAYOUT & EDGE OF SLAB PLAN |
| A1-0-13            | SECOND & THIRD FLOOR EDGE OF SLAB PLANS         |
| A1-0-14            | FOURTH FLOOR EDGE OF SLAB PLAN                  |
| A1-1-0C            | LOWER LEVEL FLOOR PLAN - AREA C                 |
| A1-1-0D            | LOWER LEVEL FLOOR PLAN - AREA D                 |
| A1-1-0MC           | LOWER LEVEL MEZZANINE PLAN - AREA C             |
| A1-1-0MD           | LOWER LEVEL MEZZANINE PLAN - AREA D             |
| A1-1-1A            | FIRST FLOOR PLAN - AREA A                       |
| A1-1-1B            | FIRST FLOOR PLAN - AREA B                       |
| A1-1-1C            | FIRST FLOOR PLAN - AREA C                       |
| A1-1-1D            | FIRST FLOOR PLAN - AREA D                       |
| A1-1-1MA           | FIRST FLOOR MEZZANINE PLAN - AREA A             |
| A1-1-1MB           | FIRST FLOOR MEZZANINE PLAN - AREA B             |
| A1-1-2A            | SECOND ELOOR PLAN - AREA A                      |
| A1-1-2B            | SECOND FLOOR PLAN - AREA B                      |
| Δ1_1_2C            | SECOND FLOOR PLAN - AREA C                      |
| Δ1_1_20            |   |
| A1-1-2D<br>A1-1-2A |   |
| AI-I-JA<br>A1 1 2D |   |
| AI-I-3D            |   |
| AI-1-3C            |   |
| A1-1-3D            |   |
| A1-1-4A            | FOURTH FLOOR PLAN - AREA A                      |
| A1-1-4B            | FOURTH FLOOR PLAN - AREA B                      |
| A1-1-4C            | FOURTH FLOOR PLAN - AREA C                      |
| A1-1-4D            | FOURTH FLOOR PLAN - AREA D                      |
| A1-2-1A            | ROOF PLAN - AREA A                              |
| A1-2-1B            | ROOF PLAN - AREA B                              |
| A1-2-1C            | ROOF PLAN - AREA C                              |
| A1-2-1D            | ROOF PLAN - AREA D                              |
| A2-0-1             | OVERALL BUILDING ELEVATIONS                     |
| A2-1-1             | BUILDING ELEVATIONS                             |
| A2-1-2             | BUILDING ELEVATIONS                             |
| A2-1-3             | BUILDING ELEVATIONS                             |
| A2-1-4             | BUILDING ELEVATIONS                             |
| A2-1-5             | BUILDING ELEVATIONS                             |
| A2-1-6             | BUILDING ELEVATIONS                             |
| A2-1-7             | BUILDING ELEVATIONS                             |
| Δ2-1-8             |   |
| Δ2-1-0             |   |
| A2-2-1             |   |
| AZ-Z-Z             |   |
| AZ-Z-3             |   |
| AZ-Z-4             |   |
| AZ-Z-5             |   |
| A2-2-6             |   |
| A2-2-7             | INTERIOR ELEVATIONS                             |
| A2-2-8             | INTERIOR ELEVATIONS                             |
| A2-2-9             | INTERIOR ELEVATIONS                             |
| A2-2-10            | INTERIOR ELEVATIONS                             |
| A2-2-11            | INTERIOR ELEVATIONS                             |
| A2-2-12            | INTERIOR ELEVATIONS                             |
| A2-2-13            | INTERIOR ELEVATIONS                             |
| A2-2-14            | INTERIOR ELEVATIONS                             |

| AD 0 14 |   |
|---------|---|
| A2-2-10 |   |
| AZ-Z-10 |   |
| A3-1-1  |   |
| A3-1-2  | BUILDING SECTIONS                               |
| A3-1-3  | BUILDING SECTIONS                               |
| A3-1-4  | BUILDING SECTIONS                               |
| A3-1-5  | BUILDING SECTIONS                               |
| A3-1-6  | BUILDING SECTIONS                               |
| A3-2-1  | WALL SECTIONS                                   |
| A3-2-2  | WALL SECTIONS                                   |
| A3-2-3  | WALL SECTIONS                                   |
| A3-2-4  | WALL SECTIONS                                   |
| A3-2-5  | WALL SECTIONS                                   |
| A3-2-6  | WALL SECTIONS                                   |
| A3-2-7  | WALL SECTIONS                                   |
| A3-2-8  | WALL SECTIONS                                   |
| A3-2-9  | WALL SECTIONS                                   |
| A3-2-10 | ) WALL SECTIONS                                 |
| A3-2-11 | I WALL SECTIONS                                 |
| A3-2-12 | 2 WALL SECTIONS                                 |
| A3-2-13 | 3 WALL SECTIONS                                 |
| A3-2-14 | 4 WALL SECTIONS                                 |
| A3-2-15 | 5 WALL SECTIONS                                 |
| A3-2-16 | 3 WALL SECTIONS                                 |
| A3-2-17 | WALL SECTIONS                                   |
| A3-2-18 | 3 WALL SECTIONS                                 |
| A3-2-19 | WALL SECTIONS                                   |
| A3-2-20 | ) WALL SECTIONS                                 |
| A3-2-22 | WALL SECTIONS                                   |
| A3-2-22 | 2 WALL SECTIONS                                 |
| A3-3-1  | VERTICAL DETAILS                                |
| A3-3-1  | VERTICAL DETAILS                                |
| A4-1-1  | TOILET AND LOCKER ROOM PLANS                    |
| A4-1-2  | TOILET AND LOCKER ROOM PLANS                    |
| A4-1-3  | TOILET AND LOCKER ROOM PLANS                    |
| A4-1-4  | TOILET AND LOCKER ROOM PLANS                    |
| A4-1-5  | TOILET AND LOCKER ROOM ELEVATIONS               |
| A4-1-6  | TOILET AND LOCKER ROOM ELEVATIONS               |
| A4-1-7  | LOCKER ROOM AND TOILET ELEVATIONS               |
| A4-1-8  | LOCKER ROOM AND TOILET ELEVATIONS               |
| A4-1-9  | LOCKER ROOM AND TOILET ELEVATIONS               |
| A5-1-1  | EXTERIOR PLAN DETAILS                           |
| A5-1-2  | EXTERIOR PLAN DETAILS                           |
| A5-1-3  | EXTERIOR PLAN DETAILS                           |
| A5-2-1  | INTERIOR PLAN DETAILS                           |
| A5-2-2  | INTERIOR PLAN DETAILS                           |
| A5-3-1  | ROOF DETAILS                                    |
| A5-3-2  | ROOF DETAILS                                    |
| A5-3-3  | ROOF DETAILS                                    |
| A5-3-4  | ROOF DETAILS                                    |
| A6-2-1  | DOOR SCHEDULE                                   |
| A6-2-2  | DOOR SCHEDULE                                   |
| A6-2-3  | DOOR SCHEDULE, FRAME & BORROWED LIGHT TYPES     |
| A6-3-1  | WINDOW, TRANSLUCENT WALL PANEL AND LOUVER TYPES |
|         |   |

| A6-3-2             | CURTAIN WALL TYPES                                    |
|--------------------|---|
| A6-3-3             | CURTAIN WALL TYPES                                    |
| A6-3-4             | CURTAIN WALL TYPES                                    |
| A6-3-5             | INTERIOR CURTAIN WALL TYPES                           |
| A6-3-6             | STOREFRONT AND INTERIOR STOREFRONT TYPES              |
| A6-3-7             | INTERIOR STOREFRONT AND BORROWED LIGHT TYPES          |
| A6-3-8             | WINDOW & TRANSI UCENT WALL PANEL DETAILS              |
| A6-3-9             |   |
| A6-3-10            | CURTAIN WALL DETAILS                                  |
| A7-1-1             | STAIR PLANS   |
| A7-1-2             | STAIR SECTIONS  |
| A7-1-3             | STAIR PLANS & SECTIONS                                |
| A7-1-4             | STAIR PLANS   |
| Δ7-1-5             | STAIR SECTIONS  |
| Δ7_1_6             | STAIR DI ANS & SECTIONS                               |
| Δ7_1_7             | STAIR PLANS & SECTIONS                                |
| Λ7 1 8             |   |
| A7-1-0<br>A7-1-0   |   |
| A7-1-9<br>A7-1-10  |   |
| A7-1-10<br>A7-1-10 | STAIN DETAILS - ELEVATOR DETAILS, SPECIALTT DETAILS   |
| A7 1 10            |   |
| A7-1-12<br>A8 1 0C |   |
|                    | LOWER LEVEL REFLECTED CEILING FLAN - AREA C           |
|                    | LOWER LEVEL REFLECTED CEILING FLAN - AREA D           |
|                    | LOWER LEVEL MEZZANINE REFLECTED CEILING PLAN - AREA C |
|                    | LOWER LEVEL MEZZANINE REFLECTED CEILING PLAN - AREA D |
| A0-1-1A            | FIRST FLOOR REFLECTED CEILING PLAN - AREA A           |
| A0-1-1D            |   |
|                    |   |
| A0-1-1D            |   |
| A0-1-11VIA         | FIRST FLOOR MEZZANINE REFLECTED CEILING PLAN - AREA A |
|                    | FIRST FLOOR MEZZANINE REFLECTED CEILING FLAN - AREA D |
| A0-1-2A            | SECOND FLOOR REFLECTED CEILING PLAN - AREA A          |
| A0-1-2D            | SECOND FLOOR REFLECTED CEILING PLAN - AREA D          |
| A0-1-20            | SECOND FLOOR REFLECTED CEILING PLAN - AREA C          |
| A8-1-2D            | SECUND FLOOR REFLECTED CEILING PLAN - AREA D          |
| A8-1-3A            | THIRD FLOOR REFLECTED CEILING PLAN - AREA A           |
| A8-1-3B            | THIRD FLOOR REFLECTED CEILING PLAN - AREA B           |
| A8-1-3C            | THIRD FLOOR REFLECTED CEILING PLAN - AREA C           |
| A0-1-3D            | THIRD FLOOR REFLECTED CEILING PLAN - AREA D           |
| A0-1-4A            | FOURTH FLOOR REFLECTED CEILING PLAN - AREA A          |
| A8-1-4B            | FOURTH FLOOR REFLECTED CEILING PLAN - AREA B          |
| A8-1-4C            | FOURTH FLOOR REFLECTED CEILING PLAN - AREA C          |
| A8-1-4D            | FOURTH FLOOR REFLECTED CEILING PLAN - AREA D          |
| A9-1-1             |   |
| A9-1-2             |   |
| AC-1-1             | TOILET AND CONCESSION BUILDING PLANS & ELEVATIONS     |
| AC-1-2             | WALL SECTIONS, PLAN & SCHEDULES                       |
| AC-1-3             |   |
| AL-1-1             | LOUKER BUILDING PLANS AND ELEVATIONS                  |
| AL-1-2             |   |
| AL-1-3             | LOUKER BUILDING STAIR & ELEVATOR DRAWINGS             |
| AL-1-4             |   |
| AM-1-1             |   |
| AM-1-2             | MAIN LENANCE BUILDING TOILET ELEVATIONS               |

#### **ARCHITECTURAL FINISHES**

| AF1-1-0C | LOWER LEVEL FLOOR FINISHES PLAN- AREA C   |
|----------|---|
| AF1-1-0D | LOWER LEVEL FLOOR FINISHES PLAN - AREA D  |
| AF1-1-1A | FIRST LEVEL FLOOR FINISHES PLAN - AREA A  |
| AF1-1-1B | FIRST LEVEL FLOOR FINISHES PLAN - AREA B  |
| AF1-1-1C | FIRST LEVEL FLOOR FINISHES PLAN - AREA C  |
| AF1-1-1D | FIRST LEVEL FLOOR FINISHES PLAN - AREA D  |
| AF1-1-2A | SECOND LEVEL FLOOR FINISHES PLAN - AREA A |
| AF1-1-2B | SECOND LEVEL FLOOR FINISHES PLAN - AREA B |
| AF1-1-2C | SECOND LEVEL FLOOR FINISHES PLAN - AREA C |
| AF1-1-2D | SECOND LEVEL FLOOR FINISHES PLAN - AREA D |
| AF1-1-3A | THIRD LEVEL FLOOR FINISHES PLAN - AREA A  |
| AF1-1-3B | THIRD LEVEL FLOOR FINISHES PLAN - AREA B  |
| AF1-1-3C | THIRD LEVEL FLOOR FINISHES PLAN - AREA C  |
| AF1-1-3D | THIRD LEVEL FLOOR FINISHES PLAN - AREA D  |
| AF1-1-4A | FOURTH LEVEL FLOOR FINISHES PLAN - AREA A |
| AF1-1-4B | FOURTH LEVEL FLOOR FINISHES PLAN - AREA B |
| AF1-1-4C | FOURTH LEVEL FLOOR FINISHES PLAN - AREA C |
| AF1-1-4D | FOURTH LEVEL FLOOR FINISHES PLAN - AREA D |
| AF1-2-0C | LOWER LEVEL WALL FINISHES PLAN - AREA C   |
| AF1-2-0D | LOWER LEVEL WALL FINISHES PLAN - AREA D   |
| AF1-2-1A | FIRST LEVEL WALL FINISHES PLAN - AREA A   |
| AF1-2-1B | FIRST LEVEL WALL FINISHES PLAN - AREA B   |
| AF1-2-1C | FIRST LEVEL WALL FINISHES PLAN - AREA C   |
| AF1-2-1D | FIRST LEVEL WALL FINISHES PLAN - AREA D   |
| AF1-2-2A | SECOND LEVEL WALL FINISHES PLAN - AREA A  |
| AF1-2-2B | SECOND LEVEL WALL FINISHES PLAN - AREA B  |
| AF1-2-2C | SECOND LEVEL WALL FINISHES PLAN - AREA C  |
| AF1-2-2D | SECOND LEVEL WALL FINISHES PLAN - AREA D  |
| AF1-2-3A | THIRD LEVEL WALL FINISHES PLAN - AREA A   |
| AF1-2-3B | THIRD LEVEL WALL FINISHES PLAN - AREA B   |
| AF1-2-3C | THIRD LEVEL WALL FINISHES PLAN- AREA C    |
| AF1-2-3D | THIRD LEVEL WALL FINISHES PLAN - AREA D   |
| AF1-2-4A | FOURTH LEVEL WALL FINISHES PLAN - AREA A  |
| AF1-2-4B | FOURTH LEVEL WALL FINISHES PLAN - AREA B  |
| AF1-2-4C | FOURTH LEVEL WALL FINISHES PLAN - AREA C  |
| AF1-2-4D | FOURTH LEVEL WALL FINISHES PLAN - AREA D  |
| AF1-3-1  | TRANSITION DETAILS                        |
| AF1-3-2  | TRANSITION DETAILS                        |
| AF1-4-1  | BASE DETAILS                              |
| AF1-4-2  | BASE DETAILS                              |
| AF1-4-3  |   |
| AF1-5-1  |   |
| AF1-6-1  | PHENOLIC RESIN PANEL DETAILS              |
| AF1-/-1  | INTERIOR WALL PANEL DETAILS               |
| AF1-8-1  | CERAMIC TILES PATTERN                     |

#### **ARCHITECTURAL SIGNAGE**

- SL1-1-1 CONCESSION BUILDING SIGNAGE PLAN
- SL1-1-2 MAINTENANCE BUILDING SIGNAGE PLAN
- SL1-1-3 LOCKER BUILDING FIRST FLOOR SIGNAGE PLAN
- SL1-1-4 LOCKER BUILDING SECOND FLOOR SIGNAGE PLAN
- SL1-1-5 LOWER LEVEL SIGNAGE PLAN
- SL1-1-6 FIRST FLOOR SIGNAGE PLAN
- SL1-1-7 SECOND FLOOR SIGNAGE PLAN
- SL1-1-8 THIRD FLOOR SIGNAGE PLAN
- SL1-1-9 FOURTH FLOOR SIGNAGE PLAN
- SL1-1-10 SITE SIGNAGE PLAN

#### EQUIPMENT

| EQ0.00   | NOTES, SCHEDULES, AND ABBREVIATIONS         |
|----------|---|
| EQ1-1-0C | FF&E/CASEWORK LOWER LEVEL AREA C            |
| EQ1.1-0D | FF&E/CASEWORK LOWER LEVEL AREA D            |
| EQ1.1-1A | FF&E/CASEWORK FIRST FLOOR AREA A            |
| EQ1.1-1B | FF&E/CASEWORK FIRST FLOOR AREA B            |
| EQ1.1-1C | FF&E/CASEWORK FIRST FLOOR AREA C            |
| EQ1.1-1D | FF&E/CASEWORK FIRST FLOOR AREA D            |
| EQ1.1-2A | FF&E/CASEWORK SECOND FLOOR AREA A           |
| EQ1.1-2B | FF&E/CASEWORK SECOND FLOOR AREA B           |
| EQ1.1-2C | FF&E/CASEWORK SECOND FLOOR AREA C           |
| EQ1.1-2D | FF&E/CASEWORK SECOND FLOOR AREA D           |
| EQ1.1-3A | FF&E/CASEWORK THIRD FLOOR AREA A            |
| EQ1.1-3B | FF&E/CASEWORK THIRD FLOOR AREA B            |
| EQ1.1-4A | FF&E/CASEWORK FOURTH FLOOR AREA A           |
| EQ1.1-4B | FF&E/CASEWORK FOURTH FLOOR AREA B           |
| EQ2.1    | METAL FABRICATION CASEWORK & EQUIPMENT      |
| EQ2.2    | AUTO COLLISION CASEWORK & EQUIPMENT         |
| EQ2.3    | AUTO TECHNOLOGY CASEWORK & EQUIPMENT        |
| EQ2.4    | HVAC TECH CASEWORK & EQUIPMENT              |
| EQ2.5    | CARPENTRY CASEWORK & EQUIPMENT              |
| EQ2.6    | PLUMBING / PIPEFITTING CASEWORK & EQUIPMENT |
| EQ2.7    | ELECTRICAL TECHNOLOGY CASEWORK & EQUIPMENT  |
| EQ2.8    | DENTAL ASSISTING CASEWORK & EQUIPMENT       |
| EQ2.9    | ROBOTICS CASEWORK & EQUIPMENT               |
| EQ2.10   | DESIGN/VISUAL COM CASEWORK & EQUIPMENT      |
| EQ2.11   | DRAFTING / DESIGN CASEWORK & EQUIPMENT      |
| EQ2.12   | COSMOTOLOGY CASEWORK & EQUIPMENT            |
| EQ2.13   | MEDICAL ASSIST CASEWORK & EQUIPMENT         |
| EQ2.14   | HEALTH ASSIST CASEWORK & EQUIPMENT          |
| EQ2.15   | BIOTECH CASEWORK & EQUIPMENT                |
| EQ3.1    | CASEWORK ELEVATIONS                         |
| EQ3.2    | CASEWORK ELEVATIONS                         |
| EQ3.3    | CASEWORK ELEVATIONS                         |

#### THEATRE EQUIPMENT

- TR-1 THEATRE RIGGING PLAN
- TR-2 THEATER RIGGING SECTION
- TR-3 HOUSE AND WINDOW TRAVELER CURTAIN RIGGING
- TE-1 THEATRE ELECTRICS POWER + DATA RISERS
- TE-2.0 THEATRE ELECTICS DEVICE LOCATIONS
- TE-2.1 THEATRE ELECTICS DEVICE LOCATIONS
- TD-1 HOUSE AND WINDOW TRAVELER CURTAINS

#### FOOD SERVICE

| FS1-1-1A | FOODSERVICE EQUIPMENT OVERALL PLAN                               |
|----------|--|
| FS1-2-0  | MAIN KITCHEN FOODSERVICE EQUIPMENT SCHEDULE                      |
| FS1-2-1  | MAIN KITCHEN FOODSERVICE EQUIPMENT PLAN                          |
| FS1-3-0  | CULINARY KITCHEN FOODSERVICE EQUIPMENT SCHEDULE                  |
| FS1-3-1  | CULINARY KITCHEN FOODSERVICE EQUIPMENT PLAN                      |
| FS2-2-1  | MAIN KITCHEN FOODSERVICE EQUIPMENT ROUGH-IN PLAN                 |
| FS2-3-1  | CULINARY KITCHEN FOODSERVICE EQUIPMENT ROUGH-IN PLAN             |
| FS3-2-1  | MAIN KITCHEN FOODSERVICE EQUIPMENT VENTILATION ROUGH-IN PLAN     |
| FS3-3-1  | CULINARY KITCHEN FOODSERVICE EQUIPMENT VENTILATION ROUGH-IN PLAN |
| FS4-2-1  | MAIN KITCHEN FOODSERVICE EQUIPMENT BUILDING CONDITIONS PLAN      |
| FS4-3-1  | CULINARY KITCHEN FOODSERVICE EQUIPMENT BUILDING CONDITIONS PLAN  |

#### **VOLUME 4 OF 4**

#### **COVER SHEET – VOLUME 4 OF 4**

#### **DRAWING LIST**

01 – INFO DRAWING LIST

#### **GEOTECHNICAL**

| GT-0-1 | GEOTECHNICAL PLAN EAST |
|--------|------------------------|
| GT-0-2 | GEOTECHNICAL PLAN WEST |

#### **PLUMBING**

| P0-0-1   | PLUMBING LEGENDS, ABBREVIATIONS, AND GENERAL NOTES   |
|----------|--|
| P1-0-0A  | PLUMBING FIRST FLOOR PLAN - AREA A BELOW SLAB        |
| P1-0-0B  | PLUMBING FIRST FLOOR PLAN - AREA B BELOW SLAB        |
| P1-0-0C  | PLUMBING LOWER LEVEL FLOOR PLAN - AREA C BELOW SLAB  |
| P1-0-0D  | PLUMBING LOWER LEVEL FLOOR PLAN - AREA D BELOW SLAB  |
| P1-1-0C  | PLUMBING LOWER LEVEL FLOOR PLAN - AREA C             |
| P1-1-0D  | PLUMBING LOWER LEVEL FLOOR PLAN - AREA D             |
| P1-1-1A  | PLUMBING FIRST FLOOR PLAN - AREA A                   |
| P1-1-1AB | PLUMBING FIRST FLOOR BELOW MEZZANINE PLAN – AREA A/B |
| P1-1-1B  | PLUMBING FIRST FLOOR PLAN - AREA B                   |
| P1-1-1C  | PLUMBING FIRST FLOOR PLAN - AREA C                   |
| P1-1-1D  | PLUMBING FIRST FLOOR PLAN - AREA D                   |
| P1-1-2A  | PLUMBING SECOND FLOOR PLAN - AREA A                  |
| P1-1-2B  | PLUMBING SECOND FLOOR PLAN - AREA B                  |

P1-1-2C PLUMBING SECOND FLOOR PLAN - AREA C P1-1-2D PLUMBING SECOND FLOOR PLAN - AREA D P1-1-3A PLUMBING THIRD FLOOR PLAN - AREA A P1-1-3B PLUMBING THIRD FLOOR PLAN - AREA B P1-1-3C PLUMBING THIRD FLOOR PLAN - AREA C PLUMBING THIRD FLOOR PLAN - AREA D P1-1-3D PLUMBING FOURTH FLOOR PLAN - AREA A P1-1-4A P1-1-4B PLUMBING FOURTH FLOOR PLAN - AREA B P1-1-4C PLUMBING FOURTH FLOOR PLAN - AREA C P1-1-4D PLUMBING FOURTH FLOOR PLAN - AREA D P1-2-1A PLUMBING ROOF PLAN - AREA A P1-2-1B PLUMBING ROOF PLAN - AREA B P1-2-1C PLUMBING ROOF PLAN - AREA C PLUMBING ROOF PLAN - AREA D P1-2-1D PLUMBING BELOW FLOOR ENLARGED PLANS P2-0-0A PLUMBING FIRST FLOOR ENLARGED PLANS P2-1-1A P3-0-1 PLUMBING DETAILS SHEET P4-0-1 PLUMBING SCHEDULES SHEET P5-0-1 PLUMBING RISER P5-0-2 PLUMBING RISER PC-1-1 PLUMBING - CONCESSIONS FLOOR LEVEL PLAN PL-1-1 PLUMBING LOCKER BUILDING PLAN PM-1-1 PLUMBING MAINTENANCE BUILDING PLAN

#### FIRE PROTECTION

| FP0-0-1     | FIRE PROTECTION COVER SHEET                             |
|-------------|---|
| FP1-1-0.5CD | FIRE PROTECTION UNDER MEZZANINE - AREAS C&D             |
| FP1-1-0C    | FIRE PROTECTION LOWER LEVEL FLOOR PLAN - AREA C         |
| FP1-1-0D    | FIRE PROTECTION LOWER LEVEL FLOOR PLAN - AREA D         |
| FP1-1-1.5AB | FIRE PROTECTION FIRST FLOOR MEZZANINE LVL PLAN - AREA A |
| FP1-1-1A    | FIRE PROTECTION FIRST FLOOR PLAN - AREA A               |
| FP1-1-1B    | FIRE PROTECTION FIRST FLOOR PLAN - AREA B               |
| FP1-1-1C    | FIRE PROTECTION FIRST FLOOR PLAN - AREA C               |
| FP1-1-1D    | FIRE PROTECTION FIRST FLOOR PLAN - AREA D               |
| FP1-1-2A    | FIRE PROTECTION SECOND FLOOR PLAN - AREA A              |
| FP1-1-2B    | FIRE PROTECTION SECOND FLOOR PLAN - AREA B              |
| FP1-1-2C    | FIRE PROTECTION SECOND FLOOR PLAN - AREA C              |
| FP1-1-2D    | FIRE PROTECTION SECOND FLOOR PLAN - AREA D              |
| FP1-1-3A    | FIRE PROTECTION THIRD FLOOR PLAN - AREA A               |
| FP1-1-3B    | FIRE PROTECTION THIRD FLOOR PLAN - AREA B               |
| FP1-1-3C    | FIRE PROTECTION THIRD FLOOR PLAN - AREA C               |
| FP1-1-3D    | FIRE PROTECTION THIRD FLOOR PLAN - AREA D               |
| FP1-1-4A    | FIRE PROTECTION FOURTH FLOOR PLAN - AREA A              |
| FP1-1-4B    | FIRE PROTECTION FOURTH FLOOR PLAN - AREA B              |
| FP1-1-4C    | FIRE PROTECTION FOURTH FLOOR PLAN - AREA C              |
| FP1-1-4D    | FIRE PROTECTION FOURTH FLOOR PLAN - AREA D              |
| FP1-2-1-A   | FIRE PROTECTION ROOF PLAN - AREA A                      |
| FP1-2-1-B   | FIRE PROTECTION ROOF PLAN - AREA B                      |
| FP1-2-1-C   | FIRE PROTECTION ROOF PLAN - AREA C                      |
| FP1-2-1-D   | FIRE PROTECTION ROOF PLAN - AREA D                      |
| FP5-0-1     | FIRE PROTECTION RISER DIAGARAM                          |
| FP6-0-1     | FIRE PROTECTION DETAILS                                 |

#### MECHANICAL

| M0-0-1  | MECHANICAL LEGENDS AND ABBREVIATIONS                |
|---------|---|
| M0-0-2  | MECHANICAL GENERAL NOTES                            |
| M0-0-3  | MECHANICAL SCOPE OF WORK                            |
| M1-1-0C | MECHANICAL DUCTWORK LOWER LEVEL FLOOR PLAN - AREA C |
| M1-1-0D | MECHANICAL DUCTWORK LOWER LEVEL FLOOR PLAN - AREA D |
| M1-1-1A | MECHANICAL DUCTWORK FIRST FLOOR PLAN - AREA A       |
| M1-1-1B | MECHANICAL DUCTWORK FIRST FLOOR PLAN - AREA B       |
| M1-1-1C | MECHANICAL DUCTWORK FIRST FLOOR PLAN - AREA C       |
| M1-1-1D | MECHANICAL DUCTWORK FIRST FLOOR PLAN - AREA D       |
| M1-1-2A | MECHANICAL DUCTWORK SECOND FLOOR PLAN - AREA A      |
| M1-1-2B | MECHANICAL DUCTWORK SECOND FLOOR PLAN - AREA B      |
| M1-1-2C | MECHANICAL DUCTWORK SECOND FLOOR PLAN - AREA C      |
| M1-1-2D | MECHANICAL DUCTWORK SECOND FLOOR PLAN - AREA D      |
| M1-1-3A | MECHANICAL DUCTWORK THIRD FLOOR PLAN - AREA A       |
| M1-1-3B | MECHANICAL DUCTWORK THIRD FLOOR PLAN - AREA B       |
| M1-1-3C | MECHANICAL DUCTWORK THIRD FLOOR PLAN - AREA C       |
| M1-1-3D | MECHANICAL DUCTWORK THIRD FLOOR PLAN - AREA D       |
| M1-1-4A | MECHANICAL DUCTWORK FOURTH FLOOR PLAN - AREA A      |
| M1-1-4B | MECHANICAL DUCTWORK FOURTH FLOOR PLAN - AREA B      |
| M1-1-CB | MECHANICAL CONCESSION BUILDING PLAN                 |
| M1-1-LB | MECHANICAL LOCKER BUILDING PLAN                     |
| M1-1-MB | MECHANICAL MAINTENANANCE BUILDING PLAN              |
| M1-2-1A | MECHANICAL ROOF PLAN - AREA A                       |
| M1-2-1B | MECHANICAL ROOF PLAN - AREA B                       |
| M1-2-1C | MECHANICAL ROOF PLAN - AREA C                       |
| M1-2-1D | MECHANICAL ROOF PLAN - AREA D                       |
| M1-3-0C | MECHANICAL PIPING LOWER LEVEL FLOOR PLAN - AREA C   |
| M1-3-0D | MECHANICAL PIPING LOWER LEVEL FLOOR PLAN - AREA D   |
| M1-3-1A | MECHANICAL PIPING FIRST FLOOR PLAN - AREA A         |
| M1-3-1B | MECHANICAL PIPING FIRST FLOOR PLAN - AREA B         |
| M1-3-1C | MECHANICAL PIPING FIRST FLOOR PLAN - AREA C         |
| M1-3-1D | MECHANICAL PIPING FIRST FLOOR PLAN - AREA D         |
| M1-3-2A | MECHANICAL PIPING SECOND FLOOR PLAN - AREA A        |
| M1-3-2B | MECHANICAL PIPING SECOND FLOOR PLAN - AREA B        |
| M1-3-2C | MECHANICAL PIPING SECOND FLOOR PLAN - AREA C        |
| M1-3-2D | MECHANICAL PIPING SECOND FLOOR PLAN - AREA D        |
| M1-3-3A | MECHANICAL PIPING THIRD FLOOR PLAN - AREA A         |
| M1-3-3B | MECHANICAL PIPING THIRD FLOOR PLAN - AREA B         |
| M1-3-3C | MECHANICAL PIPING THIRD FLOOR PLAN - AREA C         |
| M1-3-3D | MECHANICAL PIPING THIRD FLOOR PLAN - AREA D         |
| M1-3-4A | MECHANICAL PIPING FOURTH FLOOR PLAN - AREA A        |
| M1-3-4B | MECHANICAL PIPING FOURTH FLOOR PLAN - AREA B        |
| M2-0-1  | MECHANICAL ENLARGED PLANS                           |
| M2-0-2  | MECHANICAL ENLARGED PLANS                           |
| M2-0-3  | MECHANICAL ENLARGED PLANS                           |
| M3-0-1  | MECHANICAL VRF SYSTEM DIAGRAMS SHEET #1             |
| M3-0-2  | MECHANICAL VRF SYSTEM DIAGRAMS SHEET #2             |
| M3-0-3  | MECHANICAL VRF SYSTEM DIAGRAMS SHEFT #3             |
| M3-0-4  | MECHANICAL AIR RISER DIAGRAMS                       |
| M4-0-1  | MECHANICAL DETAILS SHEET #1                         |
| M4-0-2  | MECHANICAL DETAILS SHEET #2                         |
| M5-0-1  | MECHANICAL SCHEDULES SHEET #1                       |
|         |   |

| M5-0-2 | MECHANICAL SCHEDULES SHEET #2 |
|--------|-------------------------------|
| M5 0 3 |                               |

M5-0-3 MECHANICAL SCHEDULE SHEET #3

#### FIRE ALARM

| FAO-1    | FIRE ALARM LEGENDS, ABBREVIATIONS, AND GENERAL NOTES |
|----------|--|
| FA1-1-0C | FIRE ALARM LOWER LEVEL FLOOR PLAN - AREA C           |
| FA1-1-0D | FIRE ALARM LOWER LEVEL FLOOR PLAN - AREA D           |
| FA1-1-MC | FIRE ALARM LOWER LEVEL MEZZANINE PLAN - AREA C       |
| FA1-1-1A | FIRE ALARM FIRST FLOOR PLAN - AREA A                 |
| FA1-1-1B | FIRE ALARM FIRST FLOOR PLAN - AREA B                 |
| FA1-1-1C | FIREALARM FIRST FLOOR PLAN - AREA C                  |
| FA1-1-1D | FIRE ALARM FIRST FLOOR PLAN - AREA D                 |
| FA1-1-MA | FIRE ALARM FIRST FLOOR MEZZANINE PLAN - AREA A       |
| FA1-1-2A | FIRE ALARM SECOND FLOOR PLAN - AREA A                |
| FA1-1-2B | FIRE ALARM SECOND FLOOR PLAN - AREA B                |
| FA1-1-2C | FIRE ALARM SECOND FLOOR PLAN - AREA C                |
| FA1-1-2D | FIRE ALARM SECOND FLOOR PLAN - AREA D                |
| FA1-1-3A | FIRE ALARM THIRD FLOOR PLAN - AREA A                 |
| FA1-1-3B | FIRE ALARM THIRD FLOOR PLAN - AREA B                 |
| FA1-1-3C | FIRE ALARM THIRD FLOOR PLAN - AREA C                 |
| FA1-1-3D | FIRE ALARM THIRD FLOOR PLAN - AREA D                 |
| FA1-1-4A | FIRE ALARM FOURTH FLOOR PLAN - AREA A                |
| FA1-1-4B | FIRE ALARM FOURTH FLOOR PLAN - AREA B                |
| FA1-1-4C | FIRE ALARM FOURTH FLOOR PLAN - AREA C                |
| FA1-1-4D | FIRE ALARM FOURTH FLOOR PLAN - AREA D                |
| FA1-1-CB | FIRE ALARM CONCESSION BUILDING PLAN                  |
| FA1-1-LB | FIRE ALARM LOCKER BUILDING PLAN                      |
| FA1-1-MB | FIRE ALARM MAINTENANANCE BUILDING PLAN               |
| FA2-1-A  | FIRE ALARM ROOF PLAN - AREA A                        |
| FA2-1-B  | FIRE ALARM ROOF PLAN - AREA B                        |
| FA2-1-C  | FIRE ALARM ROOF PLAN - AREA C                        |
| FA2-1-D  | FIRE ALARM ROOF PLAN - AREA D                        |
| FA4-0    | FIRE ALARM HIGH SCHOOL BUILDING RISER DIAGRAM        |
| FA4-1    | FIRE ALARM RISER DIAGRAMS                            |

#### ELECTRICAL

| E0-0-1  | ELECTRICAL TITLE SHEET (NOTES & DWG LIST)            |
|---------|--|
| E0-0-2  | ELECTRICAL LEGENDS AND ABBREVIATIONS                 |
| E0-0-3  | ELECTRICAL SCOPE OF WORK                             |
| E0-1-1  | ELECTRICAL SITE PLAN                                 |
| E0-1-2  | ELECTRICAL SITE PLAN                                 |
| E0-1-3  | ELECTRICAL SITE PLAN                                 |
| E0-1-4  | SITE DETAILS   |
| E0-1-5  | SITE DETAILS   |
| E0-1-6  | TYPICAL SPORTS LIGHTING DETAILS                      |
| E0-1-7  | TYPICAL EVSE DETAILS                                 |
| E1-1-0  | ELECTRICAL LOWER LEVEL FLOOR PLAN - OVERALL PLAN     |
| E1-1-0C | ELECTRICAL POWER LOWER LEVEL FLOOR PLAN - AREA C     |
| E1-1-0D | ELECTRICAL POWER LOWER LEVEL FLOOR PLAN - AREA D     |
| E1-1-MC | ELECTRICAL POWER LOWER LEVEL MEZZANINE PLAN - AREA C |
| E1-1-MD | ELECTRICAL POWER LOWER LEVEL MEZZANINE PLAN - AREA D |
| E1-1-1  | ELECTRICAL FIRST FLOOR PLAN - OVERALL PLAN           |
|         |  |

| E1-1-1A  | ELECTRICAL POWER FIRST FLOOR PLAN - AREA A           |
|----------|--|
| E1-1-1B  | ELECTRICAL POWER FIRST FLOOR PLAN - AREA B           |
| E1-1-1C  | ELECTRICAL POWER FIRST FLOOR PLAN - AREA C           |
| E1-1-1D  | ELECTRICAL POWER FIRST FLOOR PLAN - AREA D           |
| E1-1-1MA | ELECTRICAL POWER FIRST FLOOR MEZZANINE PLAN - AREA A |
| E1-1-1MB | ELECTRICAL POWER FIRST FLOOR MEZZANINE PLAN - AREA B |
| E1-1-2   | ELECTRICAL SECOND FLOOR PLAN - OVERALL PLAN          |
| E1-1-2A  | ELECTRICAL POWER SECOND FLOOR PLAN - AREA A          |
| E1-1-2B  | ELECTRICAL POWER SECOND FLOOR PLAN - AREA B          |
| E1-1-2C  | ELECTRICAL POWER SECOND FLOOR PLAN - AREA C          |
| E1-1-2D  | ELECTRICAL POWER SECOND FLOOR PLAN - AREA D          |
| F1-1-3   | ELECTRICAL THIRD FLOOR PLAN - OVERALL PLAN           |
| E1-1-3A  | ELECTRICAL POWER THIRD FLOOR PLAN - AREA A           |
| E1-1-3B  | ELECTRICAL POWER THIRD FLOOR PLAN - AREA B           |
| E1-1-3C  | ELECTRICAL POWER THIRD FLOOR PLAN - AREA C           |
| E1-1-30  | ELECTRICAL POWER THIRD FLOOR PLAN - AREA D           |
|          |  |
|          |  |
|          |  |
|          |  |
|          |  |
| E1-1-4D  | ELECTRICAL POWER FOURTH FLOUR PLAN - AREA D          |
| E1-2-1   | ELECTRICAL POWER ROOF PLAN - OVERALL PLAN            |
| E1-2-1A  | ELECTRICAL POWER ROOF PLAN - AREA A                  |
| E1-2-1B  | ELECTRICAL POWER ROOF PLAN - AREA B                  |
| E1-2-1C  | ELECTRICAL POWER ROOF PLAN - AREA C                  |
| E1-2-1D  | ELECTRICAL POWER ROOF PLAN - AREA D                  |
| E1-1-CB  | ELECTRICAL POWER CONCESSION BUILDING PLAN            |
| E1-1-LB  | ELECTRICAL POWER LOCKER BUILDING PLAN                |
| E1-1-MB  | ELECTRICAL POWER MAINTENANCE BUILDING PLAN           |
| E2-0-05  | ELECTRICAL ROOMS POWER PART PLANS                    |
| E2-1-0C  | ELECTRICAL LIGHTING LOWER LEVEL FLOOR PLAN - AREA C  |
| E2-1-0D  | ELECTRICAL LIGHTING LOWER LEVEL FLOOR PLAN - AREA D  |
| E2-1-1A  | ELECTRICAL LIGHTING FIRST FLOOR PLAN - AREA A        |
| E2-1-1B  | ELECTRICAL LIGHTING FIRST FLOOR PLAN - AREA B        |
| E2-1-1C  | ELECTRICAL LIGHTING FIRST FLOOR PLAN - AREA C        |
| E2-1-1D  | ELECTRICAL LIGHTING FIRST FLOOR PLAN - AREA D        |
| E2-1-2A  | ELECTRICAL LIGHTING SECOND FLOOR PLAN - AREA A       |
| E2-1-2B  | ELECTRICAL LIGHTING SECOND FLOOR PLAN - AREA B       |
| E2-2-2C  | ELECTRICAL LIGHTING SECOND FLOOR PLAN - AREA C       |
| E2-1-2D  | ELECTRICAL LIGHTING SECOND FLOOR PLAN - AREA D       |
| E2-1-3A  | ELECTRICAL LIGHTING THIRD FLOOR PLAN - AREA A        |
| E2-1-3B  | ELECTRICAL LIGHTING THIRD FLOOR PLAN - AREA B        |
| E2-1-3C  | ELECTRICAL LIGHTING THIRD FLOOR PLAN - AREA C        |
| E2-1-3D  | ELECTRICAL LIGHTING THIRD FLOOR PLAN - AREA D        |
| E2-1-4A  | ELECTRICAL LIGHTING FOURTH FLOOR PLAN - AREA A       |
| E2-1-4B  | ELECTRICAL LIGHTING FOURTH FLOOR PLAN - AREA B       |
| E2-1-4C  | ELECTRICAL LIGHTING FOURTH FLOOR PLAN - AREA C       |
| E2-1-4D  | ELECTRICAL LIGHTING FOURTH FLOOR PLAN - AREA D       |
| E2-2-1A  | ELECTRICAL LIGHTING ROOF PLAN - AREA A               |
| E2-2-1B  | ELECTRICAL LIGHTING ROOF PLAN - ARFA B               |
| E2-2-1C  | ELECTRICAL LIGHTING ROOF PLAN - ARFA C               |
| E2-2-1D  | ELECTRICAL LIGHTING ROOF PLAN - AREA D               |
| E2-1-CB  | ELECTRICAL LIGHTING CONCESSION BUILDING PLAN         |
| E2-1-I R |  |
|          |  |

| E2-1-MB | ELECTRICAL LIGHTING MAINTENANCE BUILDING PLAN |
|---------|---|
| E2-3-1  | LIGHTNING PROTECTION PLAN - ROOFTOP LAYOUT    |
| E2-3-2  | LIGHTNING PROTECTION PLAN - UNDERSLAB LAYOUT  |
| E3-0-0  | ELECTRICAL SINGLE LINE DIAGRAM SHEET #1       |
| E3-0-1  | ELECTRICAL SINGLE LINE DIAGRAM SHEET #2       |
| E3-0-2  | ELECTRICAL SINGLE LINE DIAGRAM SHEET #3       |
| E3-0-3  | GROUNDING RISER DIAGRAM                       |
| E4-0-0  | ELECTRICAL POWER SCHEDULES                    |
| E4-0-1  | ELECTRICAL SCHEDULES SHEET 1                  |
| E4-0-2  | ELECTRICAL SCHEDULES SHEET 2                  |
| E4-0-3  | ELECTRICAL SCHEDULES SHEET 3                  |
| E4-0-4  | ELECTRICAL SCHEDULES SHEET 4                  |
| E4-0-5  | ELECTRICAL SCHEDULES SHEET 5                  |
| E4-0-6  | ELECTRICAL SCHEDULES SHEET 6                  |
| E4-0-7  | ELECTRICAL SCHEDULES SHEET 7                  |
| E4-0-8  | ELECTRICAL SCHEDULES SHEET 8                  |
| E4-0-9  | ELECTRICAL SCHEDULES SHEET 9                  |
| E4-0-10 | ELECTRICAL SCHEDULES SHEET 10                 |
| E4-0-11 | ELECTRICAL SCHEDULES SHEET 11                 |
| E4-0-12 | ELECTRICAL DETAIL SHEET 1                     |
| E4-0-13 | ELECTRICAL DETAIL SHEET 2                     |
| E4-0-14 | ELECTRICAL DETAIL SHEET 3                     |
| E4-0-15 | ELECTRICAL DETAIL SHEET 4                     |
| E4-0-16 | LIGHTING CONTROL SINGLE LINE DIAGRAM          |
| E4-0-17 | GROUNDING DETAILS                             |
| F4-0-18 | LUMINAIRE SCHEDUI E                           |

- E4-0-18 LUMINAIRE SCHEDULE E4-0-19 LUMINAIRE SCHEDULE E4-0-20 LUMINAIRE SCHEDULE

**TECHNOLOGY** 

| TECHNOLOGY, SECURITY & AUDIOVISUAL SYMBOL LIST<br>TECHNOLOGY AND SECURITY SITE PLAN<br>LOWER LEVEL TECHNOLOGY CABLE ROUTING<br>LOWER LEVEL TECHNOLOGY AND SECURITY PLAN - AREA C<br>LOWER LEVEL TECHNOLOGY AND SECURITY PLAN - AREA D<br>FIRST FLOOR TECHNOLOGY AND SECURITY PLAN - AREA A<br>FIRST FLOOR TECHNOLOGY AND SECURITY PLAN - AREA A<br>FIRST FLOOR TECHNOLOGY AND SECURITY PLAN - AREA B<br>FIRST FLOOR TECHNOLOGY AND SECURITY PLAN - AREA B |
|---|
| FIRST FLOOR TECHNOLOGY AND SECURITY PLAN - AREA D   |
| SECOND FLOOR TECHNOLOGY CABLE ROUTING   |
| SECOND FLOOR TECHNOLOGY AND SECURITY PLAN - AREA A  |
| SECOND FLOOR TECHNOLOGY AND SECURITY PLAN - AREA B  |
| SECOND FLOOR TECHNOLOGY AND SECURITY PLAN - AREA C  |
| SECOND FLOOR TECHNOLOGY AND SECURITY PLAN - AREA D  |
| THIRD FLOOR TECHNOLOGY CABLE ROUTING  |
| THIRD FLOOR TECHNOLOGY AND SECURITY PLAN - AREA A   |
| THIRD FLOOR TECHNOLOGY AND SECURITY PLAN - AREA B   |
| THIRD FLOOR TECHNOLOGY AND SECURITY PLAN - AREA C   |
| THIRD FLOOR TECHNOLOGY AND SECURITY PLAN - AREA D   |
| FOURTH FLOOR TECHNOLOGY CABLE ROUTING   |
| FOURTH FLOOR TECHNOLOGY AND SECURITY PLAN - AREA A  |
| FOURTH FLOOR TECHNOLOGY AND SECURITY PLAN - AREA B  |
|   |

- T1-1-4C FOURTH FLOOR TECHNOLOGY AND SECURITY PLAN AREA C
- T1-1-4D FOURTH FLOOR TECHNOLOGY AND SECURITY PLAN AREA D
- TC-1-1 CONCESSION BUILDING TECHNOLOGY & SECURITY PLAN
- TL-1-1 LOCKER BUILDING TECHNOLOGY & SECURITY PLAN
- TM-1-1 MAINTENANCE BUILDING TECHNOLOGY & SECURITY PLAN
- T2-1 ENLARGED PLANS TECHNOLOGY
- T2-2 ENLARGED PLANS AND RACK DETAILS TECHNOLOGY
- T2-3 RISER DIAGRAMS TECHNOLOGY AND SECURITY
- T2-4 TYPICAL DETAIL DIAGRAMS TECHNOLOGY
- T3-1 TYPICAL WIRING AND DETAIL DIAGRAMS SECURITY

END OF TABLE OF CONTENTS
Table of Contents **01** 

# 6B.3.6

### **60% CONSTRUCTION DOCUMENT PROJECT MANUAL**

## 60% CONSTRUCTION DOCUMENT PROJECT MANUAL **TABLE OF CONTENTS**

#### **PROJECT MANUAL**

#### TABLE OF CONTENTS

#### **DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

Document 000110Table of ContentsDocument 000115List of Drawings

#### VOLUME 1

#### PROCUREMENT REQUIREMENTS

By CM/OPM

CONTRACTING REQUIREMENTS

By CM/OPM

Document 003100 Available Project Information Geotechnical Report Hazardous Material Summary Report

#### **SPECIFICATIONS**

#### **DIVISION 01 - GENERAL REQUIREMENTS**

| Section 011100 | Summary of Work                                  |
|----------------|--|
| Section 011400 | Work Restrictions                                |
|                | CORI Requirements                                |
| Section 012200 | Unit Prices                                      |
| Section 012201 | Unit Price Schedule                              |
| Section 012300 | Alternates                                       |
| Section 012400 | Schedule of Values                               |
| Section 013100 | Project Management and Coordination              |
| Section 013119 | Project Meetings                                 |
| Section 013200 | Construction Progress Documentation              |
| Section 013300 | Submittal Procedures                             |
| Section 013301 | Substitution Request Form                        |
| Section 014000 | Quality Requirements                             |
| Section 014523 | Testing and Inspecting Services                  |
| Section 015000 | Temporary Facilities and Controls                |
|                | Project Sign                                     |
| Section 017329 | Cutting and Patching                             |
| Section 017400 | Construction Waste Management                    |
| Section 017700 | Closeout Procedures                              |
| Section 017839 | Project Record Documents                         |
| Section 018110 | Sustainable Design Requirements                  |
|                | LEED Scorecard                                   |
| Section 018120 | Construction Indoor Air Quality (IAQ) Management |
| Section 019113 | Commissioning Requirements                       |

#### **DIVISION 02 - EXISTING CONDITIONS**

| Section 023000 | Subsurface Investigation                  |
|----------------|---|
| Section 024100 | Demolition                                |
| Section 028213 | Asbestos Abatement                        |
| Section 028313 | Hazardous Materials Handling And Disposal |

#### **DIVISION 03 – CONCRETE**

| Section 033000 | Cast-In-Place Concrete                 |
|----------------|--|
| Section 033300 | Architectural Concrete                 |
| Section 034113 | Precast and Prestressed Concrete Plank |

#### DIVISION 04 - MASONRY

| Section 040001 * | Masonry Work   |
|------------------|--|
| Section 042000   | Unit Masonry (part of 040001 TB)                                 |
| Section 044313   | Calcium Silicate Masonry Veneer (Cast Stone) (part of 040001 TB) |

#### **DIVISION 05 – METALS**

| Section 050001 * | Miscellaneous and Ornamental Iron             |
|------------------|---|
| Section 051200   | Structural Steel Framing                      |
| Section 051500   | Stud Shear Connectors                         |
| Section 052100   | Steel Joist Framing                           |
| Section 053100   | Steel Decking                                 |
| Section 054000   | Cold-Formed Metal Framing                     |
| Section 055000   | Metal Fabrications (part of 050001 TB)        |
| Section 055100   | Metal Stairs and Railings (part of 050001 TB) |
| Section 055300   | Metal Grating (part of 050001 TB)             |
| Section 055813   | Architectural Metal Column Covers             |
| Section 057300   | Decorative Metal Railings (part of 050001 TB) |
|                  |   |

#### **DIVISION 06 - WOOD, PLASTICS AND COMPOSITES**

| Section 061000 | Rough Carpentry                 |
|----------------|---------------------------------|
| Section 061600 | Sheathing                       |
| Section 064020 | Interior Architectural Woodwork |
| Section 066400 | FRP Paneling                    |

#### **DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

| Section 070001 * | Waterproofing, Dampproofing and Caulking              |
|------------------|---|
| Section 070002 * | Roofing and Flashing                                  |
| Section 070800   | Thermal and Moisture Protection Systems Commissioning |
| Section 071100   | Bituminous Dampproofing (part of 070001 TB)           |
| Section 071300   | Sheet Waterproofing (part of 070001 TB)               |
| Section 071610   | Crystalline Waterproofing (part of 070001 TB)         |
| Section 072100   | Thermal Insulation                                    |
| Section 072600   | Vapor Retarder  |
| Section 072700   | Air Barriers (part of 070001 TB)                      |
| Section 074200   | Metal Wall Panels                                     |
| Section 075400   | Thermoplastic Membrane Roofing (part of 070002 TB)    |
| Section 076100   | Sheet Metal Siding (part of 070002 TB)                |
| Section 076200   | Sheet Metal Flashing and Trim (part of 070002 TB)     |
| Section 077100   | Roof Specialties (part of 070002 TB)                  |
| Section 077200   | Roof Accessories                                      |
| Section 077700   | Wall Cladding Support System                          |
| Section 078100   | Applied Fireproofing                                  |
| Section 078410   | Penetration Firestopping                              |
| Section 078440   | Fire-Resistive Joint Systems                          |
| Section 079200   | Joint Sealants (part of 070001 TB)                    |
| Section 079500   | Expansion Control                                     |

#### **DIVISION 08 – OPENINGS**

| Section 080001 * | Metal Windows                             |
|------------------|---|
| Section 080002 * | Glass and Glazing                         |
| Section 080800   | Opening Systems Commissioning             |
| Section 081110   | Hollow Metal Doors and Frames             |
| Section 081119   | Stainless-Steel Doors and Frames          |
| Section 081400   | Flush Wood Doors                          |
| Section 083110   | Access Doors and Frames                   |
| Section 083310   | Overhead Coiling Doors                    |
| Section 083470   | Interior Sound Control Door Assemblies    |
| Section 083510   | Horizontal-Sliding Accordion Fire Doors   |
| Section 083610   | Sectional Doors                           |
| Section 084110   | Aluminum-Framed Entrances and Storefronts |
| Section 084410   | Glazed Aluminum Curtain Walls             |
| Section 084523   | Fiberglass-Sandwich-Panel Assemblies      |
| Section 085110   | Aluminum Windows (part of 080001 TB)      |
| Section 085610   | Pass Windows                              |
| Section 086200   | Plastic Unit Skylights                    |
| Section 087100   | Door Hardware                             |
| Section 088000   | Glazing (part of 080002 TB)               |
| Section 088050   | Fire-Rated Glazing and Frames             |
| Section 089000   | Louvers and Vents                         |

#### **DIVISION 09 – FINISHES**

| Section 090002 * | Tile   |
|------------------|--|
| Section 090003 * | Acoustical Tile  |
| Section 090005 * | Resilient Floors   |
| Section 090006 * | Terrazzo   |
| Section 090007 * | Painting   |
| Section 092110   | Gypsum Board Assemblies                                      |
| Section 092120   | Gypsum Board Shaft-Wall Assemblies                           |
| Section 093013   | Ceramic Tile (part of 090002 TB)                             |
| Section 093019   | Porcelain Tiling (part of 090002 TB)                         |
| Section 095100   | Acoustical Ceilings (part of 090003 TB)                      |
| Section 096400   | Wood Flooring  |
| Section 096460   | Wood Athletic Flooring                                       |
| Section 096510   | Resilient Flooring and Accessories (part of 090005 TB)       |
| Section 096516   | Vinyl Sheet Flooring (part of 090005 TB)                     |
| Section 096523   | Rubber Stair Tread, Riser, Tile and Base (part of 090005 TB) |
| Section 096530   | Rubber Wall Base (part of 090005 TB)                         |
| Section 096543   | Linoleum Sheet Flooring (part of 090005 TB)                  |
| Section 096560   | Resilient Athletic Flooring (part of 090005 TB)              |
| Section 096600   | Terrazzo Flooring (part of 090006 TB)                        |
| Section 096710   | Resinous Flooring  |
| Section 096813   | Tile Carpeting   |
| Section 096816   | Sheet Carpeting  |
| Section 097200   | Wall Coverings   |
| Section 097730   | Interior Wall Panels   |
| Section 098120   | Sprayed Acoustic Insulation                                  |
| Section 098430   | Sound-Absorbing Panels                                       |
| Section 099000   | Painting and Coating (part of 090007 TB)                     |

#### **DIVISION 10 – SPECIALTIES**

| Section 101100 | Visual Display Surfaces                         |
|----------------|---|
| Section 101400 | Signage   |
| Section 102110 | Toilet Compartments                             |
| Section 102120 | Cubicle Curtains and Tracks                     |
| Section 102210 | Wire Mesh Partitions                            |
| Section 102220 | Folding Panel Partitions                        |
| Section 102610 | Corner Guards                                   |
| Section 102800 | Toilet Accessories                              |
| Section 104100 | Emergency Access and Information Cabinets       |
| Section 104313 | Automatic External Defibrillator (AED) Cabinets |
| Section 104400 | Fire Protection Specialties                     |
| Section 105110 | Metal Lockers                                   |
| Section 107110 | Exterior Sun Control                            |

#### **DIVISION 11 – EQUIPMENT**

| Section 111300 | Loading Dock Equipment   |
|----------------|--------------------------|
| Section 113300 | Retractable Stairs       |
| Section 114000 | Food Service Equipment   |
| Section 114500 | Residential Appliances   |
| Section 115210 | Projection Screens       |
| Section 115730 | Cosmetology Equipment    |
| Section 116100 | Automotive Equipment     |
| Section 116133 | Stage Rigging            |
| Section 116143 | Stage Drapery            |
| Section 116153 | Stage Power and Control  |
| Section 116620 | Athletic Equipment       |
| Section 116800 | Playground Equipment     |
| Section 116833 | Athletic Field Equipment |
| Section 118129 | Facility Fall Protection |
|                |                          |

#### **DIVISION 12 – FURNISHINGS**

| Section 122216 | Vertical Louver Blinds         |
|----------------|--------------------------------|
| Section 122400 | Shades                         |
| Section 123000 | Manufactured Casework          |
| Section 123570 | Dental Cabinets                |
| Section 124810 | Entrance Floor Mats and Frames |
| Section 124820 | Entrance Floor Grilles         |
| Section 126600 | Telescoping Stands             |
| Section 126623 | Telescopic Chair Platform      |
|                |                                |

#### **DIVISION 13 - SPECIAL CONSTRUCTION**

Section 133416BleachersSection 133420Pre-Engineered Building Systems

#### **DIVISION 14 - CONVEYING EQUIPMENT**

| Section 140001 * | Elevators   |
|------------------|---|
| Section 142150 * | Gearless Machine Room Less Traction Elevators (part of 140001 TB) |

#### VOLUME 2

**DIVISION 21 - FIRE SUPPRESSION\*** 

| Section 210517 Sleeves and Sleeve Seals for Fire-suppression Pipir | ۱q |
|--|----|
|  | 0  |
| Section 210533 Heat Tracing for Fire-Suppression Piping            |    |
| Section 210800 Fire Protection Systems Commissioning               |    |
| Section 211313 Fire Protection Piping Systems                      |    |
| Section 212933 Controllers for Fire-Pump Drivers                   |    |
| Section 213113 Fire Protection Fire Pump Systems                   |    |

#### **DIVISION 22 - PLUMBING\***

| Section 220000    | General Requirements for Plumbing                      |
|-------------------|--|
| Section 220005    | Coordination Drawing Requirements for Plumbing         |
| Section 220513    | Common Motor Requirements for Plumbing                 |
| Section 220517    | Sleeves and Sleeve Seals for Plumbing Piping           |
| Section 220518    | Escutcheons For Plumbing Piping                        |
| Section 220519    | Meters and Gages for Plumbing Piping                   |
| Section 220523    | Valves and Specialties for Plumbing Piping             |
| Section 220529    | Hangers and Supports for Plumbing Piping and Equipment |
| Section 220548.13 | Vibration Controls for Plumbing Piping and Equipment   |
| Section 220553    | Identification for Plumbing Piping and Equipment       |
| Section 220719    | Plumbing Piping Insulation                             |
| Section 220800    | Plumbing Systems Commissioning                         |
| Section 221116    | Domestic Water Piping                                  |
| Section 221123    | Natural Gas Piping                                     |
| Section 221123.21 | Inline, Domestic-Water Pumps                           |
| Section 221316    | Sanitary Waste and Vent Piping                         |
| Section 224100    | Plumbing Fixtures                                      |
| Section 224500    | Emergency Plumbing Fixtures                            |
| Section 226113    | Compressed Air Piping for Laboratory Facilities        |
| Section 226119    | Compressed Air-Equipment for Laboratory Facilities     |
| Section 226213    | Vacuum Piping for Laboratory Facilities                |
| Section 226219    | Vacuum Equipment for Laboratory Facilities             |
| Section 226600    | Chemical Waste Systems for Laboratory Facilities       |
|                   |  |

#### DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING\*

| Section | 230000    | General Requirements for HVAC                      |
|---------|-----------|--|
| Section | 230005    | Coordinated Drawing Requirements for HVAC          |
| Section | 230513    | Common Motor Requirements for HVAC Equipment       |
| Section | 230516    | Expansion Fittings and Loops for HVAC Piping       |
| Section | 230517    | Sleeves and Sleeve Seals for HVAC Piping           |
| Section | 230518    | Escutcheons For HVAC Piping                        |
| Section | 230519    | Meters and Gauges for HVAC Piping                  |
| Section | 230523    | Valves for HVAC Piping                             |
| Section | 230529    | Hangers And Supports for HVAC Piping and Equipment |
| Section | 230533    | Heat Tracing for HVAC Piping                       |
| Section | 230553    | Identification For HVAC Piping and Equipment       |
| Section | 230593    | Testing, Adjusting, And Balancing For HVAC         |
| Section | 230713    | Duct Insulation                                    |
| Section | 230719    | HVAC Piping Insulation                             |
| Section | 230800    | HVAC Systems Commissioning                         |
| Section | 230910    | Instrumentation and Control Equipment              |
| Section | 230923    | Direct Digital Control (DDC) System for HVAC       |
| Section | 230993.11 | Sequence of Operations for HVAC DDC                |
| Section | 232300    | Refrigerant Piping                                 |
| Section | 232500    | HVAC Water Treatment                               |
| Section | 233113    | Metal Ducts  |
| Section | 233300    | Air Duct Accessories                               |
| Section | 233423    | HVAC Power Ventilators                             |
| Section | 233600    | Air Terminal Units                                 |
| Section | 233713    | Grilles, Registers and Diffusers                   |
| Section | 237223.19 | Packaged Indoor Fixed Plate Energy Recovery Units  |
| Section | 237343.19 | Outdoor, Custom Air-Handling Units                 |
| Section | 238126    | Split-System Air-Conditioners                      |
| Section | 238129    | Variable-Refrigerant-Flow HVAC Systems             |
| Section | 238216.14 | Electric Resistance Air Coils                      |
| Section | 238239.13 | Cabinet Unit Heaters                               |
| Section | 238239.19 | Wall and Ceiling Unit Heaters                      |

#### **DIVISION 26 - ELECTRICAL\***

| Section 260000    | General Requirements for Electrical                          |
|-------------------|--|
| Section 260005    | Coordination Drawing Requirements for Electrical             |
| Section 260519    | Low-Voltage Electrical Power Conductors and Cables           |
| Section 260526    | Grounding and Bonding for Electrical Systems                 |
| Section 260529    | Hangers and Supports for Electrical Systems                  |
| Section 260533    | Raceways and Boxes for Electrical Systems                    |
| Section 260544    | Sleeves and Sleeve Seals for Electrical Raceways and Cabling |
| Section 260553    | Identification for Electrical Systems                        |
| Section 260573.13 | Short-circuit Studies  |
| Section 260573.16 | Coordination Studies   |
| Section 260573.19 | Arc-Flash Hazard Analysis                                    |
| Section 260800    | Electrical Systems Commissioning                             |
| Section 260943.16 | Digital Addressable Lighting Controls                        |
| Section 262213    | Low-Voltage Distribution Transformers                        |
| Section 262413    | Switchboards   |
| Section 262416    | Panelboards  |
| Section 262713    | Electricity Metering   |
| Section 262726    | Wiring Devices   |
| Section 262816    | Enclosed Switches and Circuit Breakers                       |
| Section 263600    | Transfer Switches  |
| Section 264621    | Addressable Fire Alarm Systems                               |

#### **DIVISION 27 - COMMUNICATIONS\***

| Section 270800 | Communications Systems Commissioning   |
|----------------|--|
| Section 271000 | Communications                         |
| Section 274100 | IPTV And Video On Demand System        |
| Section 274101 | Large Venue Audiovisual Systems        |
| Section 274120 | Classroom Speech Reinforcement Systems |
| Section 275115 | Public Address System                  |
| Section 275313 | Clock System                           |
|                |  |

#### **DIVISION 28 - ELECTRONIC SAFETY AND SECURITY\***

| Section 280800 | Electronic Safety and Security Systems Commissioning |
|----------------|--|
| Section 281600 | Integrated Electronic Security Systems               |

#### **DIVISION 31 - EARTHWORK**

| Section 311000 | Site Clearing And Preparation      |
|----------------|------------------------------------|
| Section 312000 | Earth Moving                       |
| Section 312500 | Erosion And Sedimentation Controls |

#### **DIVISION 32 - EXTERIOR IMPROVEMENTS**

| Section 321216    | Asphalt Paving                              |
|-------------------|---|
| Section 321313    | Exterior Concrete                           |
| Section 321600    | Curbing                                     |
| Section 321723    | Pavement Markings                           |
| Section 321816.13 | Playground Protective Surfacing Curbing     |
| Section 321823    | Synthetic Turf Curbing – Curbing            |
| Section 321823.13 | Baseball & Softball Field Surfacing Curbing |
| Section 321823.39 | Resilient Sport Surfacing Curbing           |
| Section 321823.43 | Recreational Court Surfacing Curbing        |
| Section 323000    | Site Improvements Curbing                   |
| Section 323100    | Fencing                                     |
| Section 323300    | Site Furnishings                            |
| Section 329000    | Planting                                    |
| Section 329100    | Loam And Planting Preparation               |
| Section 329200    | Turf And Grasses                            |

#### **DIVISION 33 - UTILITIES**

| Section 330130 | Relining Sewer And Drain Pipes |
|----------------|--------------------------------|
| Section 331000 | Water Utilities                |
| Section 333000 | Sanitary Sewerage Utilities    |
| Section 334000 | Storm Drainage Utilities       |
|                |                                |

#### END OF TABLE OF CONTENTS

Designer Confirmation that Science Labs Comply with MSBA Guidelines 01

# **6B.3.7** PROJECT COORDINATION

### PROJECT COORDINATION DESIGNER CONFIRMATION THAT SCIENCE LABS COMPLY WITH MSBA GUIDELINES

#### 6B.3.7-01

DESIGNER CONFIRMATION THAT SCIENCE LABS COMPLY WITH MSBA GUIDELINES

The science labs at Northeast Metro Tech follow MSBA's Science Lab Guidelines.

There are eight (8) science labs, each meeting the following requirements:

- Each lab meets the 1,440 SF requirement which is based on 60 SF per student for a total of 24 students.
- The furniture is designed to be flexible, allowing for either lecture style seating or a peninsula layout for lab work.
- No fixed casework within the central floor area.
- Fixed casework is around the perimeter with movable lab benches that match the height of the perimeter counters. This allows the benches to be pulled up to the perimeter counters when students are doing lab work.

