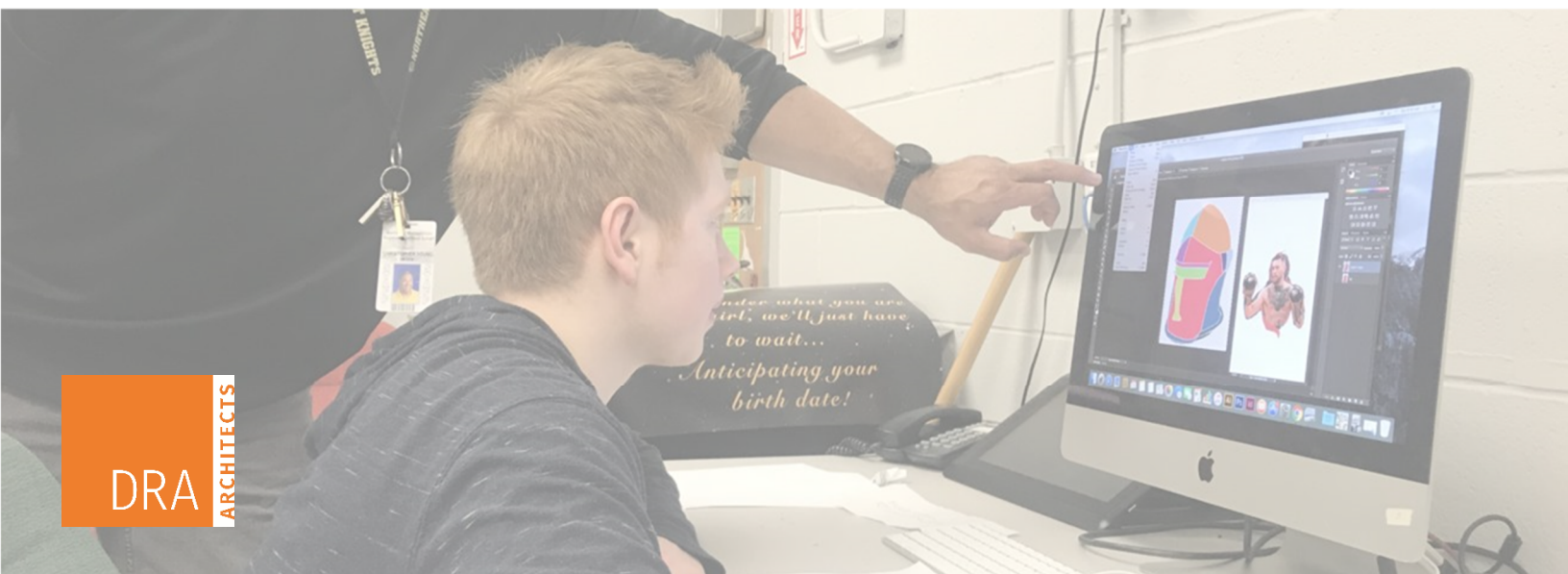




MSBA 90% CONSTRUCTION
DOCUMENTS SUBMITTAL

MAY 12, 2023

Northeast Metropolitan Regional Vocational High School



MSBA 90% CONSTRUCTION DOCUMENTS SUBMITTAL

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BASIC PROJECT INFORMATION

Project Update

The project is currently in MSBA Module 6 – Detailed Design, specifically the 90% Construction Documents (90% CD's) phase. On May 24, 2023, the NEMT School Building Committee voted to approve the project team to submit the 90% CD's package to the MSBA. As it relates to early bidding and procurement, on May 1, 2023, the District executed Amendment 003 which included a Request to Award (RTA) from Gilbane Building Company for the sitework package. Additionally, on May 16, 2023, the District executed Amendment 004 that included an RTA for the structural steel package. Gilbane Amendment 003 and Amendment 004 have been included in this submittal for reference which includes the contract award amounts and have been submitted to the MSBA under separate cover for record. Currently, Gilbane is also actively soliciting proposals for the concrete foundations/slabs and precast concrete plank scopes of work. Gilbane anticipates an RTA for both bid packages will be submitted to the project team and District for review and approval in early June 2023. Looking forward, the project team aims to complete the 100% CD's by mid-July 2023 with the goal of issuing bidding documents at the end of July 2023. The project team anticipates awarding filed sub-bid trade contractors in September 2023, with the hope of an executed Guaranteed Maximum Price (GMP) by the end of 2023.

The project team continues the permitting process with Wakefield Conservation Commission for the approval of an Order of Conditions. As a recap, the project team submitted the Notice of Intent (NOI) on September 22, 2022, and the public hearing process closed on May 16, 2023. The Wakefield Conservation Commission is currently meeting to discuss a vote to approve or deny an Order of Conditions, and develop said conditions if approved. The Wakefield Conservation Commission owes the District an approval with an Order of Conditions or a denial by June 6, 2023.

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 6C.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 Site Preparation and Structural Steel Packages have been bid. 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 the MSBA 60% CD Submittal.

District Project Budget Updates

As a recap, the project did receive additional funding appropriation at the 60% CDs submission timeline which has been documented within the 60% CD submission cover letter/updated project budget. Since the 60% CDs submission to the MSBA, there have not been any additional funding appropriations received for the project. Additionally, there have been no changes to the construction cost or total project budget.

- 01** OPM's Cover Letter
- 02** OPM's Coordinated Design Review
- 03** Commissioning Consultants Review
- 04** MSBA 60% Construction Document Review
 - 04a** Copy of MSBA 60% CD Review w/ Designer Comments
 - 04b** Comments Addressed Since 60% CD Review
- 05** Confirmation of Designer Evaluation Submittal

6C.2.1

OPM SUBMITTAL REVIEW & COORDINATION

OPM SUBMITTAL REVIEW & COORDINATION
OPM'S COVER LETTER

6C.2.1 - 01



May 24, 2023

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

RE: NEMT High School Project 90% Construction Documents Submittal

Dear Ms. Pappacostas:

On behalf of the Northeast Metropolitan Regional Vocational School District, attached please find the project's 90% 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 90% CD package to the MSBA on 5/24/2023. PMA has coordinated and reviewed the materials within and finds this submittal to be complete and in accordance with all MSBA requirements. PMA has approved this submission.

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, phasing, 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 60% CD Review and the project team's response is included in this package.

Please note the total project budget remains the same as documented within the 60% CD MSBA submission at \$324,922,542. The Proposed Project as documented within this 90% CD 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,

Joseph DeSantis
Director
PMA Consultants – OPM

OPM SUBMITTAL REVIEW & COORDINATION

OPM'S COORDINATED DESIGN REVIEW

6C.2.1 - 02

NORTHEAST METRO TECH – 90% CD REVIEW COMMENTS

Date:	5/15/2023
Project:	Northeast Metropolitan Regional Vocational High School Project
Subject:	90% CD Cost Estimate Set - PMA Review Comments (3/31/2023 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 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-0-01	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, Nitsch, DRA, 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, Nitsch		Open

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
3.0.9	L203, 5/L603	5/15/20223	90% CD	Coordinate student lot gate access with Owner (fob, keycard, etc.).	Warner Larson, BALA, DRA		Open
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	Furniture 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 without rotating screen or hard drawings in hand (should be reviewing wall sections from bottom floor-top floor without needing to rotate page). 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
4.0.10	GENERAL	8/19/2022	DD	Record Item: Final selection of Graphic Arts printer to be coordinated with construction / location within building depending on weight limitations.	DRA		Closed
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 pooling with some areas currently designated to slope towards center and do 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

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
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), but asks DRA to review and confirm access to general roofs area for C/D is based off doorway off main staircase in NE portion of the building	DRA		Open
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 A1-2-1D	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 areas around the building to avoid icicles in winter/potential impalement 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 & TYP	8/19/2022	DD	Title under floor plan and highlighted building key plan appear that they need to be updated to reflect Area C lower level. See A1-1-0D for similar issue. Can 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 next update to show general lighting layout, fire protection heads, mechanical information (think classroom fans). Some RCPs in specific rooms/hallways have ceiling heights but others are missing	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 next update to show general lighting layout, fire protection heads, mechanical information (think classroom fans), miscellaneous devices, etc. Some RCPs in specific rooms/hallways have ceiling heights but others are missing	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 A8-1-1D	8/19/2022	DD	In general, most RCPs in areas on this drawing need to be progressed in next update to show fire protection heads, mechanical information (think classroom fans), miscellaneous devices, etc. Most RCPs in specific 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 opening prior to Auditorium entrance required	DRA		Open

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
4.0.43	A8-1-2A through A8-1-2D	8/19/2022	DD	In general, most RCPs in areas on this drawing need to be progressed in next update to show lighting layout, fire protection heads, mechanical information (think classroom fans), miscellaneous devices, etc. Most RCPs in specific rooms/hallways have ceiling heights but other small rooms are missing (i.e. Storage)	DRA		Open
4.0.47	A8-1-3A through A8-1-3D	8/19/2022	DD	In general, most RCPs in areas on this drawing need to be progressed in next update to show lighting layout, fire protection heads, mechanical information (think classroom fans), miscellaneous devices, etc. Most RCPs in specific rooms/hallways have ceiling heights but other small rooms are missing (i.e. 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 A8-1-4D	8/19/2022	DD	In general, most RCPs in areas on this drawing need to be progressed in next update to show lighting layout, fire protection heads, mechanical information (think classroom fans), miscellaneous devices, etc. Most RCPs in specific 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 A6-3-7	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 discrepancies.	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 elevations vs. landscape/civil plans (DRA preference to keep Architectural baseline/landscape separate but make plenty of notes indicating what the first floor elevation on architectural equals landscape, but Gilbane has 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

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
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
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 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 A2-1-8	1/20/2023	60% CD	Expansion joint between column lines AA and Y.9 not shown on SOME building elevation views where these column lines exist. Asking DRA to add this expansion joint for any building elevation that has these column lines. 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 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 on several drawings (example: A1-1-0C, Area C displayed; however, Area A 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 department leaders had requested multiple tack boards. The current design appears to include only (1) 8' tackboard. Please confirm if additional 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, high ceilings in the Photo/Storage room were requested. A ceiling height is not listed for this space. Please confirm ceiling height and verify it meets staff needs	DRA		Open
4.0.89	A3-2-1 through A3-2-19	1/20/2023	60% CD	Wall Sections look good dimension wise as well as reinforcing, façade, etc. but need some sections need to call out flashing, and additionally details for transition of materials are required to be circled on sections/referred to 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". 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. 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

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4.0.98	A1-1-1A, 1/A7-1-1, 1/A7-1-2,	5/15/2023	90% CD	The bench under Stair 1 doesn't appear to have a callout on the Architectural floor plans and the detail is difficult to find. Suggest adding a callout and detail for the bench on the floor plans.	DRA		Open
4.0.99	A1-1-1A	5/15/2023	90% CD	Locker Room A148A shows lockers on the plan West wall; however, a locker count or tier height is not identified.	DRA		Open
4.0.100	A1-1-1A, etc.	5/15/2023	90% CD	Missing locker count and tier height on several drawings.	DRA		Open
4.0.101	A1-1-1A	5/15/2023	90% CD	Please confirm the swing for door A141C.2 (Room A141C) is correct. As currently drawn, the inswing door may interfere with the adjacent closet doors. If it is anticipated that this will be a high traffic door, please review if it should be changed to an outswing door.	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 added at each bed. The drawings appear to reflect this for the beds surrounding the shop space; however, a data drop is not shown for the Mock Ant room. Please confirm if a data drop is required here.	DRA		Open
6.0 Theater							
7.0 Food Service							
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 plans (S1-1-OOC 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 plans (S1-1-OOC 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 mezzanine framing drawings	1/20/2023	60% CD	Mezzanine framing plan needs to indicate design loads. Typical throughout all mezzanine drawings.	EDG		Open

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8.0.16	All framing drawings (S1-1-C 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 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
8.0.24	S1-1-0C	1/20/2023	60% CD	Clean up of existing dimensions / adding dimensions for various wall segments required for concrete retaining wall on Column Lines Y.9-AA 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. 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							
10.0.1	GENERAL	8/19/2022	DD	Trap Primers are suggested for all floor drains.	BALA		Open
10.0.2	GENERAL	8/19/2022	DD	Any under slab piping should show symbols and/or verbage/callouts that they 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	The line item of "provide wall hydrant" is this appropriate for the plumbing 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

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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
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. BALA to confirm	BALA		Open
10.0.23	P1-0-0C	8/19/2022	DD	There are three symbols in the boiler room COO2, one looks like a gas/oil 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 not labeled.	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 TLT 579. Is this Domestic water, vents, or drains? All of these should be 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 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 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

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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
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 shows "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	EWB 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

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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". 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. Please confirm that these should be located in column enclosures and not in 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 and 607. This line is not labeled or sized and open-ended. This line also 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
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 plumbing lines (for the biotech compressor and the line leading towards the 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 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

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
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
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, TLT B103C, (unlabeled) bathroom next to Locker B101B, Fire Pump Room, 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 C008 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

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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 is in the "Generator Panels C007" room. To be relocated. This is in Room 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 diagrammatically 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 "provide wall hydrant" do not show those symbols at those locations, nor does it have any water piping shown to it	BALA		Open
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 specified or labeled to refer contractor to the specifications of that piece of equipment. Thermometer on 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 runs through Maintenance Room. Are those meant to be there? Not 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 floor drain should ALL be shown and labeled/specified in this room. It should also show the plumbing lines to each of these equipment for estimating purposes. If there is a grease trap, we should have location and associated 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

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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 Off that is readily accessible. Each shop should have the ability to shut down 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 separate sink for disposal of urine was indicated to be required in addition to a standard handwashing sink within the "Dirty" room. The Plumbing and Equipment drawings only show 1 sink in this room. Please update drawings to reflect 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 sink in the "shop space" should be ADA. PMA believes one sink may be used to cleaning art supplies, should a plaster trap be specified for one of these 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
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 at a lower elevation than Corridor ceiling, then sprinkler heads should be 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 outhur 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

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
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	Hatching 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
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 ceiling 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-4 to the 50" diameter and 60" diameter ductwork that span through the Electrical shop. However, the largest size of ductwork is shown, however 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	Ductwork in southwestern most portion of drawing (coming from Dry Storage) is not sized	BALA		Open

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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 condensers?	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 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
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. 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 Stadium Elevator	BALA		Open

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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
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-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 indicté 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 Fire Alarm							
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-OC 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

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15.0.5	General	8/19/2022	DD	Design team to review all overhang areas and determine with if gutter/heat trace is required to avoid potential impalment situation in winter with icicles 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 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
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. 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	EWB'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

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
15.0.36	E1-1-1A	8/19/2022	DD	There is an outlet in Vestibule 420, but no outlets in Vestibule of Main 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? 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
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 labeled.	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 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

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
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 located on the exterior of the building. Right next to that is an outlet that is on the exterior of the building. To confirm that is the intent. Not sure it would belong in Classroom either, as adjacent classrooms do not have an 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
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 to the east of General Supply C015, across the hallway where desks are 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 GFIs are required? 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 there should be a ceiling hung pull down outlet to be able to utilize for 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

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
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 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							
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 Small Engine Room within the Auto Tech Shop. The current mounting location may create visibility issues for other students. Please confirm if this screen should be mounted on the East wall of the room or a mobile screen on 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 Automotive 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 Req'd		Record
17.0.4	VOC-03 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 Req'd		Record
17.0.5	VOC-04 Business Office 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 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 Carpentry	8/19/2022	DD	Has NEMT confirmed that 11'-4" OH door is acceptable?	DRA/NEMT(?)		Open
17.0.8	VOC-05 Carpentry	8/19/2022	DD	Has DRA contacted Dustpipe to discuss dust collection system design?	DRA		Open
17.0.9	VOC-06 Cosmetology	8/19/2022	DD	Need to meet with Staff to review June plans	NEMT		Tracking

Item No.	Ref Drawing.	Date Opened	Document Set	Review Comment	Action by	Comment Response	Status
17.0.10	VOC-07 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 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 Dental Asstg	8/19/2022	DD	Please revise note directly above storage room to only point to chairs on Upper Classmen side for medical grade. School will only use Upper Classmen side in the future.	DRA		Open
17.0.13	VOC-08 Dental Asstg	8/19/2022	DD	Has NEMT followed up regarding the Ultrasonic setup?	DRA		Open
17.0.14	VOC-08 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 & 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 & 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
17.0.17	VOC-11: Early Childhood 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: 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 shon	DRA		Open
17.0.19	VOC-13: 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: 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: 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: 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: Plumbing & Pipefitting	8/19/2022	DD	Soldering tables appear to have been removed?	DRA		Open
17.0.24	VOC-19 Marketing	8/19/2022	DD	Lab - Can you confirm if sublimation machine is carried per staff request at 6/1/22 meeting?	DRA		Open
18.0 General							
18.0.1	ALL	5/15/2023	90% CD	Update drawings to reflect maintenance building change.	ALL		Open
18.0.2	ALL	5/15/2023	90% CD	Update drawings to reflect cosmetology layout change.	ALL		Open



Gilbane Building Company | J09299.000 - Northeast Metro Tech High School - Wakefield, MA

Coordination Issues Report

Status Open

Created By Kerri Estano
Karina Guo

Gilbane Building Company
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Providence, Rhode Island 02903

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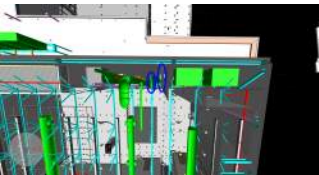
**J09299.000 - Northeast Metro Tech High School -
Wakefield, MA**
United States

Issue #415 - Duct vs Arch wall framing and Struc truss layout in conflict

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-2C, M1-1-2C, S1-1-3C) / IDC CI 366

Snapshots



Activity

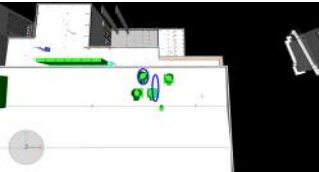
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #416 - Duct & Mech rooftop equipment vs Struc truss layout - C117

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(M1-1-2C, M1-1-3C, S1-1-3C)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #428 - No heating or cooling in Elec Life Safety Rm - D121

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm if acceptable/design intent. (M1-1-1D, M1-3-1D)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #429 - No heating or cooling to Elec Rm, confirm if acceptable - A312 : critical (M1-1-

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm if acceptable/design intent (M1-1-3A, M1-3-3A)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #430 - No heating or cooling in Elec Main Standby & Life Safety Rms - C005 & C006

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm design intent. (M1-1-0C, M1-3-0C)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #431 - No heating or cooling in Elec Life Safety Rm - A203

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm design intent. (M1-1-2A, M1-3-2A)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #432 - No heating or cooling in Elec Life Safety Rm - B222

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm design intent. (M1-1-2B, M1-3-2B)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #433 - No heating or cooling in Elec Life Safety Rm - B319

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm design intent. (M1-1-3B, M1-3-3B)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #434 - No heating or cooling in Elec Amplifier & Life Safety Rm - B417, B415

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm design intent. (M1-1-4B, M1-3-4B)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:30 am EDT

Issue #435 - No heating or cooling in Elec Life Safety Rm - A419

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm design intent. (M1-1-4A, M1-3-4A)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:30 am EDT

Issue #426 - No heating or cooling to Elec Rm - A426A

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
Confirm if acceptable/design intent. (M1-3-4A)

Snapshots



Activity

Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #427 - No room tag or heating/cooling to Room - Area A

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-23		

Description
onfirm if acceptable. (A1-1-3A, M1-1-3A, M1-3-3A)

Snapshots



Activity

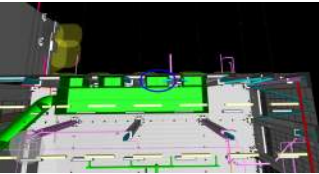
Karina Guo created this issue.
on Tuesday, May 23, 2023 at 09:29 am EDT

Issue #417 - Duct vs Struc x-bracing conflict - D003

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-4, M1-1-0D, S1-1-0MD, S4-0-4)

Snapshots



Activity

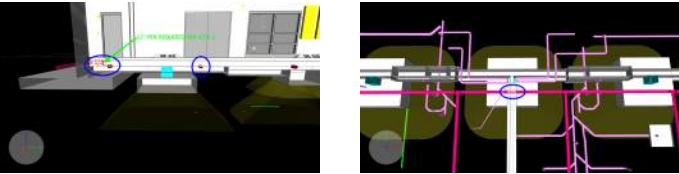
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #424 - Underslab drainage in conflict with Struc footing

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-22		

Description
Not modeled per system requirements. (GT-0-1, GT-0-2, S1-1-0D, S1-1-1B)

Snapshots



Activity

Karina Guo created this issue.
on Monday, May 22, 2023 at 11:12 am EDT

Issue #422 - Confirm beam pens possible for pitched pipe - Area A

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(P1-1-1A, S1-1-2A, A8-1-1A)

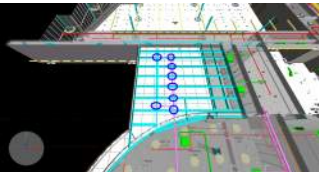
Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Karina Guo
on Friday, May 19, 2023 at 03:04 pm EDT

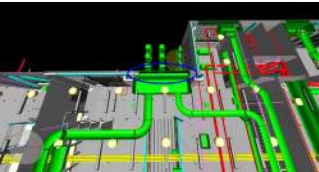


Issue #421 - Arch Louver & Duct vs Struc x-bracing - B103

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-6, M1-1-1B, S1-1-2B, S4-0-3)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #420 - Arch Louver & Duct vs Struc x-bracing - B101

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-6, M1-1-1B, S1-1-2B, S4-0-2)

Snapshots



Activity

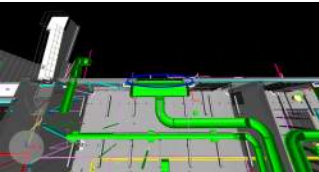
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #419 - Duct vs Struc x-bracing conflict - A141: critical (A2-1-6, M1-1-1A, S1-1-2A, S4-

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-6, M1-1-1A, S1-1-2A, S4-0-2)

Snapshots



Activity

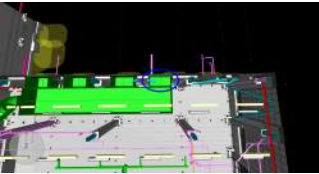
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #418 - Duct vs Struc x-bracing conflict & missing Arch louver - D003

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-4, M1-1-0D, S1-1-0MD, S4-0-4)

Snapshots



Activity

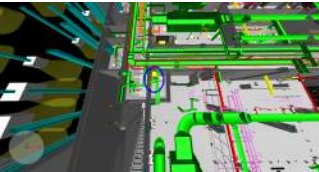
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #411 - Elec equipment located in double height space - M003A

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
need confirmation equip fits in Elec Room(A1-1-0MD, E1-1-0M)

Snapshots



Activity

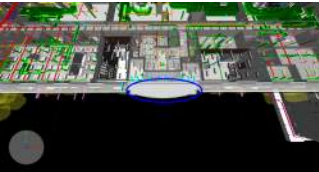
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #412 - Drains shown on Arch drawings, not sown on Plumbing

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-2B, P-1-1-2B)

Snapshots



Activity

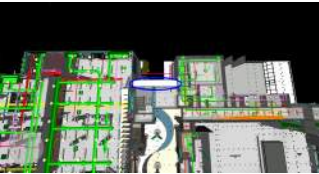
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #413 - Drains shown on Arch drawings, not sown on Plumbing

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-2C, P-1-1-1C)

Snapshots



Activity

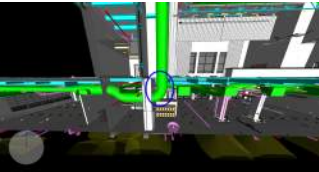
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #414 - Duct vs Arch wall framing & slab opening, no rated enclosure - C022 : critical (

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-0C, A1-0-12, M1-1-0C) / IDC CI 366

Snapshots



Activity

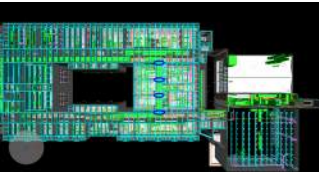
Karina Guo created this issue.
on Friday, May 19, 2023 at 02:52 pm EDT

Issue #407 - Duct not coordinated with Arch ceiling height, Struc framing & other MEPs - B312

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A8-1-3B, S1-1-4B, M1-1-3B)

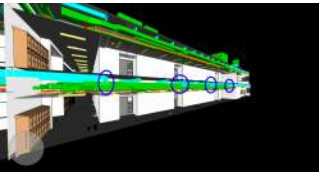
Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Karina Guo
on Friday, May 19, 2023 at 02:40 pm EDT

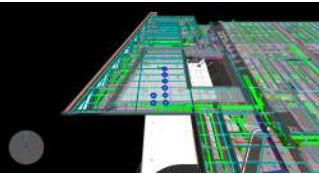


Issue #408 - Duct, Arch ceiling height & Struc framing not coordinated - A114

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
Need to account for duct insulation & steel fireproofing. (A8-1-1A, S1-1-2A, M1-1-1A)

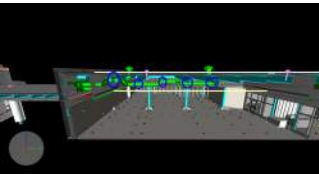
Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Karina Guo
on Friday, May 19, 2023 at 02:42 pm EDT



Issue #409 - Struc footing and FP water entry in conflict, 4'-0" min coverage needed - Area B

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(FP1-1-1B, S1-1-1B)

Snapshots



Activity

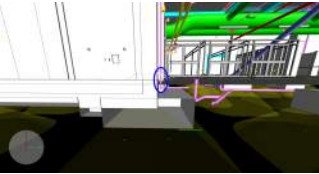
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:58 pm EDT

Issue #410 - Plmb vent stack in conflict with Struc foundation - Area B

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
None

Snapshots



Activity

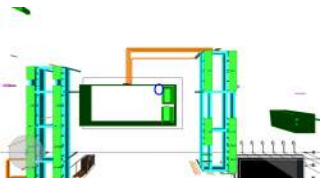
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:58 pm EDT

Issue #389 - Plmb vent vs Mechanical RTU - Roof

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(M1-2-1A, P1-2-1A)

Snapshots



Activity

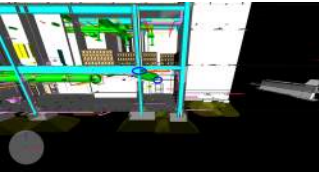
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #390 - Duct vs Struc framing & Arch overhead door track - D003

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-0D, M1-1-0D)

Snapshots



Activity

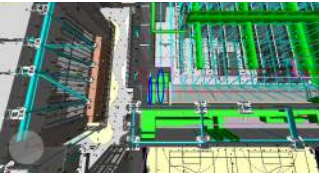
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #391 - Duct vs Struc truss layout

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(M1-1-2C, S1-1-3C)

Snapshots



Activity

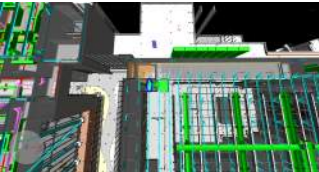
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #392 - Duct vs Struc truss layout

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(M1-1-2C, S1-1-3C)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #393 - Duct vs Struc truss layout

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(M1-1-2C, S1-1-3C)

Snapshots



Activity

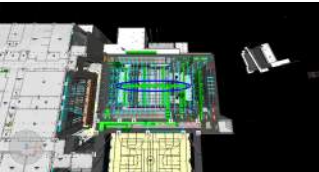
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #394 - Duct vs Struc truss layout - C117

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(M1-1-2C, S1-1-3C)

Snapshots



Activity

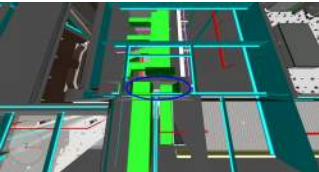
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #395 - Duct vs Arch wall framing and Struc framing

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-1C, A4-1-2, M1-1-1C, S1-1-2C)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #396 - Elec panel locations not coordinated with Food Service drawings - A148

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(E1-1-1A, FS1-3-1)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #397 - Elec panel locations not coordinated with Food Service drawings - A108

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(E1-1-1A, FS1-2-1)

Snapshots



Activity

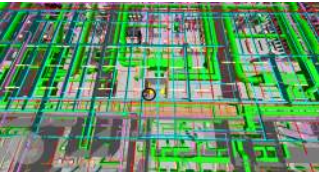
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #398 - Foreign system (Plumbing ST) in Elec Rm - B108

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(P1-1-1B)

Snapshots



Activity

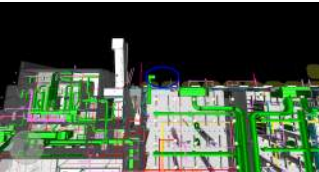
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #399 - Pad required for existing dust collector?

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(M1-1-1A)

Snapshots



Activity

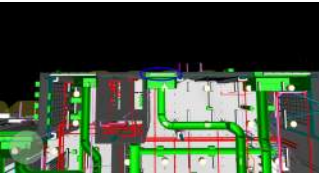
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #400 - Arch louver vs Duct size conflict - B104

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-6, A6-3-1, M1-1-1B)

Snapshots



Activity

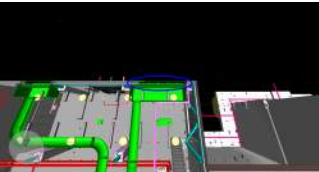
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #401 - Arch louver vs Duct size conflict - B104

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-6, A6-3-1, M1-1-1B)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #425 - Underslab drainage routed under structural zone of influence

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-22		

Description
(GT-0-1, S1-1-0C, S1-1-0D)

Snapshots



Activity

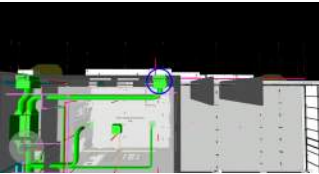
Karina Guo created this issue.
on Monday, May 22, 2023 at 11:17 am EDT

Issue #402 - Arch louver vs Duct size conflict - C106

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-5, A6-3-1, M1-1-1C)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Karina Guo
on Friday, May 19, 2023 at 02:29 pm EDT



Issue #403 - Arch louver vs Duct size conflict - C106G

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-5, A6-3-1, M1-1-1C)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Karina Guo
on Friday, May 19, 2023 at 02:32 pm EDT

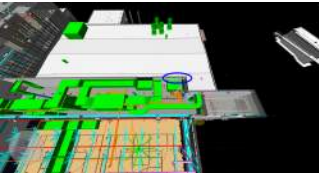


Issue #404 - Missing Arch louver at Duct Exhaust Air - C302

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A2-1-5, M2-0-3)

Snapshots



Activity

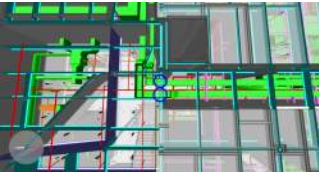
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Issue #405 - Duct, Lighting, Arch ceiling height & Struc framing not coordinated - A119

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A8-1-1A, S1-1-2A, M1-1-1A, E2-1-1A)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Karina Guo
on Friday, May 19, 2023 at 02:37 pm EDT



Karina Guo
on Friday, May 19, 2023 at 02:37 pm EDT

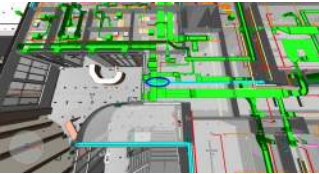


Issue #406 - Duct, Arch ceiling height & Struc framing not coordinated - A212

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A8-1-2A, S1-1-3A, M1-1-2A)

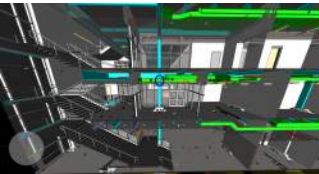
Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:57 pm EDT

Karina Guo
on Friday, May 19, 2023 at 02:39 pm EDT



Karina Guo
on Friday, May 19, 2023 at 02:39 pm EDT

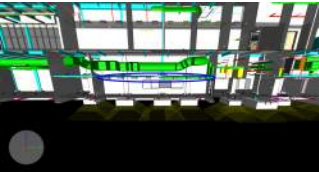


Issue #384 - Recessed lights (RB-1) with no ceiling to host to and exposed duct below slab.

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
D003D. Please confirm design intent. (A8-1-0D, E2-1-0D, E4-0-19, M1-1-0D)

Snapshots



Activity

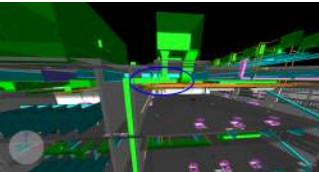
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #382 - Mech RTU/MEPFP ceiling conflicts - A425

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A8-1-4A, M1-1-4A, M1-3-4A, M1-2-1A, E1-1-4A, P1-1-4A, FP1-1-4A)

Snapshots



Activity

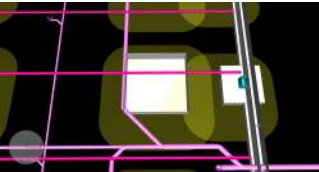
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #423 - Underslab drainage in conflict with Struc footing

Status Open	Assignee --	Due Date --	Priority Medium
Location --	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Karina Guo	Created Date 2023-05-22		

Description
Design parameters not achievable. Note: Typical issue throughout underground

Snapshots



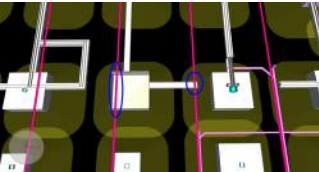
Activity

Karina Guo created this issue.
on Monday, May 22, 2023 at 09:50 am EDT

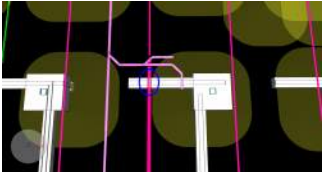
Karina Guo
on Monday, May 22, 2023 at 09:50 am EDT



Karina Guo
on Monday, May 22, 2023 at 09:52 am EDT



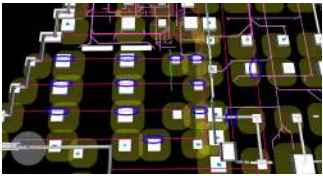
Karina Guo
on Monday, May 22, 2023 at 09:52 am EDT



Karina Guo
on Monday, May 22, 2023 at 09:53 am EDT



Karina Guo
on Monday, May 22, 2023 at 09:53 am EDT



Issue #383 - Plmb in conflict with wall, additional chase needed (~1') - Area B

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(P1-0-0B, S1-1-1B)

Snapshots



Activity

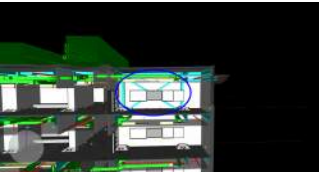
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #387 - Exposed Struc x-bracing (BF-A5), please confirm if this is design
intwnt - A429

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
please confirm if this is design intent(A1-1-4A, S1-1-5A, S4-0-1)

Snapshots



Activity

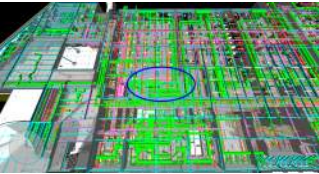
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #381 - Service access path required? - M101

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-1MA, M2-0-1)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #380 - No detail provided for custom millwork benches - A146 & B111

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-1A, A1-1-1B)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #388 - Plmb associated with sink locations not coordinated with Arch windows.

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
A209, A318 & A425(A1-1-2A, A1-1-3A, A1-1-4A, P1-1-2A)

Snapshots



Activity

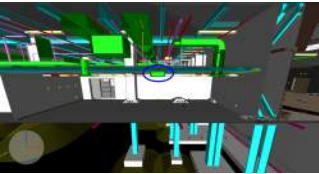
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #379 - Mech FCU 3-1 vs Struct precast plank & Arch ceiling (4") - B104G

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A8-1-1B, S1-1-1MB, M1-1-1B)

Snapshots



Activity

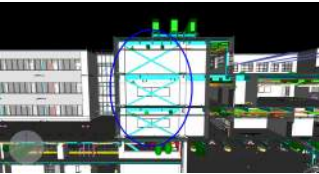
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #385 - Exposed Struc x-bracing & framing through Arch walls (BF-B9) - B212, B310, B410

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
(A1-1-2B, A1-1-3B, A1-1-4B, S1-1-3B, S1-1-4B, S1-1-5B, S4-0-2)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #457 - Slight discrepancies between Arch and Struct grid lines JJ.5 & MM.8 - Area C & D

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
JJ.5 off by 3/8" and MM.8 off by 5/16" (A1-0-11, S1-1-1C)

Snapshots



Activity

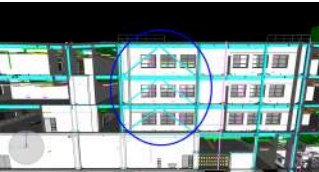
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:43 pm EDT

Issue #386 - Exposed Struc x-bracing (SW-A5BF-X) - A209, A318 & A425

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
--	--	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
please confirm if this is design intent (A1-1-2A, A1-1-3A, A1-1-4A, S1-1-3A, S1-1-4A, S1-1-5A, S4-0-5)

Snapshots



Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #449 - RGD locations do not align with ceiling grids - Typ. issue throughout building

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
None

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:17 pm EDT

Issue #450 - Discrepancies between steel in Arch model vs Structural model - Typ. issue

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
--	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
throughout building

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:18 pm EDT

Issue #452 - Plmb in conflict with Struc footing - Area B

Status	Assignee	Due Date	Priority
Open	--	--	High
Location	Trade	Type	Source File
Main Building>00 - Undergrou...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(S1-1-1B, P1-0-0B)

Snapshots



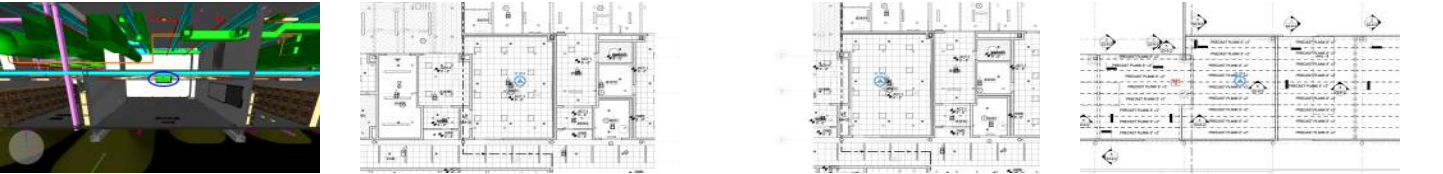
Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:34 pm EDT

Issue #376 - Mech FCU 3-6 vs Struct precast plank & Arch ceiling (4") - A141C

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>01 - Ground FL...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		
Description			
None			

Snapshots



Linked Items

RFI	Drawings	Observation
	M1-1-1B: MECHANICAL DUC...	
	S1-1-1MB: MEZZANINE FLO...	
	S1-1-1MA: MEZZANINE FLO...	
	A8-1-1B: FIRST FLOOR REFL...	
	A8-1-1A: FIRST FLOOR REFL...	

Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #375 - Elec panel located at Arch half height wall - A141

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>01 - Ground Fl...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
None

Snapshots



Linked Items

RFI	Drawings	Observation
	E1-1-1A: ELECTRICAL POWE...	
	A1-1-1A: FIRST FLOOR PLA...	

Activity

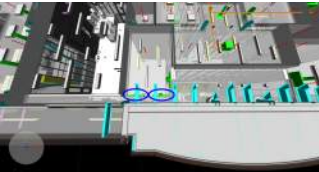
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #373 - Linear diffusers vs Struc framing - B113

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>01 - Ground Fl...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
None

Snapshots



Linked Items

RFI	Drawings	Observation
	S1-1-2B: SECOND FLOOR F...	
	M1-1-1B: MECHANICAL DUC...	

Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #377 - Mech FCU 3-5 vs Struct precast plank & Arch ceiling (4") - B103E

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>01 - Ground FL...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
None

Snapshots



Linked Items

RFI	Drawings	Observation
	A8-1-1B: FIRST FLOOR REFL...	
	S1-1-1MB: MEZZANINE FLO...	
	M1-1-1B: MECHANICAL DUC...	

Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #372 - FA panel located at Arch door - B101

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>01 - Ground Fl...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
multiple devices located at other side of door.

Snapshots



Linked Items

RFI	Drawings	Observation
	A1-1-1A: FIRST FLOOR PLA...	
	FA1-1-1B: FIRE ALARM FIRS...	
	FA1-1-1A: FIRE ALARM FIRS...	

Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #378 - Mech FCU 3-3 vs Struct precast plank & Arch ceiling (4") - B101E

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>01 - Ground Fl...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		
Description			
None			

Snapshots



Linked Items

RFI	Drawings	Observation
	S1-1-1MB: MEZZANINE FLO...	
	M1-1-1B: MECHANICAL DUC...	
	A8-1-1B: FIRST FLOOR REFL...	

Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #451 - Plmb vent not connected to underground system - A141B

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
Main Building>01 - Ground Fl...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(P1-0-0A)

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:33 pm EDT

Issue #371 - FA panel located at Arch curtain wall - B218G

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>02 - Second Fl...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
None

Snapshots



Linked Items

RFI	Drawings	Observation
	FA1-1-2B: FIRE ALARM SEC...	
	A1-1-2B: SECOND FLOOR P...	

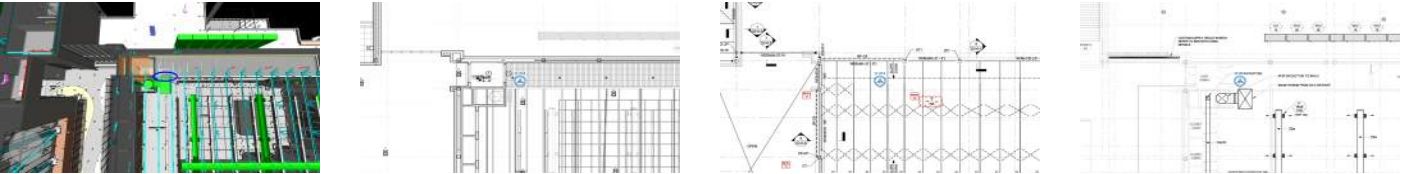
Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #374 - Duct vs Arch soffit framing & baffles - C202

Status Open	Assignee --	Due Date --	Priority Medium
Location Main Building>02 - Second Fl...	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Karina Guo	Created Date 2023-05-19		
Description None			

Snapshots



Linked Items

RFI	Drawings	Observation
	M1-1-2C: MECHANICAL DUC...	
	S1-1-3C: THIRD FLOOR FRA...	
	A8-1-2C: SECOND FLOOR R...	

Activity

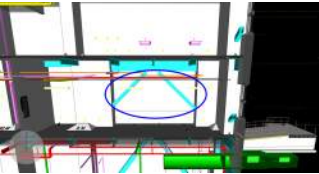
Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #453 - Exposed Struc x-bracing (BF-A17), please confirm if this is design intent- A260F

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
Main Building>02 - Second Fl...	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(A1-1-2A, S1-1-3A, S4-0-2)

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:35 pm EDT

Issue #370 - Duct vs Arch wall framing - C201

Status	Assignee	Due Date	Priority
Open	--	--	Medium
Location	Trade	Type	Source File
Main Building>03 - Third Floor	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Karina Guo	2023-05-19		

Description
None

Snapshots



Linked Items

RFI	Drawings	Observation
	M1-1-3D: MECHANICAL DU...	
	A8-1-3D: THIRD FLOOR REF...	

Activity

Karina Guo created this issue.
on Friday, May 19, 2023 at 01:09 pm EDT

Issue #456 - FP Main, Arch ceiling height in model & Struc framing not coordinated - Area C

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
Main Building>03 - Third Floor	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
Ceiling height not provided in CDs. (A8-1-3C, S1-1-4C, FP1-1-3C)

Snapshots



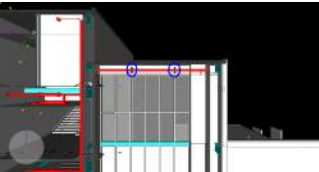
Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:40 pm EDT

Kerri Estano
on Tuesday, May 23, 2023 at 01:40 pm EDT



Kerri Estano
on Tuesday, May 23, 2023 at 01:40 pm EDT



Issue #454 - Exposed Struc x-bracing (BF-A16), please confirm if this is design intent - A401

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
Main Building>04 - Fourth Floor	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(A1-1-4A, S1-1-5A, S4-0-2)

Snapshots



Activity

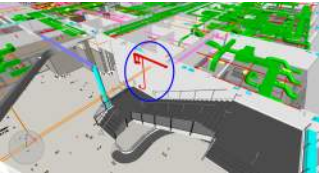
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:36 pm EDT

Issue #455 - Exposed FDV and gate valve at Lobby stairs - A119

Status	Assignee	Due Date	Priority
Open	--	--	--
Location	Trade	Type	Source File
Main Building>04 - Fourth Floor	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(FP1-1-1A)

Snapshots



Activity

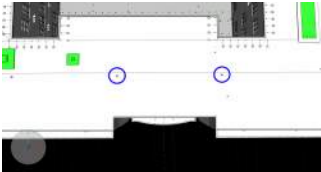
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:39 pm EDT

Issue #437 - Roof drain location discrepancies between Arch & Plumbing drawings - Area B

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
Main Building>05 - Roof	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(A1-2-1B, P1-2-1B)

Snapshots



Activity

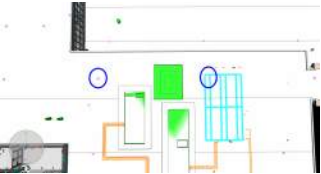
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 12:50 pm EDT

Issue #440 - Roof drain location discrepancies between Arch & Plumbing drawings - Area D

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
Main Building>05 - Roof	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(A1-2-1D, P1-1-4D)

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:05 pm EDT

Issue #445 - Roof drain quantity & location discrepancies between Arch & Plumbing drawings

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
Area B (A1-2-1B, P1-1-2B)

Snapshots



Activity

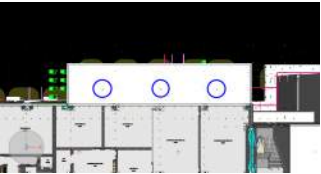
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:08 pm EDT

Issue #444 - Roof drain location discrepancies between Arch & Plumbing drawings - Area B

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
Main Building>05 - Roof	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(A1-2-1B, P1-1-2B)

Snapshots



Activity

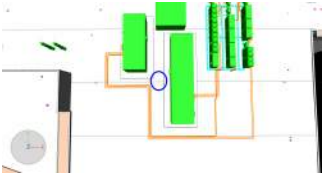
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:07 pm EDT

Issue #439 - Roof drain quantity discrepancy between Arch & Plumbing drawings - Area D

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
Main Building>05 - Roof	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
(A1-2-1D, P1-1-4D)

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:00 pm EDT

Issue #443 - Roof drain location discrepancies between Arch & Plumbing drawings - Area C

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
(A1-2-1C, P1-1-2C)

Snapshots



Activity

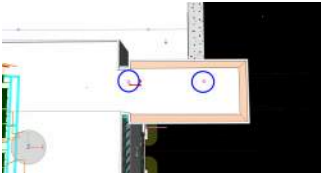
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:07 pm EDT

Issue #438 - Roof drain location discrepancies between Arch & Plumbing drawings - Area D

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
(A1-2-1D, P1-1-4D)

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:00 pm EDT

Issue #442 - Roof drain location discrepancy between Arch & Plumbing drawings - Area D

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
(A1-2-1D, P1-1-3D)

Snapshots



Activity

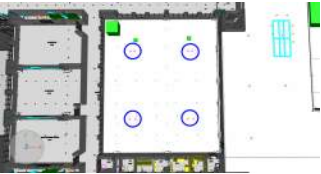
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:06 pm EDT

Issue #441 - Roof drain quantity & location discrepancies between Arch & Plumbing drawings

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
Area B (A1-2-1B, P1-1-4B)

Snapshots



Activity

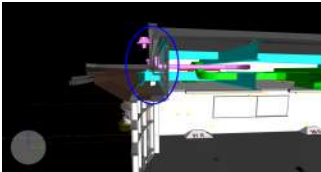
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:06 pm EDT

Issue #448 - Eyebrow roof drain conflict with Structural and Architectural - Areas A & B

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
(A1-2-1A, A1-2-1A, P1-2-1A, P1-2-1B)

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:15 pm EDT

Kerri Estano
on Tuesday, May 23, 2023 at 01:15 pm EDT

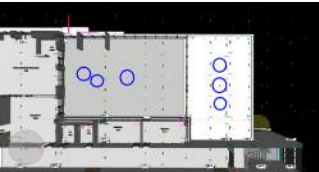


Issue #447 - Roof drain quantity & location discrepancies between Arch & Plumbing drawings

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
Area C (A1-2-1C, P1-1-1C)

Snapshots



Activity

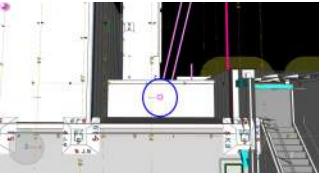
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:09 pm EDT

Issue #446 - Roof drain location discrepancy between Arch & Plumbing drawings - Area A

Status Open	Assignee --	Due Date --	Priority Critical
Location Main Building>05 - Roof	Trade VDC - DMC - 90	Type --	Source File NEMT.nwf
Created By Kerri Estano	Created Date 2023-05-23		

Description
(A1-2-1A, P1-1-2A)

Snapshots



Activity

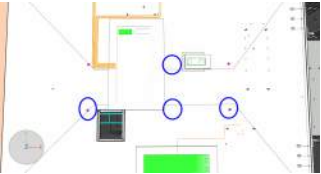
Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 01:09 pm EDT

Issue #436 - Roof drain quantity & location discrepancies between Arch & Plumbing drawings

Status	Assignee	Due Date	Priority
Open	--	--	Critical
Location	Trade	Type	Source File
Main Building>05 - Roof	VDC - DMC - 90	--	NEMT.nwf
Created By	Created Date		
Kerri Estano	2023-05-23		

Description
Area A (A1-2-1A, P1-2-1A)

Snapshots



Activity

Kerri Estano created this issue.
on Tuesday, May 23, 2023 at 12:49 pm EDT

OPM SUBMITTAL REVIEW & COORDINATION
COMMISSIONING CONSULTANTS REVIEW

6C.2.1 - 03



**Consulting
Engineering Services**

CxA DESIGN REVIEW COMMENTS - Plumbing

Northeast Metropolitan Regional Vocational High School

Project Name:		Northeast Metropolitan Regional Vocational High School				Reviewing Agency:		Consulting Engineering Services		
Project No.:		2022604.00 G				Reviewed By:		Jacob Coons		
Milestone:		90% CD				Review Date:		4/17/2023		
NO.	Drawing/ Spec Section	Detail/ Room Number	DISCIP LINE	Cx Review Comments	REVIEW COMMENT BY:		Designer Response	Follow Up Comments	Reviewer Response (Open/ Closed)	Review Set
CES 4.01	P0-0-1 (applicable to all sheets)	General Comment	P	Show locations of cleanouts	CES		Cleanout locations will be added in future submission	Cleanouts shown.	Closed	60% CD
CES 4.02	P0-0-1 (applicable to all sheets)	General Comment	P	Many pipes are shown rising in locations where they will not be concealed. Confirm intent.	CES		Piping to be coordinated with architect accordingly.	Piping still shown exposed, outside of walls, in some locations.	Open	60% CD
CES 4.03	P0-0-1 (applicable to all sheets)	General Comment	P	Floor drains in many areas do not appear to be vented. Clarify intent.	CES		Floor drain venting to be added in future submission.	Venting for floor drains has been added.	Closed	60% CD
CES 4.04	P1-0-0A	Kitchen A108	P	Sanitary connection to floor grate?	CES		Drain connection to be added in future submission	Drain connection has been added to floor troughs.	Closed	60% CD
CES 4.05	P1-0-0A	Recycling A109	P	Location shown to grease waste. Should it go to sanitary instead?	CES		FD waste shall go to sanitary.	FD shown going to sanitary.	Closed	60% CD
CES 4.06	P1-0-0A	Servery A112	P	Several of the storm pipe risers do no appear to be in enclosures. Verify exposed piping is acceptable	CES		Final location to be confirmed with architect.	Some storm locations have been moved to an enclosure from the last submission. Some pipe risers are still exposed.	Open	60% CD
CES 4.07	P1-0-0A	Carpentry A141	P	Is the intent to have floor drains in carpentry?	CES		Yes.		Closed	60% CD
CES 4.08	P1-0-0A	Carpentry A141	P	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.		Closed	60% CD
CES 4.09	P1-0-0B	Cosmetology B120	P	How are these fixtures vented?	CES		Venting to be added below slab in future submission.	Fixtures are bow vented.	Closed	60% CD
CES 4.10	P1-0-0C	Elev #2 E2	P	Where does the pump discharge to?	CES		Pump will discharge and drain to sanitary system.	Pump discharge shown.	Closed	60% CD
CES 4.11	P1-0-0C	Shower	P	Sanitary connection to fixtures missing. Also relocate room name/ number to proper location.	CES		Noted. Will be revised in future submission.	Sanitary and vent piping shown to plumbing fixtures in Shower Room C025.	Closed	60% CD
CES 4.12	P1-0-0C	TLT C022C	P	Floor drain not connected to sanitary	CES		Noted. Connection to be added in future submission	Floor drain has been removed from this room.	Closed	60% CD
CES 4.13	P1-0-0C	Auto Collision C022	P	10" Storm - Appears to be an excessively convoluted route. Clarify intent	CES		Routing to be simplified.	Storm piping/routing has been modified since last submission.	Closed	60% CD
CES 4.14	P1-0-0C	Metal Fabrication C004	P	8" Storm - Riser appears to go through a piece of equipment. Clarify intent	CES		Riser shall drop against column. Location will be revised in future submission.	Riser location has been revised.	Closed	60% CD
CES 4.15	P1-0-0C	Metal Fabrication C004	P	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.	Floor cleanout locations has been revised.	Closed	60% CD
CES 4.16	P1-1-1A	Dry Storage A103	P	Piping to fixture not shown	CES		Piping to be indicated in future submission.	Piping shown to fixture on drawing P2-1-1A.	Closed	60% CD
CES 4.17	P1-1-1A	Cooler A102	P	Exposed Piping? Confirm intent.	CES		Final location to be coordinated with architect.	Storm piping location has been revised.	Closed	60% CD
CES 4.18	P1-1-1A	OFF A104	P	8" vent for radon mitigation - exposed piping rising in the middle of the room? Verify intent.	CES		Final location to be coordinated with architect.	Radon mitigation piping moved to wet wall.	Closed	60% CD

CES 4.19	P1-1-1A	Receiving A110	P	Piping shown in space but where is it going?	CES		Piping layout to be completed and intent clarified in future submission.		Open	60% CD
CES 4.20	P1-0-0A	Receiving A110	P	Floor drain not properly vented. Floor drain connects to a sanitary main with a water closet discharging upstream. Vent should be added between the floor drain and where it connects to the sanitary main.	CES		Venting to be revised.		Open	90% CD
CES 4.21	P1-0-0A	Theory CR A148D	P	Storm piping shown as 6" above grade and then increases to 8" below grade with no additional connections. Is this due to a lower pitch? Confirm intent.	CES		The 6" storm is able to handle the storm load vertically. When running horizontally the storm line must be increased to handle the line with a pitch of 1/8" per foot.		Open	90% CD
CES 4.22	P1-0-0A & P1-1-1AB	Corridor A146	P	Show sanitary/vent & water piping to drinking fountains.	CES		Sanitary and venting of fixture is shown in riser diagrams on P5-0-1.		Open	90% CD
CES 4.23	P1-0-0A & P1-1-1A (typ of all locations)	Carpentry A141	P	How is fixture P-3B vented? Is water supply from below or overhead?	CES		Water supply is from overhead. The trap for the fixture is vented above slab. Piping to be added.		Open	90% CD
CES 4.24	P1-0-0B	HVAC Technology B103	P	How is floor grate vented? Sanitary drain from fixtures on different level are connecting upstream.	CES		Venting to be added to below slab piping.		Open	90% CD
CES 4.25	P1-0-0B	Near Locker B121A	P	Duplicate radon piping tags shown.	CES		Duplicate tag to be removed.		Open	90% CD
CES 4.26	P0-0-1 (applicable to all sheets)	General Comment	P	Finish tagging pipes.	CES		Noted.		Open	90% CD
CES 4.27	P1-1-0C	Room below IDF C009	P	Missing water piping to janitors sink, missing fixture tag	CES		Water piping to be added.		Open	90% CD
CES 4.28	P1-1-0C	Shower C025	P	Add cold water supply to water closet/modify pipe size. Only 1/2" CW shown currently.	CES		CW Size to be increased to 1".		Open	90% CD
CES 4.29	P1-1-0C	Plumbing Room C008	P	Where is vent piping routed to?	CES		Vent pipe routing to be completed and routed to level above.		Open	90% CD
CES 4.30	P1-1-0C	General Comment	P	Where is argon piping supplied from?	CES		Argon is supplied from portable canisters. Piping distribution is built to support connection to portable canisters.		Open	90% CD
CES 4.31	P1-1-1C	Stair 7	P	Duplicate storm piping tags with conflicting areas.	CES		Duplicate tags to be deleted.		Open	90% CD
CES 4.32	P1-1-0D & P1-1-1D	TLT/Showers D117A & D122A	P	Only (4) 2" V shown on floor below. Can these be battery vented to reduce number of vent connections?	CES		Grouping of (3) showers are currently battery vented. Each grouping of (3) showers has two vents.		Open	90% CD
CES 4.33	P1-1-2B	TLT B201C & Business Office Tech B202	P	Missing hot and cold water piping to sink and bathroom fixtures.	CES		Piping to be added.		Open	90% CD
CES 4.34	P1-1-2B	TLT B217	P	Water piping does not look correct. Hot water dropping in wet wall serving urinals. No water shown next to lavatory. No water shown serving water closets.	CES		Piping in this area to be revised and completed.		Open	90% CD
CES 4.35	P1-1-2B	TLT B228	P	Missing water supply to bathroom fixtures.	CES		Piping in this area to be revised and completed.		Open	90% CD
CES 4.36	P1-1-2B	TLT B228	P	Pipes showing through fixtures, what are these pipes serving?	CES		Pipes to be relocated to proper location.		Open	90% CD

CES 4.37	P1-1-4B	Robotics & Automation B402	P	Where is the compressed air piping supplied from?	CES		Compressed air supplied from compressor AC-4 in Storage Room B402G.		Open	90% CD
CES 4.38	P1-1-4B	Robotics & Automation B402	P	Piping not tagged.	CES		Pipe tag to be added.		Open	90% CD
CES 4.39	P3-0-1	Detail 11 - Condensate Receptor		Vent connection is required for p-trap serving indirect waste receptor.	CES		Condensate receptor venting to be added.		Open	90% CD
CES 4.40	PL-1-1	Field Maint. Garage LR104		No vent piping shown for trench drains.	CES		Vent to be added.		Open	90% CD
CES 4.41	PL-1-1	Field Maint. Garage LR104		Confirm storm requirements. Understorm 6" storm lateral shown but no storm piping shown above grade.	CES		Storm requirements to be confirmed.		Open	90% CD
CES 4.42	P0-0-1 & PL-1-1	General Comment		Pipe tagged as "PD" but not listed in the piping legend.	CES		PD pump discharge to be added		Open	90% CD
CES 4.43	P0-0-1 & PL-1-1	General Comment		Suggest reviewing/editing pipe legends as necessary. Sanitary piping is noted as "SAN" in legend, on drawings it is mostly tagged as "S".	CES		Noted. Legend to be revised.		Open	90% CD

		CxA DESIGN REVIEW COMMENTS - Fire Protection								
		Northeast Metropolitan Regional Vocational High School								
Project Name:		Northeast Metropolitan Regional Vocational High School				Reviewing Agency: Consulting Engineering Services				
Project No.:		2022604.00 G				Reviewed By: Jacob Coons				
Milestone:		90% CD				Review Date: #####				
NO.	Drawing/ Spec Section	Detail/ Room Number	DISCIP LINE	Cx Review Comments	REVIE W COMME NT BY:		Designer Response	Follow Up Comments	Reviewer Respons e (Open/Closed)	Review Set
CES 3.01	FP1-1-0.5CD	Detail 2	FP	Sprinklers are shown too close together	CES		Sprinkler graphics/layout to be revised accordingly.	Sprinkler graphics/layout has been revised.	Closed	60% CD
CES 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.	Sprinkler graphics/layout has been revised.	Closed	60% CD
CES 3.03	FP1-1-0C (Typical)	Key Plan	FP	Correct hatching on key plan to indicate area shown. typical for all sheets	CES		Noted, will address for future submission.	Key plan is accurate to area of building shown on drawing.	Closed	60% CD
CES 3.04	FP1-1-0C	Hatched Area above Corridor C010	FP	Light Hazard Area label shown in Ordinary Hazard Area	CES		Light Hazard Area, is noted for toilet room. Will be addressed for clarity on partial plans.	Clarified.	Closed	60% CD
CES 3.05	FP1-1-0C	Generator Panels C007 and Elec Main Elec C001	FP	Should these areas be shown as Ordinary Hazard?	CES		Areas will be noted as Ordinary Hazard.	Clarified.	Closed	60% CD
CES 3.06	FP1-1-0C	Plumbing Room C008	FP	Where does the drain piping for the floor control valves terminate?	CES		Drain piping termination point shall be indicated in future submission.	Drain piping indicated on drawings.	Closed	60% CD
CES 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.		Closed	60% CD
CES 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.		Closed	60% CD
CES 3.09	FP1-1-0C	Paint Booth	FP	The two sets of sprinklers appear to be too close together. is there a separation not readily visible on the plans? Typical for both spray booths	CES		One set of sprinkler heads are shown within the booth. Other set is intended to provide coverage at the shop ceiling outside the paint booth. Plans shall be updated for clarity.	Clarified based on pipe routing.	Closed	60% CD
CES 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 under mezzanine. Classifications to be modified as needed for clarity. Sprinkler layout to be modified.	Clarified showing sprinklers at ceiling level and below ductwork.	Closed	60% CD
CES 3.11	FP1-1-0C	TLT C022C	FP	Heads shown too close together.	CES		Sprinkler below mezzanine and at shop ceiling appearing on same plan. Graphics to be modified.	Clarified.	Closed	60% CD
CES 3.12	FP1-1-0C	Auto Collision C022	FP	Heads shown too close together.	CES		Sprinkler layout to be modified accordingly.	Sprinklers modified.	Closed	60% CD
CES 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 valve. Drain riser to terminate through exterior wall underside of stair.	Clarified, tags added.	Closed	60% CD
CES 3.14	FP1-1-0C	Auto Collision C022	FP	Missing sprinkler head on the far right side of the plan.	CES		Sprinkler layout to be modified accordingly.	Sprinklers modified.	Closed	60% CD
CES 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.	Clarified, tags added.	Closed	60% CD
CES 3.16	FP1-1-0C/D	Stair 6	FP	Sprinkler coverage in the stair looks deficient. Typical	CES		Sprinklers will be shown at underside of bottom landing and at top of the stairways. Typical for all stairways.	Sprinklers adequately shown.	Closed	60% CD
CES 3.17	FP1-1-0D	Related C022D and TLT C022C	FP	Sprinklers shown too close together	CES		Sprinkler below mezzanine and at shop ceiling appearing on same plan. Graphics to be modified.	Clarified, sprinklers now shown on FP1-1-0C.	Closed	60% CD
CES 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.	Drain termination shown on FP1-1-0C.	Closed	60% CD
CES 3.19	FP1-1-0D	Just above Stair 6	FP	What does the riser serve?	CES		Riser serves auditorium fire department valve connection.	Hose valve connections at stage have been removed. Confirm this is intended.	Open	60% CD

CES 3.20	FP1-1-0D	Area outlined in detail 3 callout	FP	Conflicting hazard classification	CES		Hazard classifications are for rooms under mezzanine. Classifications to be modified as needed for clarity. Sprinkler layout to be modified.	Clarified using callout.	Closed	60% CD
CES 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 shop ceiling appearing on same plan. Graphics to be modified.	Clarified using callout.	Closed	60% CD
CES 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.	Sprinklers shown at top of stairwell. Confirm if sprinkler coverage required below stairs at bottom level and/or intermediate levels.	Open	60% CD
CES 3.23	FP1-1-1A	Kitchen A108	FP	Has full coverage been provided?	CES		Full sprinkler coverage to be provided except for areas under hoods, covered under separate ANSUL system.	Clarified.	Closed	60% CD
CES 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.	Hose valve shown.	Closed	60% CD
CES 3.25	FP1-1-1A	Area below Tool 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.	Sprinklers now shown.	Closed	60% CD
CES 3.26	FP1-1-1B	Fire Pump Room B105	FP	Where is fire pump test header shown?	CES		Fire pump test header shown on north exterior wall outside fire pump room.	Fire pump test header shown.	Closed	60% CD
CES 3.27	FP1-1-1B	Fire Pump Room B105	FP	10" service shown on riser diagram	CES		Riser diagram shall be updated to show 8" service.	Riser diagram has been updated.	Closed	60% CD
CES 3.28	FP1-1-1B	Fire Pump Room B105	FP	Pump shown backwards	CES		Pump layout to be revised.	Pump shown correctly.	Closed	60% CD
CES 3.29	FP1-1-1B	Fire Pump Room B105	FP	Piping doesn't match riser	CES		Piping to be coordinated accordingly.	Not yet corrected. Fire pump test header piping and fire department connection supply piping shown on suction side of fire pump.	Open	60% CD
CES 3.30	FP1-1-1B/C	General Comment	FP	piping not visible in multiple areas	CES		Drawings to be revised for clarity.	Piping appears visible in all areas.	Closed	60% CD
CES 3.31	FP1-1-1B	Plumbing and Pipe Fitting B101	FP	FHVC tag shown. What is this associated with?	CES		Fire hose valve connection for standpipe system.	Clarified.	Closed	60% CD
CES 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.	Sprinklers appear to be shown correctly.	Closed	60% CD
CES 3.33	FP1-1-1B	General Comment	FP	Should LH tags be on the part plan on P1-1-1.5AB?	CES		Correct. Tag locations to be modified.	Hazard tags shown on FP1-1-1.5AB	Closed	60% CD
CES 3.34	FP1-1-1C	Stair 4 S4	FP	Where does the drain terminate	CES		Drain terminates through exterior wall at Lower Level.	Clarified.	Closed	60% CD
CES 3.35	FP1-1-1C	Cust A205	FP	Identify symbols shown in space.	CES		Graphical error. Should not appear on FP drawings.	Symbols still showing on FP1-1-2A.	Open	60% CD
CES 3.36	FP1-1-2C	Near Corridor C201	FP	6" FSP and 3" SDR not pointing to anything outside Corridor	CES		To be deleted.	Tags deleted.	Closed	60% CD
CES 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.	Sprinkler coverage clarified.	Closed	60% CD
CES 3.38	FP1-1-2C	Proscenium opening	FP	Are any special fire protection measures necessary at the proscenium opening?	CES		Sprinklers required at underside of walkway. Window sprinklers are required at glass separation at upper levels.	No special sprinkler measures shown at the proscenium, confirm proscenium wall not required to be fire-rated or provided with a means of achieving a fire-resistance rating.	Open	60% CD
CES 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.	Sprinkler layout corrected.	Closed	60% CD
CES 3.40	FP1-1-4D	General Comment	FP	The entire 4th floor appears to be fed off of a single riser. Verify the floor area doesn't exceed that allowed by NFPA 13. Check for other floors as well	CES		Noted and will be reviewed.	4th floors appears to be served split between multiple two alarm risers.	Closed	60% CD
CES 3.41	FP1-2-1A	General Comment	FP	Is more than one standpipe connection required for the roof?	CES		Roof area standpipe coverage shall be reviewed and confirmed.	Multiple hose valve connections shown on roof.	Open	60% CD
CES 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 reflect piping layout.	Riser diagram still shows check valve on suction side of fire pump in addition to the the double check valve assembly.	Open	60% CD
CES 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 reflect piping layout.	Quantity on plans matches riser diagram.	Closed	60% CD

CES 3.44	FP6-0-1	Detail 7	FP	Fire Pump Tag incomplete	CES		Noted. Will address.	Tags still need to be updated.	Closed	60% CD
CES 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.	PRV removed from standpipe detail.	Closed	60% CD
CES 3.46	FP1-1-0C	Auto Collision C022	FP	Floating sprinkler head shown with no piping.	CES		Sprinkler to be removed.		Open	90%CD
CES 3.47	FP1-1-0C	Between IDF C009 & General Supply C015	FP	Room appears to be missing sprinkler coverage.	CES		Sprinkler coverage to be modified for this area.		Open	90%CD
CES 3.48	FP1-1-0D	Storage D003J	FP	Sprinklers appear close together.	CES		Key note added. This sprinkler is under HVAC equipment.		Open	90%CD
CES 3.49	FP1-1-1A, FP1-1-1B, FP5-0-1	General Comments	FP	Piping to fire department connection near Stair 1, on drawing FP1-1-1A, is connecting to sprinkler main piping on system side of one of the alarm check valves. If the FDC is serving the entire building, it should connect in between the supply piping control valves and before the alarm check valves.	CES		Piping to FDC modified.		Open	90%CD
CES 3.50	FP1-1-1A, FP1-1-1B, FP5-0-1	General Comments	FP	Drawings show 2 separate fire department connections, riser diagram only shows 1. Confirm quantity and location.	CES		1 FDC in Part A. 1 Fire Pump Test Header in Part B. Drawings to be revised		Open	90%CD
CES 3.51	FP1-1-1B	Fire Pump Room B105	FP	Piping to fire pump test header shown before inlet to fire pump. Update to match riser diagram.	CES		Piping on drawing to be revised.		Open	90%CD
CES 3.52	FP1-1-1B	Fire Pump Room B105	FP	Keynote #3 does not correspond to where it placed on the drawing.	CES		Instance of Key Note 3 removed.		Open	90%CD
CES 3.53	FP1-1-1B & FP5-0-1	Fire Pump Room B106	FP	Update drawings/riser so tag for fire pump test header matches.	CES		Will be updated.		Open	90%CD
CES 3.54	FP1-2-1A	General Com	FP	Duplicate text shown on roof, leaders not pointing to any objects.	CES		Duplicate text to be deleted.		Open	90%CD

 Consulting Engineering Services		CxA DESIGN REVIEW COMMENTS - Mechanical and Controls (ATC) Specifics								
		Northeast Metropolitan Regional Vocational High School								
Project Name:		Northeast Metropolitan Regional Vocational High School			Reviewing Agency:		Consulting Engineering Services			
Project No.:		2022604.00 G			Reviewed By:		Jeanine Palmieri			
Milestone:		90% CD			Review Date:		4/17/2023			
NO.	Drawing/ Spec Section	Detail/ Room Number	DISCIPLINE	Cx Review Comments	REVIEW COMMENT BY:		Designer Response	Follow Up Comments	Reviewer Response (Open/Closed)	Review Set
CES 1.01	230993.11 and M Drawings	Split System A/C Units (Typical)	M	230993.11, 1.15, C for split A/C units it indicates Spaces served by these systems shall be instrumented with temperature sensors for monitoring by the BMS, alarming temperatures out of range. Monitoring sensors now shown on drawings.	CES		Will be indicated in a future submission.	Some sensors have been provided in 90% Set. Not yet complete	In Progress	60%CD
CES 1.02	230993.11 and M Drawings	EUH/ECUH (Typical)	M	230993.11, 1.13, B for electric cabinet unit heaters indicates that the shall be provided with manufacturers thermostats for field installation but also shall be instrumented with temperature sensors for monitoring by the BMS and alarming when 5°F below the temp setpoint (adj.) Monitoring sensors not yet shown on drawings.	CES		This will be clarified in a future submission.	Currently still no monitoring sensor shown for low space temp for 90% Set	Open	60%CD
CES 1.03	M Drawings	General Comment - Control Sensors	M	Control sensor placement on drawings not yet complete	CES		This will be indicated in a future submission.	Some sensors have been provided in 90% Set. Not yet complete	In Progress	60%CD
CES 1.04	M1-1-1A	TIT A107	M	No exhaust Shown to this toilet room	CES		Exhaust to this toilet room will be indicated in a future submission.	Provided	Closed	60%CD
CES 1.05	M1-1-1A and M5-0-1	F-18 (Kitchen Area)	M	Review schedule to ensure location and "serving" for F-18 are accurate. Appears to be located in the kitchen A108 and serve Recycling Room A109, custodial A113, Office A104, Tilt A106 and should serve A107 (no grille shown in there currently)	CES		Will review and revised.	Revised to Kitchen BOH	Closed	60%CD
CES 1.06	M1-1-1A	Elevator Machine Room	M	What is this room (Elev Machine Room?) and how is it accessed? No door shown. Split A/C in space missing Tag - Assumed 2-4 based on M1-3-1A	CES		The location of this AC will be revised in a future submission.	Now shown as chair storage with door	Closed	60%CD
CES 1.07	M1.1-0D	General Comment	M	Ductwork Sizing in progress. To be reviewed for completeness during next review.	CES		Noted.		Closed	60%CD
CES 1.08	M1.1-0D	Auto Technology D003	M	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 will be included in the specification in a future submission	CES to review SOP	Open	60%CD
CES 1.09	M1.1-0D	VAV Schedules (Typical)	M	Sound Data appears to be incomplete	CES		Will be completed in a future submission.		Closed	60%CD
CES 1.10	M1.1-0D	Receiving A110	M	Confirm sufficient heat near this exterior door.	CES		Confirmed. EUH to be provided in Receiving A110.	EUH is provided in space	Closed	60%CD
CES 1.11	M1.1-0D	Carpentry A141	M	Confirm necessary controls will be provided with relocated dust collector.	CES		Confirmed.		Closed	60%CD
CES 1.12	M1-1-2A	CR A224, 225, 226, 227	M	Suggest moving room name indication for clarity.	CES		Noted.	Moved	Closed	60%CD
CES 1.13	M1-1-2B	Records B227	M	Does this records area require any ventilation?	CES		Ventilation will be added in a future submission.	Provided	Closed	60%CD
CES 1.14	M1-1-2B	CR B212 Typical	M	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 in a future submission.		In Progress	60%CD
CES 1.15	M1-1-2B	TLT 217?	M	Exhaust not shown in space	CES		Exhaust will be indicated in future submission.	Provided	Closed	60%CD
CES 1.16	M1-1-3A	Elev Machine EE	M	Is split A/C needed in here?	CES		AC noted in item number CES 1.06 is to be relocated to this elevator machine room in a future submission.	Provided	Closed	60%CD
CES 1.17	M1-1-3A	Digital Learning A308 (typical)	M	Similar locations on other pages show T and TC2 serving similar areas. Is this shown correctly here? If the Thermostat controls the VRF. What is controlling the electric reheat on the VAV?	CES		This is shown correctly. The thermostat is controlling the VRF FCU and the CO2 sensor is controlling the VAV. The HRU discharge air temperature will be reset based on outdoor air temperature. VAVs connected to HRU-1, 2, 3 will not be provided with electric reheat coils.		Closed	60%CD
CES 1.18	HVAC Drawing Notes	General Comment	M	Update detail and drawing number for reference.	CES		Noted. Bala 4/26/23: Clarify comment and location of issue. Reference drawing number and drawing note number.	Not yet addressed	Open	60%CD
CES 1.19	M1-1-LB	Detail 2	M	Room names not identified on plan.	CES		Will update in a future submission.	Added	Closed	60%CD
CES 1.20	M1-3-0C	Near Coach OFF C024	M	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.	Tagged	Closed	60%CD
CES 1.21	M1-3-1D	Elec Rm	M	Split A/C not tagged	CES		Will be tagged in a future submission.	Tagged	Closed	60%CD
CES 1.22	M5-0-3	Sound Attenuator Schedule	M	Schedule not yet filled in.	CES		Will be completed in a future submission.		Closed	60%CD
CES 1.23	230993.11	Air Handling/Rooftop Units	M	Suggest identifying sequences with associated unit numbers for clarity.	CES		Sequences of operation will be revised and clarified in a future submission.	TBD	Open	60%CD
CES 1.24	230993 and M Dwgs	Control Diagrams	M	Will control diagrams be provided?	CES		No.	For such a complicated and technical job, control diagrams should have been utilized for clarity of control.	Closed	60%CD
CES 1.25	M1-1-0C	DEH Units (Typical)	M	Have these been scheduled? Schedules not found for Dehumidification Units	CES		Will be scheduled in a future submission.		Open	90% CD
CES 1.26	M1-1-0C	Auto Colloision C022 Metal Fabrication C004	M	Are these separate sensors or is this a combination sensor? Does the humidity sensor control the DEH? and the Temperature sensor control the EUH's. Clarity needed.	CES		Humidity sensor will control dehumidifiers. Temperature sensor will control AHU.		Open	90% CD

CES 1.27	M1-1-0D	VVE-0D-02 and VVE-0D-03	M	These are identified here but are not clearly labeled on this drawing. tag accordingly for clarity	CES		Will be clarified in a future submission		Open	90% CD
CES 1.28	M1-1-1A	Stair 2	M	Untagged CUH	CES		Will be tagged in a future submission.		Open	90% CD
CES 1.29	M1-1-1B	Condensing Unit outside Electrical Technology	M	Unit not tagged or noted.	CES		Will be noted in a future submission. Equipment is not provided by Div. 23 contractor.		Open	90% CD
CES 1.30	M1-1-1A	VAV A1-08	M	Review location of sensor	CES		Will be revised in a future submission.		Open	90% CD
CES 1.31	M1-1-1A	Culinary Arts VAV	M	VAV Tag missing	CES		Will be tagged in a future submission.		Open	90% CD
CES 1.32	M1-1-1D	Stairwell	M	Should this be stair 6 S6?. Is there a FCU or CUH that serves this space?	CES		This stair is in Area C (refer to matchline). Refer to M1-1-1C for label and other levels of Area C for equipment serving this space.		Open	90% CD
CES 1.33	M1-1-1A	Stair 6	M	FCU shown in space but not tagged	CES		Could not locate stair 6 on M1-1-1A. Stair 6 on M1-1-1C does not indicate an FCU. Clarify comment.		Open	90% CD
CES 1.34	M1-1-4A	Dental Assisting A402 amd Sci Lab A425 (area)	M	Sensors not shown	CES		Will be indicated in a future submission.		Open	90% CD
CES 1.35	M1-1-4A	Elec Rm A426A	M	Is this electric room need to be served by anything? AC, Exhaust ,etc?	CES		Exhaust will be added in a future submission		Open	90% CD
CES 1.36	M1-1-4B	Utility A402K	M	Identify wall hung unit. Is this a split A/C? or a FCU?	CES		Will be indentified in a future submission. Unit is identified on M1-3-4B in this submission.		Open	90% CD
CES 1.37	M1-1-4B	Corridor B403	M	Tag FCU	CES		Will be indentified in a future submission. Unit is identified on M1-3-4B in this submission.		Open	90% CD
CES 1.38	230993.11	VRF Condensing Unit SOP	M	Suggest that the Defrost mode be identified on the VRF graphic to let the user know the unit is in defrost mode. General Alarms shall be picked up from the condensing unit and displayed on the graphic.	CES		Will be included in a future submission.		Open	90% CD
CES 1.39	230993.11	Variable Frefigerant Flow Systems	M	All available points shall be monitored/alarmed/etc.	CES		Will be included in a future submission.		Open	90% CD
CES 1.40	230993.11	Miscellaneous Exhaust Fans	M	Sequences to be provided for 100% CD Submission	CES		Sequences are included in 90%CD set.		Open	90% CD
CES 1.41	230993.11	Domestic Hot Water	M	Section indicates to monitor and alarm domestic hot water heaters. Are recirc pumps to be monitored as well?	CES		Will be included in a future submission.		Open	90% CD
CES 1.42	230993.11	General	M	Suggest all spaces to alarm if temperature falls below 50°F	CES		Will be included in a future submission.		Open	90% CD
CES 1.43	230993.11	Dehumidification Units	M	No SOP provided for DEH Units	CES		Will be included in a future submission.		Open	90% CD

 Consulting Engineering Services		CxA DESIGN REVIEW COMMENTS - Electrical Northeast Metropolitan Regional Vocational High School							
Project Name:		Northeast Metropolitan Regional Vocational High School			Reviewing Agency:		Consulting Engineering Services		
Project No.:		2022604.00 G			Reviewed By:		Matt Penrose		
Milestone:		90% CD			Review Date:		4/13/2023		
NO.	Drawing/ Spec Section	Detail/ Room Number	DISCIP LINE	Cx Review Comments	REVIEW COMMENT BY:	Designer Response	Follow Up Comments	Reviewer Response (Open/Closed)	Review Set
CES 2.01	E1-1-0	MSB-1A - Main Elec C001	E	PLEASE REVIEW INSTALLTION METHODS/FUTURE REPLACEMENT OF LARGER EQUIPMENT SUCH AS THE MAIN SWITCHBOARD, TRANSFORMERS, ETC. DOUBLE DOORS INTO ELECTRICAL ROOM WILL ACCOMMODATE, HOWEVER, THIS LEADS INTO A CORRIDOR WITH STANDARD WITH DOORS AT STAIRS.	CES	Accommodation for replacement of larger equipment will be reviewed.		Open	60% CD
CES 2.02	E1-1-0	PV Panelboard - Main Elec C001	E	PLEASE INDICATE LOCATION OF PV DISCONNECT SWITCH. NORMALLY REQUIRED AT EXTERIOR ADJACENT TO UTILITY METER/UTILITY TRANSFORMER.	CES	Location of PV switch will be included in future submission.		Open	60% CD
CES 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 2.04	E1-1-0C	Key Plan (Typical)	E	PLEASE EDIT KEYPLAN TO MATCH	CES	Key plans will be revised to match.		Open	60% CD
CES 2.05	E1-1-0D	General Comment	E	PLEASE REVIEW ARTICLE 511 REQUIREMENTS FOR WIRING AND DEVICES AS DESIGN PROGRESSES.	CES	Any area classifications and requirements for wiring devices will be coordinated as design progresses.		Open	60% CD
CES 2.06	E1-1-MC/MD and On	General Comment	E	DRAWING INCOMPLETE, CANNOT BE REVIEWED. Not ready for a 60% CD review.	CES	The scope indicated on the drawings is sufficient for a 60%CD pricing set. Drawings issued for the 60%CD MSBA submission will meeting MSBA 60%CD requirements with the exception of all circuiting being completed.		Open	60% CD
CES 2.07	E1-1-0D and on	Controlled Receptacles	E	CONSIDER HALF-CONTROLLED OUTLETS TO MEET REQUIREMENTS OF UPDATED STRETCH CODE EFFECTIVE JULY 1ST (TYPICAL ROOMS WITH CONTROLLED OUTLETS).	CES	Half-controlled outlets will be considered.		Open	90% CD
CES 2.08	E1-1-0M	General Comment	E	IS THERE NEED FOR ADDITIONAL CONVENIENCE RECEPTACLES AT PERIMETER OF MEZZANINE EQUIPMENT SPACES?	CES	Some additional receptacles will be added.		Open	90% CD
CES 2.09	E1-1-1D	Instructor Office near U022	E	OFFICE MISSING POWER.	CES	Power will be added to office.		Open	90% CD
CES 2.10	E1-1-1D	Stair 5	E	CONFIRM IF HEATING AT EXTERIOR DOOR REQUIRES POWER.	CES	Heater will be provided with power.		Open	90% CD
CES 2.11	E1-1-1D and on	Restrooms with single toilet	E	CONSIDER CALL FOR AID PULL CORDS IN SINGLE RESTROOMS (TYPICAL).	CES	Will be coordinated with architect.		Open	90% CD
CES 2.12	E1-1-2A	Media Center A221	E	CLARIFY POWER REQUIREMENTS FOR MEDIA CENTER.	CES	Media center power requirements will be clarified.		Open	90% CD
CES 2.13	E1-1-2A	Workroom A216, MC Small Groups	E	SUGGEST ADDITIONAL CONTROLLED OUTLETS TO MEET NEC 210.71 & STRETCH CODE.	CES	Additional controlled outlets will be added.		Open	90% CD
CES 2.14	E1-1-2B	In-House Suspension B216	E	CONSIDER ADDING POWER FOR TEACHER/CUSTODIAN.	CES	Power will be added.		Open	90% CD
CES 2.15	E1-1-2C	Upper Multipurpose Room C202	E	CONSIDER POWER AT UPPER LANDING IN AUDITORIUM.	CES	Power will be added at upper landing.		Open	90% CD
CES 2.16	E1-1-MD	Mezzanine M003	E	CONSIDER INDICATING SCOPE SHOWN ON OTHER DRAWINGS (E1-1-0M)	CES	Clarification will be added as required to avoid showing same scope on multiple sheets.		Open	90% CD
CES 2.17	E2-1-0C and on	General Comment	E	CONSIDER SHADING EMERGENCY FIXTURES FOR CLARITY	CES	Shading, or another means of distinguishing EM fixtures, will be considered.		Open	90% CD
CES 2.18	E2-1-4A	Comment	E	CONSIDER HIDING OTHER TRADES FOR CLARITY.	CES	Will be considered.		Open	90% CD

		CxA DESIGN REVIEW COMMENTS - Architectural									
Consulting Engineering Services		Northeast Metropolitan Regional Vocational High School									
Project Name:		Northeast Metropolitan Regional Vocational High School									
Project No.:		2022604.00 G					Reviewed By: Chris Walczak				
Milestone:		90% Backcheck					Review Date: 12/4/2022				
NO.	Drawing/ Spec Section	Detail/ Room Number	DISCIP LINE	IMPOR TANCE (H, M, L)	Cx Review Comments	REVIE W COMME NT BY:		Designer Response	Follow Up Comments	Review or Respon se (Open/ Closed)	Review Set
CES 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.		Closed	CD
CES 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.		Closed	CD
CES 6.03	A2-1-6	Detail 3	A		This section of curtain wall, tagged CW24, does not appear to graphically match the CW24 detail shown on Drawing A6-3-4.	CES		Curtain wall was tagged incorrectly. It has now been fixed.		Closed	CD
CES 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.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.05	A5-3-1	Detail N, Q, O, K, H, G, F, E & D	A		Recommend adding a tag to identify the roof vapor barrier in this detail. (Typical)	CES		Will add appropriate notations.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.06	A5-3-1	Detail F & E	A		Should the sealant bead located beneath the stainless steel rain hood be tagged? (Typical)	CES		Will add appropriate notations.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.07	A6-3-2	Detail 1	A		Recommend moving the dimension label for graphical clarity.	CES		Will clean up dimensioning for better clarity.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.08	A6-3-2	Detail 1	A		Recommend reviewing conflicting labels. (Typical)	CES		Will review and resolve conflicting labels.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.09	A6-3-3	Detail 1	A		Recommend reviewing conflicting labels.	CES		Will review and resolve conflicting labels.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.10	A6-3-4	Detail 1	A		Recommend reviewing conflicting labels. (Typical)	CES		Will review and resolve conflicting labels.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.11	A6-3-4	Detail 1	A		Both curtain wall types are identified as CW25. Please clarify design intent.	CES		We have fixed the labeling conflict.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 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.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.13	A6-3-6	Detail 1 & 2	A		Recommend reviewing conflicting labels. (Typical)	CES		Will review and resolve conflicting labels.	Closed anticipating this this will be completed as noted by Architect	Closed	CD
CES 6.14	A6-3-8	Detail 1	A		Recommend identifying component on graphical detail.	CES		Will identify all components in detailing.	Closed anticipating this this will be completed as noted by Architect	Closed	CD

OPM SUBMITTAL REVIEW & COORDINATION

MSBA 60% CONSTRUCTION DOCUMENT REVIEW

6C.2.1 - 04

6C.2.1 – 04a

60% CD REVIEW
W/ DESIGNER
COMMENTS

MSBA 60% CD Review

APPENDIX 6B

MODULE 6 – 60% CONSTRUCTION DOCUMENTS REVIEW COMMENTS

District: *Northeast Metropolitan Regional Vocational School District***School:** *Northeast Metropolitan Regional Vocational High School***Owner's Project Manager:** *PMA Consultants***Designer Firm:** *DRA Architects***Submittal Received Date:** *January 20, 2023***Review Date:** *January 23, 2023 – February 2, 2023***Reviewed by:** *Gienapp Architects, K. Brown, Lee Deveau***Received:** February 3, 2023**Response:** February 15, 2023**MSBA REVIEW COMMENTS**

The following comments¹ on the 60% construction documents submittal are issued pursuant to a project submittal review document for the proposed project and presented as a 60% construction documents 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.

6B.1 Summary Comments

	Comments
• Basic Project Information	
o Enrollment (describe grade configuration, design enrollment and number of PK students if applicable)	<i>1,600 students grades 9-12 with no Pre-K</i>
o GSF area (describe approved GSF in the Project Funding Agreement and as currently proposed)	<i>It appears there is a discrepancy regarding the GSF area. The project summary and space summary both indicate 386,630 GSF, which matches the PFA. However, the Cost Estimate Comparison Form indicates 382,610 GSF, a difference of 4,020 GSF. Please clarify with the response to these comments.</i> Design Team Response: The cost estimate summary does not include the add alternate for the Satellite Locker Building. Within the Space Summary, under Health & Physical Education, this is under line-item Satellite Locker Rooms.
o Project Type (all new, add/reno, reno)	<i>New construction</i>
o Delivery method (DBB, CMR). If CMR, describe contract status	<i>CMR, Gilbane</i>

¹ 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 coordination of design criteria, 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 provisions of federal, state, and local law. 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.

o For projects with Chapter 74 CVTE programs, OPM and Designer review and acknowledge requirements described here (Chapter 74 Meeting with MSBA and DESE following the 60% CD submission).	<i>Included</i>
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- Project Budget Compliance:

- o *The Project Funding Agreement ("PFA") has a Total Project Budget of \$317,422,620. The submittal notes that the current total project budget is \$324,922,542, and exceeds the PFA budget by \$7,499,922.*
 - *The submission indicates that the District has increased the budget to account for this overage.*
- o *The PFA has an estimated construction cost of \$243,591,092. The submittal notes that the OPM's current reconciled estimated construction cost is \$249,224,736 and exceeds the PFA budget by \$5,633,644.*
- o *The (OPM/CMR)'s current construction cost estimate is \$249,314,640 by (Gilbane). The Designer's current construction cost estimate is \$249,224,736 by (Rider Levitt Bucknall).*

- General Comments:

- o *Work included in early bid packages issued either before this submission or within 35 days of this submission is not included in this review. Consequently, items included in the Early Bid Package are not reviewed here. It is clear an early site work package has already been issued to bid. It is not clear if the foundations and steel package has either already been or will soon be issued to bid. Consequently, site work, foundations, and steel are not included in this review. Please clarify in the response to this review.*

OPM Response: The foundations and steel packages have not yet been issued for bidding.

- o *The Code Analysis does not mention if the building can be classified as "high-rise", and there are parts of the building that appear to be over the threshold for "high-rise". Please confirm that this was reviewed by the District, and describe in the response to this review.*

Design Team Response: The building is not classified as a high-rise building.

The International Building Code defines a high-rise building as a building with an occupied floor located more than 75-feet above the lowest level of the fire department vehicle access. The distance from the Lower Level to the Fourth Floor, at the proposed NE Metro building, is 68-feet.

- o *Workforce participation goals for minorities and women, and processes and procedures to include compliance are not included in the Project Manual. Please include this information in the next submission.*

OPM Response: Acknowledged.

6B.2 OPM Deliverables:

6B.2.1 OPM Submittal Review & Coordination		Comments
• OPM's written Designer submission review, with recommendations to the Owner for one of the following (choose one): ☒ OPM approves the submission ☐ OPM approves the submission partially; reject remainder ☐ OPM rejects the submission ☐ OPM requires additional supporting information		
• Coordinate design; include written recommendations to the Owner. Address each of the following items individually, and describe how the OPM evaluated each item. - o Technical accuracy, coordination, & clarity		
		<i>Not addressed. Please address this in the next submission.</i> OPM Response: This was addressed, please refer to cover letter and the OPM/CM/Cx review comments.

	o Efficiency & cost effectiveness	<i>Not addressed. Please address this in the next submission.</i> OPM Response: This was addressed, please refer to cover letter and the OPM/CM/Cx review comments.
	o Operability	<i>Not addressed. Please address this in the next submission.</i> OPM Response: This was addressed, please refer to cover letter and the OPM/CM/Cx review comments.
	o Constructability	<i>Not addressed. Please address this in the next submission.</i> OPM Response: This was addressed, please refer to cover letter and the OPM/CM/Cx review comments.
	o Phasing	<i>Not addressed. Please address this in the next submission.</i> OPM Response: This was addressed, please refer to cover letter and the OPM/CM/Cx review comments.
	o Bid ability	<i>Not addressed. Please address this in the next submission.</i> OPM Response: This was addressed, please refer to cover letter and the OPM/CM/Cx review comments.
	o Site access during construction	<i>Not addressed. Please address this in the next submission.</i> OPM Response: This was addressed, please refer to cover letter and the OPM/CM/Cx review comments.
•	Coordinate Commissioning consultant's review	
	o Describe the commissioning consultant's review status.	
	o Include a copy of the commissioning consultant's review & project team's response to each item.	
•	o Describe the consideration and incorporation of commissioning consultant's recommendations into the current submittal.	
	Coordinate the District response to the MSBA comments of previous submittals.	
	o Include a copy of the previous MSBA review & District response, including any supplemental submittals and reviews.	
•	o Provide documentation of comments addressed and comments resolution outstanding.	

6B.2.2 Project Schedule		Comments
•	The OPM is responsible to submit a project schedule that conforms to the following requirements, whether the schedule is produced by the OPM or the CMR (if 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 update should provide the same level of detail as was included in the Project Funding Agreement Exhibit C, expanded and updated to include milestones for Design Development, Bidding, Construction, and	

Closeout. The updated schedule should include proposed critical path and construction milestone information. In addition to the construction milestones, the schedule must also include the following information as listed in MSBA Module 7, Schedule Activities:	
o Punch list start and end dates	
o Project Registration date with the US Green Building Council ("USGBC") or Collaboration for High Performance Schools ("CHPS")	
o Provisional/Design package submittal date to USGBC or CHPS	
o MSBA 50% DCAMM Notification submittal date and MSBA 100% DCAMM Standard Contractor Evaluation Form notification date	
o General Contractor/Construction Manager request for final payment	
o Commissioning Consultant inspection (substantial completion plus approximately 10 months)	
o Final Commissioning report to MSBA submittal date	
o Final Construction package to USGBC/CHPS including the Final Commissioning Report submittal date	
o Anticipated final Green School Program Certification letter from USGBC/CHPS issuance date	
o Commissioning Certificate of Completion submittal date to MSBA	
o Final reimbursement request submittal date to MSBA	
• Include application submission and approval dates in the project schedule for the following approvals, coordinated with the Designer's submittal information. In addition, provide dates for any other state or federal approval not listed below (the following list is not a comprehensive itemization of required state approvals; other requirements may apply, and some items listed below might not be applicable to this project) Indicate "Non-Applicable" on the project schedule where appropriate.	
o DESE - Special Education approval by Department of Elementary and Secondary Education	
o MHC – Project Notification Form and approvals by MA Historical Commission	
o OIG - Construction Manager at Risk approval by the Office of Inspector General	
o Executive Office of Energy and Environmental Affairs/EEA:	
▪ MEPA - MA Environmental Policy Act by Energy & Environmental Affairs:	
• ENF - Environmental Notification Form	
• EIR - Environmental Impact Report	
▪ Article 97 Land Disposition Policy approval by Energy & Environmental Affairs	

	- o MA DEP - Massachusetts Department of Environmental Protection - o MA DOT - Massachusetts Department of Transportation - o MA DPH - Massachusetts Department of Public Health - o EPA –NPDES National Pollutant Discharge Elimination System Notice of Intent approval by the US Environmental Protection Agency - o MAAB - Accessibility variances by MA Architectural Access Board	
•	Indicate all required state reviews or permits on the milestone schedule including actual or planned approval dates which are required in order to maintain the planned bidding and construction schedule and milestones indicated therein. For required state reviews or permit approvals which have not been obtained on schedule, provide a separate (sub network) schedule depicting recovery actions to obtain required approvals in order to maintain the bidding and construction schedule.	
•	A letter on District letterhead confirming that the Project has undergone review and obtained all necessary state reviews and approvals by any departments or Commonwealth agencies required by law to review the Project, including but not limited to the approvals listed above. Attach such documentation letter evidencing such state reviews and approvals:	<i>Not included. Please include this in the next submission.</i> Project Team Response: Acknowledged.
	o Identify any state reviews or permits for which approval has not been obtained as of the 60% Construction Documents submission date, and include in the District letter a status update including actions taken to date and actions planned to obtain the required approval(s) in order to comply with Project Funding Agreement (the "PFA") Section 4.12. and maintain the projected schedule milestones listed in OPM Deliverables.	
	o PFA Section 4.12, executed between the District and the MSBA, requires that each project successfully undergo review and obtain all necessary approvals "prior to the solicitation of construction bids, by any departments or agencies of the Commonwealth required by law to review such projects..." In response to these 60% CD submission review comments, MSBA requires documentation that the District complies with this PFA requirement.	
•	The schedule is to be updated and submitted to MSBA as often as 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).	

Indicate the date for the 60% Construction Documents and proposed 90% Construction Documents submission dates. The schedule is to incorporate 21 calendar day required duration for each MSBA submission review, and a minimum 14 calendar days for project team incorporation of MSBA review comments as well as all others into the project documents prior to the next submission due date or finalizing project documents to make available to bidders. 35 calendar days between each MSBA design submission (DD, 60%, 90%) is the minimum acceptable duration; if the project team believes additional time is required for any or all the submissions the durations for these activities are to be increased accordingly.	
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6B.2.3 Project Scope and Budget		Comments
- Develop project scope and budget, cost estimates and reconciliation: - o OPM construction cost estimate using CSI MasterFormat 6-digit format to Level 3 and MGL c.149 s 44F (filed sub-bid) format showing unit rates and quantities; with escalation projected to the mid-point of construction. - o OPM reconciliation of the OPM/CMR and Designer construction cost estimates including a description of the method to derive this reconciliation. Refer to this link for an example of the Cost Estimate Reconciliation Form. - o Updated Cost Estimate Comparison Form. Refer to this link for an example of the Cost Estimate Comparison Form.		<i>The included Cost Estimate Comparison Form only includes the cost estimate for the 60% CD phase and the blank template for the 90% CD phase. Earlier phases, such as PS&B, PFA, and DD are not shown. Please include the full cost estimate comparison form showing all relevant phases in the next submission.</i> OPM Response: The CSI Cost Comparison template begins with 60% CD Phase. Omission of the Uniformat Cost Comparison spreadsheet was a clerical error and is included with this response.
- CMR (if applicable) - o If the Owner has not yet contracted with a Construction Manager (CM), the OPM must develop a construction cost estimate as described above for comparison with the Designer's cost estimate. - o If the Owner has given the CM a Notice to Proceed, the OPM must review cost estimates provided by the Designer and CM and provide a Designer's and CM's construction cost estimates reconciliation as described above.		

Updated project budget in the total project budget format, based on the reconciled construction cost estimate. If the reconciled estimate is not used for the updated project budget, provide an explanation.	<i>The submission's Total Project Budget uses an Estimated Construction Cost of \$244,991,092 instead of the reconciled estimate of \$249,224,736. It is not clear why another value is used or where the value came from. Please clarify and provide an updated Total Project Budget that uses the reconciled cost estimate with the response to these comments.</i> OPM Response: Please refer to the OPM Cover Letter which clarifies the recent grant received by the District and associated impact to the Total Project Budget. Also please note, the grant funds are reflected in the submitted Total Project Budget as ineligible third party funding on the final page.
Describe any early-bid packages anticipated scope and schedule. Include any early-bid packages in the submittal (if applicable) to show a complete project. Provide bid tables for any completed sub-bid packages.	
- Value Engineering recommendations (if any) - Provide the list of potential and accepted Value Engineering recommendations, and associated costs of each item. - For any Value Engineering recommendations which have been accepted, provide a copy of the Committee vote.	<i>Not included. Include this in the next submission.</i> OPM Response: Value Engineering efforts have been coordinated directly with District leadership.

6B.3 Designer Deliverables:

6B.3.1 General Requirements		Comments
Submit an updated work plan.		
- Updated and expanded Basis of Design narrative description for each following discipline: - Architecture - Structural: narrative must include lateral bracing methods and how earthquake code requirements will be met - Civil - MEP + FP - Data/Comms./Security		

Updated building code analysis	<i>The Code Analysis does not mention if the building can be classified as "high-rise", and there are parts of the building that appear to be over the threshold for "high-rise". Please confirm that this was reviewed by the District and describe in the response to these review comments.</i> Design Team Response: The building is <u>not</u> classified as a high-rise building. The International Building Code defines a high-rise building as a building with an occupied floor located more than 75-feet above the lowest level of the fire department vehicle access. The distance from the Lower Level to the Fourth Floor, at the proposed NE Metro building, is 68-feet.
Provide an updated list of proprietary items under consideration.	
Updated interior color theory statement describing proposed paint and material selections and colors for typical and special spaces, why they have been selected and how these selections relate to exterior materials and colors. Confirm that color and material selections have been presented to and approved by the District.	<i>The submission does not confirm if color and material selections have been presented to or approved by the District. Please address this in the next submission.</i> Design Team Response: The Interior Color Theory Statement, submitted with the 60% CD Binder Material, provides a sampling of the color selections that were reviewed during at the October 25, 2022, meeting with the District. The Design Team will be meeting with the District again prior to going out to bid.
Updated structural calculations and required floor loads	
Evidence that an independent structural design review is initiated or being arranged (an MSBA requirement for all projects with new construction over 10,000 sf). MSBA requires a structural engineering peer review submission as part of the Final (100%) Construction Documents submission, to include documentation of any issues identified by the Peer Reviewer and resolution. Actions are to be advanced well prior to the 90% CD submission to engage the peer reviewer, and that scheduling be arranged to allow final structural design drawings and calculations to be submitted to the peer reviewer at the completion of the 90% Construction Documents submittal, or earlier as may be required for early (structural) bid packages, in order to incorporate comments and response action reporting in the final construction documents and avoid delays. Confirm this process has been initiated.	
Updated energy model calculations	
Updated Life Cycle cost analysis for energy and water consuming devices	
Updated heat gain and loss calculations for Heating, Ventilating and Air Conditioning systems	
Updated calculations showing total electrical load	
Updated security and visual access requirements:	

	o Confirmation that the persons responsible for the District's emergency procedures implementation, and responding emergency medical, fire protection, and police agency representatives have been consulted in the planning process and any associated requirements have been included in the project.	<i>The submission does not confirm if emergency medical personnel have been consulted. Please address this in the next submission.</i> Design Team Response: The project has been reviewed by first responders. It is expected that additional meetings will be held in the next phase to review and finalize hardware.
	o Identify other security related items particular to the District and/or the proposed project.	
	o Verification that the following safety and security related issues have been reviewed and are in accordance with the District's procedures as noted above:	
	▪ Main entrance design – describe District protocol for visitor entry and check-in related to the current design for visitors to remain in the vestibule versus a side sub-vestibule.	
	▪ Classroom lockset hardware - confirm hardware functions are compatible with the District's protocols related to lockdown.	
	▪ Classroom / Instructional spaces visibility - confirm that the inclusion of sidelights at entrance locations is compatible with the District's current standards related to visibility from corridors and whether any related vision control option measures are to be incorporated.	
	▪ Alternative entry/exit locations - confirm project includes site and building signage, as may be required by District's emergency procedures, to 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:	
	o Confirmation that the district personnel responsible for maintenance have been consulted in the planning process and any associated requirements have been considered for this project. Describe maintenance related items particular to the District and/or the proposed project.	
	o Confirmation that the district personnel responsible for budgeting and maintenance have participated in discussions regarding the selection and long-term operational and maintenance costs of the mechanical systems and building maintenance system controls.	
	o Confirmation that the district personnel responsible for the maintenance have participated in discussions regarding the proposed training program and that these discussions have determined that the hours and the schedule for training included in the contract are sufficient to train the facility operational and maintenance personnel to operate the building management system, as designed. Confirmation that	

	adequate hours have been scheduled both before the opening of the school and after the turnover of the building.	
	o Verification that at a minimum the following issues have been reviewed:	
	▪ Training hours and scheduling	
	▪ HVAC systems	
	▪ Building Management Systems	
	▪ Lighting fixtures and controls	<i>Not included. Include this in the next submission.</i> Design Team Response: Will be included in the next submission.
	▪ Cleaning procedures and materials	<i>Not included. Include this in the next submission.</i> Design Team Response: Interior finish materials have been reviewed with the District's Maintenance Personnel regarding durability and cleaning procedures.
	▪ Roof access	
	▪ Mechanical room access	
•	Updated Quality Control narratives, supporting plans and documents demonstrating:	
	o Ceiling clearances	
	o Mechanical room and shaft sizes	
	o Coordinate specifications and drawings	
	o Filed sub-bid work	
	o Scheduling	
	o Equipment and power	
	o Existing and new construction	
	o Phasing	

6B.3.2 Space Summary					Comments		
<u>Spaces</u>	<u>PFA Space Summary</u>	<u>DD Space Summary</u>	<u>60% CD Space Summary</u>	<u>90% CD Space Summary</u>	<u>Difference to PFA</u>	<u>Comments</u>	
Core Academic Spaces	51,990	52,020	51,980		(10)	General classrooms reduced 85 sf; Teacher Planning/ Workrooms added 15 sf; Science Classrooms/Labs added 85 sf; Prep Room added 5 sf; Health CR/Team Meeting Room reduced 10 sf; Language Lab/Distance Learning reduced 20 sf. In the response to these review comments, please confirm that no classroom sizes are below the minimum size stated in MSBA's guidelines. Design Team Response: All the General Classrooms comply within MSBA's square footage guidelines (825 SF minimum and maximum of 950 SF). All the science classrooms meet MSBA minimum size requirement of 1440 square feet. Special Education spaces meet the square footage and location requirements as approved by DESE and included in the MSBA Schematic Design Submission.	
Special Education	7,070	7,070	7,070		-	No proposed changes	
Art and Music	-	-			-		

	Vocations & Technology	127,755	127,510	127,165	(590)	Tech./Engineering Rooms reduced 5 sf; Automotive Collision Rpr reduced 80 sf; Automotive Technology reduced 115 sf; Business Office Tech. increased 25 sf; Carpentry reduced 150 sf; Culinary Arts increased 5 sf; Dental Assisting reduced 50 sf; Design & Visual Communications reduced 25 sf; Drafting & Design reduced 5 sf; Early Childhood Ed. increased 20 sf; Electrical Tech. reduced 110 sf; Health Assisting reduced 40 sf; HVAC Tech. reduced 35 sf; Plumbing & Pipefitting reduced 35 sf; Robotics & Automation reduced 5 sf; Biotech. reduced 30 sf; Marketing increased 25 sf; Medical Assisting increased 20 sf. In the response to these review comments, please confirm DESE includes the revisions in this submission. Design Team Response: The latest revisions are consistent with the previous DESE approval. Spaces that are being presented at the current DESE Chapter 74 review meetings reflect plans that were submitted as a part of the MSBA 60% CD Submission.
	Health and Physical Education	25,750	25,535	25,750	-	Gym reduced 165 sf; PE Alternatives increased 160 sf; Gym Storeroom reduced 20 sf; Locker Rooms w/Toilets reduced 900 sf; Satellite Locker Rooms reduced 15 sf; Phys Ed Storage & Closets increased 25 sf; Athletic Director's Office increased 15 sf; Officials/Trans Locker Room w/Shower & Toilet increased 10 sf; PE Instructor & Coach Office w/Shower & toilet reduced 65 sf; Trainer increased 25 sf; Auxiliary PE increased 930 sf. Space Summary indicates Aux. PE space to be 835 NFA and 930 total area. In the response to these review comments, please resubmit the Space

							Summary and confirm area of Aux. PE. Design Team Response: Auxiliary PE is intended to be 930 SF and not 835 SF. The Space Summary has been corrected.
	Media Center	5,455	5,460	5,450		(5)	Media Center/Reading Room reduced 45 sf; Workroom increased 35 sf; Small Group Room reduced 5 sf; Project Room/TV Studio/Storage increased 10 sf.
	Auditorium / Drama	10,505	10,540	10,935		430	Auditorium increased 1,890 sf; Stage reduced 1,610 sf; Make-up/Dressing/Green Room increased 10 sf; Controls/Lighting/Projection increased 140 sf.
	Dining and Food Service	13,180	13,180	13,175		(5)	Cafeteria/Student Lounge/Break-out increased 10 sf; Chair/Table Storage reduced 50 sf; Scramble Serving Area increased 65 sf; Kitchen reduced 20 sf; Staff Lunch Room reduced 10 sf.
	Medical	1,340	1,325	1,340		-	Medical Suite Toilet reduced 10 sf; Nurses' Office increased 5 sf; Interview/Exam Room reduced 5 sf; Resting increased 10 sf.

	Administration and Guidance	8,655	8,630	8,682		27	Gen Off./Waiting Rm/Toilet increased 15 sf; Teacher's Mail/Time Rm increased 2 sf; Duplicating Rm increased 25 sf; Records Rm increased 76 sf; Principal's Off. reduced 8 sf; Principal's Secretary/Waiting reduced 6 sf; Asst Principal's Off. increased 2 sf; Asst Principal's Off.- Voc Deans, Academic Program Coord, Co-Op reduced 3 sf; Supervisory & Paraprofessional Off. reduced 2 sf; Dept Head Off. reduced 4 sf; Safety Resource Officer increased 3 sf; In-House Suspension increased 2 sf; Conf. Rm reduced 77 sf; Guidance/Adj. Diversity Off. increased 22 sf; Guidance Storeroom reduced 1 sf; Career Center/Classroom reduced 8 sf; Records Rm increased 2 sf; Teacher Work Rm reduced 13 sf.
	Custodial and Maintenance	4,150	4,175	4,335		185	Custodian Storage increased 90 sf; Recycling Room/Trash increased 5 sf; Receiving & General Supply increased 90 sf. Space Summary includes Network/Telecom Room & Offices as both 200 sf and 255 sf. In the response to these review comments, please resubmit the Space Summary to clarify. Design Team Response: Network / Telecom Room is intended to be 255 SF. This square footage matches the space summary area from Schematic Design. The Space Summary has been corrected.
	Other	1,900	1,870	1,880		(20)	Adult Ed Offices & Storage reduced 40 sf; Superintendent's Office increased 5 sf; Business Office Suite, HR increased 15 sf.
	Total Building Net	257,750	257,315	257,762	-	12	
	Non Programmed						
	Vocational Offices	2,560	2,936	3,195		635	
	Custodial Closets	-		690		690	

	Technology	-		1,060		1,060	
	Unoccupied MEP/FP	10,280	10,562	8,150		(2,130)	
	Unoccupied Closets, Supply Rooms & Storage	725	774	680		(45)	
	Toilet Rooms	4,375	4,359	4,480		105	
	Circulation	77,430	69,739	67,850		(9,580)	
	Remaining	33,510	40,945	42,763		9,253	
	Total Gross	386,630	386,630	386,630		-	
	Grossing Factor	1.50	1.50	1.50	#DIV/0!	(0)	
Updated space summary and signed certification that reflects the current design							
- Comparison of the current design with the final educational program, and confirmation that there are no variations. If there are variations, the written summary must address the following: - o Explain deviations within the space summary from the Project Funding Agreement. The MSBA will either: ▪ MSBA accepts this variation to the approved project with no further action required. ▪ Prior to MSBA accepting this variation to the project, the Designer must describe in detail the reason for the change.				<i>The MSBA will continue to monitor areas in excess of/ or below the agreed upon GSF at PFA and may consider deviations over or under guidelines as either Ineligible at PFA Bid Amendment and/or requiring a decrease to the approved grant.</i> Design Team Response: Acknowledged			
- o The MSBA considers that deviations include size changes of a specific space, the total program area nsf (e.g. general classrooms, voc tech, dining etc.), space location, surrounding space adjacencies and/or the intended room purpose. ▪ The submittal must clearly call out deviations to location and surrounding adjacencies using redlines or "clouding". ▪ The explanation should clearly identify the basis of the change identifying both architectural and/or programmatic reasons. ▪ If the basis of the change is programmatic, the submittal should include a red-lined version of the educational plan included in the Project Funding Agreement.							
- Regarding DESE approved SPED Spaces: - o Include a copy of the most recent letter from DESE approving the current proposed SPED spaces. - o Confirm that the DESE approved SPED spaces have not deviated, using the definition above; or, ▪ If the District wishes to submit a change to its DESE approved submittal, it must a) confirm							

	that all changes to SPED spaces are final; b) provide a new SPED submittal in the original submittal format (described in Module 4 Schematic Design Section 4.1.1 and Mod 4 Appendix 4B) noting any changes with clouded floor plans and red-lined narratives and tables; and c) indicate how the project schedule can accommodate a potential DESE resubmittal and approval. Please provide a separate package for changes to DESE approved SPED spaces. ▪ If the District chooses not to change from the DESE approved submittal it should explain when and how the spaces will be returned to the approved size, configuration and location.	
•	Regarding DESE Approved Public Day Education Spaces:	
	o Indicate "Not Applicable" if the project does not include DESE approved Public Day Education spaces	
	o If applicable, confirm that the DESE approved Public Day Education spaces have not deviated, using the definition above; or, ▪ If the District wishes to submit a change to its DESE approved submittal, it must a) confirm that all changes to Public Day Education spaces are final; b) provide a new submittal in the original submittal format, noting any changes with clouded floor plans and red-lined narratives and tables; and c) indicate how the project schedule can accommodate a potential DESE resubmittal and approval. Please provide a separate package for changes to Public Day Education Spaces. ▪ If the District chooses not to change from the DESE approved submittal it should confirm that the spaces are the same or explain when and how the spaces will be returned to the approved size, configuration and location.	
•	Regarding DESE approved Chapter 74 Program Spaces:	
	o Indicate "Not Applicable" if the project does not include DESE approved Chapter 74 Spaces.	
	o If applicable, confirm that the proposed Chapter 74 spaces conform to the current DESE Chapter 74 manual for Vocational Technical Education Programs.	

o Include a copy of the most recent letter from DESE approving the current proposed Chapter 74 Program spaces.	<i>A letter from July 2021 is included in the submission that anticipates approval in August 2021. Please provide an update with the response to these comments.</i> Design Team Response: The July 2021 letter from DESE, which was included in the 60% CD submission, states that DESE has reviewed the proposed career tech programs and they are viable and the number of students per program is reasonable. The August 2021 date referenced in this letter is referring to the anticipated date of MSBA's grant approval (which occurred at the 8/25/21 MSBA Board of Directors meeting) and not a DESE milestone. Please let us know if additional clarification is needed.
o Confirm that a <u>Chapter 74 Meeting</u> has been scheduled with the MSBA and DESE following submittal of the 60% construction documents.	
- o If applicable, confirm that the DESE approved Chapter 74 Program spaces have not deviated, using the definition above, or; ▪ If the District wishes to submit a change to its DESE approved submittal, it must a) confirm that all changes to Chapter 74 Program spaces are final; b) provide a new submittal utilizing the original submittal format, noting any changes with clouded floor plans and red-lined narratives and tables; and c) indicate how the project schedule can accommodate a potential DESE resubmittal and approval. Please provide a separate package for changes to the Chapter 74 Programming. ▪ If the District chooses not to change from the DESE approved submittal it should explain when and how the spaces will be returned to the approved size, configuration and location.	<i>Changes to Chapter 74 Program spaces were noted in the Space Summary review. In the response to these review comments, please confirm that DESE approval of Chapter 74 Program includes the most recent revisions included in this submission.</i> Design Team Response: The latest revisions are consistent with the previous DESE approval. Space that are being presented at the DESE Chapter 74 review meetings reflect plans that were submitted as a part of the MSBA 60% CD Submission.

6B.3.3 Project Approvals	Comments
• Describe the status of the following approvals. In addition, provide the status of any other state or federal approval not listed below (the following list is not a comprehensive itemization of required state approvals; other requirements may apply, and some items listed below may not be applicable to this project). Provide a copy of the appropriate application forms and/or approval letters where applicable. Indicate "Not Applicable" where appropriate and describe why each item is not applicable. For each agency approval required for this project, indicate the date when approval was received. All required approvals should have an associated approval date indicated as part of the 90% CD submission and prior to advertising for bids. Confirm that the required approvals are coordinated with the OPM's project schedule.	

	o DESE - Special Education approval by Department of Elementary and Secondary Education	
	o MHC – Project Notification Form and approvals by MA Historical Commission	
	o OIG - Construction Manager at Risk approval by the Office of Inspector General	
	o Executive Office of Energy and Environmental Affairs / EEA:	
	▪ MEPA - MA Environmental Policy Act by Energy & Environmental Affairs:	
	• ENF - Environmental Notification Form	
	• EIR - Environmental Impact Report	
	▪ Article 97 Land Disposition Policy approval by Energy & Environmental Affairs	
	o MA DEP - Massachusetts Department of Environmental Protection	
	o MA DOT - Massachusetts Department of Transportation	
	o MA DPH - Massachusetts Department of Public Health	
	o EPA –NPDES National Pollutant Discharge Elimination System Notice of Intent approval by the US Environmental Protection Agency (or indicate as “by GC/CMR”)	
	o MAAB - Accessibility variances by MA Architectural Access Board	
•	Confirmation that the Project has undergone review and obtained all necessary approvals by any departments or Commonwealth agencies required by law to review the Project, including but not limited to the approvals listed above. Attach such documentation letters evidencing such reviews and approvals. In accordance with the Project Funding Agreement (the “PFA”) Section 4.12, the District must obtain such reviews or approvals prior to the construction bids solicitation.	
•	For any required state reviews or permits for which approval has not been obtained as of the 60% Construction Documents submission date, provide a status update including actions taken to date and actions planned to obtain the required state reviews and permit approval(s) in order to comply with PFA Section 4.12 and maintain the projected schedule milestones listed in OPM Deliverables.	
•	List all target dates for all local zoning approvals, testing and permits.	
•	Provide a certification that all applicable utility officials have been contacted by the Designer regarding each basic utility connection.	

6B.3.4 Cost Estimate		Comments
•	Provide a Designer's construction cost estimate based on the 60% Construction Documents, including cost estimates for general conditions, overhead and profit, insurance, bonds, and all other items; allowances expressed as percentage rates for construction contingencies, and other mutually agreed upon contingencies. Prepare the construction cost estimate using CSI MasterFormat 6-digit format to Level 3 and MGL c.149 s 44F (filed sub-bid) format showing unit rates and quantities; with escalation projected to the mid-point of construction.	
•	The estimate date should be no earlier than the 60% Construction Documents date.	
•	Provide summary sheets including the following:	
	o Date that the estimate was prepared (value date)	
	o Anticipated bid date	<i>Not included. Please include in the next submission.</i> Design Team Response: Acknowledged.
	o Project and contract number	<i>Not included. Please include in the next submission.</i> Design Team Response: Acknowledged.
	o Project title and location	
	o Designer name	
	o Estimator name	
	o Site cost (including all utilities)	
	o Building cost (including fixed equipment)	
	o Estimated construction cost of each work phase, totaled	<i>Not included. Please include in the next submission.</i> Design Team Response: Acknowledged.
	o Items 1 and 2 work costs, as distinguished in the General Contractor's bid forms, individually totaled	<i>Not included. Please include in the next submission.</i> Design Team Response: Acknowledged.

6B.3.5 Drawings (developed to 60% CD progress level)		Comments
•	Half-size drawings only. Confirm that text, symbols, shading and all drawings content are legible.	<i>Due to the current COVID-19 situation, hard copies were not provided. MSBA may request hard copies at a later date for record.</i> Design Team Response: Acknowledged
•	If applicable, include early bid package contract documents in the submittal to show a complete project.	<i>Early bid packages are included. However, they are not reviewed as part of this submission since they are or will soon be issued to bid.</i> Design Team Response: Acknowledged
•	Cover sheet showing a drawings list and a locations map (the project title should be visible when the drawings are rolled)	
•	Sheet(s) containing all symbols, abbreviations and notes applicable to each discipline	

•	Site and Utility drawings should show the following:	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
	o Proposed work layout and location with details	<i>See comment above.</i>
	o Existing and proposed contours	<i>See comment above.</i>
	o Building locations fixed and referenced from main survey baseline	<i>See comment above.</i>
	o Floor elevations at each entrance/exit and key exterior grades at perimeter showing drainage away from the building	<i>See comment above.</i>
	o Site Benchmarks	<i>See comment above.</i>
	o Boring locations	<i>See comment above.</i>
	o Retaining walls	<i>See comment above.</i>
	o All utility service lines, systems and structures for electricity, gas, oil, water, steam, telephone, CATV, fire alarm, sanitary and storm drainage	<i>See comment above.</i>
	o Contract limit line and storage area for construction materials	<i>See comment above.</i>
	o Site survey which includes, but is not limited to, all existing foundations, obstructions and other site characteristics	<i>See comment above.</i>
•	Mobilization and enabling works	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
•	Architectural drawings showing the following:	
	o Demolition drawings	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
	o Floor plans of each floor, with dimensions, column locations, floor elevations, door designations, partition types & fire-rated partitions and smoke partitions, built in furniture and equipment, keyed to other architectural drawings and coordinated with exterior grade elevations at all interior to exterior transitions	<i>Top of curb elevations are not shown on the Edge of Slab drawings. Suggest including this information for clarity.</i> Design Team Response: Trying to understand your request. We do not have any concrete “curbs” at the slab edge. <i>Interior partitions and doors are not dimensioned on the drawings. Suggest including this information for clarity.</i> Design Team Response: Prior to going out to bid, interior partitions and doors will be dimensioned. At the 60% CD phase, we provided dimensions to all column grid lines. <i>Sheets A1-1-3C, 4C, and D include remnant MEP symbols and elements. This should be reviewed and cleaned up in the next submission.</i> Design Team Response: We will review and clean up the graphics.
	o Key plans / overall plans where required	
	o Large scale plans showing key areas e.g. lobby, special spaces. Indicate floor surface materials (minimum 1/4" = 1'-0" before reduction)	<i>Specialized areas are shown on the general floor plans and are not shown on large-scale plans. Suggest including large scale plans of these areas for clarity.</i> Design Team Response: Large scale plans will be added, as needed, for areas requiring additional detailing.

o Roof plans showing the following:	
▪ Proposed systems type	
▪ Pitch and drainage pattern	
▪ Roof drains, gutters and scuppers	
▪ Skylights, penthouses, major equipment, chimneys	
▪ Roof access and ladders	
▪ Walk pads	
▪ Rooftop Solar Readiness area, PV support and interconnection pathways	
o Building Sections updated and coordinated with plans and elevations	
o Building elevations showing the following:	
▪ Full height elevations including roof structures, e.g., mechanical equipment, chimneys, and penthouses	
▪ Floor elevations, floor-to-floor height, and overall height related to benchmarks on site plans	<i>The floor elevations on the architectural building elevations and wall sections show the finish floor at 100'-0", but the civil drawings (which do not indicate the finish floor level) show typically underground utility connections being around 130' or 140'. This should be reviewed. Suggest providing more information to make the relationship between the civil elevations and architectural elevations clearer.</i> Design Team Response: Landscape drawings indicate top of first floor slab, as it relates to sea level, as 163.5 feet. Refer to drawings L402 & L403. Architectural drawings indicate the top of slab at the first floor as 100'-0." Reasoning behind this is to avoid mathematical errors for tradesmen who are measuring from finished floor slab. The Architectural floor plans have a general note that states: T.O. SLAB @ FIRST FLOOR DATUM ELEVATION OF 100'-0" CORRESPONDS TO 163.50' MEAN SEA LEVEL, AS SHOWN ON SITE AND CIVIL DRAWINGS. ALL OTHER ELEVATION DATUM SHOWN IN THE ARCHITECTURAL SET IS RELATIVE TO 100'-0"
▪ Windows, storefront, and curtain wall systems	
▪ All columns located on a centerline and coordinated with the structural drawings	
▪ Materials indicating major control and expansion joints, and divisions of materials where required	<i>Control and expansion joints and lintel relief are not shown. This should be reviewed and, if needed, added in the next submission.</i> Design Team Response: Expansion joint detailing can be found on plan detail 1/A5-1-3 and sections 2 & 3/A3-2-15. Additional details will be added as the drawings are developed.
▪ Exterior grades and topographical features in context	

o Wall sections indicating dimensions, flashing, anchorage, reinforcing, masonry coursing, cladding, and all other conditions at wall, roof, foundation, interior floors; coordinated with exterior grade elevations	<i>Tags for wall sections are not shown on the elevations. Suggest including these for clarity.</i> Design Team Response: On this project, section detailing occurs not only at the exterior of the building, but at interior locations as well. To show information in a consistent location, our office standard is to show wall section tags on the floor plans and <u>not</u> on exterior elevations. <i>Interior courtyard details and wall construction are not shown. Suggest including these for clarity.</i> Design Team Response: Detailing of the courtyard walls can be found on wall sections 1, 2, 3, 4 and 5 on drawing sheet A3-2-3. <i>The roof drain appears to be shown in an incorrect location on Section 8 on Sheet A5-3-2. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: Graphics will be revised.
o Details demonstrating continuous thermal insulation and thermal breaks between conditioned interior spaces and unconditioned exterior spaces (parking garages, loading zones and other open areas)	<i>See note above regarding interior courtyard details.</i> Design Team Response: Detailing of the courtyard walls can be found on wall sections 1, 2, 3, 4 and 5 on drawing sheet A3-2-3.
o Exterior details, for roofing, flashing and other details showing all major conditions	
o Door, window, entrance, curtain wall and storefront, schedules, and details	
o Vertical circulation plans, sections and details including ramps, stairs, lifts and elevators	
o Guardrails and handrails including details	<i>The center handrails are missing or shown inconsistently such as on the stair plans on Sheet A7-1-1 & 3. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: Graphics for Stair 1 on sheet A7-1-1 will be cleaned up. Stair 2 on sheet A7-1-3 does not require a center handrail. The width of the stair allows a 30" reach to the handrail per the International Building Code requirements.
o Interior elevations of all significant and typical spaces	
o Interior details including casework, paneling surfacing and acoustical treatment	<i>Casework details are not shown. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: Casework is shown on the Equipment Drawings. Refer to the sequence of drawings with the prefix EQ. <i>Interior finishes on some interior elevations are not clear. Suggest adding more interior elevations for clarity.</i> Design Team Response: We will review and add additional interior elevations as needed.
o Reflected ceiling plans coordinated with fire protection, mechanical and electrical drawings	

	o Ceiling details	<i>Ceiling details are in-progress and need further development. Suggest comprehensive ceiling details for clarity.</i> Design Team Response: We will review and add additional ceiling details as needed.
	o Schedules	
	▪ Finishes	<i>Suggest including floor patterning, layouts, and transition details at floor material drawings for next submission.</i> Design Team Response: Floor pattern layouts will be further developed in the next submission. For floor transition details, refer to drawings AF1-3-1 and AF1-3-2. <i>Suggest including game layout for Gymnasium.</i> Design Team Response: Game lines are shown on drawing AF1-1-2D for reference. Specification Section 096460, Wood Athletic Flooring, calls out game line and school logo scope of work.
	▪ Doors	<i>Door details are not keyed and require further development. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: This will be further developed in the next submission.
	▪ Windows	<i>Window details are not keyed and require further development. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: Additional detail tags will be added to window elevations. <i>The air and vapor barrier terminations are not shown consistently at storefront and curtain wall transitions. One example is Detail 13 on Sheet A5-1-2. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: Acknowledged.
	▪ Equipment schedules; e.g., food service, instructional media	
	▪ Partitions	
•	Structural drawings showing the following:	<i>This appears to be part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
	o Structural drawings legend and/or graphical symbols	<i>See comment above.</i>
	o Foundation plans with bottom grades showing all footing layouts, walls, slabs on grade including reinforcing, grade beams, and columns; include design soil bearing pressures and live loads for each area	<i>See comment above.</i>
	o Structural floor and roof plans including framing, finished floor elevations and depressed slab areas, with locations and dimensions for all openings and depressions, coordinated with the architectural drawings	<i>See comment above.</i>
	o Floor and roof framing design loads	<i>See comment above.</i>

	o Complete foundation wall elevation and typical sections, with reinforcing indicating location, dimensions and grades for all footings, steps and wall openings	<i>See comment above.</i>
	o All lintels, beams, joists, and columns are identified (with typical sizes shown) on schedules or on drawings	<i>See comment above.</i>
	o All Structural supports required for mechanical equipment	<i>See comment above.</i>
	o General notes including the following information: class and 28 day concrete strength for each portion, structural steel and concrete reinforcing design stresses for each structural member type, concrete cover for each structural member type, shrinkage and temperature steel requirements, reinforcing laps for main reinforcing and temperature steel; bend point, cutoff, and hook locations for all members, minimum beam and lintel bearing.	<i>See comment above.</i>
•	Fire protection drawings showing the following:	
	o Fire protection drawings legend and/or graphical symbols	
	o Standpipe systems, sprinkler systems, suppression systems, fire pump where required, accessories, and piping	
	o All piping, equipment, fixtures, valves and devices	<i>Sprinklers are not shown under the Gym bleachers. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: Will be reviewed prior to next submission.
	o Design criteria shall be provided on the drawings in accordance with NFPA requirements.	
•	Plumbing drawings showing the following:	
	o Plumbing drawings legend and/or graphical symbols	
	o All work done by the Plumbing Subcontractor, which includes all water, gas, air, vacuum, sanitary and storm wastes, and accessories	<i>It is not clear where the division is between the plumbing filed sub-bid and the civil work for plumbing outside of the building. This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Limit of work for plumbing piping is 10'-0" outside the building, as noted on the underslab plumbing drawings.
	o Plumbing fixtures trapping and venting including floor drains	<i>It appears there is radon piping through the Gymnasium, and it is not clear if this is a coordination issue. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: This will be reviewed prior to the next submission.
	o Dimensioned floor drain locations in coordination with the structural plan	<i>Floor drains are not located on the architectural Edge of Slab drawings. Suggest including them for clarity.</i> Design Team Response: They will be indicated in large scale plans.

o Confirm any hazard or noxious contaminants such as chimneys, plumbing vents or cooling towers are located a minimum 25 feet from outside air intakes or such openings are a minimum two feet below the contaminant source and ten feet horizontally from the nearest edge of the air intake to the nearest edge of the contaminant source (refer to 780 CMR Massachusetts State Building Code in effect at the time of project approval). Consider adding filters to the contaminant source if necessary.	
o Water and gas supply sources, storm and sanitary discharge mains	
o All piping sizes shall be indicated on drawings and riser diagrams, including flow and pitch directions	
o All accessories, valves, fixtures including all drinking fountains and grease traps for kitchen waste	
o Verify eyewash stations are provided in all areas where chemicals are stored or used.	
o All piping and connections required for other trades (e.g., kitchen equipment, HVAC make-up water, etc.)	
o Acid waste (where required), vents and neutralization systems for laboratories	
o Plumbing riser diagrams	
o Domestic water booster pumps, boiler feed water, meter locations, hose bibs	
o Domestic hot water: Storage tanks, piping material, hanger details	
o Backflow preventers, and cleanouts	
• Heating, Ventilating and Air Conditioning Drawings showing the following:	
o Mechanical drawings legend and/or graphical symbols	
o Large scale plans of all mechanical & electrical spaces showing equipment to scale	
o All piping and ductwork systems located and sized. All ductwork is shown double line and drawn to scale	
o All piping and duct systems sized at all reductions and riser diagrams	
o All flow directions and pitch on piping, and duct systems indicate flow and volumes direction	
o All equipment shall have enough servicing and/or replacement space indicated on drawings	<i>Service areas on Mechanical mezzanines not shown. Suggest including in the next submission to confirm layout requirements.</i> Design Team Response: Service clearances will be indicated for all equipment in the next submission.
o All equipment, accessories, valves and dampers identified as to type and size	
o Cooling system pumps, chillers, cooling towers, air handling units, ductwork system and dampers, fan details, temperature control system, air and hydronic	

	balancing equipment, and schedules shall be indicated.	
	o Confirm outside air intake openings are a minimum 25 feet from any hazard or noxious contaminants such as chimneys, plumbing vents, cooling towers, streets, alleys, parking lots and loading docks. When locating an air intake within 25 feet of a contaminant source is unavoidable, such opening shall be a minimum two feet below the contaminant source and ten feet horizontally from the air intake nearest edge to the contaminant source nearest edge. All intakes shall be six feet above landscaped grade including soil, lawn, shrubs, or any plant life within 1.5 feet horizontally.	
	o Cooling tower (where required) shall be indicated on the drawings showing site location, elevations and equipment layout floor plan and typical flow diagram as related to the total HVAC system.	
	o Fire and smoke dampers	<i>Suggest reviewing the requirements for Fire Dampers at all vertical chases prior to next submission.</i> Design Team Response: Will be reviewed prior to the next submission.
	o Mechanical room designs:	
	▪ Vent pipes for safety valves, relief valves, back pressure valves and tanks shall be extended above flat roofs in accordance with all governing authorities.	
	▪ In all designs for boiler and refrigeration plants, include a complete floor plan indicating all major mechanical equipment location and service space.	
	▪ In new and/or replacement boiler and refrigeration plants designs, provide a flow diagram detailing steam or hot water distribution systems, return systems, including all existing equipment and their function, as well as any proposed expansions with all necessary instrumentation and controls.	
•	Electrical Drawings showing the following:	
	o Electrical drawings legend and/or graphical symbols	
	o General arrangement: Outline each floor layout	
	o Indicate interface with other systems. Identify any work by general contractor or other trades.	
	o Interior lighting system: Light fixture schedules, circuiting location and fixture mounting heights, receptacle and switch outlets, lamp sizes and types, conduits, all other accessories and riser diagrams shall be indicated on drawings. Designer shall specify that all electrical lighting fixtures be supported from the building structure, and shall be independent of ducts, pipes, ceilings and their supporting members. Comply with seismic design criteria.	<i>Floor power outlets are not shown on the architectural Edge of Slab drawings. Suggest including these for clarity.</i> Design Team Response: Outlets locations shall be coordinated during shop drawings submissions.

o Power system: Locations, types and control method for all motors, heaters, appliances, controllers, starters, branch circuits, feeder conductors and conduits. Indicate riser diagrams. Show electrical conduit supporting method and details. For larger projects, thermostats and control wiring are normally covered under the HVAC sub-contract, assure coordination.	<i>It appears one De-strat Gym Fan symbol is missing from the layout. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: This will be reviewed prior to the next submission. <i>Electrical service is not shown to the vegetated roof gardens. It is not clear if this is intentional. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: This will be reviewed prior to the next submission.
o Fire Alarm, Data, Communications, CATV/CCTV Systems: device types and locations, outlets and equipment, service connections, wiring diagrams, all other essential details	<i>Knox box(s) are not shown. Please include in the next submission.</i> Design Team Response: This will be included in the next submission.
o Services: location and details, whether overhead or underground, feeder sizes, switchgear and transformer plans and elevations, metering and service switchboard arrangements, wiring and ground fault diagram and bus ducts	<i>It appears a conflict may exist with the Main Distribution Electrical Pull Boxes with Architectural and Structural features at Column Line Y.9. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: This has been coordinated with Structural and will be reviewed again prior to the next submission.
o Utility interconnection pathways to Solar Readiness areas	<i>The riser diagram for solar path is not included. Please provide in the next submission.</i> Design Team Response: This will be included in the next submission.
o General stations and sub-stations: Location, size, connection method and generator protection, transformers, exciters, motor generators, switch gear, and associated equipment, current characteristics and equipment capacities. Indicate equipment connections with one line and/or wiring diagrams and schedule all major equipment and instruments items.	<i>Electric panel schedules are not completed. Please include in the next submission.</i> Design Team Response: Panel schedules will be completed for the next submission.
o Underground work: manholes sizes and locations, cable types, duct number, sizes and locations, cable support sizes, types and locations, fireproofing, duct line profile, and one-line connection diagrams	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
o Pole line work: Location, length, treatment and class of poles, guying, cross arms, insulators, circuiting, transformers, protective and switching devices, lightning arresters, special structures, diagrams, current characteristics and grounding	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
o Exterior lighting: Location, size, and transformer types, luminary, poles, light standards, cables, ducts, and manholes, control equipment details and connection diagrams	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
o Emergency system (where provided) details including transfer switch, fuel types	
o One-line diagram indicating load KVA, and available short circuit amperes at each transformer,	

	switchboard, distribution panel board, branch circuit panel board, and at major equipment	
	o Riser diagrams for all systems	<i>Clarify if a Bi-Directional Amplifier System will be included in the next submission.</i> Design Team Response: This will be clarified in the next submission.

6B.3.6 Project Manual (developed to 60% CD progress level)		Comments
•	If applicable, include early bid package contract documents in the submittal to show a complete project.	<i>There are two early bid packages: #1 Early Site Preparation and #2 Early Structural (Foundations & Steel), which are not included in the Project Manual. Please include contract documents for both early bid packages in the next submission.</i> Design Team Response: Acknowledged
•	The technical specifications format in CSI Master format (full-length, current version) with separate sections for each class of work required by M.G.L. c. 149 §44F.	
•	Confirmation that the contract meets the applicable requirements of M.G.L. c. 149, § 44A (2)(g) and contains workforce participation goals for minorities and women. Confirm that the contract includes the processes and procedures to ensure compliance with the workforce participation goals, including reporting and enforcement provisions.	<i>Workforce participation goals for minorities and women, and processes and procedures to include compliance are not included in the Project Manual. Please include this information in the next submission.</i> Design Team Response: Construction Managers Responsibility-Division 0
•	Confirmation that the contract meets the applicable requirements of M.G.L. c 7c, §6 and M.G.L. c. 7, §61(I), and contains Annual Program Goals for Minority Business Enterprise ("MBE") and Women Business Enterprise ("WBE") Participation and includes the processes and procedures to ensure compliance with the Minority and Women Business Goals, including reporting and enforcement provisions.	<i>Participation goals for MBE/WBE and processes and procedures to ensure compliance are not included in the Project Manual. Please include this information in the next submission.</i> Design Team Response: Construction Managers Responsibility-Division 0
•	For each material or equipment item, the specifications shall provide for a minimum three named material or equipment brands and the words "or equal" or a material or equipment description which can be met by a minimum three manufacturers or producers, and the words "or equal". Proprietary products shall not be specified except as provided by M.G.L. c. 30, § 39M; however, when they are specified, proprietary specifications are subject to the "or equal" provisions of c. 30, § 39M.	<i>Some sections (for example, 113300 "Retractable Stairs", 1158230 "Cosmetology Equipment", 116100 "Automotive Equipment", 116620 "Athletic Equipment") do not specify a minimum of three brands or manufacturers. For the next submission, please include at least three named material or equipment brands or a material or equipment description which can be met by a minimum of three manufacturers and the words "or equal".</i> Design Team Response: Currently the specifications are written in a manner describing equipment that can be met by a minimum of three manufacturers. Listed Manufacturers will be added in the next specification update.
•	Do not specify that a product or system shall require prequalification for use prior to bidding.	
•	Include a copy of the geotechnical report, including test boring hole locations and dates, and soil investigation results, including water levels, allowable	

	solid bearing pressure recommendations, foundations and bottom grades of footing and slabs.	
•	Indicate all required filed sub-bids specification sections.	
•	Each filed sub-bid section shall detail all labor and materials required by the sub-trade.	<i>It is unclear whether duct-mounted smoke detectors are to be furnished and installed by 264621 "Addressable Fire Alarm Systems" or 233300 "Air Duct Accessories". This should be reviewed and updated in the next submission.</i> Design Team Response: This will be clarified in the next submission. <i>Section 260000 "General Requirements for Electrical" includes several sections as Paragraph E/Sub-sub-bids that are not otherwise indicated to be part of the Electrical Trade Contract (for example, 116133 "Theater Rigging") and also a number of sections with incorrect section names or numbers. This should be reviewed and coordinated in the next submission.</i> Design Team Response: This will be reviewed and coordinated in the next submission.
•	Staging, scaffolding, cutting and patching, refuse collection and disposal, demolition work and cleaning task, allocation policy and proposed language shall be carefully assigned to avoid duplication or omission.	<i>Some further coordination is needed. For example, Section 015000 "Temporary Facilities & Controls" states that each trade shall provide all staging and scaffolding necessary for their work. However, some filed sub-bid sections (for example, 042000) specify that all staging and scaffolding will be furnished by the General Contractor. This should be reviewed and coordinated in the next submission.</i> Design Team Response: This will be clarified going forward. <i>Similarly, Section 017329 "Cutting & Patching" specifies that openings in masonry walls shall be performed by 042000; and that penetrations in non-masonry construction shall be performed by the trade responsible for surrounding construction. However, some sections (for example, 220000, 230000) state that all cutting, coring and patching shall be performed "by others", while Sections 210000 and 260000 specify that all cutting and patching shall be performed by the Fire Protection Subcontractor and Electrical Subcontractor respectively. This should be reviewed and coordinated in the next submission.</i> Design Team Response: This will be reviewed and coordinated in the next submission.
•	Describe the work extent, the materials and workmanship, and include the work under the proper section. If any portion of work included in a specifications section is to be performed by a trade covered by another section, there shall be clear and distinct cross-referencing between the sections. Merely to state "by others" is not acceptable.	<i>Some sections (for example, 087100, 116100, 116833) refer to materials furnished or work performed "by others". In the next submission, please cross-reference the relevant specification section for all work performed or materials furnished by other trades.</i> Design Team Response: Further coordination between trades and additional cross-referencing will be added where required.

• All "Work by Others" specification references are coordinated.	<i>See above comment.</i>
• Specify work in appropriate Sections according to local trade jurisdiction.	
• In sections for which filed sub-bids are required, refrain from using such terms as "the Contractor," the "Heating Contractor," or "the Plumbing Contractor," but where necessary for clarity refer to the "HVAC Subcontractor," the "General Contractor" and so on.	<i>The term "the Contractor" is used in some trade contract sections. For clarity, consider referring to "the General Contractor", the "Plumbing Subcontractor", "the HVAC Subcontractor" and so on in the next submission.</i> Design Team Response: This will be reviewed and coordinated in the next submission.
• Alternates, if approved in writing by the owner, shall be properly described and cross-referenced in the project manual and drawings.	<i>An Alternates section is included, with 9 alternates listed. For the next submission, consider cross-referencing relevant specification sections and drawings on the Schedule of Alternates.</i> Design Team Response: Alternates are still being explored and reviewed. Once complete the specifications will be updated and cross-referenced.
• Allowances are prohibited pursuant to M.G.L. c. 149, § 44G(A).	<i>Section 142150 "Gearless Machine Room Less Traction Elevators" contains reference to a \$25,000 allowance per car for cab finishes. Allowances are prohibited pursuant to MGL c. 149§44G(A). This should be reviewed and corrected in the next submission.</i> Design Team Response: The reference was included only for Cost Estimate purposes. This will be removed and replaced with specified finishes in the next submission.
• Unit price items, if permitted or ordered by the owner, shall be properly described in the specifications.	<i>A Unit Prices section is included. However, no unit price items are identified on the Unit Price Schedule. Section 310000 "Earth Moving" appears to contain unit price items. This should be reviewed and coordinated in the next submission.</i> Design Team Response: Unit prices will be reviewed and included as appropriate near bidding time.
• Do not use general clauses intended to be all-inclusive in lieu of complete descriptions.	
• Do not duplicate standard requirements that are contained in the contract form.	
• Use consistency throughout. The word "will" shall be used to designate what the owner, authority, owner's project manager, or the Designer can be expected to do, and the word "shall" shall be used to designate what is mandatory for the contractor or subcontractors to do.	<i>The term "will" is sometimes used to designate what is mandatory for the contractor to do, and "shall" is sometimes used to designate what the Owner or Architect can be expected to do.</i> Design Team Response: This will be reviewed, and specifications will be updated accordingly.
• Use the same term throughout for the same subject and the term shall be the same as that used on the drawings.	
• Do not use the term "etc.".	<i>The term "etc." is used throughout the project manual, particularly in Volume 2. This should be reviewed and, if necessary, updated in the next submission.</i> Design Team Response: This will be reviewed and updated in the next submission.
• Avoid such terms as "to the satisfaction of the Designer", "as directed by the Designer", "as approved" and "as required".	<i>The terms "to the satisfaction of the Architect", "to the satisfaction of the Engineer", "as directed by the Architect", "as required" and "as approved" are used</i>

		<i>throughout the Project Manual. This should be reviewed and, if necessary, updated in the next submission.</i> Design Team Response: This will be reviewed and updated in the next submission.
•	Avoid using symbols.	
•	Do not give numbers both in words and figures. Numbers less than 10 shall be written in words, 10 and higher numbers shall be written in figures. In expressing dimensions, figures such as 2 in., 16 in., 7 ft., 6 in., shall be used.	<i>Numbers are sometimes expressed in both words and figures. This should be reviewed and, if necessary, updated in the next submission.</i> Design Team Response: This will be reviewed, and specifications will be updated accordingly.
•	Specify materials mined or manufactured in Massachusetts first and the United States of America second whenever possible.	

6B.3.7 Project Coordination		Comments
•	Verify the submittal is coordinated with any early-bid packages, if applicable.	<i>Drawings for early bid packages are included, but specifications are not. Coordination could not be verified.</i> Design Team Response: Early bid package site specifications are included in their entirety in the MSBA package for coordination purposes. These sections will remain in the specifications "For Reference Only" going forward with the final Bid Documents.
•	Room names and numbers are coordinated between all disciplines.	
•	Finish grade elevations coordinated between all disciplines.	<i>The finish grade elevations for the architectural drawings do not match the ones on the civil drawings. This should be reviewed and coordinated.</i> Design Team Response: Landscape drawings indicate top of first floor slab, as it relates to sea level, as 163.5 feet. Refer to drawings L402 & L403. Architectural drawings indicate the top of slab at the first floor as 100'-0". Reasoning behind this is to avoid mathematical errors for tradesmen who are measuring from finished floor slab. The Architectural floor plans have a general note that states: T.O. SLAB @ FIRST FLOOR DATUM ELEVATION OF 100'-0" CORRESPONDS TO 163.50' MEAN SEA LEVEL, AS SHOWN ON SITE AND CIVIL DRAWINGS. ALL OTHER ELEVATION DATUM SHOWN IN THE ARCHITECTURAL SET IS RELATIVE TO 100'-0"
•	Civil earthwork grading and excavation plans are coordinated with architectural and landscape plans.	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
•	Materials/soil terms used in the Earthwork specification is coordinated with architectural, structural and civil specifications and plans.	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
•	Seismic detailing coordinates with architectural drawings.	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged

• Confirm that there are no beams and columns protruding horizontally and vertically into stairwells, and other interior spaces.	
• Structural dimensions match architectural drawings.	<i>This is part of an early bid package. Consequently, it is not reviewed as part of this submission.</i> Design Team Response: Acknowledged
• 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.	
• Slab depressions are indicated in the structural drawings and coordinated with the architectural finishes and plumbing drawings.	<i>Not all items are shown on the slab depression drawings such as floor drain locations. This should be reviewed and, if needed, revised in the next submission.</i> Design Team Response: They will be indicated in large scale plans.
• Verify that the structural, mechanical, or other disciplines, do not conflict with architectural plans or specifications.	
• Verify coursing dimensions at vertical masonry construction.	
• Coordinate thermal insulation and thermal breaks between conditioned interior spaces and unconditioned exterior spaces.	
• Room wall/floor/ceiling construction coordinated with the finish schedule.	<i>This is mostly coordinated, however, some areas are less clear. Suggest including additional interior elevations to clarify scope of finishes.</i> Design Team Response: We will review interior elevations and add additional views as needed.
• Coordinate access to mechanical and plumbing systems with architectural finishes. Confirm that requirements for access panel sizes and locations are coordinated between architectural and MEP/FP drawings and specifications.	
• Mechanical equipment power requirements and physical locations, including special information as to who mounts, connects, tests, etc.	
• Coordinate outside air intake opening locations and any hazard or noxious contaminants as described by 780 CMR: Massachusetts State Building Code.	<i>Clearance information is not fully shown. Therefore, coordination could not be confirmed. Suggest including clearance information for clarity.</i> Design Team Response: Clearance information has been indicated for the majority of equipment. All clearances will be identified in the next submission.
• Verify potential spatial conflicts in mechanical equipment.	<i>Clearance information is not fully shown. Therefore, coordination could not be confirmed. Suggest including clearance information for clarity.</i> Design Team Response: Clearance information has been indicated for the majority of equipment. All clearances will be identified in the next submission.
• Coordinate roof plans with MEP drawings; indicate roof top systems, access, walk pads & guardrails.	

•	Coordinate Solar Readiness areas on roof plans, structural plans and electrical/plumbing drawings.	<i>The solar riser diagram is not included. Therefore, coordination could not be confirmed.</i> Design Team Response: Solar readiness riser diagram will be provided in the next submission.
•	Equipment plan coordinates with architectural plans.	<i>Clearance information is not fully shown. Therefore, coordination could not be confirmed. Suggest including clearance information for clarity.</i> Design Team Response: Clearances at major equipment will be added for the next submission.
•	The Designer confirms that the project continues to comply with the MSBA High School Science Lab Guidelines and/or Recommendations of Best Practices for K-12 STEM learning Spaces.	<i>Confirmation of compliance to these standards are not included. Please include this in the next submission.</i> Design Team Response: Please refer to Section 6B.3.7-01, located within the MSBA 60% CD Submission, for Designer's confirmation that science labs comply with MSBA guidelines.

6C.2.1 – 04b

**COMMENTS
ADDRESSED
SINCE 60%
CD REVIEW**

MSBA 60% CD Review

6C.2.1-04b

MSBA COMMENTS ADDRESSED SINCE 60% CD REVIEW

The following describes items addressed from MSBA's review of the previous 60% Construction Document Submission. Refer to Section 6C.2.1-04a, within this submittal, for a copy of MSBA's 60% Construction Documents Review.

6B.1 Summary Comments

	MSBA's 60% CD Review Comment	Current Status
GSF Area	<i>It appears there is a discrepancy regarding the GSF area. The project summary and space summary both indicate 386,630 GSF, which matches the PFA. However, the Cost Estimate Comparison Form indicates 382,610 GSF, a difference of 4,020 GSF. Please clarify with the response to these comments.</i>	Design Team Response: The cost estimate summary does not include the add alternate for the Satellite Locker Building. Within the Space Summary, under Health & Physical Education, this is under line-item Satellite Locker Rooms.
Early Bid Packages	<i>Work included in early bid packages issued either before this submission or within 35 days of this submission is not included in this review. Consequently, items included in the Early Bid Package are not reviewed here. It is clear an early site work package has already been issued to bid. It is not clear if the foundations and steel package has either already been or will soon be issued to bid. Consequently, site work, foundations, and steel are not included in this review. Please clarify in the response to this review.</i>	Design Team Response: Both the Early Site Preparation and Early Structural Bid Package have been bid. Drawings for these bid packages can be found in section 6C.3.5-03a and 6C.3.5-03b of the MSBA 90% CD Submittal.
Code Analysis	<i>The Code Analysis does not mention if the building can be classified as "high-rise", and there are parts of the building that appear to be over the threshold for "high-rise". Please confirm that this was reviewed by the District, and describe in the response to this review.</i>	Design Team Response: The building is <u>not</u> classified as a high-rise building. The International Building Code defines a high-rise building as a building with an occupied floor located more than 75-feet above the lowest level of the fire department vehicle access. The distance from the Lower Level to the Fourth Floor, at the proposed NE Metro building, is 68-feet.
Workforce Participation	<i>Workforce participation goals for minorities and women, and processes and procedures to include compliance are not included in the Project Manual. Please include this information in the next submission.</i>	OPM Response: Addressed, please refer to Section 6C.3.6-04 MBE-WEBE Goals of the 90% CD binder submission. PMA has previously reached out to the Supplier Diversity Office (SDO) regarding establishing Minority and Women owned business workforce

		participation goals. The SDO informed them that they do not review projects until at least 75% CD cost estimates have been performed. Following the 90% CD submission, PMA will be re-engage the SDO and established workforce goals for incorporation into the 100% CD bid set.
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6B.2 OPM Deliverables

	MSBA's 60% CD Review Comment	Current Status
Coordinated Design Review	<i>Not addressed. Please address this in the next submission.</i>	OPM Response: This was addressed in the 60% CD submission, please refer to cover letter and the OPM/CM/Cx review comments.

6B.2.2 Project Schedule

	MSBA's 60% CD Review Comment	Current Status
Letter Regarding State Reviews	<i>Not included. Please include this in the next submission.</i>	Project Team Response: Addressed, please see Section 6C.2.2-02 District Letter Confirming State & Local Approvals of the 90% CD binder submission.

6B.2.3 Project Scope and Budget

	MSBA's 60% CD Review Comment	Current Status
Cost Estimate Comparison Form	<i>The included Cost Estimate Comparison Form only includes the cost estimate for the 60% CD phase and the blank template for the 90% CD phase. Earlier phases, such as PS&B, PFA, and DD are not shown. Please include the full cost estimate comparison form showing all relevant phases in the next submission.</i>	OPM Response: Omission of the Uniformat Cost Comparison spreadsheet was a clerical error and was emailed to the MSBA project team on 2/16/23 in conjunction with the responses to the MSBA 60% CD review comments.
Updated Project Budget	<i>The submission's Total Project Budget uses an Estimated Construction Cost of \$244,991,092 instead of the reconciled estimate of \$249,224,736. It is not clear why another value is used or where the value came from. Please clarify and provide an updated Total Project Budget that uses the reconciled cost estimate with the response to these comments.</i>	OPM Response: Please refer to the OPM Cover Letter from the 60% CD submission which clarifies the recent grant received by the District and associated impact to the Total Project Budget. Please note, the grant funds are reflected in the submitted Total Project Budget as ineligible third party funding on the final page.
Value Engineering – Committee Vote	<i>Not included. Include this in the next submission.</i>	OPM Response: On January 19, 2023, the NEMT School Building Committee voted to approve the 60% CD submission to the MSBA which included the associated value engineering log. The 90% CD submission was under budget and did not require value engineering efforts.

6B.3 Designer Deliverables

	MSBA's 60% CD Review Comment	Current Status
Building Code	<i>The Code Analysis does not mention if the building can be classified as "high-rise", and there are parts of the building that appear to be over the threshold for "high-rise". Please confirm that this was reviewed by the District and describe in the response to these review comments.</i>	Design Team Response: The building is <u>not</u> classified as a high-rise building. The International Building Code defines a high-rise building as a building with an occupied floor located more than 75-feet above the lowest level of the fire department vehicle access. The distance from the Lower Level to the Fourth Floor, at the proposed NE Metro building, is 68-feet.
Interior Color Theory Statement	<i>The submission does not confirm if color and material selections have been presented to or approved by the District. Please address this in the next submission.</i>	Design Team Response: The Interior Color Theory Statement, has been updated to reflect all colors reviewed and approved by the district to date.
District's Emergency Procedure	<i>The submission does not confirm if emergency medical personnel have been consulted. Please address this in the next submission.</i>	Design Team Response: A follow-up meeting with the Wakefield Fire Department took place on April 21, 2023. We met with Thomas Purcell, Deputy Fire Chief to follow up on earlier discussions and to confirm that design was in compliance with their earlier requests. Medical dispatches are handled through the fire department.
Facility & Maintenance Light Fixture & Controls	<i>Not included. Include this in the next submission.</i>	Design Team Response: Light Control Sequence of Operations and Lighting Control Diagrams are included on drawings E4-0-0 and E4-0-16. The fixture schedule can be found on sheets E4-0-18 through E4-0-20.
Facility & Maintenance Cleaning Procedures & Materials	<i>Not included. Include this in the next submission.</i>	Design Team Response: Interior finish materials have been reviewed with the District's Maintenance Personnel regarding durability and cleaning procedures. The specifications require that the CM submit O&M manuals with all cleaning and maintenance procedures for specifically installed material.

6B.3.2 Space Summary

	MSBA's 60% CD Review Comment	Current Status
Core Academic Spaces	<i>General classrooms reduced 85 sf; Teacher Planning/ Workrooms added 15 sf; Science Classrooms/Labs added 85 sf; Prep Room added 5 sf; Health CR/Team Meeting Room reduced 10 sf; Language Lab/Distance Learning reduced 20 sf. In the response to these review comments, please confirm that no classroom sizes are below the minimum size stated in MSBA's guidelines.</i>	Design Team Follow-up Response: All the General Classrooms comply within MSBA's square footage guidelines (825 SF minimum and maximum of 950 SF). All the science classrooms meet MSBA minimum size requirement of 1440 square feet. Special Education spaces meet the square footage and location requirements as approved by DESE and included in the MSBA Schematic Design Submission.
Vocational & Technology	<i>Tech./Engineering Rooms reduced 5 sf; Automotive Collision Rpr reduced 80 sf; Automotive Technology reduced 115 sf; Business Office Tech. increased 25 sf; Carpentry reduced 150 sf;</i>	Design Team Follow-up Response: The latest revisions are consistent with the previous DESE approval. Spaces that are being presented at the current DESE Chapter 74 review meetings reflect plans that were submitted as a part of the MSBA 60% CD Submission.

	<i>Culinary Arts increased 5 sf; Dental Assisting reduced 50 sf; Design & Visual Communications reduced 25 sf; Drafting & Design reduced 5 sf; Early Childhood Ed. increased 20 sf; Electrical Tech. reduced 110 sf; Health Assisting reduced 40 sf; HVAC Tech. reduced 35 sf; Plumbing & Pipefitting reduced 35 sf; Robotics & Automation reduced 5 sf; Biotech. reduced 30 sf; Marketing increased 25 sf; Medical Assisting increased 20 sf. In the response to these review comments, please confirm DESE includes the revisions in this submission.</i>	
Health & Physical Education	<i>Gym reduced 165 sf; PE Alternatives increased 160 sf; Gym Storeroom reduced 20 sf; Locker Rooms w/Toilets reduced 900 sf; Satellite Locker Rooms reduced 15 sf; Phys Ed Storage & Closets increased 25 sf; Athletic Director's Office increased 15 sf; Officials/Trans Locker Room w/Shower & Toilet increased 10 sf; PE Instructor & Coach Office w/Shower & toilet reduced 65 sf; Trainer increased 25 sf; Auxiliary PE increased 930 sf. Space Summary indicates Aux. PE space to be 835 NFA and 930 total area. In the response to these review comments, please resubmit the Space Summary and confirm area of Aux. PE.</i>	Design Team Follow-up Response: Auxiliary PE is intended to be 930 SF and not 835 SF. The Space Summary has been corrected.
Custodial & Maintenance	<i>Custodian Storage increased 90 sf; Recycling Room/Trash increased 5 sf; Receiving & General Supply increased 90 sf. Space Summary includes Network/Telecom Room & Offices as both 200 sf and 255 sf. In the response to these review comments, please resubmit the Space Summary to clarify.</i>	Design Team Follow-up Response: Network / Telecom Room is intended to be 255 SF. This square footage matches the space summary area from Schematic Design. The Space Summary has been corrected.
DESE Letter	<i>A letter from July 2021 is included in the submission that anticipates approval in August 2021. Please provide an update with the response to these comments.</i>	Design Team Follow-up Response: The July 2021 letter from DESE, which was included in the 60% CD submission, states that DESE has reviewed the proposed career tech programs and they are viable and the number of students per program is reasonable. The August 2021 date referenced in this letter is referring to the anticipated date of MSBA's grant approval (which occurred at the 8/25/21 MSBA Board of Directors meeting) and not a DESE milestone. Please let us know if additional clarification is needed.

DESE Chapter 74 Deviations	<i>Changes to Chapter 74 Program spaces were noted in the Space Summary review. In the response to these review comments, please confirm that DESE approval of Chapter 74 Program includes the most recent revisions included in this submission.</i>	Design Team Response: The latest minor revisions are consistent with previous DESE approval of Chapter 74 Program Offerings. Spaces that were presented at the 60% CD DESE Chapter 74 review meetings are consistent with the spaces shown in the MSBA 90% CD submission. Layouts for Carpentry and Cosmetology have been revised based on feedback from Vocational Department Heads and industry advisory groups. Please refer 6C.3.2-07 within the 90% CD submission for revised equipment layouts.
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6B.3.3 Project Approvals

	MSBA's 60% CD Review Comment	Current Status
	<i>No MSBA Comments</i>	

6B.3.4 Cost Estimates

	MSBA's 60% CD Review Comment	Current Status
Summary Sheet Bid Date, Contract Number, Estimate for each work phase, bid form	<i>Not included. Please include in the next submission.</i>	Design Team Response: Acknowledged.

6B.3.5 Drawings

	MSBA's 60% CD Review Comment	Current Status
Architectural – Floor Plans Curb Elevations	<i>Top of curb elevations are not shown on the Edge of Slab drawings. Suggest including this information for clarity.</i>	Design Team Response: We are trying to understand your request. We do not have any concrete “curbs” at the slab edge. Refer to wall sections for edge of slab conditions.
Architectural – Floor Plans Dimensioning Interior Partitions	<i>Interior partitions and doors are not dimensioned on the drawings. Suggest including this information for clarity.</i>	Design Team Response: Dimensions have been provided to column grids. Prior to going out to bid, interior partitions and doors will be dimensioned.
Architectural – Floor Plans	<i>Sheets A1-1-3C, 4C, and D include remnant MEP symbols and elements. This should be</i>	Design Team Response: Graphics have been cleaned up removing the remnant MEP symbols.

	<i>reviewed and cleaned up in the next submission.</i>	
<u>Architectural – Large Scale Plans</u>	<i>Specialized areas are shown on the general floor plans and are not shown on large-scale plans. Suggest including large scale plans of these areas for clarity.</i>	Design Team Response: Large scale plans were reviewed/added, as needed, for areas requiring additional detailing.
<u>Architectural – Building Elevations</u> Floor Elevations	<i>The floor elevations on the architectural building elevations and wall sections show the finish floor at 100'-0", but the civil drawings (which do not indicate the finish floor level) show typically underground utility connections being around 130' or 140'. This should be reviewed. Suggest providing more information to make the relationship between the civil elevations and architectural elevations clearer.</i>	Design Team Response: Landscape drawings indicate top of first floor slab, as it relates to sea level, as 163.5 feet. Refer to drawings L402 & L403. Architectural drawings indicate the top of slab at the first floor as 100'-0." Reasoning behind this is to avoid mathematical errors for tradesmen who are measuring from finished floor slab. The Architectural floor plans have a general note that states: T.O. SLAB @ FIRST FLOOR DATUM ELEVATION OF 100'-0" CORRESPONDS TO 163.50' MEAN SEA LEVEL, AS SHOWN ON SITE AND CIVIL DRAWINGS. ALL OTHER ELEVATION DATUM SHOWN IN THE ARCHITECTURAL SET IS RELATIVE TO 100'-0"
<u>Architectural – Building Elevations</u> Control Joints	<i>Control and expansion joints and lintel relief are not shown. This should be reviewed and, if needed, added in the next submission.</i>	Design Team Response: Expansion joint detailing can be found on plan detail 1/A5-1-4 and sections 2,3 & 4/A3-2-17 and 3/A3-2-18. Masonry control joints are shown on the exterior elevations. Relieving Angle/brick relief detail can be found on details 9 and 18/A3-3-1
<u>Architectural – Building Elevations</u> Wall Sections	<i>Tags for wall sections are not shown on the elevations. Suggest including these for clarity.</i>	Design Team Response: On this project, section detailing occurs not only at the exterior of the building, but at interior locations as well. To show information in a consistent location, our office standard is to show wall section tags on the floor plans and <u>not</u> on exterior elevations.
	<i>Interior courtyard details and wall construction are not shown. Suggest including these for clarity.</i>	Design Team Response: Detailing of the courtyard walls can be found on wall sections 1, 2, 3, 4, 5 and 6 on drawing sheet A3-2-3.
	<i>The roof drain appears to be shown in an incorrect location on Section 8 on Sheet A5-3-2. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: Detailing of the courtyard walls can be found on wall sections 1, 2, 3, 4, 5 and 6 on drawing sheet A3-2-3.
<u>Architectural – Building Sections</u> Thermal Insulation	<i>See note above regarding interior courtyard details.</i>	Design Team Response: Detailing of the courtyard walls can be found on wall sections 1, 2, 3, 4, 5 and 6 on drawing sheet A3-2-3.
<u>Architectural – Building Sections</u>	<i>The center handrails are missing or shown inconsistently</i>	Design Team Response:

Handrails	<i>such as on the stair plans on Sheet A7-1-1 & 3. This should be reviewed and, if needed, revised in the next submission.</i>	Graphics for Stair 1 on sheet A7-1-1, Stair 3 on sheet A7-1-4, and Stair 6 on A7-1-6 have been updated. The remaining stairs do not have center rails as the width of the stairs allows a 30" reach to the handrail per the International Building Code requirements.
<u>Architectural</u> Casework / Paneling / Acoustics	<i>Casework details are not shown. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: Casework is shown on the Equipment Drawings. Refer to the sequence of drawings with the prefix EQ.
	<i>Interior finishes on some interior elevations are not clear. Suggest adding more interior elevations for clarity.</i>	Design Team Response: Interior Elevations have been updated. In addition, the AF series drawings contain wall finish plans for materials used in every room.
Ceiling Details		
<u>Schedules</u> Finishes	<i>Suggest including floor patterning, layouts, and transition details at floor material drawings for next submission.</i>	Design Team Response: Floor pattern layouts have been further developed. Transition details can be found on drawings AF1-3-1 and AF1-3-2.
	<i>Suggest including game layout for Gymnasium.</i>	Design Team Response: Game lines are shown on drawing AF1-1-2D for reference. Specification Section 096460, Wood Athletic Flooring, calls out game line and school logo scope of work.
<u>Schedules</u> Doors	<i>Door details are not keyed and require further development. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: The door schedules have been updated to include detail references.
<u>Schedules</u> Windows	<i>Window details are not keyed and require further development. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: Detail tags have been added to the Curtain wall and window types.
	<i>The air and vapor barrier terminations are not shown consistently at storefront and curtain wall transitions. One example is Detail 13 on Sheet A5-1-2. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: We are in the process of finalizing the curtainwall and window details and will be sure that the AVB terminations and transitions are clearly shown in the final submission.
<u>Fire Protection</u> Piping / Equipment / Fixtures / Valves	<i>Sprinklers are not shown under the Gym bleachers. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: Sprinklers have been included on sheet FP1-1-2D
<u>Plumbing</u> Work done by Plumbing Subcontractor	<i>It is not clear where the division is between the plumbing filed sub-bid and the civil work for plumbing outside of the building. This is part of</i>	Design Team Response: Limit of work for plumbing piping is 10'-0" outside the building, as noted on the under-slab plumbing drawings.

	<i>an early bid package. Consequently, it is not reviewed as part of this submission.</i>	
Plumbing Traps / Vents / Floor Drains	<i>It appears there is radon piping through the Gymnasium, and it is not clear if this is a coordination issue. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: The radon piping and other piping shown in the gymnasium are in the process of being coordinated and will be completed for the final submission.
Plumbing Dimension Floor Drains	<i>Floor drains are not located on the architectural Edge of Slab drawings. Suggest including them for clarity.</i>	Design Team Response: Floor drain dimension will be shown and dimensioned on the floor plans to show relationship to adjacent materials and equipment. This will occur prior to the final submission.
HVAC Servicing Clearances	<i>Service areas on Mechanical mezzanines not shown. Suggest including in the next submission to confirm layout requirements.</i>	Design Team Response: Service clearances have been indicated on the Mechanical drawings.
HVAC Fire & Smoke Dampers	<i>Suggest reviewing the requirements for Fire Dampers at all vertical chases prior to next submission.</i>	Design Team Response: Fire Damper coordination has been completed and included in the 90% Submission.
Electrical Interior Lighting Systems	<i>Floor power outlets are not shown on the architectural Edge of Slab drawings. Suggest including these for clarity.</i>	Design Team Response: Floor box dimensions, where appropriate, will be shown and dimensioned on the floor plans to show relationship to adjacent materials and equipment. Some floor boxes associated with specific equipment will not be dimensioned as they have to be coordinated between the equipment suppliers and the CM.
Electrical Power System	<i>It appears one De-strat Gym Fan symbol is missing from the layout. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: Both De-Strat fans currently scheduled are shown in the layout on E1-1-3D.
	<i>Electrical service is not shown to the vegetated roof gardens. It is not clear if this is intentional. This should be reviewed and, if needed, revised in the next submission.</i>	Design Team Response: Convenience receptacles are included on the building exterior at the roof garden.
Electrical Fire Alarm	<i>Knox box(s) are not shown. Please include in the next submission.</i>	Design Team Response: Knox Boxes are included in the 90% Submission
Electrical Services	<i>It appears a conflict may exist with the Main Distribution Electrical Pull Boxes with Architectural and Structural features at Column Line Y.9. This should be reviewed and, if</i>	Design Team Response: This has been coordinated with Structural and included in the 90% submission.

	<i>needed, revised in the next submission.</i>	
Electrical Solar	<i>The riser diagram for solar path is not included. Please provide in the next submission.</i>	Design Team Response: Solar Riser diagrams are included on sheet E3-0-4.
Electrical General Stations & Sub Stations	<i>Electric panel schedules are not completed. Please include in the next submission.</i>	Design Team Response: Electric Panel Schedules can be found on sheets E4-0-4 through E4-0-11.
Electrical Riser Diagrams	<i>Clarify if a Bi-Directional Amplifier System will be included in the next submission.</i>	Design Team Response: Bi-Directional Amplifier System has been included in this submission.

6B.3.6 Project Manual

	MSBA's 60% CD Review Comment	Current Status
Early Bid Packages	<i>There are two early bid packages: #1 Early Site Preparation and #2 Early Structural (Foundations & Steel), which are not included in the Project Manual. Please include contract documents for both early bid packages in the next submission.</i>	Design Team Response: Both the Early Site and Early Structural Bid Drawings are included with this submission. The Specifications always included the Sections that were issued with each Early packages. They will remain as part of the bid documents for reference purposes. The Table of Content notes which sections are For Reference Only and which package that they were originally issued with.
MBE / WBE Contracts	<i>Workforce participation goals for minorities and women, and processes and procedures to include compliance are not included in the Project Manual. Please include this information in the next submission.</i>	Design Team Response: PMA was informed by SDO that in order to calculate workforce participation goals a minimum of a 75% Cost Estimate must be completed. The reconciled 90% cost estimate has been completed as of 25 May 2023 and PMA will re-engage with SDO to determine the workforce participation goals. The goal will be included in the Construction Managers Division 0 specification section.
MBE / WBE Program Goals	<i>Participation goals for MBE/WBE and processes and procedures to ensure compliance are not included in the Project Manual. Please include this information in the next submission.</i>	Design Team Response: PMA was informed by SDO that in order to calculate workforce participation goals a minimum of a 75% Cost Estimate must be completed. The reconciled 90% cost estimate has been completed as of 25 May 2023 and PMA will re-engage with SDO to determine the workforce participation goals. The goal will be included in the Construction Managers Division 0 specification section.
Three Manufacturers	<i>Some sections (for example, 113300 "Retractable Stairs", 1158230 "Cosmetology Equipment", 116100 "Automotive Equipment", 116620 "Athletic</i>	Design Team Response: Currently the specifications are written in a manner describing equipment that can be met by a minimum of three manufacturers. Listed Manufacturers are also included in most sections.

	<i>Equipment”) do not specify a minimum of three brands or manufacturers. For the next submission, please include at least three named material or equipment brands or a material or equipment description which can be met by a minimum of three manufacturers and the words "or equal".</i>	
Filed Sub-Bid Labor & Materials	<i>It is unclear whether duct-mounted smoke detectors are to be furnished and installed by 264621 "Addressable Fire Alarm Systems" or 233300 "Air Duct Accessories". This should be reviewed and updated in the next submission.</i>	Design Team Response: Duct-mounted smoke detectors are furnished and installed by Section 284621-Addressable Fire Alarm Systems.
	<i>Section 260000 "General Requirements for Electrical" includes several sections as Paragraph E/Sub-sub-bids that are not otherwise indicated to be part of the Electrical Trade Contract (for example, 116133 "Theater Rigging") and also a number of sections with incorrect section names or numbers. This should be reviewed and coordinated in the next submission.</i>	Design Team Response: Final coordination between specification sections is currently underway and these items will be resolved for the final submission.
Staging, Scaffolding, Cutting & Patching	<i>Some further coordination is needed. For example, Section 015000 "Temporary Facilities & Controls" states that each trade shall provide all staging and scaffolding necessary for their work. However, some filed sub-bid sections (for example, 042000) specify that all staging and scaffolding will be furnished by the General Contractor. This should be reviewed and coordinated in the next submission.</i>	Design Team Response: The specifications have been updated to clarify the scaffolding requirements. Coordination is on-going to catch any other discrepancies.
	<i>Similarly, Section 017329 "Cutting & Patching" specifies that openings in masonry walls shall be performed by 042000; and that penetrations in non-masonry construction shall be performed by the trade responsible for surrounding construction. However, some sections (for example, 220000, 230000) state that all cutting, coring and</i>	Design Team Response: Final specification coordination is currently in process. This will be reviewed, and specifications will be updated accordingly.

	<i>patching shall be performed "by others", while Sections 210000 and 260000 specify that all cutting and patching shall be performed by the Fire Protection Subcontractor and Electrical Subcontractor respectively. This should be reviewed and coordinated in the next submission.</i>	
"By Others"	<i>Some sections (for example, 087100, 116100, 116833) refer to materials furnished or work performed "by others". In the next submission, please cross-reference the relevant specification section for all work performed or materials furnished by other trades.</i>	Design Team Response: Further coordination between trades and additional cross-referencing is currently in process. These items will be picked up prior to the final submission.
"The Contractor"	<i>The term "the Contractor" is used in some trade contract sections. For clarity, consider referring to "the General Contractor", the "Plumbing Subcontractor", "the HVAC Subcontractor" and so on in the next submission.</i>	Design Team Response: Final specification coordination is currently in process. We will look to clarify "the Contractor" in the final submission.
Alternates	<i>An Alternates section is included, with 9 alternates listed. For the next submission, consider cross-referencing relevant specification sections and drawings on the Schedule of Alternates.</i>	Design Team Response: The alternates have recently been reviewed with the Owner and are included in this submission. Cross referencing is currently under review.
Allowances	<i>Section 142150 "Gearless Machine Room Less Traction Elevators" contains reference to a \$25,000 allowance per car for cab finishes. Allowances are prohibited pursuant to MGL c. 149§44G(A). This should be reviewed and corrected in the next submission.</i>	Design Team Response: The reference was included only for Cost Estimate purposes. It has since been removed and replaced with specified finishes for the elevators.
Unit Prices	<i>A Unit Prices section is included. However, no unit price items are identified on the Unit Price Schedule. Section 310000 "Earth Moving" appears to contain unit price items. This should be reviewed and coordinated in the next submission.</i>	Design Team Response: Unit prices will be reviewed and included as appropriate near bidding time. Early bid packages unit prices were included as part of the bidding.
"will" / "shall"	<i>The term "will" is sometimes used to designate what is mandatory for the contractor to do, and "shall" is sometimes used to</i>	Design Team Response: Final specification coordination is currently in process. This will be reviewed, and specifications will be updated accordingly.

	<i>designate what the Owner or Architect can be expected to do.</i>	
"etc"	<i>The term "etc." is used throughout the project manual, particularly in Volume 2. This should be reviewed and, if necessary, updated in the next submission.</i>	Design Team Response: Final specification coordination is currently in process. This will be reviewed, and specifications will be updated accordingly.
"as required"	<i>The terms "to the satisfaction of the Architect", "to the satisfaction of the Engineer", "as directed by the Architect", "as required" and "as approved" are used throughout the Project Manual. This should be reviewed and, if necessary, updated in the next submission.</i>	Design Team Response: Final specification coordination is currently in process. This will be reviewed, and specifications will be updated accordingly.
numbers	<i>Numbers are sometimes expressed in both words and figures. This should be reviewed and, if necessary, updated in the next submission.</i>	Design Team Response: Final specification coordination is currently in process. This will be reviewed, and specifications will be updated accordingly.

6B.3.7 Project Coordination

	MSBA's 60% CD Review Comment	Current Status
Architectural Early Bid Packages	<i>Drawings for early bid packages are included, but specifications are not. Coordination could not be verified.</i>	Design Team Response: The Specifications always included the Sections that were issued with each Early package. They will remain as part of the bid documents for reference purposes. The Table of Content notes which sections are For Reference Only and which package that they were originally issued with.
Architectural Finish Grade Elevations	<i>The finish grade elevations for the architectural drawings do not match the ones on the civil drawings. This should be reviewed and coordinated.</i>	Design Team Response: Landscape drawings indicate top of first floor slab, as it relates to sea level, as 163.5 feet. Refer to drawings L402 & L403. Architectural drawings indicate the top of slab at the first floor as 100'-0". The reasoning behind this is to avoid mathematical errors for tradesmen who are measuring from finished floor slab. The Architectural floor plans have a general note that states: T.O. SLAB @ FIRST FLOOR DATUM ELEVATION OF 100'-0" CORRESPONDS TO 163.50' MEAN SEA LEVEL, AS SHOWN ON SITE AND CIVIL DRAWINGS. ALL OTHER ELEVATION DATUM SHOWN IN THE ARCHITECTURAL SET IS RELATIVE TO 100'-0"
Architectural Slab Depressions	<i>Not all items are shown on the slab depression drawings such as floor drain locations. This should be</i>	Design Team Response: Floor box and floor drain dimensions, where appropriate, will be shown and dimensioned on the floor plans to show relationship

	<i>reviewed and, if needed, revised in the next submission.</i>	to adjacent materials and equipment. Some floor boxes and drains associated with specific equipment will not be dimensioned as they have to be coordinated between the equipment suppliers and the CM.
Architectural Wall/Floor/Ceiling Construction	<i>This is mostly coordinated, however, some areas are less clear. Suggest including additional interior elevations to clarify scope of finishes.</i>	Design Team Response: Interior Elevations have been updated. In addition, the AF drawings contain wall finish plans clarifying the finish scope in each room.
Mechanical Coord Outside Air Intake	<i>Clearance information is not fully shown. Therefore, coordination could not be confirmed. Suggest including clearance information for clarity.</i>	Design Team Response: Clearances have been included on the Mechanical drawings included in the 90% submission.
Mechanical Spatial Conflicts	<i>Clearance information is not fully shown. Therefore, coordination could not be confirmed. Suggest including clearance information for clarity.</i>	Design Team Response: Clearances have been included on the Mechanical drawings included in the 90% submission.
Electrical Solar	<i>The solar riser diagram is not included. Therefore, coordination could not be confirmed.</i>	Design Team Response: Solar Riser diagrams are included on sheet E3-0-4.
Equipment Coordinated w/ Architectural	<i>Clearance information is not fully shown. Therefore, coordination could not be confirmed. Suggest including clearance information for clarity.</i>	Design Team Response: Clearance zones around relevant equipment have been denoted on the Equipment drawings (EQ series) Safety Zone Paint Lines, defining a clear path of travel from the entrance into the shop are now defined on the Architectural Finish drawings (AF Series drawings).
MSBA Science Labs	<i>Confirmation of compliance to these standards are not included. Please include this in the next submission.</i>	Design Team Response: Compliance was addressed in the previous MSBA 60% CD Submission under Section 6B.3.7-01. In the 90% CD submission, refer to section 6C.3.7-01.

**OPM SUBMITTAL REVIEW & COORDINATION
CONFIRMATION OF DESIGNER EVALUATION SUBMITTAL**

6C.2.1 - 05

MASSACHUSETTS SCHOOL BUILDING AUTHORITY DESIGNER EVALUATION NOTIFICATION FORM

Confirmation that the District has submitted all required Designer Evaluations to the Division of Capital Asset Management and Maintenance (DCAMM), using the DCAMM/DSB Autocene platform, pursuant to M.G.L. c. 7c, § 48(h)

Awarding Authority (District): **Northeast Metropolitan Regional Vocational School District**
Project Name: **Northeast Metropolitan Regional Vocational High School**
MSBA Project ID: **2017-085-30605**

Designer Evaluation #1 - "Study" (at completion of schematic design)

5/25/2023

(Indicate the submission date of the Study Evaluation)

4.00

(Indicate the overall score for the Study Evaluation)

 5/26/23
District Signature Date

;and,

Joseph DeSantis

OPM Signature

Date

Designer Evaluation #2 - "Design" (at completion of 100% construction documents)

(Indicate the submission date of the Design Evaluation)

(Indicate the overall score for the Design Evaluation)

District Signature

Date

;and,

OPM Signature

Date

Designer Evaluation #3 - "Construction" (at final GC/CM payment)

(Indicate the submission date of the Construction Evaluation)

(Indicate the overall score for the Construction Evaluation)

District Signature

Date

;and,

OPM Signature

Date

The information submitted in this notification form represents, to the best of my knowledge, a true and accurate summary of the information submitted by the District to the DCAMM, using the DCAMM/DSB Autocene platform. Districts that need to update or correct any information submitted in this notification form shall contact the MSBA immediately. Districts are solely responsible for any false or misleading information submitted in this notification form.

- 01** Project Schedule
- 02** District Letter Confirming State & Local Approvals

6C.2.2

PROJECT SCHEDULE

PROJECT SCHEDULE

PROJECT SCHEDULE

NE Metro - Master Project Schedule			PMA MSBA Project Layout					25-May-23 14:20																																													
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float																																																
NE Metro - Master Project Schedule																																																					
OPM Selection																																																					
A1000	PMA Interview	1	27-Jun-19 A	27-Jun-19 A		PMA Interview																																															
A1010	OPM Selection Period	27	27-Jun-19 A	05-Aug-19 A		OPM Selection Period																																															
A1380	MSBA OPM Review Panel	1	05-Aug-19 A	05-Aug-19 A		MSBA OPM Review Panel																																															
A1020	Contract Negotiation	3	05-Aug-19 A	08-Aug-19 A		Contract Negotiation																																															
A1390	PMA Contract Executed	1	08-Aug-19 A	08-Aug-19 A		PMA Contract Executed																																															
Designer Selection																																																					
A1030	OPM Draft Designer RFS & Send DRAFT to District	10	05-Aug-19 A	16-Aug-19 A		OPM Draft Designer RFS & Send DRAFT to District																																															
A1430	District Approve Designer RFS	5	28-Aug-19 A	03-Sep-19 A		District Approve Designer RFS																																															
A1040	MSBA Approve Designer RFS	8	04-Sep-19 A	13-Sep-19 A		MSBA Approve Designer RFS																																															
A1060	Designer RFS Advertisements	5	03-Oct-19 A	09-Oct-19 A		Designer RFS Advertisements																																															
A1470	Designer Site Visit	1	16-Oct-19 A	16-Oct-19 A		Designer Site Visit																																															
A1050	Designer RFS Response Period	21	09-Oct-19 A	06-Nov-19 A		Designer RFS Response Period																																															
A1070	Evaluate Responses & Submit to MSBA	6	07-Nov-19 A	14-Nov-19 A		Evaluate Responses & Submit to MSBA																																															
A1080	Designer Selection Panel Mtg #1	0		06-Dec-19 A		Designer Selection Panel Mtg #1																																															
A1090	Designer Selection Panel Mtg #2	0		17-Dec-19 A		Designer Selection Panel Mtg #2																																															
A1100	Negotiate & Execute Contract	17	18-Dec-19 A	09-Jan-20 A		Negotiate & Execute Contract																																															
Preliminary Design Program																																																					
A1110	School Dept Develop DRAFT Education Program	126	09-Aug-19 A	31-Jan-20 A		School Dept Develop DRAFT Education Program																																															
A1130	Evaluation of Existing Conditions	31	10-Jan-20 A	21-Feb-20 A		Evaluation of Existing Conditions																																															
A1190	Education Program Refined with Designer Input	21	03-Feb-20 A	02-Mar-20 A		Education Program Refined with Designer Input																																															
A1120	Draft Initial Space Summary	10	24-Mar-20 A	06-Apr-20 A		Draft Initial Space Summary																																															
A1140	Establish Site Development Requirements	5	31-Mar-20 A	29-May-20 A		Establish Site Development Requirements																																															
A1150	Preliminary Evaluation of Alternatives	20	07-Apr-20 A	23-Jul-20 A		Preliminary Evaluation of Alternatives																																															
A1160	Compile & Submit PDP to MSBA (target Aug 14, 2020)	3	11-Aug-20 A	13-Aug-20 A		Compile & Submit PDP to MSBA (target Aug 14, 2020)																																															
A1200	Final Review & Acceptance of Education Program	15	03-Mar-20 A	13-Aug-20 A		Final Review & Acceptance of Education Program																																															
A1220	SBC Approval of PDP Alternatives (target Aug 13, 2020)	1	13-Aug-20 A	13-Aug-20 A		SBC Approval of PDP Alternatives (target Aug 13, 2020)																																															
A1210	Cost & Schedule Analysis of PDP Alternatives	31	01-Jul-20 A	14-Aug-20 A		Cost & Schedule Analysis of PDP Alternatives																																															
A1170	MSBA Review Period	21	14-Aug-20 A	16-Oct-20 A		MSBA Review Period																																															
A1180	Respond to MSBA Review Comments	12	19-Oct-20 A	30-Oct-20 A		Respond to MSBA Review Comments																																															
Preferred Schematic Report																																																					
A1230	Evaluation of Existing Conditions (Phase II Exploration)	30	17-Aug-20 A	09-Dec-20 A		Evaluation of Existing Conditions (Phase II Exploration)																																															
A1240	Final Evaluation of Alternatives	40	17-Aug-20 A	09-Dec-20 A		Final Evaluation of Alternatives																																															
A1250	Identification and Development of Preferred Solution	23	09-Nov-20 A	09-Dec-20 A		Identification and Development of Preferred Solution																																															
A1260	Local Actions and Approvals (Dec 10, 2020 SBC Mtg)	1	10-Dec-20 A	10-Dec-20 A		Local Actions and Approvals (Dec 10, 2020 SBC Mtg)																																															
A1310	Compile and Submit PSR [Dec 29, 2020 Deadline]	13	11-Dec-20 A	23-Dec-20 A		Compile and Submit PSR [Dec 29, 2020 Deadline]																																															
A1290	MSBA Facilities Assessment Subcommittee [Jan 13, 2021 or Jan 20, 2021]	1	13-Jan-21 A	13-Jan-21 A		MSBA Facilities Assessment Subcommittee [Jan 13, 2021 or Jan 20, 2021]																																															
A1280	MSBA PSR Review Period	21	24-Dec-20 A	28-Jan-21 A		MSBA PSR Review Period																																															
A1300	Response to MSBA PSR Review Comments Due	13	29-Jan-21 A	10-Feb-21 A		Response to MSBA PSR Review Comments Due																																															
A1270	MSBA Board of Directors Approval of PSR [Feb 11, 2020 estimated]	0		11-Feb-21 A		MSBA Board of Directors Approval of PSR [Feb 11, 2020 estimated]																																															
Schematic Design																																																					
A1400	Schematic Estimate Set Due	0		19-May-21 A		Schematic Estimate Set Due																																															
A1320	Schematic Design Period (early start @ risk after FAS)	99	04-Jan-21 A	09-Jun-21 A		Schematic Design Period (early start @ risk after FAS)																																															
A1410	Schematic Estimating Period	16	20-May-21 A	11-Jun-21 A		Schematic Estimating Period																																															
A1420	Estimate Reconciliation & Value Engineering	11	14-Jun-21 A	28-Jun-21 A		Estimate Reconciliation & Value Engineering																																															
A1480	SBC Meeting for VE & Approval of SD (7/1/21)	1	01-Jul-21 A	01-Jul-21 A		SBC Meeting for VE & Approval of SD (7/1/21)																																															
A1330	Compile and Submit SD to MSBA [July 7, 2021 deadline]	4	02-Jul-21 A	07-Jul-21 A		Compile and Submit SD to MSBA [July 7, 2021 deadline]																																															
A1340	MSBA Review Period	21	07-Jul-21 A	27-Jul-21 A		MSBA Review Period																																															
Project Baseline Bar		Remaining Work		Milestone		Page 1 of 4																																															
Actual Work		Critical Remaining Work																																																			

NE Metro - Master Project Schedule					PMA MSBA Project Layout												25-May-23 14:22																																				
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float																																																
A1350	Respond to MSBA Review Comments	14	28-Jul-21 A	10-Aug-21 A		■ Respond to MSBA Review Comments																																															
A1370	Negotiate PS&B / Project Funding Agreement	15	27-Jul-21 A	17-Aug-21 A		■ Negotiate PS&B / Project Funding Agreement																																															
A1360	MSBA Board Approval of Project Scope and Budget [Aug 25, 2021 estimated]	0		25-Aug-21 A		◆ MSBA Board Approval of Project Scope and Budget [Aug 25, 2021 estimated]																																															
A1490	Execute MSBAPS&B	10	25-Aug-21 A	15-Dec-21 A		■ Execute MSBAPS&B																																															
A1500	Execute Final MSBAPFA	10	11-Mar-22 A	24-Mar-22 A		■ Execute Final MSBAPFA																																															
DESE Submittal																																																					
A2620	Schematic Design DESE Submittal (July 7 deadline)	23	07-Jun-21 A	07-Jul-21 A		■ Schematic Design DESE Submittal (July 7 deadline)																																															
A2630	DESE Review Period (21 calendar days)	21	07-Jul-21 A	27-Jul-21 A		■ DESE Review Period (21 calendar days)																																															
A2640	DESE Supplement - Provide add'l info if requested	10	27-Jul-21 A	10-Aug-21 A		■ DESE Supplement - Provide add'l info if requested																																															
OIG CMAR Approval																																																					
A2940	PMA Submit Application to OIG	39	04-Jan-21 A	25-Feb-21 A		■ PMA Submit Application to OIG																																															
A2950	OIG Review & Approval Period	20	26-Feb-21 A	23-Mar-21 A		■ OIG Review & Approval Period																																															
Project Funding																																																					
A1450	Appropriation of Funds - Special Town Meeting (60 day window)	10	09-Sep-21 A	08-Nov-21 A		■ Appropriation of Funds - Special Town Meeting (60 day window)																																															
A1440	Critical Community Outreach Period	47	25-Aug-21 A	24-Jan-22 A		■ Critical Community Outreach Period																																															
A1460	Authorization of Borrowing - Ballot Vote	1	25-Jan-22 A	25-Jan-22 A		■ Authorization of Borrowing - Ballot Vote																																															
A3040	DRA Proceeds into DD	5	26-Jan-22 A	14-Feb-22 A		■ DRA Proceeds into DD																																															
Detailed Design																																																					
A2570	LEED/CHPS Registration (After DD Estimate Set)	5	24-Jun-22 A	30-Jun-22 A		■ LEED/CHPS Registration (After DD Estimate Set)																																															
A2580	LEED/CHPS Provisional Design Pkg Submittal (After 60% Estimate Set)	10	29-May-23	09-Jun-23	64	■ LEED/CHPS Provisional Design Pkg Submittal (After 60% Estimate Set)																																															
Design Development																																																					
A1630	DD Estimate Set	109	15-Feb-22 A	24-Jun-22 A		■ DD Estimate Set																																															
A1870	DD Cx Review	10	27-Jun-22 A	15-Jul-22 A		■ DD Cx Review																																															
A1640	DD Estimating	20	27-Jun-22 A	22-Jul-22 A		■ DD Estimating																																															
A1660	DD Design & Constructibility Reviews	20	27-Jun-22 A	29-Jul-22 A		■ DD Design & Constructibility Reviews																																															
A1650	DD VE & Reconciliation	15	22-Jul-22 A	18-Aug-22 A		■ DD VE & Reconciliation																																															
A1670	DD Submission to MSBA	5	08-Aug-22 A	19-Aug-22 A		■ DD Submission to MSBA																																															
A1680	DD MSBA Review Period	21	20-Aug-22 A	09-Sep-22 A		■ DD MSBA Review Period																																															
A1690	DD District Response to MSBA Review Comments	14	10-Sep-22 A	23-Sep-22 A		■ DD District Response to MSBA Review Comments																																															
60% Design (Early Site Blasting)																																																					
A1770	60% Estimate Set (EARLY SITE BLASTING)	66	22-Aug-22 A	21-Nov-22 A		■ 60% Estimate Set (EARLY SITE BLASTING)																																															
A1850	60% Cx Review	10	22-Nov-22 A	05-Dec-22 A		■ 60% Cx Review																																															
A1780	60% Estimating	19	22-Nov-22 A	16-Dec-22 A		■ 60% Estimating																																															
A1800	60% Design & Constructibility Reviews	20	22-Nov-22 A	19-Dec-22 A		■ 60% Design & Constructibility Reviews																																															
A1790	60% VE & Reconciliation (SBC Mtg 1/12/23)	19	19-Dec-22 A	19-Jan-23 A		■ 60% VE & Reconciliation (SBC Mtg 1/12/23)																																															
A1810	60% Submission to MSBA	12	20-Jan-23 A	20-Jan-23 A		■ 60% Submission to MSBA																																															
A1820	60% MSBA Review Period	21	23-Jan-23 A	03-Feb-23 A		■ 60% MSBA Review Period																																															
A1830	60% District Response to MSBA Review Comments (in working days)	14	06-Feb-23 A	16-Feb-23 A		■ 60% District Response to MSBA Review Comments (in working days)																																															
90% Design (100% Foundation & Steel)																																																					
A2030	75% Steel (EARLY BID PACKAGE)	12	16-Jan-23 A	24-Feb-23 A		■ 75% Steel (EARLY BID PACKAGE)																																															
A1700	90% Estimate Set (EARLY FOUNDATION BID DOCUMENTS)	55	16-Jan-23 A	31-Mar-23 A		■ 90% Estimate Set (EARLY FOUNDATION BID DOCUMENTS)																																															
A1860	90% Cx Review	10	03-Apr-23 A	17-Apr-23 A		■ 90% Cx Review																																															
A1710	90% Estimating	15	03-Apr-23 A	21-Apr-23 A		■ 90% Estimating																																															
A1730	90% Design & Constructibility Reviews	20	03-Apr-23 A	23-May-23 A		■ 90% Design & Constructibility Reviews																																															
A1720	90% VE & Reconciliation (SBC Mtg 5/22/23 Target)	14	24-Apr-23 A	24-May-23 A		■ 90% VE & Reconciliation (SBC Mtg 5/22/23 Target)																																															
A1740	90% Submission to MSBA	5	08-May-23 A	26-May-23 A		■ 90% Submission to MSBA																																															
A1750	90% MSBA Review Period	21	29-May-23	18-Jun-23	116	■ 90% MSBA Review Period																																															
A1760	90% District Response to MSBA Review Comments (in working days)	14	19-Jun-23	02-Jul-23	116	■ 90% District Response to MSBA Review Comments (in working days)																																															
■ Project Baseline Bar ■ Remaining Work ◆ Milestone						Page 2 of 4						⚠																																									
■ Actual Work ■ Critical Remaining Work																																																					

NE Metro - Master Project Schedule

PMA MSBA Project Layout

25-May-23 14:23

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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PROJECT SCHEDULE

DISTRICT LETTER CONFIRMING STATE & LOCAL APPROVALS

6C.2.2 - 02

NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT

100 HEMLOCK ROAD • WAKEFIELD, MASSACHUSETTS 01880-3597

781-246-0810 • FAX 781-246-4919



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

May 23, 2023

RE: Northeast Metro Tech High School Project – Local and State Approvals

Dear Ms. Pappacostas:

As we work with our project team toward construction of a new Northeast Metro Tech High School, DRA Architects and/or the Construction Manager are responsible for the permitting and filing requirements. The project, through the architect, with legal advice provided by the attorneys engaged by the school district, has sought and has been granted approvals from both local and state authorities, with the exception of an Order of Conditions and building permit, which are in progress as outlined below.

The Wakefield Traffic Advisory Committee (TAC) conducted an extensive review of the traffic impact study for the project. The review included an assessment of the site access, sidewalks, new driveway, and the proposed traffic calming measures at the intersection of the new driveway and Farm Road. On March 22, 2023, the TAC issued a memorandum supporting the new driveway with a roundabout at the intersection of Farm Road, which will be designed, permitted, constructed, and funded by the Town.

On April 6, 2023, the Wakefield Zoning Board of Appeals (ZBA) granted local approval of the projects non-compliance with the following requirements of the Town's Bylaw: 190-21A Parking Unregistered Vehicles, 190-21C(1) Yard Requirements, 190-31E Exemptions to Maximum Height Regulations, 190-21K Substantially Irregular Lot Shape, and 190-37E Landscaping of Parking Lots. The ZBA determined that based on the information presented at the public hearings, the requirements of the Bylaw are unreasonable as applied for the proposed construction of the project. On May 4, 2023, the Board issued an official decision, and the appeal period elapsed on May 24, 2023, with no appeals filed. The certified ZBA decision is in the process of being recorded with the Registry of Deeds. The project team is actively coordinating the building permit application with the Wakefield Building Inspector.

As indicated above, the project team is in the process of working with ConComm for the issuance of an Order of Conditions. The project filed a Notice of Intent (NOI) with the Commission on September 22, 2022. Since the submission, the project team has attended 16 public meetings (not including additional meetings/site walks related to the design of the driveway, stormwater, etc.). On May 16, 2023, the Commission voted to close public hearing and will be meeting on May 23, 2023, to discuss the NOI documents and potentially vote to approve/deny an Order of Conditions.

The project has also undergone review by state authorities. On March 14, 2022, a group of project petitioners issued a Request for Advisory Opinion letter to the Executive Office of Energy and Environmental Affairs Office (EEAO) suggesting that agency action is required as the project meets or exceeds thresholds under the Massachusetts Environmental Policy Act Office (MEPA) jurisdiction. On May 26, 2022, MEPA concluded that the proposed project does not meet or exceed any thresholds and thus MEPA review is not required. Furthermore, a Fail-Safe Petition was issued by project petitioners on January 27, 2023, requesting reconsideration that the project is subject to MEPA jurisdiction. On March 23, 2023, MEPA reaffirmed that the project does not meet or exceed any thresholds, and that a fail-safe review is not warranted.

The project team is not aware of any other outstanding permits required for this project, except for the permits required to be filed by the Construction Manager as part of the construction process. The project team contacted MEPA, MHC, Town of Wakefield Engineering Department, Town of Wakefield Fire Department, Wakefield Municipal Gas and Light Department and confirmed that no additional approvals were required at this time. The project team is working with the Town of Wakefield Board of Health to finalize the review of the foodservice operations.

The architect has informed us that all applicable local, state and utility officials have been contacted regarding this project and that all permits, and agreements have been achieved as of this date and that there are no outstanding permits or filings required at this phase of the project by the project with the exception of the building permit, the plumbing board variance for the reduced fixture counts within the toilet/concessions building, and Order of Conditions as indicated herein.

Please contact me with any questions regarding the State or Local Approvals.

Sincerely,



David DiBarri

Superintendent, Northeast Metropolitan Regional Vocational High School
100 Hemlock Road Wakefield, MA 01880
781-246-0810

Enclosures:

- Wakefield TAC NEMT-TAC Review Summary-03-22-23
- 2023.05.04 ZBA DECISION 100 HEMLOCK ROAD
- Request for Advisory Opinion to EOEPA MEPA (03-14-22)
- Metro Voc Tech RAO (5-26-22 ruling)
- MEPA Fail Safe Petition and Project Changes that Exceed Review Thresholds 1_27_23
- Metro Voc Tech Fail Safe (3-23-23 ruling) (final)

6C.2.2 – 02a

**TRAFFIC
ADVISORY
COMMITTEE**

PROJECT SCHEDULE



Memorandum

To: Lt. Joseph Anderson, Chair
Wakefield Traffic Advisory Comm.
Mr. Steven Maio
Wakefield Town Administrator

Date: March 22, 2023

Project #: 06298.01

From: Matt Kealey, P.E., PTOE
Senior Project Manager

Re: NEMT Traffic Memo Review

As part of the Traffic Advisory Committee's (TAC) review of the proposed Northeast Metropolitan Regional Vocational High School (NEMT) VHB has reviewed materials provided by Nitsch Engineering and the NEMT project team. These materials included the Traffic Impact Study prepared by Nitsch in June 2021 as well as site plans and conceptual plans for offsite improvements. In addition to the document review, detailed discussions were held most recently at the October 21, 2022 and February 10, 2023 TAC meetings. The following provides a brief summary of the review.

- **Traffic Impact Study** – As part of the TAC's review of the NEMT and Wakefield Memorial High School (WMHS) projects, extensive review was conducted for the traffic impact studies prepared for both projects. Based on VHB's review and discussions held at past TAC meeting with the NEMT and WMHS engineering teams, VHB has no outstanding comments or questions related to the traffic analyses prepared to date.
- **Site Access** – The proposed plans for the NEMT campus include the construction of a new access driveway on Farm Street just south of the southern intersection of Farm Street and Old Nahant Road. Prior to the October 21, 2022 TAC meeting, NEMT provided two conceptual plans for traffic control at the intersection of the proposed driveway at Farm Street:
 - **Traffic Signal Control** – This plan included installation of a new traffic signal at the proposed driveway. No widening of Farm Street was proposed, but Farm Street would be restriped to provide a brief left-turn lane on the southbound approach and a brief right-turn lane on the northbound approach. The proposed site driveway approach provided exclusive left and right turn lanes. No proposed sidewalks were shown on the plan.

VHB and the TAC had significant concerns related to the traffic signal option. VHB noted that based on initial analyses, traffic signal warrants were not met at this intersection. Subsequent analyses provided by Nitsch demonstrated that a peak hour signal warrant could be met. However, installation of a new traffic signal solely based on a peak hour warrant is not common practice. In addition, based on discussions with the Wakefield Police, speeding on this segment of Farm Street is a significant concern with vehicles sometimes traveling over 50 mph. While installation of a signal would facilitate access to NEMT, it would not address speeding and safety concerns on Farm Street. For these primary reasons, the TAC does not support the traffic signal option.
 - **Roundabout Control** – This plan included installation of a roundabout at the proposed driveway. Widening on the west side of Farm Street is required to accommodate the roundabout layout. The conceptual layout provides single-lane approaches and a single circulating lane. The initial conceptual layout showed no proposed sidewalks on the site driveway.

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Based on subsequent discussions regarding the layout of the roundabout and the site driveway, the TAC requested sidewalks along the proposed site driveway. As part of the conceptual layout plan shown at the February 10, 2023 TAC meeting, sidewalks were shown on the east side of Farm Street and on the north side of the proposed site driveway. There was extensive discussion at the February meeting regarding sidewalks and pedestrian connectivity through the site. The TAC requested sidewalk connections to the guard shack, the rear parking lots and Breakheart Reservation.

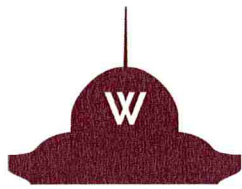
The TAC supports the installation of the new access road with a roundabout at the intersection of Farm Street. The roundabout will provide safe operations for NEMT and will also provide traffic calming along Farm Street, which should lead to a reduction in vehicle speeds in the area. The new access road will provide a second egress to the site improving emergency services and improving operations at the Farm Street and Hemlock Road intersection.

- **Sidewalks** – The TAC requested the applicant expand the internal sidewalk network to provide pedestrian access between the end of Hemlock Road and Breakheart. Additionally the TAC recommended sidewalk network be expanded to the new parking facilities between football field, baseball field and track.
- **Recommendations** –
 - NEMT should continue to coordinate with the Town on the design of the roundabout
 - NEMT should provide updates on sidewalk connections throughout the site

6C.2.2 – 02b

**ZONING BOARD
OF APPEALS**

PROJECT SCHEDULE



TOWN OF WAKEFIELD

BOARD OF APPEALS

May 4, 2023

Attorney Adam Brillard
Prince Lobel Tye LLP
One International Place, Suite 3700
Boston, MA 02110

RE: **100 HEMLOCK ROAD**
NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT

Dear Attorney Brillard:

Enclosed is a copy of the Decision(s) of the Board of Appeals. If there were any restrictions or conditions noted in the Decision(s) it is necessary that you comply with them.

The original Decision(s) were filed with the Town Clerk on **MAY 4, 2023**. After twenty (20) days have elapsed from the date of the Decision(s) were filed in the office of the Town Clerk, and no appeal has been filed, or if such appeal has been filed and was either dismissed or denied, you shall obtain from the Town Clerk a copy of the Decision(s) with the Town Clerk's Certification. The Decision(s) certified by the Town Clerk, is to be recorded by you, at your expense, in the Registry of Deeds at Cambridge, MA and indexed in the grantor index under the name of the owner of record. No Building Permit will be issued until evidence of such recording is provided to the Building Inspector.

Please note that a building/occupancy permit must be obtained from the Building Inspector prior to the initiation of any construction work or actual occupancy.

Very truly yours,

David Hatfield, Chairman
Wakefield Zoning Board of Appeals

Cc: Town Engineer, Community & Economic Development
Planning Board, Board of Health,
Fire Chief, Fire Superintendent (Randy Hudson)



2023 MAY -4 AM 9:21

WAKEFIELD, MASS.

**DECISION OF THE WAKEFIELD BOARD OF APPEALS PURSUANT TO
M.G.L. CHAPTER 40A, SECTION 8 AND ARTICLE X, SECTION 190-65 OF
THE WAKEFIELD ZONING BYLAW AND RELATING TO PROPERTY
SHOWN AS LOT 0RS, MAP 40A ON THE TOWN OF WAKEFIELD
ASSESSORS MAP AND KNOWN AND NUMBERED AS 100 HEMLOCK ROAD,
WAKEFIELD, MASSACHUSETTS**

DECISION of the Board of Appeals (the “Board”) on the Appeal and Application of **NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT** (the “Applicant”) asking the Board to review a decision of the Building Inspector pursuant to MGL Chapter 40A, Section 8 and Article X, Section 190-65 of the Wakefield Zoning Bylaw (the “Bylaw”) relating to property, owned by the Applicant, known and numbered as 100 Hemlock Road, Wakefield, Massachusetts (the “Property”). The Property is shown as Lot 0RS on Map 40A of the Wakefield Assessor’s Maps and is located in the Single Residence Zoning District.

Procedural History

1. The Applicant requested a Building Permit from the Wakefield Building Inspector (the “Building Inspector”) for the construction of a new Northeast Metropolitan Vocational Technical High School (the “NEMT”) on the Property.
2. The Building Inspector issued a letter dated February 9, 2023 denying the Applicant’s request for a Building Permit due to his decision that “...the proposed project would contain zoning violations and that your client may be protected under MGL Chapter 40A, Section 3 with respect to some or all of them.” (the “Building Inspector’s Decision”)
3. The Applicant subsequently filed an appeal of the Building Inspector’s Decision with the Board as a party aggrieved on February 21, 2023.
4. Notice of a Public Hearing to the Applicant and to owners of all property affected, as they appeared in the last local tax list, was given by mail, and by advertising in the Wakefield Daily Item and by displaying in a prominent place in the Town Hall as required by Massachusetts General Laws. Attorney Adam F. Braillard of the law firm Prince Lobel Tye LLP with offices at One International Place, Suite 3700, Boston, Massachusetts represented the Applicant. Pursuant to said notice and advertisement, a public hearing on the application was opened via remote participation (Zoom) on Wednesday March 22, 2023. The hearings were continued to April 12 and then to April 26, 2023, at which time the Board closed the public hearing to further comment by the public, and the Board held its

deliberations on the question of whether to overturn the Building Inspector's Decision. A vote by five (5) members of the Board who are sitting on this case, each of whom was eligible to vote on this application, was taken on April 26, 2023. On that date, the Board unanimously voted (5 to 0) to overturn the Building Inspector's Decision, pursuant to MGL Chapter 40A, Section 8 and Article X, Section 190-65, subject to the Board's Conditions summarized below.

Materials, Documents, and Correspondence Submitted to the Board

The Applicant submitted the following materials:

1. Site Plans prepared by Drummey Rosane Anderson, Inc. entitled "Northeast Metro Technical High School, Wakefield, Massachusetts" dated January 30, 2023 and revised April 4, 2023 consisting of the sheets listed below (the "Site Plan"):
 - Zoning Site Plans & Zoning Table (Z-100, 2 pages) - dated April 4, 2023
 - Drainage Plans (C400-C405) – dated March 30, 2023
 - Utility Site Plans (C500-C505) – dated March 30, 2023
 - Driveway Layout & Grading Plans (C600-C605) – dated March 30, 2023
 - Materials Plan (L301-L305) – dated March 31, 2023
 - Grading Plans (L401-L405) – dated March 31, 2023
 - Building Elevations
 - Street Views
2. Architectural drawings prepared by Drummey Rosane Anderson, Inc. entitled "Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, Massachusetts, 01880" dated February 17, 2023 (the "Architectural Drawings").
3. Wetlands Delineation Plans dated December 6, 2022.
4. Proposed Space Summary – High Schools prepared by Drummey Rosane Anderson, Inc. dated June 30, 2021.
5. Northeast Metro Tech (NEMT), Wakefield, MA Zoning Analysis Table, dated April 24, 2023.
6. Traffic Impact Study prepared by Nitsch Engineering dated June 29, 2021.
7. Stormwater Report prepared by Nitsch Engineering dated September 21, 2022 and revised through April 24, 2023.

The Board also received the following correspondence:

1. Memoranda from the Wakefield Department of Public Works Engineering Division dated March 15, 2023, March 22, 2023, April 12, 2023, and April 25, 2023.

2. Memorandum from the Wakefield Commission on Disabilities dated March 22, 2023.
3. Memorandum from the Wakefield Traffic Advisory Committee (TAC) traffic consultant VHB dated March 22, 2023.
4. Memorandum from the Wakefield Planning Board dated March 21, 2023.
5. Memorandum from the Wakefield Community and Economic Development Director dated March 16, 2023.
6. E-mail from Kelly Slater dated April 26, 2023.
7. E-mail from Julie Scott dated March 22, 2023.
8. E-mails between Bob Brooks and William Renault (Town Engineer) dated March 20-21, 2023.
9. E-mail from Kenneth & Margaret Young dated March 20, 2023.
10. Memorandum from Peter Scott and Brian Thomson dated April 3, 2023.

Findings

The Applicant is proposing changes, extensions, and/or alterations to the Property including construction of a new NEMT, as shown on the Site Plan and Architectural Drawings. The Board recognized that while an educational use is allowed in the Single Residence Zoning District, even if it were not allowed, NEMT's use would be exempt from zoning pursuant to M.G.L. Chapter 40A Section 3.

The Applicant stated and the Board agreed that while pursuant to M.G.L. Chapter 40A, Section 3 the Bylaw could not restrict the use of land or structures for educational purposes, the land could, however, be subject to reasonable regulations concerning such things as bulk, height, lot area, setback, open space, parking and building coverage.

At the Public Hearing, the Site Plan, Architectural Drawings, and other materials were reviewed by the Board, and testimony was presented by the Applicant. Public testimony was also invited and received during the hearings.

The Board determined that the proposed changes, extensions, and/or alterations to the Property as shown on the Site Plan and Architectural Drawings met many of the Bylaw requirements in the Single Residence zone.

The Board also determined that under M.G.L. Chapter 40A, Section 3, the Applicant met the burden of proving to the Board that the requirements of the Bylaw, including, but not limited to, Article IV & VI and Table 2, are unreasonable as applied to the proposed changes, extensions, and/or alterations to the Property including construction of a new NEMT building as shown on the Site Plan and Architectural Drawings, and thus, said proposal as depicted on the Site Plan and Architectural Drawings is allowed to proceed notwithstanding noncompliance with the following requirements of the Bylaw:

- 190-21A - Parking Unregistered Vehicles
 - Automotive Technology is one of NEMT's programs that necessarily involves the storage of unregistered vehicles on site for students' educational use. Such NEMT vehicles are not stored between the principal building and a street line. It is unreasonable to apply this Single Family Residence zone requirement to a vocational school.
- 190-31C(1) - Yard Requirements
 - Proposed Driveway width is 24 feet. This represents two lanes to allow for safe two-way traffic. During morning arrival and afternoon dismissal, there will be significant two-way traffic of passenger vehicles and buses. The twelve-foot wide travel lanes are also reasonable and appropriate to accommodate the curved alignment of the driveway. It is unreasonable to apply this Single Family Residence zone requirement to a vocational school.
- 190-31E - Exemptions to maximum height regulations
 - Buildings with 2.5 stories are permitted in a Single Residence zone. The proposed new school is 5 stories. Required Educational Program calls for 386,000 square feet; to minimize environmental impact, design proposes compact footprint and multi-story building. It is unreasonable to apply Single Family Residence zone requirements to a 386,000 square foot vocational school on a lot of this size.
 - Buildings up to 35 feet in height are permitted in a Single Residence zone. The Proposed new school is 68 feet. Required Educational Program calls for 386,000 square feet; to minimize environmental impact, design proposes compact footprint and multi-story building. Certain Vocational spaces require 20 feet floor-to-floor height. It is unreasonable to apply this Single Family Residence zone requirement to a vocational school on a lot of this size.
- 190-31K – Substantially Irregular Lot Shape
 - The Project complies to the extent applicable. The requirements of this section for a regularity coefficient of 0.65 where the current lot has regularity coefficient of 0.43 are nonetheless met as these requirements are waivable for any lot that can contain an inscribed shape that meets the coefficient of regularity. Here, the 2.5 million square foot lot can handily contain a conforming lot of 4,000 square feet (e.g. 50'x80'), thereby

meeting this requirement in addition to being a preexisting condition on the Property. To the extent the project does not comply, it is unreasonable to apply Single Family Residence Zone requirements to a vocational school on a lot of this size.

- 190-37E – Landscaping of Parking Lots
 - Parking lots are required to include certain landscaping depending on their size. The proposed parking meets the required number of parking spaces, and the design of the parking lots accommodates the required drainage necessary for the project, while accounting for a compact footprint thereby minimizing environmental impacts. While this provision is a landscaping requirement such that NEMT is exempt from compliance pursuant to Chapter 40A, Section 3, for the avoidance of doubt, all vehicles parked on in these lots will be for educational purposes, and therefore it is unreasonable to apply this Single Family Residence Zone requirement to a vocational school.

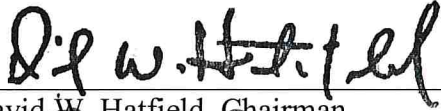
Decision

After careful review of all testimony and evidence submitted, the Board unanimously voted (5-0) to overturn the Building Inspector's Decision, pursuant to MGL Chapter 40A, Section 8 and Article X, Section 190-65 of the Bylaw, and in doing so approve the Applicant's proposed changes, extensions, and/or alterations to the Property including construction of a new NEMT building as shown on the Site Plan and Architectural Drawings.

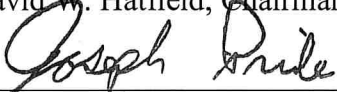
The Board's vote is based on the following and thus they shall be Conditions of this decision:

1. Conformity With Plans: The new NEMT building shall be constructed on the Property in conformance with the Site Plan and the Architectural Drawings.
2. The Board retains jurisdiction to make any necessary clarification(s) of this decision which cannot be resolved by the Building Inspector or Zoning Enforcement Officer.
3. The Board retains jurisdiction to approve any minor amendments to this decision that do not materially alter the terms of this decision. If, in the Board's judgment, a proposed change is material, then a new hearing shall be required to amend this decision.

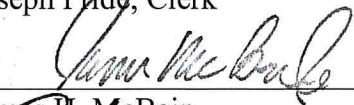
The Board certifies that this Decision has been filed with the Wakefield Town Clerk and the Planning Board. Any person aggrieved by the Decision of the Board has the right to appeal to the Land Court or Superior Court within twenty (20) days from the date of filing of this Decision with the Town Clerk under Section 17 of the Massachusetts General Law, Chapter 40(A).



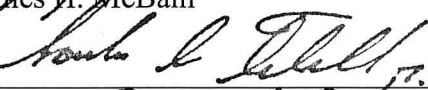
David W. Hatfield, Chairman



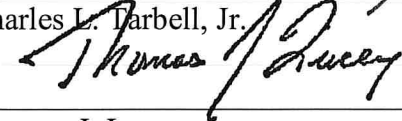
Joseph Pride, Clerk



James H. McBain



Charles L. Darbell, Jr.



Thomas J. Lucey

**WAKEFIELD BOARD OF APPEALS
MAY 4, 2023**

6C.2.2 – 02c

**REQUEST FOR
EEA ADVISORY
OPINION**

PROJECT SCHEDULE

KEEGAN WERLIN LLP

ATTORNEYS AT LAW
99 HIGH STREET, SUITE 2900
BOSTON, MASSACHUSETTS 02110

— — —
(617) 951-1400

TELECOPIER:
(617) 951- 1354

March 14, 2022

BY ELECTRONIC MAIL

tori.kim@mass.gov

Secretary Kathleen A. Theoharides
Executive Office of Energy and Environmental Affairs
Attention: MEPA Unit
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: Request for Advisory Opinion
Northeast Metropolitan Regional Vocational Technical High School Project

Dear Secretary Theoharides:

This letter is sent on behalf of a group of ten or more persons, identified as the Friends of Wakefield's Northeast Metro Tech Forest (the "Petitioners"), who believe the proposal by the Northeast Metropolitan Regional Vocational Technical School Committee (the "Proponent") to construct new high school facilities on 28 acres of forest, wetlands and bedrock outcrops in Wakefield (the "Project") is subject to review under the Massachusetts Environmental Policy Act ("MEPA"). This letter requests that you issue an Advisory Opinion pursuant to 310 CMR 11.01(6)(a) confirming the Project is subject to MEPA jurisdiction because (a) Agency Action is required for the Project, and (b) the Project meets or exceeds several MEPA review thresholds.¹

A. Agency Action is Required for the Project.

Under 301 CMR 11.01(2)(a)1, the Project is subject to MEPA jurisdiction because "Financial Assistance" for the Project is being provided by the Massachusetts School Building Authority ("MSBA"), which is a Commonwealth authority and an "Agency" under MEPA.

The Project also is subject to MEPA jurisdiction because a Permit from the Division of Fisheries and Wildlife ("Division") under the Massachusetts Endangered Species Act ("MESA")

¹ An Advisory Opinion is required to confirm the Project must complete MEPA review because the Proponent has not submitted the Project for MEPA review in accordance with applicable requirements. However, if necessary, the Petitioners are prepared to submit a petition for fail-safe review under 301 CMR 11.04(1).

and 321 CMR 10.00 is required for the Project. Most of the Project site is within an area designated as Priority Habitat by the Division in August 2021, and as described herein, the Project does not qualify for any exemption from MESA review. Based upon review of available Project materials, the Project will disturb at least 10 acres of this Priority Habitat and result in a take of a state-listed endangered or threatened species or species of special concern.

With regard to whether the Project requires action under MESA, the Proponent claimed in a letter to the Division dated February 22, 2022, that the Project should be exempt from Division review under 321 CMR 10.13(2) because the Project site was not in Priority Habitat when the Project was proposed but the site subsequently was delineated as Priority Habitat. In that letter, the Proponent cited the exemption under 321 CMR 10.13(2)(b)1, claiming (without explanation) that MEPA review is “not applicable” to the Project, and indicating that an Order of Resource Area Delineation (“ORAD”) has been obtained and an Order of Conditions (“OOC”) will be obtained within three years of issuance of the ORAD.²

In an e-mail to the Proponent dated February 25, 2022, the Division responded with a statement indicating that the Division concurred with the Proponent’s “interpretation of the Project’s MESA Grandfathering eligibility,” with the caveat that the Project must actually meet the requirement that the Project is not subject to MEPA. The Petitioners understand that a subsequent email was sent to the Proponent on March 14, 2022, in which the Division asked if there has been any coordination with the MEPA office and stated that, if not, “the Division strongly encourages the Proponent to contact the MEPA office to confirm if a review is required. It is common for project Proponents to seek advisory opinion from the MEPA office.” While this is an encouraging step, the Petitioners request that you urge the Division to make clear to the Proponent that the Project would be subject to review under 321 CMR 10.00, either because the claimed exemption does not apply or, even if it did apply, because MESA review would be necessary to prevent a permanent destruction of Priority Habitat.³

B. The Project Meets or Exceeds Several Review Thresholds.

In addition to requiring Agency Action, the Project exceeds several review thresholds. First, the Project exceeds the threshold at 301 CMR 11.03(2)(b)2, where the Project will

² The applicability of the requirement to obtain an ORAD and a timely OOC is not being questioned here.

³ The Division’s emails to the Proponent do not address the separate inquiry in the Proponent’s letter asking whether MESA review would be required under 321 CMR 10.13(2)(d)2. That provision authorizes the Division to determine, based on special circumstances, that any project that meets an exemption category in 321 CMR 10.13(2)(a) through (d) “shall be subject to review under 321 CMR 10.18 to prevent a substantial and permanent modification, degradation or destruction of Priority Habitat for an Endangered or Threatened State-listed Species.” The Petitioners believe that even if the exemption at 321 CMR 10.13(2)(b) did apply (which it does not, as stated herein), MESA review must be required by the Division to prevent a substantial and permanent destruction of more than ten acres of designated Priority Habitat on the Project site.

Letter to EOEEA Secretary Theoharides
Request for MEPA Advisory Opinion
New Northeast Metropolitan Regional Vocational Technical High School
March 14, 2022
Page 3 of 3

permanently destroy at least ten acres of Priority Habitat and result in a take of a state-listed endangered or threatened species or species of special concern. Second, the Project exceeds the threshold at 301 CMR 11.03(1)(b)2, where (based on review of available design materials) the Project is estimated to involve the creation of approximately seven acres of impervious area. Third, the Project exceeds the threshold at 301 CMR 11.03(6)(b)1.a, where the Project includes construction of a “New” roadway that is approximately one-half mile long, and the Project does not consist *solely* of that new roadway.

* * * * *

Based on these factors, the Petitioners respectfully request that you issue an Advisory Opinion to confirm that the Project is subject to MEPA jurisdiction and that MEPA review (and MESA review) must be completed before any work may proceed. If you believe it is necessary to obtain further information prior to making this determination, the Petitioners request that you publish notice of this request for public comment in accordance with 301 CMR 11.01(6)(c).

Please note that despite the fact that construction is not scheduled to commence until 2023, according to available project materials the Proponent is scheduled to present design materials for the Project to MSBA this month, and apparently is planning to commence some physical site work as soon as April 7, 2022. Therefore, to ensure that irreversible destruction of designated Priority Habitat does not occur at the Project site, the Petitioners ask you to notify the Proponent that no work can commence on the Project site pending issuance of your Advisory Opinion and compliance with applicable MEPA and MESA requirements.⁴ Thank you.

Sincerely,



Barry P. Fogel

Cc: Friends of Wakefield’s Northeast Metro Tech Forest

⁴ The Petitioners note that the current Project design being advanced by the Proponent was identified as the so-called “hilltop option” that was rejected in a Pre-Feasibility Study submitted to the Proponent in 2016. Subsequently, after the Priority Habitat designation in August 2021 *and* after MSBA noted concerns about the substantial site development costs associated with this option, the Proponent has continued to advance this option as their preferred alternative based on a set of criteria that do not include environmental impacts. However, several feasible alternatives that do not have significant environmental impacts remain fully available to the Proponent.

6C.2.2 – 02d

**EEA ADVISORY
OPINION**

**-
MEPA**

PROJECT SCHEDULE



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Bethany A. Card
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
<http://www.mass.gov/eea>

May 26, 2022

Barry P. Fogel, Esq.
Keegan Werlin LLP
Attorneys at Law
99 High Street, Suite 2900
Boston, MA 02110

E-mail: bfogel@keeganwerlin.com

Re: Northeast Metropolitan Regional Vocational Technical High School Project

Dear Mr. Fogel:

On behalf of Secretary Bethany Card, I write to respond to your letter of March 14, 2022 ("March 14 letter"), in which you requested an advisory ruling, on behalf of the Friends of Wakefield's Northeast Metro Tech Forest ("Friends"), in relation to the above-referenced project (the "Project"). In accordance with 301 CMR 11.01(6)(c), your March 14 letter was published in the April 8, 2022 Environmental Monitor for a 20-day public comment period. I received 19 public comments, including a letter from your client, expressing support for your request. I also received additional information from you on March 31 and May 6, 2022, and received input from the Proponent, the Northeast Metropolitan Regional Vocational High School District ("District"), on April 28 and May 13, 17, and 24, 2022.

Background

Your March 14 letter seeks a ruling that the Project is subject to review under the Massachusetts Environmental Policy Act ("MEPA") and implementing regulations at 301 CMR 11.00 et seq.

As indicated in information from the Proponent,¹ the Project involves the replacement of the existing 1,256 student Northeast Metropolitan Regional Vocational High School with a new high school on the same 59-acre parcel of land. In anticipation of future student growth, the new high school will

¹ 4/28/22 email, with attachments, from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director.

include space for 1,600 students. According to the Proponent, the existing school building is well-beyond its useful life, with accessibility issues, failing mechanical systems/envelope, and undersized spaces that are negatively impacting delivery of education. Through the facility expansion contemplated by the Project, the Proponent aims to expand enrollment and course offerings to provide beneficial opportunities to underserved students and adults. The Proponent has received funding approval from the Massachusetts School Building Authority (“MSBA”) for the current Project design.

Several comments object to the location of the proposed new high school atop a hill that the Friends refers to as “an irreplaceable oak and pine rock outcrop forest in migrating and breeding bird habitat.”² The Friends asserts that the “threatened Hentz’s Red-bellied Tiger Beetle lives on bedrock outcrops where larvae overwinter in the moss, lichens and cracks,” and indicates that the trails that crisscross the hilltop have been utilized by trail walkers for over 60 years. The Friends indicates that the hilltop location was initially disfavored in a 2016 “pre-feasibility report,” in part, due to cost considerations.

According to the Proponent, the site was chosen from among 30 options evaluated during a multi-year “MSBA Feasibility Study phase.” The Proponent’s letter highlights environmental impacts associated with several of the options considered, and indicates that the selection process was evaluated and approved by the District’s Building Committee and the MSBA. The Proponent indicates that, at this stage, material changes to the building footprint may affect MSBA grant funding. As further discussed below, the Proponent, while acknowledging that portions of the proposed site are currently mapped as rare species habitat, asserts that the site qualifies under a provision in regulations promulgated by the Natural Heritage and Endangered Species Program (NHESP), related to delineations that occur after a project has met certain permitting milestones.

Determination

MEPA review is required if there is “Agency Action” for a Project, and one or more review thresholds in 301 CMR 11.03 are triggered. See 301 CMR 11.01(2)(a)-(b). As defined in 301 CMR 11.02, “Agency Action” consists of either an Agency directly undertaking a Project, or, if the Project is undertaken by a Person, any action that “grants a Permit, provides Financial Assistance, or closes a Land Transfer.” MEPA jurisdiction is broad (or “full scope”) when a Project is undertaken by an Agency or involves Financial Assistance. 301 CMR 11.01(2)(a).

Here, the Proponent does not dispute that MSBA funding qualifies as an Agency Action that would confer broad, or full, scope jurisdiction if MEPA review were undertaken. Therefore, the only disagreement relates to applicability of MEPA review thresholds; your March 14 letter initially flagged three thresholds at 301 CMR 11.03 as follows:

- 11.03(1)(b)2. *Creation of five or more acres of impervious area;*
- 11.03(2)(b)2. *Greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02, that results in a take of a state-listed endangered or threatened species or species of special concern; and*
- 11.03(6)(b)1. *Unless the Project consists solely of an internal or on-site roadway or is located entirely on the site of a non-roadway Project: a. construction of a New roadway one-quarter*

² 4/28/22 Friends comment, available at <https://eeaonline.eea.state.ma.us/EEA/PublicComment/Landing/>.

or more miles in length; or b. widening of an existing roadway by four or more feet for one-half or more miles.

In addition, your May 6 letter indicates that an additional threshold could apply as follows:³

- 11.0(3)(1)(b)1. *Direct alteration of 25 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.*

The core dispute centers on 301 CMR 11.0(3)(2)(b)2., relating to disturbance of designated priority habitat as defined in 321 CMR 10.02. Under NHESP regulations, any project or activity located in priority habitat must be reviewed by NHESP prior to commencement of work to determine if a “take” will occur under the Massachusetts Endangered Species Act. See 321 CMR 10.18(1). However, review is not required if the work falls under certain specified exemptions at 321 CMR 10.14, or is subject to 321 CMR 10.13(2) related to “Projects or Activities that were not in Priority Habitat when they were proposed but the project site is thereafter delineated by the Division as Priority Habitat.” NHESP regulations do not define when a project or activity must be “proposed” to qualify under 321 CMR 10.13(2), but do specify certain permitting “milestones” that must be completed “prior to the project site being mapped as Priority Habitat or within the specified timeframes [in the regulation],” namely: (a) completion of MEPA review through issuance of an ENF, DEIR, or FEIR certificate; (b) issuance of a wetlands permit; and (c) if the Project or Activity is not subject to the Wetlands Protection Act and subsection (a) “does not apply,” the issuance of any permit or final approval that has been subject to public hearing that was publicly noticed, or issuance of a building permit. See 321 CMR 10.13(2)(a)-(c). Subsection (d) also specifies limits on how the subsequent delineation provision in 321 CMR 10.13(2) may be applied.

Here, the requisite wetlands permit was issued, but no MEPA certificate has been issued. While there is therefore some question as to whether the criterion in 321 CMR 10.13(2)(a) was met,⁴ prior correspondence from NHESP to the Proponent indicated that the Project would still qualify under 321 CMR 10.13(2), so long as the Project “is not subject to MEPA” and obtained the requisite wetlands permit in subsection (b).⁵ As further clarified by NHESP to the MEPA Office, I understand this correspondence to mean that the Project could qualify if it either underwent MEPA review which culminated in issuance of a certificate, or was not subject to MEPA review prior to the Project site being mapped as priority habitat—i.e., August 1, 2021. Because the site was not located in mapped habitat at that time, the Project necessarily would not have resulted in the requisite “take” for the MEPA review threshold at 301 CMR 11.0(3)(2)(b)2. to apply. In turn, if the Project is not subject to review under 321 CMR 10.13(2), it does not trigger the MEPA threshold now for purposes of MEPA review.

Because the review threshold at 301 CMR 11.0(3)(2)(b)2. does not apply, I must assess the applicability of other MEPA review thresholds.

³ The Proponent submitted information indicating that no other MEPA review thresholds apply (Attachment 7 to 4/28/22 email from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director), and you have not disputed this assertion.

⁴ In prior correspondence with NHESP, the consultant for the Proponent merely referred to 321 CMR 10.13(2)(a) as “not applicable,” and, therefore, did not address this requirement. See 2/22/22 Letter from LEC Consulting (Attachment 4 to 4/28/22 email from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director).

⁵ 2/25/22 email from David Paulson to LEC Consulting (Attachment 5 to 4/28/22 email from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director).

As to 301 CMR 11.0(3)(1)(b)2. (impervious area), the Proponent acknowledges that the construction of the new high school would result in approximately 7 acres of impervious area but indicates that 4.2 acres⁶ of existing impervious area at the site of the former high school will be converted to pervious area, including athletic fields. Thus, it asserts that the Project should be viewed as “creating” 2.8 acres (*i.e.*, 7 minus 4.2) of “net new” impervious area, which is under the 5-acre threshold. While your May 6 letter argues that MEPA regulations should be read to mean any “creation” of the requisite acreage of impervious area without offsets, MEPA certificates have consistently referred to creation of “new” or “increased” impervious area in determining applicability of thresholds. *See, e.g.*, EEA #16531 Florence Roche School (4/8/22 certificate); EEA #16221 CT Douglas Elementary School and Paul P Gates Elementary School (7/10/20 certificate); EEA #16097 Waltham High School (6/26/20 certificate). I see no reason to deviate from prior practice here.

As to 301 CMR 11.0(3)(6)(b)1. (new roadway), the Proponent asserts that a new driveway, which is described to be 1,300 linear feet (lf) from Farm Street to the Main Entrance entry, and 1,425 lf from the Main Entrance entry to the lower parking lot (where it meets the existing Hemlock Road) (total of 2,725 lf, or about 0.5 miles),⁷ consists solely of an internal or on-site roadway or is located entirely on the site of a non-roadway Project. The Proponent asserts that the driveway, therefore, falls within the stated exceptions to this threshold. While your May 6 letter notes that the new driveway connects to a public way (Farm Street), this fact does not alter the fact that the driveway is located entirely on the site of the Project (which is a “non-roadway” school project). Thus, this threshold does not apply.

Finally, as to 301 CMR 11.0(3)(1)(b)1. (land alteration), correspondence from the Proponent indicates that 13.82 acres of land alteration will occur associated with construction of the new school (13.57 acres) and alteration of previously undisturbed areas on the portion of the site where the old school will be demolished and other work completed (0.25 acres).⁸ Further correspondence clarified the nature of work activities that will occur in the area of the old school (total 13.7 acres, which is in addition to the 13.57 acres to construct the new school), as follows:⁹

- Of the 11.8 acres of existing impervious area:
 - 4.2 acres will be converted to new pervious surface;
 - Parking: 1.46 acres will replace existing parking in the same location;
 - Driveway: 0.22 acres will replace existing parking in the same location;
 - Pedestrian Walkways: 0.26 acres will replace existing parking in the same location;
 - Tennis Courts: 0.67 acres will replace existing parking and roadway in the same location;
 - Running track: 0.64 acres will replace existing parking and circulation/emergency roadways in the same location;
 - Remaining areas will remain impervious but serve other uses.
- Of 1.9 acres of existing pervious area:
 - 0.25 acres is identified as direct alteration of previously undisturbed area;

⁶ While this number was originally represented as 4.7 acres, subsequent correspondence with the Proponent confirmed that the correct number is 4.2 acres. *See* 5/24/22 email from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director.

⁷ 4/28/22 email from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director.

⁸ Attachment 8 to 4/28/22 email from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director.

⁹ 5/24/22 email from Adam Kahn, Foley Hoag LLP, to Tori Kim, MEPA Director.

- Remaining areas either will remain pervious, or were included in the 7.0 acres of impervious area identified for the new school and other uses

The foregoing indicates that the majority of impervious area will be replaced by impervious surfaces with similar uses and character in the same location (meaning that the land surface may not be “altered” in those locations). Thus, even if the land in the entire area of the old school (13.7 acres) is assumed to be altered except the areas replaced with similar impervious surfaces (3.25 acres), the total land alteration for the Project would equal 24.02 acres (13.57 acres for construction of new school + 13.7 acres in area of old school – 3.25 acres of similar replacement). I note that the Project does not involve significant earthwork or changes in grading. Based on these factors, I find that the land alteration threshold does not apply. This finding shall apply only to the facts and circumstances of this Project, and shall not serve as precedent for future projects.

* * * * *

Based on the foregoing, I find that MEPA review is not required for the Project as currently proposed because, while it requires Agency Action, it does not meet or exceed any MEPA review thresholds. I note that, if any thresholds (other than 301 CMR 11.0(3)(2)(b)2.) were to be met or exceeded due to project changes made at a future time, MEPA review would be required and the provision at 321 CMR 10.13(2) would no longer apply; in that instance, the Proponent would be required to undertake review under 321 CMR 10.18 to determine if a “take” would occur under current NHESP mapping. As you have noted, NHESP also retains authority to determine, “based on special circumstances,” that any Project otherwise exempt should be subject to review to “prevent a substantial and permanent modification, degradation or destruction of Priority Habitat.” 321 CMR 11.13(2)(d).

If you have any questions regarding this determination, please contact the MEPA Office at MEPA@mass.gov.

Sincerely,

/s/ *Tori T. Kim*
Tori T. Kim
Assistant Secretary

cc: Adam Kahn, Foley Hoag LLP

6C.2.2 – 02e

**FAIL SAFE
PETITION FOR
EIR**

PROJECT SCHEDULE

January 27, 2023

Tori Kim
MEPA Director
Executive Office of Energy and
Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Director Kim,

We are writing in reference to the Northeast Metropolitan Regional Vocational High School construction project (the Project) at 100 Hemlock Road in Wakefield, MA. The Project is within MEPA full-scope jurisdiction as it involves Financial Assistance from the Massachusetts School Building Authority (MSBA). Every aspect of the Project is financed by taxpayer money. As shown below in our Fail-Safe Petition a full Environmental Impact Report (EIR) is essential to avoid or minimize Damage to the Environment that will otherwise be extensive and involve multiple environmental resources. Information recently submitted by the Project indicates at least two MEPA review thresholds are exceeded under 310 CMR 11.03.

The Participating Agencies for this Project include MADEP and the Wakefield Conservation Commission, currently reviewing the Notice of Intent (NOI) and Stormwater Report (Nitsch Engineering. September 21, 2022; Revised January 12, 2023).

Key documents, including the revised NOI, revised Stormwater Report, and revised plan sets were received by the Wakefield Conservation Commission, and made public, January 12, 2023. Review of these documents provided a clearer picture of the extent of damage to the environment and exceedance of review thresholds, as discussed below. We request that if any additional information is provided to you in response to this letter and failsafe petition that is not in the public record, we receive that information with an opportunity to review and comment before you make your final determination.

As interested persons committed to environmental protection, we have closely followed the Project developments through public document submissions, presentations at public meetings, and public hearings held by the Wakefield Conservation Commission.

The purpose of our letter is two-fold: (1) to submit a fail-safe petition under 301 CMR 11.04 submitted by ten Persons, the undersigned; and (2) provide documentation from Project submissions to the public record which indicate exceedance of MEPA review thresholds. We urge you to use your discretion to grant this Fail-Safe Petition to require an ENF and draft and final EIR because all of the following Fail-Safe criteria of 11.04(1) are met:

- (a) the Project is subject to MEPA jurisdiction;
- (b) the Project has the potential to cause Damage to the Environment and the potential Damage

to the Environment either:

1. could not reasonably have been foreseen prior to or when 301 CMR 11.00 was promulgated; or
 2. would be caused by a circumstance or combination of circumstances that individually would not ordinarily cause Damage to the Environment; and
- (c) requiring the filing of an ENF and other compliance with MEPA and 301 CMR 11.00:
1. is essential to avoid or minimize Damage to the Environment; and
 2. will not result in an undue hardship for the Proponent.

Undisturbed portions of the project location are considered highly archaeologically sensitive by numerous experts including staff at the Department of Conservation and Recreation. The archaeological sensitivity of the site was previously documented during a partial survey by former DCR archaeologist Thomas Mahlstedt. It is inexplicable and a gross disservice to the heritage of the citizens of the Commonwealth, especially Native American persons, that an intensive (locational) archaeological survey was not required or conducted by the proponent well in advance of project construction. We appeal to MEPA officials to rectify this injustice.

This letter states with specificity the Project-related facts that the Petitioners believe support the Secretary's required findings under 11.04(1). The following two thresholds are exceeded:

- 11.03(1)(b)1. Direct alteration of 25 or more acres of land unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.
- 11.03(1)(b)3. Use of Article 97 land for project-related activities.

With MEPA review, a third review threshold, 11.03(2)(b)2., would also be exceeded which pertains to greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02.

As stated in 301 CMR 11.00, the purpose of MEPA is to:

“provide meaningful opportunities for public review of the potential environmental impacts of Projects for which Agency Action is required, and to assist each Agency in using (in addition to applying any other applicable statutory and regulatory standards and requirements) all feasible means to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable.”

This letter demonstrates for the public record the Damage to the Environment from this Project and that MEPA thresholds are exceeded and at a minimum an ENF is required. We urge you to require full MEPA review and an Environmental Impact Report, or other review based on both exceedance of review thresholds and Damage to the Environment. The Proponent should be required to comply with MEPA and demonstrate it has used all feasible means to prevent, mitigate and avoid Damage to the Environment.

Background

On March 14, 2022 (“March 14 letter”), an advisory ruling was requested on behalf of the Friends of Wakefield’s Northeast Metro Tech Forest (“Friends”), in relation to the above-referenced project with additional information submitted on March 31 and May 6, 2022. Input from the Proponent, the Northeast Metropolitan Regional Vocational High School District (“District”), was submitted on April 28 and May 13, 17, and 24, 2022.

The following determination was issued by Assistant Secretary Tori Kim on May 26, 2022:

“Based on the foregoing, I find that MEPA review is not required for the Project as currently proposed because, while it requires Agency Action, it does not meet or exceed any MEPA review thresholds. I note that, if any thresholds (other than 301 CMR 11.0(3)(2)(b)2.) were to be met or exceeded due to project changes made at a future time, MEPA review would be required and the provision at 321 CMR 10.13(2) would no longer apply; in that instance, the Proponent would be required to undertake review under 321 CMR 10.18 to determine if a “take” would occur under current NHESP mapping. As you have noted, NHESP also retains authority to determine, “based on special circumstances,” that any Project otherwise exempt should be subject to review to “prevent a substantial and permanent modification, degradation or destruction of Priority Habitat.” 321 CMR 11.13(2)(d).”

The Project involves two distinct areas, the current school site (~30 acres) and the proposed school site (~29 acres). The two areas differ in terms of topography, natural resource value, and final configuration.

In the May 2022 Determination, you stated regarding the issue of land alteration:

“I note that the Project does not involve significant earthwork or changes in grading.”

This is incorrect. Both areas of the Project will undergo extensive intrusive land alteration including excavation, earth removal, grading, filling and stockpiling. In addition, the proposed school site will undergo “mass tree clearing and rock blasting” [Drummey Rosane Anderson (DRA). January 2021. Preferred Solution Narrative <https://northeastbuildingproject.com/wp-content/uploads/sites/199/2021/01/3.3.4-Preferred-Solution-Narrative.pdf>)]. As allowed in the advisory ruling, here we provide new documentation on the nature and extent of land alteration at the site that was not available or not provided to you when the May 26, 2022 determination was issued. This documentation shows direct alteration of 25 or more acres of land per 11.0(3)(1)(b)1.

The Project now involves adjacent Article 97 land, review threshold 11.03(1)(b)3, that will be altered for the construction of an “Energy Park” to house batteries and associated infrastructure for the solar system on the new school. Additional details are provided below.

With the exceedance of these two thresholds, MEPA review is required and, as a result, the provision at 321 CMR 10.13(2) providing exemption to NHESP regulations would no longer

apply. Therefore, a third MEPA review threshold, 11.0(3)(2)(b)2., would also be exceeded which pertains to greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02.

I. Fail-Safe Petition: Damage to the Environment within the meaning of 301 CMR 11.02

The Project causes actual and probable damage to the natural resources of the Commonwealth as defined by 301 CMR 11.02.

“Damage to the Environment. Any destruction or impairment (not including insignificant damage or impairment), actual or probable, to any of the natural resources of the Commonwealth including, but not limited to, air pollution, GHG emissions, water pollution, improper sewage disposal, pesticide pollution, excessive noise, improper operation of dumping grounds, reduction of groundwater levels, impairment of water quality, increases in flooding or storm water flows, impairment and eutrophication of rivers, streams, flood plains, lakes, ponds or other surface or subsurface water resources, destruction of seashores, dunes, marine resources, underwater archaeological resources, wetlands, open spaces, natural areas, parks, or historic districts or sites.”

The Project involves two distinct areas, the current school site on the northern portion of the site (~30 acres) and the proposed school site on the southern portion of the site (~29 acres) (**Attachment 1**). The two areas differ in terms of topography and natural resource value. The Damage to the Environment will be primarily on the 29 acres associated with the proposed school location. Project architects describe the new school location as “an undeveloped hillside area”, “wooded with a significant amount of ledge outcroppings” that will require “creation of a flat building pad through a mass tree-clearing and blasting operation in an early site enabling phase.”

<http://northeastbuildingproject.com/wp-content/uploads/sites/199/2021/01/3.3.4-Preferred-Solution-Narrative.pdf>. Construction of a half mile driveway, parking lots and location of the school in the middle of the forested site degrades and impairs the natural resources of the Commonwealth across the entire 29-acre site.

The full impact of road building, blasting, chemical contamination, filling of wetland buffers, clear cutting, soil grubbing, settling ponds, rock crushing, clearing areas for stockpiling rock, installing pipes for water discharge and heavy truck hauling will destroy the entirety of this forest. A few trees remaining on the edges is not a functioning forest. All the symbiosis within the forest itself and extending to Breakheart Reservation will be lost and without need. There is a much better site available to build the school.

While claiming they have used an environmentally sensitive site design (Nitsch Stormwater Report. 1/12/23), this is contrary to the Wetlands Regulations, 310 CMR 10.04, and the Water Quality Certification Regulations, 314 CMR 9.02, which define environmentally sensitive site design to mean design that incorporates low impact development techniques to prevent the generation of stormwater and non-point source pollution by reducing impervious surfaces, disconnecting flow paths, treating stormwater at its source, maximizing open space, minimizing disturbance, protecting natural features and processes, and/or enhancing wildlife habitat.

The destruction of natural and cultural resources associated with this mass tree-clearing and blasting operation is detailed below.

A. *Destructive effects of construction*

The project involves clearcutting and deforestation of over 16 acres followed by topsoil removal and extensive blasting of approximately 10 acres of extremely hard water-filled volcanic bedrock that will alter hydrology in an area near multiple wetlands, including a certified vernal pool, and require ongoing management of significant volumes of water during and after construction. The deep blasting to bench out a level foundation will remove up to 35 vertical ft of water-filled bedrock over approximately 10 acres severely impairing underground springs, streams and the hydrology that supports the adjacent certified vernal pool and other wetlands.

The blasting operation will be destructive to the environment and generate rock debris that will be transported for processing to a rock crushing location behind the current school site (**Attachment 2**). Blasting operations on this scale generate high levels of noise, vibration, and dust. Land that is currently pervious surface/grass behind the existing school will be used for a stockpiling and rock crushing operation for rock that is trucked down from the new school site (Gilbane Presentation to Wakefield Conservation Commission 12/6/22).

The blasting operation will create a 650 ft long cliff wall up to 35 ft high exposing additional impervious surface and adding to the groundwater and stormwater impacts to the nearby wetlands. Geotechnical experts (Scarptec. July 25, 2022. Rock Engineering Design and Construction Recommendations) reported that along this cliff, one of several blasted areas,

“long-term weathering from water and ice action may result in localized erosion, raveling and degradation of the slope and overlying backslope soils. Exposure of the rock mass to physical and chemical weathering and slope destressing necessitates periodic scaling of the completed rock slopes and monitoring of the rock reinforcement installed during construction. Due to expected surface water runoff and episodic fracture-controlled hydraulic conductivity, localized ice buildup on the new slopes is likely. Ice build-up can induce ice jacking forces on the rock, which can in turn increase the chances of rockfall.”

Introduction of fill, loam, stone dust from rock crushing operations, and construction vehicles will introduce and spread invasive species to the remaining fragmented habitat, especially on the newly created edges and in the soil and plants introduced to the site. Newly introduced fill and loam will be at increased risk of erosion and runoff due to the steep grades on the hilltop.

B. *Destruction of Native American cultural sites, 301 CMR 11.03(10)*

According to the National Register of Historic Places, there are 50 ancient Native American sites within 1 mile of the proposed building site including 4 destroyed sites within the adjacent Breakheart Reservation. The proposed hilltop building site includes felsite outcrops, clay deposits and site characteristics consistent with early Indigenous Heritage sites (National Historic Register <https://catalog.archives.gov/id/63790266>). The archaeological sensitivity of

the site, including archaeological resources, were previously documented during a partial survey by former DCR archaeologist Thomas Mahlstedt. Undisturbed portions of the project location are considered highly archaeologically sensitive by numerous experts including staff at DCR. An intensive (locational) archaeological survey needs to be conducted before irreparable harm occurs.

On December 9, 2022, Faries Gray, Sagamore of the Massachusett Tribe at Ponkapoag and expert on Indigenous Heritage sites, visited the location of the proposed new school site. On that day, he observed archaeological resources supporting the necessity of conducting a full intensive (locational) archaeological survey of this potentially important Indigenous Heritage site.

Despite being an area of known archeological sensitivity, the Massachusetts Historical Commission failed to make a determination of adverse effect within 30 days of receipt of an adequately documented Project Notification Form. This is not equivalent to a determination that cultural resource surveys or other evaluations determined that historic properties do not exist, as claimed by the Project in this excerpt from Appendix E of the Stormwater Report:

"During the study and permitting process with the Massachusetts State Building Authority and the Massachusetts Environmental Policy Act Office it was determined that there are no historic properties on the site."

In addition, in the Historic Properties Screening Process in the Draft Stormwater Pollution Prevention Plan (Nitsch 9/21/2022) the Project answers YES to the following question but provides no documentation for the answer, as required:

Have prior cultural resource surveys or other evaluations determined that historic properties do not exist, or that prior disturbances at the site have precluded the existence of historic properties? If yes, provide documentation of the basis for your determination.

In the SWPPP, Attachment L - Historic Preservation Documentation is included as a placeholder but it is BLANK.

There has been no Determination of No Adverse Effect by the Massachusetts Historical Commission (MHC) or disclosure of the manner in which the Project is consistent with any "Memorandum of Understanding" with MHC. There can be no determination or finding by the Secretary on this issue until there is a full on-location archaeological survey conducted with full public involvement and transparency. This is needed to prevent the destruction of significant archaeological and historic resources. The cumulative past and actual and potential future damage to these historic sites and areas must be addressed in the ENF and with a full MEPA review. There must be transparent and full consultation with the Native American community. To exclude the Native American community would violate MEPA's Environmental Justice Policy and violate MEPA.

C. Pollution

The Project reports construction and ongoing maintenance activities will involve several pollutant-generating activities known to cause damage to the environment (Nitsch. Stormwater

Pollution Prevention Plan. section 2.7 of Long-term Pollution Prevention Plan and Stormwater Operation and Maintenance Plan. p. 228. In Stormwater Report. 1/12/23). These pollutants include herbicides for weed control, nitrogen and phosphorus containing fertilizers, asphalt for and from streets and parking lots, gasoline, diesel fuel and kerosene during construction and in run-off from roads and parking areas after construction. This table does not mention the chemicals that will be used for blasting in the mass rock clearing operation needed to level the site for construction. Five areas were identified for blasting ([Attachment 2](#)). The Project has not reported the type or amount of blasting chemicals that will be used on site and whether these will include perchlorate-containing explosives. Fragmentation of bedrock with explosives for construction projects is a potential source of nitrate contamination of groundwater and hundreds to tens of thousands of kg of NO_3^- are typically used at a construction site. Nitrate is a component of ammonium nitrate (NH_4NO_3), which is approximately 90% of commonly used commercial explosives by weight (Degnan, et al. 2015. <https://pubs.acs.org/doi/10.1021/acs.est.5b03671>).

Blasting will cause fracturing of the underlying hydrology that may impact areas outside the areas subject to blasting and send potentially contaminated groundwater to neighboring wetlands and abutting private residences. Geotechnical reports show ground water at surface level and in multiple locations close to the surface. One of the borings in the building footprint (B 102) had to be capped after 24-hrs for a possible “artesian condition”.

Road-salt management at the proposed NEMT project has not addressed the potential degradation and viability of wetland and vernal pool biota from applications of deicing chemicals on roads, parking lots and sidewalks. The primary pollutant of concern is chloride, which is regulated at both the federal and state level for freshwater resources such as wetlands and vernal pools, and which should be part of any project evaluation through the Wetland Protection Act.

According to the Stormwater Pollution Prevention Plan (Nitsch Stormwater Report 1/12/23. Appendix E. Long-term Pollution Prevention Plan and Stormwater Operation and Maintenance Plan), pretreatment of roads for deicing will be done with Pre-Mix (rock salt and calcium chloride). Premix, sodium chloride, magnesium chloride and calcium chloride are all injurious to freshwater aquatic organisms when chloride concentrations exceed the Clean Water Act (CWA) standards. All contain chloride, which can be toxic to wetland and vernal pool fauna. They are not environmentally friendly. EPA defined chloride toxicity to aquatic life using chronic and acute criteria.

During winter storm road-salt applications on the access road, levels of chloride that exceed the acute Ambient Water Quality Criteria of 860 mg/l are likely to flow into adjacent wetlands from the level-spreader outfalls from Subsurface Systems and subsequently degrade biota viability. While the proposed stormwater sump systems may reduce total suspended solids in effluent, they do not reduce chloride concentrations.

At the state level, Massachusetts Surface Water Quality Standards have adopted these criteria.

Light pollution is also a concern with streetlights and building lights on 24-hours/day. The lighting plan to install streetlights along the half-mile access road from Farm St to Hemlock and

along pedestrian walkways will adversely impact wildlife. The large expanse of glass in a multistory hilltop building lit at night for evening classes in migratory and resident bird habitat next to a migration corridor along the powerline cut will pose an ongoing threat to resident and migrating birds and nocturnal wildlife.

D. Destruction of core forest and rare species habitat and native soils

Over 16 acres of core forest habitat for rare wildlife will be destroyed by clearcutting, blasting and road construction. The project site of 16 acres of hilltop and wetlands is both Forest and Rare Species Core Habitat and part of a larger Critical Natural Landscape documented in BioMap3 (mass.gov/biomap). Because the project site is part of the western-most section of the larger Critical Natural Landscape and historically the least impacted by human presence, it is exceptionally rich in biodiversity, supporting rare and threatened species and multiple species of Greatest Conservation Need. Larger habitat sizes and their continuity are essential to maintaining healthy populations of rare species. Fragmentation of this forest will impact adjacent areas and drive local species extirpation ([Attachment 3](#)). The proposed project will not only destroy the acidic rock outcrop forest ecosystem that includes Priority Habitat 1550 for Hentz's Red-bellied Tiger Beetle, but the increased human presence, cars, noise, particulates, air, light, and chemical pollution, including deicing salts, will adversely impact the adjacent vernal pools, bordering vegetated wetlands, forest edge habitat and multiple species of greatest conservation need, including a recently documented population of state-listed Eastern Whip-poor-will (<https://ebird.org/checklist/S115056994>).

The predominantly oak forest with regenerating and mature oak, white pine, and hickory supports the highest possible number of caterpillar/moth species that together with multiple wetlands provide food, migratory bird stopover habitat, and support resident bird and bat populations. Multiple bird species of Greatest Conservation Need nest and forage in the forest and adjacent shrubland edge habitat and power line cut including Eastern Whip-poor-will, American Woodcock, Wood Thrush, Scarlet Tanager, Prairie Warbler, Eastern Towhee and Field Sparrow.

Ongoing rock crushing and blasting operations during nesting season will not only destroy the resident forest breeding bird habitat but will also adversely impact the adjacent shrubland and forest edge habitat in Breakheart Reservation. Both large and small bat species were observed while recording Eastern Whip-poor-will and bats are commonly observed flying out from the forest over the nearby football field. Since no investigations have been done into the multiple bat species supported by the forest, there may be endangered species including the federally endangered Northern Long-eared Bats as well as other bats of greatest conservation need. The project site habitat meets the requirements for endangered Northern Long-eared bats.

Deforestation of 16 acres of designated forest core habitat, when a suitable alternative site exists, represents callous and unnecessary damage to the environment. As part of site reconnaissance for the Energy Park on adjacent Article 97 land (discussed in the land alteration section below), a tree count was conducted indicating 170 trees (over 8 inch diameter) per acre, a number representative of the 16 acres to be deforested. We estimate a total of >2000 trees will therefore be removed from the new school site to build the school and associated pavement/hard scape.

As described in the recently released EOEEA Massachusetts Healthy Soils Action Plan 2023 <https://www.mass.gov/doc/healthy-soils-action-plan-2023/download> :

“Healthy soils are central to retaining, filtering, infiltrating, and storing water. By these functions, soils prevent flooding, erosion, and spreading of contaminants, and they provide local climate cooling. When the characteristic structure, biology and chemistry of soils is intact, they work like a sponge to slow stormwater, recharge groundwater, and clean polluted surface flows. As climate change brings more and heavier storms to our region, these vital soil functions become even more essential.”

The forest and wetland ecosystems in the area are supported by healthy native soils, rich in soil organic carbon and mycorrhizal fungal interactions that support remarkable diversity of native plants. The Floristic Quality Index of 43 - where over 35 is exceptional - indicates that this forest has taken a long time to develop, is remarkably free of invasive species, and should be protected based on plant species alone (Floristic Quality Assessment provided by Walter Kittredge, Botanist, Oakhaven Sanctuary, North Reading, MA).

The ecosystem in the area is supported by a canopy of trees, with a predominance of oaks, creating a climate-resilient habitat critically important for storing carbon and cleaning the air. The oaks are supported by mycorrhizal fungal interactions with 150-200-yr old stump-sprouted oak root systems contributing to carbon capture, and deep oak litter helps to prevent encroachment by invasive species. The forest canopy provides local cooling and both the canopy and oak litter contribute to stormwater management and regeneration of the multiple forested wetlands.

E. Destruction and Impairment of Wetlands and associated Buffer Zones

Project plans include 2.6 acres of disturbance within the 100-foot Buffer Zone of the wetlands series identified on the project site (Nitsch. Buffer Zone Existing and Proposed Conditions. Prepared for Conservation Commission Hearing, December 6, 2022. <https://www.wakefield.ma.us/sites/g/files/vyhlif3986/f/uploads/northeast-metro-tech-buffer-zone.pdf>). The work will alter the water quantity and quality functions of the area, contribute to flood control and storm damage, impair wildlife habitat, and is contrary to the damage prevention interest of the Wetlands Protection Act.

Disturbance of the Buffer Zone to this degree “can be expected to result in alteration of the wetland characteristics that provide important functions and values associated with the Bordering Vegetated Wetland and the interests of the WPA (Notice of Intent Peer Review. BSC Group. November 4, 2022). <https://www.wakefield.ma.us/sites/g/files/vyhlif3986/f/uploads/bsc-group-peer-review-northeast-tech.pdf>). Extensive rock blasting in multiple locations planned for the site may result in the destruction of wetland habitat even if not directly constructed upon, due to blasting uphill from wetlands, potential water contamination, and the alteration of groundwater circulation.

The forested wetlands include a certified vernal pool with breeding populations of spotted salamander and wood frogs within 400 m of another certified vernal pool comprising a vernal pool cluster. The vernal pool cluster is connected by a network of wetlands and ephemeral

streams that form a half mile amphibian migration pathway from the certified vernal pools in neighboring Breakheart Reservation near Hemlock Rd to vernal pools and bordering vegetated wetlands near Farm St.

Impacts to the wetlands from dramatic post-development changes in stormwater volumes are discussed in Section G. *Increases in flooding and storm water flows.*

F. Impairment of Water Quality

Buffer Zones protect water quality by slowing the rate of overland flow and increasing infiltration. Vegetated buffers act as filters that adsorb and trap nutrients, toxic pollutants, bacteria, sediment, organic material, and debris before it enters a resource area. The project as proposed retains almost no naturally vegetated buffers on the site (Notice of Intent Peer Review. BSC Group. November 4, 2022).

Chemicals used in extensive and prolonged blasting such as ammonium nitrate, perchlorate, and fuel oil will potentially contaminate groundwater in the forest, pollute surrounding waterways including the Saugus River and Mill River, both located within 1/3 mile of the blasting, and contaminate wetlands making them unusable for amphibians and aquatic insects.

The potential impacts of blasting chemicals and deicing chemicals on water quality is discussed in Section C. Pollution.

G. Increases in flooding and storm water flows

The proposed project will create at least 10 acres of new impervious surface on the site of the new school. The addition of this amount of impervious surface will drastically alter the flood and storm water conditions in the area. There will be significant changes to the pre-existing drainage characteristics and flow patterns across the current school and new school portions of the site, as discussed in the section on land alteration above.

The Project reports significant changes in post-development runoff volumes in several areas which would drastically alter wetland habitats during 1-year, 2-year, and 10-year events (Table 6 of 1/12/23 Stormwater Report). The Project did not report 25-year and 100-year runoff volumes as required by Town of Wakefield <https://ecode360.com/15403856#15403856>. They state they will apply for a waiver from Stormwater requirements on this basis.

As a result of development, the post-development 1-year runoff volumes in the vicinity of two wetlands, DP-3 and DP-9 (offsite wetland), will increase by 6-fold and 2-fold, while runoff volumes will decrease in DP-10 and DP-12 (offsite wetland) by 3-fold and 4-fold, respectively. The changes are as significant for the 2-year and 10-year events. The total area within the 100-ft buffers of the highly impacted wetlands is 1.36 acres (Nitsch. 1/12/23 Notice of Intent. Buffer Zone Area Takeoffs Table pp. 72-73). The total area of the watersheds, or subcatchment areas feeding these highly impacted wetlands is 19 acres, and while some of that is offsite it will certainly be impacted by the change in onsite conditions [3.8 acres (DP-3), 13 acres (DP-9), 1.5 acres (DP-10), and 1.1 acres (DP-12) (Inflow areas from HydroCad Model. Nitsch Stormwater Report 1/12/23)].

Increasingly severe storms and channeling of water off of the hilltop will impact the large

bordering vegetated Red Maple and Yellow Birch wetland near Farm St and other nearby wetlands. It is not possible to reproduce the stormwater-holding capacity of deep oak litter over native soils and bedrock in a mature hilltop forest after grubbing out the soil and blasting the bedrock.

H. Reduction of groundwater levels

The Project will not meet Standard 3 of the MASSDEP Stormwater Management Standards pertaining to groundwater recharge stating that “Due to the presence of high groundwater and bedrock throughout the site, recharge is considered unfeasible, and is met to the best extent practical.” (Nitsch Stormwater Report 1/12/23). The increase in impervious surface and loss of almost all of the naturally vegetated buffers on the site will severely damage infiltration rates into the soil, associated groundwater recharge and result in a reduction in groundwater levels. Vegetated buffers slow the velocity of surface water flow, allowing sediments to drop out of the flowing water and increasing recharge to groundwater (Davies, G., BSC Group Scientists, & MACC Buffer Zone Review Team. (2019). MACC Wetlands Buffer Zone Guidebook (Vol.288). MACC).

The Project states they have employed environmentally-sensitive design to minimize these impacts. Environmentally-sensitive design is intended to minimize stormwater impacts, including reduction of groundwater levels. The Wetlands Regulations, 310 CMR 10.04, and the Water Quality Certification Regulations, 314 CMR 9.02, define environmentally sensitive site design to mean:

“design that incorporates low impact development techniques to prevent the generation of stormwater and non-point source pollution by reducing impervious surfaces, disconnecting flow paths, treating stormwater at its source, maximizing open space, minimizing disturbance, protecting natural features and processes, and/or enhancing wildlife habitat”.

Our thorough review of site development plans suggests the use of environmentally-sensitive design did not meet this definition.

We urge you to use your discretion to grant this Fail-Safe Petition to require an ENF and draft and final EIR because all of the following criteria of 11.04(1) are met:

(a) the Project is subject to MEPA jurisdiction;

(b) the Project has the potential to cause Damage to the Environment and the potential Damage to the Environment either:

1. could not reasonably have been foreseen prior to or when 301 CMR 11.00 was promulgated; or
2. would be caused by a circumstance or combination of circumstances that individually would not ordinarily cause Damage to the Environment; and

(c) requiring the filing of an ENF and other compliance with MEPA and 301 CMR 11.00:

1. is essential to avoid or minimize Damage to the Environment; and
2. will not result in an undue hardship for the Proponent.

The Project is currently planned for site C.3. but the alternate site, C.2, considered by the school district when evaluating construction options, is more cost-effective and has far fewer environmental impacts ([Attachment 4](#)). Requiring an Environmental Notification Form and full Environmental Impact Report would not be an undue hardship for the Project, nor would changing the proposed location of the school to site C.2. as the alternate site will “also achieve the District’s educational program goals and would allow the existing school to remain in operation throughout construction of the new school with minimal disruption” ([MSBA Recommendation to Proceed to Schematic Design, February 2021](#)). The cost of the C.2 option is substantially lower than C.3 and switching to the C.2. site would more than compensate for any design and engineering costs that have been expended to date.

II. Project changes that now meet or exceed MEPA review thresholds

1. Direct land alteration of 30 acres exceeds the threshold of 11.03(1)

There is no definition of land alteration, direct or otherwise, in the MEPA regulations. In the case of undefined terms such as land alteration, 301 CMR 11.02 states:

“any term not defined in accordance with 301 CMR 11.02(2) shall have the meaning given to the term by any statutes, regulations, executive orders or policy directives governing the subject matter of the term. Examples include a term pertaining to:

(a) wetlands, which is defined by the Massachusetts Wetlands Protection Act, M.G.L. c. 131, § 40, and its implementing regulations, 310 CMR 10.00: *Wetlands Protection*, and 33 USC 1341 and 314 CMR 9.00: *401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the United States within the Commonwealth* regarding Water Quality Certification, as well as other statutes, regulations, executive orders, or policy directives that govern wetlands issues; and

(b) roadways or traffic, which is defined by the Massachusetts Department of Transportation Highway Division at 700 CMR 13.00: *Approval of Access to Massachusetts Department of Transportation Highways and Other Property*.”

In the absence of a regulatory definition, and in recognition of the importance of clear, unambiguous guidance on this term for making consequential determinations as to the applicability of MEPA, we sought guidance from MEPA staff on the availability of any statutes, regulations, executive orders or policy directives governing the subject matter of the terms, i.e., a working definition of land alteration and direct land alteration. We were informed by Assistant Director Page **Czepiga** (January 19, 2023 email correspondence) “we do not currently maintain a list of “statutes, regulations, executive orders or policy directives” that specifically pertain to the term “direct land alteration” in 301 CMR 11.03(1).” In this correspondence, Ms. Czepiga provided a copy of your May 2022 determination letter which states:

“The foregoing indicates that the majority of impervious area will be replaced by impervious surfaces with similar uses and character in the same location (meaning that the land surface may not be “altered” in those locations). Thus, even if the land in the entire area of the old school (13.7 acres) is assumed to be altered except the areas replaced with similar impervious surfaces (3.25 acres), the total land alteration for the Project would equal 24.02 acres (13.57 acres for construction of new school + 13.7 acres in area of old school – 3.25 acres of similar replacement). I note that the Project does not involve significant earthwork or changes in grading. Based on these factors, I find that the land alteration threshold does not apply.”

Respectfully, we disagree with the characterization of “altered” as simply a change in the ultimate condition of the land surface from impervious to pervious or vice versa. In the absence of a working definition of direct land alteration from MEPA we contend that land alteration involves actions typically part of construction that alter the physical condition of the land including, but not limited to, clearing, grubbing, excavation, filling, grading, surfacing, paving, compaction, stockpiling, and stabilizing. In addition to the direct alteration to the land resulting from demolition, mass tree clearing, rock blasting, creation of new impervious surfaces (including the new school, driveway, and parking areas), there will be additional land alteration, including erosion, associated with the following changes: (1) alteration of site steepness from creation of 650-ft long cliff requiring 15 foot wide catch basin for debris; (2) soil compaction by heavy equipment; (3) alteration of pre-existing drainage characteristics and flow patterns across both the current school and new school portions of the site; and (4) alteration of the groundwater regime which in turn further impacts drainage, slope stability, survival of existing vegetation and establishment of new plants. The total land alteration of 30 acres is described in the following narrative and summarized in Table 1.

A. Current School Site Land Alteration = 11.69 acres

The current school site includes buildings (4.69 acres), pavement/hard scape (7.76 acres) and landscape areas (11.05 acres), and some amount of woods on the current school site that have not been separately reported.

Land where the current buildings are located will undergo alteration associated with demolition, earth moving, compaction, and cuts in the existing topography. The buildings will be demolished and converted into athletic fields. Construction of the athletic fields will require cuts of up to 9

feet for the proposed tennis courts and up to 6 feet for the combined football/soccer field and fill up to 7 feet (Geotechnical Report, Appendix G of Stormwater Report 1/12/23). Based on these reported values we estimate approximately 13,762 cubic yards of earth moving just for this portion of the project.

Land that is currently pavement/hard scape will be altered and reconfigured with creation of new parking areas around the new athletic fields, repaving, resurfacing, and regrading. We conservatively estimate this alteration to be 4 acres.

Land that is currently landscaped includes athletic fields, one of which has been considered as the future site of a new hockey rink/athletic facility. Several official presentations by the project team and their affiliates in 2018, 2020, 2021, 2022 include a proposed hockey rink/athletic facility located on an existing football field, also evaluated as an alternative site for the new school ([Attachment 6](#)). These presentations are in the public record. Most notably, at the meeting in December 2020, when the school building committee voted on their preferred option for this project, located on site C.3., a figure was presented showing a hockey rink on the alternate site C.2.

There is evidence that the ranking of the alternative site was negatively biased in order to reserve C.2 for this hockey rink even though C.2 meets the criteria for the new vocational school. The Project has stated: “The district gains additional athletic fields with the C.3 option and maintains the potential of reserving the current football field/ track for future development as a hockey rink” (Final Evaluation of Alternatives Narrative <http://northeastbuildingproject.com/wp-content/uploads/sites/199/2021/01/3.3.3-Final-Evaluation-of-Alternatives-Narrative.pdf>). The repeated presentation of figures by the project team showing the hockey rink on the existing football field indicates additional land alteration may occur at this site, the majority of which would be impervious surface. **The area associated with this football field is estimated at 2 acres.** We ask that Project proponents officially clarify in their response to this letter the intended use of this current football field with respect to future alteration plans with implications for 301 CMR 11.10(5). Please note the majority of land alteration would include new impervious surface that would need to be considered against the review threshold of 5 acres of new impervious surface. The Project has reported there will be a change in impervious surface (net new) of 3.87 acres (Stormwater Report 1/12/23, p. 7), an increase from the net new 2.8 acres reported in the 4/28/22 Response to Request for Advisory Opinion from “Friends of Wakefield’s Northeast Metro Tech Forest”: Northeast Metropolitan Regional Vocational Technical High School Project.

Land that is currently a baseball field will be altered with construction of an “open stone-lined infiltration pond” or “settling basin”. The pond will be used for the drainage of stormwater that will be released from the rocks during blasting and described in the Site Sequence Plan and in page C305 of the Plan Set on the Wakefield Conservation Commission website. This pond will constitute land alteration of at least 1 acre.

B. New school site land alteration = 17.2 acres

The Project reports a change of 16.3 acres of woods associated with construction of the new

school (pg. 7 of 1/12/23 Stormwater report). We assume the vast majority of this deforestation is on the new school site, which consists of designated forest core habitat. This area will be cleared and replaced with new buildings (3.3 acres), pavement and hardscape (6.82 acres), gravel/rip/rap (1.35 acres) and grass (3.2 acres). The Project has not reported whether additional woods on the site of the existing school will be cleared.

Deforestation of 16 acres along with the creation of nearly 10 new acres of impervious surface in a previously wooded area with an elevation 60 ft above the surrounding area will impact the hydrology, vegetation, and biological communities in watersheds, downgradient wetlands, and buffer zones. The following conditions, all associated with the new school site, are widely recognized to result in increased erosion and other adverse alterations to the land:

- Removal of plant cover
- Regrading the terrain and altering steepness
- Road construction
- Decrease in the area of soil that can absorb water
- Soil compaction by heavy equipment which reduces water intake
- Altering the groundwater regime resulting in adverse effects to drainage, slope stability, survival of existing vegetation and establishment of new plants

Source: Massachusetts Erosion and Sedimentation Control Guidelines, 2003

<https://www.mass.gov/doc/complete-erosion-and-sedimentation-control-guidelines-a-guide-for-planners-designers-and/download>

In addition to the direct alteration to the land surfaces resulting from demolition, mass tree clearing, rock blasting, soil grubbing, creation of new impervious surfaces including the new school, driveway, and parking areas, there will be significant changes to the pre-existing drainage characteristics and flow patterns across the current school and new school portions of the site, both of which are considered altered per Wetlands (310 CMR 10.00) where:

Alter means to change the condition of any Area Subject to Protection under M.G.L. c. 131, § 40. Examples of alterations include, but are not limited to, the following:

- (a) the changing of pre-existing drainage characteristics, flushing characteristics, salinity distribution, sedimentation patterns, flow patterns and flood retention areas;
- (b) the lowering of the water level or water table;
- (c) the destruction of vegetation;
- (d) the changing of water temperature, biochemical oxygen demand (BOD), and other physical, biological or chemical characteristics of the receiving water.

The Project reports significant changes in runoff volumes in several areas which would drastically alter wetland habitats during 1-year, 2-year, and 10-year events (Table 6 of 1/12/23 Stormwater Report). The Project did not report 25-year and 100-year runoff volumes as required by Town of Wakefield <https://ecode360.com/15403856#15403856>.

A significant portion of the acreage of land in the vicinity of the current school site and new school site that will be vulnerable to land alterations because of site development, including erosion, changes to the groundwater regime and impacts to the survival of existing vegetation

and biological communities in and outside wetlands and buffer zones. The limit of work includes approximately 0.21 acres within the 25-ft buffer of three wetlands and 2.4 acres within the 100-ft buffer of seven wetlands.

As a result of development, the post-development runoff volumes for 1-year storm events in the vicinity of two wetlands, DP-3 and DP-9 (offsite wetland), will increase by 6-fold and 2-fold, respectively, while runoff volumes will decrease in DP-10 and DP-12 (offsite wetland) by 3-fold and 3-fold, respectively. The changes are as significant for the 2-year and 10-year events. The total area within the 100-ft buffers within the limit of work that are highly impacted wetlands is 1.36 acres (Buffer Zone Area Takeoffs Table. Submitted to Wakefield Conservation Commission 01/12/23 <https://www.wakefield.ma.us/sites/g/files/vyhlf3986/f/uploads/northeast-metro-tech-buffer-zone.pdf>).

Of the 1.36 acres, approximately 0.9 acres will remain pervious and 0.43 acres will be converted to impervious surface. Land alteration will occur in both. The pervious surface will be altered at the surface and subsurface by the significant changes in runoff volumes including alteration of soil characteristics and the hydrologic regime. The amount converted to impervious surface is already counted in our calculation of land alteration but we propose the remaining 0.9 acres within 100-ft buffers of the highly impacted wetlands should be added to land alteration per the definition of alter in Wetlands (310 CMR 10.00), cited in 301 CMR 11.02(2)(a).

C. Additional Land Alteration Outside of Project Site = 1.3 acres

Energy Park - Working in close collaboration with Project proponents, the Wakefield Municipal Gas and Light Department (WMGLD) has proposed construction of an “Energy Park” on Article 97 land adjacent to the Project site that would house batteries and associated infrastructure for the solar panels on the new school (**Attachment 5**). Use of this Article 97 land for project-related activities would constitute another MEPA review trigger listed at 11.03(1)(b)3. This Energy Park project would alter 0.8 acres of woods adjacent to the new school portion of the site (see Attachment 1) and must be considered in terms of MEPA restrictions to **segmentation** (301 CMR 11.01(2)(c)). While the installation of solar panels on the school is commendable, the project owner has refused to allow the batteries and emergency generator for the system to be sited anywhere else on the current or new school site requiring WMGLD to instead seek another acre of forested land, the Article 97 land, for the batteries and infrastructure that will service the school’s solar panels.

Rotary - The Town of Wakefield has also proposed that a new rotary be constructed at the base of the new driveway to the southwest of the building site, with egress on Farm Street. The additional amount of land converted to impervious surface as a result of the new rotary is estimated to be at least 0.5 acres (Alternate Driveway Routing - Farm Street. Wetland Alteration Exhibit. For Conservation Commission Hearing 11/01/2022). This 0.5 acres is added to the total estimate of land alteration associated with the Project as presented in Table 1.

Table 1 - Total Land Alteration

Land Use	Acres	Alteration activities	Altered Acreage
A. Current School Site			
Buildings	4.69	Demolition, earth moving, cuts up to 9 feet and fill up to 7 feet for conversion to athletic fields, installation of subsurface drainage system, soil compaction	4.69
Pavement/Hard Scape	7.76	Repaving, regrading, subsurface drainage system, and creation of new parking areas	4
Landscaped Areas including existing playing fields	11.05	Current football field converted to future athletic facility (hockey rink)	2
Baseball field	1	Conversion to open stone-lined infiltration pond (settling basin) and subsurface drainage	1
B. New School Site			
Woods	30.47	Mass Tree Clearing and rock blasting for conversion to school building and pavement/hardscape	16.3
Water/Wetlands	2.88	Alteration of remaining pervious areas from dramatic changes to stormwater runoff volumes in DP-3, DP-9, and DP-10.	0.9
C. Additional Project-related land alteration			
Woods on adjacent Article 97 land	1.0	Tree clearing, paving and installation of batteries and emergency generated for school's solar panels (Energy Park)	0.8
Woods, landscaped, and paved area at bottom of proposed driveway	1.0	Construction of rotary/ roundabout	0.5
Total Land Alteration			30 acres

III. Conclusions

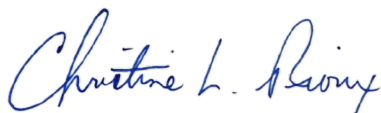
We believe this letter demonstrates the following:

- Your requiring the filing of an ENF and EIR is essential to avoid or minimize Damage to the Environment that will otherwise be extensive and involve multiple environmental resources.
- The MEPA threshold for land alteration at 11.0(3)(1)(b)1. is exceeded and therefore an ENF is mandatory. The Project will result in ≥ 30 acres of land alteration.
- Use of Article 97 land for project-related activities constitutes exceedance of a second MEPA review trigger listed at 11.03(1)(b)3. With MEPA review, a third review threshold, 11.0(3)(2)(b)2., would also be exceeded which pertains to greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02.
- Native American cultural sites will suffer actual or potential damage or destruction because of this project if no action is taken. An intensive (locational) archaeological survey must be conducted in this area well in advance of any further project construction.

Given the thresholds are exceeded, we request a full Environmental Impact Report, based on the MEPA review thresholds and overwhelming damage to the environment that we have discussed. Anything less would place an undue hardship on the current and future citizens of the Commonwealth who will bear the loss of this ecosystem, forest core habitat and historic and archaeological resources at a time when protection of these natural resources must be prioritized.

In closing, we respectfully request that you require an ENF and full MEPA review of this Project, in consideration of the extensive documentation we have provided. Consistent with the authority granted you in 301 CMR 11.00, we ask that you use all feasible means to avoid Damage to the Environment of this historic, irreplaceable, and beloved natural resource of the Commonwealth. **Based on these factors, and to ensure that irreversible Damage to the Environment does not occur at the Project site, we call upon you to notify the Proponent that no work can commence on the Project site pending your Determination.**

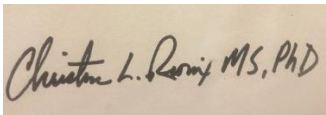
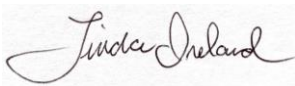
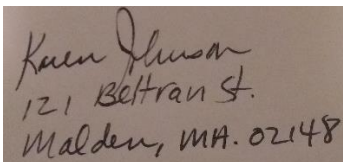
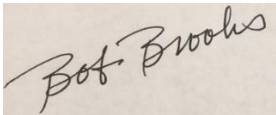
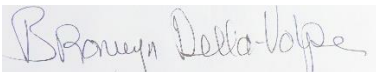
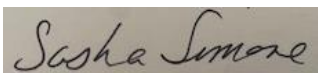
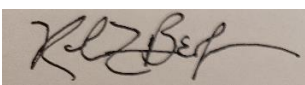
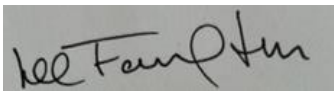
Sincerely,



Christine L. Rioux, MS, PhD (corresponding signatory)
Christinerioux2017@gmail.com

cc. Jonathan. K. Patton, DCR, Archaeologist, Office of Cultural Resources
Wakefield Conservation Commission

10 Petitioners

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 Karen Johnson 121 Beltran St. Malden, MA. 02148 Karen Johnson 121 Beltran Street Malden MA 02148	 Paul Rybicki 152 Parker Road Wakefield MA 01880
 Bob Brooks 7 June Circle Wakefield MA 01880	 Bronwyn Della-Volpe 8 Cyrus Street Wakefield MA 01880
 Sasha Simone 43 East Highland Ave Melrose MA 02176	 Robin Bergman 320 Park Avenue Arlington MA 02476
 Brian Thomson 65 Prospect Street Wakefield MA 01880	 Lee Farrington 441 Washington Street #201 Chelsea MA 02150

List of Attachments

Attachment 1 – Aerial Locus Map

Attachment 2 - Site Prep Sequence with areas of blasting

Attachment 3 - Natural Heritage and Endangered Species Program Map

Attachment 4 - School site alternatives (12/2020-NEMT Building Committee Presentation)

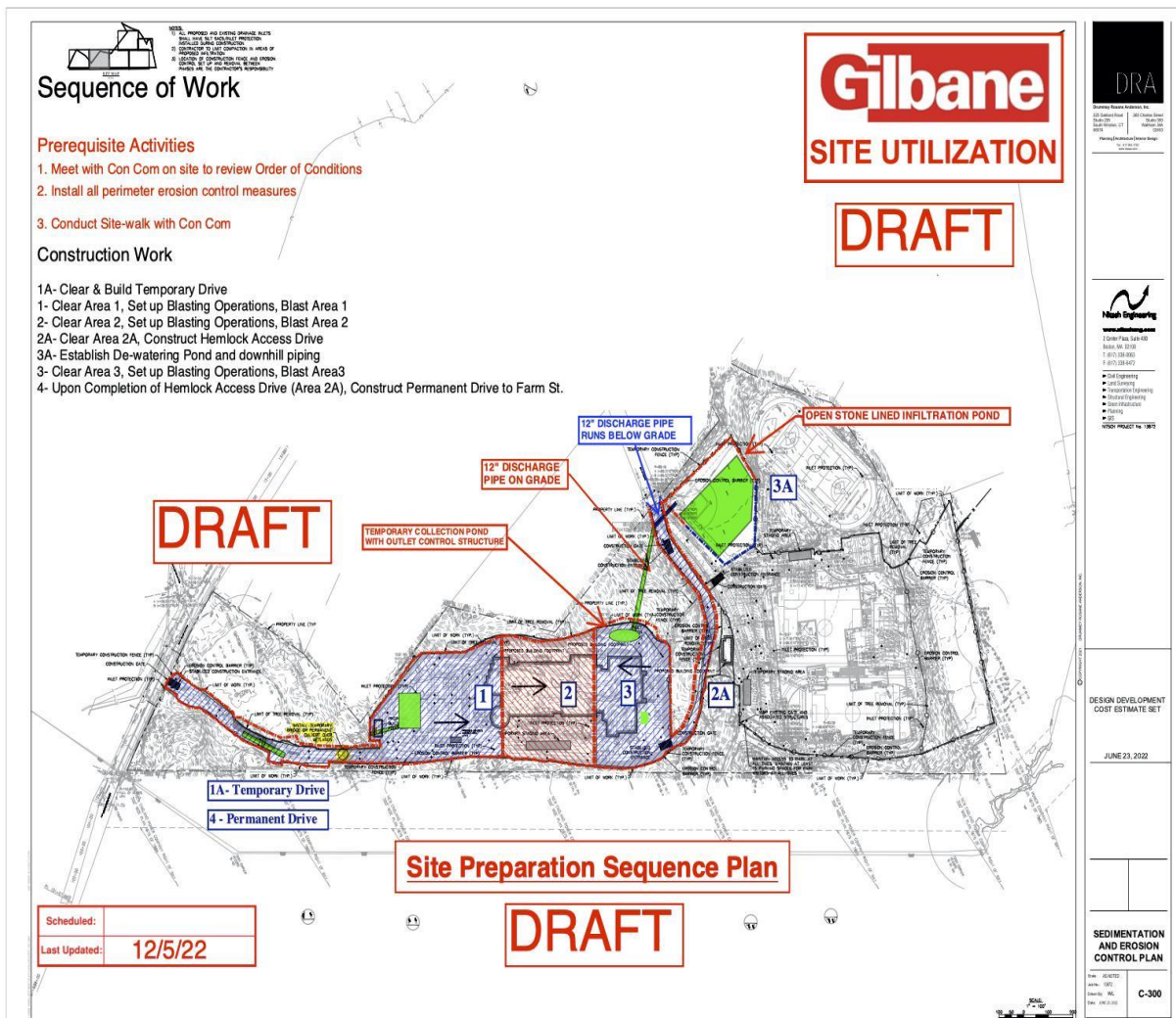
Attachment 5 - Energy Park on Article 97 land (WMGLD)

Attachment 6 – Presentations showing Hockey Rink on Project Site

Attachment 1 – Aerial Locus Map - Current school left of Hemlock Rd and proposed



Attachment 2 - Site Prep Sequence with areas of blasting



Attachment 3 - Natural Heritage and Endangered Species Program Map (Nitsch Engineering)

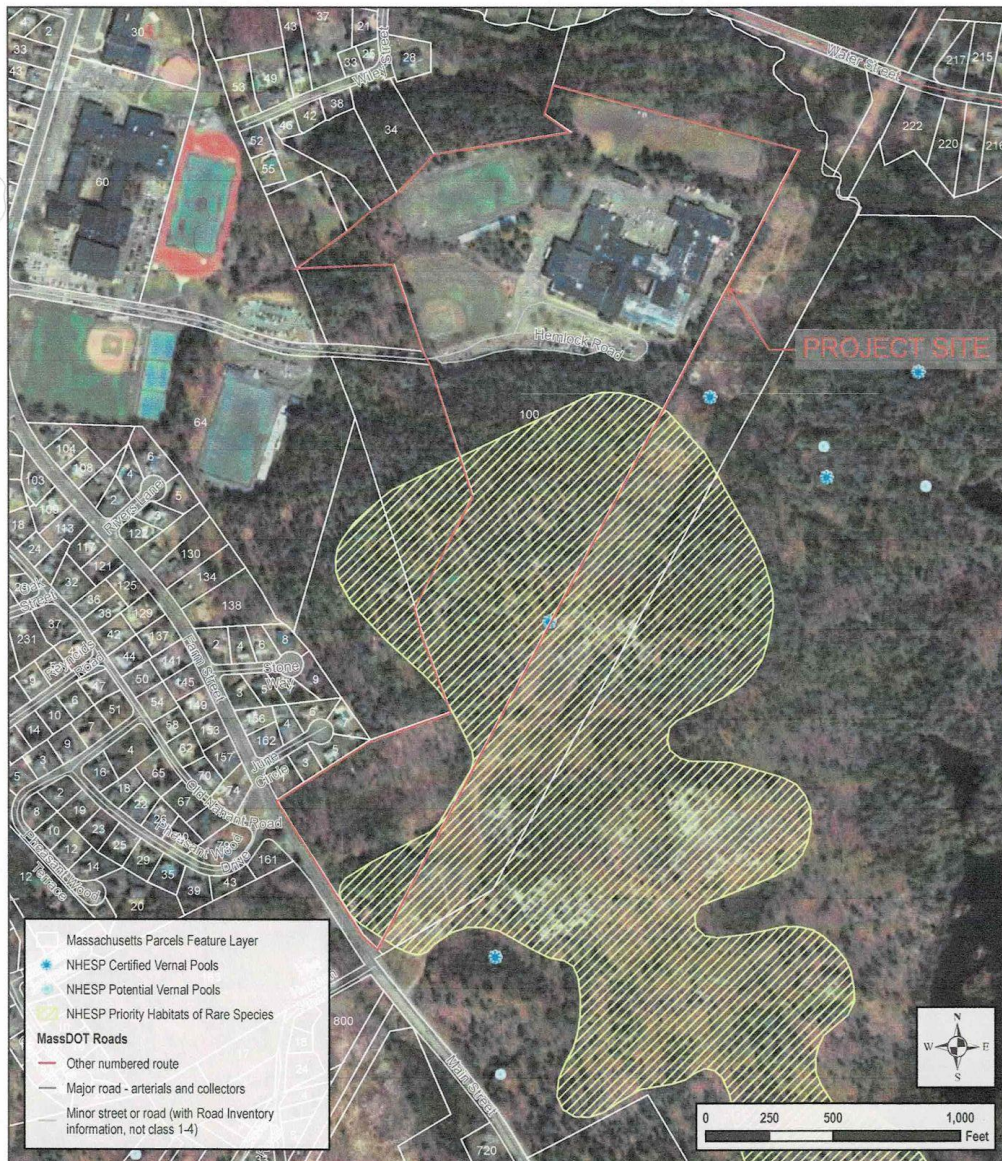
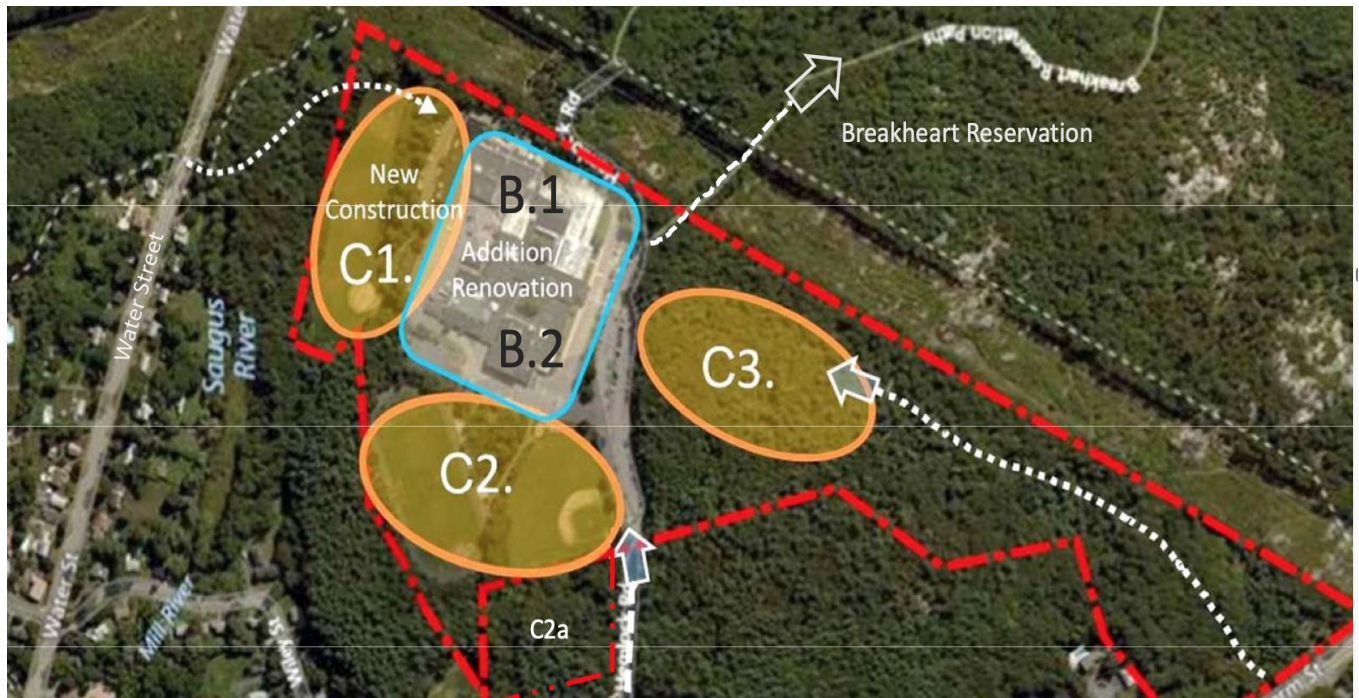


Figure 4b. Natural Heritage and Endangered Species Program Map
 Northeast Metropolitan Regional Vocational High School
 100 Hemlock Rd, Wakefield, MA 01880

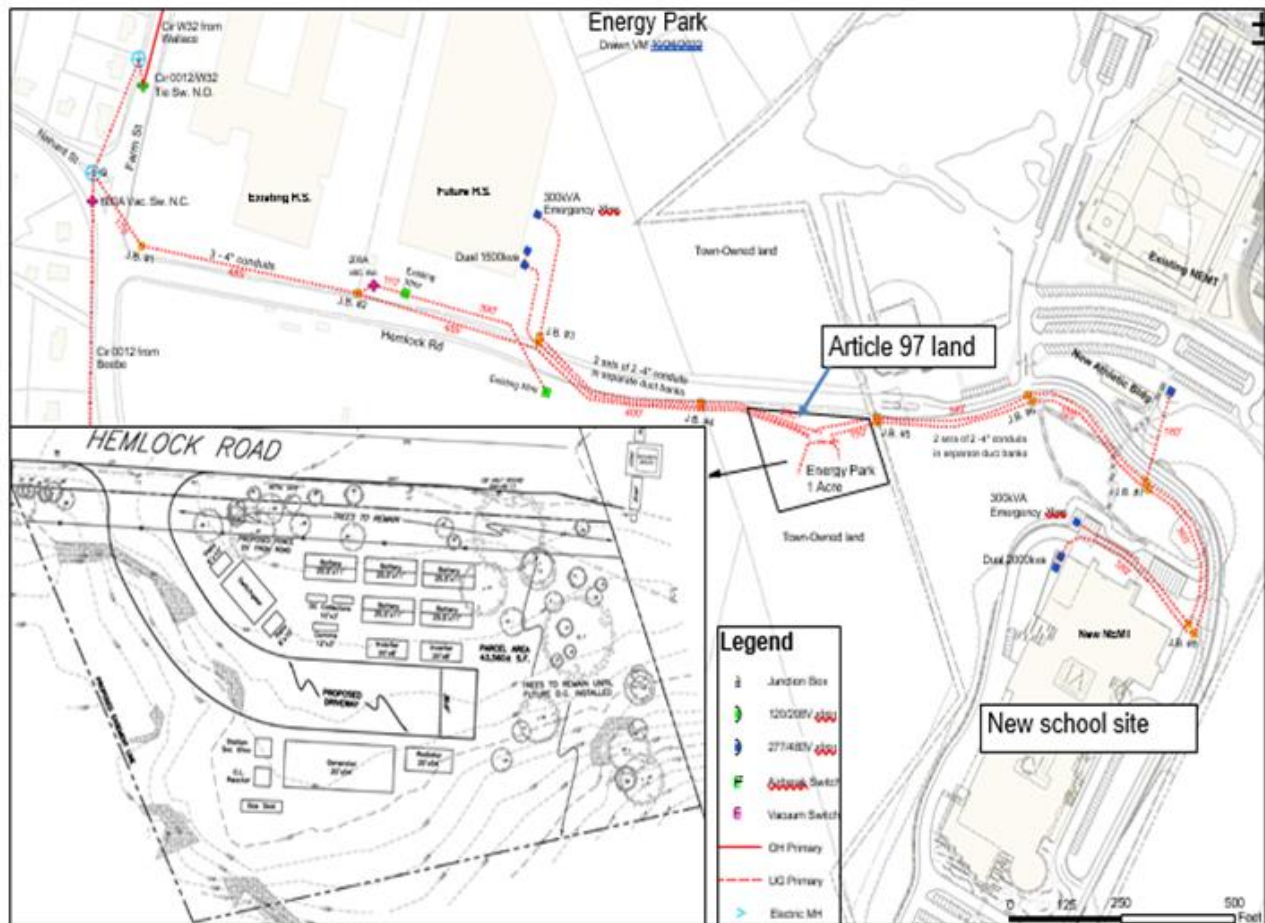
Data Source: MassGIS
 Nitsch Project #13872



Attachment 4 - School site alternatives (12/2020-NEMT Building Committee Presentation)



Attachment 5 - Energy Park on Article 97 land (WMGLD)



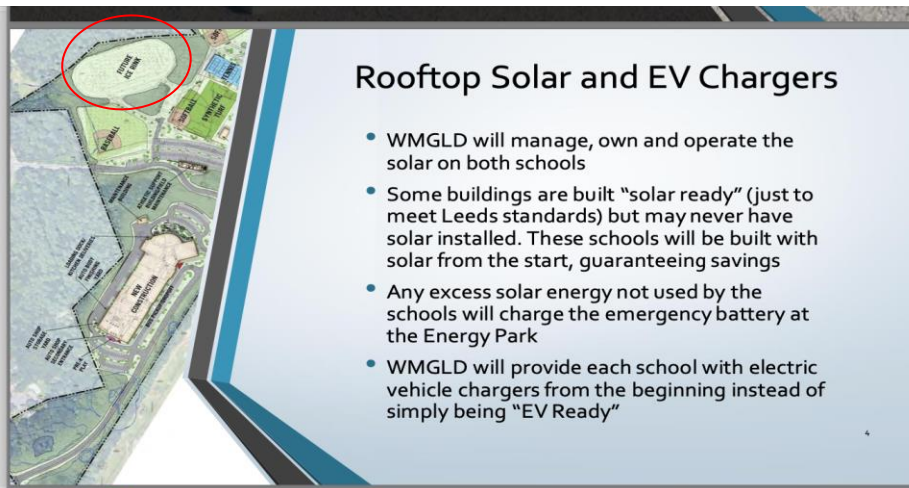
Attachment 6 – Presentations showing Hockey Rink on Project Site

Preparing for the vote, 11/12/2020 and 12/10/2020, day of School Building Committee vote. Presentation by Drummey Rosane Anderson, Inc. (DRA) To School Building Committee



OPM Work in Wakefield, 03/30/2021

Presentation by PMA Consultants LLC To Wakefield Permanent Building Committee



WMGLD Energy Park 09/28/22

Presentation by Wakefield Gas & Light Dept To Wakefield Town Council

6C.2.2 – 02f

**EEA FAIL SAFE
RULING**

PROJECT SCHEDULE



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Maura T. Healey
GOVERNOR

Kimberley Driscoll
LIEUTENANT GOVERNOR

Rebecca L. Tepper
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
<http://www.mass.gov/eea>

March 23, 2023

Christine L. Rioux, MS, PhD
22 Woodland Rd
Wakefield MA 01880
Email: Christinerioux2017@gmail.com

Re: Northeast Metropolitan Regional Vocational Technical High School Project

Dear Ms. Rioux,

On behalf of Secretary Rebecca Tepper, I write to respond to the petition submitted by you on January 27, 2023 (the "Petition"),¹ on behalf of ten signatories including yourself, requesting that the Secretary require review of the above-referenced project (the "Project") under the Massachusetts Environmental Policy Act (MEPA) and implementing regulations at 301 CMR 11.00 et seq. Consistent with the fail-safe provisions at 301 CMR 11.04(2), the Petition was forwarded to the Proponent, the Northeast Metropolitan Regional Vocational High School District (the "Proponent" or "District"), and responses were received from the Proponent on March 3, 14, and 21, 2023. The Petition was also published in the February 8, 2023 Environmental Monitor for a 20-day public comment period, which was extended with the Proponent's consent until March 3, 2023. I received 278 public comments² on the Petition, and you provided supplemental information on March 13, 14, and 17, 2023.

¹ Your submission is entitled, "Petition for Fail-Safe Review and Project Changes that Exceed Review Thresholds," and was signed by ten individuals as follows: Christine L. Rioux; Linda Ireland; Karen Johnson; Paul Rybicki; Bob Brooks; Bronwyn Della-Volpe; Sasha Simone; Robin Bergman; Brian Thomson; and Lee Farrington.

² Public comments submitted through the MEPA public comments portal can be viewed at <https://eeaonline.eea.state.ma.us/EEA/PublicComment/Landing/>.

Background

The Project was the subject of a prior advisory ruling issued by this Office on May 26, 2022 (the “May 2022 ruling”), which found that MEPA review was not required at that time because, while “Agency Action” was required, the Project did not meet or exceed any MEPA review thresholds under 301 CMR 11.03. Your Petition, which is styled, “Petition for Fail-Safe Review and Project Changes that Exceed Review Thresholds,” now seeks review of the Project under the fail-safe provisions at 301 CMR 11.04, and also asserts that project changes made since the time of the May 2022 ruling implicate at least two MEPA review thresholds. These arguments are discussed below.

As summarized in the May 2022 ruling, the Project involves the replacement of the existing 1,256 student Northeast Metropolitan Regional Vocational High School with a new high school on the same 59-acre parcel of land. In anticipation of future student growth, the new high school will include space for 1,600 students. The Project has received funding approval from the Massachusetts School Building Authority (“MSBA”). Both the Petition and the prior request for advisory ruling, which was submitted by the Friends of Wakefield’s Northeast Metro Tech Forest, object to the location of the proposed new high school atop a hill that the Petition refers to as “an undeveloped hillside area,” “wooded with a significant amount of ledge outcroppings,” which will require “creation of a flat building pad through a mass tree-clearing and blasting operation in an early site enabling phase.”

As previously described, the site was chosen from among 30 options evaluated during a multi-year “MSBA Feasibility Study phase.” The selection process was evaluated and approved by the District’s Building Committee and the MSBA. The Proponent indicates that, on January 25, 2022, registered voters within the 12 sending communities of the District (Chelsea, Malden, Melrose, North Reading, Reading, Revere, Saugus, Stoneham, Wakefield, Winchester, Winthrop, and Woburn) elected to approve the borrowing of \$317,422,620 to pay the costs of designing, constructing, and furnishing the new school and related athletic facilities. The Proponent also executed a Project Funding Agreement (PFA) with MSBA on March 24, 2022, and a Notice of Intent was submitted to the Wakefield Conservation Commission on September 22, 2022. The Proponent indicates that construction will begin upon issuance of an Order of Conditions (OOC) by the Wakefield Conservation Commission.

Determination

Your Petition seeks a ruling that the Project is subject to review under the Massachusetts Environmental Policy Act (“MEPA”) and implementing regulations at 301 CMR 11.00 et seq.

MEPA Review Thresholds

MEPA review is required if there is “Agency Action” for a Project, and one or more review thresholds in 301 CMR 11.03 are triggered. See 301 CMR 11.01(2)(a)-(b). As indicated above, the May 2022 ruling found that “Agency Action” was required in the form of MSBA funding, but that no MEPA review thresholds were triggered. However, the ruling noted that, “if any thresholds (other than 301 CMR 11.0(3)(2)(b)2.) were to be met or exceeded due to project changes made at a future time, MEPA review would be required.”

The following review thresholds were analyzed in the May 2022 ruling:

- 11.0(3)(1)(b)2. *Creation of five or more acres of impervious area.*
- 11.03(6)(b)1. *Unless the Project consists solely of an internal or on-site roadway or is located entirely on the site of a non-roadway Project: a. construction of a New roadway one-quarter or more miles in length; or b. widening of an existing roadway by four or more feet for one-half or more miles.*
- 11.0(3)(1)(b)1. *Direct alteration of 25 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.*

As discussed in the May 2022 ruling, the review threshold at 301 CMR 11.03(3)(2)(b)2., *Greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02, that results in a take of a state-listed endangered or threatened species or species of special concern*, is inapplicable under Natural Heritage and Endangered Species Program (NHESP) regulations, which allow project proponents to seek an exemption from NHESP permitting if rare species mapping is revised after the project reaches certain permitting milestones. Here, the mapping was revised on August 1, 2021 to delineate portions of the site as habitat for the Hentz's Red-bellied Tiger Beetle, and the requisite milestones were reached as of that date. However, if MEPA review were required for other independent reasons, then this NHESP regulatory provision would not apply to exempt the Project.

The Petition argues that project changes have occurred since the May 2022 ruling, such that two MEPA review thresholds are now implicated (and, in turn, the rare species threshold at 301 CMR 11.03(3)(2)(b)2.):

- 11.0(3)(1)(b)1. *Direct alteration of 25 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.*
- 11.0(3)(1)(b)3. *Disposition or change in use of land or an interest in land subject to Article 97 of the Amendments to the Constitution of the Commonwealth, unless the Secretary waives or modifies the replacement land requirement pursuant to M.G.L. c. 3, § 5A and its implementing regulations.*

a. Land Alteration

With respect to land alteration, the Petition provides a range of numbers associated with proposed work at the site of both the new and existing schools. In a "Final Reply" submitted on March 13, 2023, you provided a site plan that you indicate was prepared by a registered architect. According to this site plan, the total limit of work associated with the old school is reported to be 13.38 acres.³ You assert that the limit of work at the new school is 15.53 acres.⁴

³ The Proponent has confirmed that a 3-acre hockey rink included in the Petition is not proposed as part of this Project. You also assert that 2.71 acres associated with an "infiltration pond" should be included; however, this is a stormwater feature that will be installed underneath a baseball field, which will be restored to original conditions.

⁴ You also include the area associated with the Article 97 disposition for the energy park (0.8 acres) and additional wetland buffer zone areas that you assert will be impacted by stormwater runoff from the site (0.9 acres). However, the Article 97

The Proponent, for its part, acknowledges that minor design changes have occurred since the time of the May 2022 ruling, as a result of consultation with the Wakefield Conservation Commission. The Proponent indicates that the limit of work at the old school is 13.7 acres (no change from May 2022 ruling), and that the limit of work at the new school is now 14.05 acres (increased from 13.57 acres in the May 2022 ruling). In its March 21 response, the Proponent clarified that the total acreage at the new school includes an additional reduction in forest clearing by 0.35 acres.

Based on this information, the limit of work associated with the old school can be conservatively estimated to be 13.7 acres (higher of the Petition's and Proponent's numbers). As noted by the Proponent, the May 2022 ruling indicated that certain "like for like" replacements (e.g., parking replaced with parking) totaling 3.25 acres could be deducted, though the Proponent argues that other areas (such as landscaped areas to remain landscaped) could also qualify as "like for like" replacements. The Final Reply submitted by you acknowledges that 3.65 acres would qualify as a "Valid Area of Replacement of Similar [U]se and Character," which is higher than the deduction sought by the Proponent. Thus, based on the Proponent's (more conservative) numbers, total land alteration at the site of the old school is estimated to be 10.45 acres (13.7 acres minus 3.25 acres).

As for the new school, the Final Reply suggests that an area of about 1 acre will be altered by the "construction of ramps and sidewalks that will require extensive surface and subsurface disturbance and earth moving for the installation of steel beams to support [a] 1100 sq ft ramp." You indicate that this area was omitted from the Proponent's accounting in Attachment 4 of its March 13 letter. In its March 21 response, the Proponent indicates that its site plan, which is stamped by the District's registered professional engineers and landscape architects, is the official site plan for the Project submitted to the Wakefield Conservation Commission and the Zoning Board of Appeals. The Proponent reiterates that no work is proposed at the 1-acre area referenced in the Final Reply, as the elevated ramp and stair system proposed to connect the old and new schools is designed to leave trees and ledge outcroppings intact. As noted, the March 21 response indicates that forest clearing will be reduced by an additional 0.35 acres, bringing the total land alteration for the Project to 24.5 acres (14.05 acres at new school plus 10.45 acres at old school site).⁵

I acknowledge that this number is very close to the 25-acre land alteration threshold at 301 CMR 11.03(1)(b)1. The Proponent is advised that even minor refinements to the final design could trigger this threshold in the future, and may (yet again) raise questions about the need for MEPA review during subsequent permitting when additional Agency Actions may be required. The Proponent is strongly encouraged to continue to minimize land alteration for the Project, particularly in areas where additional trees could be preserved. I also note the Petition's argument that the MEPA Office should revisit its interpretation of the word "alteration," and construe it to include any change in the "physical condition of the land including, but not limited to, clearing, grubbing, excavation, filling, grading, surfacing, paving, compaction, stockpiling, and stabilizing." This issue could be addressed as part of future updates

parcel is not deemed a part of this Project for the reasons stated below; additionally, indirect impacts on areas outside the limit of work for a project, while relevant for assessing project impacts generally, are not considered when determining applicability of MEPA review thresholds.

⁵ I note that, with the 0.35-acre reduction, even the numbers in the Final Reply would show land alteration below 25 acres—i.e., 13.38 acres (old school) – 3.65 acres of "valid" deduction + 15.53 acres (new school) – 0.35 acres = 24.91 acres.

to MEPA regulations and policies. As with the May 2022 ruling, this determination shall apply only to the facts and circumstances of this Project.

b. Article 97

The Petition also notes that the Wakefield Municipal Gas and Light Department (WMGLD) has proposed construction of an “energy park” on land that is protected under article 97 of the amendments to the Massachusetts constitution (“Article 97”), and that the energy park will serve the Project at issue. The Petition argues that conversion of this Article 97 land triggers the MEPA review threshold at 301 CMR 11.0(3)(1)(b)3., and should be deemed to be part of the Project under anti-segmentation principles. MEPA regulations at 301 CMR 11.01(2)(c) seek to ensure that a project is not phased or segmented to evade, defer or curtail MEPA review. To that end, the Secretary must consider the entirety of a project, including any likely future expansion, and not separate phases or segments thereof, in determining whether a project is subject to MEPA jurisdiction or meets or exceeds any review thresholds.

Here, the Proponent argues that the energy park is a separate initiative by the WMGLD, and is not part of a common plan with the Project. The Proponent indicates that the energy park is intended to serve multiple customers, and that the Project does not depend on completion of the energy park as its energy needs can be met by other means. While the Proponent questions whether the energy park will be located on Article 97 land, comments from WMGLD confirm that the land to be used for the energy park was originally obtained for “park purposes” by the Town of Wakefield, and is therefore protected under Article 97. WMGLD supports the Proponent’s position that the energy park is a separate and independent undertaking from the Project, and that the Project does not depend on completion of the energy park. Based on this input, I find that the MEPA anti-segmentation provisions do not require treatment of the energy park and the Project as a common enterprise for purposes of determining the applicability of MEPA review thresholds.

Based on the foregoing, I find that the Project as revised does not meet or exceed any MEPA review thresholds. Accordingly, I must assess whether fail-safe review is warranted.

Fail-Safe Review

The fail-safe provisions at 301 CMR 11.04(1) state that “[u]pon written petition by . . . ten or more Persons, or at the initiative of the Secretary, the Secretary may require a Proponent to file an ENF or undergo other MEPA review for a proposed program, regulations, policy, or other Project that does not meet or exceed any review thresholds unless all Agency Actions for the Project have been taken, provided that the Secretary finds in the decision on the petition or initiative that:

- (a) the Project is subject to MEPA jurisdiction;
- (b) the Project has the potential to cause Damage to the Environment and the potential Damage to the Environment either:
 - 1. could not reasonably have been foreseen prior to or when 301 CMR 11.00 was promulgated; or
 - 2. would be caused by a circumstance or combination of circumstances that individually would not ordinarily cause Damage to the Environment; and
- (c) requiring the filing of an ENF and other compliance with MEPA and 301 CMR 11.00:

1. is essential to avoid or minimize Damage to the Environment; and
2. will not result in an undue hardship for the Proponent.”

I may invoke fail-safe review only if all of the requirements of 301 CMR 11.04(1)(a)-(c) are met.

a. MEPA Jurisdiction

As an initial matter, the Proponent asserts that MEPA jurisdiction no longer exists for the Project, as all Agency Actions have been taken. Specifically, the Proponent indicates that it has executed a Project Funding Agreement (PFA) with MSBA, which constitutes the final approval for the Project. MEPA regulations define Agency Action, “[i]n the case of a Project undertaken by a Person, [as] any formal and final action taken by an Agency in accordance with applicable statutes and regulations that grants a Permit, provides Financial Assistance, or closes a Land Transfer.” 301 CMR 11.02 (emphasis added). However, 301 CMR 11.12 also defines Agency responsibilities under MEPA, including an obligation, as a prerequisite to taking Agency Action, to “determine in a timely manner whether the Project requires MEPA review.” Id. 11.12(3)(a). The Proponent indicates that an assessment of MEPA review thresholds was performed during the feasibility study phase, though the PFA was ultimately signed on March 24, 2022, when a prior request for an advisory ruling as to the need for MEPA review was still pending. MEPA regulations provide that, “[i]f an Agency takes Agency Action without due compliance with MEPA and 301 CMR 11.00, the Secretary may thereafter require MEPA review, and may require the Agency to reconsider the Agency Action and any conditions thereof following completion of MEPA review.” 301 CMR 11.12(6).⁶

I need not reach the issue of whether Agency Action remains outstanding, since it appears likely that the Project will undergo additional permitting, including through the pending application for an OOC from the Wakefield Conservation Commission. While a local OOC does not qualify as Agency Action, an appeal of the OOC would result in a Superseding Order of Conditions from the Massachusetts Department of Environmental Protection (MassDEP), which is an Agency Action for MEPA purposes. The analysis below addresses whether the Project meets other applicable criteria for fail-safe review, even if Agency Action remains outstanding.

b. Damage to the Environment

To qualify for fail-safe review, the petitioner must satisfy the high standard set forth in 301 CMR 11.04(1)(b) to demonstrate that the Project has the potential to cause Damage to the Environment and that such potential: (i) could not reasonably have been foreseen prior to or when 301 CMR 11.00 was promulgated; or (ii) would be caused by a circumstance or combination of circumstances that individually would not ordinarily cause Damage to the Environment.

⁶ The Proponent’s response erroneously cites to a January 4, 2023 ruling on a petition for fail-safe review submitted for a different project (Malden artificial turf field), indicating that the ruling rejected the fail-safe petition because all Agency Actions had been taken. To the contrary, the ruling declined to reach the issue of whether Agency Actions (such as action by the Malden Redevelopment Authority) were still pending (see p. 3), since it was clear that MEPA review thresholds were exceeded; the project was deemed ineligible for fail-safe review on this basis (see p. 6).

MEPA regulations define “Damage to the Environment” to include a wide range of environmental destruction or impairment, but does not include “insignificant” damage.⁷ As a general matter, MEPA review thresholds identify “categories of Projects or aspects thereof of a nature, size or location that are likely, directly or indirectly, to cause [significant] Damage to the Environment.” 301 CMR 11.03. Thus, any project that meets or exceeds review thresholds is presumed likely to cause significant damage, and must undergo MEPA review. However, projects that do not exceed thresholds are not presumed likely to cause significant damage and are subject to fail-safe review only if I find that the conditions in 301 CMR 11.04(1)(b) are met.

As applied here, the Petition discusses a lengthy list of potential impacts from the Project, and argues that these impacts were not reasonably foreseen as of July 1, 1998.⁸ The listed impacts include construction period activity (tree removal and blasting), impacts to cultural sites, stormwater runoff, disturbance of rare species habitat and soils, wetlands and buffer zone impacts, water quality issues associated with stormwater runoff and construction period activity, increases in flooding and storm flows from new impervious surfaces, and reduction in groundwater levels associated with stormwater runoff. While I appreciate the thoughtful description of potential impacts and the concerns raised, the listed impacts do not differ materially from those associated with most new development projects. Indeed, MEPA review thresholds explicitly address most impacts—namely, land alteration and impervious area (301 CMR 11.03(1)), rare species (301 CMR 11.03(2)), wetlands (301 CMR 11.03(3)), surface and groundwater discharge (301 CMR 11.03(5)), and historical and archaeological resources (301 CMR 11.03(10)); in addition, other impacts such as stormwater runoff are routinely addressed as part of wetlands permitting. Thus, it cannot be said that these impacts were not reasonably foreseen at the time MEPA regulations were promulgated in 1998. The Petition does not argue, and I cannot find, that these impacts reflect any “circumstance or combination of circumstances” that individually would not cause Damage to the Environment.

As the Petition has not satisfied the criteria for fail-safe review under 301 CMR 11.04(1)(b), I find it unnecessary to determine whether requiring the filing of an ENF (i) is essential to avoid or minimize Damage to the Environment and (ii) will not result in an undue hardship for the Proponent under 301 CMR 11.04(1)(c). As noted above, however, the absence of MEPA review allowed an exemption to rare species permitting that otherwise would have applied after August 1, 2021. In its response, the Proponent commits to minimizing rare species impacts by preserving 1.7 acres of the site under a Conservation Restriction (CR) as habitat for the Hentz’s Red-bellied Tiger Beetle. The area of the CR is described as generally comprised of Oak-Pine forest and isolated wetland, and abuts an off-site utility corridor that contains ample exposed bedrock with full solar exposure and approximately 10 acres of high-quality Beetle habitat. The Proponent indicates that the adjacency of the proposed CR area to the abutting expanse of high-quality habitat will help ensure that the habitat protection measures

⁷ The full definition is as follows: “[a]ny destruction or impairment (not including insignificant damage or impairment), actual or probable, to any of the natural resources of the Commonwealth including, but not limited to, air pollution, GHG emissions, water pollution, improper sewage disposal, pesticide pollution, excessive noise, improper operation of dumping grounds, reduction of groundwater levels, impairment of water quality, increases in flooding or storm water flows, impairment and eutrophication of rivers, streams, flood plains, lakes, ponds or other surface or subsurface water resources, destruction of seashores, dunes, marine resources, underwater archaeological resources, wetlands, open spaces, natural areas, parks, or historic districts or sites.” 301 CMR 11.02.

⁸ Because the fail-safe standard in 301 CMR 11.04(1) was inserted through regulatory amendments made effective on July 1, 1998, I construe the standard as referring to impacts that could not reasonably have been foreseen prior to or on this date.

achieve maximum benefit for the species. In addition, the Proponent indicates that it is committed to establishing, through a newly created Natural and Environmental Science elective at the new vocational school, “a student driven and operated tree farm on District property that will plant and distribute trees to the member communities served by the District.” According to the Proponent, ten of the 12 member communities served by the District contain environmental justice populations, and the program will place special emphasis on plantings within dense urban neighborhoods of gateway member communities. The Proponent has also reached out to the Breakheart Reservation to support its efforts to regrow areas lost last summer to forest fires.

I acknowledge the numerous comments and correspondence that have been submitted, both in support of and against the Project. Many comments addressed the extent of forest clearing on the site. The Proponent indicates that it has taken all feasible measures to minimize the extent of forest clearing, including by reducing the new school building footprint and preserving significant portions of existing forested areas. In total, the Project site contains approximately 33.39 acres of forested area, of which approximately 19.22 acres (57.6%, or approximately 2,845 trees) will be preserved while 14.17 acres (42.4%, or approximately 2,097 trees) will be altered. As noted, the Proponent has committed to preserve an additional 0.35 acres of forested area, which is included in the 19.22-acre estimate above and equates to about 52 additional trees preserved. To mitigate the impacts of tree clearing, the Proponent intends to reuse larger trees in the 18”-26” diameter range that are suitable for repurposing. Current plans call for the District’s students to execute a Logs to Lumber Project, in which they will use a newly acquired sawmill to repurpose select trees into useable building lumber to create projects including benches, picnic tables, storage sheds, dugouts, concession stands and other structures. These projects will be located throughout the 12 member communities to the District.

* * * * *

Based on the foregoing, I find that MEPA review is not required for the Project because, while it may continue to require Agency Actions, it does not meet or exceed any MEPA review thresholds. I also find that fail-safe review is not warranted under 301 CMR 11.04.

If you have any questions regarding this determination, please contact the MEPA Office at MEPA@mass.gov.

Sincerely,

/s/ *Tori T. Kim*
Tori T. Kim
Assistant Secretary

cc: Adam Kahn, Foley Hoag LLP
Kathleen Brill, Foley Hoag LLP
Christine Nolan, General Counsel, MSBA

- 01** Cost Estimate Reconciliation
- 02** Cost Estimate Comparison
- 03** Cost Estimate – CM-R
- 04** Cost Estimate - Designer
- 05** Updated Project Budget
- 06** Early-Bid Package
 - 06a** Description of Packages
 - 06b** Bid Tables
- 07** Value Engineering
 - 07a** Summary Tracking Sheet
 - 07b** VE Committee Vote
- 08** Pre-qualified Subcontractors

6C.2.3

PROJECT SCOPE & BUDGET

PROJECT SCOPE & BUDGET

COST ESTIMATE RECONCILIATION

6C.2.3 - 01

RECONCILED CONSTRUCTION COST ESTIMATE

District: Northeast Metropolitan Regional Vocational High School District
Project: Northeast Metropolitan Regional Vocational High School Project
OPM: PMA Consultants
Designer: DRA Architects
CM (if applicable): Gilbane
Project Type: New Construction
Submittal (DD/60/90): 90% CD
Proposed Gross SqFt: 380,570

CSI DIVISION	DESCRIPTION
n/a	GMP Fee
n/a	GMP Insurance
n/a	GMP Contingency
n/a	Design & Estimating Contingency
n/a	Escalation
1000	General Requirements
2000	Existing Conditions
3000	Concrete
4000	Masonry
5000	Metals
6000	Woods, Plastics, Composites
7000	Thermal and Moisture Protection
8000	Openings
9000	Finishes
10000	Specialties
11000	Equipment
12000	Furnishings
13000	Special Construction
14000	Conveying Equipment
21000	Fire Suppression
22000	Plumbing
23000	Heating Ventilating and Air Conditioning
26000	Electrical
27000	Communications
28000	Electronic Safety and Security
31000	Earthwork
32000	Exterior Improvements
33000	Utilities

DESIGNER COST ESTIMATE	CM Cost Estimate	Delta
\$4,205,160	\$4,205,160	\$0
\$11,579,344	\$11,564,283	\$15,061
\$5,384,096	\$5,265,765	\$118,331
\$3,021,959	\$2,543,157	\$478,802
\$6,134,575	\$4,634,903	\$1,499,672
\$19,069,081	\$18,533,081	\$536,000
\$5,456,274	\$5,981,451	-\$525,177
\$11,408,837	\$11,587,993	-\$179,156
\$7,492,821	\$8,514,596	-\$1,021,775
\$21,999,997	\$20,197,830	\$1,802,167
\$3,064,761	\$2,978,332	\$86,429
\$15,981,455	\$13,893,335	\$2,088,120
\$10,174,962	\$10,343,548	-\$168,586
\$20,823,131	\$20,276,119	\$547,012
\$1,704,023	\$1,487,832	\$216,191
\$4,051,304	\$4,452,080	-\$400,776
\$881,423	\$1,737,911	-\$856,488
\$0	\$0	\$0
\$955,775	\$985,000	-\$29,225
\$3,922,083	\$3,775,296	\$146,787
\$8,046,999	\$8,421,659	-\$374,660
\$29,610,372	\$30,891,850	-\$1,281,478
\$18,453,277	\$18,942,517	-\$489,240
\$3,394,546	\$3,207,476	\$187,070
\$2,809,638	\$2,860,722	-\$51,084
\$16,778,946	\$15,649,704	\$1,129,242
\$7,950,595	\$10,422,406	-\$2,471,811
\$4,699,674	\$5,577,887	-\$878,213

Subtotal Base Contract Amount

\$249,055,108

\$248,931,893

\$123,215

Bid Alternates (If applicable)

\$9,524,675

\$9,610,709

TOTAL AMOUNT

\$258,579,783

\$258,542,602

TOTAL \$/SF

679.4539323

\$679.36

PROJECT SCOPE & BUDGET

COST ESTIMATE COMPARISON

6C.2.3 - 02

COST ESTIMATE COMPARISON SPREADSHEET (UNIFORMAT)

(Northeast Metropolitan Regional Vocational High School) (New Construction)																				
Estimated Construction Start Date:			February-23			February-23			February-23			February-23			June-23			XXXX		
Division #	Description		Project Scope & Budget			Project Funding Agreement			Design Development			60% CD			90% CD			100% CD		
			GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost
A		Substructure	393,624	\$7,102,544	\$18.04	393,624	\$7,102,544	\$18.04	390,400	\$9,310,100	\$23.85	382,610	\$10,299,677	\$26.92	380,570	\$9,931,831	\$26.10			#DIV/0!
B		Shell	393,624	\$47,049,999	\$119.53	393,624	\$47,049,999	\$119.53	390,400	\$48,011,461	\$122.98	382,610	\$51,811,917	\$135.42	380,570	\$51,259,329	\$134.69	0	0	#DIV/0!
	B10	Superstructure	393,624	\$22,922,963	\$58.24	393,624	\$22,922,963	\$58.24	390,400	\$26,175,691	\$67.05	382,610	\$26,264,560	\$68.65	380,570	\$25,705,534	\$67.54	0		#DIV/0!
	B20	Exterior Enclosure	393,624	\$18,244,496	\$46.35	393,624	\$18,244,496	\$46.35	390,400	\$18,812,993	\$48.19	382,610	\$19,869,936	\$51.93	380,570	\$19,682,478	\$51.72	0	0	#DIV/0!
		B2010 Exterior Walls	393,624	\$17,286,796	\$43.92	393,624	\$17,286,796	\$43.92	390,400	\$17,069,593	\$43.72	382,610	\$13,057,274	\$34.13	380,570	\$12,885,602	\$33.86	0		#DIV/0!
		B2020 Exterior Windows	393,624	\$79,800	\$0.20	393,624	\$79,800	\$0.20	390,400	\$1,309,750	\$3.35	382,610	\$6,207,882	\$16.23	380,570	\$6,222,900	\$16.35	0		#DIV/0!
		B2030 Exterior Doors	393,624	\$877,900	\$2.23	393,624	\$877,900	\$2.23	390,400	\$433,650	\$1.11	382,610	\$604,780	\$1.58	380,570	\$573,976	\$1.51	0		#DIV/0!
	B30	Roofing	393,624	\$5,882,540	\$14.94	393,624	\$5,882,540	\$14.94	390,400	\$3,022,777	\$7.74	382,610	\$5,677,421	\$14.84	380,570	\$5,871,317	\$15.43	0		#DIV/0!
C		Interiors	393,624	\$27,712,012	\$70.40	393,624	\$27,712,012	\$70.40	390,400	\$31,224,017	\$79.98	382,610	\$31,211,107	\$81.57	380,570	\$30,114,189	\$79.13	0		#DIV/0!
D		Services	393,624	\$49,488,001	\$125.72	393,624	\$49,488,001	\$125.72	390,400	\$56,060,068	\$143.60	382,610	\$59,885,785	\$156.52	380,570	\$63,911,143	\$167.94	0	0	#DIV/0!
	D10	Conveying	393,624	\$495,000	\$1.26	393,624	\$495,000	\$1.26	390,400	\$735,000	\$1.88	382,610	\$885,000	\$2.31	380,570	\$955,775	\$2.51	0		#DIV/0!
	D20	Plumbing	393,624	\$6,718,112	\$17.07	393,624	\$6,718,112	\$17.07	390,400	\$7,061,422	\$18.09	382,610	\$7,929,280	\$20.72	380,570	\$8,043,655	\$21.14	0		#DIV/0!
	D30	HVAC	393,624	\$22,233,115	\$56.48	393,624	\$22,233,115	\$56.48	390,400	\$27,553,542	\$70.58	382,610	\$28,027,560	\$73.25	380,570	\$29,610,372	\$77.81	0		#DIV/0!
	D40	Fire Protection	393,624	\$2,257,047	\$5.73	393,624	\$2,257,047	\$5.73	390,400	\$2,998,525	\$7.68	382,610	\$2,972,079	\$7.77	380,570	\$3,922,083	\$10.31	0		#DIV/0!
	D50	Electrical	393,624	\$17,784,727	\$45.18	393,624	\$17,784,727	\$45.18	390,400	\$17,711,579	\$45.37	382,610	\$20,071,866	\$52.46	380,570	\$21,379,258	\$56.18	0		#DIV/0!
E		Furnishings & Fixed Equipment	393,624	\$4,160,050	\$10.57	393,624	\$4,160,050	\$10.57	390,400	\$5,365,398	\$13.74	382,610	\$6,194,950	\$16.19	380,570	\$5,958,253	\$15.66	0		#DIV/0!
		Building Subtotal	393,624	\$135,512,606	\$344	393,624	\$135,512,606	\$344	390,400	\$149,971,044	\$384.15	382,610	\$159,403,436	\$416.62	380,570	\$161,174,745	\$423.51	0	0	#DIV/0!
F		Special Construction & Demo	393,624	\$3,702,853	\$9.41	393,624	\$3,702,853	\$9.41	390,400	\$4,461,772	\$11.43	382,610	\$3,761,772	\$9.83	380,570	\$5,139,437	\$13.50	0		#DIV/0!
G		Other Site Construction	393,624	\$39,174,607	\$99.52	393,624	\$39,174,607	\$99.52	390,400	\$37,825,049	\$96.89	382,610	\$40,817,281	\$106.68	380,570	\$33,346,711	\$87.62	0	0	#DIV/0!
	G10	Site Preparation	393,624	\$12,235,063	\$31.08	393,624	\$12,235,063	\$31.08	390,400	\$15,804,536	\$40.48	382,610	\$18,360,562	\$47.99	380,570	\$12,752,385	\$33.51	0		#DIV/0!
	G20	Site Improvements	393,624	\$12,583,194	\$31.97	393,624	\$12,583,194	\$31.97	390,400	\$10,492,116	\$26.88	382,610	\$11,213,411	\$29.31	380,570	\$11,748,234	\$30.87	0		#DIV/0!
	G30	Mechanical Utilities	393,624	\$8,046,500	\$20.44	393,624	\$8,046,500	\$20.44	390,400	\$7,768,547	\$19.90	382,610	\$6,730,279	\$17.59	380,570	\$4,699,674	\$12.35	0		#DIV/0!
	G40	Electrical Utilities	393,624	\$2,090,718	\$5.31	393,624	\$2,090,718	\$5.31	390,400	\$3,759,850	\$9.63	382,610	\$4,513,029	\$11.80	380,570	\$4,146,418	\$10.90	0		#DIV/0!
		Subtotal	393,624	\$178,390,066	\$453	393,624	\$178,390,066	\$453	390,400	\$192,257,865	\$492.46	382,610	\$203,982,489	\$533.13	380,570	\$199,660,893	\$524.64	0	0	#DIV/0!
Z		Mark-Ups	393,624	\$46,982,941	26.3%	393,624	\$46,982,941	26.3%	390,400	\$40,648,932	21.1%	382,610	\$35,833,556	17.6%	380,570	\$43,259,640	21.7%	0	#REF!	#REF!
Z		Insurance	393,624	\$4,626,775	2.6%	393,624	\$4,626,775	2.6%	390,400	\$4,026,775	2.1%	382,610	\$1,592,163	0.8%	380,570	\$9,051,901	4.5%	0	#REF!	#REF!
Z		Subcontractor Bonds	393,624	\$2,624,843	1.5%	393,624	\$2,624,843	1.5%	390,400	\$2,534,944	1.3%	382,610	\$2,621,889	1.3%	380,570	\$2,527,443	1.3%	0	#REF!	#REF!
Z		GC Bonds	393,624	\$0	0.0%	393,624	\$0	0.0%	390,400	\$0	0.0%	382,610	\$0	0.0%	380,570	\$0	0.0%	0	#REF!	#REF!
Z		Design & Pricing Contingency PMA Note: Incl. GMP Contingency	393,624	\$18,810,231	10.5%	393,624	\$18,810,231	10.5%	390,400	\$13,150,488	6.8%	382,610	\$10,682,779	5.2%	380,570	\$8,406,055	4.2%	0	#REF!	#REF!
Z		General Conditions	393,624	\$16,731,565	9.4%	393,624	\$16,731,565	9.4%	390,400	\$16,731,565	8.7%	382,610	\$16,731,565	8.2%	380,570	\$19,069,081	9.6%	0	#REF!	#REF!
Z		Overhead & Profit	393,624	\$4,189,527	2.3%	393,624	\$4,189,527	2.3%	390,400	\$4,205,160	2.2%	382,610	\$4,205,160	2.1%	380,570	\$4,205,160	2.1%	0	#REF!	#REF!
		Construction Subtotal	393,624	\$225,373,007	\$573	393,624	\$225,373,007	\$573	390,400	\$232,906,797	\$596.59	382,610	\$239,816,045	\$626.79	380,570	\$242,920,533	\$638.31	0	#REF!	#REF!
Z		Escalation to Construction Mid-Point	393,624	\$18,218,085	10.2%	393,624	\$18,218,085	10.2%	390,400	\$11,297,073	5.9%	382,610	\$9,408,691	4.6%	380,570	\$6,134,575	3.1%	0	#REF!	#REF!
Total Addition Cost			393,624	\$243,591,092		393,624	\$243,591,092		390,400	\$244,203,870		382,610	\$249,224,736		380,570	\$249,055,108		0	#REF!	
\$/GSF				\$619			\$619			\$626			\$651			\$654			#REF!	

Alternates		Value																		
1	Add Locker/Athletic Support Building	\$ 3,361,548.00																		
2	Additional Seating Capacity (add 500 seats)	\$ 344,819.00																		
3	Add Concessions/Toilet Building	\$ 1,436,510.00																		
4	Add Irrigated Softball Field	\$ 810,462.00																		
5	Add Irrigated Softball Field/Multi-Purpose Field	\$ 1,184,585.00																		
6	Add Maintenance Building	\$ 2,386,751.00																		

COST ESTIMATE COMPARISON SPREADSHEET (CSI FORMAT)

(Northeast Metropolitan Regional Vocational High School) (New Construction)													
Estimated Construction Start Date:		2/27/2023			6/19/2023			XXXX			XXXX		
Description		60% CD			90% CD			100% CD			Bid Data		
		GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost	GSF	Total Cost	Unit Cost
General Requirements Subgroup													
1	General Requirements	382610	8,519,059	\$22.27	380570	9,381,490	\$24.65	0		#DIV/0!	0		#DIV/0!
	Insurance	382610	1,592,163	\$4.16	380570	9,051,901	\$23.79	0		#DIV/0!	0		#DIV/0!
	Subcontractor Bonds	382610	2,621,889	\$6.85	380570	2,527,443	\$6.64	0		#DIV/0!	0		#DIV/0!
	GC Bonds	382610	0	\$0.00	380570	0	\$0.00	0		#DIV/0!	0		#DIV/0!
	Design & Pricing Contingency PMA Note: Incl. GMP Contingency	382610	10,682,779	\$27.92	380570	8,406,055	\$22.09	0		#DIV/0!	0		#DIV/0!
	General Conditions	382610	9,687,506	\$25.32	380570	9,687,591	\$25.46	0		#DIV/0!	0		#DIV/0!
	Overhead & Profit	382610	4,205,160	\$10.99	380570	4,205,160	\$11.05	0		#DIV/0!	0		#DIV/0!
Facilities Construction Subgroup													
2	Existing Conditions	382610	5,298,953	\$13.85	380570	5,456,274	\$14.34	0		#DIV/0!	0		#DIV/0!
3	Concrete	382610	11,349,286	\$29.66	380570	11,408,837	\$29.98	0		#DIV/0!	0		#DIV/0!
4	Masonry	382610	8,048,893	\$21.04	380570	7,492,821	\$19.69	0		#DIV/0!	0		#DIV/0!
5	Metals	382610	21,340,676	\$55.78	380570	21,999,997	\$57.81	0		#DIV/0!	0		#DIV/0!
6	Wood, Plastics and Composites	382610	3,108,888	\$8.13	380570	3,064,761	\$8.05	0		#DIV/0!	0		#DIV/0!
7	Thermal & Moisture Protection	382610	16,212,191	\$42.37	380570	15,981,455	\$41.99	0		#DIV/0!	0		#DIV/0!
8	Openings	382610	10,211,161	\$26.69	380570	10,174,962	\$26.74	0		#DIV/0!	0		#DIV/0!
9	Finishes	382610	21,198,957	\$55.41	380570	20,823,131	\$54.72	0		#DIV/0!	0		#DIV/0!
10	Specialties	382610	1,766,029	\$4.62	380570	1,704,023	\$4.48	0		#DIV/0!	0		#DIV/0!
11	Equipment	382610	4,222,900	\$11.04	380570	4,051,304	\$10.65	0		#DIV/0!	0		#DIV/0!
12	Furnishings	382610	710,668	\$1.86	380570	881,423	\$2.32	0		#DIV/0!	0		#DIV/0!
13	Special Construction	382610	153,150	\$0.40	380570	0	\$2.51	0		#DIV/0!	0		#DIV/0!
14	Conveying	382610	885,000	\$2.31	380570	955,775	\$10.31	0		#DIV/0!	0		#DIV/0!
Facilities Services Subgroup													
21	Fire Suppression	382610	2,972,079	\$7.77	380570	3,922,083	\$77.81	0		#DIV/0!	0		#DIV/0!
22	Plumbing	382610	7,929,280	\$20.72	380570	8,046,999	\$48.49	0		#DIV/0!	0		#DIV/0!
23	HVAC	382610	28,027,560	\$73.25	380570	29,610,372	\$8.92	0		#DIV/0!	0		#DIV/0!
25	Integrated Automation	382610	0	\$0.00	380570	0	\$7.38	0		#DIV/0!	0		#DIV/0!
26	Electrical	382610	18,511,138	\$48.38	380570	18,453,277	\$44.09	0		#DIV/0!	0		#DIV/0!
27	Communications	382610	3,727,249	\$9.74	380570	3,394,546	\$20.89	0		#DIV/0!	0		#DIV/0!
28	Electronic Safety and Security	382610	2,346,508	\$6.13	380570	2,809,638	\$12.35	0		#DIV/0!	0		#DIV/0!
Site and Infrastructure Subgroup													
31	Earthwork	382610	18,706,035	\$48.89	380570	16,778,946	\$44.09	0		#DIV/0!	0		#DIV/0!
32	Exterior Improvements	382610	9,050,609	\$23.65	380570	7,950,595	\$20.89	0		#DIV/0!	0		#DIV/0!
33	Utilities	382610	6,730,279	1759.0%	380570	4,699,674	\$12.35	0		#DIV/0!	0		#DIV/0!
34	Transportation	382610	0	0.0%	380570	0	\$0.00	0		#DIV/0!	0		#DIV/0!
35	Waterway and Marine Construction	382610	0	\$0.00	380570	0	\$0.00	0		#DIV/0!	0		#DIV/0!
Construction Subtotal		382610	239,816,045	\$626.79	380570	#####	\$638.31	0	0	#DIV/0!	0	0	#DIV/0!
Escalation to Construction Mid-Point		382610	9,408,691	\$24.59	380570	6,134,575	\$16.12	0		#DIV/0!	0		#DIV/0!
Total Cost		382610	249,224,736		380570	#####		0	0		0	0	
\$/GSF			\$651			\$654		#DIV/0!			#DIV/0!		

Alternates		Value								
1	Add Locker/Athletic Support Building	\$ 3,361,548.00								
2	Additional Seating Capacity (add 500 seats)	\$ 344,819.00								
3	Add Concessions/Toilet Building	\$ 1,436,510.00								
4	Add Irrigated Softball Field	\$ 810,462.00								
5	Add Irrigated Softball/Multi-Purpose Field	\$ 1,184,585.00								
6	Add Maintenance Building	\$ 2,386,751.00								

1 60% Construction Document costs are based on , 2010 dollars.
2 100% Construction Document costs are based on , 2010 dollars.
3 Bid costs are based on , 2010 dollars.

PROJECT SCOPE & BUDGET
COST ESTIMATE – CM-R

6C.2.3 - 03

6C.2.3 – 03

UNIFORMAT

**COST ESTIMATE
CM-R**

Location / Unifomat	Quantity	Unit Cost	Total Cost
MAIN BUILDING	380,570 SF	\$427.42 / SF	\$162,663,391
A10 FOUNDATIONS		\$6.66 / SF	\$2,534,490
A20 SUBGRADE ENCLOSURES		\$7.50 / SF	\$2,854,401
A40 SLABS-ON-GRADE		\$5.12 / SF	\$1,949,624
A60 WATER & GAS MITIGATION		\$1.93 / SF	\$735,750
A90 SUBSTRUCTURE RELATED ACTIVITIES		\$3.38 / SF	\$1,285,770
B10 SUPERSTRUCTURE		\$66.44 / SF	\$25,285,167
B20 EXTERIOR VERTICAL ENCLOSURES		\$51.22 / SF	\$19,494,303
B30 EXTERIOR HORIZONTAL ENCLOSURES		\$15.21 / SF	\$5,789,961
C10 INTERIOR CONSTRUCTION		\$50.57 / SF	\$19,246,516
C20 INTERIOR FINISHES		\$30.23 / SF	\$11,503,011
D10 CONVEYING		\$2.59 / SF	\$985,000
D20 PLUMBING		\$22.13 / SF	\$8,421,659
D30 HEATING, VENTILATION, & AIR CONDITIONING (HVAC)		\$81.17 / SF	\$30,891,850
D40 FIRE PROTECTION		\$9.92 / SF	\$3,775,296
D50 ELECTRICAL		\$42.33 / SF	\$16,110,997
D60 COMMUNICATIONS		\$7.71 / SF	\$2,933,945
D70 ELECTRONIC SAFETY & SECURITY		\$7.45 / SF	\$2,835,722
E10 EQUIPMENT		\$14.92 / SF	\$5,679,882
E20 FURNISHINGS		\$0.92 / SF	\$350,047
MAINTENANCE BLDG	0 SF	\$495,700.00 / SF	\$495,700
A10 FOUNDATIONS		\$0.00 / SF	\$93,200
A20 SUBGRADE ENCLOSURES		\$0.00 / SF	\$252,300
A40 SLABS-ON-GRADE		\$0.00 / SF	\$135,200
A60 WATER & GAS MITIGATION		\$0.00 / SF	\$15,000
D50 ELECTRICAL		\$0.00 / SF	\$0
SITework	60 acre	\$582,803.05 / acre	\$34,968,183
D50 ELECTRICAL		\$12,600.65 / acre	\$756,039
G10 SITE PREPARATION		\$212,539.75 / acre	\$12,752,385
G20 SITE IMPROVEMENTS		\$195,247.63 / acre	\$11,714,858
G30 LIQUID & GAS SITE UTILITIES		\$78,327.90 / acre	\$4,699,674
G40 ELECTRICAL SITE IMPROVEMENTS		\$57,370.45 / acre	\$3,442,227
G90 MISCELLANEOUS SITE CONSTRUCTION		\$0.00 / acre	\$0
Z10 GENERAL REQUIREMENTS		\$26,716.67 / acre	\$1,603,000
DEMO & ABATEMENT	0 SF	\$5,325,270.00 / SF	\$5,325,270
F20 FACILITY REMEDIATION		\$0.00 / SF	\$2,281,101
F30 DEMOLITION		\$0.00 / SF	\$3,044,169
Subtotal Direct Cost		\$534.60 /SF	\$203,452,544

Indirect Costs	Amount	Total Cost
Design and Estimating Contingency	1.25%	\$2,543,157
Subtotal 1		\$205,995,700
Escalation	2.25%	\$4,634,903
Projected Cost of Work		\$210,630,604
Subcontractor Bonds	1.20%	\$2,527,567
Insurance - CCIP (Changed from GL)	2.74%	\$6,820,734
Builders Risk		\$365,272
Payment and Performance Bond		\$1,850,710
Subtotal Insurances		\$222,194,887
CM General Conditions		\$9,687,591
Field Office Support		\$1,694,300
CM General Requirements		\$5,034,190
Cost of Work / Site Services		\$850,000
CM Contingency	2.50%	\$5,265,765
Subtotal 2		\$244,726,733
CM Fee		\$4,205,160
Total Construction Costs		\$248,931,893
Total Construction Cost		\$654.10 /SF
		\$248,931,893
Owner Costs		Total Cost
Land & Real Estate Expenses Acquisition		\$0
Professional Services		\$0
Permits and Regulatory Fees		\$0
Furniture, Fixtures, and Equipment		\$0
Telephone, Data, AV, Security		\$0
Major Equipment		\$0
Utility Costs		\$0
Occupancy Expense		\$0
Advertising and Marketing		\$0
Legal, Financial, & Insurance		\$0
Owner's Reserve		\$0
Owner's Other		\$0
Total Owner Costs		\$0
Total Project Cost		\$248,931,893

MAIN BUILDING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
A10 FOUNDATIONS	380,570 SF	\$6.66 / SF	\$2,534,490
A1010 STANDARD FOUNDATIONS		\$5.42 / SF	\$2,063,665
A1010 STANDARD FOUNDATIONS		\$0.76 / SF	\$288,836
Formwork - Continuous Footings	3,302 sfca	\$18.00 /sfca	\$59,436
Rebar - Continuous Footings (F&I)	14 ton	\$3,550.00 /ton	\$49,700
Concrete - Continuous Footings (material and placed, typ)	202 cy	\$300.00 /cy	\$60,600
CIP Concrete - Interior Footings @ CMU	116 cy	\$600.00 /cy	\$69,600
Concrete - Footing Steps	22 cy	\$2,250.00 /cy	\$49,500
A1013 COLUMN FOUNDATIONS		\$4.40 / SF	\$1,674,829
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)	6.00 ton	\$3,550.00 /ton	\$21,300
Rebar - Column Footings (F&I)	133 ton	\$3,550.00 /ton	\$472,150
Concrete Isolated Piers - Complete F&I	55 cy	\$425.00 /cy	\$23,375
Concrete - Column Footings - Complete Complete F&I	1,834 cy	\$300.00 /cy	\$550,200
Column Diamonds, Grout - Isolated Footings	258 ea	\$250.00 /ea	\$64,500
A1019 STANDARD FOUNDATION SUPPLEMENTARY COMPONENTS		\$0.26 / SF	\$100,000
ADD THICKENED SLAB HAUNCH @NON-SHEAR WALL CMU WALLS	1.00 ls	\$100,000.00 /ls	\$100,000
A2020 BASEMENT WALL CONSTRUCTION		\$1.11 / SF	\$424,325
A1011 WALL FOUNDATIONS		\$1.11 / SF	\$424,325
Formwork - Retaining Wall Footings	2,329 sfca	\$25.00 /sfca	\$58,225
Rebar - Retaining Wall Footings @ Wall (F&I)	46 ton	\$3,550.00 /ton	\$163,300
F&I Concrete - Retaining Wall Footings	676 cy	\$300.00 /cy	\$202,800
A4040 PITS & BASES		\$0.12 / SF	\$46,500
A4040 PITS & BASES		\$0.12 / SF	\$46,500
Elevator Pit Walls / Mat Slab - complete	16 cy	\$1,500.00 /cy	\$24,000
Other Pit Walls / Mat Slab - Leveling & Equipment	1.00 ls	\$22,500.00 /ls	\$22,500
A20 SUBGRADE ENCLOSURES	380,570 SF	\$7.50 / SF	\$2,854,401
A1010 STANDARD FOUNDATIONS		\$2.53 / SF	\$962,361
A1011 WALL FOUNDATIONS		\$2.53 / SF	\$962,361
Formwork - @ Foundation Wall - Exterior Frost Wall	16,387 sfca	\$24.00 /sfca	\$393,288
Formwork - @ Foundation Wall - Exterior Radial Frost Wall	1,525 sfca	\$40.00 /sfca	\$61,000
Formwork - @ Foundation Wall - Interior Wall	5,727 sfca	\$24.00 /sfca	\$137,448
Rebar - Frost Wall (F&I)	47 ton	\$3,550.00 /ton	\$166,850
Concrete - Foundation Walls	627 cy	\$325.00 /cy	\$203,775
A2020 BASEMENT WALL CONSTRUCTION		\$4.97 / SF	\$1,892,040
A2020 BASEMENT WALL CONSTRUCTION		\$3.82 / SF	\$1,455,575
Formwork - @ Basement Retaining Wall	31,385 sfca	\$25.00 /sfca	\$784,625
Rebar - Basement Wall (F&I)	85 ton	\$3,550.00 /ton	\$301,750
F&I Concrete - Basement Wall	1,136 cy	\$325.00 /cy	\$369,200
A2022 MOISTURE PROTECTION		\$1.15 / SF	\$436,465

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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	380,570 SF	\$5.12 / SF	\$1,949,624
A1010 STANDARD FOUNDATIONS		\$0.55 / SF	\$210,000
A1019 STANDARD FOUNDATION SUPPLEMENTARY COMPONENTS		\$0.55 / SF	\$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
A4010 STANDARD SLABS-ON-GRADE		\$3.60 / SF	\$1,369,936
A4010 STANDARD SLABS-ON-GRADE		\$3.60 / SF	\$1,369,936
Formwork - Slab Edge	5,423 lf	\$18.00 /lf	\$97,614
Formwork - Slab Construction Joints	2,575 lf	\$18.00 /lf	\$46,350
Welded Wire Mesh - Slab on Grade (Incl. Overlap) F&I	147,327 sf	\$1.75 /sf	\$257,822
Concrete Material - (SOG)	1,987 cy	\$150.00 /cy	\$298,050
Place & Finish Slab on Grade Concrete (6" @shops + 4" elsewhere)	128,111 sf	\$3.25 /sf	\$416,361
Sawcut Slab on Grade Control Joints	7,800 lf	\$12.00 /lf	\$93,600
Cure / Protect Slab on Grade	128,111 sf	\$1.25 /sf	\$160,139
A4040 PITS & BASES		\$0.06 / SF	\$23,200
A4040 PITS & BASES		\$0.06 / SF	\$23,200
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	\$3,900.00 /ea	\$7,800
A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.91 / SF	\$346,489
A4096 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.91 / SF	\$346,489
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
BP 31A - Compacted Base Under - ONSITE PROCESSED,@ 12" - Place & Compact	5,295 cy	\$10.00 /cy	\$52,950
BP 31A - Fine Grade Base	128,111 sf	\$0.75 /sf	\$96,083
BP 31A - Rough Grade Base	128,111 sf	\$0.40 /sf	\$51,244
A60 WATER & GAS MITIGATION	380,570 SF	\$1.93 / SF	\$735,750
A6010 BUILDING SUBDRAINAGE		\$1.93 / SF	\$735,750
A6011 FOUNDATION DRAINAGE		\$1.93 / SF	\$735,750
BP 31A - Building Foundation Drainage - Perforated PVC (F&I) - Perimeter	3,400 lf	\$35.00 /lf	\$119,000
BP 31A - Building Foundation Drainage - Perforated PVC (F&I) - underslab	10,000 lf	\$35.00 /lf	\$350,000
BP 31A - E&B for Electrical within footprint	1.00 ls	\$50,000.00 /ls	\$50,000
BP 31A - E&B for Plumbing within footprint	3,150 lf	\$45.00 /lf	\$141,750

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Radon Mitigation - 20 drops / 60' each	1.00 ls	\$75,000.00 /ls	\$75,000
A90 SUBSTRUCTURE RELATED ACTIVITIES	380,570 SF	\$3.38 / SF	\$1,285,770
A1010 STANDARD FOUNDATIONS		\$3.38 / SF	\$1,285,770
A9011 BACKFILL & COMPACTION		\$3.38 / SF	\$1,285,770
BP 31A - Excav. Column Footings	7,763 cy	\$20.00 /cy	\$155,260
BP 31A - Excav. Continuous & Retaining Wall Footings	16,675 cy	\$20.00 /cy	\$333,500
BP 31A - Excav. Pits	150 cy	\$20.00 /cy	\$3,000
BP 31A - Backfill & Compact Column Footings	5,655 cy	\$38.00 /cy	\$214,890
BP 31A - Backfill Pits	125 cy	\$38.00 /cy	\$4,750
BP 31A - Backfill Wall / Footings	15,115 cy	\$38.00 /cy	\$574,370
B10 SUPERSTRUCTURE	380,570 SF	\$66.44 / SF	\$25,285,167
B1010 FLOOR CONSTRUCTION		\$43.33 / SF	\$16,490,981
B1010 FLOOR CONSTRUCTION		\$7.93 / SF	\$3,018,174
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"	3,780 cy	\$425.00 /cy	\$1,606,500
Finish Concrete - Metal Deck	244,976 sf	\$3.75 /sf	\$918,660
B1011 FLOOR STRUCTURAL FRAME		\$30.64 / SF	\$11,661,448
Structural Steel Beams - HSS	50 ton	\$5,300.00 /ton	\$263,198
Structural Steel Beams - MC	459 lb	\$10.00 /lb	\$4,590
Structural Steel Beams - WF	1,260 ton	\$5,200.00 /ton	\$6,552,000
Structural Steel Connections	243 ton	\$5,300.00 /ton	\$1,288,165
Structural Steel Bracing Bays - HSS	107 ton	\$5,300.00 /ton	\$565,245
Temp Stairs / Scaffolding Stairs - 5 sets	1.00 ls	\$200,000.00 /ls	\$200,000
Structural Steel Columns - HSS - Square / Rectangular	283 ton..	\$5,300.00 /ton..	\$1,502,126
Metal Decking - Floor, 2"	244,976 sf	\$5.25 /sf	\$1,286,124
B1012 FLOOR DECKS, SLABS, & TOPPINGS		\$0.40 / SF	\$151,679
Concrete Topping @ Precast Plank - ADJUSTED SQFT PER RECON	15,404 sf	\$7.25 /sf	\$111,679
Housekeeping Pads Complete	1,000 sf	\$40.00 /sf	\$40,000
B1014 MEZZANINE FLOOR CONSTRUCTION		\$2.00 / SF	\$761,260
Floor Precast - Plank - Hollow Core @ Mezzanine - Furnish	15,404 sf	\$13.00 /sf	\$200,252
Floor Precast - Plank - Hollow Core @ Mezzanine - Install	15,404 sf	\$32.00 /sf	\$492,928
Wood Decking - 3/4" @ Mezzanine Complete \$/s	1,702 sf	\$40.00 /sf	\$68,080
B1019 FLOOR CONSTRUCTION SUPPLEMENTARY COMPONENTS		\$2.36 / SF	\$898,421
Applied Fireproofing Complete \$/sf	244,976 sf	\$3.30 /sf	\$808,421
Intumescent Fireproofing @ exposed framing / bracing	1.00 ls	\$40,000.00 /ls	\$40,000
Misc. Patching of Fireproofing	1.00 ls	\$50,000.00 /ls	\$50,000
B1020 ROOF CONSTRUCTION		\$18.77 / SF	\$7,142,026
B1021 ROOF STRUCTURAL FRAME		\$15.98 / SF	\$6,083,317
Structural Steel Connections	140 ton	\$5,300.00 /ton	\$744,067
Structural Steel Beams - HSS	1,691 lb	\$4.00 /lb	\$6,764
Structural Steel Beams - MC	261 lb	\$4.00 /lb	\$1,044
Structural Steel Beams - WF	446 ton	\$5,200.00 /ton	\$2,320,916

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Structural Steel Bracing Bays - HSS	62 ton	\$5,300.00 /ton	\$326,533
Structural Steel Columns - HSS - Round	26 ton..	\$5,300.00 /ton..	\$138,012
Structural Steel Columns - HSS - Square / Rectangular	164 ton..	\$5,300.00 /ton..	\$867,663
Steel Dunnage - Galvanized	43 ton	\$5,700.00 /ton	\$244,530
Steel Joist - DLH	115 ton.	\$5,100.00 /ton.	\$585,429
Metal Decking - Roof Cornice, 1"	5,915 sf	\$5.00 /sf	\$29,575
Metal Decking - Roof, 1-1/2"	291 sf	\$6.00 /sf	\$1,746
Metal Decking - Roof, 2"	20,118 sf	\$5.30 /sf	\$106,625
Metal Decking - Roof, 3"	102,555 sf	\$5.45 /sf	\$558,925
Metal Roof Deck - Acoustic	12,624 sf	\$12.00 /sf	\$151,488
B1022 ROOF DECKS, SLABS, & SHEATHING		\$1.08 / SF	\$409,599
Welded Wire Mesh - Roof Deck (Incl. Overlap) F&I	23,135 sf	\$1.75 /sf	\$40,486
Concrete Material & Place -@ Roof Deck	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
B1029 ROOF CONSTRUCTION SUPPLEMENTARY COMPONENTS		\$1.71 / SF	\$649,111
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	141,503 sf	\$3.50 /sf	\$495,261
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		\$4.34 / SF	\$1,652,160
B1081 STAIR CONSTRUCTION		\$4.18 / SF	\$1,589,500
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	16.00 flgt	\$15,000.00 /flgt	\$202,500
Stairs - Concrete risers @ Aud	1.00 ls	\$125,000.00 /ls	\$125,000
Stairs - Monument / Feature w/ Rails - Open Ornamental Stair, 1 location	3.00 flgt	\$130,000.00 /flgt	\$390,000
Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 1 locations	1.00 flgt	\$47,500.00 /flgt	\$47,500
Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 6 locations	15 flgt	\$47,500.00 /flgt	\$712,500
Stairs - Steel Stairs / Rails @ Mezzanine	1.00 ls	\$82,000.00 /ls	\$82,000
B2017 BALCONY WALLS & RAILINGS		\$0.16 / SF	\$62,660
Railing Ballasted Guardrail at High Roof	65 lf	\$160.00 /lf	\$10,400
Railing Exterior Guardrail at Rotunda Porch	195 lf	\$268.00 /lf	\$52,260
B20 EXTERIOR VERTICAL ENCLOSURES	380,570 SF	\$51.22 / SF	\$19,494,303
B2010 EXTERIOR WALLS		\$33.12 / SF	\$12,605,550
B2011 EXTERIOR WALL VENEER		\$22.53 / SF	\$8,576,008
Staging and Scaffolding - Exterior CMU - All exterior Masonry	1.00 ls	\$182,500.00 /ls	\$182,500
Exterior Face Brick Veneer	23,043 sf	\$45.00 /sf	\$1,036,935
Exterior CMU - CMU Veneer	33,750 sf	\$37.00 /sf	\$1,248,750

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Exterior Cast Stone Veneer - Arriscraft	7,245 sf	\$50.00 /sf	\$362,250
Exterior Granite Veneer - Main Entry Feature Wall	2,385 sf	\$175.00 /sf	\$417,375
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	14,913 sf	\$90.00 /sf	\$1,342,170
Metal Panel Flat-Lock Metal Tiles over 9/16" Galvanized Utility Deck	5,386 sf	\$145.00 /sf	\$780,970
Metal Panel Corrugated Insulated Metal Panels on Aluminum Clip System	4,978 sf	\$76.00 /sf	\$378,328
ACM ACM Cornice - Tapered Roof Edge, Low Roofs (~6-8' Surface Area)	1,932 lf	\$1,015.00 /lf	\$1,960,980
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 - South Elevation	150 lf	\$580.00 /lf	\$87,000
ACM ACM Column Wraps/Fin Projections at Rotunda - 27' Tall	515 lf	\$435.00 /lf	\$224,025
ACM ACM Decorative Accent Bandings	525 lf	\$145.00 /lf	\$76,125
Exterior Enclosure Painting, Staining & Transparent Finishing	720 mhr	\$90.00 /mhr	\$64,800
B2012 EXTERIOR WALL CONSTRUCTION		\$9.40 / SF	\$3,575,869
Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU, Insul, AVB, NO INT GWB)	25,909 sf	\$46.00 /sf	\$1,191,814
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 \$/lf	355 lf	\$10.00 /lf	\$3,550
Blocking @ Exterior Louver \$/lf	715 lf	\$10.00 /lf	\$7,150
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	\$0.72 /sfwa	\$94,281
Exterior Wall Backup GWB Stud Wall - 6" MS, AVB, Dens Glass, 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 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 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 / SF	\$264,790
2" Closed Cell Spray Foam Insulation	43,905 sf	\$5.50 /sf	\$241,478
6" Closed Cell Spray Foam Insulation	2,914 sf	\$8.00 /sf	\$23,312
B2018 EXTERIOR WALL SUPPLEMENTARY COMPONENTS		\$0.48 / SF	\$182,884
Sheet Metal Flashing & Trim Complete \$/sf	152,403 sfwa	\$1.20 /sfwa	\$182,884
B2019 EXTERIOR WALL OPENING SUPPLEMENTARY COMPONENTS		\$0.02 / SF	\$6,000

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Exterior Signage Name and logo sign attached to enclosure, Aluminum	1.00 ls	\$6,000.00 /ls	\$6,000
B2020 EXTERIOR WINDOWS		\$16.47 / SF	\$6,266,422
B2021 EXTERIOR OPERATING WINDOWS		\$0.21 / SF	\$81,750
Blocking @ Window Perimeter \$/lf	5,450 lf	\$15.00 /lf	\$81,750
B2022 EXTERIOR FIXED WINDOWS		\$1.17 / SF	\$446,340
Window Insulated Translucent Wall Panel System w/ Integral Louvers	2,595 sf	\$172.00 /sf	\$446,340
B2023 EXTERIOR WINDOW WALL STOREFRONTS		\$4.68 / SF	\$1,782,360
Exterior Windows Insulating Glass in Aluminum System	10,209 sf	\$120.00 /sf	\$1,225,080
Storefront Insulating Glass in Aluminum Storefront System	4,644 sf	\$120.00 /sf	\$557,280
Premium for Operable Vents at Storefront/Windows/Translucent Panels	0.00 ea		\$0
B2029 CURTAIN WALLS		\$10.39 / SF	\$3,955,972
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 6" System	60 sf	\$145.00 /sf	\$8,700
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 7" System	18,098 sf	\$148.00 /sf	\$2,678,504
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 7" System - Radiused	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 - 10" System	2,088 sf	\$160.00 /sf	\$334,080
B2050 EXTERIOR DOORS & GRILLES		\$1.36 / SF	\$518,331
B2051 EXTERIOR ENTRANCE DOORS		\$0.75 / SF	\$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		\$0.61 / SF	\$233,431
Door Insulated Overhead Coiling Door, Motor Operated, 1 each	115 sf	\$55.00 /sf	\$6,325
Door Motor Operated Overhead Door w/ Insulating Glass - Typ., 13 ea	2,442 sf	\$93.00 /sf	\$227,106
B2070 EXTERIOR LOUVERS & VENTS		\$0.27 / SF	\$104,000
B2071 EXTERIOR LOUVERS		\$0.27 / SF	\$104,000
Louver Exterior Louvers	1,040 sf	\$100.00 /sf	\$104,000
B30 EXTERIOR HORIZONTAL ENCLOSURES	380,570 SF	\$15.21 / SF	\$5,789,961
B3010 ROOFING		\$13.47 / SF	\$5,126,005
B3012 LOW SLOPE MEMBRANE SYSTEMS		\$12.98 / SF	\$4,938,920
Green Roof System - Planter / Plantings	0.00 excl		\$0
Pre-Vegetated Roof Garden System	4,820 sf	\$50.00 /sf	\$241,000

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Roof System Type A - TPO Membrane, 1/2" Cover Board, 6-1/2" Insul.	67,401 sf	\$30.00 /sf	\$2,022,030
Roof Protection Board - removed from add alternate list and added back into base design	120,000 sf	\$2.70 /sf	\$324,000
Roof System Type B- TPO Membrane, 1/2" Cover Board, 6-1/2" Tapered Insul.	67,660 sf	\$30.00 /sf	\$2,029,800
Temporary Roof - HOLD	1.00 ls	\$100,000.00 /ls	\$100,000
Rubber Paver Roof System over Membrane Roof	2,365 sf	\$55.00 /sf	\$130,075
Premium for Tapered Cricket Areas	18,403 sf	\$5.00 /sf	\$92,015
B3014.2 FLASHINGS & TRIM		\$0.41 / SF	\$155,085
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	5,363 lf	\$20.00 /lf	\$107,260
B3019 ROOFING SUPPLEMENTARY COMPONENTS		\$0.08 / SF	\$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		\$0.79 / SF	\$301,128
B3020 ROOF APPURTENANCES		\$0.35 / SF	\$132,303
Roofing Walkway Pads	12,565 sf	\$10.53 /sf	\$132,303
G2061.4 SITE FURNISHINGS		\$0.44 / SF	\$168,825
Roof Deck - Fiberglass Planters	0.00 nic		\$0
Roof Deck - Raised Stacked 4x4 Wood Platers w Semi-intensive green rf - deleted per VE	0.00 nic		\$0
Roof Deck - Roof Pavers not on pedestals - changed at 90CD	0.00 nic		\$0
Roof Deck - Synthetic Turf @ Central Roof Deck	7,085 sf	\$15.00 /sf	\$106,275
Roof Deck - Synthetic Turf @ Media Center	1,600 sf	\$18.00 /sf	\$28,800
Roof Deck - Synthetic Turf @ Play Equipment	2,250 sf	\$15.00 /sf	\$33,750
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	0.00 nic		\$0
Roof Deck - Wood Seatwalls, stacked	0.00 nic		\$0
B3080 OVERHEAD EXTERIOR ENCLOSURES		\$0.95 / SF	\$362,828
B3081 EXTERIOR CEILINGS		\$0.95 / SF	\$362,828
Soffits - ACM	1,771 sf	\$118.00 /sf	\$208,978
Soffits - Exterior Rated Gyp	1,715 sf	\$24.00 /sf	\$41,160
Soffits - Linear Metal Ceilings	955 sf	\$118.00 /sf	\$112,690
C10 INTERIOR CONSTRUCTION	380,570 SF	\$50.57 / SF	\$19,246,516
C1010 INTERIOR PARTITIONS		\$35.06 / SF	\$13,343,792
C1011 INTERIOR FIXED PARTITIONS		\$31.44 / SF	\$11,963,874
Interior CMU 4.0 - 4"	6,400 sf	\$25.00 /sf	\$160,000
Interior CMU 8.0 - 8"	90,418 sf	\$28.00 /sf	\$2,531,704
Interior CMU 8.0 - 8" LOW	420 sf	\$24.00 /sf	\$10,080
Interior CMU 8.1 - 8"	6,800 sf	\$28.00 /sf	\$190,400

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Interior CMU 8.2 - 8" (2hr RATED)	24,572 sf	\$35.00 /sf	\$860,020
Interior CMU 12.0 - 12"	3,074 sf	\$42.00 /sf	\$129,108
Interior CMU 12.1 - 12"	4,240 sf	\$42.00 /sf	\$178,080
Interior CMU 12.2 - 12"	740 sf	\$42.00 /sf	\$31,080
Interior Rough Carpentry	380,570 sf	\$1.00 /sf	\$380,570
Wall Type (F1.0) GWB on 7/8" Metal Furring	798 sf	\$10.00 /sf	\$7,980
Wall Type (F2.0) GWB on 1-5/8" Metal Stud	2,812 sf	\$10.00 /sf	\$28,120
Wall Type (F4.0) 3-5/8" MS, 1lyr 5/8" GWB OS	19,878 sf	\$10.00 /sf	\$198,780
Wall Type (F6) 6" MS, 1lyr 5/8" GWB OS	39,384 sf	\$20.00 /sf	\$787,680
Wall Type (F6.0A) 6" MS, 2lyrs 5/8" GWB OS	45,742 sf	\$20.00 /sf	\$914,840
Wall Type (F4.0A) 3-5/8" MS, 2lyrs 5/8" GWB OS	13,454 sf	\$21.00 /sf	\$282,534
Wall Type (G4.0) 3-5/8" MS, 1lyr 5/8" GWB ES, 3-1/2" Acoustic Batt	180 sf	\$18.50 /sf	\$3,330
Wall Type (G6.0) - LOW - 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	2,658 sf	\$20.00 /sf	\$53,160
Wall Type (G6.0) 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	58,789 sf	\$20.00 /sf	\$1,175,780
Wall Type (G6.0A) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	58,032 sf	\$21.00 /sf	\$1,218,672
Wall Type (G6.0B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	59,764 sf	\$21.50 /sf	\$1,284,926
Wall Type (G6.0C) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	1,064 sf	\$21.50 /sf	\$22,876
Wall Type (G6.1) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	784 sf	\$21.50 /sf	\$16,856
Wall Type (G6.1B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	3,254 sf	\$21.50 /sf	\$69,961
Wall Type (G6.2) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt, 2hr RATED	21,105 sf	\$25.00 /sf	\$527,625
Wall Type (G8.0) 8" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	480 sf	\$20.00 /sf	\$9,600
Wall Type (S4.2) 1" Liner, 4" MS, 4" Acoustic, 1lyrs 5/8" GWB, 1hr RATED	968 sf	\$24.00 /sf	\$23,232
Wall Type (S6.1) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB, 2hr RATED	1,280 sf	\$24.00 /sf	\$30,720
Wall Type (S6.2) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB, 2hr RATED	34,840 sf	\$24.00 /sf	\$836,160
Partition - Premium Abuse Resistant Drywall	0.00 lf		\$0
C1016 GLAZED PARTITIONS & STOREFRONTS		\$3.38 / SF	\$1,287,480
Borrowed lights- BL1-BL5	1,095 sf	\$55.00 /sf	\$60,225
CW Interior	2,100 sf	\$140.00 /sf	\$294,000
CW Interior - Fire Rated	1,772 sf	\$245.00 /sf	\$434,140
Storefront - Interior	4,550 sf	\$103.00 /sf	\$468,650
Art Glass Panels @ Cafeteria (PREMIUM)	219 sf	\$25.00 /sf	\$5,465
Glazing - Interior Ballistic	1.00 allw	\$25,000.00 /allw	\$25,000
C1017 INTERIOR GUARDRAILS & SCREENS		\$0.24 / SF	\$92,438
Gym Flexible Stainless Steel Safety Netting By Metal Fabrications	2,370 sf	\$39.00 /sf	\$92,438
C1020 INTERIOR WINDOWS		\$0.01 / SF	\$1,950
C1020 INTERIOR WINDOWS		\$0.01 / SF	\$1,950
Transaction Window - Interior	1.00 ea	\$1,950.00 /ea	\$1,950
C1030 INTERIOR DOORS		\$6.99 / SF	\$2,660,712

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
C1031.4 STANDARD INTERIOR DOORS		\$3.92 / SF	\$1,490,465
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	\$470.00 /ea	\$4,700
Door type FW2- 12" x 12" Vision Panel	1.00 ea	\$450.00 /ea	\$450
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	\$510.00 /ea	\$510
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	4,350 sf	\$55.00 /sf	\$239,250
Hardware Interior Door Hardware Per Leaf	645 leaf	\$600.00 /leaf	\$387,000
Install doors and hardware	2,850 hr	\$110.00 /hr	\$313,500
Paint Interior - Door & Frames	1,093 ea	\$75.00 /ea	\$81,975
C1035 INTERIOR PANEL DOORS		\$2.33 / SF	\$888,625
Support Steel - Interior Rolling Door/Grille Supports	1.00 ls	\$50,000.00 /ls	\$50,000
Overhead Coiling Doors - Stainless Steel Counter Door	1.00 ea	\$5,000.00 /ea	\$5,000
Overhead Coiling Doors - Standard	4.00 ea	\$15,000.00 /ea	\$60,000
Overhead Rolling Partition / Doors - 2 hr Fire Rated, 13 ea, various sizes	1,265 sf	\$375.00 /sf	\$474,375
Overhead Rolling Partition / Doors - 2 hr Fire Rated, curved, ~42' x 15' (1 ea main lobby)	630 sf	\$475.00 /sf	\$299,250
C1039 INTERIOR DOOR SUPPLEMENTARY COMPONENTS		\$0.74 / SF	\$281,622
Misc. Interior Caulking - General	380,570 sf	\$0.74 /sf	\$281,622
C1090 INTERIOR SPECIALTIES		\$8.51 / SF	\$3,240,062
C1091.4 INTERIOR RAILINGS & HANDRAILS		\$1.58 / SF	\$602,450
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 - Cable Guardrail System	1.00 ls	\$35,000.00 /ls	\$35,000
Guard Rail - Interior - Glass Guardrail System	200 lf	\$525.00 /lf	\$105,000
Guard Rail - Interior - Guard Rail at Mezzanine	1,425 lf	\$150.00 /lf	\$213,750
C1092.2 COMPARTMENTS & CUBICLES		\$0.18 / SF	\$67,211
Cubicles Cubicle Curtains and Track at Nurse's Area.	1.00 ls	\$7,000.00 /ls	\$7,000
Toilet Compartment - Plastic Laminate - Standard	23 stall	\$1,200.00 /stall	\$27,600
Toilet Compartment - Plastic Laminate - Handicapped	12 stall	\$1,500.00 /stall	\$18,000
Urinal Screen - Plastic Laminate	10 ea	\$425.00 /ea	\$4,250
Wire Mesh Partition (assume 8' high) - Interior	1,151 sf	\$9.00 /sf	\$10,361

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
C1092.4 TOILET, BATH, & LAUNDRY ACCESSORIES		\$0.55 / SF	\$209,850
Toilet Accessories - Unload / Store / Categorize	635.00 mhr	\$90.00 /mhr	\$57,150
Toilet Accessories - Distribute / Install	635 mhr	\$90.00 /mhr	\$57,150
Non Restroom Soap: Soap Dispenser, Wall Mtd.	143 ea	\$80.00 /ea	\$11,440
Restroom Paper Towel Dispenser & Trash, Semi Recessed	71.00 ea	\$205.00 /ea	\$14,555
Restroom Toilet Paper Dispenser, Wall Mtd.	69 ea	\$100.00 /ea	\$6,900
Restroom Sanitary Napkin Disposal, Recessed	69 ea	\$75.00 /ea	\$5,175
Restroom Soap: Shampoo Dispenser, Shower Wall Mtd.	10 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 ea	\$45.00 /ea	\$6,750
Non Restroom Lit Mirror: Single Mirror: Light in Framed Mirror Unit	10 ea	\$520.00 /ea	\$5,200
Non Restroom Mirror: Full Height Frameless Mirror Allowance - Weight room, Fitness Room, Locker Rooms, Changing Rooms, Misc.	1.00 allw	\$10,500.00 /allw	\$10,500
Restroom Grab Bar: 60" "L" Shaped, Shower, Curved, Wall Mtd.	6.00 ea	\$115.00 /ea	\$690
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	40 ea	\$165.00 /ea	\$6,600
Restroom Shower curtain and rod, typ. shower unit	10 ea	\$80.00 /ea	\$800
Restroom Shower Seat @ ADA shower units	5.00 ea	\$230.00 /ea	\$1,150
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.	54 ea	\$20.00 /ea	\$1,080
Non Restroom Paper Towel Dispenser, Wall Mtd.	143 ea	\$110.00 /ea	\$15,730
C1093 WALL & DOOR PROTECTION		\$0.10 / SF	\$38,261
Wall & Door Protection Complete \$/sf, including corner guards	382,610 gsf	\$0.10 /gsf	\$38,261
C1093.2 INFORMATION SPECIALTIES		\$1.06 / SF	\$405,000
White / Marker Boards - Small 4' x 4'	66 ea	\$500.00 /ea	\$33,000
White / Marker Boards - Medium 4' x 10'	10 ea	\$950.00 /ea	\$9,500
White / Marker Boards - Medium 4' x 6'	104 ea	\$750.00 /ea	\$78,000
White / Marker Boards - Medium 4' x 8'	3.00 ea	\$750.00 /ea	\$2,250
Corkboards / Tack Boards - Large 4' x 8'	36 ea	\$450.00 /ea	\$16,200
Corkboards / Tack Boards - Small 4' x 4'	66 ea	\$900.00 /ea	\$59,400
Signage Dedication Plaques Allowance - Interior	3.00 allw	\$2,000.00 /allw	\$9,000
Signage Egress, Waydinding, and Regulatory - Interior	4.00 ls	\$2,000.00 /ls	\$18,000
Signage Room Identification Signs - Interior	931 ea	\$150.00 /ea	\$139,650
Signage Additional Signage Allowance - Interior	1.00 allw	\$10,000.00 /allw	\$10,000
Signage Branding and Graphics Allowance - Interior, including large format wall murals and panels.	3.00 allw	\$5,000.00 /allw	\$30,000
C1097 STORAGE SPECIALTIES		\$1.62 / SF	\$614,996
Lockers Locker Room: Single and multi-tier lockers on conc, base, 15" x 15"	428 ea	\$490.00 /ea	\$209,720
Lockers Shop Lockers 2 Tier, 15" Wide x 15" Deep	204 ea	\$490.00 /ea	\$99,960

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Lockers Corridor Lockers 2 Tier, 15" Wide x 15" Deep on wood base	400 ea	\$490.00 /ea	\$196,000
Lockers Cosmetology Lockers: Single &/or double tier, 2' w x 2.5' d	22 ea	\$620.00 /ea	\$13,640
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		\$3.08 / SF	\$1,171,754
Misc. Metals and Supports	382,610 gsf	\$1.00 /gsf	\$382,610
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	\$1.90 /sf	\$746,700
D4031 FIRE PROTECTION EQUIPMENT		\$0.34 / SF	\$130,540
Fire Extinguisher Cabinets - Semi-Recessed	262 ea	\$405.00 /ea	\$106,110
AED Cabinets, units, and accessories	14.00 ea	\$1,745.00 /ea	\$24,430
C20 INTERIOR FINISHES	380,570 SF	\$30.23 / SF	\$11,503,011
C2010 WALL FINISHES		\$8.95 / SF	\$3,406,677
C2012 WALL PANELING		\$2.01 / SF	\$765,943
Wood Veneer Premium for Paneling at columns	2,304 sf	\$82.50 /sf	\$190,080
Fabric Wrapped Acoustical Wall Panels @ Auditorium	1,540 sf.	\$50.00 /sf.	\$77,000
Wood fiber Acoustical Panels	3,475 sf.	\$42.50 /sf.	\$147,688
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.	\$22.50 /sf.	\$29,063
Fiber Reinforced Panel (FRP) @ Full Height	7,354 sf.	\$22.50 /sf.	\$165,472
Phenolic Resin Wall Panels - Interior	1,530 sf.	\$88.00 /sf.	\$134,640
C2013.4 WALL COVERINGS		\$0.23 / SF	\$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		\$2.49 / SF	\$946,938
Ceramic Wall Tile	17,577 sf	\$20.00 /sf	\$351,533
2" Granite Veneer Panels	400 sf.	\$173.00 /sf.	\$69,200
Porcelain Wall Tile	1,445 sf.	\$24.00 /sf.	\$34,685
Thin Porcelain Wall Tile	20,480 sf.	\$24.00 /sf.	\$491,520
C2015 STONE FACING		\$0.00 / SF	\$0
Interior Stone - Travertine, not show on drawings EXCLUDED	0.00 sf		\$0
C2016 SPECIAL WALL SURFACING		\$0.35 / SF	\$132,000
Flat Lock Metal Tile @ Lobby	0.00 nic		\$0
Flexible Stainless Steel Safety Netting	2,400 sf	\$55.00 /sf	\$132,000
C2017 WALL PAINTING & COATING		\$2.77 / SF	\$1,052,433
Paint Interior GWB Walls	220,299 sf.	\$0.95 /sf.	\$209,284
Paint Interior GWB Walls - Soffits	1,732 sf.	\$0.95 /sf.	\$1,645
Paint Interior GWB Walls - Soffits - not shown	1.00 allw	\$5,000.00 /allw	\$5,000

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Paint Interior Walls - Epoxy	234,495 sf.	\$3.25 /sf.	\$762,107
Paint Interior CMU Walls	7,507 sf	\$3.25 /sf	\$24,397
Misc. Interior Painting	1.00 allw	\$50,000.00 /allw	\$50,000
C2018 ACOUSTICAL WALL TREATMENT		\$0.66 / SF	\$251,082
Fabric Wrapped Acoustical Panels @ Auditorium	696 sf.	\$63.00 /sf.	\$43,830
Wood Fiber Acoustical Panels @ Gymnasium	3,290 sf.	\$63.00 /sf.	\$207,252
C2019 WALL FINISH SUPPLEMENTARY COMPONENTS		\$0.44 / SF	\$168,958
Interior Window Sills @ Exterior - Solid Surface	3,379 lf	\$50.00 /lf	\$168,958
C2030 FLOORING		\$8.89 / SF	\$3,381,773
C2031 FLOORING TREATMENT		\$0.28 / SF	\$105,000
Floor Patching Allowance	1.00 allw	\$85,000.00 /allw	\$85,000
Floor Prep / Leveling Allowance	1.00 allw	\$20,000.00 /allw	\$20,000
C2032.2 TILE FLOORING		\$1.45 / SF	\$553,592
CMT-1 - Ceramic Floor Tile - Mosaic	1,687 sf	\$24.00 /sf	\$40,488
CMT-2 - Ceramic Floor Tile - Mosaic	328 sf	\$24.00 /sf	\$7,872
CMT-3 - Ceramic Floor Tile - Mosaic	309 sf	\$24.00 /sf	\$7,416
CMT-4 - Ceramic Floor Tile - Mosaic	895 sf	\$24.00 /sf	\$21,480
CMT-5 - Ceramic Floor Tile - Mosaic	499 sf	\$24.00 /sf	\$11,976
CMT-7 - Ceramic Floor Tile - Mosaic	416 sf	\$24.00 /sf	\$9,984
CMT-8 - Ceramic Floor Tile - Mosaic	464 sf	\$24.00 /sf	\$11,136
Porcelain Tile Floor	15,830 sf	\$28.00 /sf	\$443,240
C2032.4 WOOD FLOORING		\$0.63 / SF	\$240,240
Wood Flooring - Premium for Markings on Athletic Wood Floor	10,010 sf	\$2.00 /sf	\$20,020
Athletic Sports Wood Flooring - Gym	10,010 sf	\$22.00 /sf	\$220,220
C2032.6 CARPETING		\$0.38 / SF	\$144,589
Carpet - 1	5,768 sf	\$6.50 /sf	\$37,492
Carpet - 2	8,090 sf	\$6.50 /sf	\$52,585
Carpet - Walk Off Carpet	2,428 sf	\$12.00 /sf	\$29,136
Resilient Carpet Multiple Design Combinations	890 sf	\$10.00 /sf	\$8,900
Resilient Carpet RC-1	2,221 sf	\$6.00 /sf	\$13,326
Resilient Carpet RC-2	525 sf	\$6.00 /sf	\$3,150
C2032.8 WALL BASE FINISHES		\$0.52 / SF	\$199,768
Ceramic Tile Base	2,034 lf	\$19.00 /lf	\$38,646
Epoxy Base	106 lf	\$14.00 /lf	\$1,484
Rubber Base	38,410 lf	\$3.00 /lf	\$115,230
Decorative Fabric Metal Panel - Interior	493 sf	\$90.00 /sf	\$44,408
Flat Lock Metal Tiles - Interior - PER VE A04 - CHANGE TO TILE (1,366 SQFT)	0.00 sf		\$0
C2033 SPECIALTY FLOORING		\$0.12 / SF	\$46,350
Foot Grille Carpet	927 sf	\$50.00 /sf	\$46,350
C2035 RESILIENT FLOORING		\$5.00 / SF	\$1,901,513
ASF - Rubber Athletic Sports Flooring	2,589 sf	\$20.00 /sf	\$51,780
Linoleum LIN1	64,243 sf	\$8.40 /sf	\$539,641
Linoleum LIN11	14 sf	\$8.50 /sf	\$119

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Linoleum LIN13	14 sf	\$8.50 /sf	\$119
Linoleum LIN14	133 sf	\$8.50 /sf	\$1,131
Linoleum LIN2	374 sf	\$8.40 /sf	\$3,142
Linoleum LIN3	279 sf	\$8.50 /sf	\$2,372
Linoleum LIN4	16,062 sf	\$8.50 /sf	\$136,527
Linoleum LIN5	7.00 sf	\$8.50 /sf	\$60
Linoleum LIN6	107 sf	\$8.50 /sf	\$910
Linoleum LIN7	13 sf	\$8.50 /sf	\$111
Linoleum Multiple Design Combinations	43,589 sf	\$10.00 /sf	\$435,890
Sheet Vinyl - Multipurpose	10,028 sf	\$13.00 /sf	\$130,364
Sheet Vinyl - Slip Resistant	619 sf	\$12.00 /sf	\$7,428
Luxury Viyl Tile LVT	2,354 sf	\$6.50 /sf	\$15,301
Sheet Vinyl Flooring - SV1	1,258 sf	\$10.75 /sf	\$13,524
Sheet Vinyl Flooring Multiple Design Combinations	9,999 sf	\$15.00 /sf	\$149,985
Rubber Flooring at Stair Treads and Risers - RR - INCLUDED ABOVE	0.00 sf		\$0
Rubber Stair Treads & Risers	8,637 sf	\$28.00 /sf	\$241,836
Rubber Tile Flooring - RT	83 sf	\$15.00 /sf	\$1,245
Epoxy Flooring EF-1	10,061 sf	\$16.90 /sf	\$170,031
C2036.2 TERRAZZO FLOORING		\$0.07 / SF	\$27,020
Precast Terrazzo risers & treads	386 sf	\$70.00 /sf	\$27,020
C2036.4 MASONRY & STONE FLOORING		\$0.29 / SF	\$109,238
Stone Thresholds at wet rooms	68 sf	\$100.00 /sf	\$6,800
Sealed Concrete	68,292 sf	\$1.50 /sf	\$102,438
C2037 FLUID-APPLIED FLOORING		\$0.14 / SF	\$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		\$12.39 / SF	\$4,714,562
C2051 PLASTER & GYPSUM BOARD FINISH		\$6.10 / SF	\$2,320,284
Ceiling - GWB Soffit - Interior	7,116 sf	\$18.00 /sf	\$128,092
GWB GWB Ceiling, Moisture Resistant GWB Ceiling	6,172 sf	\$25.00 /sf	\$154,300
GWB GWB Ceiling, Typical	45,983 sf	\$20.00 /sf	\$919,660
Ceiling - GWB Soffit - Interior @ Curved Media Center	426 sf	\$25.00 /sf	\$10,658
Ceiling - GWB SOUND ISOLATION	54,028 sf	\$20.50 /sf	\$1,107,574
Ceiling - GWB SOUND ISOLATION - VE A03 - Change Spec to open up more than Kinetics	0.00 incl		\$0
C2054 ACOUSTICAL CEILING TILES & PANELS		\$5.37 / SF	\$2,044,135
ACT-1 Acoustical Ceiling Tiles - 2 X 2 HIGH NRC ACOUSTICAL CEILING TILE	164,031 sf	\$7.25 /sf	\$1,189,225
ACT-2 Acoustical Ceiling Tiles - 2 X 2 WASHABLE ACOUSTICAL CEILING TILE FOR KITCHEN LOCATIONS	6,499 sf	\$8.50 /sf	\$55,242
ACT-4 Acoustical Ceiling Tiles - 2 X 6 HIGH NRC TEGULAR ACOUSTICAL CEILING TILE	4,701 sf	\$11.50 /sf	\$54,062
ACT-5	4,017 sf	\$12.00 /sf	\$48,204

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
ACT-3 Acoustical Ceiling Tiles - 2 X 2 HIGH NRC TEGULAR ACOUSTICAL CEILING TILE AT ADMIN AREAS	12,519 sf	\$6.75 /sf	\$84,503
Interior Ceiling Linear Metal Ceiling W/ Woodlook, 4" Wide Plank	10,523 sf	\$50.00 /sf	\$526,150
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	0.00 incl		\$0
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	0.00 incl		\$0
C2056 PAINTING & STAINING CEILINGS		\$0.78 / SF	\$296,115
Paint Painted Interior GWB - Moisture Resistant GWB Ceiling	6,172 sf	\$1.00 /sf	\$6,172
Paint Painted Interior GWB - Soffits - Latex	45,983 sf	\$1.00 /sf	\$45,983
Paint Painted Interior GWB - Typical Ceilings - Latex	7,116 sf	\$1.00 /sf	\$7,116
Paint Exposed Painted Structural Steel & Metal Deck	98,685 sf	\$2.40 /sf	\$236,844
C2059 CEILING FINISH SUPPLEMENTARY COMPONENTS		\$0.14 / SF	\$54,028
Paint Sound Barrier Painted GWB Ceiling - CEILING OCCURRING BETWEEN STEEL GIRDERS	54,028 sf	\$1.00 /sf	\$54,028
D10 CONVEYING	380,570 SF	\$2.59 / SF	\$985,000
D1010 ELEVATORS & LIFTS		\$2.59 / SF	\$985,000
D1010 ELEVATORS & LIFTS		\$2.40 / SF	\$915,000
Elevator #1, Passenger (Otis Gen2, 3,500 capacity)	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
Elevator Operator Time / Fees for other trades - work within shaft	1.00 ls	\$100,000.00 /ls	\$100,000
D1017 CAB FINISHES		\$0.18 / SF	\$70,000
Cab Finish Premium Allowance	2.00 ea	\$35,000.00 /ea	\$70,000
D20 PLUMBING	380,570 SF	\$22.13 / SF	\$8,421,659
D2000 PLUMBING EQUIPMENT		\$5.12 / SF	\$1,949,585
D2000 PLUMBING EQUIPMENT		\$5.12 / SF	\$1,949,585
Sub-Meters	1.00 ls	\$10,000.00 /ls	\$10,000
Circulating Pump	8.00 ea	\$3,000.00 /ea	\$24,000
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
TMV-1 thru 6 - Thermostatic Mixing Valve	6.00 ea	\$15,000.00 /ea	\$90,000
DWP-1 - Domestic Water Booster Pump	1.00 ea	\$60,000.00 /ea	\$60,000
Backflow Preventers	1.00 ls	\$55,000.00 /ls	\$55,000
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	\$5,000.00 /ls	\$5,000
Trap Primers & Associated Piping	148 ea	\$1,000.00 /ea	\$148,000
Floor Drain W/Trap	148 ea	\$955.00 /ea	\$141,340

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Trench Drains	195 lf	\$60.00 /lf	\$11,700
4" & 5" Backwater Valve	11 ea	\$800.00 /ea	\$8,800
Roof Drains	115 ea	\$1,367.94 /ea	\$157,313
Exterior Grease Interceptor	2.00 ea	\$41,711.68 /ea	\$83,423
GT-1&2 - Local Grease Interceptor 50 GPM	5.00 ea	\$2,927.92 /ea	\$14,640
Ceiling UTL Panels	17 ea	\$500.00 /ea	\$8,500
Elevator Sump Pumps	3.00 ea	\$5,010.77 /ea	\$15,032
Gas / Oil Interceptor - Shops	5.00 ea	\$15,000.00 /ea	\$75,000
AC-1 - Compressed Air System - Auto Collision / Auto Tech / Metal Fab	2.00 ea	\$48,321.36 /ea	\$96,643
AC-2 - Compressed Air System - Carpentry Shop	1.00 ea	\$31,821.36 /ea	\$31,821
AC-3 - Compressed Air System - Bio Tech Lab	1.00 ea	\$28,821.36 /ea	\$28,821
AC-4 - Compressed Air System - Robotics	1.00 ea	\$35,821.36 /ea	\$35,821
AC-5 - Compressed Air System - Dental	1.00 ea	\$36,821.36 /ea	\$36,821
Compressed Air Hose Reels	15 ea	\$800.00 /ea	\$12,000
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
Electric / Gas Fired Water Heaters - Serving Shops	5.00 ea	\$2,855.84 /ea	\$14,279
EWB-1 - Elec Water Heater - PVI Durawatt - 460L 200A	2.00 ea	\$66,069.80 /ea	\$132,140
EWB-2 - Elec Water Heater - PVI Durawatt - 270L 119A	2.00 ea	\$41,069.80 /ea	\$82,140
EWB-3 - Elec Water Heater - AO Smith DSE-100	1.00 ea	\$16,855.84 /ea	\$16,856
EWB-4 - Elec Water Heater - PVI Durawatt - 550	2.00 ea	\$68,069.80 /ea	\$136,140
EWB-5,6, & 7 - Elec Water Heater - AO Smith DES-10	3.00 ea	\$5,427.92 /ea	\$16,284
EWB-8 - Elec Water Heater - AO Smith DSE-120	1.00 ea	\$14,427.92 /ea	\$14,428
Argon / Oxygen / Acetylene Manifolds	3.00 ea	\$8,000.00 /ea	\$24,000
Natural Gas Control at Kitchen - Kitchen	4.00 ea	\$5,000.00 /ea	\$20,000
Natural Gas Shut off Valve & Cabinet - HVAC Tech & Paint Booth	2.00 ea	\$5,000.00 /ea	\$10,000
pH Neutralization System	1.00 ea	\$50,000.00 /ea	\$50,000
ET-1 thru ET-8 - Expansion Tanks	8.00 ea	\$1,500.00 /ea	\$12,000
D2010 DOMESTIC WATER DISTRIBUTION		\$4.44 / SF	\$1,690,000
D2012 DOMESTIC WATER PIPING		\$4.44 / SF	\$1,690,000
Domestic Hot & Cold Water Piping - 2" & Less	20,000 lf	\$45.00 /lf	\$900,000
Domestic Water Piping - 3"	2,700 lf	\$90.00 /lf	\$243,000
Domestic Water Piping - 4"	1,000 lf	\$125.00 /lf	\$125,000
Domestic Water Piping - 6"	300 lf	\$220.00 /lf	\$66,000
Insulation	24,000 lf	\$12.00 /lf	\$288,000
Valves & Accessories	1.00 ls	\$68,000.00 /ls	\$68,000
D2020 SANITARY DRAINAGE		\$5.14 / SF	\$1,957,100
D2025 SANITARY DRAIN PIPING - UG		\$1.47 / SF	\$559,100
Sanitary Waste & Vent Piping - 2"- 3"	1,735 lf	\$60.00 /lf	\$104,100
Sanitary Waste & Vent Piping - 4"- 6"	4,200 lf	\$85.00 /lf	\$357,000
Kitchen Waste & Vent Piping - 4"	1,400 lf	\$70.00 /lf	\$98,000
D2026 SANITARY DRAIN PIPING - AG		\$3.23 / SF	\$1,230,000
Sanitary Waste & Vent Piping - 2" - 4"	10,000 lf	\$60.00 /lf	\$600,000

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Sanitary Waste & Vent Piping - 4" - 6"	7,000 lf	\$90.00 /lf	\$630,000
D2029 LABORATORY / INDUSTRIAL DRAIN PIPING - UG		\$0.44 / SF	\$168,000
Acid Waste & Vent Piping - 2" - 4"	1,600 lf	\$105.00 /lf	\$168,000
D2040 PLUMBING FIXTURES		\$2.07 / SF	\$789,124
D2043 PLUMBING FIXTURES		\$2.07 / SF	\$789,124
P-1 & P-1A - Water Closet - Wall Hung	90 ea	\$2,815.17 /ea	\$253,365
P-10 & P-11 - Hand & Utility Sink	5.00 ea	\$1,424.20 /ea	\$7,121
P-2 & P-2A - Urinal	15 ea	\$2,008.12 /ea	\$30,122
P-3A - Lavatory - Wall Hung	57 ea	\$1,794.49 /ea	\$102,286
PX-4 - Science Classroom Sinks	46 ea	\$881.03 /ea	\$40,527
PX-5 - Lab Sinks	31 ea	\$1,369.02 /ea	\$42,439
PX-1 Sink - Casework - Installation & Hook-Up	49 ea	\$745.24 /ea	\$36,517
PX-2 - Sink w/Eyewash - Casework - Installation & Hook-Up	6.00 ea	\$948.38 /ea	\$5,690
PX-3 - Sink - Cosmetology w/Hair Trap	15 ea	\$1,463.96 /ea	\$21,959
PX-6 - Dental Station	16 ea	\$881.03 /ea	\$14,096
P-4 - Mop Sink	11 ea	\$2,069.84 /ea	\$22,768
Cosmetology - Pedicure Station - Hook-ups	0.00 ea		\$0
P-3C - Solid Surface Sink, 2 Station - Bradley	7.00 ea	\$4,272.60 /ea	\$29,908
P-5 & P-5A - Drinking Fountain - Bi-Level Electric	17 ea	\$4,272.60 /ea	\$72,634
Washing Machine Box	1.00 ea	\$242.11 /ea	\$242
P-6A - Shower - HC (no enclosure)	4.00 ea	\$839.25 /ea	\$3,357
P-6 - Shower - (Trim & Drain)	7.00 ea	\$1,993.88 /ea	\$13,957
P-7 - Emergenc Eyewash	8.00 ea	\$522.21 /ea	\$4,178
P-8 & 8A - Emergency Shower/Eyewash	14 ea	\$2,658.50 /ea	\$37,219
P-9 - Emergency Eyewash	9.00 ea	\$0.00 /ea	\$0
P-3B - Wash Fountain - Circular - Bradley	1.00 ea	\$6,624.22 /ea	\$6,624
P-3B - Wash Fountain - Semi-Circular - Bradley	6.00 ea	\$5,674.75 /ea	\$34,048
Hose Bibb	25 ea	\$180.40 /ea	\$4,510
Roof Hydrant	4.00 ea	\$308.58 /ea	\$1,234
Wall Hydrant	14 ea	\$308.58 /ea	\$4,320
D2050 GENERAL SERVICE COMPRESSED - AIR		\$0.93 / SF	\$355,350
D2051 COMPRESSED-AIR SYSTEMS		\$0.93 / SF	\$355,350
Valves & Accessories	1.00 ls	\$46,350.00 /ls	\$46,350
2" & Less CA Piping - Copper	5,700 lf	\$50.00 /lf	\$285,000
CA Piping Intake - Copper	300 lf	\$80.00 /lf	\$24,000
D2070 RAIN WATER DRAINAGE		\$2.76 / SF	\$1,050,900
D2071 STORM DRAIN PIPING - UG		\$0.51 / SF	\$194,100
Open End Drain	20 ea	\$1,000.00 /ea	\$20,000
Storm Piping - 10"	300 lf	\$165.00 /lf	\$49,500
Storm Piping - 4"	220 lf	\$70.00 /lf	\$15,400
Storm Piping - 6"	455 lf	\$90.00 /lf	\$40,950
Storm Piping - 8"	525 lf	\$130.00 /lf	\$68,250
D2072 STORM DRAIN PIPING - AG		\$2.25 / SF	\$856,800
Insulation - Storm	5,745 lf	\$20.00 /lf	\$114,900

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Heat Trace	1.00 ls	\$5,000.00 /ls	\$5,000
Storm Piping - 4"	3,600 lf	\$75.00 /lf	\$270,000
Storm Piping - 5" & 6"	2,685 lf	\$140.00 /lf	\$375,900
Storm Piping - 8"	700 lf	\$130.00 /lf	\$91,000
D2080 OTHER PLUMBING SYSTEMS		\$0.20 / SF	\$75,400
D2085 MEDICAL GAS PIPING		\$0.11 / SF	\$40,400
Vacuum - Exhaust	100 lf	\$80.00 /lf	\$8,000
Vacuum Piping - 1" & Less	735 lf	\$40.00 /lf	\$29,400
Valves & Accessories	1.00 ls	\$3,000.00 /ls	\$3,000
D2088 PROCESS / INDUSTRIAL GAS PIPING		\$0.09 / SF	\$35,000
Argon Piping - 1" & Less	800 lf	\$40.00 /lf	\$32,000
Valves & Accessories	1.00 ls	\$3,000.00 /ls	\$3,000
D2090 MISC. PLUMBING SYSTEMS		\$1.06 / SF	\$405,000
D2090 PLUMBING MISC ITEMS		\$1.06 / SF	\$405,000
Admin & Expenses	1.00 ls	\$180,000.00 /ls	\$180,000
Coordination / BIM	1.00 ls	\$100,000.00 /ls	\$100,000
Rigging / Matl Handling	1.00 ls	\$75,000.00 /ls	\$75,000
Sleeving / Firestopping / Coring	1.00 ls	\$50,000.00 /ls	\$50,000
D3010 FACILITY FUEL SYSTEMS		\$0.39 / SF	\$149,200
D2080 NATURAL GAS PIPING		\$0.39 / SF	\$149,200
Natural Gas Piping - 2" & Less	175 lf	\$60.00 /lf	\$10,500
Natural Gas Piping - 3"	85 lf	\$85.00 /lf	\$7,225
Natural Gas Piping - 4"	250 lf	\$95.00 /lf	\$23,750
Natural Gas Piping - 5" & 6"	450 lf	\$165.00 /lf	\$74,250
Natural Gas Piping - 8"	95 lf	\$205.00 /lf	\$19,475
Valves & Accessories	1.00 ls	\$14,000.00 /ls	\$14,000
D30 HEATING, VENTILATION, & AIR CONDITIONING (HVAC)	380,570 SF	\$81.17 / SF	\$30,891,850
D3040 HVAC MAJOR EQUIPMENT		\$30.39 / SF	\$11,567,384
D3040 HVAC MAJOR EQUIPMENT		\$30.23 / SF	\$11,505,028
AHU 1-10, HRU 1-5, RTU 1-2, MUA-1&2	1.00 ls	\$6,300,000.00 /ls	\$6,300,000
AHU 1-10, Labor & Conns	10 ea	\$9,276.00 /ea	\$92,760
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 (30 Qty)	1.00 ls	\$160,492.00 /ls	\$160,492
Vehicle Exhaust fans and reels	1.00 ls	\$69,076.05 /ls	\$69,076
Dehumidifiers	35 ea	\$13,952.00 /ea	\$488,320
Destrat Fans	2.00 ea	\$8,952.00 /ea	\$17,904
ERU 1-4 & ERU-7	5.00 ea	\$20,436.00 /ea	\$102,180
Dust Collector - Owner To Relocate Existing	0.00 allw		\$0
Dust Collector -Rigging	1.00 ls	\$15,000.00 /ls	\$15,000
Split Systems Labor & Connect	52 ea	\$4,872.00 /ea	\$253,344

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
VRF/VCU/Splits Equipment	1.00 ls	\$3,100,000.00 /ls	\$3,100,000
VRF Selector Boxes Install	44 ea	\$976.00 /ea	\$42,944
VRF -CU Install	33 ea	\$2,436.00 /ea	\$80,388
VRF Fan Coil Units Install	263 ea	\$1,952.00 /ea	\$513,376
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 / SF	\$62,356
Unit Heater - Elec	30 ea	\$1,434.00 /ea	\$43,020
Cabinet Unit Heater (ceiling)	7.00 ea	\$2,762.30 /ea	\$19,336
D3050 FACILITY HVAC DISTRIBUTION SYSTEMS		\$28.02 / SF	\$10,663,893
D3053 HVAC AIR DISTRIBUTION		\$28.02 / SF	\$10,663,893
Duct Coordination & Material Handling	1.00 ls	\$270,000.00 /ls	\$270,000
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"	175,000 sf	\$4.60 /sf	\$804,801
Ductwork - Galvanized	460,000 lb	\$15.97 /lb	\$7,344,360
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	15 ea	\$7,500.00 /ea	\$112,500
Duct Dampers & Accessories	1.00 ls	\$735,000.00 /ls	\$735,000
VAV OA & Exhaust w/o RHC	102 ea	\$998.41 /ea	\$101,838
VAV Box w/ERHC	119 ea	\$1,469.04 /ea	\$174,815
VAV FPTU w/ ERHC	9.00 ea	\$3,139.95 /ea	\$28,260
Duct Collection Duct - Fabricated	0.00 lf		\$0
Plenums	3,400 sf	\$69.00 /sf	\$234,600
Register, Diffusers, & Grilles	785 ea	\$216.00 /ea	\$169,560
Register, Diffusers, & Grilles - LD	143 ea	\$442.00 /ea	\$63,206
Sound Attenuators	1.00 ls	\$113,232.00 /ls	\$113,232
D3060 CONTROLS & INSTRUMENTATION		\$6.09 / SF	\$2,318,278
D3061 AUTOMATIC TEMPERATURE CONTROLS		\$6.09 / SF	\$2,318,278
ATC - BMS	380,570 sf	\$5.75 /sf	\$2,188,278
Dashboard Allowance	1.00 allw	\$50,000.00 /allw	\$50,000
Dehumidifer Controls	1.00 allw	\$55,000.00 /allw	\$55,000
Lighting Control	1.00 allw	\$25,000.00 /allw	\$25,000
D3070 SPECIAL PURPOSE HVAC SYSTEMS		\$11.83 / SF	\$4,502,412
D3075 REFRIGERANT PIPING		\$10.10 / SF	\$3,845,200
Refrigeration Piping	19,000 ea	\$38.00 /ea	\$722,000
VRF Piping	56,500 lf	\$44.00 /lf	\$2,486,000
Roof Pipe Jacketing	3,540 lf	\$15.00 /lf	\$53,100
RTU/AHU/HRU Condensers-2 Pipe Circuit	3,540 lf	\$165.00 /lf	\$584,100
D3076 CONDENSATE DRAIN PIPING		\$1.73 / SF	\$657,212

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Condensate Drain Piping & Insulation	12,500 lf	\$51.75 /lf	\$646,875
Condensate Drain Pumps	25 ea	\$413.47 /ea	\$10,337
D3080 SYSTEMS TESTING & BALANCING		\$0.65 / SF	\$247,371
D3080 AIR & WATER BALANCE		\$0.65 / SF	\$247,371
Testing & Balancing	380,570 sf	\$0.65 /sf	\$247,371
D3090 OTHER HVAC SYSTEMS & EQUIP		\$4.18 / SF	\$1,592,513
D3091 HVAC MISC ITEMS		\$4.18 / SF	\$1,592,513
Mechanical duct cleaning	380,570 sf	\$0.90 /sf	\$342,513
Rigging and Hoisting	1.00 ls	\$225,000.00 /ls	\$225,000
Project Expenses and Commissioning	1.00 ls	\$775,000.00 /ls	\$775,000
Project Management	1.00 ls	\$250,000.00 /ls	\$250,000
D40 FIRE PROTECTION	380,570 SF	\$9.92 / SF	\$3,775,296
D4010 SPRINKLERS		\$7.46 / SF	\$2,838,158
D4011 WET SPRINKLER SYSTEM		\$7.46 / SF	\$2,838,158
Sprinkler Distribution Piping - 1"	29,915 lf	\$35.00 /lf	\$1,047,025
Sprinkler Distribution Piping - 2"	6,355 lf	\$45.00 /lf	\$285,975
Sprinkler Distribution Piping - 3"	2,400 lf	\$53.00 /lf	\$127,200
Sprinkler Distribution Piping - 4"	6,665 lf	\$80.00 /lf	\$533,200
Sprinkler Piping Qty and Unit Rate Adj - Per Reconcile	1.00 ls	\$350,000.00 /ls	\$350,000
Head - Pendant, Concealed	2,235 ea	\$147.06 /ea	\$328,679
Head - Upright	1,530 ea	\$108.55 /ea	\$166,078
D4020 STANDPIPES		\$1.43 / SF	\$545,739
D4022 STANDPIPE & FIRE MAINS		\$1.43 / SF	\$545,739
Standpipes & Fire Mains - 6"	3,000 lf	\$87.00 /lf	\$261,000
Standpipes & Fire Mains - 8"	235 lf	\$195.00 /lf	\$45,825
Double Check Valve 8"	1.00 ea	\$16,582.59 /ea	\$16,583
Hose Valve, 2-1/2"	28 ea	\$475.12 /ea	\$13,303
Zone Control Valve Assembly	28 ea	\$6,125.60 /ea	\$171,517
Wet Check Valve Assembly - 6"	3.00 ea	\$4,850.72 /ea	\$14,552
Wet Check Valve Assembly - 8"	1.00 ea	\$4,850.72 /ea	\$4,851
Fire Department Connection	1.00 ea	\$1,430.36 /ea	\$1,430
Fire Pump Test Header	1.00 ea	\$1,675.36 /ea	\$1,675
Roof Manifold	8.00 ea	\$1,875.36 /ea	\$15,003
D4030 FIRE PROTECTION SPECIALTIES		\$0.33 / SF	\$125,000
D4031 FIRE PROTECTION EQUIPMENT		\$0.33 / SF	\$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		\$0.70 / SF	\$266,399
D4096 FIRE PROTECTION MISC ITEMS		\$0.70 / SF	\$266,399
Coordination & Expenses	380,570 sf	\$0.70 /sf	\$266,399
D50 ELECTRICAL	380,570 SF	\$42.33 / SF	\$16,110,997

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$24.28 / SF	\$9,239,771
D5023 LARGE POWER & DISTRIBUTION		\$4.19 / SF	\$1,595,815
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	13 ea	\$3,608.00 /ea	\$46,904
30 KVA NEMA 1 Transformer composite unit	20 ea	\$4,998.21 /ea	\$99,964
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
125 AMP 120/208 panel board surface mounted composite	4.00 ea	\$3,326.64 /ea	\$13,307
150 AMP 120/208 panel board surface mounted composite	4.00 ea	\$3,566.84 /ea	\$14,267
225 AMP 120/208 Panel board surface mounted composite unit	1.00 ea	\$4,107.12 /ea	\$4,107
400 AMP 120/208 Panel board surface mounted composite unit	25 ea	\$6,062.34 /ea	\$151,558
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
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	2.00 ea	\$12,411.87 /ea	\$24,824
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 Location for Cicurit meter cand Cat 6 Data Link recon 11-28-2022 Remove all and left generator and primary metering	-1.00 ls	\$340,000.00 /ls	(\$340,000)
Metering Allowance reduction based on Metering for up to 16 circuits for 16 Meter locatons	1.00 ls	\$400,000.01 /ls	\$400,000
Utility Meter Sockets composite unit	3.00 ea	\$510.69 /ea	\$1,532
D5024 LARGE POWER FEEDER CONDUIT		\$10.53 / SF	\$4,009,148
#136 15 AMP EMT Composite feeders copper - Large Power	775 lf	\$15.84 /lf	\$12,279
#137 15 AMP EMT Composite feeders copper - Large Power	770 lf	\$15.84 /lf	\$12,200
#138 15 AMP EMT Composite feeders copper - Large Power	761 lf	\$15.84 /lf	\$12,057
#144 20 AMP EMT Composite feeders copper - Large Power	796 lf	\$16.37 /lf	\$13,030
#148 35 AMP EMT Composite feeders copper - Large Power	727 lf	\$19.66 /lf	\$14,293
#150 25 AMP EMT Composite feeders copper - Large Power	714 lf	\$16.82 /lf	\$12,008
#151 25 AMP EMT Composite feeders copper - Large Power	712 lf	\$16.82 /lf	\$11,975
#152 30 AMP EMT Composite feeders copper - Large Power	736 lf	\$17.87 /lf	\$13,156
#153 35 AMP EMT Composite feeders copper - Large Power	817 lf	\$19.66 /lf	\$16,062
#155 25 AMP EMT Composite feeders copper - Large Power	676 lf	\$16.82 /lf	\$11,369

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#156 25 AMP EMT Composite feeders copper - Large Power	683 lf	\$16.82 /lf	\$11,487
#159 35 AMP EMT Composite feeders copper - Large Power	666 lf	\$19.66 /lf	\$13,094
#160 35 AMP EMT Composite feeders copper - Large Power	672 lf	\$19.66 /lf	\$13,212
#167 20 AMP EMT Composite feeders copper - Large Power	820 lf	\$16.37 /lf	\$13,423
#175.1 35 AMP EMT Composite feeders copper - Large Power	822 lf	\$19.66 /lf	\$16,161
#176.1 35 AMP EMT Composite feeders copper - Large Power	838 lf	\$19.66 /lf	\$16,475
#177.1 35 AMP EMT Composite feeders copper - Large Power	811 lf	\$19.66 /lf	\$15,944
#231 25 AMP EMT Composite feeders copper - Large Power	313 lf	\$16.82 /lf	\$5,264
#236 15 AMP EMT Composite feeders copper - Large Power	766 lf	\$15.94 /lf	\$12,206
#238 35 AMP EMT Composite feeders copper - Large Power	382 lf	\$19.66 /lf	\$7,510
#250 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#254 25 AMP EMT Composite feeders copper - Large Power	342 lf	\$16.82 /lf	\$5,752
#255 25 AMP EMT Composite feeders copper - Large Power	345 lf	\$16.82 /lf	\$5,802
#257 25 AMP EMT Composite feeders copper - Large Power	316 lf	\$16.82 /lf	\$5,315
#258 20 AMP EMT Composite feeders copper - Large Power	367 lf	\$16.05 /lf	\$5,890
#260 35 AMP EMT Composite feeders copper - Large Power	319 lf	\$19.66 /lf	\$6,272
#269.1 25 AMP EMT Composite feeders copper - Large Power	353 lf	\$16.82 /lf	\$5,937
#270.1 25 AMP EMT Composite feeders copper - Large Power	353 lf	\$16.82 /lf	\$5,937
#271.1 25 AMP EMT Composite feeders copper - Large Power	343 lf	\$16.82 /lf	\$5,769
#276 25 AMP EMT Composite feeders copper - Large Power	376 lf	\$16.82 /lf	\$6,324
#277.1 25 AMP EMT Composite feeders copper - Large Power	345 lf	\$16.82 /lf	\$5,802
#278.1 25 AMP EMT Composite feeders copper - Large Power	332 lf	\$16.82 /lf	\$5,584
#279.1 25 AMP EMT Composite feeders copper - Large Power	330 lf	\$16.82 /lf	\$5,550
#283.1 25 AMP EMT Composite feeders copper - Large Power	355 lf	\$16.82 /lf	\$5,971
#284.1 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#285.1 25 AMP EMT Composite feeders copper - Large Power	346 lf	\$16.82 /lf	\$5,819
#294 15 AMP EMT Composite feeders copper - Large Power	243 lf	\$15.84 /lf	\$3,850
#296 15 AMP EMT Composite feeders copper - Large Power	235 lf	\$15.84 /lf	\$3,723
#297 15 AMP EMT Composite feeders copper - Large Power	250 lf	\$15.84 /lf	\$3,961
#298 30 AMP EMT Composite feeders copper - Large Power	267 lf	\$17.87 /lf	\$4,773
#327 25 AMP EMT Composite feeders copper - Large Power	220 lf	\$16.82 /lf	\$3,700
#347 15 AMP EMT Composite feeders copper - Large Power	775 lf	\$15.84 /lf	\$12,279
#348 15 AMP EMT Composite feeders copper - Large Power	769 lf	\$15.84 /lf	\$12,184
#349 30 AMP EMT Composite feeders copper - Large Power	740 lf	\$17.87 /lf	\$13,227
#357 25 AMP EMT Composite feeders copper - Large Power	283 lf	\$16.82 /lf	\$4,760
#358 20 AMP EMT Composite feeders copper - Large Power	305 lf	\$16.44 /lf	\$5,015
#359 20 AMP EMT Composite feeders copper - Large Power	298 lf	\$16.44 /lf	\$4,900
#361 25 AMP EMT Composite feeders copper - Large Power	298 lf	\$16.82 /lf	\$5,012
#363 15 AMP EMT Composite feeders copper - Large Power	321 lf	\$15.84 /lf	\$5,086
#364 15 AMP EMT Composite feeders copper - Large Power	335 lf	\$15.84 /lf	\$5,308
#365 25 AMP EMT Composite feeders copper - Large Power	323 lf	\$16.82 /lf	\$5,432
#367 25 AMP EMT Composite feeders copper - Large Power	335 lf	\$16.82 /lf	\$5,634
#369 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#371 25 AMP EMT Composite feeders copper - Large Power	352 lf	\$16.82 /lf	\$5,920
#125 50 AMP EMT Composite feeders copper - Large Power	512 lf	\$22.55 /lf	\$11,548

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#130 50 AMP EMT Composite feeders copper - Large Power	476 lf	\$22.55 /lf	\$10,736
#134 50 AMP EMT Composite feeders copper - Large Power	294 lf	\$22.55 /lf	\$6,631
#145 50 AMP EMT Composite feeders copper - Large Power	720 lf	\$22.55 /lf	\$16,240
#146 50 AMP EMT Composite feeders copper - Large Power	716 lf	\$22.55 /lf	\$16,149
#147 50 AMP EMT Composite feeders copper - Large Power	735 lf	\$22.55 /lf	\$16,578
#149 80 AMP EMT Composite feeders copper - Large Power	723 lf	\$27.17 /lf	\$19,645
#154 50 AMP EMT Composite feeders copper - Large Power	808 lf	\$22.55 /lf	\$18,224
#163 50 AMP EMT Composite feeders copper - Large Power	673 lf	\$22.55 /lf	\$15,179
#164 50 AMP EMT Composite feeders copper - Large Power	674 lf	\$22.55 /lf	\$15,202
#171 50 AMP EMT Composite feeders copper - Large Power	628 lf	\$22.55 /lf	\$14,164
#172 50 AMP EMT Composite feeders copper - Large Power	626 lf	\$22.55 /lf	\$14,119
#173 50 AMP EMT Composite feeders copper - Large Power	707 lf	\$22.55 /lf	\$15,946
#174 50 AMP EMT Composite feeders copper - Large Power	696 lf	\$22.55 /lf	\$15,698
#175.2 50 AMP EMT Composite feeders copper - Large Power	812 lf	\$22.55 /lf	\$18,315
#176.2 50 AMP EMT Composite feeders copper - Large Power	831 lf	\$22.55 /lf	\$18,743
#177.2 50 AMP EMT Composite feeders copper - Large Power	827 lf	\$22.55 /lf	\$18,653
#187 50 AMP EMT Composite feeders copper - Large Power	407 lf	\$22.55 /lf	\$9,180
#232.1 25 AMP EMT Composite feeders copper - Large Power	347 lf	\$16.82 /lf	\$5,836
#232.2 35 AMP EMT Composite feeders copper - Large Power	347 lf	\$19.66 /lf	\$6,822
#233.1 25 AMP EMT Composite feeders copper - Large Power	341 lf	\$16.82 /lf	\$5,735
#233.2 35 AMP EMT Composite feeders copper - Large Power	341 lf	\$19.66 /lf	\$6,704
#234.1 25 AMP EMT Composite feeders copper - Large Power	341 lf	\$16.82 /lf	\$5,735
#234.2 35 AMP EMT Composite feeders copper - Large Power	341 lf	\$19.66 /lf	\$6,704
#235.1 25 AMP EMT Composite feeders copper - Large Power	347 lf	\$16.82 /lf	\$5,836
#235.2 35 AMP EMT Composite feeders copper - Large Power	347 lf	\$19.66 /lf	\$6,822
#243 50 AMP EMT Composite feeders copper - Large Power	332 lf	\$22.55 /lf	\$7,488
#244 50 AMP EMT Composite feeders copper - Large Power	344 lf	\$22.55 /lf	\$7,759
#245 35 AMP EMT Composite feeders copper - Large Power	352 lf	\$19.66 /lf	\$6,920
#246 50 AMP EMT Composite feeders copper - Large Power	337 lf	\$22.55 /lf	\$7,601
#247 35 AMP EMT Composite feeders copper - Large Power	340 lf	\$19.66 /lf	\$6,684
#248 50 AMP EMT Composite feeders copper - Large Power	330 lf	\$22.55 /lf	\$7,443
#249 35 AMP EMT Composite feeders copper - Large Power	336 lf	\$19.66 /lf	\$6,606
#251 50 AMP EMT Composite feeders copper - Large Power	320 lf	\$22.55 /lf	\$7,218
#252 35 AMP EMT Composite feeders copper - Large Power	327 lf	\$19.66 /lf	\$6,429
#256 50 AMP EMT Composite feeders copper - Large Power	323 lf	\$22.55 /lf	\$7,285
#259 35 AMP EMT Composite feeders copper - Large Power	326 lf	\$19.66 /lf	\$6,409
#263 35 AMP EMT Composite feeders copper - Large Power	330 lf	\$19.66 /lf	\$6,488
#264 35 AMP EMT Composite feeders copper - Large Power	328 lf	\$19.66 /lf	\$6,449
#269.2 50 AMP EMT Composite feeders copper - Large Power	353 lf	\$22.55 /lf	\$7,962
#270.2 50 AMP EMT Composite feeders copper - Large Power	324 lf	\$22.55 /lf	\$7,308
#271.2 50 AMP EMT Composite feeders copper - Large Power	343 lf	\$22.55 /lf	\$7,736
#275 50 AMP EMT Composite feeders copper - Large Power	368 lf	\$22.55 /lf	\$8,300
#277.2 50 AMP EMT Composite feeders copper - Large Power	352 lf	\$22.55 /lf	\$7,939
#278.2 50 AMP EMT Composite feeders copper - Large Power	339 lf	\$22.55 /lf	\$7,646
#279.2 50 AMP EMT Composite feeders copper - Large Power	337 lf	\$22.55 /lf	\$7,601

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#283.2 50 AMP EMT Composite feeders copper - Large Power	348 lf	\$22.55 /lf	\$7,849
#284.2 50 AMP EMT Composite feeders copper - Large Power	333 lf	\$22.55 /lf	\$7,511
#285.2 50 AMP EMT Composite feeders copper - Large Power	353 lf	\$22.55 /lf	\$7,962
#317 50 AMP EMT Composite feeders copper - Large Power	209 lf	\$22.55 /lf	\$4,714
#318 50 AMP EMT Composite feeders copper - Large Power	228 lf	\$22.55 /lf	\$5,143
#325 35 AMP EMT Composite feeders copper - Large Power	216 lf	\$19.66 /lf	\$4,247
#326 50 AMP EMT Composite feeders copper - Large Power	228 lf	\$22.55 /lf	\$5,143
#346 50 AMP EMT Composite feeders copper - Large Power	626 lf	\$22.55 /lf	\$14,119
#356 35 AMP EMT Composite feeders copper - Large Power	276 lf	\$19.66 /lf	\$5,426
#360 40 AMP EMT Composite feeders copper - Large Power	228 lf	\$20.88 /lf	\$4,761
#366 35 AMP EMT Composite feeders copper - Large Power	329 lf	\$19.66 /lf	\$6,468
#368 50 AMP EMT Composite feeders copper - Large Power	327 lf	\$22.55 /lf	\$7,375
#372 50 AMP EMT Composite feeders copper - Large Power	359 lf	\$22.55 /lf	\$8,097
#044 50 AMP MI Composite feeders copper - Large Power	34 lf	\$86.00 /lf	\$2,924
#047 50 AMP MI Composite feeders copper - Large Power	319 lf	\$86.00 /lf	\$27,433
#050 50 AMP MI Composite feeders copper - Large Power	457 lf	\$86.00 /lf	\$39,301
#053 50 AMP MI Composite feeders copper - Large Power	254 lf	\$86.00 /lf	\$21,844
#056 50 AMP MI Composite feeders copper - Large Power	451 lf	\$86.00 /lf	\$38,785
#059 50 AMP MI Composite feeders copper - Large Power	285 lf	\$86.00 /lf	\$24,509
#062 50 AMP MI Composite feeders copper - Large Power	476 lf	\$86.00 /lf	\$40,935
#065 50 AMP MI Composite feeders copper - Large Power	239 lf	\$86.00 /lf	\$20,554
#234 60 AMP EMT Composite feeders copper - Large Power	356 lf	\$26.40 /lf	\$9,400
#235 60 AMP EMT Composite feeders copper - Large Power	366 lf	\$26.40 /lf	\$9,664
#303 35 AMP EMT Composite feeders copper - Large Power	234 lf	\$19.66 /lf	\$4,600
#370 50 AMP EMT Composite feeders copper - Large Power	347 lf	\$22.55 /lf	\$7,827
#036 100 AMP MI Composite feeders Copper - Large Power	32 lf	\$100.59 /lf	\$3,219
#037 100 AMP MI Composite feeders Copper - Large Power	321 lf	\$104.26 /lf	\$33,467
#038 100 AMP MI Composite feeders Copper - Large Power	467 lf	\$104.26 /lf	\$48,689
#039 100 AMP MI Composite feeders Copper - Large Power	259 lf	\$104.26 /lf	\$27,003
#040 100 AMP MI Composite feeders Copper - Large Power	455 lf	\$104.26 /lf	\$47,438
#041 100 AMP MI Composite feeders Copper - Large Power	271 lf	\$104.26 /lf	\$28,254
#042 100 AMP MI Composite feeders Copper - Large Power	475 lf	\$104.26 /lf	\$49,523
#043 100 AMP MI Composite feeders Copper - Large Power	239 lf	\$104.26 /lf	\$24,918
#183 110 AMP EMT Composite feeders Copper - Large Power	389 lf	\$35.71 /lf	\$13,893
#226 100 AMP EMT Composite feeders Copper - Large Power	428 lf	\$33.52 /lf	\$14,348
#227 110 AMP EMT Composite feeders Copper - Large Power	466 lf	\$35.71 /lf	\$16,643
#230 80 AMP EMT Composite feeders Copper - Large Power	255 lf	\$27.17 /lf	\$6,929
#328 225 AMP EMT Composite feeders Copper - Large Power	211 lf	\$88.01 /lf	\$18,571
#329 175 AMP EMT Composite feeders Copper - Large Power	212 lf	\$77.91 /lf	\$16,518
#083 Fire Pump Assume 200 AMP MI Composite feeders Copper - Large Power	90 lf	\$290.84 /lf	\$26,176
#084 175 AMP MI Composite feeders Copper - Large Power	62 lf	\$242.92 /lf	\$15,061
#106 200 AMP EMT Composite feeders Copper - Large Power	271 lf	\$95.04 /lf	\$25,757
#107 200 AMP EMT Composite feeders Copper - Large Power	53 lf	\$95.04 /lf	\$5,037
#142 175 AMP EMT Composite feeders Copper - Large Power	757 lf	\$77.91 /lf	\$58,981

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#143 175 AMP EMT Composite feeders Copper - Large Power	685 lf	\$77.91 /lf	\$53,371
#181 150 AMP EMT Composite feeders Copper - Large Power	386 lf	\$61.00 /lf	\$23,546
#185 150 AMP EMT Composite feeders Copper - Large Power	720 lf	\$61.00 /lf	\$43,919
#186 200 AMP EMT Composite feeders Copper - Large Power	746 lf	\$98.48 /lf	\$73,465
#225 150 AMP EMT Composite feeders Copper - Large Power	379 lf	\$61.00 /lf	\$23,119
#304 35 AMP EMT Composite feeders Copper - Large Power	256 lf	\$19.66 /lf	\$5,033
#307.1 25 AMP EMT Composite feeders Copper - Large Power	275 lf	\$16.82 /lf	\$4,625
#307.2 35 AMP EMT Composite feeders Copper - Large Power	250 lf	\$19.66 /lf	\$4,915
#308.1 25 AMP EMT Composite feeders Copper - Large Power	231 lf	\$16.82 /lf	\$3,885
#308.2 35 AMP EMT Composite feeders Copper - Large Power	213 lf	\$19.66 /lf	\$4,188
#240 175 AMP EMT Composite feeders Copper - Large Power	284 lf	\$77.91 /lf	\$22,128
#033 600 AMP EMT Composite feeders Copper - Large Power	36 lf	\$247.41 /lf	\$8,907
#068 400 AMP MI Composite feeders Copper - Large Power	63 lf	\$418.68 /lf	\$26,377
#081 400 AMP MI Composite feeders Copper - Large Power	36 lf	\$418.68 /lf	\$15,072
#082 400 AMP MI Composite feeders Copper - Large Power	34 lf	\$418.68 /lf	\$14,235
#182 400 AMP EMT Composite feeders Copper - Large Power	819 lf	\$168.09 /lf	\$137,663
#224 450 AMP EMT Composite feeders Copper - Large Power	336 lf	\$192.58 /lf	\$64,708
#293 400 AMP EMT Composite feeders Copper - Large Power	336 lf	\$168.09 /lf	\$56,477
#362 450 AMP EMT Composite feeders Copper - Large Power	189 lf	\$192.58 /lf	\$36,398
#032 800 AMP EMT Composite feeders Aluminum - Large Power	81 lf	\$269.45 /lf	\$21,826
#003 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#004 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#077 1200 AMP EMT Composite feeders Aluminum - Large Power	48 lf	\$406.75 /lf	\$19,524
#078 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#289.1 1200 AMP EMT Composite feeders Aluminum - Large Power	126 lf	\$406.75 /lf	\$51,250
#289.2 1200 AMP EMT Composite feeders Aluminum - Large Power	156 lf	\$406.75 /lf	\$63,452
#076 1600 AMP EMT Composite feeders Aluminum - Large Power	276 lf	\$538.91 /lf	\$148,738
#005 2000 AMP EMT Composite feeders Aluminum - Large Power	488 lf	\$674.44 /lf	\$329,128
#131 100 AMP EMT Composite feeders Aluminum - Large Power	60 lf	\$37.00 /lf	\$2,220
#132 125 AMP EMT Composite feeders Aluminum - Large Power	338 lf	\$42.14 /lf	\$14,244
#211 150 AMP EMT Composite feeders Aluminum - Large Power	84 lf	\$49.08 /lf	\$4,123
#350 125 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$42.14 /lf	\$5,057
#351 125 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$42.14 /lf	\$6,321
#352 125 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$42.14 /lf	\$6,321
#353 125 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$42.14 /lf	\$5,057
#354 150 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$49.08 /lf	\$5,890
#355 150 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$49.08 /lf	\$7,363
#008 200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$79.15 /lf	\$2,849

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#011 200 AMP EMT Composite feeders Aluminum - Large Power	321 lf	\$79.15 /lf	\$25,408
#014 200 AMP EMT Composite feeders Aluminum - Large Power	481 lf	\$79.15 /lf	\$38,072
#017 200 AMP EMT Composite feeders Aluminum - Large Power	278 lf	\$79.15 /lf	\$22,004
#020 200 AMP EMT Composite feeders Aluminum - Large Power	493 lf	\$79.15 /lf	\$39,022
#023 200 AMP EMT Composite feeders Aluminum - Large Power	288 lf	\$79.15 /lf	\$22,796
#026 200 AMP EMT Composite feeders Aluminum - Large Power	507 lf	\$79.15 /lf	\$40,130
#029 200 AMP EMT Composite feeders Aluminum - Large Power	267 lf	\$79.15 /lf	\$21,134
#071 200 AMP EMT Composite feeders Aluminum - Large Power	476 lf	\$79.15 /lf	\$37,676
#073 200 AMP EMT Composite feeders Aluminum - Large Power	53 lf	\$79.15 /lf	\$4,195
#087 225 AMP EMT Composite feeders Aluminum - Large Power	43 lf	\$84.71 /lf	\$3,643
#090 225 AMP EMT Composite feeders Aluminum - Large Power	465 lf	\$84.71 /lf	\$39,390
#094 225 AMP EMT Composite feeders Aluminum - Large Power	302 lf	\$84.71 /lf	\$25,582
#097 225 AMP EMT Composite feeders Aluminum - Large Power	464 lf	\$84.71 /lf	\$39,305
#100 225 AMP EMT Composite feeders Aluminum - Large Power	459 lf	\$84.71 /lf	\$38,882
#103 225 AMP EMT Composite feeders Aluminum - Large Power	479 lf	\$84.71 /lf	\$40,576
#108 225 AMP EMT Composite feeders Aluminum - Large Power	402 lf	\$84.71 /lf	\$34,053
#113 225 AMP EMT Composite feeders Aluminum - Large Power	346 lf	\$84.71 /lf	\$29,310
#118 225 AMP EMT Composite feeders Aluminum - Large Power	462 lf	\$84.71 /lf	\$39,136
#127 225 AMP EMT Composite feeders Aluminum - Large Power	341 lf	\$84.71 /lf	\$28,886
#189 225 AMP EMT Composite feeders Aluminum - Large Power	144 lf	\$84.71 /lf	\$12,198
#190 175 AMP EMT Composite feeders Aluminum - Large Power	50 lf	\$69.12 /lf	\$3,456
#192 225 AMP EMT Composite feeders Aluminum - Large Power	344 lf	\$84.71 /lf	\$29,140
#199 225 AMP EMT Composite feeders Aluminum - Large Power	202 lf	\$84.71 /lf	\$17,111
#202 225 AMP EMT Composite feeders Aluminum - Large Power	71 lf	\$84.71 /lf	\$6,014
#205 225 AMP EMT Composite feeders Aluminum - Large Power	211 lf	\$84.71 /lf	\$17,874
#208 225 AMP EMT Composite feeders Aluminum - Large Power	278 lf	\$84.71 /lf	\$23,549
#212 175 AMP EMT Composite feeders Aluminum - Large Power	318 lf	\$69.12 /lf	\$21,981
#213 225 AMP EMT Composite feeders Aluminum - Large Power	168 lf	\$84.71 /lf	\$14,231
#215 225 AMP EMT Composite feeders Aluminum - Large Power	251 lf	\$84.71 /lf	\$21,262
#218 225 AMP EMT Composite feeders Aluminum - Large Power	263 lf	\$84.71 /lf	\$22,279
#221 225 AMP EMT Composite feeders Aluminum - Large Power	242 lf	\$84.71 /lf	\$20,500
#006 400 AMP EMT Composite feeders Aluminum - Large Power	56 lf	\$134.93 /lf	\$7,556
#034 400 AMP EMT Composite feeders Aluminum - Large Power	40 lf	\$134.93 /lf	\$5,397
#069 400 AMP EMT Composite feeders Aluminum - Large Power	39 lf	\$134.93 /lf	\$5,262
#075 400 AMP EMT Composite feeders Aluminum - Large Power	64 lf	\$134.93 /lf	\$8,636
#121 400 AMP EMT Composite feeders Aluminum - Large Power	283 lf	\$134.93 /lf	\$38,186
#191 400 AMP EMT Composite feeders Aluminum - Large Power	50 lf	\$134.93 /lf	\$6,747
#195 400 AMP EMT Composite feeders Aluminum - Large Power	287 lf	\$134.93 /lf	\$38,725
#330 400 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$134.93 /lf	\$20,240
D5025 EMERGENCY GEN SET W/ATS		\$0.11 / SF	\$42,970
Auto Transfer Switch 3P - Fire pump ATS install only (included with fire pump)	1.00 ea	\$8,695.58 /ea	\$8,696
Auto Transfer Switch 3P - 400a	3.00 ea	\$11,424.75 /ea	\$34,274
D5027 MECHANICAL EQUIPMENT CONNECTIONS		\$5.46 / SF	\$2,076,788

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ AC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	53 ea	\$655.72 /ea	\$34,753
E3EQ AC Air compressors AC2-5 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	4.00 ea	\$655.72 /ea	\$2,623
E3EQ ACh 04 composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ ACh 05 composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ AD2-4 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	3.00 ea	\$655.72 /ea	\$1,967
E3EQ CP1 with motor rated Switch composite unit	4.00 ea	\$655.72 /ea	\$2,623
E3EQ DEH1 with 120 Volt Circuit	27 ea	\$655.72 /ea	\$17,705
E3EQ j box with 30 amp disconnect	5.00 ea	\$655.72 /ea	\$3,279
E3EQ j box with with motor rated Switch	11 ea	\$655.72 /ea	\$7,213
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 disconnect 600 volt composite unit	112 ea	\$655.72 /ea	\$73,441
E3EQ ACCCU - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	13 ea	\$655.72 /ea	\$8,524
E3EQ BS - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	38 ea	\$655.72 /ea	\$24,917
E3EQ CU-1 with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-10A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-10B with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-11A with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-11B with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-11C with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-12 with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13C with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-14A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-14B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-15 with VFD 50A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-16 with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ CU-17 with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-19A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-19B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-2A with VFD 45A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-2B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-3 with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-4A with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-4B with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-5A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-5B with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-6A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-6B with VFD 35 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-7 with VFD 15 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-8A with VFD 80 A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-8B with VFD 60 A composite unit connection only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ CU-9A with VFD 40 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-9B with VFD 30 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-9C with VFD 20 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ DF - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	2.00 ea	\$655.72 /ea	\$1,311
E3EQ DWP - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ ERV-1 with VFD 45 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-3 with VFD 15 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-4 with VFD 15 A composite unit connection	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-7 with VFD 45 A composite unit connection	1.00 ea	\$448.22 /ea	\$448
E3EQ EUH - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	28 ea	\$655.72 /ea	\$18,360
E3EQ F: Fan w/ VFD composite unit connection	12 ea	\$448.22 /ea	\$5,379

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ F: Fan w/ VFD composite unit connection only feeder in large power	8.00 ea	\$448.22 /ea	\$3,586
E3EQ Fire Pump Controler FBO composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ FTU - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit(large qty from mech sched)	9.00 ea	\$655.72 /ea	\$5,902
E3EQ HWRP 1-8 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	8.00 ea	\$655.72 /ea	\$5,246
E3EQ KEF - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	5.00 ea	\$655.72 /ea	\$3,279
E3EQ MAU1 with VFD 200 A composite unit connection only on drawing only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ MAU2 with VFD 400A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ PE-1 with Cntrl composite unit connection only off riser only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ PE-2 with Cntrl composite unit connection only off riser only feeder in large power	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 associated with Ahu1 and Ahu2	2.00 ea	\$655.72 /ea	\$1,311
E3EQ SP - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	3.00 ea	\$655.72 /ea	\$1,967
E3EQ VAC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	2.00 ea	\$655.72 /ea	\$1,311
E3EQ VAV - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	62 ea	\$655.72 /ea	\$40,655
E3EQ VCU composite unit connection only feeder in large power	48 ea	\$655.72 /ea	\$31,475
E3EQ ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit	40 ea	\$727.02 /ea	\$29,081
E3EQ AD1 - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit	1.00 ea	\$727.02 /ea	\$727
E3EQ RTU1 - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ RTU2 - 200 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ VAV Connection for electric Rehated coil - not shown on electrical	162 ea	\$800.00 /ea	\$129,600
E3EQ VRF branch selector 208 composite unit connection off mechanical schedule	47 ea	\$516.82 /ea	\$24,290
E3EQ AC01 air compressor 100 A composite unit connection	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU1 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250
E3EQ AHU10 with VFD 200 A composite unit connection only feeder in large power	1.00 ea	\$2,500.00 /ea	\$2,500
E3EQ AHU2 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ AHU3 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU4 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU5 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU6 with VFD 200 A composite unit connection only feeder in large power	1.00 ea	\$1,421.00 /ea	\$1,421
E3EQ AHU7 with VFD 225 A composite unit connection only feeder in large power	1.00 ea	\$1,421.00 /ea	\$1,421
E3EQ AHU8 with VFD 150 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250
E3EQ AHU9 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$2,500.00 /ea	\$2,500
E3EQ DC-1 ith VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU4 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU5 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU1 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ HRU2 with VFD 300 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ HRU3 with VFD 300 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ EWH w/ junction box Composite Unit 200 amps only feeder in large power	4.00 ea	\$655.72 /ea	\$2,623
E3EQ EWH w/ junction box Composite Unit 30 amps	5.00 ea	\$655.72 /ea	\$3,279
E3EQ FCU w/ junction box - Composite Unit	271 ea	\$655.72 /ea	\$177,700
E3EQ GWH w/ junction box Composite Unit 30 amps	1.00 ea	\$655.72 /ea	\$656
20 AMP EMT Composite feeders copper - Mechanical	28,950 lf	\$17.51 /lf	\$506,917
30 AMP EMT Composite feeders copper - Mechanical	38,250 lf	\$19.75 /lf	\$755,422
60 AMP EMT Composite feeders copper - Mechanical	3,075 lf	\$28.17 /lf	\$86,607
100 AMP EMT Composite feeders Copper - Mechanical	75 lf	\$33.82 /lf	\$2,537
D5029 SMALL POWER DEVICES & WIRING		\$3.98 / SF	\$1,515,051
Wiremold Dual Channel Empty Raceway with wiring - no devices included - Composite Unit	32 lf	\$60.36 /lf	\$1,932
Wiremold Duplex Receptacle Only Composite Unit	15 ea	\$45.60 /ea	\$684
E3EQ Auto 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Auto 208 volt connetions - Assume Power is covered on 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 covered on Electrical Power plans	0.00 ea		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ Biotech 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Carpentry 120 volt connetions - Assume Power is covered 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 Electrical Power plans	0.00 ea		\$0
E3EQ Cosmo 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Dental 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Dental 208 volt connetions - Assume Power is covered on 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 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 Electrical Power plans	0.00 ea		\$0
E3EQ HVAC 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 120 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 208 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 480 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 120 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 208 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 480 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Medical 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ Medical 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 480 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Plumbing 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Robotics 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Robotics 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
Gym Scoreboard control System Wiring	1.00 ea	\$1,500.00 /ea	\$1,500
Gym Shot timer Wiring	1.00 ea	\$1,500.00 /ea	\$1,500
Small Power Projection Screen	2.00 ea	\$1,500.00 /ea	\$3,000
FB: Quad Floor Box - Composite Unit	50 ea	\$875.00 /ea	\$43,750
Transformer: 24 V XFMR Low Voltage transformer	24 ea	\$217.48 /ea	\$5,220
Recep: 20A Twist lock (Type 1) Poke thru Receptacle Composite unit	1.00 ea	\$1,200.00 /ea	\$1,200
Recep: 20A Twist lock (Type 1) Receptacle Composite unit	28 ea	\$131.58 /ea	\$3,684
Recep: 20A Twist lock (Type 1) Heavy Duty Receptacle Composite unit	2.00 ea	\$131.58 /ea	\$263
Recep: 20A Twist lock (Type 4) 250V Receptacle Composite unit	5.00 ea	\$131.58 /ea	\$658
Recep: 30 Amp Twist Lock Heavy duty, 208V Nema Receptacle type 5	7.00 ea	\$165.17 /ea	\$1,156
Recep: 30 Amp Twist Lock, 208V floor box Nema Receptacle type 5	1.00 ea	\$165.17 /ea	\$165
Recep: 30 Amp Twist Lock, 208V Nema Receptacle type 5	5.00 ea	\$165.17 /ea	\$826
Recep: 30A Type 2 Twist Lock Nema Receptacle Composite unit	15 ea	\$165.17 /ea	\$2,478
Recep: 30A Type 2 Twist Lock poke thry Receptacle Composite unit	4.00 ea	\$1,200.00 /ea	\$4,800
Recep: 50 Amp Type 3 Twist Lock Floor Box Receptacle Composite unit	2.00 ea	\$1,200.00 /ea	\$2,400
Recep: 50 Amp Type 3 Twist Lock Receptacle Composite unit	21 ea	\$199.56 /ea	\$4,191
Recep: 50 Amp Type 3 Twist Lock Receptacle Composite unit Heavy duty	20 ea	\$199.56 /ea	\$3,991
Recep: I520/I530	80 ea	\$199.56 /ea	\$15,965
JB: Power Junction Box - Typ. Composite Unit	132 ea	\$85.04 /ea	\$11,291
JB: Power Junction Box - Typ. Composite Unit fsd	14 ea	\$150.00 /ea	\$2,100
JB: Power Junction Box - XP Composite Unit	2.00 ea	\$125.00 /ea	\$250
Switch: EPO Switch at Shops	30 ea	\$85.04 /ea	\$2,551
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	536 ea	\$116.68 /ea	\$62,540

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Switch: EPO Switch at Shops XP	1.00 ea	\$116.68 /ea	\$117
Recep: Quad receptacle Composite unit	446 ea	\$119.92 /ea	\$53,485
Recep: Quad GFI receptacle Composite unit	38 ea	\$186.35 /ea	\$7,081
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 Type 2 Twistlock Composite Unit	6.00 ea	\$905.53 /ea	\$5,433
CR: Cord Reel Type 3Twistlock Composite Unit	15 ea	\$905.53 /ea	\$13,583
CR: Cord Reel Type duplex Composite Unit	226 ea	\$905.53 /ea	\$204,650
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		\$14.25 / SF	\$5,424,823
D5042 LIGHT FIXTURES		\$11.59 / SF	\$4,409,154
20 AMP EMT Composite feeders copper - Large Power	48,000 lf	\$16.93 /lf	\$812,704
DPB2 Composite Unit	32 ea	\$661.71 /ea	\$21,175
GSB Light Fixture	20 ea	\$461.71 /ea	\$9,234
GSC 8.3 Light Fixture	13 ea	\$461.71 /ea	\$6,002
GSD Lighting Fixture	24 ea	\$411.71 /ea	\$9,881
LSE Light Fixture	4.00 ea	\$561.71 /ea	\$2,247
RC1 Recessed Can lighting Fixture	272 ea	\$391.71 /ea	\$106,546
RC2 Recessed Can lighting Fixture	15 ea	\$391.71 /ea	\$5,876
RE Lighting	31 ea	\$391.71 /ea	\$12,143
RF Recessed Can light Fixture	70 ea	\$391.71 /ea	\$27,420
RJ Square Recess Can Light Fixture	55 ea	\$391.71 /ea	\$21,544
RK Lighting Fixture	8.00 ea	\$391.71 /ea	\$3,134
RN1 Light Fixture	15 ea	\$391.71 /ea	\$5,876
RN2 Light Fixture	42 ea	\$391.71 /ea	\$16,452
RQ Lighting Fixture	35 ea	\$391.71 /ea	\$13,710
RB2 2x4 Lighting Fixture	10 ea	\$382.99 /ea	\$3,830
RDA 2x4	31 ea	\$382.99 /ea	\$11,873
RDB	13 ea	\$382.99 /ea	\$4,979
RL1 2X4 Lighting Fixture	155 ea	\$382.99 /ea	\$59,364
RL2 2x4 Led Recessed Troffer Composite Unit	35 ea	\$382.99 /ea	\$13,405
RA1 2X2 Lighting Fixture	210 ea	\$391.71 /ea	\$82,259
RA2 Lighting Fixture	5.00 ea	\$391.71 /ea	\$1,959
RA3 Lighting Fixture	19 ea	\$391.71 /ea	\$7,443
RB1 Lighting Fixture	205 ea	\$391.71 /ea	\$80,301
RLC 4 foot Lighting Fixture (348)	1,644 ea	\$179.96 /ea	\$295,846
RLC 6 foot Lighting Fixture (14)	84 ea	\$179.96 /ea	\$15,116
RLC 8 foot Lighting Fixture (6)	48 ea	\$179.96 /ea	\$8,638
GSE 25.2 foot Lighting Fixture (1)	25 lf	\$190.99 /lf	\$4,813
GSE 32.2 foot Lighting Fixture (1)	32 lf	\$190.99 /lf	\$6,150
GSE 33.2 foot Lighting Fixture (1)	33 lf	\$190.99 /lf	\$6,341
GSE 33.7 foot Lighting Fixture (2)	67 lf	\$190.99 /lf	\$12,873
LPJ 10 Foot (2) Composite Unit	20 lf	\$135.99 /lf	\$2,720

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
LPJ 16 Foot (2) Composite Unit	32 lf	\$135.99 /lf	\$4,352
LPJ 20 Foot (2) Composite Unit	40 lf	\$135.99 /lf	\$5,440
LPJ 24 Foot (4) Composite Unit	96 lf	\$135.99 /lf	\$13,056
LPJ 30 Foot (2) Composite Unit	60 lf	\$135.99 /lf	\$8,160
LPJ 4 Foot (41) Composite Unit	164 lf	\$135.99 /lf	\$22,303
LPJ 8Foot (8) Composite Unit	64 lf	\$135.99 /lf	\$8,704
LSA 10.5 foot linear Fixture per foot(1)	10 lf	\$135.99 /lf	\$1,428
LSA 18.50 foot linear Fixture per foot(6)	111 lf	\$135.99 /lf	\$15,095
LSA 2.5 foot linear Fixture per foot(1)	2.50 lf	\$135.99 /lf	\$340
LSA 24 foot linear Fixture per foot(3)	72 lf	\$135.99 /lf	\$9,792
LSA 26 foot linear Fixture per foot(2)	52 lf	\$135.99 /lf	\$7,072
LSA 26.11 foot linear Fixture per foot	26 lf	\$135.99 /lf	\$3,551
LSA 26.11 foot linear Fixture per foot(2)	52 lf	\$135.99 /lf	\$7,102
LSA 7 foot linear Fixture per foot(1)	7.00 lf	\$135.99 /lf	\$952
LSA 7.3 foot linear Fixture per foot(5)	36 lf	\$135.99 /lf	\$4,964
LSA 9.6 foot linear Fixture per foot(6)	48 lf	\$135.99 /lf	\$6,528
LSA 9.9 foot linear Fixture per foot(4)	40 lf	\$135.99 /lf	\$5,385
LSA 8 foot linear Fixture per foot(1)	8.00 lf	\$135.99 /lf	\$1,088
LSB 18 foot linear fixture per foot (2)	36 lf	\$135.99 /lf	\$4,896
LSB 89 foot linear fixture per foot (2)	188 lf	\$135.99 /lf	\$25,567
RLA1 12 foot Light Fixture(3)	36 lf	\$135.99 /lf	\$4,896
RLA1 4 foot Light Fixture(116)	464 lf	\$135.99 /lf	\$63,102
RLA1 6 foot Light Fixture(23)	138 lf	\$135.99 /lf	\$18,767
RLA1 8 foot Light Fixture(2)	16 lf	\$135.99 /lf	\$2,176
RLA2 4 foot Lighting Fixture (7)	28 lf	\$160.99 /lf	\$4,508
RLB-1 Linear fixture per foot	178 lf	\$135.99 /lf	\$24,207
RLD1 18 foot Light fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLD1 4 foot Light fixture (2)	8.00 lf	\$135.99 /lf	\$1,088
RLD1 8 foot Light fixture (4)	32 lf	\$135.99 /lf	\$4,352
RLD3 13.9 foot Light Fixture (11)	153 lf	\$135.99 /lf	\$20,794
RLD3 22 foot Light Fixture (4)	88 lf	\$135.99 /lf	\$11,968
RLD3 25.6 foot Light Fixture (2)	51 lf	\$135.99 /lf	\$6,963
RLD3 38.2 foot Light Fixture (2)	76 lf	\$135.99 /lf	\$10,390
GPL2 4 foot	17 ea	\$508.96 /ea	\$8,652
LPB Light Fixture 4 foot	41 ea	\$608.96 /ea	\$24,967
LPE4 Lighting Fixture	19 ea	\$608.96 /ea	\$11,570
LPH8 Light Fixture	130 ea	\$608.96 /ea	\$79,165
GPL1 8 foot	20 ea	\$817.96 /ea	\$16,359
LPA Light Fixture 8 foot (3)	24 lf	\$234.96 /lf	\$5,639
LPA1 Light Fixture 10 foot(214)	2,140 lf	\$234.96 /lf	\$502,804
LPA1 Light Fixture 12 foot (13)	156 lf	\$234.96 /lf	\$36,653
LPA1 Light Fixture 14 foot (5)	70 lf	\$234.96 /lf	\$16,447
LPA1 Light Fixture 16 foot (4)	64 lf	\$234.96 /lf	\$15,037
LPA1 Light Fixture 18 foot (7)	126 lf	\$234.96 /lf	\$29,604
LPA1 Light Fixture 20 foot (2)	40 lf	\$234.96 /lf	\$9,398

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
LPA1 Light Fixture 4 foot (60)	240 lf	\$234.96 /lf	\$56,389
LPA1 Light Fixture 6 foot (24)	144 lf	\$234.96 /lf	\$33,834
LPA1 Light Fixture 8 foot (61)	488 lf	\$234.96 /lf	\$114,658
LPA2 per linear 4 foot (2)	17 lf	\$190.99 /lf	\$3,287
LPC Lighting Fixture 20 foot (2)	40 lf	\$135.99 /lf	\$5,440
LPC Lighting Fixture 25 foot (1)	25 lf	\$135.99 /lf	\$3,400
LPC Lighting Fixture 36 foot (1)	216 lf	\$135.99 /lf	\$29,375
LPC Lighting Fixture 42 foot (1)	42 lf	\$135.99 /lf	\$5,712
LPC Lighting Fixture 49 foot (1)	50 lf	\$135.99 /lf	\$6,800
LPC Lighting Fixture 53 foot (3)	162 lf	\$135.99 /lf	\$22,031
LPC Lighting Fixture 6foot (15)	90 lf	\$135.99 /lf	\$12,240
LPC Lighting Fixture 8 foot (41)	328 lf	\$135.99 /lf	\$44,606
LPC Lighting Fixture 10 foot (45)	450 lf	\$135.99 /lf	\$61,198
LPD Lighting Fixture 4 foot (46)	184 lf	\$135.99 /lf	\$25,023
LPD Lighting Fixture 6 foot (1)	6.00 lf	\$135.99 /lf	\$816
LPG Light Fixture 12 foot (2)	24 lf	\$135.99 /lf	\$3,264
LPG Light Fixture 18 foot (2)	36 lf	\$135.99 /lf	\$4,896
LPG Light Fixture 4 foot (3)	12 lf	\$135.99 /lf	\$1,632
LPH3A per linear foot	80 lf	\$135.99 /lf	\$10,880
LPK 12 foot (10) composite Unit	120 lf	\$135.99 /lf	\$16,319
LPK 16 foot (10) composite Unit	160 lf	\$135.99 /lf	\$21,759
LPK 8 foot (1) composite Unit	8.00 lf	\$135.99 /lf	\$1,088
LPL 10 foot Pendant (9)	90 lf	\$135.99 /lf	\$12,240
LPL 12 foot Pendant (3)	36 lf	\$135.99 /lf	\$4,896
LPL 15 foot Pendant (1)	15 lf	\$135.99 /lf	\$2,040
LPL 16 foot Pendant (5)	80 lf	\$135.99 /lf	\$10,880
LPL4 foot Pendant	48 lf	\$135.99 /lf	\$6,528
LPM1 4 foot (7)Lighting Fixture	28 lf	\$135.99 /lf	\$3,808
LPM1 8 foot (6)Lighting Fixture	48 lf	\$135.99 /lf	\$6,528
LPM2 4 foot (14)Lighting Fixture	56 lf	\$135.99 /lf	\$7,616
LPM2 6 foot (3)Lighting Fixture	18 lf	\$135.99 /lf	\$2,448
LPM2 8foot (9)Lighting Fixture	72 lf	\$135.99 /lf	\$9,792
GWD4 Wall Mounted Fixture	32 ea	\$391.71 /ea	\$12,535
GWE1 Light Fixture	39 ea	\$561.71 /ea	\$21,907
GWE2 Light Fixture	31 ea	\$561.71 /ea	\$17,413
GWF Fixture	24 ea	\$391.71 /ea	\$9,401
LSG1 Lighting Fixture 4 foot fixture 04-20-2023	84 ea	\$561.71 /ea	\$47,184
LSH 4 Foot	24 ea	\$561.71 /ea	\$13,481
LSG2 Light Fixture 8 foot fixture	54 ea	\$706.21 /ea	\$38,135
LSH 2 foot per linear foot(10)	20 lf	\$135.99 /lf	\$2,720
LSH 30 foot per linear foot(10)	60 lf	\$135.99 /lf	\$8,160
LSH 8 foot per linear foot(29)	232 lf	\$135.99 /lf	\$31,551
LSH 8.3 foot per linear foot(7)	58 lf	\$135.99 /lf	\$7,901
LSJ 7.7 foot Light Fixture(1)	7.70 lf	\$135.99 /lf	\$1,047
LSJ 8 foot Light Fixture(1)	8.00 lf	\$135.99 /lf	\$1,088

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
LSJ 10 foot Light Fixture(1)	10 lf	\$135.99 /lf	\$1,360
LSJ 10.4 foot Light Fixture(1)	10 lf	\$135.99 /lf	\$1,414
LSJ 10.7 foot Light Fixture(3)	32 lf	\$135.99 /lf	\$4,365
RLB2 10.8 foot Lighting Fixture (2)	22 lf	\$135.99 /lf	\$2,937
RLB2 12.3 foot Lighting Fixture (1)	12 lf	\$135.99 /lf	\$1,673
RLB2 15.5 foot Lighting Fixture (1)	16 lf	\$135.99 /lf	\$2,108
RLB2 16.9 foot Lighting Fixture (3)	51 lf	\$135.99 /lf	\$6,895
RLB2 18 foot Lighting Fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLB2 19.1 foot Lighting Fixture (1)	19 lf	\$135.99 /lf	\$2,598
RLB2 23.6 foot Lighting Fixture (1)	24 lf	\$135.99 /lf	\$3,209
RLB2 40.85 foot Lighting Fixture (1)	41 lf	\$135.99 /lf	\$5,555
RLB2 6.1 foot Lighting Fixture (2)	12 lf	\$135.99 /lf	\$1,659
RLB2 6.6 foot Lighting Fixture (2)	13 lf	\$135.99 /lf	\$1,795
RLB2 68 foot Lighting Fixture (4)	272 lf	\$135.99 /lf	\$36,991
RLB2 8 foot Lighting Fixture (2)	16 lf	\$135.99 /lf	\$2,176
RLB2 86.4 foot Lighting Fixture (1)	86 lf	\$135.99 /lf	\$11,750
RLB3 18 foot Lighting Fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLB3 23 foot Lighting Fixture (1)	23 lf	\$135.99 /lf	\$3,128
RLB3 23.4 foot Lighting Fixture (1)	23 lf	\$135.99 /lf	\$3,182
RLB3 29.9 foot Lighting Fixture (1)	30 lf	\$135.99 /lf	\$4,066
RLB3 37.3 foot Lighting Fixture (1)	37 lf	\$135.99 /lf	\$5,073
RLB4 15.2 foot Lighting Fixture(1)	15 lf	\$135.99 /lf	\$2,067
RLB4 29.9 foot Lighting Fixture(2)	60 lf	\$135.99 /lf	\$8,132
RLD2 10.3 foot Light Fixture (1)	10 lf	\$135.99 /lf	\$1,401
RLD2 4 foot Light Fixture (11)	44 lf	\$135.99 /lf	\$5,984
RLD2 7.1 foot Light Fixture (2)	14 lf	\$135.99 /lf	\$1,918
RLD2 8 foot Light Fixture (1)	8.00 lf	\$135.99 /lf	\$1,088
GWC Exterior Wall mounted Light	19 ea	\$668.96 /ea	\$12,710
RLF Lighti Fixture	9.00 lf	\$135.99 /lf	\$1,224
RLG Lighting Fixture	3.00 ea	\$818.96 /ea	\$2,457
RLH Lighting Fixture	9.00 ea	\$818.96 /ea	\$7,371
RM Light Fixture	6.00 ea	\$448.96 /ea	\$2,694
SWA Lighting Fixture	14 ea	\$618.96 /ea	\$8,665
DPA Light Fixutre	12 ea	\$618.96 /ea	\$7,428
DPB Lighting Fixture	12 ea	\$718.96 /ea	\$8,628
GPB Fixture	145 ea	\$818.96 /ea	\$118,749
GPK Light Fixture	23 ea	\$1,240.98 /ea	\$28,543
GSA Light Fixture	56 ea	\$718.96 /ea	\$40,262
PB Lighting Fixture	36 ea	\$618.96 /ea	\$22,283
PD1 Lighting Fixture	97 ea	\$618.96 /ea	\$60,039
PF1 Lighting Fixture	84 ea	\$618.96 /ea	\$51,993
RP Lighting Fixture	10 ea	\$448.96 /ea	\$4,490
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	19 ea	\$207.21 /ea	\$3,937

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
EC1	87 ea	\$391.71 /ea	\$34,079
EW1	8.00 ea	\$391.71 /ea	\$3,134
Exit Sign	2.00 ea	\$391.71 /ea	\$783
F1 Lighting Fixture 4 foot	9.00 ea	\$200.00 /ea	\$1,800
F1 Lighting Fixture 6 foot	81 ea	\$200.00 /ea	\$16,200
12/2 MC Cable Composite Unit	72,000 lf	\$3.70 /lf	\$266,292
D5044 LIGHTING CONTROLS & WIRING		\$2.34 / SF	\$890,669
S (1) Single pole Switch Composite unit	1.00 ea	\$78.72 /ea	\$79
ST Single Pole Switch	57 ea	\$78.72 /ea	\$4,487
SD (1) Dimmer Switch composite unit	329 ea	\$155.59 /ea	\$51,188
S3 (1) 3 way switch composite unit	18 ea	\$85.00 /ea	\$1,530
SLC for projection Screen (1) Low voltage Switch Composite unit	3.00 ea	\$92.22 /ea	\$277
SLV (1) Low voltage Switch Composite unit	111 ea	\$92.22 /ea	\$10,236
SLV (1) Low voltage Switch Composite unit for projection Screen	5.00 ea	\$92.22 /ea	\$461
Occupancy sensor Wall mounted Composite unit	79 ea	\$255.70 /ea	\$20,200
SVSD Vacancy Sensor Dimmer	70 ea	\$286.76 /ea	\$20,073
Vacancy sensor Wall mounted Composite unit	69 ea	\$286.76 /ea	\$19,787
OS1 Occupancy sensor Ceiling mounted Composite unit	434 ea	\$289.42 /ea	\$125,609
Lighting Control Panel composite unit q qscamps-0 quantum management system	1.00 ea	\$4,964.04 /ea	\$4,964
Lighting Control Panel composite unit qp2-2posce`120	1.00 ea	\$4,964.04 /ea	\$4,964
Lighting Control Panel composite unit qp3 1 pl 100-240	2.00 ea	\$4,964.04 /ea	\$9,928
Lighting Control Panel composite unit qsn-4s20	3.00 ea	\$4,964.04 /ea	\$14,892
Lighting Control Panel composite unit qsn-4t-16-s	14 ea	\$4,964.04 /ea	\$69,497
Lighting Control Panel composite unit xp48dr	3.00 ea	\$4,964.04 /ea	\$14,892
Recptacle Control Panel composite unit	9.00 ea	\$4,964.04 /ea	\$44,676
VS1 Vacancy sensor Ceiling mounted Composite unit	260 ea	\$250.32 /ea	\$65,084
Daylight Sensor Ceiling Mounted Composite unit	154 ea	\$278.70 /ea	\$42,919
20 AMP EMT Composite feeders copper - Large Power	15,000 lf	\$16.93 /lf	\$253,970
12/2 MC Cable Composite Unit	30,000 lf	\$3.70 /lf	\$110,955
D5046 THEATRICAL LIGHTING		\$0.33 / SF	\$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		\$3.80 / SF	\$1,446,403
D5094 GROUNDING & LIGHTNING PROTECTION SYS.		\$0.70 / SF	\$264,651
Ground Rod - Copperclad 3/4" x 10'	27 ea	\$126.99 /ea	\$3,429
Ground Surface Mounted Electrode	1.00 ea	\$500.00 /ea	\$500
Lightening Protection Air Terminal	244 ea	\$465.25 /ea	\$113,521
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	2.00 ea	\$729.00 /ea	\$1,458
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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Cadweld Cable to Steel - 250 Max	82 ea	\$74.99 /ea	\$6,149
Lp Cadweld	44 ea	\$96.26 /ea	\$4,235
Grounding Cable Copper Bare Stranded # 4/0	3,297 lf	\$7.41 /lf	\$24,440
Grounding Cable Copper Bare Stranded # 500	1,500 lf	\$12.00 /lf	\$18,000
Lightening Protection Cable Copper Bare Stranded # 4/0	8,487 lf	\$7.41 /lf	\$62,914
D5095 MISCELLANEOUS ELECTRICAL SYSTEMS		\$3.11 / SF	\$1,181,752
Electrical Permit assumed to be waived by town	0.00 ea		\$0
Full time Safety 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	382,610 gsf	\$0.72 /gsf	\$275,000
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	\$100,000.00 /ea	\$100,000
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 through E26	0.00 ls		\$0
VE01 In each classroom, reduce lighting control zones from four zones per classroom to three zones per classroom.	0.00 ls		\$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		\$0
VE03 Provide aluminum feeders for those within the main building 200Amps and larger. This does not include feeders run to the satellite buildings	0.00 ls		\$0
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 Viper - https://hubbellcdn.com/specsheet/BEA_VIPERSPEC.pdf	0.00 ls		\$0
VE06 Shorten Duct Bank Primary, Telcom and Generator to more in the range of to in the range of 500 lf	0.00 ls		\$0
VE07 Move All Transformer closer to their prospective Switchboards in the range of 50 linear feet per run currently 200+ feet away	0.00 ls		\$0
VE08 Utilize Aluminum Feeders 100 amps can be added to above	0.00 ls		\$0
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 NOW VE07 ACCEPTED - TARGET REDUCTION VIA COORDINATION	0.00 ls		\$0
VE14 Utilize Lightning Preventor System in lieu of Lightning Protection cannot be take with E12 - NOW VE E02 ACCEPTED	0.00 ls		\$0
VE15 Move Class Speech Reinforcement to tech Budget Wireless Ceiling Panel	0.00 ls		\$0
VE16 Remove Draw-out Breakers from Main Switchboard	0.00 ls		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
VE17 Have Single ended Switchboard would remove set of Secondaries and remove Secondary Duct Bank reduces redundancy NOW VE EO4 ACCEPTED	0.00 ls		\$0
VE18 Eliminate panels and transformers for Parking EV charging Stations conduit, wire ,panels transformer and charging station	0.00 ls		\$0
VE19 Re-evaluate conduit and Service going from Maintenance Building to Main Building(reduce spares and shorter conduits)	0.00 ls		\$0
VE20 Eliminate Theatrical Dimming and rough in(eliminates all Electrical Scope associated with Theater) - NOW VE E03A ACCEPTED	0.00 ls		\$0
VE21 Revaluate Conduit and how site Lighting is powered for entrance near School Sign and power and communication for sign potentially wireless NOW VE E11 ACCEPTED	0.00 ls		\$0
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	380,570 SF	\$7.71 / SF	\$2,933,945
D5090 OTHER ELECTRICAL SYSTEMS		\$0.45 / SF	\$172,408
D5092 CLOCK SYSTEMS		\$0.45 / SF	\$172,408
Clock Single Face Battery or 110 clock	238 ea	\$447.15 /ea	\$106,422
Clock Single Face Battery or 110 clock 16"	26 ea	\$496.84 /ea	\$12,918
Clock Rough in and Backboxes	1.00 ls	\$32,791.18 /ls	\$32,791
LV Cabling (included in overall)	7,920 lf	\$2.56 /lf	\$20,277
D6010 COMMUNICATIONS & SECURITY		\$3.75 / SF	\$1,426,114
D6013 TEL/DATA SYSTEM		\$3.75 / SF	\$1,426,114
Wiremold D2 Data Jack Only Composite Unit	6.00 ea	\$305.03 /ea	\$1,830
Floor Box D2/VPL data con. - Composite Unit	3.00 ea	\$1,251.56 /ea	\$3,755
Poke thru D2/VPL data con. - Composite Unit	7.00 ea	\$1,251.56 /ea	\$8,761
Poke Thru D3 data con. - Composite Unit	4.00 ea	\$1,251.56 /ea	\$5,006
Poke Thru D2 data con. - Composite Unit	65 ea	\$1,077.79 /ea	\$70,056
IDF Room Fit-Out composite unit	11 ea	\$17,163.42 /ea	\$188,798
MDF Room Fit-Out composite unit	1.00 ea	\$54,651.93 /ea	\$54,652
Tel/data Backbone Cabling , additional Devices and Testing	2,000 lf	\$39.75 /lf	\$79,494
D1 Telephone jack with 3/4" Stub to accessible ceiling composite unit 30 feet	1.00 ea	\$609.22 /ea	\$609
DPI - D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
E jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
F jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
Vape D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	76 ea	\$609.22 /ea	\$46,301
VH - D1 Data jack... at additional TVs and Displays not labeled	14 ea	\$609.22 /ea	\$8,529
Water Heat Detection D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	3.00 ea	\$609.22 /ea	\$1,828
WE WAP Enclosure	31 ea	\$609.22 /ea	\$18,886

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
WP - "VOIP" Wall Telephone Outlet	19 ea	\$609.22 /ea	\$11,575
WPIP - "VOIP" Wall Telephone Outlet	69 ea	\$609.22 /ea	\$42,036
EMP - Empty back box for Simman Cabling by Owner	13 ea	\$419.03 /ea	\$5,447
S2 Data jack with 3/4" Stub up to accessible ceiling composite unit 30 feet	10 ea	\$735.71 /ea	\$7,357
TD2 TelData jack with 3/4" Stub up to accessible ceiling composite unit 30 feet	9.00 ea	\$735.71 /ea	\$6,621
D2 Data jack with 1/2" Stub to accessible ceiling composite unit 30 feet _2_	666 ea	\$693.75 /ea	\$462,036
VPL - Low Video Presentation Outlet composite unit 10 feet _1_	102 ea	\$599.94 /ea	\$61,194
VPH - High Video Presentation Outlet composite unit 10 feet	140 ea	\$751.68 /ea	\$105,235
D4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet	1.00 ea	\$988.70 /ea	\$989
S4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet	2.00 ea	\$988.70 /ea	\$1,977
Audio Visual Cabling Overall Value	1.00 ea	\$98,373.49 /ea	\$98,373
IPTV and Video on Demand(overal IPTV and Video Demand) - shift to Tech Budget	0.00 excl		\$0
WAP jack ceiling mounted composite unit	236 ea	\$488.67 /ea	\$115,326
Telcom not Defined in Media Center	2,648 gsf	\$5.96 /gsf	\$15,787
55" Signage - Wall Mtd Display - Composite Assembly	2.00 excl	\$0.00 /excl	\$0
65" Signage - Wall Mtd Display - Composite Assembly	23 excl	\$0.00 /excl	\$0
75" Wall Mtd Display - Composite Assembly	120 excl	\$0.00 /excl	\$0
Additional telcom Adjustment	0.00 ea		\$0
D6030 SOUND AND A/V		\$3.51 / SF	\$1,335,424
D6031 AUDIO-VIDEO SYSTEMS		\$2.79 / SF	\$1,061,452
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	\$313.01 /ea	\$2,504
Speech Reinforcement System	111 ea	\$2,327.18 /ea	\$258,317
Fitness Center Audio Visual System	1.00 ea	\$15,401.91 /ea	\$15,402
IC - Intercom Wall Plate, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$245.92 /ea	\$246
Weight Audio Visual System	1.00 ea	\$17,389.25 /ea	\$17,389
Gym Audio Visual System RACK	1.00 ea	\$23,777.14 /ea	\$23,777
Studen Commons Audio Visual System	1.00 ea	\$89,004.49 /ea	\$89,004
TP - AV Sys. Control Touch Plate, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$219.48 /ea	\$219
Auditorium ALS Assisted Listening System Antenna	1.00 ea	\$3,296.40 /ea	\$3,296
Auditorium VPO Video Projector with 1" to AV rack	1.00 ea	\$2,354.57 /ea	\$2,355
Auditorium AV Rack	2.00 ea	\$23,545.69 /ea	\$47,091
Auditorium Dante Input Plate with 1" to AV rack	4.00 ea	\$1,412.74 /ea	\$5,651
Auditorium Fill Speaker	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Intercom Wall Plate with 1" to AV rack	4.00 ea	\$1,412.74 /ea	\$5,651
Auditorium Local Speakr in Hall Way	3.00 ea	\$470.91 /ea	\$1,413
Auditorium LSS Loud Speaker	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Mon with Wall Plate with 1" to AV rack	2.00 ea	\$2,354.57 /ea	\$4,709

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Auditorium Motorized Projection Screen	1.00 ea	\$14,127.42 /ea	\$14,127
Auditorium Projector	1.00 ea	\$47,091.39 /ea	\$47,091
Auditorium Sub Woofer	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium TP Touch Control Plate with 1" to AV rack	5.00 ea	\$3,296.40 /ea	\$16,482
Auditorium/Stage Video	1.00 ea	\$58,626.62 /ea	\$58,627
Cafeteria Local Speaker	16 ea	\$470.91 /ea	\$7,535
Class Room and Conference Room Interactive Flat Panel excluded shifted to tech Budget	0.00 excl		\$0
Gym Local Speaker	24 ea	\$1,417.50 /ea	\$34,020
DAN - Dante Input Wall Panel, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$502.41 /ea	\$502
Video Projector	1.00 ea	\$144.20 /ea	\$144
Instructional AV Excluded part of tech budget	1.00 ea	\$0.00 /ea	\$0
Large AV Allowance	1.00 ea	\$554,230.20 /ea	\$554,230
Scoreboards Exterior Connection	1.00 ea	\$1,495.89 /ea	\$1,496
VE E01 - ADJUST BASED ON TECH / SECURITY FEEDBACK	-1.00 ea	\$163,955.79 /ea	(\$163,956)
D6032 SOUND/PA SYSTEMS		\$0.72 / SF	\$273,972
Public Address Speaker	713 ea	\$183.83 /ea	\$131,070
Sound Chime	9.00 ea	\$149.05 /ea	\$1,341
PA Horn Speaker	63 ea	\$298.10 /ea	\$18,780
Sound AES	1.00 ea	\$397.47 /ea	\$397
Sound AV floor box	1.00 ea	\$1,192.41 /ea	\$1,192
Sound Exterior Speaker	1.00 ea	\$397.47 /ea	\$397
VCE	2.00 ea	\$1,192.41 /ea	\$2,385
VC - PA Speaker Volume Control	73 ea	\$149.05 /ea	\$10,881
LV Cabling for Speaker	42,000 lf	\$2.56 /lf	\$107,527
D70 ELECTRONIC SAFETY & SECURITY	380,570 SF	\$7.45 / SF	\$2,835,722
D6010 COMMUNICATIONS & SECURITY		\$5.03 / SF	\$1,914,206
D6011 FIRE ALARM SYSTEM		\$1.48 / SF	\$563,056
Fire Alarm Manual pull station composite unit	57 ea	\$271.61 /ea	\$15,482
Fire Alarm Bell Exterior - WP composite unit	1.00 ea	\$278.99 /ea	\$279
Fire Alarm Smoke detector composite unit	143 ea	\$338.62 /ea	\$48,422
Fire Alarm Duct smoke detector with relay base composite unit	23 ea	\$707.94 /ea	\$16,283
Fire Alarm Flow switch composite unit	7.00 ea	\$242.39 /ea	\$1,697
Fire Alarm Tamper switch composite unit	14 ea	\$242.39 /ea	\$3,393
Fire Alarm Sounder composite unit	60 ea	\$274.64 /ea	\$16,479
Fire Alarm Strobe Wall composite unit	68 ea	\$268.00 /ea	\$18,224
Fire Alarm BDA	2.00 ea	\$509.44 /ea	\$1,019
Fire Alarm Remote indicating light composite unit	38 ea	\$203.70 /ea	\$7,741
Fire Alarm Knox Box composite unit	3.00 ea	\$500.00 /ea	\$1,500
Fire Alarm Speaker strobe composite unit	494 ea	\$327.46 /ea	\$161,763
FACP	1.00 ea	\$23,643.21 /ea	\$23,643
Fire Alarm Terminal cabinet composite unit	9.00 ea	\$1,395.43 /ea	\$12,559
Control Relay	42 ea	\$335.17 /ea	\$14,077
Fire Alarm Monitor module composite unit	56 ea	\$335.17 /ea	\$18,770

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Fire Alarm Relay Monitor composite unit	10 ea	\$335.17 /ea	\$3,352
FDS Fire Alarm	25 ea	\$2,377.21 /ea	\$59,430
SD smoke Damper Fire Alarm	3.00 ea	\$2,377.21 /ea	\$7,132
Ventalation Control Panels	1.00 ea	\$3,500.00 /ea	\$3,500
ARM Two Way Fire Dept Communcation Station	2.00 ea	\$3,436.21 /ea	\$6,872
BP Fire Booster Panel	10 ea	\$3,436.21 /ea	\$34,362
Fire Alarm Annunciator large composite unit	19 ea	\$4,425.21 /ea	\$84,079
Fire Alarm Misc connection Fire Pump , Gas Shut off to FACP	2.00 ea	\$1,500.00 /ea	\$3,000
D6016 SURVEILLANCE CCTV SYSTEM		\$2.47 / SF	\$939,423
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 Exterior 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	69 ea	\$330.99 /ea	\$22,838
CCTV Camera D1 Data jack with 1/2" Stub to accessible ceiling composite unit 10 feet _1_	183 ea	\$356.76 /ea	\$65,288
Security CCTV Head End - Medium Composite Unit	1.00 ea	\$36,689.00 /ea	\$36,689
CCTV Video Camera - PTZ Dome Camera, Interior Assembly Composite Unit	202 ea	\$1,893.00 /ea	\$382,386
CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly Composite Unit	69 ea	\$2,101.00 /ea	\$144,969
D6017 SECURITY ACCESS CONTROL		\$1.08 / SF	\$411,726
(1) 2" Empty PVC Conduit with pull string composite unit - Large 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 SA - Siren	15 ea	\$186.75 /ea	\$2,801
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 included LR	69 ea	\$179.28 /ea	\$12,370
Security Card Reader Composite Unit	72 ea	\$259.29 /ea	\$18,669
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	61 ea	\$198.77 /ea	\$12,125
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 Unit	8.00 ea	\$1,319.70 /ea	\$10,558
Security Reconciliation Adjustment	1.00 ea	\$160,000.00 /ea	\$160,000
Security Intercom Station With Video Interior / Exterior WP Composite Unit	6.00 ea	\$684.76 /ea	\$4,109
Security VES - Security Stantion with airphone intercom	7.00 ea	\$684.76 /ea	\$4,793
Security VMS - Security Stantion with airphone intercom	5.00 ea	\$684.76 /ea	\$3,424
Security Head End and Testing	1.00 ea	\$125,000.00 /ea	\$125,000
D7050 DETECTION & ALARM		\$2.42 / SF	\$921,516
D6011 FIRE ALARM SYSTEM		\$2.42 / SF	\$921,516

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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
Fire Alarm CO detector composite unit	50 ea	\$341.54 /ea	\$17,077
Fire Alarm Heat detector composite unit	102 ea	\$341.54 /ea	\$34,837
Area of Refuge ESC	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
E10 EQUIPMENT	380,570 SF	\$14.92 / SF	\$5,679,882
E1030 COMMERCIAL EQUIPMENT		\$6.34 / SF	\$2,411,900
E1038 FOODSERVICE EQUIPMENT		\$6.34 / SF	\$2,411,900
Food Service Equipment (Sub quote)	1.00 ls	\$2,411,900.00 /ls	\$2,411,900
E1040 INSTITUTIONAL EQUIPMENT		\$1.20 / SF	\$457,006
E1044.2 LABORATORY EQUIPMENT		\$0.24 / SF	\$93,000
Equipment - Fume Hood (FH-1) - Ductless, ADA Base - REDUCED PER RECON	6.00 ea	\$15,500.00 /ea	\$93,000
E1044.4 EDUCATIONAL & SCIENTIFIC EQUIPMENT		\$0.96 / SF	\$364,006
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 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 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 / 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 Collection Arms - Welding	0.00 ea		\$0
Equipment - Auto Collision (AT11) Install ONLY Vehicle Exhaust Collection	0.00 ea		\$0
Equipment - Auto Collision (AT12) F&I 1 Ton Chain Fall	0.00 ea		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Equipment - Auto Collision (AT25) F&I Hoist Crane	0.00 ea		\$0
Equipment - Carpentry (CP01) F&I Dust Collection - Full Shop, see 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 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 Styling Stations	24 ea	\$5,035.00 /ea	\$120,840
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 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 Package	0.00 ea		\$0
Equipment - Design and Visual (DV01) Install ONLY Large Digital Press	0.00 ea		\$0
Equipment - Design and Visual (DV01A) Install ONLY 3PH 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 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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 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 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 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 Squaring Shear	0.00 ea		\$0
Equipment - Metal Fabrication (MF02A) Install ONLY Hydraulic Squaring Shear	0.00 ea		\$0
Equipment - Metal Fabrication (MF03) Install ONLY CNC Hydraulic Press Brake	0.00 ea		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Equipment - Metal Fabrication (MF61) Install ONLY Overhead 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
Equipment - Robotics (RB01) F&I Air Compressor	900 mhr	\$110.00 /mhr	\$99,000
E1070 ENTERTAINMENT & RECREATIONAL EQUIPMENT		\$1.32 / SF	\$503,880
E1071 THEATER & STAGE EQUIPMENT		\$1.32 / SF	\$503,880
Stage Curtains and Rigging - Powered rigging	1.00 ls	\$195,000.00 /ls	\$195,000
Theater - Auditorium Fixed Seating	572 ea	\$540.00 /ea	\$308,880
E1090 OTHER EQUIPMENT		\$0.92 / SF	\$351,281
E1097 ATHLETIC, RECREATIONAL, & THERAPEUTIC EQUIPMENT		\$0.92 / SF	\$351,281
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	\$52,500.00 /ea	\$210,000
E1098 RESIDENTIAL EQUIPMENT		\$0.00 / SF	\$0
Rooftop Play Equipment - not shown, exclude	0.00 nic		\$0
E2010 FIXED FURNISHINGS		\$5.14 / SF	\$1,955,815
E2013 CASEWORK		\$5.14 / SF	\$1,955,815
Countertop-Casework, Epoxy	1,138 lf	\$118.00 /lf	\$134,333
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	\$0
Custom Millwork - Wood Cubbie - 4' high	24 ea	\$745.00 /ea	\$17,880
Casework - Base Cabinets	754 lf	\$320.00 /lf	\$241,146
Casework - Base Cabinets - Design Visual Flat File	14 lf	\$495.00 /lf	\$6,707
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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Casework - Mailroom	12 lf	\$350.00 /lf	\$4,242
Casework - Tall Storage 7' high	384 lf	\$595.00 /lf	\$228,721
Casework - Cabinet - Cubbies (2'-3"x2'8")	5.00 ea	\$495.00 /ea	\$2,475
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	\$555.00 /lf	\$24,690
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	380,570 SF	\$0.92 / SF	\$350,047
E2010 FIXED FURNISHINGS		\$0.92 / SF	\$350,047
E2012 WINDOW TREATMENTS		\$0.92 / SF	\$350,047
Window Shades - Manual Operated - Interior	174 ea	\$150.00 /ea	\$26,100
Roller Shades - Manual Operated - Translucent Wall Panel System, assume not required	2,630 sf	\$0.00 /sf	\$0
Roller Shades - Manual Operated - Exterior Windows Aluminum System	10,209 sf	\$9.75 /sf	\$99,538
Roller Shades - Manual Operated - Exterior Storefront System	4,658 sf	\$9.75 /sf	\$45,416
Roller Shades - Manual Operated - Exterior Curtain Wall System	13,100 sf	\$9.75 /sf	\$127,725
Roller Shades - Electrically Operated - Exterior Curtain Wall System @ Rotunda	2,563 sf	\$20.00 /sf	\$51,269
TOTAL MAIN BUILDING		\$427.42 / SF	\$162,663,391

MAINTENANCE BLDG

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
A10 FOUNDATIONS	0 SF	\$93,200.00 / SF	\$93,200
A1010 STANDARD FOUNDATIONS		\$93,200.00 / SF	\$93,200
A1010 STANDARD FOUNDATIONS		\$93,200.00 / SF	\$93,200
Standard Concrete Foundation - Complete \$/sf - Storage Building	10,400 sf	\$8.00 /sf	\$83,200
BP 31A - F&I Building Foundation Drainage - Perforated PVC	1.00 ls	\$10,000.00 /ls	\$10,000
A20 SUBGRADE ENCLOSURES	0 SF	\$252,300.00 / SF	\$252,300
A2010 WALLS FOR SUBGRADE ENCLOSURES		\$232,500.00 / SF	\$232,500
A2011 SUBGRADE ENCLOSURE WALL CONSTRUCTION		\$232,500.00 / SF	\$232,500
Standard Concrete Foundation - Complete \$/sf - walls	150 cy	\$1,550.00 /cy	\$232,500
A2020 BASEMENT WALL CONSTRUCTION		\$19,800.00 / SF	\$19,800
A2020 BASEMENT WALL CONSTRUCTION		\$9,000.00 / SF	\$9,000
Rigid Insulation @ Fndn. Walls	1,800 sf	\$5.00 /sf	\$9,000
A2022 MOISTURE PROTECTION		\$10,800.00 / SF	\$10,800
Dampproofing - Foundation Walls	1,800 sf	\$6.00 /sf	\$10,800
A40 SLABS-ON-GRADE	0 SF	\$135,200.00 / SF	\$135,200
A4010 STANDARD SLABS-ON-GRADE		\$135,200.00 / SF	\$135,200
A4010 STANDARD SLABS-ON-GRADE		\$135,200.00 / SF	\$135,200
Standard Concrete SOG - Complete \$/sf Storage Building	10,400 sf	\$12.00 /sf	\$124,800
Waterproof SOG - Vapor Barrier	10,400 sf	\$1.00 /sf	\$10,400
A60 WATER & GAS MITIGATION	0 SF	\$15,000.00 / SF	\$15,000
A6010 BUILDING SUBDRAINAGE		\$15,000.00 / SF	\$15,000
A6011 FOUNDATION DRAINAGE		\$15,000.00 / SF	\$15,000
BP 31A - Building Foundation Drainage - Perforated PVC (F&I)	332 lf	\$45.18 /lf	\$15,000
D50 ELECTRICAL	0 SF	\$0.00 / SF	\$0
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$0.00 / SF	\$0
D5023 LARGE POWER & DISTRIBUTION		\$0.00 / SF	\$0
112.5 KVA NEMA 1 Transformer composite unit	0.00 ea		\$0
400 AMP 120/208 Panel board surface mounted composite unit	0.00 ea		\$0
225 AMP 277/480 Panel board surface mounted composite unit	0.00 ea		\$0
D5024 LARGE POWER FEEDER CONDUIT		\$0.00 / SF	\$0
#333 400 AMP EMT Composite feeders Aluminum - Large Power	0.00 lf		\$0
#331 225 AMP PVC Composite feeder aluminum - Large Power	0.00 lf		\$0
TOTAL MAINTENANCE BLDG		\$495,700.00 / SF	\$495,700

SITEWORK

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
D50 ELECTRICAL	60 acre	\$12,600.65 / acre	\$756,039
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$12,600.65 / acre	\$756,039
D5021 MEDIUM VOLTAGE CONDUIT AND CABLING		\$9,727.85 / acre	\$583,671
Duct Bank B (2) 4" Empty PVC Conduit with pull string composite unit Spares	1,528 lf	\$38.00 /lf	\$58,064
Duct Bank C (8) 4" Empty PVC Conduit with pull string composite unit Spares	1,247 lf	\$152.00 /lf	\$189,544
Duct Bank D (4) 4" Empty PVC Conduit with pull string composite unit Spares	1,527 lf	\$76.00 /lf	\$116,052
Duct Bank F (4) 4" Empty PVC Conduit with pull string composite unit Spares	90 lf	\$76.00 /lf	\$6,840
Duct Bank H (4) 4" Empty PVC Conduit with pull string composite unit Spares	713 lf	\$76.00 /lf	\$54,188
Duct Bank K (2) 4" Empty PVC Conduit with pull string composite unit Spares	34 lf	\$38.00 /lf	\$1,292
Duct Bank N (6) 4" Empty PVC Conduit with pull string composite unit Spares	824 lf	\$114.00 /lf	\$93,936
Duct Bank O (3) 4" Empty PVC Conduit with pull string composite unit Spares	263 lf	\$51.00 /lf	\$13,413
Duct Bank M (6) 2" Empty PVC Conduit with pull string composite unit - Large Power	771 lf	\$54.08 /lf	\$41,698
Site Duct Bank (2) 2" Empty PVC Conduit with pull string composite unit - Large Power	339 lf	\$18.00 /lf	\$6,102
Site Duct Bank (6) 2" Empty PVC Conduit with pull string composite unit - Large Power	47 lf	\$54.08 /lf	\$2,542
D5023 LARGE POWER & DISTRIBUTION		\$707.00 / acre	\$42,420
75 KVA NEMA 1 Transformer composite unit at Site	1.00 ea	\$9,961.68 /ea	\$9,962
75 kva and combined Panelboard for ev charging	3.00 ea	\$3,500.00 /ea	\$10,500
225 AMP 120/208 Panel board surface mounted composite unit at Site	1.00 ea	\$3,989.84 /ea	\$3,990
300 AMP 277/480 Panel board surface mounted composite unit Site	1.00 ea	\$5,556.76 /ea	\$5,557
800 AMP 277/480 Distribution Panel board surface mounted composite unit - LPH in site lighting pedestal cabinet	1.00 ea	\$12,411.87 /ea	\$12,412
D5024 LARGE POWER FEEDER CONDUIT		\$1,622.57 / acre	\$97,354
#343 125 AMP PVC Composite feeder aluminum - Large Power	700 lf	\$38.22 /lf	\$26,756
#345 300 AMP PVC Composite feeder aluminum - Large Power	700 lf	\$73.97 /lf	\$51,776
#339 800 AMP PVC Composite feeder copper - Large Power	60 lf	\$283.47 /lf	\$17,008
Site Duct Bank (1) 1" Empty PVC Conduit with pull string composite unit - Large Power	115 lf	\$15.77 /lf	\$1,814
D5029 SMALL POWER DEVICES & WIRING		\$277.91 / acre	\$16,675
60 AMP PVC Composite feeder copper - Large Power for transh compactors	652 lf	\$25.57 /lf	\$16,675
D5049 SITE LIGHTING		\$265.32 / acre	\$15,919
30 AMP EMT Composite feeders copper - Large Power Site Wall Lighting	806 lf	\$19.75 /lf	\$15,919

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
G10 SITE PREPARATION	60 acre	\$212,539.75 / acre	\$12,752,385
G1010 SITE CLEARING		\$15,506.87 / acre	\$930,412
G1011 CLEARING & GRUBBING		\$15,506.87 / acre	\$930,412
BP 31A - Bulk Site Clearing & Grubbing	35 acre	\$5,600.00 /acre	\$196,000
BP 31A - Strip Forest Mat P1 - Offsite Disposal - P1	10,000 cy	\$42.00 /cy	\$420,000
BP 31A - Strip topsoil & screen & stockpile for re-use P1 - P2	8,274 cy	\$38.00 /cy	\$314,412
G1020 SITE ELEMENTS DEMOLITION		\$5,336.35 / acre	\$320,181
G1023 INFRASTRUCTURE DEMOLITION		\$5,336.35 / acre	\$320,181
BP 31A - R&D Elec Conduit	581 lf	\$27.00 /lf	\$15,687
BP 31A - R&D Elec DB	1,173 lf	\$43.00 /lf	\$50,439
BP 31A - R&D Gas	132 lf	\$27.00 /lf	\$3,564
BP 31A - R&D Sewer/Drain Pipe	4,122 lf	\$28.00 /lf	\$115,416
BP 31A - R&D Water	2,859 lf	\$25.00 /lf	\$71,475
BP 31A - Cut & Cap Water Service	2.00 ea	\$16,500.00 /ea	\$33,000
BP 31A - R&D Sewer Drain Structure	51 ea	\$600.00 /ea	\$30,600
G1030 SITE ELEMENT RELOCATIONS		\$146,026.75 / acre	\$8,761,605
G1033 ROCK EXCAVATION		\$131,943.32 / acre	\$7,916,599
BP 31A - Mass Rock Blasting	138,361 cy	\$17.35 /cy	\$2,400,563
BP 31A - Mass Rock Excavation	138,361 cy	\$13.00 /cy	\$1,798,693
BP 31A - Mass Rock Processing	138,361 cy	\$11.00 /cy	\$1,521,971
BP 31A - ROCK EXCAVATION TO SUBSURFACE SYTEM #2	5,327 cy	\$36.00 /cy	\$191,760
BP 31A - Allow for additional material handling due to logistics	148,632 cy	\$3.00 /cy	\$445,896
BP 31A - Allow for Rock Scaling	1.00 ls	\$154,300.00 /ls	\$154,300
BP 31A - TO 5' BELOW SLAB FOR OVERBLAST	16,667 cy	\$35.00 /cy	\$583,333
BP 31A - Trench Rock Blasting	10,001 cy	\$55.00 /cy	\$550,055
BP 31A - Trench Rock Excavation	10,001 cy	\$15.00 /cy	\$150,015
BP 31A - Trench Rock Processing	10,001 cy	\$12.00 /cy	\$120,012
G1034 FILL & BORROW		\$10,101.47 / acre	\$606,088
BP 31A - Fill to get to sub grade elev - phase 1 - from onsite processed rock	49,222 cy	\$8.00 /cy	\$393,776
BP 31A - Fill to get to sub grade elev - phase 2 - from onsite processed rock	26,539 cy	\$8.00 /cy	\$212,312
G1035 TEMPORARY EROSION & SEDIMENT CONTROL		\$3,981.97 / acre	\$238,918
BP 31A - Antitracking Pads	6.00 ea	\$5,000.00 /ea	\$30,000
BP 31A - Erosion Control Hay Bales / Silt Fence	8,377 lf	\$9.00 /lf	\$75,393
BP 31A - Erosion Control Blankets & Mats	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Erosion Control - CB Inlet Protection	149 ls	\$225.00 /ls	\$33,525
BP 31A - Erosion Control - Maintain / remove	1.00 ls	\$75,000.00 /ls	\$75,000
G1070 SITE EARTHWORK		\$45,669.78 / acre	\$2,740,187
G1072 EXCAVATION & FILL		\$45,669.78 / acre	\$2,740,187
BP31A - Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 1	20,386 cy	\$32.00 /cy	\$652,352

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP31A - Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 2	39,376 cy	\$32.00 /cy	\$1,260,032
BP31A - Bulk Excavation Offsite Disposal - processed rock Phase 1 (sell)	62,601 cy	\$3.00 /cy	\$187,803
BP31A - Excavate & Backfill for Site Improvements items (pads / stairs, etc)	20,000 cy	\$32.00 /cy	\$640,000
G20 SITE IMPROVEMENTS	60 acre	\$195,247.63 / acre	\$11,714,858
G1070 SITE EARTHWORK		\$4,083.75 / acre	\$245,025
G1072 EXCAVATION & FILL		\$4,083.75 / acre	\$245,025
BP31A - Rip Rap Slopes	3,267 cy	\$75.00 /cy	\$245,025
G2010 ROADWAYS		\$34,937.34 / acre	\$2,096,240
G2011 ROADWAY PAVEMENT		\$22,810.36 / acre	\$1,368,621
BP31A - Fine Grade Pavement Base	316,791 sf	\$0.35 /sf	\$110,877
BP31A - Backfill Pavement Base Mat'l. - processed material	15,650 cy	\$8.00 /cy	\$125,200
BP 31A - Bituminious Paving - Parking Lot Pavement	16,957 sy	\$28.00 /sy	\$474,796
BP 31A - Bituminious Paving - Roadway Pavement	17,073 sy	\$28.00 /sy	\$478,044
BP 31A - Raised Crosswalks @ Bit Pavement	208 sy	\$30.00 /sy	\$6,240
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		\$10,709.65 / acre	\$642,579
BP 31A - Granite Curbing - Vertical (Staight & Radius)	10,994 lf	\$56.00 /lf	\$615,664
BP 31A - Bituminous Curbing (Cape Cod Berm)	5,383 lf	\$5.00 /lf	\$26,915
G2013 MARKING & SIGNAGE		\$1,417.33 / acre	\$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		\$7,454.23 / acre	\$447,254
G2031 PEDESTRIAN PAVEMENT		\$7,454.23 / acre	\$447,254
BP31A - Prepare & Compact Subbase	78,756 sf	\$0.50 /sf	\$39,378
BP31A - Backfill Pavement Base Mat'l. - processed material	2,550 cy	\$10.00 /cy	\$25,500
BP 31A - Asphalt Walkway Paving	5,420 sy	\$27.00 /sy	\$146,340
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 bands	0.00 sf		\$0
Concrete Paving - Integral Color Exposed Aggregate - accent bands - etched	0.00 sf		\$0
Concrete Paving - Ramps	324 sf	\$15.00 /sf	\$4,860
Stone Dust Walk - stabilized	179 sf	\$10.00 /sf	\$1,790
Unit Pavers - Granite / Precast	0.00 excl		\$0
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$53,594.55 / acre	\$3,215,673
E1097 ATHLETIC, RECREATIONAL, & THERAPEUTIC EQUIPMENT		\$10,592.92 / acre	\$635,575
Permanent Bleachers (F&I) including pressbox	508 seat	\$679.13 /seat	\$345,000

SITEWORK [CONTINUED]

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 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 alt		\$0
Sportsfield Specialties - Baseball - Dugouts 8'x34' (material only)	0.00 alt		\$0
Sportsfield Specialties - Softball- Dugouts 8'x34' (material only)	0.00 alt		\$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 (material only)	0.00 lf		\$0
Sportsfield Specialties - Tension Netting Backstop - 42'h - Baseball (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 (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 (material only)	1.00 ea	\$1,085.00 /ea	\$1,085
Sportsfield Specialties - Tennis Court Nets - Net, Posts, Sleeves (material only)	0.00 alt		\$0
Exterior Athletic Equipment - Labor to Unbox, Assemble, & Install Outdoor Fitness Equipment	16 crdy	\$5,440.00 /crdy	\$87,040
Backstops	0.00 alt		\$0
Softball - Field Backstops	0.00 alt		\$0
G2057 PLAYING FIELDS		\$43,001.63 / acre	\$2,580,098
BP 31A - Prepare & Compact Subbase	130,000 sf	\$1.00 /sf	\$130,000
BP 31A - Subgrade layer @ Natural Playing surfaces, FB & Track	130,000 sf	\$4.00 /sf	\$520,000
BP 31A - Subgrade layer @ Synthetic Playing surfaces	0.00 sf		\$0

SITWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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	0.00 alt		\$0
FB Field Natural Turf FB Field	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	31,852 sf	\$25.00 /sf	\$796,300
Resilient Track D Zone (FB Endzone)	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		\$58,393.00 / acre	\$3,503,580
G2033 EXTERIOR STEPS & RAMPS		\$4,372.67 / acre	\$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		\$6,889.17 / acre	\$413,350
BP 31A - Retaining Walls Complete \$/lf - segmental	492 lf	\$350.00 /lf	\$172,200
Retaining Wall - Concrete (CIP) -BENCH SHELF 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
BP 31A - Retaining Walls - Crushed Stone Base	725 cy	\$70.00 /cy	\$50,750
G2056 SIGNAGE		\$500.00 / acre	\$30,000
Custom Site / Building Sign Allowance	1.00 allw	\$30,000.00 /allw	\$30,000
G2059 OTHER SITE IMPROVEMENTS		\$5,086.67 / acre	\$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
Flagpoles w/ Base	1.00 ls	\$10,000.00 /ls	\$10,000
G2061.4 SITE FURNISHINGS		\$38,152.83 / acre	\$2,289,170
Backless Wood Bench w Perforated Metal Skirting & LED Lightng	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	8,424 sf	\$150.00 /sf	\$1,263,600
Pre-engineeered Boardwalk Stairs System	421 sf	\$170.00 /sf	\$71,570
Pre-engineeered Boardwalk System - detail chenge from 60CD on railing	1.00 ls	\$750,000.00 /ls	\$750,000
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

SITWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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	\$53,500.00 /ls	(\$53,500)
Metal Shipping containers - excluded - still shown but previous VE / FFE	0.00 ea		\$0
G2062 FENCES & GATES		\$3,391.67 / acre	\$203,500
Site Fencing - Ornamental - metal stair w integrated guardrail - 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		\$36,784.76 / acre	\$2,207,086
G2061.4 SITE FURNISHINGS		\$3,387.50 / acre	\$203,250
Seating Boulder - Furnish and Set, assume imported (ave weight > 2 tons ea)	30 ea	\$6,775.00 /ea	\$203,250
G2081 PLANTING IRRIGATION		\$3,319.01 / acre	\$199,141
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 - not at athletic fields - excluded	0.00 nic		\$0
G2082 TURF & GRASSES		\$24,714.33 / acre	\$1,482,860
Topsoil / Loam	2,000 cy	\$38.00 /cy	\$76,000
Topsoil / Loam - From Stockpile - F&I	4,250 cy	\$15.00 /cy	\$63,750
Topsoil / Loam - Off-Site - F&I	17,894 cy	\$65.00 /cy	\$1,163,110
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		\$5,363.92 / acre	\$321,835
Groundcover - Pennsylvania Sedge - 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	\$4,650
02 - Red Maple - 1" cal	7.00 ea	\$650.00 /ea	\$4,550
03 - Sugar Maple - 2.5" cal	3.00 ea	\$1,000.00 /ea	\$3,000
04 - Clump Paper Birch - 7-8' ht	7.00 ea	\$750.00 /ea	\$5,250
05 - Heritage Birch - 10-12' ht	6.00 ea	\$750.00 /ea	\$4,500
06 - Whitespire Birch - 12-14' ht	6.00 ea	\$1,100.00 /ea	\$6,600

SITWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
07 - Renaissance Upright Paper Birch - 12' - 14'	9.00 ea	\$1,000.00 /ea	\$9,000
08 - American Beech - 2.5" cal	5.00 ea	\$1,000.00 /ea	\$5,000
09 - Dawn Redwood - 3" cal	6.00 ea	\$1,200.00 /ea	\$7,200
11 - Black Gum - 2.5" cal	8.00 ea	\$1,000.00 /ea	\$8,000
11- White Oak - 1.5" cal	8.00 ea	\$650.00 /ea	\$5,200
12 - Swamp White Oak - 3" cal	4.00 ea	\$1,200.00 /ea	\$4,800
13 - Burr Oak - 2-2.5" cal	9.00 ea	\$1,400.00 /ea	\$12,600
14 - Red Oak - 2.5" - 3" cal	12 ea	\$1,300.00 /ea	\$15,600
15 - American Elm - 2.5-3" cal	17 ea	\$1,300.00 /ea	\$22,100
21 - Eastern Red Cedar - 7-8'	7.00 ea	\$785.00 /ea	\$5,495
22 - Pitch Pine - 6-7' ht	7.00 ea	\$900.00 /ea	\$6,300
23 - White Pine - 8-10' ht	15 ea	\$950.00 /ea	\$14,250
24 - White Pine - 5-6' ht	6.00 ea	\$675.00 /ea	\$4,050
25 - Autumn Brilliance Serviceberry - 7-8' ht	17 ea	\$750.00 /ea	\$12,750
26 - Donald Wyman Crabapple - 2"-2.5" cal	6.00 ea	\$750.00 /ea	\$4,500
27 - Autumn Flowering Cherry - 3" cal	1.00 ea	\$1,400.00 /ea	\$1,400
28 - Downy Serviceberry - 4.5-5' ht	6.00 ea	\$575.00 /ea	\$3,450
50 - Temporary Wetland Impacts	1.00 ls	\$50,000.00 /ls	\$50,000
60 - Invasive Planting Areas Plantings - #1 through #4	280 ea	\$150.00 /ea	\$42,000
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	60 acre	\$78,327.90 / acre	\$4,699,674
G3010 WATER UTILITIES		\$12,688.50 / acre	\$761,310
G3011 SITE DOMESTIC WATER DISTRIBUTION		\$12,688.50 / acre	\$761,310
BP 31A - Excav / Bkfl / Install - 2" Copper Water Line	72 lf	\$75.00 /lf	\$5,400
BP 31A - Excav / Bkfl / Install - 4" DI Water Line	236 lf	\$85.00 /lf	\$20,060
BP 31A - Excav / Bkfl / Install - 6" DI run out to hydrant	353 lf	\$90.00 /lf	\$31,770
BP 31A - Excav / Bkfl / Install - 6" DI water service to bldg	52 lf	\$90.00 /lf	\$4,680
BP 31A - Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg	190 lf	\$100.00 /lf	\$19,000
BP 31A - Excav / Bkfl / Install - 8" DICL Water Line - loop	5,954 lf	\$100.00 /lf	\$595,400
BP 31A - Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES	1,500 lf	\$15.00 /lf	\$22,500
BP 31A - Tap Existing Water Main	3.00 cond	\$10,000.00 /cond	\$30,000
BP 31A - Test / Flush-out	1.00 ls	\$5,000.00 /ls	\$5,000
BP 31A - Fire Hydrants	11 ea	\$2,500.00 /ea	\$27,500
G3020 SANITARY SEWERAGE UTILITIES		\$9,450.42 / acre	\$567,025
G3020 SANITARY SEWERAGE UTILITIES		\$9,450.42 / acre	\$567,025
BP 31A - Relining existing sewer (videotape by others to confirm need)	0.00 nic		\$0
BP 31A - Sanitary Sewerage Piping, PVC, New 4" PVC	87 lf	\$50.00 /lf	\$4,350
BP 31A - Sanitary Sewerage Piping, PVC, New 4" PVC Vent pipe	145 lf	\$50.00 /lf	\$7,250
BP 31A - Sanitary Sewerage Piping, PVC, New 6" Cast Iron	174 lf	\$90.00 /lf	\$15,660
BP 31A - Sanitary Sewerage Piping, PVC, New 6" PVC	949 lf	\$65.00 /lf	\$61,685

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Sanitary Sewerage Piping, PVC, New 6" PVC, Forced Main	0.00 nic		\$0
BP 31A - Sanitary Sewerage Piping, PVC, New 8"	3,144 lf	\$70.00 /lf	\$220,080
BP 31A - Sanitary Sewerage Pump Station	0.00 nic		\$0
BP 31A - Oil/ Gas Sperator	3.00 ea	\$5,000.00 /ea	\$15,000
BP 31A - Sanitary Manhole	39 ea	\$4,500.00 /ea	\$175,500
BP 31A - Tie-in to Existing Manholes / Pipe	1.00 cond	\$10,000.00 /cond	\$10,000
BP 31A - Grease Trap - Installed - 1,000 gal	1.00 ea	\$7,500.00 /ea	\$7,500
BP 31A - Grease Trap - Installed - 10,000 gal	1.00 ea	\$50,000.00 /ea	\$50,000
G3030 STORM DRAINAGE UTILITIES		\$56,188.98 / acre	\$3,371,339
G3032 STORM DRAINAGE PIPING		\$16,406.58 / acre	\$984,395
BP 31A - Excav / Bkfl / Install - 06" CPP Storm Drainage	345 lf	\$55.00 /lf	\$18,975
BP 31A - Excav / Bkfl / Install - 06" CPP Storm Drainage , underdrain	940 lf	\$55.00 /lf	\$51,700
BP 31A - Excav / Bkfl / Install - 08" CPP Storm Drainage	237 lf	\$65.00 /lf	\$15,405
BP 31A - Excav / Bkfl / Install - 10" CPP Storm Drainage	164 lf	\$68.00 /lf	\$11,152
BP 31A - Excav / Bkfl / Install - 12" CPP Storm Drainage	7,844 lf	\$72.00 /lf	\$564,768
BP 31A - Excav / Bkfl / Install - 12" CPP Storm Drainage, perforated	458 lf	\$75.00 /lf	\$34,350
BP 31A - Excav / Bkfl / Install - 15" CPP Storm Drainage	213 lf	\$90.00 /lf	\$19,170
BP 31A - Excav / Bkfl / Install - 18" CPP Storm Drainage	971 lf	\$110.00 /lf	\$106,810
BP 31A - Excav / Bkfl / Install - 24" CPP Storm Drainage	1,112 lf	\$120.00 /lf	\$133,440
BP 31A - Excav / Bkfl / Install - 30" CPP Storm Drainage	75 lf	\$130.00 /lf	\$9,750
BP 31A - Excav / Bkfl / Install - 36" CPP Storm Drainage	0.00 nic		\$0
BP 31A - Trench Drain	151 lf	\$125.00 /lf	\$18,875
G3033 STORM SEWER STRUCTURES		\$15,126.67 / acre	\$907,600
BP 31A - Storm Septors Water Quality Unit - Installed (WQS & WQI)	18 ea	\$8,000.00 /ea	\$144,000
BP 31A - Precast Storm Manholes 4'- 6" - Installed	78 ea	\$4,500.00 /ea	\$351,000
BP 31A - Precast Culvert - installed	1.00 ls	\$60,000.00 /ls	\$60,000
BP 31A - Precast Storm Catch Basins - Installed	70 ea	\$4,000.00 /ea	\$280,000
BP 31A - Storm Structures - Connect new pipe to Existing	2.00 ea	\$5,000.00 /ea	\$10,000
BP 31A - Precast Storm Oil/Water Separator Tank - Installed (OCS)	6.00 ea	\$4,200.00 /ea	\$25,200
BP 31A - Area Drains - Installed	17 ea	\$2,200.00 /ea	\$37,400
G3036.4 SITE SUBDRAINAGE		\$1,666.67 / acre	\$100,000
BP 31A - Maintain Groundwater System Operation through construction (temp swales, etc)	1.00 allw	\$100,000.00 /allw	\$100,000
G3037 STORM DRAINAGE PONDS & RESERVOIRS		\$22,989.07 / acre	\$1,379,344
BP 31A - Underground Storm Water Retention System - #1	11,440 sf	\$32.00 /sf	\$366,080
BP 31A - Underground Storm Water Retention System - #2	14,063 sf	\$32.00 /sf	\$450,016
BP 31A - Underground Storm Water Retention System - #3	12,665 sf	\$32.00 /sf	\$405,280
BP 31A - Underground Storm Water Retention System - #4	3,921 sf	\$32.00 /sf	\$125,472
BP 31A - Underground Storm Water Retention System - #5	703 sf	\$32.00 /sf	\$22,496
BP 31A - Flared End / Swale	4.00 cond	\$2,000.00 /cond	\$8,000
BP 31A - Headwall	1.00 ea	\$2,000.00 /ea	\$2,000

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
G3060 SITE FUEL DISTRIBUTION		\$0.00 / acre	\$0
G3066.2 GAS DISTRIBUTION PIPING (NATURAL & PROPANE)		\$0.00 / acre	\$0
BP 31A - Excav / Bkfl / Install - 6" Natural Gas Line	0.00 lf		\$0
G40 ELECTRICAL SITE IMPROVEMENTS	60 acre	\$57,370.45 / acre	\$3,442,227
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$13,365.50 / acre	\$801,930
D5021 MEDIUM VOLTAGE CONDUIT AND CABLING		\$1,807.15 / acre	\$108,429
Primary Above Ground Enclosures- 07/01/22 Main Distribution	12 ea	\$5,806.14 /ea	\$69,674
Ground Manholes and above Ground Enclosures	12 ea	\$740.48 /ea	\$8,886
Ground Transformer Pads - 07/01/22 Main Distribution	3.00 ea	\$2,683.37 /ea	\$8,050
Layout Transformer Pads - 07/01/22 Main Distribution	3.00 ea	\$2,683.37 /ea	\$8,050
Existing overhead Services Removed	312 ea	\$19.84 /ea	\$6,191
Feeder #001 (2) 5" Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Feeder #079 (4) 5" Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Feeder #086 (4) 5" Emergency Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Telcom Cable Overhead	99 lf	\$76.55 /lf	\$7,579
D5022 MEDIUM VOLTAGE SWITCHGEAR AND PANELBOARD		\$0.00 / acre	\$0
Generator by Utility Company	1.00 ea	\$0.00 /ea	\$0
D5024 LARGE POWER FEEDER CONDUIT		\$11,507.64 / acre	\$690,458
100 AMP PVC Composite feeders Copper - Large Power EV charging Station	839 lf	\$102.06 /lf	\$85,629
250 AMP PVC Composite feeder copper - Large Power to sports field lighting	650 lf	\$98.13 /lf	\$63,787
Feeder #085 600 AMP PVC Composite feeder copper - Large Power	220 lf	\$243.95 /lf	\$53,669
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 Power	169 lf	\$1,464.53 /lf	\$247,506
Feeder #080 4000 AMP PVC Composite feeder copper - Large Power	191 lf	\$1,464.53 /lf	\$279,726
Reduce Secondary Lenth 4000 AMP PVC Composite feeder copper - Large Power per recon 05-08-2023	-100.00 lf	\$1,464.53 /lf	(\$146,453)
D5029 SMALL POWER DEVICES & WIRING		\$50.71 / acre	\$3,043
Power to field Scoreboards	2.00 gsf	\$1,521.43 /gsf	\$3,043
D5040 LIGHTING		\$21,108.85 / acre	\$1,266,531
D5048 SPORTS LIGHTING		\$7,606.29 / acre	\$456,378
Site Lighting Branch	2,000 ea	\$25.69 /ea	\$51,378
Sport Lighting S1 thru @4 for Football includes base install and rigging	4.00 ea	\$100,000.00 /ea	\$400,000
Sprts Lighting Cabinet	1.00 ea	\$5,000.00 /ea	\$5,000
D5049 SITE LIGHTING		\$13,502.56 / acre	\$810,154
120 Votl Cirucit for all Site Pole may need small tranformer	90 ea	\$800.00 /ea	\$72,000

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 Pedestal Cabinet	1.00 ea	\$2,500.00 /ea	\$2,500
Sitel Lighting Pedestal Cabinet for digital sign out near street	1.00 ea	\$2,500.00 /ea	\$2,500
Sitel Lighting Pole Base	112 ea	\$993.66 /ea	\$111,290
Quazite Handhole Enclosure Composite Unit - Cover included	132 ea	\$918.52 /ea	\$121,244
1" for EV chaging Pedstalls	2,403 ea	\$25.00 /ea	\$60,075
2" PVC Gas Storage to building	918 ea	\$16.45 /ea	\$15,103
Site Branch to Digital Sign 2"	918 ea	\$14.77 /ea	\$13,556
Site Lighting Branch 1" for Sign Floor Light	23 ea	\$14.77 /ea	\$340
Site Lighting Branch 2" branch	8,873 ea	\$14.77 /ea	\$131,027
Electrical Vehicle Charging Station Charging Station @ Site VE 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)	1.00 ls	\$6,121.62 /ls	\$6,122
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	24 ea	\$1,886.51 /ea	\$45,276
Site Lighting EXP3	10 ea	\$2,200.00 /ea	\$22,000
EXP1BC Light Fixture Site Pole Single Head Composite Unit	2.00 ea	\$2,017.98 /ea	\$4,036
Exp4 Light Fixture Site Pole Single Head Composite Unit	2.00 ea	\$2,017.98 /ea	\$4,036
Site Lighting EXF1	18 ea	\$1,600.00 /ea	\$28,800
Site Lighting EXP1	40 ea	\$2,017.98 /ea	\$80,719
Site Lighting EXP2	14 ea	\$2,017.98 /ea	\$28,252
D5090 OTHER ELECTRICAL SYSTEMS		\$117.00 / acre	\$7,020
D5095 MISCELLANEOUS ELECTRICAL SYSTEMS		\$117.00 / acre	\$7,020
Quad Shak Lighting Power and Teldata	1.00 ea	\$7,020.00 /ea	\$7,020
D6010 COMMUNICATIONS & SECURITY		\$4,558.85 / acre	\$273,531
D6013 TEL/DATA SYSTEM		\$4,558.85 / acre	\$273,531
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) 1" Empty PVC Conduit with pull String composite unit with 2 Stand Fiber	439 lf	\$20.00 /lf	\$8,780
(1) 2" Empty PVC Conduit with pull String composite unit with 2 Stand Fiber	494 lf	\$28.00 /lf	\$13,832
(1) 4" Empty PVC Conduit with pull String composite unit with 12 Stand Fiber	5,871 lf	\$34.00 /lf	\$199,614
D7050 DETECTION & ALARM		\$416.67 / acre	\$25,000
D6017 SECURITY ACCESS CONTROL		\$416.67 / acre	\$25,000
Security Gate and Power added during Recon 12-20-2022	1.00 ea	\$25,000.00 /ea	\$25,000
G4020 SITE ELECTRICAL		\$14,470.25 / acre	\$868,215
G4025 DUCTBANKS, MANHOLES, & HANDHOLES		\$14,470.25 / acre	\$868,215
BP 31A - Exavate / Backfill / Install Elec MH	14 ea	\$7,500.00 /ea	\$105,000
BP 31A - Excavate / Backfill / Concrete Encasement	4,271 lf	\$75.00 /lf	\$320,325
BP 31A - Excavate / Backfill / Install- Precast Light pole / Bollard Base	107 ea	\$1,500.00 /ea	\$160,500

SITWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Excavate / Backfill site lighting conduit	9,413 lf	\$30.00 /lf	\$282,390
G5010 SITE COMMUNICATIONS SYSTEMS		\$3,333.33 / acre	\$200,000
X9770 CONCEPTUAL BUDGET		\$3,333.33 / acre	\$200,000
BP 31A - Traffic Signal Work - allow moved to G40	1.00 ls	\$200,000.00 /ls	\$200,000
G90 MISCELLANEOUS SITE CONSTRUCTION	60 acre	\$0.00 / acre	\$0
G5010 SITE COMMUNICATIONS SYSTEMS		\$0.00 / acre	\$0
X9770 CONCEPTUAL BUDGET		\$0.00 / acre	\$0
BP 31A - Traffic Signal Work - allow moved to G40	0.00 ls		\$0
Z10 GENERAL REQUIREMENTS	60 acre	\$26,716.67 / acre	\$1,603,000
Z1050 TEMPORARY FACILITIES & CONTROLS		\$26,716.67 / acre	\$1,603,000
Z1055 TEMPORARY CONSTRUCTION		\$26,716.67 / acre	\$1,603,000
BP 31A - Emergency Spill Kit	1.00 ea	\$2,000.00 /ea	\$2,000
BP 31A - Temporary Water and Electric Service - Hook-up & Maintenance	1.00 ls	\$35,000.00 /ls	\$35,000
BP 31A - Temporary Walkways	1.00 ls	\$50,000.00 /ls	\$50,000
BP 31A - Water Truck / Dust Control	1.00 ls	\$30,000.00 /ls	\$30,000
BP 31A - Dewatering - Pumps / Maintenance - Demo/Foundation	1.00 ls	\$400,000.00 /ls	\$400,000
BP 31A - Temporary Access Roads - Farm Rd & Existing Campus Path	4,600 sy	\$32.50 /sy	\$149,500
BP 31A - Temporary Laydown Area - Prep / Maintain	14,275 sy	\$20.00 /sy	\$285,500
BP 31A - Repair Existing Streets, Sidewalks	1.00 allw	\$50,000.00 /allw	\$50,000
BP 31A - Temporary Barriers & Public Safety	1.00 ls	\$40,000.00 /ls	\$40,000
BP 31A - Temporary Bridge Crossing	1.00 ls	\$150,000.00 /ls	\$150,000
BP 31A - Traffic Control - Install & Maintain	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Snow Removal	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Street Sweeping	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Temp Construction Fence w Rock Cores	7,000 lf	\$48.00 /lf	\$336,000
Wrap Building to Place Slabs - incl w GRs	0.00 ls		\$0
TOTAL SITWORK		\$582,803.05 / acre	\$34,968,183

DEMO & ABATEMENT

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
F20 FACILITY REMEDIATION	0 SF	\$2,281,101.00 / SF	\$2,281,101
F2010 HAZARDOUS MATERIALS REMEDIATION		\$2,281,101.00 / SF	\$2,281,101
F2019 OTHER HAZARDOUS SELECTIVE BUILDING DEMOLITION		\$2,281,101.00 / SF	\$2,281,101
Hazardous Materials Abatement	1.00 ls	\$2,281,101.00 /ls	\$2,281,101
F30 DEMOLITION	0 SF	\$3,044,169.00 / SF	\$3,044,169
F3010 STRUCTURE DEMOLITION		\$3,044,169.00 / SF	\$3,044,169
F3011 BUILDING DEMOLITION		\$3,044,169.00 / SF	\$3,044,169
Demolish Existing School Building	239,144 sf	\$12.73 /sf	\$3,044,169
TOTAL DEMO & ABATEMENT		\$5,325,270.00 / SF	\$5,325,270

6C.2.3 – 03

CSI MASTERFORMAT

**COST ESTIMATE
CM-R**

Location / Masterformat	Quantity	Unit Cost	Total Cost
MAIN BUILDING	380,570 SF	\$427.42 / SF	\$162,663,391
03 CONCRETE		\$29.25 / SF	\$11,132,493
04 MASONRY		\$22.37 / SF	\$8,514,596
05 METALS		\$53.07 / SF	\$20,197,830
06 WOOD, PLASTICS, & COMPOSITES		\$7.83 / SF	\$2,978,332
07 THERMAL & MOISTURE PROTECTION		\$36.43 / SF	\$13,863,135
08 OPENINGS		\$27.18 / SF	\$10,343,548
09 FINISHES		\$53.28 / SF	\$20,276,119
10 SPECIALTIES		\$3.83 / SF	\$1,457,832
11 EQUIPMENT		\$10.03 / SF	\$3,816,505
12 FURNISHINGS		\$4.57 / SF	\$1,737,911
14 CONVEYING EQUIPMENT		\$2.59 / SF	\$985,000
21 FIRE SUPPRESSION		\$9.92 / SF	\$3,775,296
22 PLUMBING		\$22.13 / SF	\$8,421,659
23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC)		\$81.17 / SF	\$30,891,850
26 ELECTRICAL		\$42.33 / SF	\$16,110,997
27 COMMUNICATIONS		\$7.71 / SF	\$2,933,945
28 ELECTRONIC SAFETY & SECURITY		\$7.45 / SF	\$2,835,722
31 EARTHWORK		\$5.31 / SF	\$2,021,520
32 EXTERIOR IMPROVEMENTS		\$0.97 / SF	\$369,103
MAINTENANCE BLDG	0 SF	\$495,700.00 / SF	\$495,700
03 CONCRETE		\$0.00 / SF	\$455,500
07 THERMAL & MOISTURE PROTECTION		\$0.00 / SF	\$30,200
26 ELECTRICAL		\$0.00 / SF	\$0
33 UTILITIES		\$0.00 / SF	\$10,000
SITework	60 acre	\$582,803.05 / acre	\$34,968,183
01 GENERAL REQUIREMENTS		\$21,116.67 / acre	\$1,267,000
02 EXISTING CONDITIONS		\$10,936.35 / acre	\$656,181
10 SPECIALTIES		\$500.00 / acre	\$30,000
11 EQUIPMENT		\$10,592.92 / acre	\$635,575
26 ELECTRICAL		\$47,192.00 / acre	\$2,831,520
27 COMMUNICATIONS		\$4,558.85 / acre	\$273,531
28 ELECTRONIC SAFETY & SECURITY		\$416.67 / acre	\$25,000
31 EARTHWORK		\$227,136.40 / acre	\$13,628,184
32 EXTERIOR IMPROVEMENTS		\$167,555.05 / acre	\$10,053,303
33 UTILITIES		\$92,798.15 / acre	\$5,567,889
DEMO & ABATEMENT	0 SF	\$5,325,270.00 / SF	\$5,325,270
02 EXISTING CONDITIONS		\$0.00 / SF	\$5,325,270

Subtotal Direct Cost	\$534.60 /SF	\$203,452,544
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Indirect Costs		Amount	Total Cost
Design and Estimating Contingency	1.25%		\$2,543,157
Subtotal 1			\$205,995,700
Escalation	2.25%		\$4,634,903
Projected Cost of Work			\$210,630,604
Subcontractor Bonds	1.20%		\$2,527,567
Insurance - CCIP (Changed from GL)	2.74%		\$6,820,734
Builders Risk			\$365,272
Payment and Performance Bond			\$1,850,710
Subtotal Insurances			\$222,194,887
CM General Conditions			\$9,687,591
Field Office Support			\$1,694,300
CM General Requirements			\$5,034,190
Cost of Work / Site Services			\$850,000
CM Contingency	2.50%		\$5,265,765
Subtotal 2			\$244,726,733
CM Fee			\$4,205,160
Total Construction Costs			\$248,931,893
Total Construction Cost		\$654.10 /SF	\$248,931,893
Owner Costs			Total Cost
Land & Real Estate Expenses Acquisition			\$0
Professional Services			\$0
Permits and Regulatory Fees			\$0
Furniture, Fixtures, and Equipment			\$0
Telephone, Data, AV, Security			\$0
Major Equipment			\$0
Utility Costs			\$0
Occupancy Expense			\$0
Advertising and Marketing			\$0
Legal, Financial, & Insurance			\$0
Owner's Reserve			\$0
Owner's Other			\$0
Total Owner Costs			\$0
Total Project Cost			\$248,931,893

MAIN BUILDING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
03 CONCRETE	380,570 SF	\$29.25 / SF	\$11,132,493
A1010 STANDARD FOUNDATIONS		\$8.50 / SF	\$3,236,026
A1010 STANDARD FOUNDATIONS		\$0.76 / SF	\$288,836
Formwork - Continuous Footings	3,302 sfca	\$18.00 /sfca	\$59,436
Rebar - Continuous Footings (F&I)	14 ton	\$3,550.00 /ton	\$49,700
Concrete - Continuous Footings (material and placed, typ)	202 cy	\$300.00 /cy	\$60,600
CIP Concrete - Interior Footings @ CMU	116 cy	\$600.00 /cy	\$69,600
Concrete - Footing Steps	22 cy	\$2,250.00 /cy	\$49,500
A1011 WALL FOUNDATIONS		\$2.53 / SF	\$962,361
Formwork - @ Foundation Wall - Exterior Frost Wall	16,387 sfca	\$24.00 /sfca	\$393,288
Formwork - @ Foundation Wall - Exterior Radial Frost Wall	1,525 sfca	\$40.00 /sfca	\$61,000
Formwork - @ Foundation Wall - Interior Wall	5,727 sfca	\$24.00 /sfca	\$137,448
Rebar - Frost Wall (F&I)	47 ton	\$3,550.00 /ton	\$166,850
Concrete - Foundation Walls	627 cy	\$325.00 /cy	\$203,775
A1013 COLUMN FOUNDATIONS		\$4.40 / SF	\$1,674,829
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)	6.00 ton	\$3,550.00 /ton	\$21,300
Rebar - Column Footings (F&I)	133 ton	\$3,550.00 /ton	\$472,150
Concrete Isolated Piers - Complete F&I	55 cy	\$425.00 /cy	\$23,375
Concrete - Column Footings - Complete Complete F&I	1,834 cy	\$300.00 /cy	\$550,200
Column Diamonds, Grout - Isolated Footings	258 ea	\$250.00 /ea	\$64,500
A1019 STANDARD FOUNDATION SUPPLEMENTARY COMPONENTS		\$0.81 / SF	\$310,000
ADD THICKENED SLAB HAUNCH @NON-SHEAR WALL CMU 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
A2020 BASEMENT WALL CONSTRUCTION		\$4.94 / SF	\$1,879,900
A1011 WALL FOUNDATIONS		\$1.11 / SF	\$424,325
Formwork - Retaining Wall Footings	2,329 sfca	\$25.00 /sfca	\$58,225
Rebar - Retaining Wall Footings @ Wall (F&I)	46 ton	\$3,550.00 /ton	\$163,300
F&I Concrete - Retaining Wall Footings	676 cy	\$300.00 /cy	\$202,800
A2020 BASEMENT WALL CONSTRUCTION		\$3.82 / SF	\$1,455,575
Formwork - @ Basement Retaining Wall	31,385 sfca	\$25.00 /sfca	\$784,625
Rebar - Basement Wall (F&I)	85 ton	\$3,550.00 /ton	\$301,750
F&I Concrete - Basement Wall	1,136 cy	\$325.00 /cy	\$369,200
A4010 STANDARD SLABS-ON-GRADE		\$3.60 / SF	\$1,369,936
A4010 STANDARD SLABS-ON-GRADE		\$3.60 / SF	\$1,369,936
Formwork - Slab Edge	5,423 lf	\$18.00 /lf	\$97,614
Formwork - Slab Construction Joints	2,575 lf	\$18.00 /lf	\$46,350
Welded Wire Mesh - Slab on Grade (Incl. Overlap) F&I	147,327 sf	\$1.75 /sf	\$257,822
Concrete Material - (SOG)	1,987 cy	\$150.00 /cy	\$298,050

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Place & Finish Slab on Grade Concrete (6" @shops + 4" elsewhere)	128,111 sf	\$3.25 /sf	\$416,361
Sawcut Slab on Grade Control Joints	7,800 lf	\$12.00 /lf	\$93,600
Cure / Protect Slab on Grade	128,111 sf	\$1.25 /sf	\$160,139
A4040 PITS & BASES		\$0.12 / SF	\$46,500
A4040 PITS & BASES		\$0.12 / SF	\$46,500
Elevator Pit Walls / Mat Slab - complete	16 cy	\$1,500.00 /cy	\$24,000
Other Pit Walls / Mat Slab - Leveling & Equipment	1.00 ls	\$22,500.00 /ls	\$22,500
B1010 FLOOR CONSTRUCTION		\$10.15 / SF	\$3,863,032
B1010 FLOOR CONSTRUCTION		\$7.93 / SF	\$3,018,174
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"	3,780 cy	\$425.00 /cy	\$1,606,500
Finish Concrete - Metal Deck	244,976 sf	\$3.75 /sf	\$918,660
B1012 FLOOR DECKS, SLABS, & TOPPINGS		\$0.40 / SF	\$151,679
Concrete Topping @ Precast Plank - ADJUSTED SQFT PER RECON	15,404 sf	\$7.25 /sf	\$111,679
Housekeeping Pads Complete	1,000 sf	\$40.00 /sf	\$40,000
B1014 MEZZANINE FLOOR CONSTRUCTION		\$1.82 / SF	\$693,180
Floor Precast - Plank - Hollow Core @ Mezzanine - Furnish	15,404 sf	\$13.00 /sf	\$200,252
Floor Precast - Plank - Hollow Core @ Mezzanine - Install	15,404 sf	\$32.00 /sf	\$492,928
B1020 ROOF CONSTRUCTION		\$1.08 / SF	\$409,599
B1022 ROOF DECKS, SLABS, & SHEATHING		\$1.08 / SF	\$409,599
Welded Wire Mesh - Roof Deck (Incl. Overlap) F&I	23,135 sf	\$1.75 /sf	\$40,486
Concrete Material & Place -@ Roof Deck	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 / SF	\$327,500
B1081 STAIR CONSTRUCTION		\$0.86 / SF	\$327,500
Stairs - Concrete In Steel Pan Stairs	16.00 flgt	\$15,000.00 /flgt	\$202,500
Stairs - Concrete risers @ Aud	1.00 ls	\$125,000.00 /ls	\$125,000
04 MASONRY	380,570 SF	\$22.37 / SF	\$8,514,596
B2010 EXTERIOR WALLS		\$11.62 / SF	\$4,424,124
B2011 EXTERIOR WALL VENEER		\$8.61 / SF	\$3,277,810
Staging and Scaffolding - Exterior CMU - All exterior Masonry	1.00 ls	\$182,500.00 /ls	\$182,500
Exterior Face Brick Veneer	23,043 sf	\$45.00 /sf	\$1,036,935
Exterior CMU - CMU Veneer	33,750 sf	\$37.00 /sf	\$1,248,750
Exterior Cast Stone Veneer - Arriscraft	7,245 sf	\$50.00 /sf	\$362,250
Exterior Granite Veneer - Main Entry Feature Wall	2,385 sf	\$175.00 /sf	\$417,375
Cast Stone Column Wraps at South Entrance	2.00 ea	\$15,000.00 /ea	\$30,000
B2012 EXTERIOR WALL CONSTRUCTION		\$3.01 / SF	\$1,146,314
Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU, Insul, AVB, NO INT GWB)	25,909 sf	\$46.00 /sf	\$1,191,814
PER VE-A02 - change 12" Back-up to 8"	-1.00 ls	\$45,500.00 /ls	(\$45,500)
C1010 INTERIOR PARTITIONS		\$10.75 / SF	\$4,090,472

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
C1011 INTERIOR FIXED PARTITIONS		\$10.75 / SF	\$4,090,472
Interior CMU 4.0 - 4"	6,400 sf	\$25.00 /sf	\$160,000
Interior CMU 8.0 - 8"	90,418 sf	\$28.00 /sf	\$2,531,704
Interior CMU 8.0 - 8" LOW	420 sf	\$24.00 /sf	\$10,080
Interior CMU 8.1 - 8"	6,800 sf	\$28.00 /sf	\$190,400
Interior CMU 8.2 - 8" (2hr RATED)	24,572 sf	\$35.00 /sf	\$860,020
Interior CMU 12.0 - 12"	3,074 sf	\$42.00 /sf	\$129,108
Interior CMU 12.1 - 12"	4,240 sf	\$42.00 /sf	\$178,080
Interior CMU 12.2 - 12"	740 sf	\$42.00 /sf	\$31,080
C2010 WALL FINISHES		\$0.00 / SF	\$0
C2015 STONE FACING		\$0.00 / SF	\$0
Interior Stone - Travertine, not show on drawings EXCLUDED	0.00 sf		\$0
05 METALS	380,570 SF	\$53.07 / SF	\$20,197,830
A4040 PITS & BASES		\$0.06 / SF	\$23,200
A4040 PITS & BASES		\$0.06 / SF	\$23,200
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	\$3,900.00 /ea	\$7,800
B1010 FLOOR CONSTRUCTION		\$30.64 / SF	\$11,661,448
B1011 FLOOR STRUCTURAL FRAME		\$30.64 / SF	\$11,661,448
Structural Steel Beams - HSS	50 ton	\$5,300.00 /ton	\$263,198
Structural Steel Beams - MC	459 lb	\$10.00 /lb	\$4,590
Structural Steel Beams - WF	1,260 ton	\$5,200.00 /ton	\$6,552,000
Structural Steel Connections	243 ton	\$5,300.00 /ton	\$1,288,165
Structural Steel Bracing Bays - HSS	107 ton	\$5,300.00 /ton	\$565,245
Temp Stairs / Scaffolding Stairs - 5 sets	1.00 ls	\$200,000.00 /ls	\$200,000
Structural Steel Columns - HSS - Square / Rectangular	283 ton..	\$5,300.00 /ton..	\$1,502,126
Metal Decking - Floor, 2"	244,976 sf	\$5.25 /sf	\$1,286,124
B1020 ROOF CONSTRUCTION		\$15.98 / SF	\$6,083,317
B1021 ROOF STRUCTURAL FRAME		\$15.98 / SF	\$6,083,317
Structural Steel Connections	140 ton	\$5,300.00 /ton	\$744,067
Structural Steel Beams - HSS	1,691 lb	\$4.00 /lb	\$6,764
Structural Steel Beams - MC	261 lb	\$4.00 /lb	\$1,044
Structural Steel Beams - WF	446 ton	\$5,200.00 /ton	\$2,320,916
Structural Steel Bracing Bays - HSS	62 ton	\$5,300.00 /ton	\$326,533
Structural Steel Columns - HSS - Round	26 ton..	\$5,300.00 /ton..	\$138,012
Structural Steel Columns - HSS - Square / Rectangular	164 ton..	\$5,300.00 /ton..	\$867,663
Steel Dunnage - Galvanized	43 ton	\$5,700.00 /ton	\$244,530
Steel Joist - DLH	115 ton.	\$5,100.00 /ton.	\$585,429
Metal Decking - Roof Cornice, 1"	5,915 sf	\$5.00 /sf	\$29,575
Metal Decking - Roof, 1-1/2"	291 sf	\$6.00 /sf	\$1,746
Metal Decking - Roof, 2"	20,118 sf	\$5.30 /sf	\$106,625
Metal Decking - Roof, 3"	102,555 sf	\$5.45 /sf	\$558,925

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Metal Roof Deck - Acoustic	12,624 sf	\$12.00 /sf	\$151,488
B1080 STAIRS		\$3.48 / SF	\$1,324,660
B1081 STAIR CONSTRUCTION		\$3.32 / SF	\$1,262,000
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 location	3.00 flgt	\$130,000.00 /flgt	\$390,000
Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 1 locations	1.00 flgt	\$47,500.00 /flgt	\$47,500
Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 6 locations	15 flgt	\$47,500.00 /flgt	\$712,500
Stairs - Steel Stairs / Rails @ Mezzanine	1.00 ls	\$82,000.00 /ls	\$82,000
B2017 BALCONY WALLS & RAILINGS		\$0.16 / SF	\$62,660
Railing Ballasted Guardrail at High Roof	65 lf	\$160.00 /lf	\$10,400
Railing Exterior Guardrail at Rotunda Porch	195 lf	\$268.00 /lf	\$52,260
B2010 EXTERIOR WALLS		\$0.18 / SF	\$70,145
B2012 EXTERIOR WALL CONSTRUCTION		\$0.18 / SF	\$70,145
Stabilizer Clips-Galv. @ Perimeter Masonry Walls	70,145 sf	\$1.00 /sf	\$70,145
C1030 INTERIOR DOORS		\$0.13 / SF	\$50,000
C1035 INTERIOR PANEL DOORS		\$0.13 / SF	\$50,000
Support Steel - Interior Rolling Door/Grille Supports	1.00 ls	\$50,000.00 /ls	\$50,000
C1090 INTERIOR SPECIALTIES		\$2.59 / SF	\$985,060
C1091.4 INTERIOR RAILINGS & HANDRAILS		\$1.58 / SF	\$602,450
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 - Cable Guardrail System	1.00 ls	\$35,000.00 /ls	\$35,000
Guard Rail - Interior - Glass Guardrail System	200 lf	\$525.00 /lf	\$105,000
Guard Rail - Interior - Guard Rail at Mezzanine	1,425 lf	\$150.00 /lf	\$213,750
C1099 OTHER INTERIOR SPECIALTIES		\$1.01 / SF	\$382,610
Misc. Metals and Supports	382,610 gsf	\$1.00 /gsf	\$382,610
C2010 WALL FINISHES		\$0.00 / SF	\$0
C2016 SPECIAL WALL SURFACING		\$0.00 / SF	\$0
Flat Lock Metal Tile @ Lobby	0.00 nic		\$0
06 WOOD, PLASTICS, & COMPOSITES	380,570 SF	\$7.83 / SF	\$2,978,332
B1010 FLOOR CONSTRUCTION		\$0.18 / SF	\$68,080
B1014 MEZZANINE FLOOR CONSTRUCTION		\$0.18 / SF	\$68,080
Wood Decking - 3/4" @ Mezzanine Complete \$/s	1,702 sf	\$40.00 /sf	\$68,080
B1020 ROOF CONSTRUCTION		\$0.35 / SF	\$133,850
B1029 ROOF CONSTRUCTION SUPPLEMENTARY COMPONENTS		\$0.35 / SF	\$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 / SF	\$10,700

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
B2012 EXTERIOR WALL CONSTRUCTION		\$0.03 / SF	\$10,700
Blocking @ Exterior Wall Mounted Railing \$/lf	355 lf	\$10.00 /lf	\$3,550
Blocking @ Exterior Louver \$/lf	715 lf	\$10.00 /lf	\$7,150
B2020 EXTERIOR WINDOWS		\$0.21 / SF	\$81,750
B2021 EXTERIOR OPERATING WINDOWS		\$0.21 / SF	\$81,750
Blocking @ Window Perimeter \$/lf	5,450 lf	\$15.00 /lf	\$81,750
C1010 INTERIOR PARTITIONS		\$1.00 / SF	\$380,570
C1011 INTERIOR FIXED PARTITIONS		\$1.00 / SF	\$380,570
Interior Rough Carpentry	380,570 sf	\$1.00 /sf	\$380,570
C1090 INTERIOR SPECIALTIES		\$2.11 / SF	\$803,170
C1097 STORAGE SPECIALTIES		\$0.04 / SF	\$14,026
Locker Benches	216 lf	\$65.00 /lf	\$14,026
C1099 OTHER INTERIOR SPECIALTIES		\$2.07 / SF	\$789,144
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	\$1.90 /sf	\$746,700
C2010 WALL FINISHES		\$2.45 / SF	\$932,261
C2012 WALL PANELING		\$1.66 / SF	\$631,303
Wood Veneer Premium for Paneling at columns	2,304 sf	\$82.50 /sf	\$190,080
Fabric Wrapped Acoustical Wall Panels @ Auditorium	1,540 sf.	\$50.00 /sf.	\$77,000
Wood fiber Acoustical Panels	3,475 sf.	\$42.50 /sf.	\$147,688
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.	\$22.50 /sf.	\$29,063
Fiber Reinforced Panel (FRP) @ Full Height	7,354 sf.	\$22.50 /sf.	\$165,472
C2013.4 WALL COVERINGS		\$0.00 / SF	\$0
Interior Misc. Millwork not shown or within F&E Estimate	0.00 nic		\$0
C2016 SPECIAL WALL SURFACING		\$0.35 / SF	\$132,000
Flexible Stainless Steel Safety Netting	2,400 sf	\$55.00 /sf	\$132,000
C2019 WALL FINISH SUPPLEMENTARY COMPONENTS		\$0.44 / SF	\$168,958
Interior Window Sills @ Exterior - Solid Surface	3,379 lf	\$50.00 /lf	\$168,958
E2010 FIXED FURNISHINGS		\$1.49 / SF	\$567,951
E2013 CASEWORK		\$1.49 / SF	\$567,951
Countertop-Casework, Epoxy	1,138 lf	\$118.00 /lf	\$134,333
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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	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	\$745.00 /ea	\$17,880
07 THERMAL & MOISTURE PROTECTION	380,570 SF	\$36.43 / SF	\$13,863,135
A2020 BASEMENT WALL CONSTRUCTION		\$1.15 / SF	\$436,465
A2022 MOISTURE PROTECTION		\$1.15 / SF	\$436,465
Insulation / dampproofing - 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
A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.38 / SF	\$146,211
A4096 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.38 / SF	\$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 / SF	\$898,421
B1019 FLOOR CONSTRUCTION SUPPLEMENTARY COMPONENTS		\$2.36 / SF	\$898,421
Applied Fireproofing Complete \$/sf	244,976 sf	\$3.30 /sf	\$808,421
Intumescent Fireproofing @ exposed framing / bracing	1.00 ls	\$40,000.00 /ls	\$40,000
Misc. Patching of Fireproofing	1.00 ls	\$50,000.00 /ls	\$50,000
B1020 ROOF CONSTRUCTION		\$1.35 / SF	\$515,261
B1029 ROOF CONSTRUCTION SUPPLEMENTARY COMPONENTS		\$1.35 / SF	\$515,261
Applied Fireproofing Complete \$/sf	141,503 sf	\$3.50 /sf	\$495,261
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		\$15.18 / SF	\$5,775,352
B2011 EXTERIOR WALL VENEER		\$13.75 / SF	\$5,233,398
Metal Panel Insulated Metal Panels w/ 4" LGMF Backup	14,913 sf	\$90.00 /sf	\$1,342,170
Metal Panel Flat-Lock Metal Tiles over 9/16" Galvanized Utility Deck	5,386 sf	\$145.00 /sf	\$780,970
Metal Panel Corrugated Insulated Metal Panels on Aluminum Clip System	4,978 sf	\$76.00 /sf	\$378,328
ACM ACM Cornice - Tapered Roof Edge, Low Roofs (~6-8' Surface Area)	1,932 lf	\$1,015.00 /lf	\$1,960,980
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 - South Elevation	150 lf	\$580.00 /lf	\$87,000
ACM ACM Column Wraps/Fin Projections at Rotunda - 27' Tall	515 lf	\$435.00 /lf	\$224,025
ACM ACM Decorative Accent Bandings	525 lf	\$145.00 /lf	\$76,125
B2012 EXTERIOR WALL CONSTRUCTION		\$0.25 / SF	\$94,281
Exterior Air and Vapor Barrier System (AVB) - Total enclosure SF	130,946 sfwa	\$0.00 /sfwa	\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Caulking and Sealants, Exterior - Total enclosure SF	130,946 sfa	\$0.72 /sfa	\$94,281
B2013 EXTERIOR WALL INTERIOR SKIN		\$0.70 / SF	\$264,790
2" Closed Cell Spray Foam Insulation	43,905 sf	\$5.50 /sf	\$241,478
6" Closed Cell Spray Foam Insulation	2,914 sf	\$8.00 /sf	\$23,312
B2018 EXTERIOR WALL SUPPLEMENTARY COMPONENTS		\$0.48 / SF	\$182,884
Sheet Metal Flashing & Trim Complete \$/sf	152,403 sfa	\$1.20 /sfa	\$182,884
B3010 ROOFING		\$13.47 / SF	\$5,126,005
B3012 LOW SLOPE MEMBRANE SYSTEMS		\$12.98 / SF	\$4,938,920
Green Roof System - Planter / Plantings	0.00 excl		\$0
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" Insul.	67,401 sf	\$30.00 /sf	\$2,022,030
Roof Protection Board - removed from add alternate list and added back into base design	120,000 sf	\$2.70 /sf	\$324,000
Roof System Type B- TPO Membrane, 1/2" Cover Board, 6-1/2" Tapered Insul.	67,660 sf	\$30.00 /sf	\$2,029,800
Temporary Roof - HOLD	1.00 ls	\$100,000.00 /ls	\$100,000
Rubber Paver Roof System over Membrane Roof	2,365 sf	\$55.00 /sf	\$130,075
Premium for Tapered Cricket Areas	18,403 sf	\$5.00 /sf	\$92,015
B3014.2 FLASHINGS & TRIM		\$0.41 / SF	\$155,085
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	5,363 lf	\$20.00 /lf	\$107,260
B3019 ROOFING SUPPLEMENTARY COMPONENTS		\$0.08 / SF	\$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		\$0.35 / SF	\$132,303
B3020 ROOF APPURTENANCES		\$0.35 / SF	\$132,303
Roofing Walkway Pads	12,565 sf	\$10.53 /sf	\$132,303
B3080 OVERHEAD EXTERIOR ENCLOSURES		\$0.95 / SF	\$362,828
B3081 EXTERIOR CEILINGS		\$0.95 / SF	\$362,828
Soffits - ACM	1,771 sf	\$118.00 /sf	\$208,978
Soffits - Exterior Rated Gyp	1,715 sf	\$24.00 /sf	\$41,160
Soffits - Linear Metal Ceilings	955 sf	\$118.00 /sf	\$112,690
C1030 INTERIOR DOORS		\$0.74 / SF	\$281,622
C1039 INTERIOR DOOR SUPPLEMENTARY COMPONENTS		\$0.74 / SF	\$281,622
Misc. Interior Caulking - General	380,570 sf	\$0.74 /sf	\$281,622
C2010 WALL FINISHES		\$0.35 / SF	\$134,640
C2012 WALL PANELING		\$0.35 / SF	\$134,640
Phenolic Resin Wall Panels - Interior	1,530 sf.	\$88.00 /sf.	\$134,640
C2050 CEILING FINISHES		\$0.14 / SF	\$54,028
C2059 CEILING FINISH SUPPLEMENTARY COMPONENTS		\$0.14 / SF	\$54,028
Paint Sound Barrier Painted GWB Ceiling - CEILING OCCURRING BETWEEN STEEL GIRDERS	54,028 sf	\$1.00 /sf	\$54,028

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
08 OPENINGS	380,570 SF	\$27.18 / SF	\$10,343,548
B2010 EXTERIOR WALLS		\$0.00 / SF	\$0
B2011 EXTERIOR WALL VENEER		\$0.00 / SF	\$0
Screen Wall RTU Screen @ mech. equip. - none shown, excluded	0.00 excl		\$0
B2020 EXTERIOR WINDOWS		\$16.25 / SF	\$6,184,672
B2022 EXTERIOR FIXED WINDOWS		\$1.17 / SF	\$446,340
Window Insulated Translucent Wall Panel System w/ Integral Louvers	2,595 sf	\$172.00 /sf	\$446,340
B2023 EXTERIOR WINDOW WALL STOREFRONTS		\$4.68 / SF	\$1,782,360
Exterior Windows Insulating Glass in Aluminum System	10,209 sf	\$120.00 /sf	\$1,225,080
Storefront Insulating Glass in Aluminum Storefront System	4,644 sf	\$120.00 /sf	\$557,280
Premium for Operable Vents at Storefront/Windows/Translucent Panels	0.00 ea		\$0
B2029 CURTAIN WALLS		\$10.39 / SF	\$3,955,972
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 6" System	60 sf	\$145.00 /sf	\$8,700
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 7" System	18,098 sf	\$148.00 /sf	\$2,678,504
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 7" System - Radiused	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 - 10" System	2,088 sf	\$160.00 /sf	\$334,080
B2050 EXTERIOR DOORS & GRILLES		\$1.36 / SF	\$518,331
B2051 EXTERIOR ENTRANCE DOORS		\$0.75 / SF	\$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		\$0.61 / SF	\$233,431
Door Insulated Overhead Coiling Door, Motor Operated, 1 each	115 sf	\$55.00 /sf	\$6,325
Door Motor Operated Overhead Door w/ Insulating Glass - Typ., 13 ea	2,442 sf	\$93.00 /sf	\$227,106
B2070 EXTERIOR LOUVERS & VENTS		\$0.27 / SF	\$104,000
B2071 EXTERIOR LOUVERS		\$0.27 / SF	\$104,000
Louver Exterior Louvers	1,040 sf	\$100.00 /sf	\$104,000
C1010 INTERIOR PARTITIONS		\$3.38 / SF	\$1,287,480
C1016 GLAZED PARTITIONS & STOREFRONTS		\$3.38 / SF	\$1,287,480
Borrowed lights- BL1-BL5	1,095 sf	\$55.00 /sf	\$60,225
CW Interior	2,100 sf	\$140.00 /sf	\$294,000
CW Interior - Fire Rated	1,772 sf	\$245.00 /sf	\$434,140

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Storefront - Interior	4,550 sf	\$103.00 /sf	\$468,650
Art Glass Panels @ Cafeteria (PREMIUM)	219 sf	\$25.00 /sf	\$5,465
Glazing - Interior Ballistic	1.00 allw	\$25,000.00 /allw	\$25,000
C1020 INTERIOR WINDOWS		\$0.01 / SF	\$1,950
C1020 INTERIOR WINDOWS		\$0.01 / SF	\$1,950
Transaction Window - Interior	1.00 ea	\$1,950.00 /ea	\$1,950
C1030 INTERIOR DOORS		\$5.90 / SF	\$2,247,115
C1031.4 STANDARD INTERIOR DOORS		\$3.70 / SF	\$1,408,490
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	\$470.00 /ea	\$4,700
Door type FW2- 12" x 12" Vision Panel	1.00 ea	\$450.00 /ea	\$450
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	\$510.00 /ea	\$510
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	4,350 sf	\$55.00 /sf	\$239,250
Hardware Interior Door Hardware Per Leaf	645 leaf	\$600.00 /leaf	\$387,000
Install doors and hardware	2,850 hr	\$110.00 /hr	\$313,500
C1035 INTERIOR PANEL DOORS		\$2.20 / SF	\$838,625
Overhead Coiling Doors - Stainless Steel Counter Door	1.00 ea	\$5,000.00 /ea	\$5,000
Overhead Coiling Doors - Standard	4.00 ea	\$15,000.00 /ea	\$60,000
Overhead Rolling Partition / Doors - 2 hr Fire Rated, 13 ea, various sizes	1,265 sf	\$375.00 /sf	\$474,375
Overhead Rolling Partition / Doors - 2 hr Fire Rated, curved, ~42' x 15' (1 ea main lobby)	630 sf	\$475.00 /sf	\$299,250
09 FINISHES	380,570 SF	\$53.28 / SF	\$20,276,119
B2010 EXTERIOR WALLS		\$6.09 / SF	\$2,319,229
B2011 EXTERIOR WALL VENEER		\$0.17 / SF	\$64,800
Exterior Enclosure Painting, Staining & Transparent Finishing	720 mhr	\$90.00 /mhr	\$64,800
B2012 EXTERIOR WALL CONSTRUCTION		\$5.92 / SF	\$2,254,429
Exterior Wall Backup GWB Stud Wall - 6" MS, AVB, Dens Glass, 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 Glass, Insul.	11,323 sf	\$28.00 /sf	\$317,044

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 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
C1010 INTERIOR PARTITIONS		\$19.69 / SF	\$7,492,832
C1011 INTERIOR FIXED PARTITIONS		\$19.69 / SF	\$7,492,832
Wall Type (F1.0) GWB on 7/8" Metal Furring	798 sf	\$10.00 /sf	\$7,980
Wall Type (F2.0) GWB on 1-5/8" Metal Stud	2,812 sf	\$10.00 /sf	\$28,120
Wall Type (F4.0) 3-5/8" MS, 1lyr 5/8" GWB OS	19,878 sf	\$10.00 /sf	\$198,780
Wall Type (F6) 6" MS, 1lyr 5/8" GWB OS	39,384 sf	\$20.00 /sf	\$787,680
Wall Type (F6.0A) 6" MS, 2lyrs 5/8" GWB OS	45,742 sf	\$20.00 /sf	\$914,840
Wall Type (F4.0A) 3-5/8" MS, 2lyrs 5/8" GWB OS	13,454 sf	\$21.00 /sf	\$282,534
Wall Type (G4.0) 3-5/8" MS, 1lyr 5/8" GWB ES, 3-1/2" Acoustic Batt	180 sf	\$18.50 /sf	\$3,330
Wall Type (G6.0) - LOW - 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	2,658 sf	\$20.00 /sf	\$53,160
Wall Type (G6.0) 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	58,789 sf	\$20.00 /sf	\$1,175,780
Wall Type (G6.0A) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	58,032 sf	\$21.00 /sf	\$1,218,672
Wall Type (G6.0B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	59,764 sf	\$21.50 /sf	\$1,284,926
Wall Type (G6.0C) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	1,064 sf	\$21.50 /sf	\$22,876
Wall Type (G6.1) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	784 sf	\$21.50 /sf	\$16,856
Wall Type (G6.1B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	3,254 sf	\$21.50 /sf	\$69,961
Wall Type (G6.2) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt, 2hr RATED	21,105 sf	\$25.00 /sf	\$527,625
Wall Type (G8.0) 8" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	480 sf	\$20.00 /sf	\$9,600
Wall Type (S4.2) 1" Liner, 4" MS, 4" Acoustic, 1lyrs 5/8" GWB, 1hr RATED	968 sf	\$24.00 /sf	\$23,232
Wall Type (S6.1) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB, 2hr RATED	1,280 sf	\$24.00 /sf	\$30,720
Wall Type (S6.2) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB, 2hr RATED	34,840 sf	\$24.00 /sf	\$836,160
Partition - Premium Abuse Resistant Drywall	0.00 lf		\$0
C1030 INTERIOR DOORS		\$0.22 / SF	\$81,975
C1031.4 STANDARD INTERIOR DOORS		\$0.22 / SF	\$81,975
Paint Interior - Door & Frames	1,093 ea	\$75.00 /ea	\$81,975
C2010 WALL FINISHES		\$6.15 / SF	\$2,339,776
C2013.4 WALL COVERINGS		\$0.23 / SF	\$89,323
Vinyl Wall Covering (Auditorium - IWP)	1,985 sf.	\$45.00 /sf.	\$89,323
C2014 TILE & TERRAZZO WALL FINISHES		\$2.49 / SF	\$946,938
Ceramic Wall Tile	17,577 sf	\$20.00 /sf	\$351,533
2" Granite Veneer Panels	400 sf.	\$173.00 /sf.	\$69,200
Porcelain Wall Tile	1,445 sf.	\$24.00 /sf.	\$34,685

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Thin Porcelain Wall Tile	20,480 sf.	\$24.00 /sf.	\$491,520
C2017 WALL PAINTING & COATING		\$2.77 / SF	\$1,052,433
Paint Interior GWB Walls	220,299 sf.	\$0.95 /sf.	\$209,284
Paint Interior GWB Walls - Soffits	1,732 sf.	\$0.95 /sf.	\$1,645
Paint Interior GWB Walls - Soffits - not shown	1.00 allw	\$5,000.00 /allw	\$5,000
Paint Interior Walls - Epoxy	234,495 sf.	\$3.25 /sf.	\$762,107
Paint Interior CMU Walls	7,507 sf	\$3.25 /sf	\$24,397
Misc. Interior Painting	1.00 allw	\$50,000.00 /allw	\$50,000
C2018 ACOUSTICAL WALL TREATMENT		\$0.66 / SF	\$251,082
Fabric Wrapped Acoustical Panels @ Auditorium	696 sf.	\$63.00 /sf.	\$43,830
Wood Fiber Acoustical Panels @ Gymnasium	3,290 sf.	\$63.00 /sf.	\$207,252
C2030 FLOORING		\$8.89 / SF	\$3,381,773
C2031 FLOORING TREATMENT		\$0.28 / SF	\$105,000
Floor Patching Allowance	1.00 allw	\$85,000.00 /allw	\$85,000
Floor Prep / Leveling Allowance	1.00 allw	\$20,000.00 /allw	\$20,000
C2032.2 TILE FLOORING		\$1.45 / SF	\$553,592
CMT-1 - Ceramic Floor Tile - Mosaic	1,687 sf	\$24.00 /sf	\$40,488
CMT-2 - Ceramic Floor Tile - Mosaic	328 sf	\$24.00 /sf	\$7,872
CMT-3 - Ceramic Floor Tile - Mosaic	309 sf	\$24.00 /sf	\$7,416
CMT-4 - Ceramic Floor Tile - Mosaic	895 sf	\$24.00 /sf	\$21,480
CMT-5 - Ceramic Floor Tile - Mosaic	499 sf	\$24.00 /sf	\$11,976
CMT-7 - Ceramic Floor Tile - Mosaic	416 sf	\$24.00 /sf	\$9,984
CMT-8 - Ceramic Floor Tile - Mosaic	464 sf	\$24.00 /sf	\$11,136
Porcelain Tile Floor	15,830 sf	\$28.00 /sf	\$443,240
C2032.4 WOOD FLOORING		\$0.63 / SF	\$240,240
Wood Flooring - Premium for Markings on Athletic Wood Floor	10,010 sf	\$2.00 /sf	\$20,020
Athletic Sports Wood Flooring - Gym	10,010 sf	\$22.00 /sf	\$220,220
C2032.6 CARPETING		\$0.38 / SF	\$144,589
Carpet - 1	5,768 sf	\$6.50 /sf	\$37,492
Carpet - 2	8,090 sf	\$6.50 /sf	\$52,585
Carpet - Walk Off Carpet	2,428 sf	\$12.00 /sf	\$29,136
Resilient Carpet Multiple Design Combinations	890 sf	\$10.00 /sf	\$8,900
Resilient Carpet RC-1	2,221 sf	\$6.00 /sf	\$13,326
Resilient Carpet RC-2	525 sf	\$6.00 /sf	\$3,150
C2032.8 WALL BASE FINISHES		\$0.52 / SF	\$199,768
Ceramic Tile Base	2,034 lf	\$19.00 /lf	\$38,646
Epoxy Base	106 lf	\$14.00 /lf	\$1,484
Rubber Base	38,410 lf	\$3.00 /lf	\$115,230
Decorative Fabric Metal Panel - Interior	493 sf	\$90.00 /sf	\$44,408
Flat Lock Metal Tiles - Interior - PER VE A04 - CHANGE TO TILE (1,366 SQFT)	0.00 sf		\$0
C2033 SPECIALTY FLOORING		\$0.12 / SF	\$46,350
Foot Grille Carpet	927 sf	\$50.00 /sf	\$46,350
C2035 RESILIENT FLOORING		\$5.00 / SF	\$1,901,513

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
ASF - Rubber Athletic Sports Flooring	2,589 sf	\$20.00 /sf	\$51,780
Linoleum LIN1	64,243 sf	\$8.40 /sf	\$539,641
Linoleum LIN11	14 sf	\$8.50 /sf	\$119
Linoleum LIN13	14 sf	\$8.50 /sf	\$119
Linoleum LIN14	133 sf	\$8.50 /sf	\$1,131
Linoleum LIN2	374 sf	\$8.40 /sf	\$3,142
Linoleum LIN3	279 sf	\$8.50 /sf	\$2,372
Linoleum LIN4	16,062 sf	\$8.50 /sf	\$136,527
Linoleum LIN5	7.00 sf	\$8.50 /sf	\$60
Linoleum LIN6	107 sf	\$8.50 /sf	\$910
Linoleum LIN7	13 sf	\$8.50 /sf	\$111
Linoleum Multiple Design Combinations	43,589 sf	\$10.00 /sf	\$435,890
Sheet Vinyl - Multipurpose	10,028 sf	\$13.00 /sf	\$130,364
Sheet Vinyl - Slip Resistant	619 sf	\$12.00 /sf	\$7,428
Luxury Viyl Tile LVT	2,354 sf	\$6.50 /sf	\$15,301
Sheet Vinyl Flooring - SV1	1,258 sf	\$10.75 /sf	\$13,524
Sheet Vinyl Flooring Multiple Design Combinations	9,999 sf	\$15.00 /sf	\$149,985
Rubber Flooring at Stair Treads and Risers - RR - INCLUDED ABOVE	0.00 sf		\$0
Rubber Stair Treads & Risers	8,637 sf	\$28.00 /sf	\$241,836
Rubber Tile Flooring - RT	83 sf	\$15.00 /sf	\$1,245
Epoxy Flooring EF-1	10,061 sf	\$16.90 /sf	\$170,031
C2036.2 TERRAZZO FLOORING		\$0.07 / SF	\$27,020
Precast Terrazzo risers & treads	386 sf	\$70.00 /sf	\$27,020
C2036.4 MASONRY & STONE FLOORING		\$0.29 / SF	\$109,238
Stone Thresholds at wet rooms	68 sf	\$100.00 /sf	\$6,800
Sealed Concrete	68,292 sf	\$1.50 /sf	\$102,438
C2037 FLUID-APPLIED FLOORING		\$0.14 / SF	\$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		\$12.25 / SF	\$4,660,534
C2051 PLASTER & GYPSUM BOARD FINISH		\$6.10 / SF	\$2,320,284
Ceiling - GWB Soffit - Interior	7,116 sf	\$18.00 /sf	\$128,092
GWB GWB Ceiling, Moisture Resistant GWB Ceiling	6,172 sf	\$25.00 /sf	\$154,300
GWB GWB Ceiling, Typical	45,983 sf	\$20.00 /sf	\$919,660
Ceiling - GWB Soffit - Interior @ Curved Media Center	426 sf	\$25.00 /sf	\$10,658
Ceiling - GWB SOUND ISOLATION	54,028 sf	\$20.50 /sf	\$1,107,574
Ceiling - GWB SOUND ISOLATION - VE A03 - Change Spec to open up more than Kinetics	0.00 incl		\$0
C2054 ACOUSTICAL CEILING TILES & PANELS		\$5.37 / SF	\$2,044,135
ACT-1 Acoustical Ceiling Tiles - 2 X 2 HIGH NRC ACOUSTICAL CEILING TILE	164,031 sf	\$7.25 /sf	\$1,189,225
ACT-2 Acoustical Ceiling Tiles - 2 X 2 WASHABLE ACOUSTICAL CEILING TILE FOR KITCHEN LOCATIONS	6,499 sf	\$8.50 /sf	\$55,242

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
ACT-4 Acoustical Ceiling Tiles - 2 X 6 HIGH NRC TEGULAR ACOUSTICAL CEILING TILE	4,701 sf	\$11.50 /sf	\$54,062
ACT-5	4,017 sf	\$12.00 /sf	\$48,204
ACT-3 Acoustical Ceiling Tiles - 2 X 2 HIGH NRC TEGULAR ACOUSTICAL CEILING TILE AT ADMIN AREAS	12,519 sf	\$6.75 /sf	\$84,503
Interior Ceiling Linear Metal Ceiling W/ Woodlook, 4" Wide Plank	10,523 sf	\$50.00 /sf	\$526,150
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	0.00 incl		\$0
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	0.00 incl		\$0
C2056 PAINTING & STAINING CEILINGS		\$0.78 / SF	\$296,115
Paint Painted Interior GWB - Moisture Resistant GWB Ceiling	6,172 sf	\$1.00 /sf	\$6,172
Paint Painted Interior GWB - Soffits - Latex	45,983 sf	\$1.00 /sf	\$45,983
Paint Painted Interior GWB - Typical Ceilings - Latex	7,116 sf	\$1.00 /sf	\$7,116
Paint Exposed Painted Structural Steel & Metal Deck	98,685 sf	\$2.40 /sf	\$236,844
10 SPECIALTIES	380,570 SF	\$3.83 / SF	\$1,457,832
B2010 EXTERIOR WALLS		\$0.02 / SF	\$6,000
B2019 EXTERIOR WALL OPENING SUPPLEMENTARY COMPONENTS		\$0.02 / SF	\$6,000
Exterior Signage Name and logo sign attached to enclosure, Aluminum	1.00 ls	\$6,000.00 /ls	\$6,000
C1090 INTERIOR SPECIALTIES		\$3.81 / SF	\$1,451,832
C1092.2 COMPARTMENTS & CUBICLES		\$0.18 / SF	\$67,211
Cubicles Cubicle Curtains and Track at Nurse's Area.	1.00 ls	\$7,000.00 /ls	\$7,000
Toilet Compartment - Plastic Laminate - Standard	23 stall	\$1,200.00 /stall	\$27,600
Toilet Compartment - Plastic Laminate - Handicapped	12 stall	\$1,500.00 /stall	\$18,000
Urinal Screen - Plastic Laminate	10 ea	\$425.00 /ea	\$4,250
Wire Mesh Partition (assume 8' high) - Interior	1,151 sf	\$9.00 /sf	\$10,361
C1092.4 TOILET, BATH, & LAUNDRY ACCESSORIES		\$0.55 / SF	\$209,850
Toilet Accessories - Unload / Store / Categorize	635.00 mhr	\$90.00 /mhr	\$57,150
Toilet Accessories - Distribute / Install	635 mhr	\$90.00 /mhr	\$57,150
Non Restroom Soap: Soap Dispenser, Wall Mtd.	143 ea	\$80.00 /ea	\$11,440
Restroom Paper Towel Dispenser & Trash, Semi Recessed	71.00 ea	\$205.00 /ea	\$14,555
Restroom Toilet Paper Dispenser, Wall Mtd.	69 ea	\$100.00 /ea	\$6,900
Restroom Sanitary Napkin Disposal, Recessed	69 ea	\$75.00 /ea	\$5,175
Restroom Soap: Shampoo Dispenser, Shower Wall Mtd.	10 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 ea	\$45.00 /ea	\$6,750
Non Restroom Lit Mirror: Single Mirror: Light in Framed Mirror Unit	10 ea	\$520.00 /ea	\$5,200

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Non Restroom Mirror: Full Height Frameless Mirror Allowance - Weight room, Fitness Room, Locker Rooms, Changing Rooms, Misc.	1.00 allw	\$10,500.00 /allw	\$10,500
Restroom Grab Bar: 60" "L" Shaped, Shower, Curved, Wall Mtd.	6.00 ea	\$115.00 /ea	\$690
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	40 ea	\$165.00 /ea	\$6,600
Restroom Shower curtain and rod, typ. shower unit	10 ea	\$80.00 /ea	\$800
Restroom Shower Seat @ ADA shower units	5.00 ea	\$230.00 /ea	\$1,150
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.	54 ea	\$20.00 /ea	\$1,080
Non Restroom Paper Towel Dispenser, Wall Mtd.	143 ea	\$110.00 /ea	\$15,730
C1093 WALL & DOOR PROTECTION		\$0.10 / SF	\$38,261
Wall & Door Protection Complete \$/sf, including corner guards	382,610 gsf	\$0.10 /gsf	\$38,261
C1093.2 INFORMATION SPECIALTIES		\$1.06 / SF	\$405,000
White / Marker Boards - Small 4' x 4'	66 ea	\$500.00 /ea	\$33,000
White / Marker Boards - Medium 4' x 10'	10 ea	\$950.00 /ea	\$9,500
White / Marker Boards - Medium 4' x 6'	104 ea	\$750.00 /ea	\$78,000
White / Marker Boards - Medium 4' x 8'	3.00 ea	\$750.00 /ea	\$2,250
Corkboards / Tack Boards - Large 4' x 8'	36 ea	\$450.00 /ea	\$16,200
Corkboards / Tack Boards - Small 4' x 4'	66 ea	\$900.00 /ea	\$59,400
Signage Dedication Plaques Allowance - Interior	3.00 allw	\$2,000.00 /allw	\$9,000
Signage Egress, Waydinding, and Regulatory - Interior	4.00 ls	\$2,000.00 /ls	\$18,000
Signage Room Identification Signs - Interior	931 ea	\$150.00 /ea	\$139,650
Signage Additional Signage Allowance - Interior	1.00 allw	\$10,000.00 /allw	\$10,000
Signage Branding and Graphics Allowance - Interior, including large format wall murals and panels.	3.00 allw	\$5,000.00 /allw	\$30,000
C1097 STORAGE SPECIALTIES		\$1.58 / SF	\$600,970
Lockers Locker Room: Single and multi-tier lockers on conc, base, 15" x 15"	428 ea	\$490.00 /ea	\$209,720
Lockers Shop Lockers 2 Tier, 15" Wide x 15" Deep	204 ea	\$490.00 /ea	\$99,960
Lockers Corridor Lockers 2 Tier, 15" Wide x 15" Deep on wood base	400 ea	\$490.00 /ea	\$196,000
Lockers Cosmetology Lockers: Single &/or double tier, 2' w x 2.5' d	22 ea	\$620.00 /ea	\$13,640
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 / SF	\$130,540
Fire Extinguisher Cabinets - Semi-Recessed	262 ea	\$405.00 /ea	\$106,110
AED Cabinets, units, and accessories	14.00 ea	\$1,745.00 /ea	\$24,430
11 EQUIPMENT	380,570 SF	\$10.03 / SF	\$3,816,505

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
C1010 INTERIOR PARTITIONS		\$0.24 / SF	\$92,438
E1030 COMMERCIAL EQUIPMENT		\$6.34 / SF	\$2,411,900
E1038 FOODSERVICE EQUIPMENT		\$6.34 / SF	\$2,411,900
Gym Flexible Stainless Steel Safety Netting By Metal Fabrications	2,370 sf	\$39.00 /sf	\$92,438
E1040 INSTITUTIONAL EQUIPMENT		\$1.20 / SF	\$457,006
E1044.2 LABORATORY EQUIPMENT		\$0.24 / SF	\$93,000
Equipment - Fume Hood (FH-1) - Ductless, ADA Base - REDUCED PER RECON	6.00 ea	\$15,500.00 /ea	\$93,000
E1044.4 EDUCATIONAL & SCIENTIFIC EQUIPMENT		\$0.96 / SF	\$364,006
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 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 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 / 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 Collection Arms - Welding	0.00 ea		\$0
Equipment - Auto Collision (AT11) Install ONLY Vehicle Exhaust 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 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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 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 Stations	24 ea	\$5,035.00 /ea	\$120,840
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 Sperator	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 Package	0.00 ea		\$0
Equipment - Design and Visual (DV01) Install ONLY Large Digital Press	0.00 ea		\$0
Equipment - Design and Visual (DV01A) Install ONLY 3PH 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 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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 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 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 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 Squaring Shear	0.00 ea		\$0
Equipment - Metal Fabrication (MF02A) Install ONLY Hydraulic Squaring Shear	0.00 ea		\$0
Equipment - Metal Fabrication (MF03) Install ONLY CNC Hydraulic Press Brake	0.00 ea		\$0
Equipment - Metal Fabrication (MF61) Install ONLY Overhead 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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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	\$99,000
E1070 ENTERTAINMENT & RECREATIONAL EQUIPMENT		\$1.32 / SF	\$503,880
E1071 THEATER & STAGE EQUIPMENT		\$1.32 / SF	\$503,880
Stage Curtains and Rigging - Powered rigging	1.00 ls	\$195,000.00 /ls	\$195,000
Theater - Auditorium Fixed Seating	572 ea	\$540.00 /ea	\$308,880
E1090 OTHER EQUIPMENT		\$0.92 / SF	\$351,281
E1097 ATHLETIC, RECREATIONAL, & THERAPEUTIC EQUIPMENT		\$0.92 / SF	\$351,281
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	\$52,500.00 /ea	\$210,000
E1098 RESIDENTIAL EQUIPMENT		\$0.00 / SF	\$0
Rooftop Play Equipment - not shown, exclude	0.00 nic		\$0
12 FURNISHINGS	380,570 SF	\$4.57 / SF	\$1,737,911
E2010 FIXED FURNISHINGS		\$4.57 / SF	\$1,737,911
E2012 WINDOW TREATMENTS		\$0.92 / SF	\$350,047
Window Shades - Manual Operated - Interior	174 ea	\$150.00 /ea	\$26,100
Roller Shades - Manual Operated - Translucent Wall Panel System, assume not required	2,630 sf	\$0.00 /sf	\$0
Roller Shades - Manual Operated - Exterior Windows Aluminum System	10,209 sf	\$9.75 /sf	\$99,538
Roller Shades - Manual Operated - Exterior Storefront System	4,658 sf	\$9.75 /sf	\$45,416
Roller Shades - Manual Operated - Exterior Curtain Wall System	13,100 sf	\$9.75 /sf	\$127,725
Roller Shades - Electrically Operated - Exterior Curtain Wall System @ Rotunda	2,563 sf	\$20.00 /sf	\$51,269
E2013 CASEWORK		\$3.65 / SF	\$1,387,864
Casework - Base Cabinets	754 lf	\$320.00 /lf	\$241,146
Casework - Base Cabinets - Design Visual Flat File	14 lf	\$495.00 /lf	\$6,707
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	\$595.00 /lf	\$228,721
Casework - Cabinet - Cubbies (2'-3"x2'8")	5.00 ea	\$495.00 /ea	\$2,475
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	\$555.00 /lf	\$24,690
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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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
14 CONVEYING EQUIPMENT	380,570 SF	\$2.59 / SF	\$985,000
D1010 ELEVATORS & LIFTS		\$2.59 / SF	\$985,000
D1010 ELEVATORS & LIFTS		\$2.40 / SF	\$915,000
Elevator #1, Passenger (Otis Gen2, 3,500 capacity)	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
Elevator Operator Time / Fees for other trades - work within shaft	1.00 ls	\$100,000.00 /ls	\$100,000
D1017 CAB FINISHES		\$0.18 / SF	\$70,000
Cab Finish Premium Allowance	2.00 ea	\$35,000.00 /ea	\$70,000
21 FIRE SUPPRESSION	380,570 SF	\$9.92 / SF	\$3,775,296
D4010 SPRINKLERS		\$7.46 / SF	\$2,838,158
D4011 WET SPRINKLER SYSTEM		\$7.46 / SF	\$2,838,158
Sprinkler Distribution Piping - 1"	29,915 lf	\$35.00 /lf	\$1,047,025
Sprinkler Distribution Piping - 2"	6,355 lf	\$45.00 /lf	\$285,975
Sprinkler Distribution Piping - 3"	2,400 lf	\$53.00 /lf	\$127,200
Sprinkler Distribution Piping - 4"	6,665 lf	\$80.00 /lf	\$533,200
Sprinkler Piping Qty and Unit Rate Adj - Per Reconcile	1.00 ls	\$350,000.00 /ls	\$350,000
Head - Pendant, Concealed	2,235 ea	\$147.06 /ea	\$328,679
Head - Upright	1,530 ea	\$108.55 /ea	\$166,078
D4020 STANDPIPES		\$1.43 / SF	\$545,739
D4022 STANDPIPE & FIRE MAINS		\$1.43 / SF	\$545,739
Standpipes & Fire Mains - 6"	3,000 lf	\$87.00 /lf	\$261,000
Standpipes & Fire Mains - 8"	235 lf	\$195.00 /lf	\$45,825
Double Check Valve 8"	1.00 ea	\$16,582.59 /ea	\$16,583
Hose Valve, 2-1/2"	28 ea	\$475.12 /ea	\$13,303
Zone Control Valve Assembly	28 ea	\$6,125.60 /ea	\$171,517
Wet Check Valve Assembly - 6"	3.00 ea	\$4,850.72 /ea	\$14,552
Wet Check Valve Assembly - 8"	1.00 ea	\$4,850.72 /ea	\$4,851
Fire Department Connection	1.00 ea	\$1,430.36 /ea	\$1,430
Fire Pump Test Header	1.00 ea	\$1,675.36 /ea	\$1,675
Roof Manifold	8.00 ea	\$1,875.36 /ea	\$15,003
D4030 FIRE PROTECTION SPECIALTIES		\$0.33 / SF	\$125,000
D4031 FIRE PROTECTION EQUIPMENT		\$0.33 / SF	\$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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
D4090 OTHER FIRE PROTECTION SYSTEMS		\$0.70 / SF	\$266,399
D4096 FIRE PROTECTION MISC ITEMS		\$0.70 / SF	\$266,399
Coordination & Expenses	380,570 sf	\$0.70 /sf	\$266,399
22 PLUMBING	380,570 SF	\$22.13 / SF	\$8,421,659
D2000 PLUMBING EQUIPMENT		\$5.12 / SF	\$1,949,585
D2000 PLUMBING EQUIPMENT		\$5.12 / SF	\$1,949,585
Sub-Meters	1.00 ls	\$10,000.00 /ls	\$10,000
Circulating Pump	8.00 ea	\$3,000.00 /ea	\$24,000
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
TMV-1 thru 6 - Thermostatic Mixing Valve	6.00 ea	\$15,000.00 /ea	\$90,000
DWP-1 - Domestic Water Booster Pump	1.00 ea	\$60,000.00 /ea	\$60,000
Backflow Preventers	1.00 ls	\$55,000.00 /ls	\$55,000
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	\$5,000.00 /ls	\$5,000
Trap Primers & Associated Piping	148 ea	\$1,000.00 /ea	\$148,000
Floor Drain W/Trap	148 ea	\$955.00 /ea	\$141,340
Trench Drains	195 lf	\$60.00 /lf	\$11,700
4" & 5" Backwater Valve	11 ea	\$800.00 /ea	\$8,800
Roof Drains	115 ea	\$1,367.94 /ea	\$157,313
Exterior Grease Interceptor	2.00 ea	\$41,711.68 /ea	\$83,423
GT-1&2 - Local Grease Interceptor 50 GPM	5.00 ea	\$2,927.92 /ea	\$14,640
Ceiling UTL Panels	17 ea	\$500.00 /ea	\$8,500
Elevator Sump Pumps	3.00 ea	\$5,010.77 /ea	\$15,032
Gas / Oil Interceptor - Shops	5.00 ea	\$15,000.00 /ea	\$75,000
AC-1 - Compressed Air System - Auto Collision / Auto Tech / Metal Fab	2.00 ea	\$48,321.36 /ea	\$96,643
AC-2 - Compressed Air System - Carpentry Shop	1.00 ea	\$31,821.36 /ea	\$31,821
AC-3 - Compressed Air System - Bio Tech Lab	1.00 ea	\$28,821.36 /ea	\$28,821
AC-4 - Compressed Air System - Robotics	1.00 ea	\$35,821.36 /ea	\$35,821
AC-5 - Compressed Air System - Dental	1.00 ea	\$36,821.36 /ea	\$36,821
Compressed Air Hose Reels	15 ea	\$800.00 /ea	\$12,000
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
Electric / Gas Fired Water Heaters - Serving Shops	5.00 ea	\$2,855.84 /ea	\$14,279
EWB-1 - Elec Water Heater - PVI Durawatt - 460L 200A	2.00 ea	\$66,069.80 /ea	\$132,140
EWB-2 - Elec Water Heater - PVI Durawatt - 270L 119A	2.00 ea	\$41,069.80 /ea	\$82,140
EWB-3 - Elec Water Heater - AO Smith DSE-100	1.00 ea	\$16,855.84 /ea	\$16,856
EWB-4 - Elec Water Heater - PVI Durawatt - 550	2.00 ea	\$68,069.80 /ea	\$136,140
EWB-5,6, & 7 - Elec Water Heater - AO Smith DES-10	3.00 ea	\$5,427.92 /ea	\$16,284
EWB-8 - Elec Water Heater - AO Smith DSE-120	1.00 ea	\$14,427.92 /ea	\$14,428
Argon / Oxygen / Acetylene Manifolds	3.00 ea	\$8,000.00 /ea	\$24,000

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Natural Gas Control at Kitchen - Kitchen	4.00 ea	\$5,000.00 /ea	\$20,000
Natural Gas Shut off Valve & Cabinet - HVAC Tech & Paint Booth	2.00 ea	\$5,000.00 /ea	\$10,000
pH Neutralization System	1.00 ea	\$50,000.00 /ea	\$50,000
ET-1 thru ET-8 - Expansion Tanks	8.00 ea	\$1,500.00 /ea	\$12,000
D2010 DOMESTIC WATER DISTRIBUTION		\$4.44 / SF	\$1,690,000
D2012 DOMESTIC WATER PIPING		\$4.44 / SF	\$1,690,000
Domestic Hot & Cold Water Piping - 2" & Less	20,000 lf	\$45.00 /lf	\$900,000
Domestic Water Piping - 3"	2,700 lf	\$90.00 /lf	\$243,000
Domestic Water Piping - 4"	1,000 lf	\$125.00 /lf	\$125,000
Domestic Water Piping - 6"	300 lf	\$220.00 /lf	\$66,000
Insulation	24,000 lf	\$12.00 /lf	\$288,000
Valves & Accessories	1.00 ls	\$68,000.00 /ls	\$68,000
D2020 SANITARY DRAINAGE		\$5.14 / SF	\$1,957,100
D2025 SANITARY DRAIN PIPING - UG		\$1.47 / SF	\$559,100
Sanitary Waste & Vent Piping - 2"- 3"	1,735 lf	\$60.00 /lf	\$104,100
Sanitary Waste & Vent Piping - 4"- 6"	4,200 lf	\$85.00 /lf	\$357,000
Kitchen Waste & Vent Piping - 4"	1,400 lf	\$70.00 /lf	\$98,000
D2026 SANITARY DRAIN PIPING - AG		\$3.23 / SF	\$1,230,000
Sanitary Waste & Vent Piping - 2" - 4"	10,000 lf	\$60.00 /lf	\$600,000
Sanitary Waste & Vent Piping - 4" - 6"	7,000 lf	\$90.00 /lf	\$630,000
D2029 LABORATORY / INDUSTRIAL DRAIN PIPING - UG		\$0.44 / SF	\$168,000
Acid Waste & Vent Piping - 2" - 4"	1,600 lf	\$105.00 /lf	\$168,000
D2040 PLUMBING FIXTURES		\$2.07 / SF	\$789,124
D2043 PLUMBING FIXTURES		\$2.07 / SF	\$789,124
P-1 & P-1A - Water Closet - Wall Hung	90 ea	\$2,815.17 /ea	\$253,365
P-10 & P-11 - Hand & Utility Sink	5.00 ea	\$1,424.20 /ea	\$7,121
P-2 & P-2A - Urinal	15 ea	\$2,008.12 /ea	\$30,122
P-3A - Lavatory - Wall Hung	57 ea	\$1,794.49 /ea	\$102,286
PX-4 - Science Classroom Sinks	46 ea	\$881.03 /ea	\$40,527
PX-5 - Lab Sinks	31 ea	\$1,369.02 /ea	\$42,439
PX-1 Sink - Casework - Installation & Hook-Up	49 ea	\$745.24 /ea	\$36,517
PX-2 - Sink w/Eyewash - Casework - Installation & Hook-Up	6.00 ea	\$948.38 /ea	\$5,690
PX-3 - Sink - Cosmetology w/Hair Trap	15 ea	\$1,463.96 /ea	\$21,959
PX-6 - Dental Station	16 ea	\$881.03 /ea	\$14,096
P-4 - Mop Sink	11 ea	\$2,069.84 /ea	\$22,768
Cosmetology - Pedicure Station - Hook-ups	0.00 ea		\$0
P-3C - Solid Surface Sink, 2 Station - Bradley	7.00 ea	\$4,272.60 /ea	\$29,908
P-5 & P-5A - Drinking Foutain - Bi-Level Electric	17 ea	\$4,272.60 /ea	\$72,634
Washing Machine Box	1.00 ea	\$242.11 /ea	\$242
P-6A - Shower - HC (no enclosure)	4.00 ea	\$839.25 /ea	\$3,357
P-6 - Shower - (Trim & Drain)	7.00 ea	\$1,993.88 /ea	\$13,957
P-7 - Emergenc Eyewash	8.00 ea	\$522.21 /ea	\$4,178
P-8 & 8A - Emergency Shower/Eyewash	14 ea	\$2,658.50 /ea	\$37,219
P-9 - Emergeny Eyewash	9.00 ea	\$0.00 /ea	\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
P-3B - Wash Fountain - Circular - Bradley	1.00 ea	\$6,624.22 /ea	\$6,624
P-3B - Wash Fountain - Semi-Circular - Bradley	6.00 ea	\$5,674.75 /ea	\$34,048
Hose Bibb	25 ea	\$180.40 /ea	\$4,510
Roof Hydrant	4.00 ea	\$308.58 /ea	\$1,234
Wall Hydrant	14 ea	\$308.58 /ea	\$4,320
D2050 GENERAL SERVICE COMPRESSED - AIR		\$0.93 / SF	\$355,350
D2051 COMPRESSED-AIR SYSTEMS		\$0.93 / SF	\$355,350
Valves & Accessories	1.00 ls	\$46,350.00 /ls	\$46,350
2" & Less CA Piping - Copper	5,700 lf	\$50.00 /lf	\$285,000
CA Piping Intake - Copper	300 lf	\$80.00 /lf	\$24,000
D2070 RAIN WATER DRAINAGE		\$2.76 / SF	\$1,050,900
D2071 STORM DRAIN PIPING - UG		\$0.51 / SF	\$194,100
Open End Drain	20 ea	\$1,000.00 /ea	\$20,000
Storm Piping - 10"	300 lf	\$165.00 /lf	\$49,500
Storm Piping - 4"	220 lf	\$70.00 /lf	\$15,400
Storm Piping - 6"	455 lf	\$90.00 /lf	\$40,950
Storm Piping - 8"	525 lf	\$130.00 /lf	\$68,250
D2072 STORM DRAIN PIPING - AG		\$2.25 / SF	\$856,800
Insulation - Storm	5,745 lf	\$20.00 /lf	\$114,900
Heat Trace	1.00 ls	\$5,000.00 /ls	\$5,000
Storm Piping - 4"	3,600 lf	\$75.00 /lf	\$270,000
Storm Piping - 5" & 6"	2,685 lf	\$140.00 /lf	\$375,900
Storm Piping - 8"	700 lf	\$130.00 /lf	\$91,000
D2080 OTHER PLUMBING SYSTEMS		\$0.20 / SF	\$75,400
D2085 MEDICAL GAS PIPING		\$0.11 / SF	\$40,400
Vacuum - Exhaust	100 lf	\$80.00 /lf	\$8,000
Vacuum Piping - 1" & Less	735 lf	\$40.00 /lf	\$29,400
Valves & Accessories	1.00 ls	\$3,000.00 /ls	\$3,000
D2088 PROCESS / INDUSTRIAL GAS PIPING		\$0.09 / SF	\$35,000
Argon Piping - 1" & Less	800 lf	\$40.00 /lf	\$32,000
Valves & Accessories	1.00 ls	\$3,000.00 /ls	\$3,000
D2090 MISC. PLUMBING SYSTEMS		\$1.06 / SF	\$405,000
D2090 PLUMBING MISC ITEMS		\$1.06 / SF	\$405,000
Admin & Expenses	1.00 ls	\$180,000.00 /ls	\$180,000
Coordination / BIM	1.00 ls	\$100,000.00 /ls	\$100,000
Rigging / Matl Handling	1.00 ls	\$75,000.00 /ls	\$75,000
Sleeving / Firestopping / Coring	1.00 ls	\$50,000.00 /ls	\$50,000
D3010 FACILITY FUEL SYSTEMS		\$0.39 / SF	\$149,200
D2080 NATURAL GAS PIPING		\$0.39 / SF	\$149,200
Natural Gas Piping - 2" & Less	175 lf	\$60.00 /lf	\$10,500
Natural Gas Piping - 3"	85 lf	\$85.00 /lf	\$7,225
Natural Gas Piping - 4"	250 lf	\$95.00 /lf	\$23,750
Natural Gas Piping - 5" & 6"	450 lf	\$165.00 /lf	\$74,250
Natural Gas Piping - 8"	95 lf	\$205.00 /lf	\$19,475

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Valves & Accessories	1.00 ls	\$14,000.00 /ls	\$14,000
23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC)	380,570 SF	\$81.17 / SF	\$30,891,850
D3040 HVAC MAJOR EQUIPMENT		\$30.39 / SF	\$11,567,384
D3040 HVAC MAJOR EQUIPMENT		\$30.23 / SF	\$11,505,028
AHU 1-10, HRU 1-5, RTU 1-2, MUA-1&2	1.00 ls	\$6,300,000.00 /ls	\$6,300,000
AHU 1-10, Labor & Conns	10 ea	\$9,276.00 /ea	\$92,760
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 (30 Qty)	1.00 ls	\$160,492.00 /ls	\$160,492
Vehicle Exhaust fans and reels	1.00 ls	\$69,076.05 /ls	\$69,076
Dehumidifiers	35 ea	\$13,952.00 /ea	\$488,320
Destrat Fans	2.00 ea	\$8,952.00 /ea	\$17,904
ERU 1-4 & ERU-7	5.00 ea	\$20,436.00 /ea	\$102,180
Dust Collector - Owner To Relocate Existing	0.00 allw		\$0
Dust Collector -Rigging	1.00 ls	\$15,000.00 /ls	\$15,000
Split Systems Labor & Connect	52 ea	\$4,872.00 /ea	\$253,344
VRF/VCU/Splits Equipment	1.00 ls	\$3,100,000.00 /ls	\$3,100,000
VRF Selector Boxes Install	44 ea	\$976.00 /ea	\$42,944
VRF -CU Install	33 ea	\$2,436.00 /ea	\$80,388
VRF Fan Coil Units Install	263 ea	\$1,952.00 /ea	\$513,376
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 / SF	\$62,356
Unit Heater - Elec	30 ea	\$1,434.00 /ea	\$43,020
Cabinet Unit Heater (ceiling)	7.00 ea	\$2,762.30 /ea	\$19,336
D3050 FACILITY HVAC DISTRIBUTION SYSTEMS		\$28.02 / SF	\$10,663,893
D3053 HVAC AIR DISTRIBUTION		\$28.02 / SF	\$10,663,893
Duct Coordination & Material Handling	1.00 ls	\$270,000.00 /ls	\$270,000
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"	175,000 sf	\$4.60 /sf	\$804,801
Ductwork - Galvanized	460,000 lb	\$15.97 /lb	\$7,344,360
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	15 ea	\$7,500.00 /ea	\$112,500
Duct Dampers & Accessories	1.00 ls	\$735,000.00 /ls	\$735,000
VAV OA & Exhaust w/o RHC	102 ea	\$998.41 /ea	\$101,838
VAV Box w/ERHC	119 ea	\$1,469.04 /ea	\$174,815

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
VAV FPTU w/ ERHC	9.00 ea	\$3,139.95 /ea	\$28,260
Duct Collection Duct - Fabricated	0.00 lf		\$0
Plenums	3,400 sf	\$69.00 /sf	\$234,600
Register, Diffusers, & Grilles	785 ea	\$216.00 /ea	\$169,560
Register, Diffusers, & Grilles - LD	143 ea	\$442.00 /ea	\$63,206
Sound Attenuators	1.00 ls	\$113,232.00 /ls	\$113,232
D3060 CONTROLS & INSTRUMENTATION		\$6.09 / SF	\$2,318,278
D3061 AUTOMATIC TEMPERATURE CONTROLS		\$6.09 / SF	\$2,318,278
ATC - BMS	380,570 sf	\$5.75 /sf	\$2,188,278
Dashboard Allowance	1.00 allw	\$50,000.00 /allw	\$50,000
Dehumidifer Controls	1.00 allw	\$55,000.00 /allw	\$55,000
Lighting Control	1.00 allw	\$25,000.00 /allw	\$25,000
D3070 SPECIAL PURPOSE HVAC SYSTEMS		\$11.83 / SF	\$4,502,412
D3075 REFRIGERANT PIPING		\$10.10 / SF	\$3,845,200
Refrigeration Piping	19,000 ea	\$38.00 /ea	\$722,000
VRF Piping	56,500 lf	\$44.00 /lf	\$2,486,000
Roof Pipe Jacketing	3,540 lf	\$15.00 /lf	\$53,100
RTU/AHU/HRU Condensers-2 Pipe Circuit	3,540 lf	\$165.00 /lf	\$584,100
D3076 CONDENSATE DRAIN PIPING		\$1.73 / SF	\$657,212
Condensate Drain Piping & Insulation	12,500 lf	\$51.75 /lf	\$646,875
Condensate Drain Pumps	25 ea	\$413.47 /ea	\$10,337
D3080 SYSTEMS TESTING & BALANCING		\$0.65 / SF	\$247,371
D3080 AIR & WATER BALANCE		\$0.65 / SF	\$247,371
Testing & Balancing	380,570 sf	\$0.65 /sf	\$247,371
D3090 OTHER HVAC SYSTEMS & EQUIP		\$4.18 / SF	\$1,592,513
D3091 HVAC MISC ITEMS		\$4.18 / SF	\$1,592,513
Mechanical duct cleaning	380,570 sf	\$0.90 /sf	\$342,513
Rigging and Hoisting	1.00 ls	\$225,000.00 /ls	\$225,000
Project Expenses and Commissioning	1.00 ls	\$775,000.00 /ls	\$775,000
Project Management	1.00 ls	\$250,000.00 /ls	\$250,000
26 ELECTRICAL	380,570 SF	\$42.33 / SF	\$16,110,997
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$24.28 / SF	\$9,239,771
D5023 LARGE POWER & DISTRIBUTION		\$4.19 / SF	\$1,595,815
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	13 ea	\$3,608.00 /ea	\$46,904
30 KVA NEMA 1 Transformer composite unit	20 ea	\$4,998.21 /ea	\$99,964
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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
100 AMP 120/208 panel board surface mounted composite	20 ea	\$3,106.84 /ea	\$62,137
125 AMP 120/208 panel board surface mounted composite	4.00 ea	\$3,326.64 /ea	\$13,307
150 AMP 120/208 panel board surface mounted composite	4.00 ea	\$3,566.84 /ea	\$14,267
225 AMP 120/208 Panel board surface mounted composite unit	1.00 ea	\$4,107.12 /ea	\$4,107
400 AMP 120/208 Panel board surface mounted composite unit	25 ea	\$6,062.34 /ea	\$151,558
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
400 AMP 277/480 Fusible 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	2.00 ea	\$12,411.87 /ea	\$24,824
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 Location for Cicurit meter cand Cat 6 Data Link recon 11-28-2022 Remove all and left generator and primary metering	-1.00 ls	\$340,000.00 /ls	(\$340,000)
Metering Allowance reduction based on Metering for up to 16 circuits for 16 Meter locatons	1.00 ls	\$400,000.01 /ls	\$400,000
Utility Meter Sockets composite unit	3.00 ea	\$510.69 /ea	\$1,532
D5024 LARGE POWER FEEDER CONDUIT		\$10.53 / SF	\$4,009,148
#136 15 AMP EMT Composite feeders copper - Large Power	775 lf	\$15.84 /lf	\$12,279
#137 15 AMP EMT Composite feeders copper - Large Power	770 lf	\$15.84 /lf	\$12,200
#138 15 AMP EMT Composite feeders copper - Large Power	761 lf	\$15.84 /lf	\$12,057
#144 20 AMP EMT Composite feeders copper - Large Power	796 lf	\$16.37 /lf	\$13,030
#148 35 AMP EMT Composite feeders copper - Large Power	727 lf	\$19.66 /lf	\$14,293
#150 25 AMP EMT Composite feeders copper - Large Power	714 lf	\$16.82 /lf	\$12,008
#151 25 AMP EMT Composite feeders copper - Large Power	712 lf	\$16.82 /lf	\$11,975
#152 30 AMP EMT Composite feeders copper - Large Power	736 lf	\$17.87 /lf	\$13,156
#153 35 AMP EMT Composite feeders copper - Large Power	817 lf	\$19.66 /lf	\$16,062
#155 25 AMP EMT Composite feeders copper - Large Power	676 lf	\$16.82 /lf	\$11,369
#156 25 AMP EMT Composite feeders copper - Large Power	683 lf	\$16.82 /lf	\$11,487
#159 35 AMP EMT Composite feeders copper - Large Power	666 lf	\$19.66 /lf	\$13,094
#160 35 AMP EMT Composite feeders copper - Large Power	672 lf	\$19.66 /lf	\$13,212
#167 20 AMP EMT Composite feeders copper - Large Power	820 lf	\$16.37 /lf	\$13,423
#175.1 35 AMP EMT Composite feeders copper - Large Power	822 lf	\$19.66 /lf	\$16,161
#176.1 35 AMP EMT Composite feeders copper - Large Power	838 lf	\$19.66 /lf	\$16,475
#177.1 35 AMP EMT Composite feeders copper - Large Power	811 lf	\$19.66 /lf	\$15,944
#231 25 AMP EMT Composite feeders copper - Large Power	313 lf	\$16.82 /lf	\$5,264
#236 15 AMP EMT Composite feeders copper - Large Power	766 lf	\$15.94 /lf	\$12,206
#238 35 AMP EMT Composite feeders copper - Large Power	382 lf	\$19.66 /lf	\$7,510
#250 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#254 25 AMP EMT Composite feeders copper - Large Power	342 lf	\$16.82 /lf	\$5,752

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#255 25 AMP EMT Composite feeders copper - Large Power	345 lf	\$16.82 /lf	\$5,802
#257 25 AMP EMT Composite feeders copper - Large Power	316 lf	\$16.82 /lf	\$5,315
#258 20 AMP EMT Composite feeders copper - Large Power	367 lf	\$16.05 /lf	\$5,890
#260 35 AMP EMT Composite feeders copper - Large Power	319 lf	\$19.66 /lf	\$6,272
#269.1 25 AMP EMT Composite feeders copper - Large Power	353 lf	\$16.82 /lf	\$5,937
#270.1 25 AMP EMT Composite feeders copper - Large Power	353 lf	\$16.82 /lf	\$5,937
#271.1 25 AMP EMT Composite feeders copper - Large Power	343 lf	\$16.82 /lf	\$5,769
#276 25 AMP EMT Composite feeders copper - Large Power	376 lf	\$16.82 /lf	\$6,324
#277.1 25 AMP EMT Composite feeders copper - Large Power	345 lf	\$16.82 /lf	\$5,802
#278.1 25 AMP EMT Composite feeders copper - Large Power	332 lf	\$16.82 /lf	\$5,584
#279.1 25 AMP EMT Composite feeders copper - Large Power	330 lf	\$16.82 /lf	\$5,550
#283.1 25 AMP EMT Composite feeders copper - Large Power	355 lf	\$16.82 /lf	\$5,971
#284.1 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#285.1 25 AMP EMT Composite feeders copper - Large Power	346 lf	\$16.82 /lf	\$5,819
#294 15 AMP EMT Composite feeders copper - Large Power	243 lf	\$15.84 /lf	\$3,850
#296 15 AMP EMT Composite feeders copper - Large Power	235 lf	\$15.84 /lf	\$3,723
#297 15 AMP EMT Composite feeders copper - Large Power	250 lf	\$15.84 /lf	\$3,961
#298 30 AMP EMT Composite feeders copper - Large Power	267 lf	\$17.87 /lf	\$4,773
#327 25 AMP EMT Composite feeders copper - Large Power	220 lf	\$16.82 /lf	\$3,700
#347 15 AMP EMT Composite feeders copper - Large Power	775 lf	\$15.84 /lf	\$12,279
#348 15 AMP EMT Composite feeders copper - Large Power	769 lf	\$15.84 /lf	\$12,184
#349 30 AMP EMT Composite feeders copper - Large Power	740 lf	\$17.87 /lf	\$13,227
#357 25 AMP EMT Composite feeders copper - Large Power	283 lf	\$16.82 /lf	\$4,760
#358 20 AMP EMT Composite feeders copper - Large Power	305 lf	\$16.44 /lf	\$5,015
#359 20 AMP EMT Composite feeders copper - Large Power	298 lf	\$16.44 /lf	\$4,900
#361 25 AMP EMT Composite feeders copper - Large Power	298 lf	\$16.82 /lf	\$5,012
#363 15 AMP EMT Composite feeders copper - Large Power	321 lf	\$15.84 /lf	\$5,086
#364 15 AMP EMT Composite feeders copper - Large Power	335 lf	\$15.84 /lf	\$5,308
#365 25 AMP EMT Composite feeders copper - Large Power	323 lf	\$16.82 /lf	\$5,432
#367 25 AMP EMT Composite feeders copper - Large Power	335 lf	\$16.82 /lf	\$5,634
#369 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#371 25 AMP EMT Composite feeders copper - Large Power	352 lf	\$16.82 /lf	\$5,920
#125 50 AMP EMT Composite feeders copper - Large Power	512 lf	\$22.55 /lf	\$11,548
#130 50 AMP EMT Composite feeders copper - Large Power	476 lf	\$22.55 /lf	\$10,736
#134 50 AMP EMT Composite feeders copper - Large Power	294 lf	\$22.55 /lf	\$6,631
#145 50 AMP EMT Composite feeders copper - Large Power	720 lf	\$22.55 /lf	\$16,240
#146 50 AMP EMT Composite feeders copper - Large Power	716 lf	\$22.55 /lf	\$16,149
#147 50 AMP EMT Composite feeders copper - Large Power	735 lf	\$22.55 /lf	\$16,578
#149 80 AMP EMT Composite feeders copper - Large Power	723 lf	\$27.17 /lf	\$19,645
#154 50 AMP EMT Composite feeders copper - Large Power	808 lf	\$22.55 /lf	\$18,224
#163 50 AMP EMT Composite feeders copper - Large Power	673 lf	\$22.55 /lf	\$15,179
#164 50 AMP EMT Composite feeders copper - Large Power	674 lf	\$22.55 /lf	\$15,202
#171 50 AMP EMT Composite feeders copper - Large Power	628 lf	\$22.55 /lf	\$14,164
#172 50 AMP EMT Composite feeders copper - Large Power	626 lf	\$22.55 /lf	\$14,119
#173 50 AMP EMT Composite feeders copper - Large Power	707 lf	\$22.55 /lf	\$15,946

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#174 50 AMP EMT Composite feeders copper - Large Power	696 lf	\$22.55 /lf	\$15,698
#175.2 50 AMP EMT Composite feeders copper - Large Power	812 lf	\$22.55 /lf	\$18,315
#176.2 50 AMP EMT Composite feeders copper - Large Power	831 lf	\$22.55 /lf	\$18,743
#177.2 50 AMP EMT Composite feeders copper - Large Power	827 lf	\$22.55 /lf	\$18,653
#187 50 AMP EMT Composite feeders copper - Large Power	407 lf	\$22.55 /lf	\$9,180
#232.1 25 AMP EMT Composite feeders copper - Large Power	347 lf	\$16.82 /lf	\$5,836
#232.2 35 AMP EMT Composite feeders copper - Large Power	347 lf	\$19.66 /lf	\$6,822
#233.1 25 AMP EMT Composite feeders copper - Large Power	341 lf	\$16.82 /lf	\$5,735
#233.2 35 AMP EMT Composite feeders copper - Large Power	341 lf	\$19.66 /lf	\$6,704
#234.1 25 AMP EMT Composite feeders copper - Large Power	341 lf	\$16.82 /lf	\$5,735
#234.2 35 AMP EMT Composite feeders copper - Large Power	341 lf	\$19.66 /lf	\$6,704
#235.1 25 AMP EMT Composite feeders copper - Large Power	347 lf	\$16.82 /lf	\$5,836
#235.2 35 AMP EMT Composite feeders copper - Large Power	347 lf	\$19.66 /lf	\$6,822
#243 50 AMP EMT Composite feeders copper - Large Power	332 lf	\$22.55 /lf	\$7,488
#244 50 AMP EMT Composite feeders copper - Large Power	344 lf	\$22.55 /lf	\$7,759
#245 35 AMP EMT Composite feeders copper - Large Power	352 lf	\$19.66 /lf	\$6,920
#246 50 AMP EMT Composite feeders copper - Large Power	337 lf	\$22.55 /lf	\$7,601
#247 35 AMP EMT Composite feeders copper - Large Power	340 lf	\$19.66 /lf	\$6,684
#248 50 AMP EMT Composite feeders copper - Large Power	330 lf	\$22.55 /lf	\$7,443
#249 35 AMP EMT Composite feeders copper - Large Power	336 lf	\$19.66 /lf	\$6,606
#251 50 AMP EMT Composite feeders copper - Large Power	320 lf	\$22.55 /lf	\$7,218
#252 35 AMP EMT Composite feeders copper - Large Power	327 lf	\$19.66 /lf	\$6,429
#256 50 AMP EMT Composite feeders copper - Large Power	323 lf	\$22.55 /lf	\$7,285
#259 35 AMP EMT Composite feeders copper - Large Power	326 lf	\$19.66 /lf	\$6,409
#263 35 AMP EMT Composite feeders copper - Large Power	330 lf	\$19.66 /lf	\$6,488
#264 35 AMP EMT Composite feeders copper - Large Power	328 lf	\$19.66 /lf	\$6,449
#269.2 50 AMP EMT Composite feeders copper - Large Power	353 lf	\$22.55 /lf	\$7,962
#270.2 50 AMP EMT Composite feeders copper - Large Power	324 lf	\$22.55 /lf	\$7,308
#271.2 50 AMP EMT Composite feeders copper - Large Power	343 lf	\$22.55 /lf	\$7,736
#275 50 AMP EMT Composite feeders copper - Large Power	368 lf	\$22.55 /lf	\$8,300
#277.2 50 AMP EMT Composite feeders copper - Large Power	352 lf	\$22.55 /lf	\$7,939
#278.2 50 AMP EMT Composite feeders copper - Large Power	339 lf	\$22.55 /lf	\$7,646
#279.2 50 AMP EMT Composite feeders copper - Large Power	337 lf	\$22.55 /lf	\$7,601
#283.2 50 AMP EMT Composite feeders copper - Large Power	348 lf	\$22.55 /lf	\$7,849
#284.2 50 AMP EMT Composite feeders copper - Large Power	333 lf	\$22.55 /lf	\$7,511
#285.2 50 AMP EMT Composite feeders copper - Large Power	353 lf	\$22.55 /lf	\$7,962
#317 50 AMP EMT Composite feeders copper - Large Power	209 lf	\$22.55 /lf	\$4,714
#318 50 AMP EMT Composite feeders copper - Large Power	228 lf	\$22.55 /lf	\$5,143
#325 35 AMP EMT Composite feeders copper - Large Power	216 lf	\$19.66 /lf	\$4,247
#326 50 AMP EMT Composite feeders copper - Large Power	228 lf	\$22.55 /lf	\$5,143
#346 50 AMP EMT Composite feeders copper - Large Power	626 lf	\$22.55 /lf	\$14,119
#356 35 AMP EMT Composite feeders copper - Large Power	276 lf	\$19.66 /lf	\$5,426
#360 40 AMP EMT Composite feeders copper - Large Power	228 lf	\$20.88 /lf	\$4,761
#366 35 AMP EMT Composite feeders copper - Large Power	329 lf	\$19.66 /lf	\$6,468
#368 50 AMP EMT Composite feeders copper - Large Power	327 lf	\$22.55 /lf	\$7,375

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#372 50 AMP EMT Composite feeders copper - Large Power	359 lf	\$22.55 /lf	\$8,097
#044 50 AMP MI Composite feeders copper - Large Power	34 lf	\$86.00 /lf	\$2,924
#047 50 AMP MI Composite feeders copper - Large Power	319 lf	\$86.00 /lf	\$27,433
#050 50 AMP MI Composite feeders copper - Large Power	457 lf	\$86.00 /lf	\$39,301
#053 50 AMP MI Composite feeders copper - Large Power	254 lf	\$86.00 /lf	\$21,844
#056 50 AMP MI Composite feeders copper - Large Power	451 lf	\$86.00 /lf	\$38,785
#059 50 AMP MI Composite feeders copper - Large Power	285 lf	\$86.00 /lf	\$24,509
#062 50 AMP MI Composite feeders copper - Large Power	476 lf	\$86.00 /lf	\$40,935
#065 50 AMP MI Composite feeders copper - Large Power	239 lf	\$86.00 /lf	\$20,554
#234 60 AMP EMT Composite feeders copper - Large Power	356 lf	\$26.40 /lf	\$9,400
#235 60 AMP EMT Composite feeders copper - Large Power	366 lf	\$26.40 /lf	\$9,664
#303 35 AMP EMT Composite feeders copper - Large Power	234 lf	\$19.66 /lf	\$4,600
#370 50 AMP EMT Composite feeders copper - Large Power	347 lf	\$22.55 /lf	\$7,827
#036 100 AMP MI Composite feeders Copper - Large Power	32 lf	\$100.59 /lf	\$3,219
#037 100 AMP MI Composite feeders Copper - Large Power	321 lf	\$104.26 /lf	\$33,467
#038 100 AMP MI Composite feeders Copper - Large Power	467 lf	\$104.26 /lf	\$48,689
#039 100 AMP MI Composite feeders Copper - Large Power	259 lf	\$104.26 /lf	\$27,003
#040 100 AMP MI Composite feeders Copper - Large Power	455 lf	\$104.26 /lf	\$47,438
#041 100 AMP MI Composite feeders Copper - Large Power	271 lf	\$104.26 /lf	\$28,254
#042 100 AMP MI Composite feeders Copper - Large Power	475 lf	\$104.26 /lf	\$49,523
#043 100 AMP MI Composite feeders Copper - Large Power	239 lf	\$104.26 /lf	\$24,918
#183 110 AMP EMT Composite feeders Copper - Large Power	389 lf	\$35.71 /lf	\$13,893
#226 100 AMP EMT Composite feeders Copper - Large Power	428 lf	\$33.52 /lf	\$14,348
#227 110 AMP EMT Composite feeders Copper - Large Power	466 lf	\$35.71 /lf	\$16,643
#230 80 AMP EMT Composite feeders Copper - Large Power	255 lf	\$27.17 /lf	\$6,929
#328 225 AMP EMT Composite feeders Copper - Large Power	211 lf	\$88.01 /lf	\$18,571
#329 175 AMP EMT Composite feeders Copper - Large Power	212 lf	\$77.91 /lf	\$16,518
#083 Fire Pump Assume 200 AMP MI Composite feeders Copper - Large Power	90 lf	\$290.84 /lf	\$26,176
#084 175 AMP MI Composite feeders Copper - Large Power	62 lf	\$242.92 /lf	\$15,061
#106 200 AMP EMT Composite feeders Copper - Large Power	271 lf	\$95.04 /lf	\$25,757
#107 200 AMP EMT Composite feeders Copper - Large Power	53 lf	\$95.04 /lf	\$5,037
#142 175 AMP EMT Composite feeders Copper - Large Power	757 lf	\$77.91 /lf	\$58,981
#143 175 AMP EMT Composite feeders Copper - Large Power	685 lf	\$77.91 /lf	\$53,371
#181 150 AMP EMT Composite feeders Copper - Large Power	386 lf	\$61.00 /lf	\$23,546
#185 150 AMP EMT Composite feeders Copper - Large Power	720 lf	\$61.00 /lf	\$43,919
#186 200 AMP EMT Composite feeders Copper - Large Power	746 lf	\$98.48 /lf	\$73,465
#225 150 AMP EMT Composite feeders Copper - Large Power	379 lf	\$61.00 /lf	\$23,119
#304 35 AMP EMT Composite feeders Copper - Large Power	256 lf	\$19.66 /lf	\$5,033
#307.1 25 AMP EMT Composite feeders Copper - Large Power	275 lf	\$16.82 /lf	\$4,625
#307.2 35 AMP EMT Composite feeders Copper - Large Power	250 lf	\$19.66 /lf	\$4,915
#308.1 25 AMP EMT Composite feeders Copper - Large Power	231 lf	\$16.82 /lf	\$3,885
#308.2 35 AMP EMT Composite feeders Copper - Large Power	213 lf	\$19.66 /lf	\$4,188
#240 175 AMP EMT Composite feeders Copper - Large Power	284 lf	\$77.91 /lf	\$22,128
#033 600 AMP EMT Composite feeders Copper - Large Power	36 lf	\$247.41 /lf	\$8,907

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#068 400 AMP MI Composite feeders Copper - Large Power	63 lf	\$418.68 /lf	\$26,377
#081 400 AMP MI Composite feeders Copper - Large Power	36 lf	\$418.68 /lf	\$15,072
#082 400 AMP MI Composite feeders Copper - Large Power	34 lf	\$418.68 /lf	\$14,235
#182 400 AMP EMT Composite feeders Copper - Large Power	819 lf	\$168.09 /lf	\$137,663
#224 450 AMP EMT Composite feeders Copper - Large Power	336 lf	\$192.58 /lf	\$64,708
#293 400 AMP EMT Composite feeders Copper - Large Power	336 lf	\$168.09 /lf	\$56,477
#362 450 AMP EMT Composite feeders Copper - Large Power	189 lf	\$192.58 /lf	\$36,398
#032 800 AMP EMT Composite feeders Aluminum - Large Power	81 lf	\$269.45 /lf	\$21,826
#003 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#004 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#077 1200 AMP EMT Composite feeders Aluminum - Large Power	48 lf	\$406.75 /lf	\$19,524
#078 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#289.1 1200 AMP EMT Composite feeders Aluminum - Large Power	126 lf	\$406.75 /lf	\$51,250
#289.2 1200 AMP EMT Composite feeders Aluminum - Large Power	156 lf	\$406.75 /lf	\$63,452
#076 1600 AMP EMT Composite feeders Aluminum - Large Power	276 lf	\$538.91 /lf	\$148,738
#005 2000 AMP EMT Composite feeders Aluminum - Large Power	488 lf	\$674.44 /lf	\$329,128
#131 100 AMP EMT Composite feeders Aluminum - Large Power	60 lf	\$37.00 /lf	\$2,220
#132 125 AMP EMT Composite feeders Aluminum - Large Power	338 lf	\$42.14 /lf	\$14,244
#211 150 AMP EMT Composite feeders Aluminum - Large Power	84 lf	\$49.08 /lf	\$4,123
#350 125 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$42.14 /lf	\$5,057
#351 125 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$42.14 /lf	\$6,321
#352 125 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$42.14 /lf	\$6,321
#353 125 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$42.14 /lf	\$5,057
#354 150 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$49.08 /lf	\$5,890
#355 150 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$49.08 /lf	\$7,363
#008 200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$79.15 /lf	\$2,849
#011 200 AMP EMT Composite feeders Aluminum - Large Power	321 lf	\$79.15 /lf	\$25,408
#014 200 AMP EMT Composite feeders Aluminum - Large Power	481 lf	\$79.15 /lf	\$38,072
#017 200 AMP EMT Composite feeders Aluminum - Large Power	278 lf	\$79.15 /lf	\$22,004
#020 200 AMP EMT Composite feeders Aluminum - Large Power	493 lf	\$79.15 /lf	\$39,022
#023 200 AMP EMT Composite feeders Aluminum - Large Power	288 lf	\$79.15 /lf	\$22,796
#026 200 AMP EMT Composite feeders Aluminum - Large Power	507 lf	\$79.15 /lf	\$40,130
#029 200 AMP EMT Composite feeders Aluminum - Large Power	267 lf	\$79.15 /lf	\$21,134
#071 200 AMP EMT Composite feeders Aluminum - Large Power	476 lf	\$79.15 /lf	\$37,676
#073 200 AMP EMT Composite feeders Aluminum - Large Power	53 lf	\$79.15 /lf	\$4,195
#087 225 AMP EMT Composite feeders Aluminum - Large Power	43 lf	\$84.71 /lf	\$3,643
#090 225 AMP EMT Composite feeders Aluminum - Large Power	465 lf	\$84.71 /lf	\$39,390
#094 225 AMP EMT Composite feeders Aluminum - Large Power	302 lf	\$84.71 /lf	\$25,582

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#097 225 AMP EMT Composite feeders Aluminum - Large Power	464 lf	\$84.71 /lf	\$39,305
#100 225 AMP EMT Composite feeders Aluminum - Large Power	459 lf	\$84.71 /lf	\$38,882
#103 225 AMP EMT Composite feeders Aluminum - Large Power	479 lf	\$84.71 /lf	\$40,576
#108 225 AMP EMT Composite feeders Aluminum - Large Power	402 lf	\$84.71 /lf	\$34,053
#113 225 AMP EMT Composite feeders Aluminum - Large Power	346 lf	\$84.71 /lf	\$29,310
#118 225 AMP EMT Composite feeders Aluminum - Large Power	462 lf	\$84.71 /lf	\$39,136
#127 225 AMP EMT Composite feeders Aluminum - Large Power	341 lf	\$84.71 /lf	\$28,886
#189 225 AMP EMT Composite feeders Aluminum - Large Power	144 lf	\$84.71 /lf	\$12,198
#190 175 AMP EMT Composite feeders Aluminum - Large Power	50 lf	\$69.12 /lf	\$3,456
#192 225 AMP EMT Composite feeders Aluminum - Large Power	344 lf	\$84.71 /lf	\$29,140
#199 225 AMP EMT Composite feeders Aluminum - Large Power	202 lf	\$84.71 /lf	\$17,111
#202 225 AMP EMT Composite feeders Aluminum - Large Power	71 lf	\$84.71 /lf	\$6,014
#205 225 AMP EMT Composite feeders Aluminum - Large Power	211 lf	\$84.71 /lf	\$17,874
#208 225 AMP EMT Composite feeders Aluminum - Large Power	278 lf	\$84.71 /lf	\$23,549
#212 175 AMP EMT Composite feeders Aluminum - Large Power	318 lf	\$69.12 /lf	\$21,981
#213 225 AMP EMT Composite feeders Aluminum - Large Power	168 lf	\$84.71 /lf	\$14,231
#215 225 AMP EMT Composite feeders Aluminum - Large Power	251 lf	\$84.71 /lf	\$21,262
#218 225 AMP EMT Composite feeders Aluminum - Large Power	263 lf	\$84.71 /lf	\$22,279
#221 225 AMP EMT Composite feeders Aluminum - Large Power	242 lf	\$84.71 /lf	\$20,500
#006 400 AMP EMT Composite feeders Aluminum - Large Power	56 lf	\$134.93 /lf	\$7,556
#034 400 AMP EMT Composite feeders Aluminum - Large Power	40 lf	\$134.93 /lf	\$5,397
#069 400 AMP EMT Composite feeders Aluminum - Large Power	39 lf	\$134.93 /lf	\$5,262
#075 400 AMP EMT Composite feeders Aluminum - Large Power	64 lf	\$134.93 /lf	\$8,636
#121 400 AMP EMT Composite feeders Aluminum - Large Power	283 lf	\$134.93 /lf	\$38,186
#191 400 AMP EMT Composite feeders Aluminum - Large Power	50 lf	\$134.93 /lf	\$6,747
#195 400 AMP EMT Composite feeders Aluminum - Large Power	287 lf	\$134.93 /lf	\$38,725
#330 400 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$134.93 /lf	\$20,240
D5025 EMERGENCY GEN SET W/ATS		\$0.11 / SF	\$42,970
Auto Transfer Switch 3P - Fire pump ATS install only (included with fire pump)	1.00 ea	\$8,695.58 /ea	\$8,696
Auto Transfer Switch 3P - 400a	3.00 ea	\$11,424.75 /ea	\$34,274
D5027 MECHANICAL EQUIPMENT CONNECTIONS		\$5.46 / SF	\$2,076,788
E3EQ AC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	53 ea	\$655.72 /ea	\$34,753
E3EQ AC Air compressors AC2-5 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	4.00 ea	\$655.72 /ea	\$2,623
E3EQ ACh 04 composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ ACh 05 composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ AD2-4 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	3.00 ea	\$655.72 /ea	\$1,967
E3EQ CP1 with motor rated Switch composite unit	4.00 ea	\$655.72 /ea	\$2,623
E3EQ DEH1 with 120 Volt Circuit	27 ea	\$655.72 /ea	\$17,705
E3EQ j box with 30 amp disconnect	5.00 ea	\$655.72 /ea	\$3,279
E3EQ j box with with motor rated Switch	11 ea	\$655.72 /ea	\$7,213

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 disconnect 600 volt composite unit	112 ea	\$655.72 /ea	\$73,441
E3EQ ACCCU - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	13 ea	\$655.72 /ea	\$8,524
E3EQ BS - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	38 ea	\$655.72 /ea	\$24,917
E3EQ CU-1 with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-10A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-10B with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-11A with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-11B with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-11C with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-12 with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13C with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-14A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-14B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-15 with VFD 50A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-16 with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-17 with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-19A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-19B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-2A with VFD 45A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-2B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-3 with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ CU-4A with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-4B with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-5A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-5B with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-6A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-6B with VFD 35 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-7 with VFD 15 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-8A with VFD 80 A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-8B with VFD 60 A composite unit connection only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ CU-9A with VFD 40 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-9B with VFD 30 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-9C with VFD 20 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ DF - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	2.00 ea	\$655.72 /ea	\$1,311
E3EQ DWP - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ ERV-1 with VFD 45 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-3 with VFD 15 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-4 with VFD 15 A composite unit connection	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-7 with VFD 45 A composite unit connection	1.00 ea	\$448.22 /ea	\$448
E3EQ EUH - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	28 ea	\$655.72 /ea	\$18,360
E3EQ F: Fan w/ VFD composite unit connection	12 ea	\$448.22 /ea	\$5,379
E3EQ F: Fan w/ VFD composite unit connection only feeder in large power	8.00 ea	\$448.22 /ea	\$3,586
E3EQ Fire Pump Controler FBO composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ FTU - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit(large qty from mech sched)	9.00 ea	\$655.72 /ea	\$5,902
E3EQ HWRP 1-8 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	8.00 ea	\$655.72 /ea	\$5,246
E3EQ KEF - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	5.00 ea	\$655.72 /ea	\$3,279
E3EQ MAU1 with VFD 200 A composite unit connection only on drawing only feeder in large power	1.00 ea	\$448.22 /ea	\$448

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ MAU2 with VFD 400A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ PE-1 with Cntrl composite unit connection only off riser only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ PE-2 with Cntrl composite unit connection only off riser only feeder in large power	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 associated with Ahu1 and Ahu2	2.00 ea	\$655.72 /ea	\$1,311
E3EQ SP - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	3.00 ea	\$655.72 /ea	\$1,967
E3EQ VAC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	2.00 ea	\$655.72 /ea	\$1,311
E3EQ VAV - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	62 ea	\$655.72 /ea	\$40,655
E3EQ VCU composite unit connection only feeder in large power	48 ea	\$655.72 /ea	\$31,475
E3EQ ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit	40 ea	\$727.02 /ea	\$29,081
E3EQ AD1 - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit	1.00 ea	\$727.02 /ea	\$727
E3EQ RTU1 - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ RTU2 - 200 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ VAV Connection for electric Rehatad coil - not shown on electrical	162 ea	\$800.00 /ea	\$129,600
E3EQ VRF branch selector 208 composite unit connection off mechanical schedule	47 ea	\$516.82 /ea	\$24,290
E3EQ AC01 air compressor 100 A composite unit connection	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU1 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250
E3EQ AHU10 with VFD 200 A composite unit connection only feeder in large power	1.00 ea	\$2,500.00 /ea	\$2,500
E3EQ AHU2 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250
E3EQ AHU3 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU4 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU5 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU6 with VFD 200 A composite unit connection only feeder in large power	1.00 ea	\$1,421.00 /ea	\$1,421
E3EQ AHU7 with VFD 225 A composite unit connection only feeder in large power	1.00 ea	\$1,421.00 /ea	\$1,421
E3EQ AHU8 with VFD 150 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ AHU9 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$2,500.00 /ea	\$2,500
E3EQ DC-1 ith VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU4 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU5 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU1 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ HRU2 with VFD 300 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ HRU3 with VFD 300 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ EWH w/ junction box Composite Unit 200 amps only feeder in large power	4.00 ea	\$655.72 /ea	\$2,623
E3EQ EWH w/ junction box Composite Unit 30 amps	5.00 ea	\$655.72 /ea	\$3,279
E3EQ FCU w/ junction box - Composite Unit	271 ea	\$655.72 /ea	\$177,700
E3EQ GWH w/ junction box Composite Unit 30 amps	1.00 ea	\$655.72 /ea	\$656
20 AMP EMT Composite feeders copper - Mechanical	28,950 lf	\$17.51 /lf	\$506,917
30 AMP EMT Composite feeders copper - Mechanical	38,250 lf	\$19.75 /lf	\$755,422
60 AMP EMT Composite feeders copper - Mechanical	3,075 lf	\$28.17 /lf	\$86,607
100 AMP EMT Composite feeders Copper - Mechanical	75 lf	\$33.82 /lf	\$2,537
D5029 SMALL POWER DEVICES & WIRING		\$3.98 / SF	\$1,515,051
Wiremold Dual Channel Empty Raceway with wiring - no devices included - Composite Unit	32 lf	\$60.36 /lf	\$1,932
Wiremold Duplex Receptacle Only Composite Unit	15 ea	\$45.60 /ea	\$684
E3EQ Auto 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Auto 208 volt connetions - Assume Power is covered on 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 covered on Electrical Power plans	0.00 ea		\$0
E3EQ Biotech 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Carpentry 120 volt connetions - Assume Power is covered 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 Electrical Power plans	0.00 ea		\$0
E3EQ Cosmo 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ Dental 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Dental 208 volt connetions - Assume Power is covered on 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 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 Electrical Power plans	0.00 ea		\$0
E3EQ HVAC 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 120 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 208 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 480 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 120 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 208 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 480 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Medical 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Medical 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 480 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Plumbing 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Robotics 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ Robotics 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
Gym Scoreboard control System Wiring	1.00 ea	\$1,500.00 /ea	\$1,500
Gym Shot timer Wiring	1.00 ea	\$1,500.00 /ea	\$1,500
Small Power Projection Screen	2.00 ea	\$1,500.00 /ea	\$3,000
FB: Quad Floor Box - Composite Unit	50 ea	\$875.00 /ea	\$43,750
Transformer: 24 V XFMR Low Voltage transformer	24 ea	\$217.48 /ea	\$5,220
Recep: 20A Twist lock (Type 1) Poke thru Receptacle Composite unit	1.00 ea	\$1,200.00 /ea	\$1,200
Recep: 20A Twist lock (Type 1) Receptacle Composite unit	28 ea	\$131.58 /ea	\$3,684
Recep: 20A Twist lock (Type 1) Heavy Duty Receptacle Composite unit	2.00 ea	\$131.58 /ea	\$263
Recep: 20A Twist lock (Type 4) 250V Receptacle Composite unit	5.00 ea	\$131.58 /ea	\$658
Recep: 30 Amp Twist Lock Heavy duty, 208V Nema Receptacle type 5	7.00 ea	\$165.17 /ea	\$1,156
Recep: 30 Amp Twist Lock, 208V floor box Nema Receptacle type 5	1.00 ea	\$165.17 /ea	\$165
Recep: 30 Amp Twist Lock, 208V Nema Receptacle type 5	5.00 ea	\$165.17 /ea	\$826
Recep: 30A Type 2 Twist Lock Nema Receptacle Composite unit	15 ea	\$165.17 /ea	\$2,478
Recep: 30A Type 2 Twist Lock poke thry Receptacle Composite unit	4.00 ea	\$1,200.00 /ea	\$4,800
Recep: 50 Amp Type 3 Twist Lock Floor Box Receptacle Composite unit	2.00 ea	\$1,200.00 /ea	\$2,400
Recep: 50 Amp Type 3 Twist Lock Receptacle Composite unit	21 ea	\$199.56 /ea	\$4,191
Recep: 50 Amp Type 3 Twist Lock Receptacle Composite unit Heavy duty	20 ea	\$199.56 /ea	\$3,991
Recep: I520/I530	80 ea	\$199.56 /ea	\$15,965
JB: Power Junction Box - Typ. Composite Unit	132 ea	\$85.04 /ea	\$11,291
JB: Power Junction Box - Typ. Composite Unit fsd	14 ea	\$150.00 /ea	\$2,100
JB: Power Junction Box - XP Composite Unit	2.00 ea	\$125.00 /ea	\$250
Switch: EPO Switch at Shops	30 ea	\$85.04 /ea	\$2,551
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	536 ea	\$116.68 /ea	\$62,540
Switch: EPO Switch at Shops XP	1.00 ea	\$116.68 /ea	\$117
Recep: Quad receptacle Composite unit	446 ea	\$119.92 /ea	\$53,485
Recep: Quad GFI receptacle Composite unit	38 ea	\$186.35 /ea	\$7,081
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 Type 2 Twistlock Composite Unit	6.00 ea	\$905.53 /ea	\$5,433
CR: Cord Reel Type 3Twistlock Composite Unit	15 ea	\$905.53 /ea	\$13,583
CR: Cord Reel Type duplex Composite Unit	226 ea	\$905.53 /ea	\$204,650
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

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
D5040 LIGHTING		\$14.25 / SF	\$5,424,823
D5042 LIGHT FIXTURES		\$11.59 / SF	\$4,409,154
20 AMP EMT Composite feeders copper - Large Power	48,000 lf	\$16.93 /lf	\$812,704
DPB2 Composite Unit	32 ea	\$661.71 /ea	\$21,175
GSB Light Fixture	20 ea	\$461.71 /ea	\$9,234
GSC 8.3 Light Fixture	13 ea	\$461.71 /ea	\$6,002
GSD Lighting Fixture	24 ea	\$411.71 /ea	\$9,881
LSE Light Fixture	4.00 ea	\$561.71 /ea	\$2,247
RC1 Recessed Can lighting Fixture	272 ea	\$391.71 /ea	\$106,546
RC2 Recessed Can lighting Fixture	15 ea	\$391.71 /ea	\$5,876
RE Lighting	31 ea	\$391.71 /ea	\$12,143
RF Recessed Can light Fixture	70 ea	\$391.71 /ea	\$27,420
RJ Square Recess Can Light Fixture	55 ea	\$391.71 /ea	\$21,544
RK Lighting Fixture	8.00 ea	\$391.71 /ea	\$3,134
RN1 Light Fixture	15 ea	\$391.71 /ea	\$5,876
RN2 Light Fixture	42 ea	\$391.71 /ea	\$16,452
RQ Lighting Fixture	35 ea	\$391.71 /ea	\$13,710
RB2 2x4 Lighting Fixture	10 ea	\$382.99 /ea	\$3,830
RDA 2x4	31 ea	\$382.99 /ea	\$11,873
RDB	13 ea	\$382.99 /ea	\$4,979
RL1 2X4 Lighting Fixture	155 ea	\$382.99 /ea	\$59,364
RL2 2x4 Led Recessed Troffer Composite Unit	35 ea	\$382.99 /ea	\$13,405
RA1 2X2 Lighting Fixture	210 ea	\$391.71 /ea	\$82,259
RA2 Lighting Fixture	5.00 ea	\$391.71 /ea	\$1,959
RA3 Lighting Fixture	19 ea	\$391.71 /ea	\$7,443
RB1 Lighting Fixture	205 ea	\$391.71 /ea	\$80,301
RLC 4 foot Lighting Fixture (348)	1,644 ea	\$179.96 /ea	\$295,846
RLC 6 foot Lighting Fixture (14)	84 ea	\$179.96 /ea	\$15,116
RLC 8 foot Lighting Fixture (6)	48 ea	\$179.96 /ea	\$8,638
GSE 25.2 foot Lighting Fixture (1)	25 lf	\$190.99 /lf	\$4,813
GSE 32.2 foot Lighting Fixture (1)	32 lf	\$190.99 /lf	\$6,150
GSE 33.2 foot Lighting Fixture (1)	33 lf	\$190.99 /lf	\$6,341
GSE 33.7 foot Lighting Fixture (2)	67 lf	\$190.99 /lf	\$12,873
LPJ 10 Foot (2) Composite Unit	20 lf	\$135.99 /lf	\$2,720
LPJ 16 Foot (2) Composite Unit	32 lf	\$135.99 /lf	\$4,352
LPJ 20 Foot (2) Composite Unit	40 lf	\$135.99 /lf	\$5,440
LPJ 24 Foot (4) Composite Unit	96 lf	\$135.99 /lf	\$13,056
LPJ 30 Foot (2) Composite Unit	60 lf	\$135.99 /lf	\$8,160
LPJ 4 Foot (41) Composite Unit	164 lf	\$135.99 /lf	\$22,303
LPJ 8Foot (8) Composite Unit	64 lf	\$135.99 /lf	\$8,704
LSA 10.5 foot linear Fixture per foot(1)	10 lf	\$135.99 /lf	\$1,428
LSA 18.50 foot linear Fixture per foot(6)	111 lf	\$135.99 /lf	\$15,095
LSA 2.5 foot linear Fixture per foot(1)	2.50 lf	\$135.99 /lf	\$340
LSA 24 foot linear Fixture per foot(3)	72 lf	\$135.99 /lf	\$9,792
LSA 26 foot linear Fixture per foot(2)	52 lf	\$135.99 /lf	\$7,072

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
LSA 26.11 foot linear Fixture per foot	26 lf	\$135.99 /lf	\$3,551
LSA 26.11 foot linear Fixture per foot(2)	52 lf	\$135.99 /lf	\$7,102
LSA 7 foot linear Fixture per foot(1)	7.00 lf	\$135.99 /lf	\$952
LSA 7.3 foot linear Fixture per foot(5)	36 lf	\$135.99 /lf	\$4,964
LSA 9.6 foot linear Fixture per foot(6)	48 lf	\$135.99 /lf	\$6,528
LSA 9.9 foot linear Fixture per foot(4)	40 lf	\$135.99 /lf	\$5,385
LSA 8 foot linear Fixture per foot(1)	8.00 lf	\$135.99 /lf	\$1,088
LSB 18 foot linear fixture per foot (2)	36 lf	\$135.99 /lf	\$4,896
LSB 89 foot linear fixture per foot (2)	188 lf	\$135.99 /lf	\$25,567
RLA1 12 foot Light Fixture(3)	36 lf	\$135.99 /lf	\$4,896
RLA1 4 foot Light Fixture(116)	464 lf	\$135.99 /lf	\$63,102
RLA1 6 foot Light Fixture(23)	138 lf	\$135.99 /lf	\$18,767
RLA1 8 foot Light Fixture(2)	16 lf	\$135.99 /lf	\$2,176
RLA2 4 foot Lighting Fixture (7)	28 lf	\$160.99 /lf	\$4,508
RLB-1 Linear fixture per foot	178 lf	\$135.99 /lf	\$24,207
RLD1 18 foot Light fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLD1 4 foot Light fixture (2)	8.00 lf	\$135.99 /lf	\$1,088
RLD1 8 foot Light fixture (4)	32 lf	\$135.99 /lf	\$4,352
RLD3 13.9 foot Light Fixture (11)	153 lf	\$135.99 /lf	\$20,794
RLD3 22 foot Light Fixture (4)	88 lf	\$135.99 /lf	\$11,968
RLD3 25.6 foot Light Fixture (2)	51 lf	\$135.99 /lf	\$6,963
RLD3 38.2 foot Light Fixture (2)	76 lf	\$135.99 /lf	\$10,390
GPL2 4 foot	17 ea	\$508.96 /ea	\$8,652
LPB Light Fixture 4 foot	41 ea	\$608.96 /ea	\$24,967
LPE4 Lighting Fixture	19 ea	\$608.96 /ea	\$11,570
LPH8 Light Fixture	130 ea	\$608.96 /ea	\$79,165
GPL1 8 foot	20 ea	\$817.96 /ea	\$16,359
LPA Light Fixture 8 foot (3)	24 lf	\$234.96 /lf	\$5,639
LPA1 Light Fixture 10 foot(214)	2,140 lf	\$234.96 /lf	\$502,804
LPA1 Light Fixture 12 foot (13)	156 lf	\$234.96 /lf	\$36,653
LPA1 Light Fixture 14 foot (5)	70 lf	\$234.96 /lf	\$16,447
LPA1 Light Fixture 16 foot (4)	64 lf	\$234.96 /lf	\$15,037
LPA1 Light Fixture 18 foot (7)	126 lf	\$234.96 /lf	\$29,604
LPA1 Light Fixture 20 foot (2)	40 lf	\$234.96 /lf	\$9,398
LPA1 Light Fixture 4 foot (60)	240 lf	\$234.96 /lf	\$56,389
LPA1 Light Fixture 6 foot (24)	144 lf	\$234.96 /lf	\$33,834
LPA1 Light Fixture 8 foot (61)	488 lf	\$234.96 /lf	\$114,658
LPA2 per linear 4 foot (2)	17 lf	\$190.99 /lf	\$3,287
LPC Lighting Fixture 20 foot (2)	40 lf	\$135.99 /lf	\$5,440
LPC Lighting Fixture 25 foot (1)	25 lf	\$135.99 /lf	\$3,400
LPC Lighting Fixture 36 foot (1)	216 lf	\$135.99 /lf	\$29,375
LPC Lighting Fixture 42 foot (1)	42 lf	\$135.99 /lf	\$5,712
LPC Lighting Fixture 49 foot (1)	50 lf	\$135.99 /lf	\$6,800
LPC Lighting Fixture 53 foot (3)	162 lf	\$135.99 /lf	\$22,031
LPC Lighting Fixture 6foot (15)	90 lf	\$135.99 /lf	\$12,240

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
LPC Lighting Fixture 8 foot (41)	328 lf	\$135.99 /lf	\$44,606
LPC Lighting Fixture 10 foot (45)	450 lf	\$135.99 /lf	\$61,198
LPD Lighting Fixture 4 foot (46)	184 lf	\$135.99 /lf	\$25,023
LPD Lighting Fixture 6 foot (1)	6.00 lf	\$135.99 /lf	\$816
LPG Light Fixture 12 foot (2)	24 lf	\$135.99 /lf	\$3,264
LPG Light Fixture 18 foot (2)	36 lf	\$135.99 /lf	\$4,896
LPG Light Fixture 4 foot (3)	12 lf	\$135.99 /lf	\$1,632
LPH3A per linear foot	80 lf	\$135.99 /lf	\$10,880
LPK 12 foot (10) composite Unit	120 lf	\$135.99 /lf	\$16,319
LPK 16 foot (10) composite Unit	160 lf	\$135.99 /lf	\$21,759
LPK 8 foot (1) composite Unit	8.00 lf	\$135.99 /lf	\$1,088
LPL 10 foot Pendant (9)	90 lf	\$135.99 /lf	\$12,240
LPL 12 foot Pendant (3)	36 lf	\$135.99 /lf	\$4,896
LPL 15 foot Pendant (1)	15 lf	\$135.99 /lf	\$2,040
LPL 16 foot Pendant (5)	80 lf	\$135.99 /lf	\$10,880
LPL4 foot Pendant	48 lf	\$135.99 /lf	\$6,528
LPM1 4 foot (7)Lighting Fixture	28 lf	\$135.99 /lf	\$3,808
LPM1 8 foot (6)Lighting Fixture	48 lf	\$135.99 /lf	\$6,528
LPM2 4 foot (14)Lighting Fixture	56 lf	\$135.99 /lf	\$7,616
LPM2 6 foot (3)Lighting Fixture	18 lf	\$135.99 /lf	\$2,448
LPM2 8foot (9)Lighting Fixture	72 lf	\$135.99 /lf	\$9,792
GWD4 Wall Mounted Fixture	32 ea	\$391.71 /ea	\$12,535
GWE1 Light Fixture	39 ea	\$561.71 /ea	\$21,907
GWE2 Light Fixture	31 ea	\$561.71 /ea	\$17,413
GWF Fixture	24 ea	\$391.71 /ea	\$9,401
LSG1 Lighting Fixture 4 foot fixture 04-20-2023	84 ea	\$561.71 /ea	\$47,184
LSH 4 Foot	24 ea	\$561.71 /ea	\$13,481
LSG2 Light Fixture 8 foot fixture	54 ea	\$706.21 /ea	\$38,135
LSH 2 foot per linear foot(10)	20 lf	\$135.99 /lf	\$2,720
LSH 30 foot per linear foot(10)	60 lf	\$135.99 /lf	\$8,160
LSH 8 foot per linear foot(29)	232 lf	\$135.99 /lf	\$31,551
LSH 8.3 foot per linear foot(7)	58 lf	\$135.99 /lf	\$7,901
LSJ 7.7 foot Light Fixture(1)	7.70 lf	\$135.99 /lf	\$1,047
LSJ 8 foot Light Fixture(1)	8.00 lf	\$135.99 /lf	\$1,088
LSJ 10 foot Light Fixture(1)	10 lf	\$135.99 /lf	\$1,360
LSJ 10.4 foot Light Fixture(1)	10 lf	\$135.99 /lf	\$1,414
LSJ 10.7 foot Light Fixture(3)	32 lf	\$135.99 /lf	\$4,365
RLB2 10.8 foot Lighting Fixture (2)	22 lf	\$135.99 /lf	\$2,937
RLB2 12.3 foot Lighting Fixture (1)	12 lf	\$135.99 /lf	\$1,673
RLB2 15.5 foot Lighting Fixture (1)	16 lf	\$135.99 /lf	\$2,108
RLB2 16.9 foot Lighting Fixture (3)	51 lf	\$135.99 /lf	\$6,895
RLB2 18 foot Lighting Fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLB2 19.1 foot Lighting Fixture (1)	19 lf	\$135.99 /lf	\$2,598
RLB2 23.6 foot Lighting Fixture (1)	24 lf	\$135.99 /lf	\$3,209
RLB2 40.85 foot Lighting Fixture (1)	41 lf	\$135.99 /lf	\$5,555

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
RLB2 6.1 foot Lighting Fixture (2)	12 lf	\$135.99 /lf	\$1,659
RLB2 6.6 foot Lighting Fixture (2)	13 lf	\$135.99 /lf	\$1,795
RLB2 68 foot Lighting Fixture (4)	272 lf	\$135.99 /lf	\$36,991
RLB2 8 foot Lighting Fixture (2)	16 lf	\$135.99 /lf	\$2,176
RLB2 86.4 foot Lighting Fixture (1)	86 lf	\$135.99 /lf	\$11,750
RLB3 18 foot Lighting Fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLB3 23 foot Lighting Fixture (1)	23 lf	\$135.99 /lf	\$3,128
RLB3 23.4 foot Lighting Fixture (1)	23 lf	\$135.99 /lf	\$3,182
RLB3 29.9 foot Lighting Fixture (1)	30 lf	\$135.99 /lf	\$4,066
RLB3 37.3 foot Lighting Fixture (1)	37 lf	\$135.99 /lf	\$5,073
RLB4 15.2 foot Lighting Fixture(1)	15 lf	\$135.99 /lf	\$2,067
RLB4 29.9 foot Lighting Fixture(2)	60 lf	\$135.99 /lf	\$8,132
RLD2 10.3 foot Light Fixture (1)	10 lf	\$135.99 /lf	\$1,401
RLD2 4 foot Light Fixture (11)	44 lf	\$135.99 /lf	\$5,984
RLD2 7.1 foot Light Fixture (2)	14 lf	\$135.99 /lf	\$1,918
RLD2 8 foot Light Fixture (1)	8.00 lf	\$135.99 /lf	\$1,088
GWC Exterior Wall mounted Light	19 ea	\$668.96 /ea	\$12,710
RLF Lighti Fixture	9.00 lf	\$135.99 /lf	\$1,224
RLG Lighting Fixture	3.00 ea	\$818.96 /ea	\$2,457
RLH Lighting Fixture	9.00 ea	\$818.96 /ea	\$7,371
RM Light Fixture	6.00 ea	\$448.96 /ea	\$2,694
SWA Lighting Fixture	14 ea	\$618.96 /ea	\$8,665
DPA Light Fixutre	12 ea	\$618.96 /ea	\$7,428
DPB Lighting Fixture	12 ea	\$718.96 /ea	\$8,628
GPB Fixture	145 ea	\$818.96 /ea	\$118,749
GPK Light Fixture	23 ea	\$1,240.98 /ea	\$28,543
GSA Light Fixture	56 ea	\$718.96 /ea	\$40,262
PB Lighting Fixture	36 ea	\$618.96 /ea	\$22,283
PD1 Lighting Fixture	97 ea	\$618.96 /ea	\$60,039
PF1 Lighting Fixture	84 ea	\$618.96 /ea	\$51,993
RP Lighting Fixture	10 ea	\$448.96 /ea	\$4,490
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	19 ea	\$207.21 /ea	\$3,937
EC1	87 ea	\$391.71 /ea	\$34,079
EW1	8.00 ea	\$391.71 /ea	\$3,134
Exit Sign	2.00 ea	\$391.71 /ea	\$783
F1 Lighting Fixture 4 foot	9.00 ea	\$200.00 /ea	\$1,800
F1 Lighting Fixture 6 foot	81 ea	\$200.00 /ea	\$16,200
12/2 MC Cable Composite Unit	72,000 lf	\$3.70 /lf	\$266,292
D5044 LIGHTING CONTROLS & WIRING		\$2.34 / SF	\$890,669
S (1) Single pole Switch Composite unit	1.00 ea	\$78.72 /ea	\$79
ST Single Pole Switch	57 ea	\$78.72 /ea	\$4,487
SD (1) Dimmer Switch composite unit	329 ea	\$155.59 /ea	\$51,188
S3 (1) 3 way switch composite unit	18 ea	\$85.00 /ea	\$1,530

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
SLC for projection Screen (1) Low voltage Switch Composite unit	3.00 ea	\$92.22 /ea	\$277
SLV (1) Low voltage Switch Composite unit	111 ea	\$92.22 /ea	\$10,236
SLV (1) Low voltage Switch Composite unit for projection Screen	5.00 ea	\$92.22 /ea	\$461
Occupancy sensor Wall mounted Composite unit	79 ea	\$255.70 /ea	\$20,200
SVSD Vacancy Sensor Dimmer	70 ea	\$286.76 /ea	\$20,073
Vacancy sensor Wall mounted Composite unit	69 ea	\$286.76 /ea	\$19,787
OS1 Occupancy sensor Ceiling mounted Composite unit	434 ea	\$289.42 /ea	\$125,609
Lighting Control Panel composite unit q qscamps-0 quantuam management system	1.00 ea	\$4,964.04 /ea	\$4,964
Lighting Control Panel composite unit qp2-2posce`120	1.00 ea	\$4,964.04 /ea	\$4,964
Lighting Control Panel composite unit qp3 1 pl 100-240	2.00 ea	\$4,964.04 /ea	\$9,928
Lighting Control Panel composite unit qsn-4s20	3.00 ea	\$4,964.04 /ea	\$14,892
Lighting Control Panel composite unit qsn-4t-16-s	14 ea	\$4,964.04 /ea	\$69,497
Lighting Control Panel composite unit xp48dr	3.00 ea	\$4,964.04 /ea	\$14,892
Recptacle Control Panel composite unit	9.00 ea	\$4,964.04 /ea	\$44,676
VS1 Vacancy sensor Ceiling mounted Composite unit	260 ea	\$250.32 /ea	\$65,084
Daylight Sensor Ceiling Mounted Composite unit	154 ea	\$278.70 /ea	\$42,919
20 AMP EMT Composite feeders copper - Large Power	15,000 lf	\$16.93 /lf	\$253,970
12/2 MC Cable Composite Unit	30,000 lf	\$3.70 /lf	\$110,955
D5046 THEATRICAL LIGHTING		\$0.33 / SF	\$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		\$3.80 / SF	\$1,446,403
D5094 GROUNDING & LIGHTNING PROTECTION SYS.		\$0.70 / SF	\$264,651
Ground Rod - Copperclad 3/4" x 10'	27 ea	\$126.99 /ea	\$3,429
Ground Surface Mounted Electrode	1.00 ea	\$500.00 /ea	\$500
Lightening Protection Air Terminal	244 ea	\$465.25 /ea	\$113,521
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	2.00 ea	\$729.00 /ea	\$1,458
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	82 ea	\$74.99 /ea	\$6,149
Lp Cadweld	44 ea	\$96.26 /ea	\$4,235
Grounding Cable Copper Bare Stranded # 4/0	3,297 lf	\$7.41 /lf	\$24,440
Grounding Cable Copper Bare Stranded # 500	1,500 lf	\$12.00 /lf	\$18,000
Lightening Protection Cable Copper Bare Stranded # 4/0	8,487 lf	\$7.41 /lf	\$62,914
D5095 MISCELLANEOUS ELECTRICAL SYSTEMS		\$3.11 / SF	\$1,181,752
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	382,610 gsf	\$0.72 /gsf	\$275,000

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 Built	1.00 ea	\$100,000.00 /ea	\$100,000
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 through E26	0.00 ls		\$0
VE01 In each classroom, reduce lighting control zones from four zones per classroom to three zones per classroom.	0.00 ls		\$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		\$0
VE03 Provide aluminum feeders for those within the main building 200Amps and larger. This does not include feeders run to the satellite buildings	0.00 ls		\$0
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 Viper - https://hubbellcdn.com/specsheet/BEA_VIPERSPEC.pdf	0.00 ls		\$0
VE06 Shorten Duct Bank Primary, Telcom and Generator to more in the range of to in the range of 500 lf	0.00 ls		\$0
VE07 Move All Transformer closer to their prospective Switchboards in the range of 50 linear feet per run currently 200+ feet away	0.00 ls		\$0
VE08 Utilize Aluminum Feeders 100 amps can be added to above	0.00 ls		\$0
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 NOW VE07 ACCEPTED - TARGET REDUCTION VIA COORDINATION	0.00 ls		\$0
VE14 Utilize Lightning Preventor System in lieu of Lightning Protection cannot be take with E12 - NOW VE E02 ACCEPTED	0.00 ls		\$0
VE15 Move Class Speech Reinforcement to tech Budget Wireless 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 Secondaries and remove Secondary Duct Bank reduces redundancy NOW VE E04 ACCEPTED	0.00 ls		\$0
VE18 Eliminate panels and transformers for Parking EV charging Stations conduit, wire ,panels transformer and charging station	0.00 ls		\$0
VE19 Re-evaluate conduit and Service going from Maintenance Building to Main Building(reduce spares and shorter conduits)	0.00 ls		\$0
VE20 Eliminate Theatrical Dimming and rough in(eliminates all Electrical Scope associated with Theater) - NOW VE E03A ACCEPTED	0.00 ls		\$0
VE21 Revaluate Conduit and how site Lighting is powered for entrance near School Sign and power and communication for sign potentially wirless NOW VE E11 ACCEPTED	0.00 ls		\$0
VE24 Reduce Security Camera counts(target)	0.00 ls		\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
VE25 Delete Sub Metering	0.00 ls		\$0
VE26 Target Reduction in Lighting - \$1 / sqft	0.00 ls		\$0
27 COMMUNICATIONS	380,570 SF	\$7.71 / SF	\$2,933,945
D5090 OTHER ELECTRICAL SYSTEMS		\$0.45 / SF	\$172,408
D5092 CLOCK SYSTEMS		\$0.45 / SF	\$172,408
Clock Single Face Battery or 110 clock	238 ea	\$447.15 /ea	\$106,422
Clock Single Face Battery or 110 clock 16"	26 ea	\$496.84 /ea	\$12,918
Clock Rough in and Backboxes	1.00 ls	\$32,791.18 /ls	\$32,791
LV Cabling (included in overall)	7,920 lf	\$2.56 /lf	\$20,277
D6010 COMMUNICATIONS & SECURITY		\$3.75 / SF	\$1,426,114
D6013 TEL/DATA SYSTEM		\$3.75 / SF	\$1,426,114
Wiremold D2 Data Jack Only Composite Unit	6.00 ea	\$305.03 /ea	\$1,830
Floor Box D2/VPL data con. - Composite Unit	3.00 ea	\$1,251.56 /ea	\$3,755
Poke thru D2/VPL data con. - Composite Unit	7.00 ea	\$1,251.56 /ea	\$8,761
Poke Thru D3 data con. - Composite Unit	4.00 ea	\$1,251.56 /ea	\$5,006
Poke Thru D2 data con. - Composite Unit	65 ea	\$1,077.79 /ea	\$70,056
IDF Room Fit-Out composite unit	11 ea	\$17,163.42 /ea	\$188,798
MDF Room Fit-Out composite unit	1.00 ea	\$54,651.93 /ea	\$54,652
Tel/data Backbone Cabling , additional Devices and Testing	2,000 lf	\$39.75 /lf	\$79,494
D1 Telephone jack with 3/4" Stub to accessible ceiling composite unit 30 feet	1.00 ea	\$609.22 /ea	\$609
DPI - D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
E jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
F jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
Vape D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	76 ea	\$609.22 /ea	\$46,301
VH - D1 Data jack... at additional TVs and Displays not labeled	14 ea	\$609.22 /ea	\$8,529
Water Heat Detection D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	3.00 ea	\$609.22 /ea	\$1,828
WE WAP Enclosure	31 ea	\$609.22 /ea	\$18,886
WP - "VOIP" Wall Telephone Outlet	19 ea	\$609.22 /ea	\$11,575
WPIP - "VOIP" Wall Telephone Outlet	69 ea	\$609.22 /ea	\$42,036
EMP - Empty back box for Simman Cabling by Owner	13 ea	\$419.03 /ea	\$5,447
S2 Data jack with 3/4" Stub up to accessible ceiling composite unit 30 feet	10 ea	\$735.71 /ea	\$7,357
TD2 TelData jack with 3/4" Stub up to accessible ceiling composite unit 30 feet	9.00 ea	\$735.71 /ea	\$6,621
D2 Data jack with 1/2" Stub to accessible ceiling composite unit 30 feet _2_	666 ea	\$693.75 /ea	\$462,036
VPL - Low Video Presentation Outlet composite unit 10 feet _1_	102 ea	\$599.94 /ea	\$61,194
VPH - High Video Presentation Outlet composite unit 10 feet	140 ea	\$751.68 /ea	\$105,235
D4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet	1.00 ea	\$988.70 /ea	\$989

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
S4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet	2.00 ea	\$988.70 /ea	\$1,977
Audio Visual Cabling Overall Value	1.00 ea	\$98,373.49 /ea	\$98,373
IPTV and Video on Demand(overall IPTV and Video Demand) - shift to Tech Budget	0.00 excl		\$0
WAP jack ceiling mounted composite unit	236 ea	\$488.67 /ea	\$115,326
Telcom not Defined in Media Center	2,648 gsf	\$5.96 /gsf	\$15,787
55" Signage - Wall Mtd Display - Composite Assembly	2.00 excl	\$0.00 /excl	\$0
65" Signage - Wall Mtd Display - Composite Assembly	23 excl	\$0.00 /excl	\$0
75" Wall Mtd Display - Composite Assembly	120 excl	\$0.00 /excl	\$0
Additional telcom Adjustment	0.00 ea		\$0
D6030 SOUND AND A/V		\$3.51 / SF	\$1,335,424
D6031 AUDIO-VIDEO SYSTEMS		\$2.79 / SF	\$1,061,452
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	\$313.01 /ea	\$2,504
Speech Reinforcement System	111 ea	\$2,327.18 /ea	\$258,317
Fitness Center Audio Visual System	1.00 ea	\$15,401.91 /ea	\$15,402
IC - Intercom Wall Plate, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$245.92 /ea	\$246
Weight Audio Visual System	1.00 ea	\$17,389.25 /ea	\$17,389
Gym Audio Visual System RACK	1.00 ea	\$23,777.14 /ea	\$23,777
Studen Commons Audio Visual System	1.00 ea	\$89,004.49 /ea	\$89,004
TP - AV Sys. Control Touch Plate, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$219.48 /ea	\$219
Auditorium ALS Assisted Listening System Antenna	1.00 ea	\$3,296.40 /ea	\$3,296
Auditorium VPO Video Projector with 1" to AV rack	1.00 ea	\$2,354.57 /ea	\$2,355
Auditorium AV Rack	2.00 ea	\$23,545.69 /ea	\$47,091
Auditorium Dante Input Plate with 1" to AV rack	4.00 ea	\$1,412.74 /ea	\$5,651
Auditorium Fill Speaker	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Intercom Wall Plate with 1" to AV rack	4.00 ea	\$1,412.74 /ea	\$5,651
Auditorium Local Speakr in Hall Way	3.00 ea	\$470.91 /ea	\$1,413
Auditorium LSS Loud Speaker	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Mon with Wall Plate with 1" to AV rack	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Motorized Projection Screen	1.00 ea	\$14,127.42 /ea	\$14,127
Auditorium Projector	1.00 ea	\$47,091.39 /ea	\$47,091
Auditorium Sub Woofer	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium TP Touch Control Plate with 1" to AV rack	5.00 ea	\$3,296.40 /ea	\$16,482
Auditorium/Stage Video	1.00 ea	\$58,626.62 /ea	\$58,627
Cafeteria Local Speaker	16 ea	\$470.91 /ea	\$7,535
Class Room and Conference Room Interactive Flat Panel excluded shifted to tech Budget	0.00 excl		\$0
Gym Local Speaker	24 ea	\$1,417.50 /ea	\$34,020
DAN - Dante Input Wall Panel, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$502.41 /ea	\$502
Video Projector	1.00 ea	\$144.20 /ea	\$144
Instructional AV Excluded part of tech budget	1.00 ea	\$0.00 /ea	\$0

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Large AV Allowance	1.00 ea	\$554,230.20 /ea	\$554,230
Scoreboards Exterior Connection	1.00 ea	\$1,495.89 /ea	\$1,496
VE E01 - ADJUST BASED ON TECH / SECURITY FEEDBACK	-1.00 ea	\$163,955.79 /ea	(\$163,956)
D6032 SOUND/PA SYSTEMS		\$0.72 / SF	\$273,972
Public Address Speaker	713 ea	\$183.83 /ea	\$131,070
Sound Chime	9.00 ea	\$149.05 /ea	\$1,341
PA Horn Speaker	63 ea	\$298.10 /ea	\$18,780
Sound AES	1.00 ea	\$397.47 /ea	\$397
Sound AV floor box	1.00 ea	\$1,192.41 /ea	\$1,192
Sound Exterior Speaker	1.00 ea	\$397.47 /ea	\$397
VCE	2.00 ea	\$1,192.41 /ea	\$2,385
VC - PA Speaker Volume Control	73 ea	\$149.05 /ea	\$10,881
LV Cabling for Speaker	42,000 lf	\$2.56 /lf	\$107,527
28 ELECTRONIC SAFETY & SECURITY	380,570 SF	\$7.45 / SF	\$2,835,722
D6010 COMMUNICATIONS & SECURITY		\$5.03 / SF	\$1,914,206
D6011 FIRE ALARM SYSTEM		\$1.48 / SF	\$563,056
Fire Alarm Manual pull station composite unit	57 ea	\$271.61 /ea	\$15,482
Fire Alarm Bell Exterior - WP composite unit	1.00 ea	\$278.99 /ea	\$279
Fire Alarm Smoke detector composite unit	143 ea	\$338.62 /ea	\$48,422
Fire Alarm Duct smoke detector with relay base composite unit	23 ea	\$707.94 /ea	\$16,283
Fire Alarm Flow switch composite unit	7.00 ea	\$242.39 /ea	\$1,697
Fire Alarm Tamper switch composite unit	14 ea	\$242.39 /ea	\$3,393
Fire Alarm Sounder composite unit	60 ea	\$274.64 /ea	\$16,479
Fire Alarm Strobe Wall composite unit	68 ea	\$268.00 /ea	\$18,224
Fire Alarm BDA	2.00 ea	\$509.44 /ea	\$1,019
Fire Alarm Remote indicating light composite unit	38 ea	\$203.70 /ea	\$7,741
Fire Alarm Knox Box composite unit	3.00 ea	\$500.00 /ea	\$1,500
Fire Alarm Speaker strobe composite unit	494 ea	\$327.46 /ea	\$161,763
FACP	1.00 ea	\$23,643.21 /ea	\$23,643
Fire Alarm Terminal cabinet composite unit	9.00 ea	\$1,395.43 /ea	\$12,559
Control Relay	42 ea	\$335.17 /ea	\$14,077
Fire Alarm Monitor module composite unit	56 ea	\$335.17 /ea	\$18,770
Fire Alarm Relay Monitor composite unit	10 ea	\$335.17 /ea	\$3,352
FDS Fire Alarm	25 ea	\$2,377.21 /ea	\$59,430
SD smoke Damper Fire Alarm	3.00 ea	\$2,377.21 /ea	\$7,132
Ventalation Control Panels	1.00 ea	\$3,500.00 /ea	\$3,500
ARM Two Way Fire Dept Communcation Station	2.00 ea	\$3,436.21 /ea	\$6,872
BP Fire Booster Panel	10 ea	\$3,436.21 /ea	\$34,362
Fire Alarm Annunciator large composite unit	19 ea	\$4,425.21 /ea	\$84,079
Fire Alarm Misc connection Fire Pump , Gas Shut off to FACP	2.00 ea	\$1,500.00 /ea	\$3,000
D6016 SURVEILLANCE CCTV SYSTEM		\$2.47 / SF	\$939,423
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 Exterior Cameras	8,100 lf	\$29.31 /lf	\$237,411

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Cat 6 Cable	15,700 lf	\$0.79 /lf	\$12,442
Media Converters for Exterior Cameras	69 ea	\$330.99 /ea	\$22,838
CCTV Camera D1 Data jack with 1/2" Stub to accessible ceiling composite unit 10 feet _1_	183 ea	\$356.76 /ea	\$65,288
Security CCTV Head End - Medium Composite Unit	1.00 ea	\$36,689.00 /ea	\$36,689
CCTV Video Camera - PTZ Dome Camera, Interior Assembly Composite Unit	202 ea	\$1,893.00 /ea	\$382,386
CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly Composite Unit	69 ea	\$2,101.00 /ea	\$144,969
D6017 SECURITY ACCESS CONTROL		\$1.08 / SF	\$411,726
(1) 2" Empty PVC Conduit with pull string composite unit - Large 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 SA - Siren	15 ea	\$186.75 /ea	\$2,801
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 included LR	69 ea	\$179.28 /ea	\$12,370
Security Card Reader Composite Unit	72 ea	\$259.29 /ea	\$18,669
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	61 ea	\$198.77 /ea	\$12,125
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 Unit	8.00 ea	\$1,319.70 /ea	\$10,558
Security Reconciliation Adjustment	1.00 ea	\$160,000.00 /ea	\$160,000
Security Intercom Station With Video Interior / Exterior WP Composite Unit	6.00 ea	\$684.76 /ea	\$4,109
Security VES - Security Stantion with airphone intercom	7.00 ea	\$684.76 /ea	\$4,793
Security VMS - Security Stantion with airphone intercom	5.00 ea	\$684.76 /ea	\$3,424
Security Head End and Testing	1.00 ea	\$125,000.00 /ea	\$125,000
D7050 DETECTION & ALARM		\$2.42 / SF	\$921,516
D6011 FIRE ALARM SYSTEM		\$2.42 / SF	\$921,516
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
Fire Alarm CO detector composite unit	50 ea	\$341.54 /ea	\$17,077
Fire Alarm Heat detector composite unit	102 ea	\$341.54 /ea	\$34,837
Area of Refuge ESC	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 SF	\$5.31 / SF	\$2,021,520
A1010 STANDARD FOUNDATIONS		\$3.38 / SF	\$1,285,770
A9011 BACKFILL & COMPACTION		\$3.38 / SF	\$1,285,770

MAIN BUILDING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Excav. Column Footings	7,763 cy	\$20.00 /cy	\$155,260
BP 31A - Excav. Continuous & Retaining Wall Footings	16,675 cy	\$20.00 /cy	\$333,500
BP 31A - Excav. Pits	150 cy	\$20.00 /cy	\$3,000
BP 31A - Backfill & Compact Column Footings	5,655 cy	\$38.00 /cy	\$214,890
BP 31A - Backfill Pits	125 cy	\$38.00 /cy	\$4,750
BP 31A - Backfill Wall / Footings	15,115 cy	\$38.00 /cy	\$574,370
A6010 BUILDING SUBDRAINAGE		\$1.93 / SF	\$735,750
A6011 FOUNDATION DRAINAGE		\$1.93 / SF	\$735,750
BP 31A - Building Foundation Drainage - Perforated PVC (F&I) - Perimeter	3,400 lf	\$35.00 /lf	\$119,000
BP 31A - Building Foundation Drainage - Perforated PVC (F&I) - underslab	10,000 lf	\$35.00 /lf	\$350,000
BP 31A - E&B for Electrical within footprint	1.00 ls	\$50,000.00 /ls	\$50,000
BP 31A - E&B for Plumbing within footprint	3,150 lf	\$45.00 /lf	\$141,750
BP 31A - Radon Mitigation - 20 drops / 60' each	1.00 ls	\$75,000.00 /ls	\$75,000
32 EXTERIOR IMPROVEMENTS	380,570 SF	\$0.97 / SF	\$369,103
A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.53 / SF	\$200,278
A4096 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.53 / SF	\$200,278
BP 31A - Compacted Base Under - ONSITE PROCESSED,@ 12" - Place & Compact	5,295 cy	\$10.00 /cy	\$52,950
BP 31A - Fine Grade Base	128,111 sf	\$0.75 /sf	\$96,083
BP 31A - Rough Grade Base	128,111 sf	\$0.40 /sf	\$51,244
B3020 ROOF APPURTENANCES		\$0.44 / SF	\$168,825
G2061.4 SITE FURNISHINGS		\$0.44 / SF	\$168,825
Roof Deck - Fiberglass Planters	0.00 nic		\$0
Roof Deck - Raised Stacked 4x4 Wood Platers w Semi-intensive green rf - deleted per VE	0.00 nic		\$0
Roof Deck - Roof Pavers not on pedestals - changed at 90CD	0.00 nic		\$0
Roof Deck - Synthetic Turf @ Central Roof Deck	7,085 sf	\$15.00 /sf	\$106,275
Roof Deck - Synthetic Turf @ Media Center	1,600 sf	\$18.00 /sf	\$28,800
Roof Deck - Synthetic Turf @ Play Equipment	2,250 sf	\$15.00 /sf	\$33,750
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	0.00 nic		\$0
Roof Deck - Wood Seatwalls, stacked	0.00 nic		\$0
TOTAL MAIN BUILDING		\$427.42 / SF	\$162,663,391

MAINTENANCE BLDG

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
03 CONCRETE	0 SF	\$455,500.00 / SF	\$455,500
A1010 STANDARD FOUNDATIONS		\$83,200.00 / SF	\$83,200
A1010 STANDARD FOUNDATIONS		\$83,200.00 / SF	\$83,200
Standard Concrete Foundation - Complete \$/sf - Storage Building	10,400 sf	\$8.00 /sf	\$83,200
A2010 WALLS FOR SUBGRADE ENCLOSURES		\$232,500.00 / SF	\$232,500
A2011 SUBGRADE ENCLOSURE WALL CONSTRUCTION		\$232,500.00 / SF	\$232,500
Standard Concrete Foundation - Complete \$/sf - walls	150 cy	\$1,550.00 /cy	\$232,500
A4010 STANDARD SLABS-ON-GRADE		\$124,800.00 / SF	\$124,800
A4010 STANDARD SLABS-ON-GRADE		\$124,800.00 / SF	\$124,800
Standard Concrete SOG - Complete \$/sf Storage Building	10,400 sf	\$12.00 /sf	\$124,800
A6010 BUILDING SUBDRAINAGE		\$15,000.00 / SF	\$15,000
A6011 FOUNDATION DRAINAGE		\$15,000.00 / SF	\$15,000
BP 31A - Building Foundation Drainage - Perforated PVC (F&I)	332 lf	\$45.18 /lf	\$15,000
07 THERMAL & MOISTURE PROTECTION	0 SF	\$30,200.00 / SF	\$30,200
A2020 BASEMENT WALL CONSTRUCTION		\$19,800.00 / SF	\$19,800
A2020 BASEMENT WALL CONSTRUCTION		\$9,000.00 / SF	\$9,000
Rigid Insulation @ Fndn. Walls	1,800 sf	\$5.00 /sf	\$9,000
A2022 MOISTURE PROTECTION		\$10,800.00 / SF	\$10,800
Damproofing - Foundation Walls	1,800 sf	\$6.00 /sf	\$10,800
A4010 STANDARD SLABS-ON-GRADE		\$10,400.00 / SF	\$10,400
A4010 STANDARD SLABS-ON-GRADE		\$10,400.00 / SF	\$10,400
Waterproof SOG - Vapor Barrier	10,400 sf	\$1.00 /sf	\$10,400
26 ELECTRICAL	0 SF	\$0.00 / SF	\$0
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$0.00 / SF	\$0
D5023 LARGE POWER & DISTRIBUTION		\$0.00 / SF	\$0
112.5 KVA NEMA 1 Transformer composite unit	0.00 ea		\$0
400 AMP 120/208 Panel board surface mounted composite unit	0.00 ea		\$0
225 AMP 277/480 Panel board surface mounted composite unit	0.00 ea		\$0
D5024 LARGE POWER FEEDER CONDUIT		\$0.00 / SF	\$0
#333 400 AMP EMT Composite feeders Aluminum - Large Power	0.00 lf		\$0
#331 225 AMP PVC Composite feeder aluminum - Large Power	0.00 lf		\$0
33 UTILITIES	0 SF	\$10,000.00 / SF	\$10,000
A1010 STANDARD FOUNDATIONS		\$10,000.00 / SF	\$10,000
A1010 STANDARD FOUNDATIONS		\$10,000.00 / SF	\$10,000
BP 31A - F&I Building Foundation Drainage - Perforated PVC	1.00 ls	\$10,000.00 /ls	\$10,000
TOTAL MAINTENANCE BLDG		\$495,700.00 / SF	\$495,700

SITEWORK

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 GENERAL REQUIREMENTS	60 acre	\$21,116.67 / acre	\$1,267,000
Z1050 TEMPORARY FACILITIES & CONTROLS		\$21,116.67 / acre	\$1,267,000
Z1055 TEMPORARY CONSTRUCTION		\$21,116.67 / acre	\$1,267,000
BP 31A - Emergency Spill Kit	1.00 ea	\$2,000.00 /ea	\$2,000
BP 31A - Temporary Water and Electric Service - Hook-up & Maintenance	1.00 ls	\$35,000.00 /ls	\$35,000
BP 31A - Temporary Walkways	1.00 ls	\$50,000.00 /ls	\$50,000
BP 31A - Water Truck / Dust Control	1.00 ls	\$30,000.00 /ls	\$30,000
BP 31A - Dewatering - Pumps / Maintenance - Demo/Foundation	1.00 ls	\$400,000.00 /ls	\$400,000
BP 31A - Temporary Access Roads - Farm Rd & Existing Campus Path	4,600 sy	\$32.50 /sy	\$149,500
BP 31A - Temporary Laydown Area - Prep / Maintain	14,275 sy	\$20.00 /sy	\$285,500
BP 31A - Repair Existing Streets, Sidewalks	1.00 allw	\$50,000.00 /allw	\$50,000
BP 31A - Temporary Barriers & Public Safety	1.00 ls	\$40,000.00 /ls	\$40,000
BP 31A - Temporary Bridge Crossing	1.00 ls	\$150,000.00 /ls	\$150,000
BP 31A - Traffic Control - Install & Maintain	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Snow Removal	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Street Sweeping	1.00 ls	\$25,000.00 /ls	\$25,000
02 EXISTING CONDITIONS	60 acre	\$10,936.35 / acre	\$656,181
G1020 SITE ELEMENTS DEMOLITION		\$5,336.35 / acre	\$320,181
G1023 INFRASTRUCTURE DEMOLITION		\$5,336.35 / acre	\$320,181
BP 31A - R&D Elec Conduit	581 lf	\$27.00 /lf	\$15,687
BP 31A - R&D Elec DB	1,173 lf	\$43.00 /lf	\$50,439
BP 31A - R&D Gas	132 lf	\$27.00 /lf	\$3,564
BP 31A - R&D Sewer/Drain Pipe	4,122 lf	\$28.00 /lf	\$115,416
BP 31A - R&D Water	2,859 lf	\$25.00 /lf	\$71,475
BP 31A - Cut & Cap Water Service	2.00 ea	\$16,500.00 /ea	\$33,000
BP 31A - R&D Sewer Drain Structure	51 ea	\$600.00 /ea	\$30,600
Z1050 TEMPORARY FACILITIES & CONTROLS		\$5,600.00 / acre	\$336,000
Z1055 TEMPORARY CONSTRUCTION		\$5,600.00 / acre	\$336,000
BP 31A - Temp Construction Fence w Rock Cores	7,000 lf	\$48.00 /lf	\$336,000
Wrap Building to Place Slabs - incl w GRs	0.00 ls		\$0
10 SPECIALTIES	60 acre	\$500.00 / acre	\$30,000
G2060 SITE DEVELOPMENT		\$500.00 / acre	\$30,000
G2056 SIGNAGE		\$500.00 / acre	\$30,000
Custom Site / Building Sign Allowance	1.00 allw	\$30,000.00 /allw	\$30,000
11 EQUIPMENT	60 acre	\$10,592.92 / acre	\$635,575
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$10,592.92 / acre	\$635,575
E1097 ATHLETIC, RECREATIONAL, & THERAPEUTIC EQUIPMENT		\$10,592.92 / acre	\$635,575
Permanent Bleachers (F&I) including pressbox	508 seat	\$679.13 /seat	\$345,000

SITEWORK [CONTINUED]

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 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 alt		\$0
Sportsfield Specialties - Baseball - Dugouts 8'x34' (material only)	0.00 alt		\$0
Sportsfield Specialties - Softball- Dugouts 8'x34' (material only)	0.00 alt		\$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 (material only)	0.00 lf		\$0
Sportsfield Specialties - Tension Netting Backstop - 42'h - Baseball (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 (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 (material only)	1.00 ea	\$1,085.00 /ea	\$1,085
Sportsfield Specialties - Tennis Court Nets - Net, Posts, Sleeves (material only)	0.00 alt		\$0
Exterior Athletic Equipment - Labor to Unbox, Assemble, & Install Outdoor Fitness Equipment	16 crdy	\$5,440.00 /crdy	\$87,040
Backstops	0.00 alt		\$0
Softball - Field Backstops	0.00 alt		\$0
26 ELECTRICAL	60 acre	\$47,192.00 / acre	\$2,831,520
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$25,966.15 / acre	\$1,557,969
D5021 MEDIUM VOLTAGE CONDUIT AND CABLING		\$11,534.99 / acre	\$692,100

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Primary Above Ground Enclosures- 07/01/22 Main Distribution	12 ea	\$5,806.14 /ea	\$69,674
Ground Manholes and above Ground Enclosures	12 ea	\$740.48 /ea	\$8,886
Ground Transformer Pads - 07/01/22 Main Distribution	3.00 ea	\$2,683.37 /ea	\$8,050
Layout Transformer Pads - 07/01/22 Main Distribution	3.00 ea	\$2,683.37 /ea	\$8,050
Duct Bank B (2) 4" Empty PVC Conduit with pull string composite unit Spares	1,528 lf	\$38.00 /lf	\$58,064
Duct Bank C (8) 4" Empty PVC Conduit with pull string composite unit Spares	1,247 lf	\$152.00 /lf	\$189,544
Duct Bank D (4) 4" Empty PVC Conduit with pull string composite unit Spares	1,527 lf	\$76.00 /lf	\$116,052
Duct Bank F (4) 4" Empty PVC Conduit with pull string composite unit Spares	90 lf	\$76.00 /lf	\$6,840
Duct Bank H (4) 4" Empty PVC Conduit with pull string composite unit Spares	713 lf	\$76.00 /lf	\$54,188
Duct Bank K (2) 4" Empty PVC Conduit with pull string composite unit Spares	34 lf	\$38.00 /lf	\$1,292
Duct Bank N (6) 4" Empty PVC Conduit with pull string composite unit Spares	824 lf	\$114.00 /lf	\$93,936
Duct Bank O (3) 4" Empty PVC Conduit with pull string composite unit Spares	263 lf	\$51.00 /lf	\$13,413
Existing overhead Services Removed	312 ea	\$19.84 /ea	\$6,191
Feeder #001 (2) 5" Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Feeder #079 (4) 5" Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Feeder #086 (4) 5" Emergency Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Telcom Cable Overhead	99 lf	\$76.55 /lf	\$7,579
Duct Bank M (6) 2" Empty PVC Conduit with pull string composite unit - Large Power	771 lf	\$54.08 /lf	\$41,698
Site Duct Bank (2) 2" Empty PVC Conduit with pull string composite unit - Large Power	339 lf	\$18.00 /lf	\$6,102
Site Duct Bank (6) 2" Empty PVC Conduit with pull string composite unit - Large Power	47 lf	\$54.08 /lf	\$2,542
D5022 MEDIUM VOLTAGE SWITCHGEAR AND PANELBOARD		\$0.00 / acre	\$0
Generator by Utility Company	1.00 ea	\$0.00 /ea	\$0
D5023 LARGE POWER & DISTRIBUTION		\$707.00 / acre	\$42,420
75 KVA NEMA 1 Transformer composite unit at Site	1.00 ea	\$9,961.68 /ea	\$9,962
75 kva and combined Panelboard for ev charging	3.00 ea	\$3,500.00 /ea	\$10,500
225 AMP 120/208 Panel board surface mounted composite unit at Site	1.00 ea	\$3,989.84 /ea	\$3,990
300 AMP 277/480 Panel board surface mounted composite unit Site	1.00 ea	\$5,556.76 /ea	\$5,557
800 AMP 277/480 Distribution Panel board surface mounted composite unit - LPH in site lighting pedestal cabinet	1.00 ea	\$12,411.87 /ea	\$12,412
D5024 LARGE POWER FEEDER CONDUIT		\$13,130.21 / acre	\$787,812
100 AMP PVC Composite feeders Copper - Large Power EV charging Station	839 lf	\$102.06 /lf	\$85,629

SITework [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#343 125 AMP PVC Composite feeder aluminum - Large Power	700 lf	\$38.22 /lf	\$26,756
#345 300 AMP PVC Composite feeder aluminum - Large Power	700 lf	\$73.97 /lf	\$51,776
250 AMP PVC Composite feeder copper - Large Power to sports field lighting	650 lf	\$98.13 /lf	\$63,787
Feeder #085 600 AMP PVC Composite feeder copper - Large Power	220 lf	\$243.95 /lf	\$53,669
#339 800 AMP PVC Composite feeder copper - Large Power	60 lf	\$283.47 /lf	\$17,008
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 Power	169 lf	\$1,464.53 /lf	\$247,506
Feeder #080 4000 AMP PVC Composite feeder copper - Large Power	191 lf	\$1,464.53 /lf	\$279,726
Reduce Secondary Lenth 4000 AMP PVC Composite feeder copper - Large Power per recon 05-08-2023	-100.00 lf	\$1,464.53 /lf	(\$146,453)
Site Duct Bank (1) 1" Empty PVC Conduit with pull string composite unit - Large Power	115 lf	\$15.77 /lf	\$1,814
D5029 SMALL POWER DEVICES & WIRING		\$328.63 / acre	\$19,718
Power to field Scoreboards	2.00 gsf	\$1,521.43 /gsf	\$3,043
60 AMP PVC Composite feeder copper - Large Power for transh compactors	652 lf	\$25.57 /lf	\$16,675
D5049 SITE LIGHTING		\$265.32 / acre	\$15,919
30 AMP EMT Composite feeders copper - Large Power Site Wall Lighting	806 lf	\$19.75 /lf	\$15,919
D5040 LIGHTING		\$21,108.85 / acre	\$1,266,531
D5048 SPORTS LIGHTING		\$7,606.29 / acre	\$456,378
Site Lighting Branch	2,000 ea	\$25.69 /ea	\$51,378
Sport Lighting S1 thru @4 for Football includes base install and rigging	4.00 ea	\$100,000.00 /ea	\$400,000
Sprts Lighting Cabinet	1.00 ea	\$5,000.00 /ea	\$5,000
D5049 SITE LIGHTING		\$13,502.56 / acre	\$810,154
120 Votl Cirucit for all Site Pole may need small tranformer	90 ea	\$800.00 /ea	\$72,000
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 Pedistal Cabinet	1.00 ea	\$2,500.00 /ea	\$2,500
Sitel Lighting Pedistal Cabinet for digital sign out near street	1.00 ea	\$2,500.00 /ea	\$2,500
Sitel Lighting Pole Base	112 ea	\$993.66 /ea	\$111,290
Quazite Handhole Enclosure Composite Unit - Cover included	132 ea	\$918.52 /ea	\$121,244
1" for EV chaging Pedstalls	2,403 ea	\$25.00 /ea	\$60,075
2" PVC Gas Storage to building	918 ea	\$16.45 /ea	\$15,103
Site Branch to Digital Sign 2"	918 ea	\$14.77 /ea	\$13,556
Site Lighting Branch 1" for Sign Floor Light	23 ea	\$14.77 /ea	\$340
Site Lighting Branch 2" branch	8,873 ea	\$14.77 /ea	\$131,027
Electrical Vehicle Charging Station Charging Station @ Site VE 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)	1.00 ls	\$6,121.62 /ls	\$6,122

SITWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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	24 ea	\$1,886.51 /ea	\$45,276
Site Lighting EXP3	10 ea	\$2,200.00 /ea	\$22,000
EXP1BC Light Fixture Site Pole Single Head Composite Unit	2.00 ea	\$2,017.98 /ea	\$4,036
Exp4 Light Fixture Site Pole Single Head Composite Unit	2.00 ea	\$2,017.98 /ea	\$4,036
Site Lighting EXF1	18 ea	\$1,600.00 /ea	\$28,800
Site Lighting EXP1	40 ea	\$2,017.98 /ea	\$80,719
Site Lighting EXP2	14 ea	\$2,017.98 /ea	\$28,252
D5090 OTHER ELECTRICAL SYSTEMS		\$117.00 / acre	\$7,020
D5095 MISCELLANEOUS ELECTRICAL SYSTEMS		\$117.00 / acre	\$7,020
Quad Shak Lighting Power and Teldata	1.00 ea	\$7,020.00 /ea	\$7,020
27 COMMUNICATIONS	60 acre	\$4,558.85 / acre	\$273,531
D6010 COMMUNICATIONS & SECURITY		\$4,558.85 / acre	\$273,531
D6013 TEL/DATA SYSTEM		\$4,558.85 / acre	\$273,531
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) 1" Empty PVC Conduit with pull String composite unit with 2 Stand Fiber	439 lf	\$20.00 /lf	\$8,780
(1) 2" Empty PVC Conduit with pull String composite unit with 2 Stand Fiber	494 lf	\$28.00 /lf	\$13,832
(1) 4" Empty PVC Conduit with pull String composite unit with 12 Stand Fiber	5,871 lf	\$34.00 /lf	\$199,614
28 ELECTRONIC SAFETY & SECURITY	60 acre	\$416.67 / acre	\$25,000
D7050 DETECTION & ALARM		\$416.67 / acre	\$25,000
D6017 SECURITY ACCESS CONTROL		\$416.67 / acre	\$25,000
Security Gate and Power added during Recon 12-20-2022	1.00 ea	\$25,000.00 /ea	\$25,000
31 EARTHWORK	60 acre	\$227,136.40 / acre	\$13,628,184
G1010 SITE CLEARING		\$15,506.87 / acre	\$930,412
G1011 CLEARING & GRUBBING		\$15,506.87 / acre	\$930,412
BP 31A - Bulk Site Clearing & Grubbing	35 acre	\$5,600.00 /acre	\$196,000
BP 31A - Strip Forest Mat P1 - Offsite Disposal - P1	10,000 cy	\$42.00 /cy	\$420,000
BP 31A - Strip topsoil & screen & stockpile for re-use P1 - P2	8,274 cy	\$38.00 /cy	\$314,412
G1030 SITE ELEMENT RELOCATIONS		\$146,026.75 / acre	\$8,761,605
G1033 ROCK EXCAVATION		\$131,943.32 / acre	\$7,916,599
BP 31A - Mass Rock Blasting	138,361 cy	\$17.35 /cy	\$2,400,563
BP 31A - Mass Rock Excavation	138,361 cy	\$13.00 /cy	\$1,798,693
BP 31A - Mass Rock Processing	138,361 cy	\$11.00 /cy	\$1,521,971
BP 31A - ROCK EXCAVATION TO SUBSURFACE SYTEM #2	5,327 cy	\$36.00 /cy	\$191,760
BP 31A - Allow for additional material handling due to logistics	148,632 cy	\$3.00 /cy	\$445,896
BP 31A - Allow for Rock Scaling	1.00 ls	\$154,300.00 /ls	\$154,300
BP 31A - TO 5' BELOW SLAB FOR OVERBLAST	16,667 cy	\$35.00 /cy	\$583,333

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Trench Rock Blasting	10,001 cy	\$55.00 /cy	\$550,055
BP 31A - Trench Rock Excavation	10,001 cy	\$15.00 /cy	\$150,015
BP 31A - Trench Rock Processing	10,001 cy	\$12.00 /cy	\$120,012
G1034 FILL & BORROW		\$10,101.47 / acre	\$606,088
BP 31A - Fill to get to sub grade elev - phase 1 - from onsite processed rock	49,222 cy	\$8.00 /cy	\$393,776
BP 31A - Fill to get to sub grade elev - phase 2 - from onsite processed rock	26,539 cy	\$8.00 /cy	\$212,312
G1035 TEMPORARY EROSION & SEDIMENT CONTROL		\$3,981.97 / acre	\$238,918
BP 31A - Antitracking Pads	6.00 ea	\$5,000.00 /ea	\$30,000
BP 31A - Erosion Control Hay Bales / Silt Fence	8,377 lf	\$9.00 /lf	\$75,393
BP 31A - Erosion Control Blankets & Mats	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Erosion Control - CB Inlet Protection	149 ls	\$225.00 /ls	\$33,525
BP 31A - Erosion Control - Maintain / remove	1.00 ls	\$75,000.00 /ls	\$75,000
G1070 SITE EARTHWORK		\$49,753.53 / acre	\$2,985,212
G1072 EXCAVATION & FILL		\$49,753.53 / acre	\$2,985,212
BP31A - Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 1	20,386 cy	\$32.00 /cy	\$652,352
BP31A - Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 2	39,376 cy	\$32.00 /cy	\$1,260,032
BP31A - Bulk Excavation Offsite Disposal - processed rock Phase 1 (sell)	62,601 cy	\$3.00 /cy	\$187,803
BP31A - Excavate & Backfill for Site Improvements items (pads / stairs, etc)	20,000 cy	\$32.00 /cy	\$640,000
BP31A - Rip Rap Slopes	3,267 cy	\$75.00 /cy	\$245,025
G2010 ROADWAYS		\$3,934.61 / acre	\$236,077
G2011 ROADWAY PAVEMENT		\$3,934.61 / acre	\$236,077
BP31A - Fine Grade Pavement Base	316,791 sf	\$0.35 /sf	\$110,877
BP31A - Backfill Pavement Base Mat'l. - processed material	15,650 cy	\$8.00 /cy	\$125,200
G2030 PEDESTRIAN PLAZAS & WALKWAYS		\$1,081.30 / acre	\$64,878
G2031 PEDESTRIAN PAVEMENT		\$1,081.30 / acre	\$64,878
BP31A - Prepare & Compact Subbase	78,756 sf	\$0.50 /sf	\$39,378
BP31A - Backfill Pavement Base Mat'l. - processed material	2,550 cy	\$10.00 /cy	\$25,500
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$10,833.33 / acre	\$650,000
G2057 PLAYING FIELDS		\$10,833.33 / acre	\$650,000
BP 31A - Prepare & Compact Subbase	130,000 sf	\$1.00 /sf	\$130,000
BP 31A - Subgrade layer @ Natural Playing surfaces, FB & Track	130,000 sf	\$4.00 /sf	\$520,000
BP 31A - Subgrade layer @ Synthetic Playing surfaces	0.00 sf		\$0
32 EXTERIOR IMPROVEMENTS	60 acre	\$167,555.05 / acre	\$10,053,303
G2010 ROADWAYS		\$31,002.73 / acre	\$1,860,164
G2011 ROADWAY PAVEMENT		\$18,875.74 / acre	\$1,132,545
BP 31A - Bituminious Paving - Parking Lot Pavement	16,957 sy	\$28.00 /sy	\$474,796
BP 31A - Bituminious Paving - Roadway Pavement	17,073 sy	\$28.00 /sy	\$478,044
BP 31A - Raised Crosswalks @ Bit Pavement	208 sy	\$30.00 /sy	\$6,240

SITWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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		\$10,709.65 / acre	\$642,579
BP 31A - Granite Curbing - Vertical (Staight & Radius)	10,994 lf	\$56.00 /lf	\$615,664
BP 31A - Bituminous Curbing (Cape Cod Berm)	5,383 lf	\$5.00 /lf	\$26,915
G2013 MARKING & SIGNAGE		\$1,417.33 / acre	\$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		\$6,372.93 / acre	\$382,376
G2031 PEDESTRIAN PAVEMENT		\$6,372.93 / acre	\$382,376
BP 31A - Asphalt Walkway Paving	5,420 sy	\$27.00 /sy	\$146,340
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 bands	0.00 sf		\$0
Concrete Paving - Integral Color Exposed Aggregate - accent bands - etched	0.00 sf		\$0
Concrete Paving - Ramps	324 sf	\$15.00 /sf	\$4,860
Stone Dust Walk - stabilized	179 sf	\$10.00 /sf	\$1,790
Unit Pavers - Granite / Precast	0.00 excl		\$0
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$32,168.30 / acre	\$1,930,098
G2057 PLAYING FIELDS		\$32,168.30 / acre	\$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	0.00 alt		\$0
FB Field Natural Turf FB Field	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	31,852 sf	\$25.00 /sf	\$796,300
Resilient Track D Zone (FB Endzone)	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		\$57,893.00 / acre	\$3,473,580
G2033 EXTERIOR STEPS & RAMPS		\$4,372.67 / acre	\$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

SITWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Concrete Stairs & Landings, pads @ egress	1,050 sf	\$80.00 /sf	\$84,000
G2052 RETAINING WALLS		\$6,889.17 / acre	\$413,350
BP 31A - Retaining Walls Complete \$/lf - segmental	492 lf	\$350.00 /lf	\$172,200
Retaining Wall - Concrete (CIP) -BENCH SHELF AT CONTAINERS	14 cy	\$2,000.00 /cy	\$28,000
Retaining Wall - Concrete (CIP) - complete, footing & wall	116 cy	\$1,400.00 /cy	\$162,400
BP 31A - Retaining Walls - Crushed Stone Base	725 cy	\$70.00 /cy	\$50,750
G2059 OTHER SITE IMPROVEMENTS		\$5,086.67 / acre	\$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
Flagpoles w/ Base	1.00 ls	\$10,000.00 /ls	\$10,000
G2061.4 SITE FURNISHINGS		\$38,152.83 / acre	\$2,289,170
Backless Wood Bench w Perforated Metal Skirting & LED Lightng	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	8,424 sf	\$150.00 /sf	\$1,263,600
Pre-engineeered Boardwalk Stairs System	421 sf	\$170.00 /sf	\$71,570
Pre-engineeered Boardwalk System - detail chenge from 60CD on railing	1.00 ls	\$750,000.00 /ls	\$750,000
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	\$53,500.00 /ls	(\$53,500)
Metal Shipping containers - excluded - still shown but previous VE / FFE	0.00 ea		\$0
G2062 FENCES & GATES		\$3,391.67 / acre	\$203,500
Site Fencing - Ornamental - metal stair w integrated guardrail - 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

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
G2080 LANDSCAPING		\$36,784.76 / acre	\$2,207,086
G2061.4 SITE FURNISHINGS		\$3,387.50 / acre	\$203,250
Seating Boulder - Furnish and Set, assume imported (ave weight > 2 tons ea)	30 ea	\$6,775.00 /ea	\$203,250
G2081 PLANTING IRRIGATION		\$3,319.01 / acre	\$199,141
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 - not at athletic fields - excluded	0.00 nic		\$0
G2082 TURF & GRASSES		\$24,714.33 / acre	\$1,482,860
Topsoil / Loam	2,000 cy	\$38.00 /cy	\$76,000
Topsoil / Loam - From Stockpile - F&I	4,250 cy	\$15.00 /cy	\$63,750
Topsoil / Loam - Off-Site - F&I	17,894 cy	\$65.00 /cy	\$1,163,110
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		\$5,363.92 / acre	\$321,835
Groundcover - Pennsylvania Sedge - 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	\$4,650
02 - Red Maple - 1" cal	7.00 ea	\$650.00 /ea	\$4,550
03 - Sugar Maple - 2.5" cal	3.00 ea	\$1,000.00 /ea	\$3,000
04 - Clump Paper Birch - 7-8' ht	7.00 ea	\$750.00 /ea	\$5,250
05 - Heritage Birch - 10-12' ht	6.00 ea	\$750.00 /ea	\$4,500
06 - Whitespire Birch - 12-14' ht	6.00 ea	\$1,100.00 /ea	\$6,600
07 - Renaissance Upright Paper Birch - 12' - 14'	9.00 ea	\$1,000.00 /ea	\$9,000
08 - American Beech - 2.5" cal	5.00 ea	\$1,000.00 /ea	\$5,000
09 - Dawn Redwood - 3" cal	6.00 ea	\$1,200.00 /ea	\$7,200
11 - Black Gum - 2.5" cal	8.00 ea	\$1,000.00 /ea	\$8,000
11- White Oak - 1.5" cal	8.00 ea	\$650.00 /ea	\$5,200
12 - Swamp White Oak - 3" cal	4.00 ea	\$1,200.00 /ea	\$4,800
13 - Burr Oak - 2-2.5" cal	9.00 ea	\$1,400.00 /ea	\$12,600
14 - Red Oak - 2.5" - 3" cal	12 ea	\$1,300.00 /ea	\$15,600
15 - American Elm - 2.5-3" cal	17 ea	\$1,300.00 /ea	\$22,100
21 - Eastern Red Cedar - 7-8'	7.00 ea	\$785.00 /ea	\$5,495
22 - Pitch Pine - 6-7' ht	7.00 ea	\$900.00 /ea	\$6,300
23 - White Pine - 8-10' ht	15 ea	\$950.00 /ea	\$14,250
24 - White Pine - 5-6' ht	6.00 ea	\$675.00 /ea	\$4,050
25 - Autumn Brilliance Serviceberry - 7-8' ht	17 ea	\$750.00 /ea	\$12,750
26 - Donald Wyman Crabapple - 2"-2.5" cal	6.00 ea	\$750.00 /ea	\$4,500
27 - Autumn Flowering Cherry - 3" cal	1.00 ea	\$1,400.00 /ea	\$1,400
28 - Downy Serviceberry - 4.5-5' ht	6.00 ea	\$575.00 /ea	\$3,450
50 - Temporary Wetland Impacts	1.00 ls	\$50,000.00 /ls	\$50,000
60 - Invasive Planting Areas Plantings - #1 through #4	280 ea	\$150.00 /ea	\$42,000
Mulch	1.00 ls	\$15,000.00 /ls	\$15,000
Stakes & Guying	1.00 ls	\$10,000.00 /ls	\$10,000

SITEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Warranty / Maint	0.00 incl		\$0
G5010 SITE COMMUNICATIONS SYSTEMS		\$3,333.33 / acre	\$200,000
X9770 CONCEPTUAL BUDGET		\$3,333.33 / acre	\$200,000
BP 31A - Traffic Signal Work - allow moved to G40	1.00 ls		\$200,000
33 UTILITIES	60 acre	\$92,798.15 / acre	\$5,567,889
G3010 WATER UTILITIES		\$12,688.50 / acre	\$761,310
G3011 SITE DOMESTIC WATER DISTRIBUTION		\$12,688.50 / acre	\$761,310
BP 31A - Excav / Bkfl / Install - 2" Copper Water Line	72 lf	\$75.00 /lf	\$5,400
BP 31A - Excav / Bkfl / Install - 4" DI Water Line	236 lf	\$85.00 /lf	\$20,060
BP 31A - Excav / Bkfl / Install - 6" DI run out to hydrant	353 lf	\$90.00 /lf	\$31,770
BP 31A - Excav / Bkfl / Install - 6" DI water service to bldg	52 lf	\$90.00 /lf	\$4,680
BP 31A - Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg	190 lf	\$100.00 /lf	\$19,000
BP 31A - Excav / Bkfl / Install - 8" DICL Water Line - loop	5,954 lf	\$100.00 /lf	\$595,400
BP 31A - Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES	1,500 lf	\$15.00 /lf	\$22,500
BP 31A - Tap Existing Water Main	3.00 cond	\$10,000.00 /cond	\$30,000
BP 31A - Test / Flush-out	1.00 ls	\$5,000.00 /ls	\$5,000
BP 31A - Fire Hydrants	11 ea	\$2,500.00 /ea	\$27,500
G3020 SANITARY SEWERAGE UTILITIES		\$9,450.42 / acre	\$567,025
G3020 SANITARY SEWERAGE UTILITIES		\$9,450.42 / acre	\$567,025
BP 31A - Relining existing sewer (videotape by others to confirm need)	0.00 nic		\$0
BP 31A - Sanitary Sewerage Piping, PVC, New 4" PVC	87 lf	\$50.00 /lf	\$4,350
BP 31A - Sanitary Sewerage Piping, PVC, New 4" PVC Vent pipe	145 lf	\$50.00 /lf	\$7,250
BP 31A - Sanitary Sewerage Piping, PVC, New 6" Cast Iron	174 lf	\$90.00 /lf	\$15,660
BP 31A - Sanitary Sewerage Piping, PVC, New 6" PVC	949 lf	\$65.00 /lf	\$61,685
BP 31A - Sanitary Sewerage Piping, PVC, New 6" PVC, Forced Main	0.00 nic		\$0
BP 31A - Sanitary Sewerage Piping, PVC, New 8"	3,144 lf	\$70.00 /lf	\$220,080
BP 31A - Sanitary Sewerage Pump Station	0.00 nic		\$0
BP 31A - Oil/ Gas Seperator	3.00 ea	\$5,000.00 /ea	\$15,000
BP 31A - Sanitary Manhole	39 ea	\$4,500.00 /ea	\$175,500
BP 31A - Tie-in to Existing Manholes / Pipe	1.00 cond	\$10,000.00 /cond	\$10,000
BP 31A - Grease Trap - Installed - 1,000 gal	1.00 ea	\$7,500.00 /ea	\$7,500
BP 31A - Grease Trap - Installed - 10,000 gal	1.00 ea	\$50,000.00 /ea	\$50,000
G3030 STORM DRAINAGE UTILITIES		\$56,188.98 / acre	\$3,371,339
G3032 STORM DRAINAGE PIPING		\$16,406.58 / acre	\$984,395
BP 31A - Excav / Bkfl / Install - 06" CPP Storm Drainage	345 lf	\$55.00 /lf	\$18,975
BP 31A - Excav / Bkfl / Install - 06" CPP Storm Drainage , underdrain	940 lf	\$55.00 /lf	\$51,700
BP 31A - Excav / Bkfl / Install - 08" CPP Storm Drainage	237 lf	\$65.00 /lf	\$15,405
BP 31A - Excav / Bkfl / Install - 10" CPP Storm Drainage	164 lf	\$68.00 /lf	\$11,152
BP 31A - Excav / Bkfl / Install - 12" CPP Storm Drainage	7,844 lf	\$72.00 /lf	\$564,768

SITework [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Excav / Bkfl / Install - 12" CPP Storm Drainage, perforated	458 lf	\$75.00 /lf	\$34,350
BP 31A - Excav / Bkfl / Install - 15" CPP Storm Drainage	213 lf	\$90.00 /lf	\$19,170
BP 31A - Excav / Bkfl / Install - 18" CPP Storm Drainage	971 lf	\$110.00 /lf	\$106,810
BP 31A - Excav / Bkfl / Install - 24" CPP Storm Drainage	1,112 lf	\$120.00 /lf	\$133,440
BP 31A - Excav / Bkfl / Install - 30" CPP Storm Drainage	75 lf	\$130.00 /lf	\$9,750
BP 31A - Excav / Bkfl / Install - 36" CPP Storm Drainage	0.00 nic		\$0
BP 31A - Trench Drain	151 lf	\$125.00 /lf	\$18,875
G3033 STORM SEWER STRUCTURES		\$15,126.67 / acre	\$907,600
BP 31A - Storm Septors Water Quality Unit - Installed (WQS & WQI)	18 ea	\$8,000.00 /ea	\$144,000
BP 31A - Precast Storm Manholes 4'- 6" - Installed	78 ea	\$4,500.00 /ea	\$351,000
BP 31A - Precast Culvert - installed	1.00 ls	\$60,000.00 /ls	\$60,000
BP 31A - Precast Storm Catch Basins - Installed	70 ea	\$4,000.00 /ea	\$280,000
BP 31A - Storm Structures - Connect new pipe to Existing	2.00 ea	\$5,000.00 /ea	\$10,000
BP 31A - Precast Storm Oil/Water Separator Tank - Installed (OCS)	6.00 ea	\$4,200.00 /ea	\$25,200
BP 31A - Area Drains - Installed	17 ea	\$2,200.00 /ea	\$37,400
G3036.4 SITE SUBDRAINAGE		\$1,666.67 / acre	\$100,000
BP 31A - Maintain Groundwater System Operation through construction (temp swales, etc)	1.00 allw	\$100,000.00 /allw	\$100,000
G3037 STORM DRAINAGE PONDS & RESERVOIRS		\$22,989.07 / acre	\$1,379,344
BP 31A - Underground Storm Water Retention System - #1	11,440 sf	\$32.00 /sf	\$366,080
BP 31A - Underground Storm Water Retention System - #2	14,063 sf	\$32.00 /sf	\$450,016
BP 31A - Underground Storm Water Retention System - #3	12,665 sf	\$32.00 /sf	\$405,280
BP 31A - Underground Storm Water Retention System - #4	3,921 sf	\$32.00 /sf	\$125,472
BP 31A - Underground Storm Water Retention System - #5	703 sf	\$32.00 /sf	\$22,496
BP 31A - Flared End / Swale	4.00 cond	\$2,000.00 /cond	\$8,000
BP 31A - Headwall	1.00 ea	\$2,000.00 /ea	\$2,000
G3060 SITE FUEL DISTRIBUTION		\$0.00 / acre	\$0
G3066.2 GAS DISTRIBUTION PIPING (NATURAL & PROPANE)		\$0.00 / acre	\$0
BP 31A - Excav / Bkfl / Install - 6" Natural Gas Line	0.00 lf		\$0
G4020 SITE ELECTRICAL		\$14,470.25 / acre	\$868,215
G4025 DUCTBANKS, MANHOLES, & HANDHOLES		\$14,470.25 / acre	\$868,215
BP 31A - Exavate / Backfill / Install Elec MH	14 ea	\$7,500.00 /ea	\$105,000
BP 31A - Excavate / Backfill / Concrete Encasement	4,271 lf	\$75.00 /lf	\$320,325
BP 31A - Excavate / Backfill / Install- Precast Light pole / Bollard Base	107 ea	\$1,500.00 /ea	\$160,500
BP 31A - Excavate / Backfill site lighting conduit	9,413 lf	\$30.00 /lf	\$282,390
TOTAL SITework		\$582,803.05 / acre	\$34,968,183

DEMO & ABATEMENT

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
02 EXISTING CONDITIONS	0 SF	\$5,325,270.00 / SF	\$5,325,270
F2010 HAZARDOUS MATERIALS REMEDIATION		\$2,281,101.00 / SF	\$2,281,101
F2019 OTHER HAZARDOUS SELECTIVE BUILDING DEMOLITION		\$2,281,101.00 / SF	\$2,281,101
Hazardous Materials Abatement	1.00 ls	\$2,281,101.00 /ls	\$2,281,101
F3010 STRUCTURE DEMOLITION		\$3,044,169.00 / SF	\$3,044,169
F3011 BUILDING DEMOLITION		\$3,044,169.00 / SF	\$3,044,169
Demolish Existing School Building	239,144 sf	\$12.73 /sf	\$3,044,169
TOTAL DEMO & ABATEMENT		\$5,325,270.00 / SF	\$5,325,270

6C.2.3 – 03

ALTERNATES

**COST ESTIMATE
CM-R**

Northeast Metropolitan Vocational High School



90% CD Estimate - Alternates List

5/19/2023

	A	Construction Budget	\$ 249,500,000	Includes \$5.25 mil grant			
	B	Current Estimate	\$ 248,934,145	Reconciled 90% CD Estimate Dated 5-19-23			
	C	Budget Surplus	\$ 565,855	0.23%			
	D	Total Alternates (Mark-up included on each alternate below)	\$ 9,610,709				
Alt #	CSI	Description	Estimated Cost Incl Mark-up	Comments	RLB Value	Variance	%
1	Multiple	Add Locker Room Building (6,249 GSF)	\$3,529,390	Includes reduction in engineered ramp	\$3,361,548	\$167,842	4.99%
2	012300	Additional Seating Capacity at Bleachers	\$330,000	500 IS BASE, BUMP UP TO 1,000 SEATS	\$344,819	(\$14,819)	-4.30%
3	Multiple	Add Concessions / Toilet Building (Increase fixture count, add 10% cost OME)	\$1,426,129	Acceptance of Alt #2 will increase toilet fixture count here, design pending	\$1,331,582	\$94,547	7.10%
4	320000	Add Irrigated Natural Turf Softball Field (Base Condition is Seeded Lawn)	\$818,903	Alternate includes field equipment / netting / backstop / dugout / shade structures	\$810,462	\$8,441	1.04%
5	320000	Add Irrigated Multipurpose Soccer / Softball Field (Base Condition is Seeded Lawn)	\$1,184,827	Alternate includes field equipment / netting / backstop / dugout / shade structures	\$1,184,585	\$242	0.02%
6	Multiple	Maintenance Building - add back into scope (not student built)	\$2,321,460	Pre-engineered metal building on CMU base - design pending Pad prep and concrete foundation included in base estimate, utilities to building and building above pad not included and part of this alternate estimate		\$2,321,460	#DIV/0!
		Totals	\$9,610,709				

VALUE ANALYSIS LOG, COST TREND LOG					
#VALUE!					
Alternates Detail					
		QTY	UM	Unit \$	\$
1	Add Locker Room Building (6,249 GSF)				
032100.0580	Cast in Place Concrete (Per average of low 2 bids 03A)	1	ls	535,500.00	\$ 535,500
042200.0040	Interior CMU - 8"	8,121	sf	40.00	\$ 324,845
042200.0040	Interior CMU - 8" (Elevator Shaft)	1,403	sf	42.00	\$ 58,907
042200.0180	Exterior CMU - CMU Veneer	2,775	sf	45.00	\$ 124,875
042200.0250	Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU, Insul, AVB, NO INT GWB)	3,400	sf	42.00	\$ 142,800
051200.0120	Structural Steel Framing, Decking per low bid 05A	1	ls	250,000.00	\$ 250,000
055000.0110	Support Steel - Interior Rolling Door/Grille Supports	1	ls	10,000.00	\$ 10,000
055000.0110	Support Steel - Misc Supports	1	ls	3,500.00	\$ 3,500
055200.0060	Railing Exterior Guardrail at Locker Building Ramp/Steps	340	lf	225.00	\$ 76,500
061010.0010	Rough Carpentry Roofing	3,000	sf	1.50	\$ 4,500
061010.0030	Interior Rough Carpentry	1,263	sf	2.00	\$ 2,526
064200.0010	Interior Misc. Millwork not shown	1,263	sf	2.00	\$ 2,526
066100.0020	Interior Window Sills @ Exterior - Solid Surface	130	lf	70.00	\$ 9,080
071100.0010	Damproofing - Foundation Walls	450	sf	6.00	\$ 2,700
071100.0010	Waterproofing - Foundation Walls @ Elevator Pit	3,400	sf	15.00	\$ 51,000
072100.0010	Rigid Insulation @ Fndn. Walls	3,800	sf	4.50	\$ 17,100
072100.0020	Rigid Insulation @ S.O.G.	3,000	sf	4.50	\$ 13,500
072200.0020	Tapered Roof Insulation - Premium, assume not required	-	nic	3.50	\$ -
074600.0010	Metal Panel Flat-Lock Metal Tiles over 9/16" Galvanized Utility Deck	625	sf	130.00	\$ 81,250
074600.0128	Soffits	85	sf	125.00	\$ 10,625
075100.0030	Pre-Vegetated Roof Garden System per A3-2-13	1,950	sf	30.00	\$ 58,500
075300.0013	Roof System PVC Membrane w/ 6" Insulation	3,000	sf	30.00	\$ 90,000
077100.0020	Metal Coping/Roof Edge	310	lf	60.00	\$ 18,600
077100.0060	Gutters	122	lf	20.00	\$ 2,448
077100.0070	Downspouts, not shown assume required	29	lf	15.00	\$ 440
077200.0020	Roof Access Hatch, assume required	1	ea	10,000.00	\$ 10,000
078100.0010	Cementitious Spray Fireproofing (Beams & Columns)	3,000	sf	3.50	\$ 10,500
078100.0040	Misc. Patching of Fireproofing	1	ls	5,000.00	\$ 5,000
078400.0010	Firestopping / Safing @ Building Perimeter \$/lf	-	lf	7.60	\$ -
079200.0250	Misc. Interior Caulking - General	1,263	sf	0.76	\$ 960
081100.0070	Install Interior Doors and Frames	18	leaf	270.00	\$ 4,860
081100.0190	Glass & Alum Doors - Double Exterior - Incl. Door, Frame, and Hardware	1	ea	8,800.00	\$ 8,800
081100.0190	Glass & Alum Doors - Single Exterior - Incl. Door, Frame, and Hardware	2	ea	4,400.00	\$ 8,800
081100.0300	Frame Hollow Metal - Interior - Single	14	ea	450.00	\$ 6,300
081100.0320	Frame Hollow Metal - Interior - Double	2	ea	500.00	\$ 1,000
081400.0150	Door Hollow Metal Door - Interior - Single	14	leaf	510.00	\$ 7,140
081400.0160	Door Hollow Metal Door - Interior - Double	2	pair	1,020.00	\$ 2,040
083300.0010	Door Insulated Overhead Coiling Door, Motor Operated, 3 each	295	sf	55.00	\$ 16,225
084100.0018	Storefront Insulating Glass in Aluminum Storefront System	1,030	sf	120.00	\$ 123,600
084400.0032	Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 7" System	250	sf	150.00	\$ 37,500
092100.0395	GWB GWB Ceiling, Typical	4,500	sf	15.00	\$ 67,500
093100.0010	Ceramic Wall Tile	1,275	sf	28.00	\$ 35,700
093100.0010	Ceramic Tile Base	399	lf	24.00	\$ 9,584
093100.0050	Ceramic Floor Tile	584	sf	25.00	\$ 14,601
093100.0500	Stone Thresholds at wet rooms	5	sf	100.00	\$ 500
096700.0020	Epoxy Flooring - Poured	5,500	sf	16.50	\$ 90,750
099100.0050	Paint Exterior - Doors	3	ea	125.00	\$ 375
099100.0110	Hardware Interior Door Hardware Per Leaf	18	leaf	500.00	\$ 9,000
099100.0110	Paint Paint Interior Doors	18	leaf	115.00	\$ 2,070
099100.0110	Paint Interior - Doors	10	ea	100.00	\$ 1,000
099100.0160	Paint Interior Walls - Epoxy	10,513	sf.	2.90	\$ 30,488
099100.0160	Paint Interior Walls - Epoxy	868	sf.	2.90	\$ 2,516
099100.0220	Misc. Interior Painting	1	allw	5,000.00	\$ 5,000
099100.0310	Paint Painted Interior GWB - Typical Ceilings - Latex	4,500	sf	1.00	\$ 4,500
099100.0340	Paint Exposed Painted Structural Steel & Metal Deck	2,158	sf	3.50	\$ 7,555
105100.0080	Locker Benches	45	lf	65.00	\$ 2,925
105600.0020	Storage Wall Shelving - Metal (In F&E Estimate)	-	nic	-	\$ -
142100.0020	Elevator incl cab finishes	2	stop	115,000.00	\$ 230,000
211300.0040	Wet Sprinkler System - excluded	-	sf	5.50	\$ -
220500.0260	Admin & Expenses	6,249	sf	2.00	\$ 12,498
221100.0070	Water Meter 4"	1	ea	3,000.00	\$ 3,000
221100.0150	Domestic Hot & Cold Water Piping	400	lf	48.00	\$ 19,200
221100.0160	Insulation	400	lf	12.00	\$ 4,800

VALUE ANALYSIS LOG, COST TREND LOG					
#VALUE!					
Alternates Detail					
		QTY	UM	Unit \$	\$
221100.0160	Valves & Accessories	1	ls	1,000.00	\$ 1,000
221100.0180	Circulating Pump - DHWH	1	ea	800.00	\$ 800
221100.0560	Thermostatic Mixing Valve, 2"	1	ea	2,500.00	\$ 2,500
221100.0750	Backflow Preventer (RP) 4"	1	ea	5,000.00	\$ 5,000
221300.0540	Floor Drain W/Trap	6	ea	950.00	\$ 5,700
221300.0540	Trench Drains	2	ea	1,000.00	\$ 2,000
221300.0920	Sanitary Waste & Vent Piping - UG & AG	450	lf	60.00	\$ 27,000
221300.0920	Storm Drainage Piping - UG & AG	250	lf	105.00	\$ 26,250
221400.0230	Roof Drains	3	ea	1,365.00	\$ 4,095
221400.0440	Elevator Sump Pump	1	ea	2,000.00	\$ 2,000
221400.0440	Gas / Oil Interceptor	1	ea	7,500.00	\$ 7,500
221400.0440	Oil Interceptor	1	ea	4,000.00	\$ 4,000
223300.0010	Electric Water Heater - 60 KW	1	ea	7,000.00	\$ 7,000
224200.0140	Water Closet - Wall Hung	6	ea	2,469.50	\$ 14,817
224200.0300	Lavatory - Wall	6	ea	1,573.00	\$ 9,438
224200.0420	Mop Sink	1	ea	1,815.00	\$ 1,815
224200.0510	Drinking Foutain - Bi-Level Electric	2	ea	4,500.00	\$ 9,000
224200.0640	Shower - (Trim & Drain)	5	ea	1,688.50	\$ 8,443
224200.0760	Hose Bibb	6	ea	187.00	\$ 1,122
224200.0760	Wall Hydrant	1	ea	357.50	\$ 358
230100.0040	SM Coordination & Material Handling	1	ls	2,500.00	\$ 2,500
230100.0260	Rigging and Hoisting	1	ls	5,000.00	\$ 5,000
230100.0320	Project Expenses and Commissioning	1	ls	9,175.00	\$ 9,175
230900.0000	ATC - BMS	1	ls	16,250.00	\$ 16,250
230900.0000	ATC - BMS CO2 Monitoring	1	ls	2,500.00	\$ 2,500
232100.0370	Expansion Tank	1	ea	900.00	\$ 900
232200.0000	Condensate Drain Piping & Insulation	250	lf	51.75	\$ 12,938
232200.0000	Condensate Drain Pumps	1	ea	413.47	\$ 413
232300.0110	Split System Piping - Line Sets	1	ea	5,500.00	\$ 5,500
232300.0110	VRF Piping	3,095	sf	8.50	\$ 26,308
233100.0020	Ductwork - Galvanized	3,250	lb	14.88	\$ 48,352
233300.0000	Air Duct Accessories	1	ls	4,835.00	\$ 4,835
233500.0020	ERU-6	1	ea	20,436.00	\$ 20,436
233700.0500	RGDs and Vents	20	ea	301.25	\$ 6,025
237400.0010	Split Systems - 3T Heat Pump	1	ea	9,000.00	\$ 9,000
238100.0045	VRF Equipment -18T	1	ls	88,000.00	\$ 88,000
238100.0055	VRF Fan Coil Units Install	7	ea	2,436.00	\$ 17,052
238100.0055	VRF-VCU Condenser Install	2	ea	1,318.00	\$ 2,636
238200.0010	Unit Heater - Elec	2	ea	1,434.00	\$ 2,868
238200.0230	Cabinet Unit Heater (ceiling)	9	ea	3,200.00	\$ 28,800
239200.0100	Testing & Balancing	6,249	sf	0.85	\$ 5,312
260500.00220	Mis Expenses	6,249	gsf	1.75	\$ 10,936
260500.00280	Temp Lighting and Power	6,249	gsf	0.81	\$ 5,062
260500.03410	Small Power Devices and Wiring	6,249	gsf	2.95	\$ 18,435
260500.05030	Radio Master box	1	ea	9,007.46	\$ 9,007
260500.05110	E3EQ AC 30A composite unit connection Mechanical Schedule in feeder	1	ea	448.22	\$ 448
260500.05110	E3EQ ACCU 30A composite unit connection Mechanical Schedule in feeder	1	ea	448.22	\$ 448
260500.05110	E3EQ DWP with VFD 30A composite unit on drawings not on riser includes feeder	1	ea	448.22	\$ 448
260500.05110	E3EQ ERV-1 with VFD 15 A composite unit connection only off riser	1	ea	448.22	\$ 448
260500.05110	EUH 30 A composite unit connection and Feeder	7	ea	448.22	\$ 3,138
260500.22370	Single pole switch composite unit	12	ea	77.52	\$ 930
260519.00010	20 AMP EMT Composite feeders copper - Lighting Branch	1,000	lf	9.53	\$ 9,532
260519.00010	20 AMP EMT Composite feeders copper - Lighting Control Branch	360	lf	8.78	\$ 3,160
260519.02540	1200 AMP PVC Composite feeder copper - Large Power	85	lf	485.00	\$ 41,225
260519.02620	(4) 4" Empty PVC Conduit with pull String composite unit - Large Power	180	lf	158.00	\$ 28,440
260526.00690	Grounding	6,249	gsf	0.25	\$ 1,584
262200.00090	75 KVA NEMA 1 Transformer composite unit at Locker Building	1	ea	10,000.00	\$ 10,000
262400.01100	225 AMP 120/208 Panel board surface mounted composite unit at Locker Building	1	ea	4,000.00	\$ 4,000
262400.01200	1200 AMP 277/480 Distribution Panel board surface mounted composite unit at Locker Building	1	ea	17,000.00	\$ 17,000
263200.00020	Emergency Feeders	6,127	gsf	0.54	\$ 3,307
265100.00040	F1 Lighting Fixtures Composite Unit	28	ea	181.78	\$ 5,090
271500.00871	CCTV Outlet for Camera in Stari 2 Data jack with 1" Stub up to accessible ceiling composite unit 10 feet	7	ea	529.51	\$ 3,707
271500.00871	D2 Data jack with 1" Stub up to accessible ceiling composite unit 10 feet	2	ea	529.51	\$ 1,059
271500.00871	Wall Phone Data jack with 1" Stub up to accessible ceiling composite unit 10 feet	2	ea	529.51	\$ 1,059

VALUE ANALYSIS LOG, COST TREND LOG					
#VALUE!					
Alternates Detail					
		QTY	UM	Unit \$	\$
271500.00871	Wap Data jack with 1" Stub up to accessible ceiling composite unit 10 feet	4	ea	529.51	\$ 2,118
274100.00110	PA Speakers(	18	ea	250.00	\$ 4,500
274100.00160	Volume Controls	2	ea	150.00	\$ 300
275400.00010	Clock Single Face 12.5	2	ea	547.40	\$ 1,095
281500.0240	Access Control Card Reader	6	ea	1,575.00	\$ 9,450
281500.0240	Intrusion Alarm System Door Contact	13	ea	525.00	\$ 6,825
281500.0240	Intrusion Alarm System Key Pad	2	ea	1,575.00	\$ 3,150
282100.0010	CCTV Dome Camera 180 and wiring	5	ea	2,620.69	\$ 13,103
282100.0010	CCTV Dome Camera and wiring	5	ea	2,620.69	\$ 13,103
284600.00600	Fire alarm manual pull station composite unit	4	ea	269.35	\$ 1,077
284600.00610	Smoke detector composite unit	3	ea	368.30	\$ 1,105
284600.00740	Fire alarm remote indicating light composite unit	1	ea	221.28	\$ 221
284600.00750	Fire alarm speaker strobe Ceiling composite unit	4	ea	327.77	\$ 1,311
284600.00750	Fire alarm speaker strobe Ceiling WP composite unit	5	ea	327.77	\$ 1,639
284600.00750	Fire alarm speaker strobe composite unit	10	ea	327.77	\$ 3,278
284600.00790	Fire alarm terminal cabinet composite unit	1	ea	975.02	\$ 975
284600.00800	Fire alarm control module composite unit	3	ea	353.76	\$ 1,061
284600.00830	3/4" EMT 2#14 and 18/2 Twisted shielded composite unit	1,600	gsf	12.77	\$ 20,429
334100.0010	E&B for Locker / Athletic Bldg - per low bid 31A	1	ls	145,000.00	\$ 145,000
334100.0010	F&I Building Foundation Drainage - Perforated PVC	3,000	sf	5.00	\$ 15,000
334100.0011	Add Site Improvements - Plantings / Trees	23	ea	1,500.00	\$ 34,500
334100.0012	Add Site Improvements - Table & Bench	2	ea	3,950.00	\$ 7,900
334100.0013	Delete Site Improvements - Engineered Boardwalk	(3,000)	sf	150.00	\$ (450,000)
334100.0013	Add back preengineered stairs	200	sf	150.00	\$ 30,000
	Subtotal				\$ 3,188,247
	Mark-up			10.7%	\$ 341,142
	Totals				\$ 3,529,390
3	Add Concessions / Toilet Building (Increase fixture count, add 10% cost OME)				
033100.0030	SOG Complete \$/sf - 5", WWF Reinforcing	1,260	sf	12.50	\$ 15,750
033100.0130	Continuous Strip Ftg - 150' x 2' x 1'	12	cy	975.00	\$ 11,700
033100.0130	Foundation Wall - 150' x 3' x 1'	25	cy	1,975.00	\$ 49,375
042200.0040	Interior CMU - 8"	1,620	sf	42.00	\$ 68,040
042200.0180	Exterior CMU Veneer - large scale	450	sf	48.00	\$ 21,600
042200.0230	Exterior Backup Wall CMU - 8"	1,800	sf	45.00	\$ 81,000
055000.0430	Interior Misc.Metals Item -	6,127	sf	2.75	\$ 16,849
061010.0030	Interior Rough Carpentry	1,263	sf	5.00	\$ 6,315
061100.0040	Wood Framing, Roof Truss \$/sf	1,400	sf	48.00	\$ 67,200
064200.0030	Fiber Cement Panels - Exterior Wall	1,500	sf	45.00	\$ 67,500
071100.0010	Damproofing - Foundation Walls	600	sf	7.50	\$ 4,500
071300.0010	Vapor Barrier @ SOG	1,260	sf	13.33	\$ 16,796
072100.0010	Rigid Insulation @ Fndn. Walls	600	sf	4.50	\$ 2,700
072100.0020	Rigid Insulation @ S.O.G.	300	sf	5.75	\$ 1,725
075300.0013	Standing Seam Metal Roof System	1,400	sf	55.00	\$ 77,000
076500.0010	SS Snow Fence	1	ls	5,000.00	\$ 5,000
077100.0020	Metal Coping/Roof Edge	150	lf	55.00	\$ 8,250
077100.0060	Gutters	50	lf	35.00	\$ 1,750
077100.0070	Downspouts	10	nic	35.00	\$ 350
079200.0250	Misc. Interior Caulking - General	1,260	sf	0.76	\$ 958
081100.0120	Door SS Pair Exterior - Incl. Door, Frame, and Hardware	2	ea	4,500.00	\$ 9,000
081100.0120	Door SS Single Exterior - Incl. Door, Frame, and Hardware	3	ea	6,500.00	\$ 19,500
083300.0010	Roll-up concession window counter door, SS	1	ls	3,500.00	\$ 3,500
089100.0010	Louver - Exterior Aluminum	16	sf	75.00	\$ 1,200
092100.0395	GWB GWB Ceiling, Typical	1,260	sf	22.00	\$ 27,720
096700.0020	Epoxy Flooring - Poured	750	sf	17.00	\$ 12,750
096700.0020	Sealed Concrete	500	sf	1.50	\$ 750
099100.0050	Paint Exterior - Door Frms	5	ea	135.00	\$ 675
099100.0160	Paint Interior Walls - Epoxy	3,078	sf.	3.50	\$ 10,772
099100.0220	Misc. Interior Painting	1	allw	1,500.00	\$ 1,500
099100.0310	Paint Painted Interior GWB - Typical Ceilings - Epoxy Pnt	1,260	sf	3.50	\$ 4,410
102100.0030	Toilet Compartment - Stainless Steel - Standard	5	stall	3,800.00	\$ 19,000
102100.0040	Toilet Compartment - Stainless Steel - Handicapped	2	stall	4,250.00	\$ 8,500
102100.0140	Urinal Screen - Stainless Steel	3	ea	1,200.00	\$ 3,600
102800.0020	Toilet Accessories - Men's Room	1	ea	4,528.97	\$ 4,529

VALUE ANALYSIS LOG, COST TREND LOG					
#VALUE!					
Alternates Detail					
		QTY	UM	Unit \$	\$
102800.0030	Toilet Accessories - Women's Room	1	ea	5,075.96	\$ 5,076
114200.0010	Food Service Equipment	1	ls	25,000.00	\$ 25,000
220500.0260	Admin & Expenses	1	ls	11,000.00	\$ 11,000
221100.0070	Water Meter 4"	1	ea	3,300.00	\$ 3,300
221100.0150	Domestic Hot & Cold Water Piping	500	lf	48.00	\$ 24,000
221100.0160	Insulation	500	lf	12.00	\$ 6,000
221100.0160	Valves & Accessories	1	ls	1,200.00	\$ 1,200
221100.0180	Circulating Pump - DHWH	1	ea	880.00	\$ 880
221100.0560	Thermostatic Mixing Valve, 2"	1	ea	5,000.00	\$ 5,000
221100.0750	Backflow Preventer (RP) 4"	1	ea	5,500.00	\$ 5,500
221100.0750	Kitchen Equipment Connections	1	ls	5,000.00	\$ 5,000
221100.0800	Trap Primers & Associated Piping	4	ea	1,000.00	\$ 4,000
221300.0540	Floor Drain W/Trap	4	ea	1,045.00	\$ 4,180
221300.0920	Sanitary Waste & Vent Piping - UG & AG	550	lf	60.00	\$ 33,000
221400.0435	Local Grease Interceptor 35 GPM	1	ea	1,027.92	\$ 1,028
221400.0440	Elevator Sump Pump	1	ea	2,200.00	\$ 2,200
221400.0440	Oil Interceptor Elevator	1	ea	4,400.00	\$ 4,400
223300.0010	Electric Water Heater - 30 Gallon 15 KW	1	ea	2,500.00	\$ 2,500
224200.0140	Drinking Fountain - Exterior	1	ea	4,000.00	\$ 4,000
224200.0140	Water Closet - Wall Hung	7	ea	2,469.50	\$ 17,287
224200.0300	Lavatory - Wall	4	ea	1,573.00	\$ 6,292
224200.0420	Mop Sink	1	ea	1,815.00	\$ 1,815
224200.0420	Urinal	3	ea	1,760.00	\$ 5,280
224200.0760	Hose Bibb	3	ea	187.00	\$ 561
224200.0760	Wall Hydrant	1	ea	357.50	\$ 358
230100.0040	SM Coordination & Material Handling	1	ls	375.00	\$ 375
230100.0260	Rigging and Hoisting	1	ls	5,000.00	\$ 5,000
230100.0320	Project Expenses and Commissioning	1	ls	2,500.00	\$ 2,500
230900.0000	ATC - BMS - Split & ERV	1	ls	11,000.00	\$ 11,000
232100.0370	Expansion Tank	1	ea	990.00	\$ 990
232200.0000	Condensate Drain Piping & Insulation	20	lf	51.44	\$ 1,029
232200.0000	Condensate Drain Pumps	1	ea	413.47	\$ 413
232300.0110	Split System Piping - Line Sets	1	ea	5,500.00	\$ 5,500
233100.0020	Ductwork - Galvanized	500	lb	14.88	\$ 7,439
233300.0000	Air Duct Accessories	1	ls	1,000.00	\$ 1,000
233500.0020	ERU-5	1	ea	20,436.00	\$ 20,436
233700.0500	RGDs and Vents	6	ea	301.25	\$ 1,808
237400.0010	Split Systems - 3T Heat Pump	1	ea	9,372.00	\$ 9,372
238200.0010	Unit Heater - Elec	1	ea	1,434.00	\$ 1,434
238200.0230	Cabinet Unit Heater (ceiling)	3	ea	3,262.30	\$ 9,787
239200.0100	Testing & Balancing	800	sf	1.50	\$ 1,200
	ADJUST HVAC	1	ls	25,000.00	\$ 25,000
260500.00220	Mis Expenses	1,263	gsf	2.00	\$ 2,526
260500.00280	Temp Lighting and Power	1,263	gsf	0.81	\$ 1,023
260500.03410	Duplex receptacle composite unit	13	ea	82.89	\$ 1,078
260500.03430	Duplex GFI receptacle composite unit	2	ea	81.73	\$ 163
260500.05030	Radio Master box	1	ea	9,007.46	\$ 9,007
260500.05110	E3EQ AC 30A composite unit connection Mechanical Schedule in feeder	1	ea	448.22	\$ 448
260500.05110	E3EQ ACCU 30A composite unit connection Mechanical Schedule in feeder	1	ea	448.22	\$ 448
260500.05110	E3EQ ERV-1 with VFD 15 A composite unit connection only off riser	1	ea	448.22	\$ 448
260500.05110	EUH 30 A composite unit connection and Feeder	4	ea	448.22	\$ 1,793
260500.05110	EWB 30 A composite unit connection and Feeder	2	ea	448.22	\$ 896
260500.22370	Single pole switch composite unit	1	ea	77.52	\$ 78
260500.22422	SLV Low voltage Switch composite unit	5	ea	87.53	\$ 438
260500.22440	Ceiling mounted occupancy sensor composite unit	6	ea	254.07	\$ 1,524
260519.00010	20 AMP EMT Composite feeders copper - Large Power	1,000	lf	17.04	\$ 17,041
260519.00010	20 AMP EMT Composite feeders copper - Lighting Branch	420	lf	9.53	\$ 4,003
260519.00010	20 AMP EMT Composite feeders copper - Lighting Control Branch	360	lf	8.78	\$ 3,160
260519.00020	30 AMP EMT Composite feeders copper - Large Power	700	lf	19.55	\$ 13,684
260519.02490	250 AMP PVC Composite feeder copper - Large Power	565	lf	98.13	\$ 55,446
260519.02610	(1) 4" Empty PVC Conduit with pull string composite unit Spares tel	563	lf	17.35	\$ 9,769
260519.02610	(2) 4" Empty PVC Conduit with pull string composite unit Spares	571	lf	38.79	\$ 22,147
260519.02610	(1) 4" Empty PVC Conduit with pull string composite unit Spares FA	563	lf	17.35	\$ 9,769
260526.00690	Grounding	1,263	gsf	0.25	\$ 320
262200.00070	30 KVA NEMA 1 Transformer composite unit	1	ea	5,511.05	\$ 5,511

VALUE ANALYSIS LOG, COST TREND LOG					
#VALUE!					
Alternates Detail					
		QTY	UM	Unit \$	\$
262400.01090	100 AMP 120/208 panel board surface mounted composite	1	ea	2,773.62	\$ 2,774
262400.01160	250 AMP 277/480 Panel board surface mounted composite unit	1	ea	4,873.26	\$ 4,873
265100.00040	F1 Lighting Fixtures Composite Unit	14	ea	181.78	\$ 2,545
271500.00871	CCTV Outlet for Camera in Outside of Maintenance Data jack with 1" Stub up to accessible ceiling composite unit 10'	3	ea	529.51	\$ 1,589
271500.00871	D2 Data jack with 1" Stub up to accessible ceiling composite unit 10 feet	2	ea	529.51	\$ 1,059
271500.00871	Wall Phone Data jack with 1" Stub up to accessible ceiling composite unit 10 feet	1	ea	529.51	\$ 530
281500.0240	Intrusion Alarm System Door Contact	3	ea	525.00	\$ 1,575
282100.0010	CCTV Dome Camera 180 and wiring	1	ea	2,620.69	\$ 2,621
282100.0010	CCTV Dome Camera and wiring	2	ea	2,620.69	\$ 5,241
284600.00600	Fire alarm manual pull station composite unit	3	ea	269.35	\$ 808
284600.00610	Smoke detector composite unit	2	ea	368.30	\$ 737
284600.00750	Fire alarm speaker strobe Ceiling composite unit	3	ea	327.77	\$ 983
284600.00790	Fire alarm terminal cabinet composite unit	1	ea	975.02	\$ 975
284600.00800	Fire alarm control module composite unit	3	ea	353.76	\$ 1,061
284600.00830	3/4" EMT 2#14 and 18/2 Twisted shielded composite unit	650	gsf	12.77	\$ 8,299
316200.0180	Excavate, Backfill & Compact	229	cuyd	140.00	\$ 32,107
334100.0010	F&I Building Foundation Drainage	1	ls	5,000.00	\$ 5,000
334100.0011	Add Site Improvements - Concrete Pavement	810	sf	16.50	\$ 13,365
334100.0012	Add Site Improvements - Stabilized Stone Dust	200	sf	14.00	\$ 2,800
334100.0013	Add Site Improvements - Table & Bench	2	ea	3,950.00	\$ 7,900
334100.0099	Delete Site Improvements - Seeded Lawn	(2,300)	sf	1.75	\$ (4,025)
	Subtotal				\$ 1,188,441
	Mark-up			20.0%	\$ 237,688
	Totals				\$ 1,426,129
					1105.526132
4	Add Irrigated Natural Turf Softball Field (Base Condition is Seeded Lawn)				
	Prepare and Compact Sub-base	65,000	sf	1.00	\$ 65,000
	Subgrade Layer @ Natural Playing Surfaces	65,000	sf	4.25	\$ 276,250
	Engineered Infield Mix @ Baseball Field	15,000	sf	4.15	\$ 62,250
	Natural Irrigated Baseball Field	65,000	sf	2.75	\$ 178,750
	Irrigation	65,000	sf	1.50	\$ 97,500
	Sport Specialties, Shade Structures, Dug-outs, Bleachers, etc.incl E&B & Concrete Ftgs	1	Ls	90,000.00	\$ 90,000
	Add Concrete Pad	1	Ls	35,000.00	\$ 35,000
	4' Ht CLF	Included in Base			
	Delete Seeded Lawn carried in base estimate	(65,000)	sf	1.00	\$ (65,000)
	Subtotal				\$ 739,750
	Mark-up			10.7%	\$ 79,153
	Totals				\$ 818,903
5	Add Irrigated Multipurpose Soccer / Softball Field (Base Condition is Seeded Lawn)				
	Prepare and Compact Sub-base	89,427	sf	1.00	\$ 89,427
	Subgrade Layer @ Natural Playing Surfaces	89,427	sf	4.25	\$ 380,065
	Engineered Infield Mix @ Baseball Field	14,500	sf	4.15	\$ 60,175
	Natural Irrigated Baseball Field	89,427	sf	2.75	\$ 245,924
	Irrigation	89,427	sf	1.50	\$ 134,141
	Sport Specialties, Shade Structures, Dug-outs, Sports Netting, Bleachers, etc.incl E&B & Concrete Ftgs	1	Ls	250,000.00	\$ 250,000
	4' Ht CLF	Included in Base			
	Delete Seeded Lawn carried in base estimate	(89,427)	sf	1.00	\$ (89,427)
	Subtotal				\$ 1,070,305
	Mark-up			10.7%	\$ 114,523
	Totals				\$ 1,184,827

VALUE ANALYSIS LOG, COST TREND LOG					
#VALUE!					
Alternates Detail					
		QTY	UM	Unit \$	\$
6	Maintenance Building - add back into scope (not student built)				
04A	CMU Kneewall Back-up - perimeter exterior - 4' ht	1,720	sf	45.00	\$ 77,400
04A	CMU Veneer - Arriscraft	1,720	sf	50.00	\$ 86,000
05A	Misc Metals	10,200	gsf	3.50	\$ 35,700
06A	Rough Carpentry	10,200	gsf	2.00	\$ 20,400
06B	Finish Carpentry	10,200	gsf	1.00	\$ 10,200
07A	AVB / Waterproofing / Dampproofing / Caulking	10,200	gsf	2.75	\$ 28,050
08A	Drs / Frms / Hardware	10,200	gsf	3.00	\$ 30,600
08B	Overhead Doors	8	ea	20,000.00	\$ 160,000
09A	General Trades	10,200	gsf	5.00	\$ 51,000
09B	Painting	10,200	gsf	2.00	\$ 20,400
09C	Tile (assumes no toilet rooms in this buidling)		na		
10A	Specialties	10,200	gsf	0.50	\$ 5,100
11A	Not applicable		na		
12A	Not applicable		na		
13A	Pre-engineered Metal Building	10,200	gsf	75.00	\$ 765,000
14A	Not applicable		na		
21A	Fire Protection - excluded		na		
22A	Plumbing - Minor, floor drains (assumes no toilet facility in this building)	10,200	gsf	3.50	\$ 35,700
23A	HVAC - unit heaters, exhaust fans,	10,200	gsf	20.00	\$ 204,000
26A	Electrical	10,200	gsf	25.00	\$ 255,000
31B	Utilities (not designed or bought in 31A)	1	Allw	150,000.00	\$ 150,000
		-	sf	-	\$ -
		10,200	gsf	\$ 189.66	\$ 1,934,550
				20.0%	\$ 386,910
	Totals	10,200	gsf	\$ 227.59	\$ 2,321,460

6C.2.3 – 03

BID PACKAGE

**COST ESTIMATE
CM-R**

Bid Package / Location	Quantity	Unit Cost	Total Cost
02A DEMOLITION	380,570 SF	\$13.99 / SF	\$5,325,270
03A CAST-IN-PLACE CONCRETE	380,570 SF	\$31.27 / SF	\$11,900,535
03B PRECAST	380,570 SF	\$1.82 / SF	\$693,180
04A MASONRY	380,570 SF	\$22.56 / SF	\$8,583,796
05A STRUCTURAL STEEL	380,570 SF	\$46.63 / SF	\$17,744,765
05B MISC METALS	380,570 SF	\$7.19 / SF	\$2,734,753
06A MILLWORK & CASEWORK	380,570 SF	\$7.94 / SF	\$3,021,184
07A ROOFING	380,570 SF	\$13.75 / SF	\$5,231,308
07X [WATERPROOFING]	380,570 SF	\$1.20 / SF	\$457,665
07X FIREPROOFING	380,570 SF	\$3.71 / SF	\$1,413,681
07X METAL PANELS	380,570 SF	\$15.52 / SF	\$5,908,307
07X WATERPROOFING	380,570 SF	\$0.74 / SF	\$281,622
08A DOORS/FRAMES/HARDWARE	380,570 SF	\$3.03 / SF	\$1,154,365
08X [OVERHEAD DOORS	380,570 SF	\$2.89 / SF	\$1,099,031
08X INTERIORGLASS & GLAZING	380,570 SF	\$2.79 / SF	\$1,060,030
08X WINDOWS/ STOREFRONT / CURTAINWALL	380,570 SF	\$18.45 / SF	\$7,020,403
09A FRAMING & DRYWALL	380,570 SF	\$36.36 / SF	\$13,837,588
09X [ACOUSTICAL CEILINGS]	380,570 SF	\$5.67 / SF	\$2,156,825
09X [CERAMIC TILE]	380,570 SF	\$3.88 / SF	\$1,476,776
09X [FLOORING - EPOXY]	380,570 SF	\$0.45 / SF	\$170,031
09X [FLOORING - VCT, CARPET, RESILIENT]	380,570 SF	\$5.75 / SF	\$2,188,118
09X [FLOORING - WOOD ATHLETIC]	380,570 SF	\$0.63 / SF	\$240,240
09X [PAINTING & WALLCOVERING]	380,570 SF	\$4.67 / SF	\$1,778,612
10A SPECIALTIES	380,570 SF	\$2.04 / SF	\$776,212
10B SIGNAGE	380,570 SF	\$0.64 / SF	\$242,650
10C LOCKERS	380,570 SF	\$1.58 / SF	\$600,970
11A FOOD SERVICE EQUIPMENT	380,570 SF	\$6.34 / SF	\$2,411,900
11B SHOP EQUIPMENT	380,570 SF	\$0.96 / SF	\$364,006
11C ATHLETIC EQUIPMENT	380,570 SF	\$2.59 / SF	\$986,856
11X LAB EQUIPMENT	380,570 SF	\$0.24 / SF	\$93,000
11X STAGE EQUIPMENT	380,570 SF	\$0.51 / SF	\$195,000
12A FIXED SEATING	380,570 SF	\$0.81 / SF	\$308,880
12B SHADES & CURTAINS	380,570 SF	\$0.92 / SF	\$350,047
14A ELEVATORS	380,570 SF	\$2.59 / SF	\$985,000
21A FIRE PROTECTION	380,570 SF	\$9.92 / SF	\$3,775,296
22A PLUMBING	380,570 SF	\$22.13 / SF	\$8,421,659
23A HVAC	380,570 SF	\$81.17 / SF	\$30,891,850

DRA ARCHITECTS / PMA CONSULTANTS**NORTHEAST METROPOLITAN REG.V.T.****Wakefield, MA****90% CD Estimate - Final Reconciled****05/19/2023****Rev.4**

26A ELECTRICAL	380,570 SF	\$65.72 / SF	\$25,010,715
31A EXCAVATION AND FILL	380,570 SF	\$67.06 / SF	\$25,522,000
32A LANDSCAPING & IRRIGATION	380,570 SF	\$18.49 / SF	\$7,038,419

Subtotal Direct Cost		\$534.60 /SF	\$203,452,544
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Indirect Costs	Amount	Total Cost
Design and Estimating Contingency	1.25%	\$2,543,157
Subtotal 1		\$205,995,700
Escalation	2.25%	\$4,634,903
Projected Cost of Work		\$210,630,604
Subcontractor Bonds	1.20%	\$2,527,567
Insurance - CCIP (Changed from GL)	2.74%	\$6,820,734
Builders Risk		\$365,272
Payment and Performance Bond		\$1,850,710
Subtotal Insurances		\$222,194,887
CM General Conditions		\$9,687,591
Field Office Support		\$1,694,300
CM General Requirements		\$5,034,190
Cost of Work / Site Services		\$850,000
CM Contingency	2.50%	\$5,265,765
Subtotal 2		\$244,726,733
CM Fee		\$4,205,160
Total Construction Costs		\$248,931,893
Total Construction Cost		\$654.10 /SF
		\$248,931,893
Owner Costs		Total Cost
Land & Real Estate Expenses Acquisition		\$0
Professional Services		\$0
Permits and Regulatory Fees		\$0
Furniture, Fixtures, and Equipment		\$0
Telephone, Data, AV, Security		\$0
Major Equipment		\$0
Utility Costs		\$0
Occupancy Expense		\$0
Advertising and Marketing		\$0
Legal, Financial, & Insurance		\$0
Owner's Reserve		\$0
Owner's Other		\$0
Total Owner Costs		\$0
Total Project Cost		\$248,931,893

02A DEMOLITION

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
06 SITEWORK	380,570 SF	\$0.00 / SF	\$0
02 EXISTING CONDITIONS		\$0.00 / SF	\$0
Z1050 TEMPORARY FACILITIES & CONTROLS		\$0.00 / SF	\$0
Z1055 Temporary Construction		\$0.00 / SF	\$0
Wrap Building to Place Slabs - incl w GRs	0.00 ls		\$0
07 DEMO & ABATEMENT	380,570 SF	\$13.99 / SF	\$5,325,270
02 EXISTING CONDITIONS		\$13.99 / SF	\$5,325,270
F2010 HAZARDOUS MATERIALS REMEDIATION		\$5.99 / SF	\$2,281,101
F2019 Other Hazardous Selective Building Demolition		\$5.99 / SF	\$2,281,101
Hazardous Materials Abatement	1.00 ls	\$2,281,101.00 /ls	\$2,281,101
F3010 STRUCTURE DEMOLITION		\$8.00 / SF	\$3,044,169
F3011 Building Demolition		\$8.00 / SF	\$3,044,169
Demolish Existing School Building	239,144 sf	\$12.73 /sf	\$3,044,169
TOTAL 02A DEMOLITION		\$13.99 / SF	\$5,325,270

03A CAST-IN-PLACE CONCRETE

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$27.81 / SF	\$10,585,524
03 CONCRETE		\$27.43 / SF	\$10,439,313
A1010 STANDARD FOUNDATIONS		\$8.50 / SF	\$3,236,026
A1010 Standard Foundations		\$0.76 / SF	\$288,836
Formwork - Continuous Footings	3,302 sfca	\$18.00 /sfca	\$59,436
Rebar - Continuous Footings (F&I)	14 ton	\$3,550.00 /ton	\$49,700
Concrete - Continuous Footings (material and placed, typ)	202 cy	\$300.00 /cy	\$60,600
CIP Concrete - Interior Footings @ CMU	116 cy	\$600.00 /cy	\$69,600
Concrete - Footing Steps	22 cy	\$2,250.00 /cy	\$49,500
A1011 Wall Foundations		\$2.53 / SF	\$962,361
Formwork - @ Foundation Wall - Exterior Frost Wall	16,387 sfca	\$24.00 /sfca	\$393,288
Formwork - @ Foundation Wall - Exterior Radial Frost Wall	1,525 sfca	\$40.00 /sfca	\$61,000
Formwork - @ Foundation Wall - Interior Wall	5,727 sfca	\$24.00 /sfca	\$137,448
Rebar - Frost Wall (F&I)	47 ton	\$3,550.00 /ton	\$166,850
Concrete - Foundation Walls	627 cy	\$325.00 /cy	\$203,775
A1013 Column Foundations		\$4.40 / SF	\$1,674,829
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)	6.00 ton	\$3,550.00 /ton	\$21,300
Rebar - Column Footings (F&I)	133 ton	\$3,550.00 /ton	\$472,150
Concrete Isolated Piers - Complete F&I	55 cy	\$425.00 /cy	\$23,375
Concrete - Column Footings - Complete Complete F&I	1,834 cy	\$300.00 /cy	\$550,200
Column Diamonds, Grout - Isolated Footings	258 ea	\$250.00 /ea	\$64,500
A1019 Standard Foundation Supplementary Components		\$0.81 / SF	\$310,000
ADD THICKENED SLAB HAUNCH @NON-SHEAR WALL CMU 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
A2020 BASEMENT WALL CONSTRUCTION		\$4.94 / SF	\$1,879,900
A1011 Wall Foundations		\$1.11 / SF	\$424,325
Formwork - Retaining Wall Footings	2,329 sfca	\$25.00 /sfca	\$58,225
Rebar - Retaining Wall Footings @ Wall (F&I)	46 ton	\$3,550.00 /ton	\$163,300
F&I Concrete - Retaining Wall Footings	676 cy	\$300.00 /cy	\$202,800
A2020 Basement Wall Construction		\$3.82 / SF	\$1,455,575
Formwork - @ Basement Retaining Wall	31,385 sfca	\$25.00 /sfca	\$784,625
Rebar - Basement Wall (F&I)	85 ton	\$3,550.00 /ton	\$301,750
F&I Concrete - Basement Wall	1,136 cy	\$325.00 /cy	\$369,200
A4010 STANDARD SLABS-ON-GRADE		\$3.60 / SF	\$1,369,936
A4010 Standard Slabs-on-Grade		\$3.60 / SF	\$1,369,936
Formwork - Slab Edge	5,423 lf	\$18.00 /lf	\$97,614
Formwork - Slab Construction Joints	2,575 lf	\$18.00 /lf	\$46,350
Welded Wire Mesh - Slab on Grade (Incl. Overlap) F&I	147,327 sf	\$1.75 /sf	\$257,822

03A CAST-IN-PLACE CONCRETE [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Concrete Material - (SOG)	1,987 cy	\$150.00 /cy	\$298,050
Place & Finish Slab on Grade Concrete (6" @shops + 4" elsewhere)	128,111 sf	\$3.25 /sf	\$416,361
Sawcut Slab on Grade Control Joints	7,800 lf	\$12.00 /lf	\$93,600
Cure / Protect Slab on Grade	128,111 sf	\$1.25 /sf	\$160,139
A4040 PITS & BASES		\$0.12 / SF	\$46,500
A4040 Pits & Bases		\$0.12 / SF	\$46,500
Elevator Pit Walls / Mat Slab - complete	16 cy	\$1,500.00 /cy	\$24,000
Other Pit Walls / Mat Slab - Leveling & Equipment	1.00 ls	\$22,500.00 /ls	\$22,500
B1010 FLOOR CONSTRUCTION		\$8.33 / SF	\$3,169,853
B1010 Floor Construction		\$7.93 / SF	\$3,018,174
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"	3,780 cy	\$425.00 /cy	\$1,606,500
Finish Concrete - Metal Deck	244,976 sf	\$3.75 /sf	\$918,660
B1012 Floor Decks, Slabs, & Toppings		\$0.40 / SF	\$151,679
Concrete Topping @ Precast Plank - ADJUSTED SQFT PER RECON	15,404 sf	\$7.25 /sf	\$111,679
Housekeeping Pads Complete	1,000 sf	\$40.00 /sf	\$40,000
B1020 ROOF CONSTRUCTION		\$1.08 / SF	\$409,599
B1022 Roof Decks, Slabs, & Sheathing		\$1.08 / SF	\$409,599
Welded Wire Mesh - Roof Deck (Incl. Overlap) F&I	23,135 sf	\$1.75 /sf	\$40,486
Concrete Material & Place -@ Roof Deck	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 / SF	\$327,500
B1081 Stair Construction		\$0.86 / SF	\$327,500
Stairs - Concrete In Steel Pan Stairs	16.00 flgt	\$15,000.00 /flgt	\$202,500
Stairs - Concrete risers @ Aud	1.00 ls	\$125,000.00 /ls	\$125,000
07 THERMAL & MOISTURE PROTECTION		\$0.38 / SF	\$146,211
A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.38 / SF	\$146,211
A4096 Slab-On-Grade Supplementary Components		\$0.38 / SF	\$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
05 MAINTENANCE BLDG	380,570 SF	\$1.18 / SF	\$449,500
03 CONCRETE		\$1.16 / SF	\$440,500
A1010 STANDARD FOUNDATIONS		\$0.22 / SF	\$83,200
A1010 Standard Foundations		\$0.22 / SF	\$83,200
Standard Concrete Foundation - Complete \$/sf - Storage Building	10,400 sf	\$8.00 /sf	\$83,200
A2010 WALLS FOR SUBGRADE ENCLOSURES		\$0.61 / SF	\$232,500
A2011 Subgrade Enclosure Wall Construction		\$0.61 / SF	\$232,500
Standard Concrete Foundation - Complete \$/sf - walls	150 cy	\$1,550.00 /cy	\$232,500
A4010 STANDARD SLABS-ON-GRADE		\$0.33 / SF	\$124,800
A4010 Standard Slabs-on-Grade		\$0.33 / SF	\$124,800

03A CAST-IN-PLACE CONCRETE [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Standard Concrete SOG - Complete \$/sf Storage Building	10,400 sf	\$12.00 /sf	\$124,800
07 THERMAL & MOISTURE PROTECTION		\$0.02 / SF	\$9,000
A2020 BASEMENT WALL CONSTRUCTION		\$0.02 / SF	\$9,000
A2020 Basement Wall Construction		\$0.02 / SF	\$9,000
Rigid Insulation @ Fndn. Walls	1,800 sf	\$5.00 /sf	\$9,000
06 SITEWORK	380,570 SF	\$2.27 / SF	\$865,511
32 EXTERIOR IMPROVEMENTS		\$2.27 / SF	\$865,511
G2010 ROADWAYS		\$0.47 / SF	\$178,505
G2011 Roadway Pavement		\$0.46 / SF	\$173,465
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
G2013 Marking & Signage		\$0.01 / SF	\$5,040
Accessible Walkway Ramp	1,008 sf	\$5.00 /sf	\$5,040
G2030 PEDESTRIAN PLAZAS & WALKWAYS		\$0.62 / SF	\$234,246
G2031 Pedestrian Pavement		\$0.62 / SF	\$234,246
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 bands	0.00 sf		\$0
Concrete Paving - Integral Color Exposed Aggregate - accent bands - etched	0.00 sf		\$0
Concrete Paving - Ramps	324 sf	\$15.00 /sf	\$4,860
G2060 SITE DEVELOPMENT		\$1.19 / SF	\$452,760
G2033 Exterior Steps & Ramps		\$0.69 / SF	\$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		\$0.50 / SF	\$190,400
Retaining Wall - Concrete (CIP) -BENCH SHELF AT CONTAINERS	14 cy	\$2,000.00 /cy	\$28,000
Retaining Wall - Concrete (CIP) - complete, footing & wall	116 cy	\$1,400.00 /cy	\$162,400
TOTAL 03A CAST-IN-PLACE CONCRETE		\$31.27 / SF	\$11,900,535

03B PRECAST

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$1.82 / SF	\$693,180
03 CONCRETE		\$1.82 / SF	\$693,180
B1010 FLOOR CONSTRUCTION		\$1.82 / SF	\$693,180
B1014 Mezzanine Floor Construction		\$1.82 / SF	\$693,180
Floor Precast - Plank - Hollow Core @ Mezzanine - Furnish	15,404 sf	\$13.00 /sf	\$200,252
Floor Precast - Plank - Hollow Core @ Mezzanine - Install	15,404 sf	\$32.00 /sf	\$492,928
TOTAL 03B PRECAST		\$1.82 / SF	\$693,180

04A MASONRY

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$22.56 / SF	\$8,583,796
04 MASONRY		\$22.37 / SF	\$8,514,596
B2010 EXTERIOR WALLS		\$11.62 / SF	\$4,424,124
B2011 Exterior Wall Veneer		\$8.61 / SF	\$3,277,810
Staging and Scaffolding - Exterior CMU - All exterior Masonry	1.00 ls	\$182,500.00 /ls	\$182,500
Exterior Face Brick Veneer	23,043 sf	\$45.00 /sf	\$1,036,935
Exterior CMU - CMU Veneer	33,750 sf	\$37.00 /sf	\$1,248,750
Exterior Cast Stone Veneer - Arriscraft	7,245 sf	\$50.00 /sf	\$362,250
Exterior Granite Veneer - Main Entry Feature Wall	2,385 sf	\$175.00 /sf	\$417,375
Cast Stone Column Wraps at South Entrance	2.00 ea	\$15,000.00 /ea	\$30,000
B2012 Exterior Wall Construction		\$3.01 / SF	\$1,146,314
Exterior Wall Backup Wall CMU - Backup Wall Assembly (8" CMU, Insul, AVB, NO INT GWB)	25,909 sf	\$46.00 /sf	\$1,191,814
PER VE-A02 - change 12" Back-up to 8"	-1.00 ls	\$45,500.00 /ls	(\$45,500)
C1010 INTERIOR PARTITIONS		\$10.75 / SF	\$4,090,472
C1011 Interior Fixed Partitions		\$10.75 / SF	\$4,090,472
Interior CMU 4.0 - 4"	6,400 sf	\$25.00 /sf	\$160,000
Interior CMU 8.0 - 8"	90,418 sf	\$28.00 /sf	\$2,531,704
Interior CMU 8.0 - 8" LOW	420 sf	\$24.00 /sf	\$10,080
Interior CMU 8.1 - 8"	6,800 sf	\$28.00 /sf	\$190,400
Interior CMU 8.2 - 8" (2hr RATED)	24,572 sf	\$35.00 /sf	\$860,020
Interior CMU 12.0 - 12"	3,074 sf	\$42.00 /sf	\$129,108
Interior CMU 12.1 - 12"	4,240 sf	\$42.00 /sf	\$178,080
Interior CMU 12.2 - 12"	740 sf	\$42.00 /sf	\$31,080
C2010 WALL FINISHES		\$0.00 / SF	\$0
C2015 Stone Facing		\$0.00 / SF	\$0
Interior Stone - Travertine, not show on drawings EXCLUDED	0.00 sf		\$0
09 FINISHES		\$0.18 / SF	\$69,200
C2010 WALL FINISHES		\$0.18 / SF	\$69,200
C2014 Tile & Terrazzo Wall Finishes		\$0.18 / SF	\$69,200
2" Granite Veneer Panels	400 sf.	\$173.00 /sf.	\$69,200
TOTAL 04A MASONRY		\$22.56 / SF	\$8,583,796

05A STRUCTURAL STEEL

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$46.63 / SF	\$17,744,765
05 METALS		\$46.63 / SF	\$17,744,765
B1010 FLOOR CONSTRUCTION		\$30.64 / SF	\$11,661,448
B1011 Floor Structural Frame		\$30.64 / SF	\$11,661,448
Structural Steel Beams - HSS	50 ton	\$5,300.00 /ton	\$263,198
Structural Steel Beams - MC	459 lb	\$10.00 /lb	\$4,590
Structural Steel Beams - WF	1,260 ton	\$5,200.00 /ton	\$6,552,000
Structural Steel Connections	243 ton	\$5,300.00 /ton	\$1,288,165
Structural Steel Bracing Bays - HSS	107 ton	\$5,300.00 /ton	\$565,245
Temp Stairs / Scaffolding Stairs - 5 sets	1.00 ls	\$200,000.00 /ls	\$200,000
Structural Steel Columns - HSS - Square / Rectangular	283 ton..	\$5,300.00 /ton..	\$1,502,126
Metal Decking - Floor, 2"	244,976 sf	\$5.25 /sf	\$1,286,124
B1020 ROOF CONSTRUCTION		\$15.98 / SF	\$6,083,317
B1021 Roof Structural Frame		\$15.98 / SF	\$6,083,317
Structural Steel Connections	140 ton	\$5,300.00 /ton	\$744,067
Structural Steel Beams - HSS	1,691 lb	\$4.00 /lb	\$6,764
Structural Steel Beams - MC	261 lb	\$4.00 /lb	\$1,044
Structural Steel Beams - WF	446 ton	\$5,200.00 /ton	\$2,320,916
Structural Steel Bracing Bays - HSS	62 ton	\$5,300.00 /ton	\$326,533
Structural Steel Columns - HSS - Round	26 ton..	\$5,300.00 /ton..	\$138,012
Structural Steel Columns - HSS - Square / Rectangular	164 ton..	\$5,300.00 /ton..	\$867,663
Steel Dunnage - Galvanized	43 ton	\$5,700.00 /ton	\$244,530
Steel Joist - DLH	115 ton.	\$5,100.00 /ton.	\$585,429
Metal Decking - Roof Cornice, 1"	5,915 sf	\$5.00 /sf	\$29,575
Metal Decking - Roof, 1-1/2"	291 sf	\$6.00 /sf	\$1,746
Metal Decking - Roof, 2"	20,118 sf	\$5.30 /sf	\$106,625
Metal Decking - Roof, 3"	102,555 sf	\$5.45 /sf	\$558,925
Metal Roof Deck - Acoustic	12,624 sf	\$12.00 /sf	\$151,488
C2010 WALL FINISHES		\$0.00 / SF	\$0
C2016 Special Wall Surfacing		\$0.00 / SF	\$0
Flat Lock Metal Tile @ Lobby	0.00 nic		\$0
TOTAL 05A STRUCTURAL STEEL		\$46.63 / SF	\$17,744,765

05B MISC METALS

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$6.76 / SF	\$2,572,503
05 METALS		\$6.45 / SF	\$2,453,065
A4040 PITS & BASES		\$0.06 / SF	\$23,200
A4040 Pits & Bases		\$0.06 / SF	\$23,200
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	\$3,900.00 /ea	\$7,800
B1080 STAIRS		\$3.48 / SF	\$1,324,660
B1081 Stair Construction		\$3.32 / SF	\$1,262,000
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 location	3.00 flgt	\$130,000.00 /flgt	\$390,000
Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 1 locations	1.00 flgt	\$47,500.00 /flgt	\$47,500
Stairs - Steel Pan w/ Rails - Typical Shaft Stair, 6 locations	15 flgt	\$47,500.00 /flgt	\$712,500
Stairs - Steel Stairs / Rails @ Mezzanine	1.00 ls	\$82,000.00 /ls	\$82,000
B2017 Balcony Walls & Railings		\$0.16 / SF	\$62,660
Railing Ballasted Guardrail at High Roof	65 lf	\$160.00 /lf	\$10,400
Railing Exterior Guardrail at Rotunda Porch	195 lf	\$268.00 /lf	\$52,260
B2010 EXTERIOR WALLS		\$0.18 / SF	\$70,145
B2012 Exterior Wall Construction		\$0.18 / SF	\$70,145
Stabilizer Clips-Galv. @ Perimeter Masonry Walls	70,145 sf	\$1.00 /sf	\$70,145
C1030 INTERIOR DOORS		\$0.13 / SF	\$50,000
C1035 Interior Panel Doors		\$0.13 / SF	\$50,000
Support Steel - Interior Rolling Door/Grille Supports	1.00 ls	\$50,000.00 /ls	\$50,000
C1090 INTERIOR SPECIALTIES		\$2.59 / SF	\$985,060
C1091.4 Interior Railings & Handrails		\$1.58 / SF	\$602,450
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 - Cable Guardrail System	1.00 ls	\$35,000.00 /ls	\$35,000
Guard Rail - Interior - Glass Guardrail System	200 lf	\$525.00 /lf	\$105,000
Guard Rail - Interior - Guard Rail at Mezzanine	1,425 lf	\$150.00 /lf	\$213,750
C1099 Other Interior Specialties		\$1.01 / SF	\$382,610
Misc. Metals and Supports	382,610 gsf	\$1.00 /gsf	\$382,610
07 THERMAL & MOISTURE PROTECTION		\$0.07 / SF	\$27,000
B3010 ROOFING		\$0.07 / SF	\$27,000
B3019 Roofing Supplementary Components		\$0.07 / SF	\$27,000
Expansion Joints - 4" Bellows Joint	180 lf	\$150.00 /lf	\$27,000
11 EQUIPMENT		\$0.24 / SF	\$92,438
C1010 INTERIOR PARTITIONS		\$0.24 / SF	\$92,438
C1017 Interior Guardrails & Screens		\$0.24 / SF	\$92,438

05B MISC METALS [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Gym Flexible Stainless Steel Safety Netting By Metal Fabrications	2,370 sf	\$39.00 /sf	\$92,438
06 SITEWORK	380,570 SF	\$0.43 / SF	\$162,250
32 EXTERIOR IMPROVEMENTS		\$0.43 / SF	\$162,250
G2060 SITE DEVELOPMENT		\$0.43 / SF	\$162,250
G2059 Other Site Improvements		\$0.37 / SF	\$140,250
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
Metal Pipe Bollards - Exterior	53 ea	\$1,200.00 /ea	\$63,600
G2061.4 Site Furnishings		\$0.06 / SF	\$22,000
Perforated Metal Panel, 6' x 11 lf	11 lf	\$2,000.00 /lf	\$22,000
TOTAL 05B MISC METALS		\$7.19 / SF	\$2,734,753

06A MILLWORK & CASEWORK

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$7.94 / SF	\$3,021,184
06 WOOD, PLASTICS, & COMPOSITES		\$3.63 / SF	\$1,382,238
C1090 INTERIOR SPECIALTIES		\$0.04 / SF	\$14,026
C1097 Storage Specialties		\$0.04 / SF	\$14,026
Locker Benches	216 lf	\$65.00 /lf	\$14,026
C2010 WALL FINISHES		\$2.10 / SF	\$800,261
C2012 Wall Paneling		\$1.66 / SF	\$631,303
Wood Veneer Premium for Paneling at columns	2,304 sf	\$82.50 /sf	\$190,080
Fabric Wrapped Acoustical Wall Panels @ Auditorium	1,540 sf.	\$50.00 /sf.	\$77,000
Wood fiber Acoustical Panels	3,475 sf.	\$42.50 /sf.	\$147,688
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.	\$22.50 /sf.	\$29,063
Fiber Reinforced Panel (FRP) @ Full Height	7,354 sf.	\$22.50 /sf.	\$165,472
C2013.4 Wall Coverings		\$0.00 / SF	\$0
Interior Misc. Millwork not shown or within F&E Estimate	0.00 nic		\$0
C2019 Wall Finish Supplementary Components		\$0.44 / SF	\$168,958
Interior Window Sills @ Exterior - Solid Surface	3,379 lf	\$50.00 /lf	\$168,958
E2010 FIXED FURNISHINGS		\$1.49 / SF	\$567,951
E2013 Casework		\$1.49 / SF	\$567,951
Countertop-Casework, Epoxy	1,138 lf	\$118.00 /lf	\$134,333
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	\$0
Custom Millwork - Wood Cubbie - 4' high	24 ea	\$745.00 /ea	\$17,880
09 FINISHES		\$0.66 / SF	\$251,082
C2010 WALL FINISHES		\$0.66 / SF	\$251,082
C2018 Acoustical Wall Treatment		\$0.66 / SF	\$251,082
Fabric Wrapped Acoustical Panels @ Auditorium	696 sf.	\$63.00 /sf.	\$43,830
Wood Fiber Acoustical Panels @ Gymnasium	3,290 sf.	\$63.00 /sf.	\$207,252
10 SPECIALTIES		\$0.00 / SF	\$0
C1090 INTERIOR SPECIALTIES		\$0.00 / SF	\$0

06A MILLWORK & CASEWORK [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
C1097 Storage Specialties		\$0.00 / SF	\$0
Storage Wall Shelving - Metal (In F&E Estimate)	768 lf	\$0.00 /lf	\$0
12 FURNISHINGS		\$3.65 / SF	\$1,387,864
E2010 FIXED FURNISHINGS		\$3.65 / SF	\$1,387,864
E2013 Casework		\$3.65 / SF	\$1,387,864
Casework - Base Cabinets	754 lf	\$320.00 /lf	\$241,146
Casework - Base Cabinets - Design Visual Flat File	14 lf	\$495.00 /lf	\$6,707
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	\$595.00 /lf	\$228,721
Casework - Cabinet - Cubbies (2'-3"x2'8")	5.00 ea	\$495.00 /ea	\$2,475
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	\$555.00 /lf	\$24,690
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
TOTAL 06A MILLWORK & CASEWORK		\$7.94 / SF	\$3,021,184

07A ROOFING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$13.75 / SF	\$5,231,308
07 THERMAL & MOISTURE PROTECTION		\$13.75 / SF	\$5,231,308
B3010 ROOFING		\$13.40 / SF	\$5,099,005
B3012 Low Slope Membrane Systems		\$12.98 / SF	\$4,938,920
Green Roof System - Planter / Plantings	0.00 excl		\$0
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" Insul.	67,401 sf	\$30.00 /sf	\$2,022,030
Roof Protection Board - removed from add alternate list and added back into base design	120,000 sf	\$2.70 /sf	\$324,000
Roof System Type B- TPO Membrane, 1/2" Cover Board, 6-1/2" Tapered Insul.	67,660 sf	\$30.00 /sf	\$2,029,800
Temporary Roof - HOLD	1.00 ls	\$100,000.00 /ls	\$100,000
Rubber Paver Roof System over Membrane Roof	2,365 sf	\$55.00 /sf	\$130,075
Premium for Tapered Cricket Areas	18,403 sf	\$5.00 /sf	\$92,015
B3014.2 Flashings & Trim		\$0.41 / SF	\$155,085
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	5,363 lf	\$20.00 /lf	\$107,260
B3019 Roofing Supplementary Components		\$0.01 / SF	\$5,000
Elevator Roof Vent	2.00 ea	\$2,500.00 /ea	\$5,000
B3020 ROOF APPURTENANCES		\$0.35 / SF	\$132,303
B3020 Roof Appurtenances		\$0.35 / SF	\$132,303
Roofing Walkway Pads	12,565 sf	\$10.53 /sf	\$132,303
TOTAL 07A ROOFING		\$13.75 / SF	\$5,231,308

07X [WATERPROOFING]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$1.15 / SF	\$436,465
07 THERMAL & MOISTURE PROTECTION		\$1.15 / SF	\$436,465
A2020 BASEMENT WALL CONSTRUCTION		\$1.15 / SF	\$436,465
A2022 Moisture Protection		\$1.15 / SF	\$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
05 MAINTENANCE BLDG	380,570 SF	\$0.06 / SF	\$21,200
07 THERMAL & MOISTURE PROTECTION		\$0.06 / SF	\$21,200
A2020 BASEMENT WALL CONSTRUCTION		\$0.03 / SF	\$10,800
A2022 Moisture Protection		\$0.03 / SF	\$10,800
Damproofing - Foundation Walls	1,800 sf	\$6.00 /sf	\$10,800
A4010 STANDARD SLABS-ON-GRADE		\$0.03 / SF	\$10,400
A4010 Standard Slabs-on-Grade		\$0.03 / SF	\$10,400
Waterproof SOG - Vapor Barrier	10,400 sf	\$1.00 /sf	\$10,400
TOTAL 07X [WATERPROOFING]		\$1.20 / SF	\$457,665

07X FIREPROOFING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$3.71 / SF	\$1,413,681
07 THERMAL & MOISTURE PROTECTION		\$3.71 / SF	\$1,413,681
B1010 FLOOR CONSTRUCTION		\$2.36 / SF	\$898,421
B1019 Floor Construction Supplementary Components		\$2.36 / SF	\$898,421
Applied Fireproofing Complete \$/sf	244,976 sf	\$3.30 /sf	\$808,421
Intumescent Fireproofing @ exposed framing / bracing	1.00 ls	\$40,000.00 /ls	\$40,000
Misc. Patching of Fireproofing	1.00 ls	\$50,000.00 /ls	\$50,000
B1020 ROOF CONSTRUCTION		\$1.35 / SF	\$515,261
B1029 Roof Construction Supplementary Components		\$1.35 / SF	\$515,261
Applied Fireproofing Complete \$/sf	141,503 sf	\$3.50 /sf	\$495,261
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
TOTAL 07X FIREPROOFING		\$3.71 / SF	\$1,413,681

07X METAL PANELS

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$15.52 / SF	\$5,908,307
07 THERMAL & MOISTURE PROTECTION		\$15.13 / SF	\$5,759,900
B2010 EXTERIOR WALLS		\$14.23 / SF	\$5,416,282
B2011 Exterior Wall Veneer		\$13.75 / SF	\$5,233,398
Metal Panel Insulated Metal Panels w/ 4" LGMF Backup	14,913 sf	\$90.00 /sf	\$1,342,170
Metal Panel Flat-Lock Metal Tiles over 9/16" Galvanized Utility Deck	5,386 sf	\$145.00 /sf	\$780,970
Metal Panel Corrugated Insulated Metal Panels on Aluminum Clip System	4,978 sf	\$76.00 /sf	\$378,328
ACM ACM Cornice - Tapered Roof Edge, Low Roofs (~6-8' Surface Area)	1,932 lf	\$1,015.00 /lf	\$1,960,980
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 - South Elevation	150 lf	\$580.00 /lf	\$87,000
ACM ACM Column Wraps/Fin Projections at Rotunda - 27' Tall	515 lf	\$435.00 /lf	\$224,025
ACM ACM Decorative Accent Bandings	525 lf	\$145.00 /lf	\$76,125
B2018 Exterior Wall Supplementary Components		\$0.48 / SF	\$182,884
Sheet Metal Flashing & Trim Complete \$/sf	152,403 sfwa	\$1.20 /sfwa	\$182,884
B3080 OVERHEAD EXTERIOR ENCLOSURES		\$0.55 / SF	\$208,978
B3081 Exterior Ceilings		\$0.55 / SF	\$208,978
Soffits - ACM	1,771 sf	\$118.00 /sf	\$208,978
C2010 WALL FINISHES		\$0.35 / SF	\$134,640
C2012 Wall Paneling		\$0.35 / SF	\$134,640
Phenolic Resin Wall Panels - Interior	1,530 sf.	\$88.00 /sf.	\$134,640
08 OPENINGS		\$0.27 / SF	\$104,000
B2010 EXTERIOR WALLS		\$0.00 / SF	\$0
B2011 Exterior Wall Veneer		\$0.00 / SF	\$0
Screen Wall RTU Screen @ mech. equip. - none shown, excluded	0.00 excl		\$0
B2070 EXTERIOR LOUVERS & VENTS		\$0.27 / SF	\$104,000
B2071 Exterior Louvers		\$0.27 / SF	\$104,000
Louver Exterior Louvers	1,040 sf	\$100.00 /sf	\$104,000
09 FINISHES		\$0.12 / SF	\$44,408
C2030 FLOORING		\$0.12 / SF	\$44,408
C2032.8 Wall Base Finishes		\$0.12 / SF	\$44,408
Decorative Fabric Metal Panel - Interior	493 sf	\$90.00 /sf	\$44,408
Flat Lock Metal Tiles - Interior - PER VE A04 - CHANGE TO TILE (1,366 SQFT)	0.00 sf		\$0
TOTAL 07X METAL PANELS		\$15.52 / SF	\$5,908,307

07X WATERPROOFING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.74 / SF	\$281,622
07 THERMAL & MOISTURE PROTECTION		\$0.74 / SF	\$281,622
B2010 EXTERIOR WALLS		\$0.00 / SF	\$0
B2012 Exterior Wall Construction		\$0.00 / SF	\$0
Exterior Air and Vapor Barrier System (AVB) - Total enclosure SF	130,946 sfwa	\$0.00 /sfwa	\$0
C1030 INTERIOR DOORS		\$0.74 / SF	\$281,622
C1039 Interior Door Supplementary Components		\$0.74 / SF	\$281,622
Misc. Interior Caulking - General	380,570 sf	\$0.74 /sf	\$281,622
TOTAL 07X WATERPROOFING		\$0.74 / SF	\$281,622

08A DOORS/FRAMES/HARDWARE

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$3.03 / SF	\$1,154,365
08 OPENINGS		\$3.03 / SF	\$1,154,365
B2050 EXTERIOR DOORS & GRILLES		\$0.10 / SF	\$38,500
B2051 Exterior Entrance Doors		\$0.10 / SF	\$38,500
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
C1030 INTERIOR DOORS		\$2.93 / SF	\$1,115,865
C1031.4 Standard Interior Doors		\$2.93 / SF	\$1,115,865
Door type F	568 ea	\$385.00 /ea	\$218,680
Door type FW1- 24" x 31" Vision Panel	10 ea	\$470.00 /ea	\$4,700
Door type FW2- 12" x 12" Vision Panel	1.00 ea	\$450.00 /ea	\$450
Door type W1- 24" x 5'-4" Vision Panel	1.00 ea	\$510.00 /ea	\$510
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
Hardware Interior Door Hardware Per Leaf	645 leaf	\$600.00 /leaf	\$387,000
Install doors and hardware	2,850 hr	\$110.00 /hr	\$313,500
TOTAL 08A DOORS/FRAMES/HARDWARE		\$3.03 / SF	\$1,154,365

08X [OVERHEAD DOORS

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$2.89 / SF	\$1,099,031
08 OPENINGS		\$2.89 / SF	\$1,099,031
B2050 EXTERIOR DOORS & GRILLES		\$0.61 / SF	\$233,431
B2053.4 Overhead & Roll Up Doors		\$0.61 / SF	\$233,431
Door Insulated Overhead Coiling Door, Motor Operated, 1 each	115 sf	\$55.00 /sf	\$6,325
Door Motor Operated Overhead Door w/ Insulating Glass - Typ., 13 ea	2,442 sf	\$93.00 /sf	\$227,106
C1030 INTERIOR DOORS		\$2.27 / SF	\$865,600
C1031.4 Standard Interior Doors		\$0.07 / SF	\$26,975
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 RG- Overhead Rolling Security Grille 6'x 10'- 4 each	240 sf	\$100.00 /sf	\$24,000
C1035 Interior Panel Doors		\$2.20 / SF	\$838,625
Overhead Coiling Doors - Stainless Steel Counter Door	1.00 ea	\$5,000.00 /ea	\$5,000
Overhead Coiling Doors - Standard	4.00 ea	\$15,000.00 /ea	\$60,000
Overhead Rolling Partition / Doors - 2 hr Fire Rated, 13 ea, various sizes	1,265 sf	\$375.00 /sf	\$474,375
Overhead Rolling Partition / Doors - 2 hr Fire Rated, curved, ~42' x 15' (1 ea main lobby)	630 sf	\$475.00 /sf	\$299,250
TOTAL 08X [OVERHEAD DOORS		\$2.89 / SF	\$1,099,031

08X INTERIORGLASS & GLAZING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$2.79 / SF	\$1,060,030
08 OPENINGS		\$2.79 / SF	\$1,060,030
C1010 INTERIOR PARTITIONS		\$2.15 / SF	\$818,830
C1016 Glazed Partitions & Storefronts		\$2.15 / SF	\$818,830
Borrowed lights- BL1-BL5	1,095 sf	\$55.00 /sf	\$60,225
CW Interior	2,100 sf	\$140.00 /sf	\$294,000
CW Interior - Fire Rated	1,772 sf	\$245.00 /sf	\$434,140
Art Glass Panels @ Cafeteria (PREMIUM)	219 sf	\$25.00 /sf	\$5,465
Glazing - Interior Ballistic	1.00 allw	\$25,000.00 /allw	\$25,000
C1020 INTERIOR WINDOWS		\$0.01 / SF	\$1,950
C1020 Interior Windows		\$0.01 / SF	\$1,950
Transaction Window - Interior	1.00 ea	\$1,950.00 /ea	\$1,950
C1030 INTERIOR DOORS		\$0.63 / SF	\$239,250
C1031.4 Standard Interior Doors		\$0.63 / SF	\$239,250
Glazing Interior doors and sidelights	4,350 sf	\$55.00 /sf	\$239,250
TOTAL 08X INTERIORGLASS & GLAZING		\$2.79 / SF	\$1,060,030

08X WINDOWS/ STOREFRONT / CURTAINWALL

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$18.45 / SF	\$7,020,403
07 THERMAL & MOISTURE PROTECTION		\$0.25 / SF	\$94,281
B2010 EXTERIOR WALLS		\$0.25 / SF	\$94,281
B2012 Exterior Wall Construction		\$0.25 / SF	\$94,281
Caulking and Sealants, Exterior - Total enclosure SF	130,946 sfwa	\$0.72 /sfwa	\$94,281
08 OPENINGS		\$18.20 / SF	\$6,926,122
B2020 EXTERIOR WINDOWS		\$16.25 / SF	\$6,184,672
B2022 Exterior Fixed Windows		\$1.17 / SF	\$446,340
Window Insulated Translucent Wall Panel System w/ Integral Louvers	2,595 sf	\$172.00 /sf	\$446,340
B2023 Exterior Window Wall Storefronts		\$4.68 / SF	\$1,782,360
Exterior Windows Insulating Glass in Aluminum System	10,209 sf	\$120.00 /sf	\$1,225,080
Storefront Insulating Glass in Aluminum Storefront System	4,644 sf	\$120.00 /sf	\$557,280
Premium for Operable Vents at Storefront/Windows/Translucent Panels	0.00 ea		\$0
B2029 Curtain Walls		\$10.39 / SF	\$3,955,972
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 6" System	60 sf	\$145.00 /sf	\$8,700
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 7" System	18,098 sf	\$148.00 /sf	\$2,678,504
Curtain Wall Insulating Glass in Aluminum Curtain Wall System - 7" System - Radiused	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 - 10" System	2,088 sf	\$160.00 /sf	\$334,080
B2050 EXTERIOR DOORS & GRILLES		\$0.65 / SF	\$246,400
B2051 Exterior Entrance Doors		\$0.65 / SF	\$246,400
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
C1010 INTERIOR PARTITIONS		\$1.23 / SF	\$468,650
C1016 Glazed Partitions & Storefronts		\$1.23 / SF	\$468,650
Storefront - Interior	4,550 sf	\$103.00 /sf	\$468,650
C1030 INTERIOR DOORS		\$0.07 / SF	\$26,400
C1031.4 Standard Interior Doors		\$0.07 / SF	\$26,400
Door type AL2- 24" x 2'-9" & 23" x 24" Vision Panel	33 ea	\$800.00 /ea	\$26,400
TOTAL 08X WINDOWS/ STOREFRONT / CURTAINWALL		\$18.45 / SF	\$7,020,403

09A FRAMING & DRYWALL

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$36.36 / SF	\$13,837,588
06 WOOD, PLASTICS, & COMPOSITES		\$3.85 / SF	\$1,464,094
B1010 FLOOR CONSTRUCTION		\$0.18 / SF	\$68,080
B1014 Mezzanine Floor Construction		\$0.18 / SF	\$68,080
Wood Decking - 3/4" @ Mezzanine Complete \$/s	1,702 sf	\$40.00 /sf	\$68,080
B1020 ROOF CONSTRUCTION		\$0.35 / SF	\$133,850
B1029 Roof Construction Supplementary Components		\$0.35 / SF	\$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 / SF	\$10,700
B2012 Exterior Wall Construction		\$0.03 / SF	\$10,700
Blocking @ Exterior Wall Mounted Railing \$/lf	355 lf	\$10.00 /lf	\$3,550
Blocking @ Exterior Louver \$/lf	715 lf	\$10.00 /lf	\$7,150
B2020 EXTERIOR WINDOWS		\$0.21 / SF	\$81,750
B2021 Exterior Operating Windows		\$0.21 / SF	\$81,750
Blocking @ Window Perimeter \$/lf	5,450 lf	\$15.00 /lf	\$81,750
C1010 INTERIOR PARTITIONS		\$1.00 / SF	\$380,570
C1011 Interior Fixed Partitions		\$1.00 / SF	\$380,570
Interior Rough Carpentry	380,570 sf	\$1.00 /sf	\$380,570
C1090 INTERIOR SPECIALTIES		\$2.07 / SF	\$789,144
C1099 Other Interior Specialties		\$2.07 / SF	\$789,144
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	\$1.90 /sf	\$746,700
07 THERMAL & MOISTURE PROTECTION		\$0.80 / SF	\$305,950
B2010 EXTERIOR WALLS		\$0.70 / SF	\$264,790
B2013 Exterior Wall Interior Skin		\$0.70 / SF	\$264,790
2" Closed Cell Spray Foam Insulation	43,905 sf	\$5.50 /sf	\$241,478
6" Closed Cell Spray Foam Insulation	2,914 sf	\$8.00 /sf	\$23,312
B3080 OVERHEAD EXTERIOR ENCLOSURES		\$0.11 / SF	\$41,160
B3081 Exterior Ceilings		\$0.11 / SF	\$41,160
Soffits - Exterior Rated Gyp	1,715 sf	\$24.00 /sf	\$41,160
09 FINISHES		\$31.71 / SF	\$12,067,545
B2010 EXTERIOR WALLS		\$5.92 / SF	\$2,254,429
B2012 Exterior Wall Construction		\$5.92 / SF	\$2,254,429
Exterior Wall Backup GWB Stud Wall - 6" MS, AVB, Dens Glass, 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 Glass, Insul.	11,323 sf	\$28.00 /sf	\$317,044

09A FRAMING & DRYWALL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 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
C1010 INTERIOR PARTITIONS		\$19.69 / SF	\$7,492,832
C1011 Interior Fixed Partitions		\$19.69 / SF	\$7,492,832
Wall Type (F1.0) GWB on 7/8" Metal Furring	798 sf	\$10.00 /sf	\$7,980
Wall Type (F2.0) GWB on 1-5/8" Metal Stud	2,812 sf	\$10.00 /sf	\$28,120
Wall Type (F4.0) 3-5/8" MS, 1lyr 5/8" GWB OS	19,878 sf	\$10.00 /sf	\$198,780
Wall Type (F6) 6" MS, 1lyr 5/8" GWB OS	39,384 sf	\$20.00 /sf	\$787,680
Wall Type (F6.0A) 6" MS, 2lyrs 5/8" GWB OS	45,742 sf	\$20.00 /sf	\$914,840
Wall Type (F4.0A) 3-5/8" MS, 2lyrs 5/8" GWB OS	13,454 sf	\$21.00 /sf	\$282,534
Wall Type (G4.0) 3-5/8" MS, 1lyr 5/8" GWB ES, 3-1/2" Acoustic Batt	180 sf	\$18.50 /sf	\$3,330
Wall Type (G6.0) - LOW - 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	2,658 sf	\$20.00 /sf	\$53,160
Wall Type (G6.0) 6" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	58,789 sf	\$20.00 /sf	\$1,175,780
Wall Type (G6.0A) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	58,032 sf	\$21.00 /sf	\$1,218,672
Wall Type (G6.0B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	59,764 sf	\$21.50 /sf	\$1,284,926
Wall Type (G6.0C) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	1,064 sf	\$21.50 /sf	\$22,876
Wall Type (G6.1) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	784 sf	\$21.50 /sf	\$16,856
Wall Type (G6.1B) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt	3,254 sf	\$21.50 /sf	\$69,961
Wall Type (G6.2) 6" MS, 2lyrs 5/8" GWB ES, 5" Acoustic Batt, 2hr RATED	21,105 sf	\$25.00 /sf	\$527,625
Wall Type (G8.0) 8" MS, 1lyr 5/8" GWB ES, 5" Acoustic Batt	480 sf	\$20.00 /sf	\$9,600
Wall Type (S4.2) 1" Liner, 4" MS, 4" Acoustic, 1lyrs 5/8" GWB, 1hr RATED	968 sf	\$24.00 /sf	\$23,232
Wall Type (S6.1) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB, 2hr RATED	1,280 sf	\$24.00 /sf	\$30,720
Wall Type (S6.2) 1" Liner, 6" MS, 5-1/2" Acoustic, 2lyrs 5/8" GWB, 2hr RATED	34,840 sf	\$24.00 /sf	\$836,160
Partition - Premium Abuse Resistant Drywall	0.00 lf		\$0
C2050 CEILING FINISHES		\$6.10 / SF	\$2,320,284
C2051 Plaster & Gypsum Board Finish		\$6.10 / SF	\$2,320,284
Ceiling - GWB Soffit - Interior	7,116 sf	\$18.00 /sf	\$128,092
GWB GWB Ceiling, Moisture Resistant GWB Ceiling	6,172 sf	\$25.00 /sf	\$154,300
GWB GWB Ceiling, Typical	45,983 sf	\$20.00 /sf	\$919,660
Ceiling - GWB Soffit - Interior @ Curved Media Center	426 sf	\$25.00 /sf	\$10,658
Ceiling - GWB SOUND ISOLATION	54,028 sf	\$20.50 /sf	\$1,107,574
Ceiling - GWB SOUND ISOLATION - VE A03 - Change Spec to open up more than Kinetics	0.00 incl		\$0
TOTAL 09A FRAMING & DRYWALL		\$36.36 / SF	\$13,837,588

09X [ACOUSTICAL CEILINGS]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$5.67 / SF	\$2,156,825
07 THERMAL & MOISTURE PROTECTION		\$0.30 / SF	\$112,690
B3080 OVERHEAD EXTERIOR ENCLOSURES		\$0.30 / SF	\$112,690
B3081 Exterior Ceilings		\$0.30 / SF	\$112,690
Soffits - Linear Metal Ceilings	955 sf	\$118.00 /sf	\$112,690
09 FINISHES		\$5.37 / SF	\$2,044,135
C2050 CEILING FINISHES		\$5.37 / SF	\$2,044,135
C2054 Acoustical Ceiling Tiles & Panels		\$5.37 / SF	\$2,044,135
ACT-1 Acoustical Ceiling Tiles - 2 X 2 HIGH NRC ACOUSTICAL CEILING TILE	164,031 sf	\$7.25 /sf	\$1,189,225
ACT-2 Acoustical Ceiling Tiles - 2 X 2 WASHABLE ACOUSTICAL CEILING TILE FOR KITCHEN LOCATIONS	6,499 sf	\$8.50 /sf	\$55,242
ACT-4 Acoustical Ceiling Tiles - 2 X 6 HIGH NRC TEGULAR ACOUSTICAL CEILING TILE	4,701 sf	\$11.50 /sf	\$54,062
ACT-5	4,017 sf	\$12.00 /sf	\$48,204
ACT-3 Acoustical Ceiling Tiles - 2 X 2 HIGH NRC TEGULAR ACOUSTICAL CEILING TILE AT ADMIN AREAS	12,519 sf	\$6.75 /sf	\$84,503
Interior Ceiling Linear Metal Ceiling W/ Woodlook, 4" Wide Plank	10,523 sf	\$50.00 /sf	\$526,150
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	0.00 incl		\$0
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	0.00 incl		\$0
TOTAL 09X [ACOUSTICAL CEILINGS]		\$5.67 / SF	\$2,156,825

09X [CERAMIC TILE]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$3.88 / SF	\$1,476,776
09 FINISHES		\$3.88 / SF	\$1,476,776
C2010 WALL FINISHES		\$2.31 / SF	\$877,738
C2014 Tile & Terrazzo Wall Finishes		\$2.31 / SF	\$877,738
Ceramic Wall Tile	17,577 sf	\$20.00 /sf	\$351,533
Porcelain Wall Tile	1,445 sf.	\$24.00 /sf.	\$34,685
Thin Porcelain Wall Tile	20,480 sf.	\$24.00 /sf.	\$491,520
C2030 FLOORING		\$1.57 / SF	\$599,038
C2032.2 Tile Flooring		\$1.45 / SF	\$553,592
CMT-1 - Ceramic Floor Tile - Mosaic	1,687 sf	\$24.00 /sf	\$40,488
CMT-2 - Ceramic Floor Tile - Mosaic	328 sf	\$24.00 /sf	\$7,872
CMT-3 - Ceramic Floor Tile - Mosaic	309 sf	\$24.00 /sf	\$7,416
CMT-4 - Ceramic Floor Tile - Mosaic	895 sf	\$24.00 /sf	\$21,480
CMT-5 - Ceramic Floor Tile - Mosaic	499 sf	\$24.00 /sf	\$11,976
CMT-7 - Ceramic Floor Tile - Mosaic	416 sf	\$24.00 /sf	\$9,984
CMT-8 - Ceramic Floor Tile - Mosaic	464 sf	\$24.00 /sf	\$11,136
Porcelain Tile Floor	15,830 sf	\$28.00 /sf	\$443,240
C2032.8 Wall Base Finishes		\$0.10 / SF	\$38,646
Ceramic Tile Base	2,034 lf	\$19.00 /lf	\$38,646
C2036.4 Masonry & Stone Flooring		\$0.02 / SF	\$6,800
Stone Thresholds at wet rooms	68 sf	\$100.00 /sf	\$6,800
TOTAL 09X [CERAMIC TILE]		\$3.88 / SF	\$1,476,776

09X [FLOORING - EPOXY]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.45 / SF	\$170,031
09 FINISHES		\$0.45 / SF	\$170,031
C2030 FLOORING		\$0.45 / SF	\$170,031
C2035 Resilient Flooring		\$0.45 / SF	\$170,031
Epoxy Flooring EF-1	10,061 sf	\$16.90 /sf	\$170,031
TOTAL 09X [FLOORING - EPOXY]		\$0.45 / SF	\$170,031

09X [FLOORING - VCT, CARPET, RESILIENT]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$5.75 / SF	\$2,188,118
09 FINISHES		\$5.75 / SF	\$2,188,118
C2030 FLOORING		\$5.75 / SF	\$2,188,118
C2031 Flooring Treatment		\$0.28 / SF	\$105,000
Floor Patching Allowance	1.00 allw	\$85,000.00 /allw	\$85,000
Floor Prep / Leveling Allowance	1.00 allw	\$20,000.00 /allw	\$20,000
C2032.6 Carpeting		\$0.38 / SF	\$144,589
Carpet - 1	5,768 sf	\$6.50 /sf	\$37,492
Carpet - 2	8,090 sf	\$6.50 /sf	\$52,585
Carpet - Walk Off Carpet	2,428 sf	\$12.00 /sf	\$29,136
Resilient Carpet Multiple Design Combinations	890 sf	\$10.00 /sf	\$8,900
Resilient Carpet RC-1	2,221 sf	\$6.00 /sf	\$13,326
Resilient Carpet RC-2	525 sf	\$6.00 /sf	\$3,150
C2032.8 Wall Base Finishes		\$0.31 / SF	\$116,714
Epoxy Base	106 lf	\$14.00 /lf	\$1,484
Rubber Base	38,410 lf	\$3.00 /lf	\$115,230
C2033 Specialty Flooring		\$0.12 / SF	\$46,350
Foot Grille Carpet	927 sf	\$50.00 /sf	\$46,350
C2035 Resilient Flooring		\$4.55 / SF	\$1,731,482
ASF - Rubber Athletic Sports Flooring	2,589 sf	\$20.00 /sf	\$51,780
Linoleum LIN1	64,243 sf	\$8.40 /sf	\$539,641
Linoleum LIN11	14 sf	\$8.50 /sf	\$119
Linoleum LIN13	14 sf	\$8.50 /sf	\$119
Linoleum LIN14	133 sf	\$8.50 /sf	\$1,131
Linoleum LIN2	374 sf	\$8.40 /sf	\$3,142
Linoleum LIN3	279 sf	\$8.50 /sf	\$2,372
Linoleum LIN4	16,062 sf	\$8.50 /sf	\$136,527
Linoleum LIN5	7.00 sf	\$8.50 /sf	\$60
Linoleum LIN6	107 sf	\$8.50 /sf	\$910
Linoleum LIN7	13 sf	\$8.50 /sf	\$111
Linoleum Multiple Design Combinations	43,589 sf	\$10.00 /sf	\$435,890
Sheet Vinyl - Multipurpose	10,028 sf	\$13.00 /sf	\$130,364
Sheet Vinyl - Slip Resistant	619 sf	\$12.00 /sf	\$7,428
Luxury Viyl Tile LVT	2,354 sf	\$6.50 /sf	\$15,301
Sheet Vinyl Flooring - SV1	1,258 sf	\$10.75 /sf	\$13,524
Sheet Vinyl Flooring Multiple Design Combinations	9,999 sf	\$15.00 /sf	\$149,985
Rubber Flooring at Stair Treads and Risers - RR - INCLUDED ABOVE	0.00 sf		\$0
Rubber Stair Treads & Risers	8,637 sf	\$28.00 /sf	\$241,836
Rubber Tile Flooring - RT	83 sf	\$15.00 /sf	\$1,245
C2036.2 Terrazzo Flooring		\$0.07 / SF	\$27,020
Precast Terrazzo risers & treads	386 sf	\$70.00 /sf	\$27,020
C2037 Fluid-Applied Flooring		\$0.04 / SF	\$16,964

09X [FLOORING - VCT, CARPET, RESILIENT] [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Moisture Mitigation @ Tile	6,705 sf	\$2.53 /sf	\$16,964
TOTAL 09X [FLOORING - VCT, CARPET, RESILIENT]		\$5.75 / SF	\$2,188,118

09X [FLOORING - WOOD ATHLETIC]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.63 / SF	\$240,240
09 FINISHES		\$0.63 / SF	\$240,240
C2030 FLOORING		\$0.63 / SF	\$240,240
C2032.4 Wood Flooring		\$0.63 / SF	\$240,240
Wood Flooring - Premium for Markings on Athletic Wood Floor	10,010 sf	\$2.00 /sf	\$20,020
Athletic Sports Wood Flooring - Gym	10,010 sf	\$22.00 /sf	\$220,220
TOTAL 09X [FLOORING - WOOD ATHLETIC]		\$0.63 / SF	\$240,240

09X [PAINTING & WALLCOVERING]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$4.67 / SF	\$1,778,612
07 THERMAL & MOISTURE PROTECTION		\$0.14 / SF	\$54,028
C2050 CEILING FINISHES		\$0.14 / SF	\$54,028
C2059 Ceiling Finish Supplementary Components		\$0.14 / SF	\$54,028
Paint Sound Barrier Painted GWB Ceiling - CEILING OCCURRING BETWEEN STEEL GIRDERS	54,028 sf	\$1.00 /sf	\$54,028
09 FINISHES		\$4.53 / SF	\$1,724,584
B2010 EXTERIOR WALLS		\$0.17 / SF	\$64,800
B2011 Exterior Wall Veneer		\$0.17 / SF	\$64,800
Exterior Enclosure Painting, Staining & Transparent Finishing	720 mhr	\$90.00 /mhr	\$64,800
C1030 INTERIOR DOORS		\$0.22 / SF	\$81,975
C1031.4 Standard Interior Doors		\$0.22 / SF	\$81,975
Paint Interior - Door & Frames	1,093 ea	\$75.00 /ea	\$81,975
C2010 WALL FINISHES		\$3.00 / SF	\$1,141,756
C2013.4 Wall Coverings		\$0.23 / SF	\$89,323
Vinyl Wall Covering (Auditorium - IWP)	1,985 sf.	\$45.00 /sf.	\$89,323
C2017 Wall Painting & Coating		\$2.77 / SF	\$1,052,433
Paint Interior GWB Walls	220,299 sf.	\$0.95 /sf.	\$209,284
Paint Interior GWB Walls - Soffits	1,732 sf.	\$0.95 /sf.	\$1,645
Paint Interior GWB Walls - Soffits - not shown	1.00 allw	\$5,000.00 /allw	\$5,000
Paint Interior Walls - Epoxy	234,495 sf.	\$3.25 /sf.	\$762,107
Paint Interior CMU Walls	7,507 sf	\$3.25 /sf	\$24,397
Misc. Interior Painting	1.00 allw	\$50,000.00 /allw	\$50,000
C2030 FLOORING		\$0.37 / SF	\$139,938
C2036.4 Masonry & Stone Flooring		\$0.27 / SF	\$102,438
Sealed Concrete	68,292 sf	\$1.50 /sf	\$102,438
C2037 Fluid-Applied Flooring		\$0.10 / SF	\$37,500
Paint Interior Metal Pan Stairs	25 flgt	\$1,500.00 /flgt	\$37,500
C2050 CEILING FINISHES		\$0.78 / SF	\$296,115
C2056 Painting & Staining Ceilings		\$0.78 / SF	\$296,115
Paint Painted Interior GWB - Moisture Resistant GWB Ceiling	6,172 sf	\$1.00 /sf	\$6,172
Paint Painted Interior GWB - Soffits - Latex	45,983 sf	\$1.00 /sf	\$45,983
Paint Painted Interior GWB - Typical Ceilings - Latex	7,116 sf	\$1.00 /sf	\$7,116
Paint Exposed Painted Structural Steel & Metal Deck	98,685 sf	\$2.40 /sf	\$236,844
TOTAL 09X [PAINTING & WALLCOVERING]		\$4.67 / SF	\$1,778,612

10A SPECIALTIES

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$2.04 / SF	\$776,212
06 WOOD, PLASTICS, & COMPOSITES		\$0.35 / SF	\$132,000
C2010 WALL FINISHES		\$0.35 / SF	\$132,000
C2016 Special Wall Surfacing		\$0.35 / SF	\$132,000
Flexible Stainless Steel Safety Netting	2,400 sf	\$55.00 /sf	\$132,000
10 SPECIALTIES		\$1.69 / SF	\$644,212
C1090 INTERIOR SPECIALTIES		\$1.69 / SF	\$644,212
C1092.2 Compartments & Cubicles		\$0.18 / SF	\$67,211
Cubicles Cubicle Curtains and Track at Nurse's Area.	1.00 ls	\$7,000.00 /ls	\$7,000
Toilet Compartment - Plastic Laminate - Standard	23 stall	\$1,200.00 /stall	\$27,600
Toilet Compartment - Plastic Laminate - Handicapped	12 stall	\$1,500.00 /stall	\$18,000
Urinal Screen - Plastic Laminate	10 ea	\$425.00 /ea	\$4,250
Wire Mesh Partition (assume 8' high) - Interior	1,151 sf	\$9.00 /sf	\$10,361
C1092.4 Toilet, Bath, & Laundry Accessories		\$0.55 / SF	\$209,850
Toilet Accessories - Unload / Store / Categorize	635.00 mhr	\$90.00 /mhr	\$57,150
Toilet Accessories - Distribute / Install	635 mhr	\$90.00 /mhr	\$57,150
Non Restroom Soap: Soap Dispenser, Wall Mtd.	143 ea	\$80.00 /ea	\$11,440
Restroom Paper Towel Dispenser & Trash, Semi Recessed	71.00 ea	\$205.00 /ea	\$14,555
Restroom Toilet Paper Dispenser, Wall Mtd.	69 ea	\$100.00 /ea	\$6,900
Restroom Sanitary Napkin Disposal, Recessed	69 ea	\$75.00 /ea	\$5,175
Restroom Soap: Shampoo Dispenser, Shower Wall Mtd.	10 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 ea	\$45.00 /ea	\$6,750
Non Restroom Lit Mirror: Single Mirror: Light in Framed Mirror Unit	10 ea	\$520.00 /ea	\$5,200
Non Restroom Mirror: Full Height Frameless Mirror Allowance - Weight room, Fitness Room, Locker Rooms, Changing Rooms, Misc.	1.00 allw	\$10,500.00 /allw	\$10,500
Restroom Grab Bar: 60" "L" Shaped, Shower, Curved, Wall Mtd.	6.00 ea	\$115.00 /ea	\$690
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	40 ea	\$165.00 /ea	\$6,600
Restroom Shower curtain and rod, typ. shower unit	10 ea	\$80.00 /ea	\$800
Restroom Shower Seat @ ADA shower units	5.00 ea	\$230.00 /ea	\$1,150
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.	54 ea	\$20.00 /ea	\$1,080
Non Restroom Paper Towel Dispenser, Wall Mtd.	143 ea	\$110.00 /ea	\$15,730
C1093 Wall & Door Protection		\$0.10 / SF	\$38,261
Wall & Door Protection Complete \$/sf, including corner guards	382,610 gsf	\$0.10 /gsf	\$38,261
C1093.2 Information Specialties		\$0.52 / SF	\$198,350
White / Marker Boards - Small 4' x 4'	66 ea	\$500.00 /ea	\$33,000

10A SPECIALTIES [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
White / Marker Boards - Medium 4' x 10'	10 ea	\$950.00 /ea	\$9,500
White / Marker Boards - Medium 4' x 6'	104 ea	\$750.00 /ea	\$78,000
White / Marker Boards - Medium 4' x 8'	3.00 ea	\$750.00 /ea	\$2,250
Corkboards / Tack Boards - Large 4' x 8'	36 ea	\$450.00 /ea	\$16,200
Corkboards / Tack Boards - Small 4' x 4'	66 ea	\$900.00 /ea	\$59,400
D4031 Fire Protection Equipment		\$0.34 / SF	\$130,540
Fire Extinguisher Cabinets - Semi-Recessed	262 ea	\$405.00 /ea	\$106,110
AED Cabinets, units, and accessories	14.00 ea	\$1,745.00 /ea	\$24,430
TOTAL 10A SPECIALTIES		\$2.04 / SF	\$776,212

10B SIGNAGE

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.56 / SF	\$212,650
10 SPECIALTIES		\$0.56 / SF	\$212,650
B2010 EXTERIOR WALLS		\$0.02 / SF	\$6,000
B2019 Exterior Wall Opening Supplementary Components		\$0.02 / SF	\$6,000
Exterior Signage Name and logo sign attached to enclosure, Aluminum	1.00 ls	\$6,000.00 /ls	\$6,000
C1090 INTERIOR SPECIALTIES		\$0.54 / SF	\$206,650
C1093.2 Information Specialties		\$0.54 / SF	\$206,650
Signage Dedication Plaques Allowance - Interior	3.00 allw	\$2,000.00 /allw	\$9,000
Signage Egress, Waydinding, and Regulatory - Interior	4.00 ls	\$2,000.00 /ls	\$18,000
Signage Room Identification Signs - Interior	931 ea	\$150.00 /ea	\$139,650
Signage Additional Signage Allowance - Interior	1.00 allw	\$10,000.00 /allw	\$10,000
Signage Branding and Graphics Allowance - Interior, including large format wall murals and panels.	3.00 allw	\$5,000.00 /allw	\$30,000
06 SITEWORK	380,570 SF	\$0.08 / SF	\$30,000
10 SPECIALTIES		\$0.08 / SF	\$30,000
G2060 SITE DEVELOPMENT		\$0.08 / SF	\$30,000
G2056 Signage		\$0.08 / SF	\$30,000
Custom Site / Building Sign Allowance	1.00 allw	\$30,000.00 /allw	\$30,000
TOTAL 10B SIGNAGE		\$0.64 / SF	\$242,650

10C LOCKERS

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$1.58 / SF	\$600,970
10 SPECIALTIES		\$1.58 / SF	\$600,970
C1090 INTERIOR SPECIALTIES		\$1.58 / SF	\$600,970
C1097 Storage Specialties		\$1.58 / SF	\$600,970
Lockers Locker Room: Single and multi-tier lockers on conc, base, 15" x 15"	428 ea	\$490.00 /ea	\$209,720
Lockers Shop Lockers 2 Tier, 15" Wide x 15" Deep	204 ea	\$490.00 /ea	\$99,960
Lockers Corridor Lockers 2 Tier, 15" Wide x 15" Deep on wood base	400 ea	\$490.00 /ea	\$196,000
Lockers Cosmetology Lockers: Single &/or double tier, 2' w x 2.5' d	22 ea	\$620.00 /ea	\$13,640
Lockers Team Lockers: Single tier 2' w x 18" d welded locker on conc. base	142 ea	\$575.00 /ea	\$81,650
TOTAL 10C LOCKERS		\$1.58 / SF	\$600,970

11A FOOD SERVICE EQUIPMENT

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$6.34 / SF	\$2,411,900
11 EQUIPMENT		\$6.34 / SF	\$2,411,900
E1030 COMMERCIAL EQUIPMENT		\$6.34 / SF	\$2,411,900
E1038 Foodservice Equipment		\$6.34 / SF	\$2,411,900
Food Service Equipment (Sub quote)	1.00 ls	\$2,411,900.00 /ls	\$2,411,900
TOTAL 11A FOOD SERVICE EQUIPMENT		\$6.34 / SF	\$2,411,900

11B SHOP EQUIPMENT

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.96 / SF	\$364,006
11 EQUIPMENT		\$0.96 / SF	\$364,006
E1040 INSTITUTIONAL EQUIPMENT		\$0.96 / SF	\$364,006
E1044.4 Educational & Scientific Equipment		\$0.96 / SF	\$364,006
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 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 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 / 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 Collection Arms - Welding	0.00 ea		\$0
Equipment - Auto Collision (AT11) Install ONLY Vehicle Exhaust 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 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 Edge Sander	0.00 ea		\$0
Equipment - Carpentry (CP11) Install ONLY Planer	0.00 ea		\$0

11B SHOP EQUIPMENT [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 Stations	24 ea	\$5,035.00 /ea	\$120,840
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 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 Package	0.00 ea		\$0
Equipment - Design and Visual (DV01) Install ONLY Large Digital Press	0.00 ea		\$0
Equipment - Design and Visual (DV01A) Install ONLY 3PH 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 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 Mt	0.00 ea		\$0
Equipment - Health Assisting (MW-1) F&I Microwave	0.00 ea		\$0

11B SHOP EQUIPMENT [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 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 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 Squaring Shear	0.00 ea		\$0
Equipment - Metal Fabrication (MF02A) Install ONLY Hydraulic Squaring Shear	0.00 ea		\$0
Equipment - Metal Fabrication (MF03) Install ONLY CNC Hydraulic Press Brake	0.00 ea		\$0
Equipment - Metal Fabrication (MF61) Install ONLY Overhead 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
Equipment - Robotics (RB01) F&I Air Compressor	900 mhr	\$110.00 /mhr	\$99,000
TOTAL 11B SHOP EQUIPMENT		\$0.96 / SF	\$364,006

11C ATHLETIC EQUIPMENT

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.92 / SF	\$351,281
11 EQUIPMENT		\$0.92 / SF	\$351,281
E1090 OTHER EQUIPMENT		\$0.92 / SF	\$351,281
E1097 Athletic, Recreational, & Therapeutic Equipment		\$0.92 / SF	\$351,281
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	\$52,500.00 /ea	\$210,000
E1098 Residential Equipment		\$0.00 / SF	\$0
Rooftop Play Equipment - not shown, exclude	0.00 nic		\$0
06 SITEWORK	380,570 SF	\$1.67 / SF	\$635,575
11 EQUIPMENT		\$1.67 / SF	\$635,575
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$1.67 / SF	\$635,575
E1097 Athletic, Recreational, & Therapeutic Equipment		\$1.67 / SF	\$635,575
Permanent Bleachers (F&I) including pressbox	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 alt		\$0
Sportsfield Specialties - Baseball - Dugouts 8'x34' (material only)	0.00 alt		\$0
Sportsfield Specialties - Softball- Dugouts 8'x34' (material only)	0.00 alt		\$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 (material only)	0.00 lf		\$0
Sportsfield Specialties - Tension Netting Backstop - 42'h - Baseball (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

11C ATHLETIC EQUIPMENT [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 (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 (material only)	1.00 ea	\$1,085.00 /ea	\$1,085
Sportsfield Specialties - Tennis Court Nets - Net, Posts, Sleeves (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
TOTAL 11C ATHLETIC EQUIPMENT		\$2.59 / SF	\$986,856

11X LAB EQUIPMENT

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.24 / SF	\$93,000
11 EQUIPMENT		\$0.24 / SF	\$93,000
E1040 INSTITUTIONAL EQUIPMENT		\$0.24 / SF	\$93,000
E1044.2 Laboratory Equipment		\$0.24 / SF	\$93,000
Equipment - Fume Hood (FH-1) - Ductless, ADA Base - REDUCED	6.00 ea	\$15,500.00 /ea	\$93,000
PER RECON			
TOTAL 11X LAB EQUIPMENT		\$0.24 / SF	\$93,000

11X STAGE EQUIPMENT

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.51 / SF	\$195,000
11 EQUIPMENT		\$0.51 / SF	\$195,000
E1070 ENTERTAINMENT & RECREATIONAL EQUIPMENT		\$0.51 / SF	\$195,000
E1071 Theater & Stage Equipment		\$0.51 / SF	\$195,000
Stage Curtains and Rigging - Powered rigging	1.00 ls	\$195,000.00 /ls	\$195,000
TOTAL 11X STAGE EQUIPMENT		\$0.51 / SF	\$195,000

12A FIXED SEATING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.81 / SF	\$308,880
11 EQUIPMENT		\$0.81 / SF	\$308,880
E1070 ENTERTAINMENT & RECREATIONAL EQUIPMENT		\$0.81 / SF	\$308,880
E1071 Theater & Stage Equipment		\$0.81 / SF	\$308,880
Theater - Auditorium Fixed Seating	572 ea	\$540.00 /ea	\$308,880
TOTAL 12A FIXED SEATING		\$0.81 / SF	\$308,880

12B SHADES & CURTAINS

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.92 / SF	\$350,047
12 FURNISHINGS		\$0.92 / SF	\$350,047
E2010 FIXED FURNISHINGS		\$0.92 / SF	\$350,047
E2012 Window Treatments		\$0.92 / SF	\$350,047
Window Shades - Manual Operated - Interior	174 ea	\$150.00 /ea	\$26,100
Roller Shades - Manual Operated - Translucent Wall Panel System, assume not required	2,630 sf	\$0.00 /sf	\$0
Roller Shades - Manual Operated - Exterior Windows Aluminum System	10,209 sf	\$9.75 /sf	\$99,538
Roller Shades - Manual Operated - Exterior Storefront System	4,658 sf	\$9.75 /sf	\$45,416
Roller Shades - Manual Operated - Exterior Curtain Wall System	13,100 sf	\$9.75 /sf	\$127,725
Roller Shades - Electrically Operated - Exterior Curtain Wall System @ Rotunda	2,563 sf	\$20.00 /sf	\$51,269
TOTAL 12B SHADES & CURTAINS		\$0.92 / SF	\$350,047

14A ELEVATORS

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$2.59 / SF	\$985,000
14 CONVEYING EQUIPMENT		\$2.59 / SF	\$985,000
D1010 ELEVATORS & LIFTS		\$2.59 / SF	\$985,000
D1010 Elevators & Lifts		\$2.40 / SF	\$915,000
Elevator #1, Passenger (Otis Gen2, 3,500 capacity)	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
Elevator Operator Time / Fees for other trades - work within shaft	1.00 ls	\$100,000.00 /ls	\$100,000
D1017 Cab Finishes		\$0.18 / SF	\$70,000
Cab Finish Premium Allowance	2.00 ea	\$35,000.00 /ea	\$70,000
TOTAL 14A ELEVATORS		\$2.59 / SF	\$985,000

21A FIRE PROTECTION

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$9.92 / SF	\$3,775,296
21 FIRE SUPPRESSION		\$9.92 / SF	\$3,775,296
D4010 SPRINKLERS		\$7.46 / SF	\$2,838,158
D4011 Wet Sprinkler System		\$7.46 / SF	\$2,838,158
Sprinkler Distribution Piping - 1"	29,915 lf	\$35.00 /lf	\$1,047,025
Sprinkler Distribution Piping - 2"	6,355 lf	\$45.00 /lf	\$285,975
Sprinkler Distribution Piping - 3"	2,400 lf	\$53.00 /lf	\$127,200
Sprinkler Distribution Piping - 4"	6,665 lf	\$80.00 /lf	\$533,200
Sprinkler Piping Qty and Unit Rate Adj - Per Reconcile	1.00 ls	\$350,000.00 /ls	\$350,000
Head - Pendant, Concealed	2,235 ea	\$147.06 /ea	\$328,679
Head - Upright	1,530 ea	\$108.55 /ea	\$166,078
D4020 STANDPIPES		\$1.43 / SF	\$545,739
D4022 Standpipe & Fire Mains		\$1.43 / SF	\$545,739
Standpipes & Fire Mains - 6"	3,000 lf	\$87.00 /lf	\$261,000
Standpipes & Fire Mains - 8"	235 lf	\$195.00 /lf	\$45,825
Double Check Valve 8"	1.00 ea	\$16,582.59 /ea	\$16,583
Hose Valve, 2-1/2"	28 ea	\$475.12 /ea	\$13,303
Zone Control Valve Assembly	28 ea	\$6,125.60 /ea	\$171,517
Wet Check Valve Assembly - 6"	3.00 ea	\$4,850.72 /ea	\$14,552
Wet Check Valve Assembly - 8"	1.00 ea	\$4,850.72 /ea	\$4,851
Fire Department Connection	1.00 ea	\$1,430.36 /ea	\$1,430
Fire Pump Test Header	1.00 ea	\$1,675.36 /ea	\$1,675
Roof Manifold	8.00 ea	\$1,875.36 /ea	\$15,003
D4030 FIRE PROTECTION SPECIALTIES		\$0.33 / SF	\$125,000
D4031 Fire Protection Equipment		\$0.33 / SF	\$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		\$0.70 / SF	\$266,399
D4096 Fire Protection Misc Items		\$0.70 / SF	\$266,399
Coordination & Expenses	380,570 sf	\$0.70 /sf	\$266,399
TOTAL 21A FIRE PROTECTION		\$9.92 / SF	\$3,775,296

22A PLUMBING

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$22.13 / SF	\$8,421,659
22 PLUMBING		\$22.13 / SF	\$8,421,659
D2000 PLUMBING EQUIPMENT		\$5.12 / SF	\$1,949,585
D2000 Plumbing Equipment		\$5.12 / SF	\$1,949,585
Sub-Meters	1.00 ls	\$10,000.00 /ls	\$10,000
Circulating Pump	8.00 ea	\$3,000.00 /ea	\$24,000
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
TMV-1 thru 6 - Thermostatic Mixing Valve	6.00 ea	\$15,000.00 /ea	\$90,000
DWP-1 - Domestic Water Booster Pump	1.00 ea	\$60,000.00 /ea	\$60,000
Backflow Preventers	1.00 ls	\$55,000.00 /ls	\$55,000
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	\$5,000.00 /ls	\$5,000
Trap Primers & Associated Piping	148 ea	\$1,000.00 /ea	\$148,000
Floor Drain W/Trap	148 ea	\$955.00 /ea	\$141,340
Trench Drains	195 lf	\$60.00 /lf	\$11,700
4" & 5" Backwater Valve	11 ea	\$800.00 /ea	\$8,800
Roof Drains	115 ea	\$1,367.94 /ea	\$157,313
Exterior Grease Interceptor	2.00 ea	\$41,711.68 /ea	\$83,423
GT-1&2 - Local Grease Interceptor 50 GPM	5.00 ea	\$2,927.92 /ea	\$14,640
Ceiling UTL Panels	17 ea	\$500.00 /ea	\$8,500
Elevator Sump Pumps	3.00 ea	\$5,010.77 /ea	\$15,032
Gas / Oil Interceptor - Shops	5.00 ea	\$15,000.00 /ea	\$75,000
AC-1 - Compressed Air System - Auto Collision / Auto Tech / Metal Fab	2.00 ea	\$48,321.36 /ea	\$96,643
AC-2 - Compressed Air System - Carpentry Shop	1.00 ea	\$31,821.36 /ea	\$31,821
AC-3 - Compressed Air System - Bio Tech Lab	1.00 ea	\$28,821.36 /ea	\$28,821
AC-4 - Compressed Air System - Robotics	1.00 ea	\$35,821.36 /ea	\$35,821
AC-5 - Compressed Air System - Dental	1.00 ea	\$36,821.36 /ea	\$36,821
Compressed Air Hose Reels	15 ea	\$800.00 /ea	\$12,000
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
Electric / Gas Fired Water Heaters - Serving Shops	5.00 ea	\$2,855.84 /ea	\$14,279
EWB-1 - Elec Water Heater - PVI Durawatt - 460L 200A	2.00 ea	\$66,069.80 /ea	\$132,140
EWB-2 - Elec Water Heater - PVI Durawatt - 270L 119A	2.00 ea	\$41,069.80 /ea	\$82,140
EWB-3 - Elec Water Heater - AO Smith DSE-100	1.00 ea	\$16,855.84 /ea	\$16,856
EWB-4 - Elec Water Heater - PVI Durawatt - 550	2.00 ea	\$68,069.80 /ea	\$136,140
EWB-5,6, & 7 - Elec Water Heater - AO Smith DES-10	3.00 ea	\$5,427.92 /ea	\$16,284
EWB-8 - Elec Water Heater - AO Smith DSE-120	1.00 ea	\$14,427.92 /ea	\$14,428
Argon / Oxygen / Acetylene Manifolds	3.00 ea	\$8,000.00 /ea	\$24,000
Natural Gas Control at Kitchen - Kitchen	4.00 ea	\$5,000.00 /ea	\$20,000
Natural Gas Shut off Valve & Cabinet - HVAC Tech & Paint Booth	2.00 ea	\$5,000.00 /ea	\$10,000

22A PLUMBING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
pH Neutralization System	1.00 ea	\$50,000.00 /ea	\$50,000
ET-1 thru ET-8 - Expansion Tanks	8.00 ea	\$1,500.00 /ea	\$12,000
D2010 DOMESTIC WATER DISTRIBUTION		\$4.44 / SF	\$1,690,000
D2012 Domestic Water Piping		\$4.44 / SF	\$1,690,000
Domestic Hot & Cold Water Piping - 2" & Less	20,000 lf	\$45.00 /lf	\$900,000
Domestic Water Piping - 3"	2,700 lf	\$90.00 /lf	\$243,000
Domestic Water Piping - 4"	1,000 lf	\$125.00 /lf	\$125,000
Domestic Water Piping - 6"	300 lf	\$220.00 /lf	\$66,000
Insulation	24,000 lf	\$12.00 /lf	\$288,000
Valves & Accessories	1.00 ls	\$68,000.00 /ls	\$68,000
D2020 SANITARY DRAINAGE		\$5.14 / SF	\$1,957,100
D2025 Sanitary Drain Piping - UG		\$1.47 / SF	\$559,100
Sanitary Waste & Vent Piping - 2" - 3"	1,735 lf	\$60.00 /lf	\$104,100
Sanitary Waste & Vent Piping - 4" - 6"	4,200 lf	\$85.00 /lf	\$357,000
Kitchen Waste & Vent Piping - 4"	1,400 lf	\$70.00 /lf	\$98,000
D2026 Sanitary Drain Piping - AG		\$3.23 / SF	\$1,230,000
Sanitary Waste & Vent Piping - 2" - 4"	10,000 lf	\$60.00 /lf	\$600,000
Sanitary Waste & Vent Piping - 4" - 6"	7,000 lf	\$90.00 /lf	\$630,000
D2029 Laboratory / Industrial Drain Piping - UG		\$0.44 / SF	\$168,000
Acid Waste & Vent Piping - 2" - 4"	1,600 lf	\$105.00 /lf	\$168,000
D2040 PLUMBING FIXTURES		\$2.07 / SF	\$789,124
D2043 Plumbing Fixtures		\$2.07 / SF	\$789,124
P-1 & P-1A - Water Closet - Wall Hung	90 ea	\$2,815.17 /ea	\$253,365
P-10 & P-11 - Hand & Utility Sink	5.00 ea	\$1,424.20 /ea	\$7,121
P-2 & P-2A - Urinal	15 ea	\$2,008.12 /ea	\$30,122
P-3A - Lavatory - Wall Hung	57 ea	\$1,794.49 /ea	\$102,286
PX-4 - Science Classroom Sinks	46 ea	\$881.03 /ea	\$40,527
PX-5 - Lab Sinks	31 ea	\$1,369.02 /ea	\$42,439
PX-1 Sink - Casework - Installation & Hook-Up	49 ea	\$745.24 /ea	\$36,517
PX-2 - Sink w/Eyewash - Casework - Installation & Hook-Up	6.00 ea	\$948.38 /ea	\$5,690
PX-3 - Sink - Cosmetology w/Hair Trap	15 ea	\$1,463.96 /ea	\$21,959
PX-6 - Dental Station	16 ea	\$881.03 /ea	\$14,096
P-4 - Mop Sink	11 ea	\$2,069.84 /ea	\$22,768
Cosmetology - Pedicure Station - Hook-ups	0.00 ea		\$0
P-3C - Solid Surface Sink, 2 Station - Bradley	7.00 ea	\$4,272.60 /ea	\$29,908
P-5 & P-5A - Drinking Fountain - Bi-Level Electric	17 ea	\$4,272.60 /ea	\$72,634
Washing Machine Box	1.00 ea	\$242.11 /ea	\$242
P-6A - Shower - HC (no enclosure)	4.00 ea	\$839.25 /ea	\$3,357
P-6 - Shower - (Trim & Drain)	7.00 ea	\$1,993.88 /ea	\$13,957
P-7 - Emergenc Eyewash	8.00 ea	\$522.21 /ea	\$4,178
P-8 & 8A - Emergency Shower/Eyewash	14 ea	\$2,658.50 /ea	\$37,219
P-9 - Emergeny Eyewash	9.00 ea	\$0.00 /ea	\$0
P-3B - Wash Fountain - Circular - Bradley	1.00 ea	\$6,624.22 /ea	\$6,624
P-3B - Wash Fountain - Semi-Circular - Bradley	6.00 ea	\$5,674.75 /ea	\$34,048

22A PLUMBING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Hose Bibb	25 ea	\$180.40 /ea	\$4,510
Roof Hydrant	4.00 ea	\$308.58 /ea	\$1,234
Wall Hydrant	14 ea	\$308.58 /ea	\$4,320
D2050 GENERAL SERVICE COMPRESSED - AIR		\$0.93 / SF	\$355,350
D2051 Compressed-Air Systems		\$0.93 / SF	\$355,350
Valves & Accessories	1.00 ls	\$46,350.00 /ls	\$46,350
2" & Less CA Piping - Copper	5,700 lf	\$50.00 /lf	\$285,000
CA Piping Intake - Copper	300 lf	\$80.00 /lf	\$24,000
D2070 RAIN WATER DRAINAGE		\$2.76 / SF	\$1,050,900
D2071 Storm Drain Piping - UG		\$0.51 / SF	\$194,100
Open End Drain	20 ea	\$1,000.00 /ea	\$20,000
Storm Piping - 10"	300 lf	\$165.00 /lf	\$49,500
Storm Piping - 4"	220 lf	\$70.00 /lf	\$15,400
Storm Piping - 6"	455 lf	\$90.00 /lf	\$40,950
Storm Piping - 8"	525 lf	\$130.00 /lf	\$68,250
D2072 Storm Drain Piping - AG		\$2.25 / SF	\$856,800
Insulation - Storm	5,745 lf	\$20.00 /lf	\$114,900
Heat Trace	1.00 ls	\$5,000.00 /ls	\$5,000
Storm Piping - 4"	3,600 lf	\$75.00 /lf	\$270,000
Storm Piping - 5" & 6"	2,685 lf	\$140.00 /lf	\$375,900
Storm Piping - 8"	700 lf	\$130.00 /lf	\$91,000
D2080 OTHER PLUMBING SYSTEMS		\$0.20 / SF	\$75,400
D2085 Medical Gas Piping		\$0.11 / SF	\$40,400
Vacuum - Exhaust	100 lf	\$80.00 /lf	\$8,000
Vacuum Piping - 1" & Less	735 lf	\$40.00 /lf	\$29,400
Valves & Accessories	1.00 ls	\$3,000.00 /ls	\$3,000
D2088 Process / Industrial Gas Piping		\$0.09 / SF	\$35,000
Argon Piping - 1" & Less	800 lf	\$40.00 /lf	\$32,000
Valves & Accessories	1.00 ls	\$3,000.00 /ls	\$3,000
D2090 MISC. PLUMBING SYSTEMS		\$1.06 / SF	\$405,000
D2090 Plumbing Misc Items		\$1.06 / SF	\$405,000
Admin & Expenses	1.00 ls	\$180,000.00 /ls	\$180,000
Coordination / BIM	1.00 ls	\$100,000.00 /ls	\$100,000
Rigging / Matl Handling	1.00 ls	\$75,000.00 /ls	\$75,000
Sleeving / Firestopping / Coring	1.00 ls	\$50,000.00 /ls	\$50,000
D3010 FACILITY FUEL SYSTEMS		\$0.39 / SF	\$149,200
D2080 Natural Gas Piping		\$0.39 / SF	\$149,200
Natural Gas Piping - 2" & Less	175 lf	\$60.00 /lf	\$10,500
Natural Gas Piping - 3"	85 lf	\$85.00 /lf	\$7,225
Natural Gas Piping - 4"	250 lf	\$95.00 /lf	\$23,750
Natural Gas Piping - 5" & 6"	450 lf	\$165.00 /lf	\$74,250
Natural Gas Piping - 8"	95 lf	\$205.00 /lf	\$19,475
Valves & Accessories	1.00 ls	\$14,000.00 /ls	\$14,000

22A PLUMBING [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
TOTAL 22A PLUMBING		\$22.13 / SF	\$8,421,659

23A HVAC

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$81.17 / SF	\$30,891,850
23 HEATING, VENTILATING, & AIR CONDITIONING (HVAC)		\$81.17 / SF	\$30,891,850
D3040 HVAC MAJOR EQUIPMENT		\$30.39 / SF	\$11,567,384
D3040 HVAC Major Equipment		\$30.23 / SF	\$11,505,028
AHU 1-10, HRU 1-5, RTU 1-2, MUA-1&2	1.00 ls	\$6,300,000.00 /ls	\$6,300,000
AHU 1-10, Labor & Conns	10 ea	\$9,276.00 /ea	\$92,760
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 (30 Qty)	1.00 ls	\$160,492.00 /ls	\$160,492
Vehicle Exhaust fans and reels	1.00 ls	\$69,076.05 /ls	\$69,076
Dehumidifiers	35 ea	\$13,952.00 /ea	\$488,320
Destrat Fans	2.00 ea	\$8,952.00 /ea	\$17,904
ERU 1-4 & ERU-7	5.00 ea	\$20,436.00 /ea	\$102,180
Dust Collector - Owner To Relocate Existing	0.00 allw		\$0
Dust Collector -Rigging	1.00 ls	\$15,000.00 /ls	\$15,000
Split Systems Labor & Connect	52 ea	\$4,872.00 /ea	\$253,344
VRF/VCU/Splits Equipment	1.00 ls	\$3,100,000.00 /ls	\$3,100,000
VRF Selector Boxes Install	44 ea	\$976.00 /ea	\$42,944
VRF -CU Install	33 ea	\$2,436.00 /ea	\$80,388
VRF Fan Coil Units Install	263 ea	\$1,952.00 /ea	\$513,376
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 / SF	\$62,356
Unit Heater - Elec	30 ea	\$1,434.00 /ea	\$43,020
Cabinet Unit Heater (ceiling)	7.00 ea	\$2,762.30 /ea	\$19,336
D3050 FACILITY HVAC DISTRIBUTION SYSTEMS		\$28.02 / SF	\$10,663,893
D3053 HVAC Air Distribution		\$28.02 / SF	\$10,663,893
Duct Coordination & Material Handling	1.00 ls	\$270,000.00 /ls	\$270,000
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"	175,000 sf	\$4.60 /sf	\$804,801
Ductwork - Galvanized	460,000 lb	\$15.97 /lb	\$7,344,360
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	15 ea	\$7,500.00 /ea	\$112,500
Duct Dampers & Accessories	1.00 ls	\$735,000.00 /ls	\$735,000
VAV OA & Exhaust w/o RHC	102 ea	\$998.41 /ea	\$101,838
VAV Box w/ERHC	119 ea	\$1,469.04 /ea	\$174,815
VAV FPTU w/ ERHC	9.00 ea	\$3,139.95 /ea	\$28,260

23A HVAC [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Duct Collection Duct - Fabricated	0.00 lf		\$0
Plenums	3,400 sf	\$69.00 /sf	\$234,600
Register, Diffusers, & Grilles	785 ea	\$216.00 /ea	\$169,560
Register, Diffusers, & Grilles - LD	143 ea	\$442.00 /ea	\$63,206
Sound Attenuators	1.00 ls	\$113,232.00 /ls	\$113,232
D3060 CONTROLS & INSTRUMENTATION		\$6.09 / SF	\$2,318,278
D3061 Automatic Temperature Controls		\$6.09 / SF	\$2,318,278
ATC - BMS	380,570 sf	\$5.75 /sf	\$2,188,278
Dashboard Allowance	1.00 allw	\$50,000.00 /allw	\$50,000
Dehumidifer Controls	1.00 allw	\$55,000.00 /allw	\$55,000
Lighting Control	1.00 allw	\$25,000.00 /allw	\$25,000
D3070 SPECIAL PURPOSE HVAC SYSTEMS		\$11.83 / SF	\$4,502,412
D3075 Refrigerant Piping		\$10.10 / SF	\$3,845,200
Refrigeration Piping	19,000 ea	\$38.00 /ea	\$722,000
VRF Piping	56,500 lf	\$44.00 /lf	\$2,486,000
Roof Pipe Jacketing	3,540 lf	\$15.00 /lf	\$53,100
RTU/AHU/HRU Condensers-2 Pipe Circuit	3,540 lf	\$165.00 /lf	\$584,100
D3076 Condensate Drain Piping		\$1.73 / SF	\$657,212
Condensate Drain Piping & Insulation	12,500 lf	\$51.75 /lf	\$646,875
Condensate Drain Pumps	25 ea	\$413.47 /ea	\$10,337
D3080 SYSTEMS TESTING & BALANCING		\$0.65 / SF	\$247,371
D3080 Air & Water Balance		\$0.65 / SF	\$247,371
Testing & Balancing	380,570 sf	\$0.65 /sf	\$247,371
D3090 OTHER HVAC SYSTEMS & EQUIP		\$4.18 / SF	\$1,592,513
D3091 HVAC Misc Items		\$4.18 / SF	\$1,592,513
Mechanical duct cleaning	380,570 sf	\$0.90 /sf	\$342,513
Rigging and Hoisting	1.00 ls	\$225,000.00 /ls	\$225,000
Project Expenses and Commissioning	1.00 ls	\$775,000.00 /ls	\$775,000
Project Management	1.00 ls	\$250,000.00 /ls	\$250,000
TOTAL 23A HVAC		\$81.17 / SF	\$30,891,850

26A ELECTRICAL

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$57.49 / SF	\$21,880,664
26 ELECTRICAL		\$42.33 / SF	\$16,110,997
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$24.28 / SF	\$9,239,771
D5023 Large Power & Distribution		\$4.19 / SF	\$1,595,815
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	13 ea	\$3,608.00 /ea	\$46,904
30 KVA NEMA 1 Transformer composite unit	20 ea	\$4,998.21 /ea	\$99,964
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
125 AMP 120/208 panel board surface mounted composite	4.00 ea	\$3,326.64 /ea	\$13,307
150 AMP 120/208 panel board surface mounted composite	4.00 ea	\$3,566.84 /ea	\$14,267
225 AMP 120/208 Panel board surface mounted composite unit	1.00 ea	\$4,107.12 /ea	\$4,107
400 AMP 120/208 Panel board surface mounted composite unit	25 ea	\$6,062.34 /ea	\$151,558
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
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	2.00 ea	\$12,411.87 /ea	\$24,824
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 Location for Cicurit meter cand Cat 6 Data Link recon 11-28-2022 Remove all and left generator and primary metering	-1.00 ls	\$340,000.00 /ls	(\$340,000)
Metering Allowance reduction based on Metering for up to 16 circuits for 16 Meter locatons	1.00 ls	\$400,000.01 /ls	\$400,000
Utility Meter Sockets composite unit	3.00 ea	\$510.69 /ea	\$1,532
D5024 Large Power Feeder Conduit		\$10.53 / SF	\$4,009,148
#136 15 AMP EMT Composite feeders copper - Large Power	775 lf	\$15.84 /lf	\$12,279
#137 15 AMP EMT Composite feeders copper - Large Power	770 lf	\$15.84 /lf	\$12,200
#138 15 AMP EMT Composite feeders copper - Large Power	761 lf	\$15.84 /lf	\$12,057
#144 20 AMP EMT Composite feeders copper - Large Power	796 lf	\$16.37 /lf	\$13,030
#148 35 AMP EMT Composite feeders copper - Large Power	727 lf	\$19.66 /lf	\$14,293
#150 25 AMP EMT Composite feeders copper - Large Power	714 lf	\$16.82 /lf	\$12,008
#151 25 AMP EMT Composite feeders copper - Large Power	712 lf	\$16.82 /lf	\$11,975

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#152 30 AMP EMT Composite feeders copper - Large Power	736 lf	\$17.87 /lf	\$13,156
#153 35 AMP EMT Composite feeders copper - Large Power	817 lf	\$19.66 /lf	\$16,062
#155 25 AMP EMT Composite feeders copper - Large Power	676 lf	\$16.82 /lf	\$11,369
#156 25 AMP EMT Composite feeders copper - Large Power	683 lf	\$16.82 /lf	\$11,487
#159 35 AMP EMT Composite feeders copper - Large Power	666 lf	\$19.66 /lf	\$13,094
#160 35 AMP EMT Composite feeders copper - Large Power	672 lf	\$19.66 /lf	\$13,212
#167 20 AMP EMT Composite feeders copper - Large Power	820 lf	\$16.37 /lf	\$13,423
#175.1 35 AMP EMT Composite feeders copper - Large Power	822 lf	\$19.66 /lf	\$16,161
#176.1 35 AMP EMT Composite feeders copper - Large Power	838 lf	\$19.66 /lf	\$16,475
#177.1 35 AMP EMT Composite feeders copper - Large Power	811 lf	\$19.66 /lf	\$15,944
#231 25 AMP EMT Composite feeders copper - Large Power	313 lf	\$16.82 /lf	\$5,264
#236 15 AMP EMT Composite feeders copper - Large Power	766 lf	\$15.94 /lf	\$12,206
#238 35 AMP EMT Composite feeders copper - Large Power	382 lf	\$19.66 /lf	\$7,510
#250 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#254 25 AMP EMT Composite feeders copper - Large Power	342 lf	\$16.82 /lf	\$5,752
#255 25 AMP EMT Composite feeders copper - Large Power	345 lf	\$16.82 /lf	\$5,802
#257 25 AMP EMT Composite feeders copper - Large Power	316 lf	\$16.82 /lf	\$5,315
#258 20 AMP EMT Composite feeders copper - Large Power	367 lf	\$16.05 /lf	\$5,890
#260 35 AMP EMT Composite feeders copper - Large Power	319 lf	\$19.66 /lf	\$6,272
#269.1 25 AMP EMT Composite feeders copper - Large Power	353 lf	\$16.82 /lf	\$5,937
#270.1 25 AMP EMT Composite feeders copper - Large Power	353 lf	\$16.82 /lf	\$5,937
#271.1 25 AMP EMT Composite feeders copper - Large Power	343 lf	\$16.82 /lf	\$5,769
#276 25 AMP EMT Composite feeders copper - Large Power	376 lf	\$16.82 /lf	\$6,324
#277.1 25 AMP EMT Composite feeders copper - Large Power	345 lf	\$16.82 /lf	\$5,802
#278.1 25 AMP EMT Composite feeders copper - Large Power	332 lf	\$16.82 /lf	\$5,584
#279.1 25 AMP EMT Composite feeders copper - Large Power	330 lf	\$16.82 /lf	\$5,550
#283.1 25 AMP EMT Composite feeders copper - Large Power	355 lf	\$16.82 /lf	\$5,971
#284.1 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#285.1 25 AMP EMT Composite feeders copper - Large Power	346 lf	\$16.82 /lf	\$5,819
#294 15 AMP EMT Composite feeders copper - Large Power	243 lf	\$15.84 /lf	\$3,850
#296 15 AMP EMT Composite feeders copper - Large Power	235 lf	\$15.84 /lf	\$3,723
#297 15 AMP EMT Composite feeders copper - Large Power	250 lf	\$15.84 /lf	\$3,961
#298 30 AMP EMT Composite feeders copper - Large Power	267 lf	\$17.87 /lf	\$4,773
#327 25 AMP EMT Composite feeders copper - Large Power	220 lf	\$16.82 /lf	\$3,700
#347 15 AMP EMT Composite feeders copper - Large Power	775 lf	\$15.84 /lf	\$12,279
#348 15 AMP EMT Composite feeders copper - Large Power	769 lf	\$15.84 /lf	\$12,184
#349 30 AMP EMT Composite feeders copper - Large Power	740 lf	\$17.87 /lf	\$13,227
#357 25 AMP EMT Composite feeders copper - Large Power	283 lf	\$16.82 /lf	\$4,760
#358 20 AMP EMT Composite feeders copper - Large Power	305 lf	\$16.44 /lf	\$5,015
#359 20 AMP EMT Composite feeders copper - Large Power	298 lf	\$16.44 /lf	\$4,900
#361 25 AMP EMT Composite feeders copper - Large Power	298 lf	\$16.82 /lf	\$5,012
#363 15 AMP EMT Composite feeders copper - Large Power	321 lf	\$15.84 /lf	\$5,086
#364 15 AMP EMT Composite feeders copper - Large Power	335 lf	\$15.84 /lf	\$5,308
#365 25 AMP EMT Composite feeders copper - Large Power	323 lf	\$16.82 /lf	\$5,432
#367 25 AMP EMT Composite feeders copper - Large Power	335 lf	\$16.82 /lf	\$5,634

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#369 25 AMP EMT Composite feeders copper - Large Power	340 lf	\$16.82 /lf	\$5,718
#371 25 AMP EMT Composite feeders copper - Large Power	352 lf	\$16.82 /lf	\$5,920
#125 50 AMP EMT Composite feeders copper - Large Power	512 lf	\$22.55 /lf	\$11,548
#130 50 AMP EMT Composite feeders copper - Large Power	476 lf	\$22.55 /lf	\$10,736
#134 50 AMP EMT Composite feeders copper - Large Power	294 lf	\$22.55 /lf	\$6,631
#145 50 AMP EMT Composite feeders copper - Large Power	720 lf	\$22.55 /lf	\$16,240
#146 50 AMP EMT Composite feeders copper - Large Power	716 lf	\$22.55 /lf	\$16,149
#147 50 AMP EMT Composite feeders copper - Large Power	735 lf	\$22.55 /lf	\$16,578
#149 80 AMP EMT Composite feeders copper - Large Power	723 lf	\$27.17 /lf	\$19,645
#154 50 AMP EMT Composite feeders copper - Large Power	808 lf	\$22.55 /lf	\$18,224
#163 50 AMP EMT Composite feeders copper - Large Power	673 lf	\$22.55 /lf	\$15,179
#164 50 AMP EMT Composite feeders copper - Large Power	674 lf	\$22.55 /lf	\$15,202
#171 50 AMP EMT Composite feeders copper - Large Power	628 lf	\$22.55 /lf	\$14,164
#172 50 AMP EMT Composite feeders copper - Large Power	626 lf	\$22.55 /lf	\$14,119
#173 50 AMP EMT Composite feeders copper - Large Power	707 lf	\$22.55 /lf	\$15,946
#174 50 AMP EMT Composite feeders copper - Large Power	696 lf	\$22.55 /lf	\$15,698
#175.2 50 AMP EMT Composite feeders copper - Large Power	812 lf	\$22.55 /lf	\$18,315
#176.2 50 AMP EMT Composite feeders copper - Large Power	831 lf	\$22.55 /lf	\$18,743
#177.2 50 AMP EMT Composite feeders copper - Large Power	827 lf	\$22.55 /lf	\$18,653
#187 50 AMP EMT Composite feeders copper - Large Power	407 lf	\$22.55 /lf	\$9,180
#232.1 25 AMP EMT Composite feeders copper - Large Power	347 lf	\$16.82 /lf	\$5,836
#232.2 35 AMP EMT Composite feeders copper - Large Power	347 lf	\$19.66 /lf	\$6,822
#233.1 25 AMP EMT Composite feeders copper - Large Power	341 lf	\$16.82 /lf	\$5,735
#233.2 35 AMP EMT Composite feeders copper - Large Power	341 lf	\$19.66 /lf	\$6,704
#234.1 25 AMP EMT Composite feeders copper - Large Power	341 lf	\$16.82 /lf	\$5,735
#234.2 35 AMP EMT Composite feeders copper - Large Power	341 lf	\$19.66 /lf	\$6,704
#235.1 25 AMP EMT Composite feeders copper - Large Power	347 lf	\$16.82 /lf	\$5,836
#235.2 35 AMP EMT Composite feeders copper - Large Power	347 lf	\$19.66 /lf	\$6,822
#243 50 AMP EMT Composite feeders copper - Large Power	332 lf	\$22.55 /lf	\$7,488
#244 50 AMP EMT Composite feeders copper - Large Power	344 lf	\$22.55 /lf	\$7,759
#245 35 AMP EMT Composite feeders copper - Large Power	352 lf	\$19.66 /lf	\$6,920
#246 50 AMP EMT Composite feeders copper - Large Power	337 lf	\$22.55 /lf	\$7,601
#247 35 AMP EMT Composite feeders copper - Large Power	340 lf	\$19.66 /lf	\$6,684
#248 50 AMP EMT Composite feeders copper - Large Power	330 lf	\$22.55 /lf	\$7,443
#249 35 AMP EMT Composite feeders copper - Large Power	336 lf	\$19.66 /lf	\$6,606
#251 50 AMP EMT Composite feeders copper - Large Power	320 lf	\$22.55 /lf	\$7,218
#252 35 AMP EMT Composite feeders copper - Large Power	327 lf	\$19.66 /lf	\$6,429
#256 50 AMP EMT Composite feeders copper - Large Power	323 lf	\$22.55 /lf	\$7,285
#259 35 AMP EMT Composite feeders copper - Large Power	326 lf	\$19.66 /lf	\$6,409
#263 35 AMP EMT Composite feeders copper - Large Power	330 lf	\$19.66 /lf	\$6,488
#264 35 AMP EMT Composite feeders copper - Large Power	328 lf	\$19.66 /lf	\$6,449
#269.2 50 AMP EMT Composite feeders copper - Large Power	353 lf	\$22.55 /lf	\$7,962
#270.2 50 AMP EMT Composite feeders copper - Large Power	324 lf	\$22.55 /lf	\$7,308
#271.2 50 AMP EMT Composite feeders copper - Large Power	343 lf	\$22.55 /lf	\$7,736
#275 50 AMP EMT Composite feeders copper - Large Power	368 lf	\$22.55 /lf	\$8,300

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#277.2 50 AMP EMT Composite feeders copper - Large Power	352 lf	\$22.55 /lf	\$7,939
#278.2 50 AMP EMT Composite feeders copper - Large Power	339 lf	\$22.55 /lf	\$7,646
#279.2 50 AMP EMT Composite feeders copper - Large Power	337 lf	\$22.55 /lf	\$7,601
#283.2 50 AMP EMT Composite feeders copper - Large Power	348 lf	\$22.55 /lf	\$7,849
#284.2 50 AMP EMT Composite feeders copper - Large Power	333 lf	\$22.55 /lf	\$7,511
#285.2 50 AMP EMT Composite feeders copper - Large Power	353 lf	\$22.55 /lf	\$7,962
#317 50 AMP EMT Composite feeders copper - Large Power	209 lf	\$22.55 /lf	\$4,714
#318 50 AMP EMT Composite feeders copper - Large Power	228 lf	\$22.55 /lf	\$5,143
#325 35 AMP EMT Composite feeders copper - Large Power	216 lf	\$19.66 /lf	\$4,247
#326 50 AMP EMT Composite feeders copper - Large Power	228 lf	\$22.55 /lf	\$5,143
#346 50 AMP EMT Composite feeders copper - Large Power	626 lf	\$22.55 /lf	\$14,119
#356 35 AMP EMT Composite feeders copper - Large Power	276 lf	\$19.66 /lf	\$5,426
#360 40 AMP EMT Composite feeders copper - Large Power	228 lf	\$20.88 /lf	\$4,761
#366 35 AMP EMT Composite feeders copper - Large Power	329 lf	\$19.66 /lf	\$6,468
#368 50 AMP EMT Composite feeders copper - Large Power	327 lf	\$22.55 /lf	\$7,375
#372 50 AMP EMT Composite feeders copper - Large Power	359 lf	\$22.55 /lf	\$8,097
#044 50 AMP MI Composite feeders copper - Large Power	34 lf	\$86.00 /lf	\$2,924
#047 50 AMP MI Composite feeders copper - Large Power	319 lf	\$86.00 /lf	\$27,433
#050 50 AMP MI Composite feeders copper - Large Power	457 lf	\$86.00 /lf	\$39,301
#053 50 AMP MI Composite feeders copper - Large Power	254 lf	\$86.00 /lf	\$21,844
#056 50 AMP MI Composite feeders copper - Large Power	451 lf	\$86.00 /lf	\$38,785
#059 50 AMP MI Composite feeders copper - Large Power	285 lf	\$86.00 /lf	\$24,509
#062 50 AMP MI Composite feeders copper - Large Power	476 lf	\$86.00 /lf	\$40,935
#065 50 AMP MI Composite feeders copper - Large Power	239 lf	\$86.00 /lf	\$20,554
#234 60 AMP EMT Composite feeders copper - Large Power	356 lf	\$26.40 /lf	\$9,400
#235 60 AMP EMT Composite feeders copper - Large Power	366 lf	\$26.40 /lf	\$9,664
#303 35 AMP EMT Composite feeders copper - Large Power	234 lf	\$19.66 /lf	\$4,600
#370 50 AMP EMT Composite feeders copper - Large Power	347 lf	\$22.55 /lf	\$7,827
#036 100 AMP MI Composite feeders Copper - Large Power	32 lf	\$100.59 /lf	\$3,219
#037 100 AMP MI Composite feeders Copper - Large Power	321 lf	\$104.26 /lf	\$33,467
#038 100 AMP MI Composite feeders Copper - Large Power	467 lf	\$104.26 /lf	\$48,689
#039 100 AMP MI Composite feeders Copper - Large Power	259 lf	\$104.26 /lf	\$27,003
#040 100 AMP MI Composite feeders Copper - Large Power	455 lf	\$104.26 /lf	\$47,438
#041 100 AMP MI Composite feeders Copper - Large Power	271 lf	\$104.26 /lf	\$28,254
#042 100 AMP MI Composite feeders Copper - Large Power	475 lf	\$104.26 /lf	\$49,523
#043 100 AMP MI Composite feeders Copper - Large Power	239 lf	\$104.26 /lf	\$24,918
#183 110 AMP EMT Composite feeders Copper - Large Power	389 lf	\$35.71 /lf	\$13,893
#226 100 AMP EMT Composite feeders Copper - Large Power	428 lf	\$33.52 /lf	\$14,348
#227 110 AMP EMT Composite feeders Copper - Large Power	466 lf	\$35.71 /lf	\$16,643
#230 80 AMP EMT Composite feeders Copper - Large Power	255 lf	\$27.17 /lf	\$6,929
#328 225 AMP EMT Composite feeders Copper - Large Power	211 lf	\$88.01 /lf	\$18,571
#329 175 AMP EMT Composite feeders Copper - Large Power	212 lf	\$77.91 /lf	\$16,518
#083 Fire Pump Assume 200 AMP MI Composite feeders Copper - Large Power	90 lf	\$290.84 /lf	\$26,176
#084 175 AMP MI Composite feeders Copper - Large Power	62 lf	\$242.92 /lf	\$15,061

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#106 200 AMP EMT Composite feeders Copper - Large Power	271 lf	\$95.04 /lf	\$25,757
#107 200 AMP EMT Composite feeders Copper - Large Power	53 lf	\$95.04 /lf	\$5,037
#142 175 AMP EMT Composite feeders Copper - Large Power	757 lf	\$77.91 /lf	\$58,981
#143 175 AMP EMT Composite feeders Copper - Large Power	685 lf	\$77.91 /lf	\$53,371
#181 150 AMP EMT Composite feeders Copper - Large Power	386 lf	\$61.00 /lf	\$23,546
#185 150 AMP EMT Composite feeders Copper - Large Power	720 lf	\$61.00 /lf	\$43,919
#186 200 AMP EMT Composite feeders Copper - Large Power	746 lf	\$98.48 /lf	\$73,465
#225 150 AMP EMT Composite feeders Copper - Large Power	379 lf	\$61.00 /lf	\$23,119
#304 35 AMP EMT Composite feeders Copper - Large Power	256 lf	\$19.66 /lf	\$5,033
#307.1 25 AMP EMT Composite feeders Copper - Large Power	275 lf	\$16.82 /lf	\$4,625
#307.2 35 AMP EMT Composite feeders Copper - Large Power	250 lf	\$19.66 /lf	\$4,915
#308.1 25 AMP EMT Composite feeders Copper - Large Power	231 lf	\$16.82 /lf	\$3,885
#308.2 35 AMP EMT Composite feeders Copper - Large Power	213 lf	\$19.66 /lf	\$4,188
#240 175 AMP EMT Composite feeders Copper - Large Power	284 lf	\$77.91 /lf	\$22,128
#033 600 AMP EMT Composite feeders Copper - Large Power	36 lf	\$247.41 /lf	\$8,907
#068 400 AMP MI Composite feeders Copper - Large Power	63 lf	\$418.68 /lf	\$26,377
#081 400 AMP MI Composite feeders Copper - Large Power	36 lf	\$418.68 /lf	\$15,072
#082 400 AMP MI Composite feeders Copper - Large Power	34 lf	\$418.68 /lf	\$14,235
#182 400 AMP EMT Composite feeders Copper - Large Power	819 lf	\$168.09 /lf	\$137,663
#224 450 AMP EMT Composite feeders Copper - Large Power	336 lf	\$192.58 /lf	\$64,708
#293 400 AMP EMT Composite feeders Copper - Large Power	336 lf	\$168.09 /lf	\$56,477
#362 450 AMP EMT Composite feeders Copper - Large Power	189 lf	\$192.58 /lf	\$36,398
#032 800 AMP EMT Composite feeders Aluminum - Large Power	81 lf	\$269.45 /lf	\$21,826
#003 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#004 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#077 1200 AMP EMT Composite feeders Aluminum - Large Power	48 lf	\$406.75 /lf	\$19,524
#078 1200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$406.75 /lf	\$14,643
#289.1 1200 AMP EMT Composite feeders Aluminum - Large Power	126 lf	\$406.75 /lf	\$51,250
#289.2 1200 AMP EMT Composite feeders Aluminum - Large Power	156 lf	\$406.75 /lf	\$63,452
#076 1600 AMP EMT Composite feeders Aluminum - Large Power	276 lf	\$538.91 /lf	\$148,738
#005 2000 AMP EMT Composite feeders Aluminum - Large Power	488 lf	\$674.44 /lf	\$329,128
#131 100 AMP EMT Composite feeders Aluminum - Large Power	60 lf	\$37.00 /lf	\$2,220
#132 125 AMP EMT Composite feeders Aluminum - Large Power	338 lf	\$42.14 /lf	\$14,244
#211 150 AMP EMT Composite feeders Aluminum - Large Power	84 lf	\$49.08 /lf	\$4,123
#350 125 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$42.14 /lf	\$5,057
#351 125 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$42.14 /lf	\$6,321
#352 125 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$42.14 /lf	\$6,321
#353 125 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$42.14 /lf	\$5,057

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
#354 150 AMP EMT Composite feeders Aluminum - Large Power	120 lf	\$49.08 /lf	\$5,890
#355 150 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$49.08 /lf	\$7,363
#008 200 AMP EMT Composite feeders Aluminum - Large Power	36 lf	\$79.15 /lf	\$2,849
#011 200 AMP EMT Composite feeders Aluminum - Large Power	321 lf	\$79.15 /lf	\$25,408
#014 200 AMP EMT Composite feeders Aluminum - Large Power	481 lf	\$79.15 /lf	\$38,072
#017 200 AMP EMT Composite feeders Aluminum - Large Power	278 lf	\$79.15 /lf	\$22,004
#020 200 AMP EMT Composite feeders Aluminum - Large Power	493 lf	\$79.15 /lf	\$39,022
#023 200 AMP EMT Composite feeders Aluminum - Large Power	288 lf	\$79.15 /lf	\$22,796
#026 200 AMP EMT Composite feeders Aluminum - Large Power	507 lf	\$79.15 /lf	\$40,130
#029 200 AMP EMT Composite feeders Aluminum - Large Power	267 lf	\$79.15 /lf	\$21,134
#071 200 AMP EMT Composite feeders Aluminum - Large Power	476 lf	\$79.15 /lf	\$37,676
#073 200 AMP EMT Composite feeders Aluminum - Large Power	53 lf	\$79.15 /lf	\$4,195
#087 225 AMP EMT Composite feeders Aluminum - Large Power	43 lf	\$84.71 /lf	\$3,643
#090 225 AMP EMT Composite feeders Aluminum - Large Power	465 lf	\$84.71 /lf	\$39,390
#094 225 AMP EMT Composite feeders Aluminum - Large Power	302 lf	\$84.71 /lf	\$25,582
#097 225 AMP EMT Composite feeders Aluminum - Large Power	464 lf	\$84.71 /lf	\$39,305
#100 225 AMP EMT Composite feeders Aluminum - Large Power	459 lf	\$84.71 /lf	\$38,882
#103 225 AMP EMT Composite feeders Aluminum - Large Power	479 lf	\$84.71 /lf	\$40,576
#108 225 AMP EMT Composite feeders Aluminum - Large Power	402 lf	\$84.71 /lf	\$34,053
#113 225 AMP EMT Composite feeders Aluminum - Large Power	346 lf	\$84.71 /lf	\$29,310
#118 225 AMP EMT Composite feeders Aluminum - Large Power	462 lf	\$84.71 /lf	\$39,136
#127 225 AMP EMT Composite feeders Aluminum - Large Power	341 lf	\$84.71 /lf	\$28,886
#189 225 AMP EMT Composite feeders Aluminum - Large Power	144 lf	\$84.71 /lf	\$12,198
#190 175 AMP EMT Composite feeders Aluminum - Large Power	50 lf	\$69.12 /lf	\$3,456
#192 225 AMP EMT Composite feeders Aluminum - Large Power	344 lf	\$84.71 /lf	\$29,140
#199 225 AMP EMT Composite feeders Aluminum - Large Power	202 lf	\$84.71 /lf	\$17,111
#202 225 AMP EMT Composite feeders Aluminum - Large Power	71 lf	\$84.71 /lf	\$6,014
#205 225 AMP EMT Composite feeders Aluminum - Large Power	211 lf	\$84.71 /lf	\$17,874
#208 225 AMP EMT Composite feeders Aluminum - Large Power	278 lf	\$84.71 /lf	\$23,549
#212 175 AMP EMT Composite feeders Aluminum - Large Power	318 lf	\$69.12 /lf	\$21,981
#213 225 AMP EMT Composite feeders Aluminum - Large Power	168 lf	\$84.71 /lf	\$14,231
#215 225 AMP EMT Composite feeders Aluminum - Large Power	251 lf	\$84.71 /lf	\$21,262
#218 225 AMP EMT Composite feeders Aluminum - Large Power	263 lf	\$84.71 /lf	\$22,279
#221 225 AMP EMT Composite feeders Aluminum - Large Power	242 lf	\$84.71 /lf	\$20,500
#006 400 AMP EMT Composite feeders Aluminum - Large Power	56 lf	\$134.93 /lf	\$7,556
#034 400 AMP EMT Composite feeders Aluminum - Large Power	40 lf	\$134.93 /lf	\$5,397
#069 400 AMP EMT Composite feeders Aluminum - Large Power	39 lf	\$134.93 /lf	\$5,262
#075 400 AMP EMT Composite feeders Aluminum - Large Power	64 lf	\$134.93 /lf	\$8,636
#121 400 AMP EMT Composite feeders Aluminum - Large Power	283 lf	\$134.93 /lf	\$38,186
#191 400 AMP EMT Composite feeders Aluminum - Large Power	50 lf	\$134.93 /lf	\$6,747
#195 400 AMP EMT Composite feeders Aluminum - Large Power	287 lf	\$134.93 /lf	\$38,725
#330 400 AMP EMT Composite feeders Aluminum - Large Power	150 lf	\$134.93 /lf	\$20,240
D5025 Emergency Gen Set W/ATS		\$0.11 / SF	\$42,970
Auto Transfer Switch 3P - Fire pump ATS install only (included with fire pump)	1.00 ea	\$8,695.58 /ea	\$8,696

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Auto Transfer Switch 3P - 400a	3.00 ea	\$11,424.75 /ea	\$34,274
D5027 Mechanical Equipment Connections		\$5.46 / SF	\$2,076,788
E3EQ AC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	53 ea	\$655.72 /ea	\$34,753
E3EQ AC Air compressors AC2-5 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	4.00 ea	\$655.72 /ea	\$2,623
E3EQ ACh 04 composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ ACh 05 composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ AD2-4 - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	3.00 ea	\$655.72 /ea	\$1,967
E3EQ CP1 with motor rated Switch composite unit	4.00 ea	\$655.72 /ea	\$2,623
E3EQ DEH1 with 120 Volt Circuit	27 ea	\$655.72 /ea	\$17,705
E3EQ j box with 30 amp disconnect	5.00 ea	\$655.72 /ea	\$3,279
E3EQ j box with with motor rated Switch	11 ea	\$655.72 /ea	\$7,213
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 disconnect 600 volt composite unit	112 ea	\$655.72 /ea	\$73,441
E3EQ ACCCU - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	13 ea	\$655.72 /ea	\$8,524
E3EQ BS - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	38 ea	\$655.72 /ea	\$24,917
E3EQ CU-1 with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-10A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-10B with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-11A with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-11B with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-11C with VFD 35A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-12 with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-13C with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-14A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-14B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-15 with VFD 50A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ CU-16 with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-17 with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-19A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-19B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-2A with VFD 45A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-2B with VFD 20A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-3 with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-4A with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-4B with VFD 80A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-5A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-5B with VFD 30A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-6A with VFD 40A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-6B with VFD 35 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-7 with VFD 15 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-8A with VFD 80 A composite unit connection only feeder in large power	1.00 ea	\$936.66 /ea	\$937
E3EQ CU-8B with VFD 60 A composite unit connection only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ CU-9A with VFD 40 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-9B with VFD 30 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ CU-9C with VFD 20 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ DF - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	2.00 ea	\$655.72 /ea	\$1,311
E3EQ DWP - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	1.00 ea	\$655.72 /ea	\$656
E3EQ ERV-1 with VFD 45 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-3 with VFD 15 A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-4 with VFD 15 A composite unit connection	1.00 ea	\$448.22 /ea	\$448
E3EQ ERV-7 with VFD 45 A composite unit connection	1.00 ea	\$448.22 /ea	\$448

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ EUH - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	28 ea	\$655.72 /ea	\$18,360
E3EQ F: Fan w/ VFD composite unit connection	12 ea	\$448.22 /ea	\$5,379
E3EQ F: Fan w/ VFD composite unit connection only feeder in large power	8.00 ea	\$448.22 /ea	\$3,586
E3EQ Fire Pump Controler FBO composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ FTU - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit(large qty from mech sched)	9.00 ea	\$655.72 /ea	\$5,902
E3EQ HWRP 1-8 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	8.00 ea	\$655.72 /ea	\$5,246
E3EQ KEF - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	5.00 ea	\$655.72 /ea	\$3,279
E3EQ MAU1 with VFD 200 A composite unit connection only on drawing only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ MAU2 with VFD 400A composite unit connection only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ PE-1 with Cntrl composite unit connection only off riser only feeder in large power	1.00 ea	\$448.22 /ea	\$448
E3EQ PE-2 with Cntrl composite unit connection only off riser only feeder in large power	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 associated with Ahu1 and Ahu2	2.00 ea	\$655.72 /ea	\$1,311
E3EQ SP - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	3.00 ea	\$655.72 /ea	\$1,967
E3EQ VAC - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	2.00 ea	\$655.72 /ea	\$1,311
E3EQ VAV - 30 AMP 3 POLE N1 fused disconnect 600 volt composite unit	62 ea	\$655.72 /ea	\$40,655
E3EQ VCU composite unit connection only feeder in large power	48 ea	\$655.72 /ea	\$31,475
E3EQ ACCU - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit	40 ea	\$727.02 /ea	\$29,081
E3EQ AD1 - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit	1.00 ea	\$727.02 /ea	\$727
E3EQ RTU1 - 60 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ RTU2 - 200 AMP 3 POLE N1 fused disconnect 600 volt composite unit only feeder in large power	1.00 ea	\$727.02 /ea	\$727
E3EQ VAV Connection for electric Rehatad coil - not shown on electrical	162 ea	\$800.00 /ea	\$129,600
E3EQ VRF branch selector 208 composite unit connection off mechanical schedule	47 ea	\$516.82 /ea	\$24,290
E3EQ AC01 air compressor 100 A composite unit connection	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU1 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ AHU10 with VFD 200 A composite unit connection only feeder in large power	1.00 ea	\$2,500.00 /ea	\$2,500
E3EQ AHU2 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250
E3EQ AHU3 with VFD 600 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU4 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU5 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ AHU6 with VFD 200 A composite unit connection only feeder in large power	1.00 ea	\$1,421.00 /ea	\$1,421
E3EQ AHU7 with VFD 225 A composite unit connection only feeder in large power	1.00 ea	\$1,421.00 /ea	\$1,421
E3EQ AHU8 with VFD 150 A composite unit connection only feeder in large power	1.00 ea	\$1,250.00 /ea	\$1,250
E3EQ AHU9 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$2,500.00 /ea	\$2,500
E3EQ DC-1 ith VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU4 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU5 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$920.18 /ea	\$920
E3EQ HRU1 with VFD 100 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ HRU2 with VFD 300 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ HRU3 with VFD 300 A composite unit connection only feeder in large power	1.00 ea	\$4,785.56 /ea	\$4,786
E3EQ EWH w/ junction box Composite Unit 200 amps only feeder in large power	4.00 ea	\$655.72 /ea	\$2,623
E3EQ EWH w/ junction box Composite Unit 30 amps	5.00 ea	\$655.72 /ea	\$3,279
E3EQ FCU w/ junction box - Composite Unit	271 ea	\$655.72 /ea	\$177,700
E3EQ GWH w/ junction box Composite Unit 30 amps	1.00 ea	\$655.72 /ea	\$656
20 AMP EMT Composite feeders copper - Mechanical	28,950 lf	\$17.51 /lf	\$506,917
30 AMP EMT Composite feeders copper - Mechanical	38,250 lf	\$19.75 /lf	\$755,422
60 AMP EMT Composite feeders copper - Mechanical	3,075 lf	\$28.17 /lf	\$86,607
100 AMP EMT Composite feeders Copper - Mechanical	75 lf	\$33.82 /lf	\$2,537
D5029 Small Power Devices & Wiring		\$3.98 / SF	\$1,515,051
Wiremold Dual Channel Empty Raceway with wiring - no devices included - Composite Unit	32 lf	\$60.36 /lf	\$1,932
Wiremold Duplex Receptacle Only Composite Unit	15 ea	\$45.60 /ea	\$684
E3EQ Auto 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Auto 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 covered on Electrical Power plans	0.00 ea		\$0
E3EQ Biotech 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Carpentry 120 volt connetions - Assume Power is covered 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 Electrical Power plans	0.00 ea		\$0
E3EQ Cosmo 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Dental 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Dental 208 volt connetions - Assume Power is covered on 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 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 Electrical Power plans	0.00 ea		\$0
E3EQ HVAC 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 120 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 208 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Culinary Arts Equipment 480 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 120 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Kitchen: Main Equipment 208 volt connetions Mechanical schedule with feeder	0.00 ea		\$0

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
E3EQ Kitchen: Main Equipment 480 volt connetions Mechanical schedule with feeder	0.00 ea		\$0
E3EQ Medical 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Medical 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ MF 480 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Plumbing 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Robotics 120 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
E3EQ Robotics 208 volt connetions - Assume Power is covered on Electrical Power plans	0.00 ea		\$0
Gym Scoreboard control System Wiring	1.00 ea	\$1,500.00 /ea	\$1,500
Gym Shot timer Wiring	1.00 ea	\$1,500.00 /ea	\$1,500
Small Power Projection Screen	2.00 ea	\$1,500.00 /ea	\$3,000
FB: Quad Floor Box - Composite Unit	50 ea	\$875.00 /ea	\$43,750
Transformer: 24 V XFMR Low Voltage transformer	24 ea	\$217.48 /ea	\$5,220
Recep: 20A Twist lock (Type 1) Poke thru Receptacle Composite unit	1.00 ea	\$1,200.00 /ea	\$1,200
Recep: 20A Twist lock (Type 1) Receptacle Composite unit	28 ea	\$131.58 /ea	\$3,684
Recep: 20A Twist lock (Type 1) Heavy Duty Receptacle Composite unit	2.00 ea	\$131.58 /ea	\$263
Recep: 20A Twist lock (Type 4) 250V Receptacle Composite unit	5.00 ea	\$131.58 /ea	\$658
Recep: 30 Amp Twist Lock Heavy duty, 208V Nema Receptacle type 5	7.00 ea	\$165.17 /ea	\$1,156
Recep: 30 Amp Twist Lock, 208V floor box Nema Receptacle type 5	1.00 ea	\$165.17 /ea	\$165
Recep: 30 Amp Twist Lock, 208V Nema Receptacle type 5	5.00 ea	\$165.17 /ea	\$826
Recep: 30A Type 2 Twist Lock Nema Receptacle Composite unit	15 ea	\$165.17 /ea	\$2,478
Recep: 30A Type 2 Twist Lock poke thry Receptacle Composite unit	4.00 ea	\$1,200.00 /ea	\$4,800
Recep: 50 Amp Type 3 Twist Lock Floor Box Receptacle Composite unit	2.00 ea	\$1,200.00 /ea	\$2,400
Recep: 50 Amp Type 3 Twist Lock Receptacle Composite unit	21 ea	\$199.56 /ea	\$4,191
Recep: 50 Amp Type 3 Twist Lock Receptacle Composite unit Heavy duty	20 ea	\$199.56 /ea	\$3,991
Recep: I520/I530	80 ea	\$199.56 /ea	\$15,965
JB: Power Junction Box - Typ. Composite Unit	132 ea	\$85.04 /ea	\$11,291
JB: Power Junction Box - Typ. Composite Unit fsd	14 ea	\$150.00 /ea	\$2,100
JB: Power Junction Box - XP Composite Unit	2.00 ea	\$125.00 /ea	\$250
Switch: EPO Switch at Shops	30 ea	\$85.04 /ea	\$2,551
Recep: Duplex receptacle Composite unit	1,398 ea	\$83.40 /ea	\$116,589

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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	536 ea	\$116.68 /ea	\$62,540
Switch: EPO Switch at Shops XP	1.00 ea	\$116.68 /ea	\$117
Recep: Quad receptacle Composite unit	446 ea	\$119.92 /ea	\$53,485
Recep: Quad GFI receptacle Composite unit	38 ea	\$186.35 /ea	\$7,081
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 Type 2 Twistlock Composite Unit	6.00 ea	\$905.53 /ea	\$5,433
CR: Cord Reel Type 3Twistlock Composite Unit	15 ea	\$905.53 /ea	\$13,583
CR: Cord Reel Type duplex Composite Unit	226 ea	\$905.53 /ea	\$204,650
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		\$14.25 / SF	\$5,424,823
D5042 Light Fixtures		\$11.59 / SF	\$4,409,154
20 AMP EMT Composite feeders copper - Large Power	48,000 lf	\$16.93 /lf	\$812,704
DPB2 Composite Unit	32 ea	\$661.71 /ea	\$21,175
GSB Light Fixture	20 ea	\$461.71 /ea	\$9,234
GSC 8.3 Light Fixture	13 ea	\$461.71 /ea	\$6,002
GSD Lighting Fixture	24 ea	\$411.71 /ea	\$9,881
LSE Light Fixture	4.00 ea	\$561.71 /ea	\$2,247
RC1 Recessed Can lighting Fixture	272 ea	\$391.71 /ea	\$106,546
RC2 Recessed Can lighting Fixture	15 ea	\$391.71 /ea	\$5,876
RE Lighting	31 ea	\$391.71 /ea	\$12,143
RF Recessed Can light Fixture	70 ea	\$391.71 /ea	\$27,420
RJ Square Recess Can Light Fixture	55 ea	\$391.71 /ea	\$21,544
RK Lighting Fixture	8.00 ea	\$391.71 /ea	\$3,134
RN1 Light Fixture	15 ea	\$391.71 /ea	\$5,876
RN2 Light Fixture	42 ea	\$391.71 /ea	\$16,452
RQ Lighting Fixture	35 ea	\$391.71 /ea	\$13,710
RB2 2x4 Lighting Fixture	10 ea	\$382.99 /ea	\$3,830
RDA 2x4	31 ea	\$382.99 /ea	\$11,873
RDB	13 ea	\$382.99 /ea	\$4,979
RL1 2X4 Lighting Fixture	155 ea	\$382.99 /ea	\$59,364
RL2 2x4 Led Recessed Troffer Composite Unit	35 ea	\$382.99 /ea	\$13,405
RA1 2X2 Lighting Fixture	210 ea	\$391.71 /ea	\$82,259
RA2 Lighting Fixture	5.00 ea	\$391.71 /ea	\$1,959
RA3 Lighting Fixture	19 ea	\$391.71 /ea	\$7,443
RB1 Lighting Fixture	205 ea	\$391.71 /ea	\$80,301
RLC 4 foot Lighting Fixture (348)	1,644 ea	\$179.96 /ea	\$295,846
RLC 6 foot Lighting Fixture (14)	84 ea	\$179.96 /ea	\$15,116
RLC 8 foot Lighting Fixture (6)	48 ea	\$179.96 /ea	\$8,638
GSE 25.2 foot Lighting Fixture (1)	25 lf	\$190.99 /lf	\$4,813
GSE 32.2 foot Lighting Fixture (1)	32 lf	\$190.99 /lf	\$6,150

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
GSE 33.2 foot Lighting Fixture (1)	33 lf	\$190.99 /lf	\$6,341
GSE 33.7 foot Lighting Fixture (2)	67 lf	\$190.99 /lf	\$12,873
LPJ 10 Foot (2) Composite Unit	20 lf	\$135.99 /lf	\$2,720
LPJ 16 Foot (2) Composite Unit	32 lf	\$135.99 /lf	\$4,352
LPJ 20 Foot (2) Composite Unit	40 lf	\$135.99 /lf	\$5,440
LPJ 24 Foot (4) Composite Unit	96 lf	\$135.99 /lf	\$13,056
LPJ 30 Foot (2) Composite Unit	60 lf	\$135.99 /lf	\$8,160
LPJ 4 Foot (41) Composite Unit	164 lf	\$135.99 /lf	\$22,303
LPJ 8Foot (8) Composite Unit	64 lf	\$135.99 /lf	\$8,704
LSA 10.5 foot linear Fixture per foot(1)	10 lf	\$135.99 /lf	\$1,428
LSA 18.50 foot linear Fixture per foot(6)	111 lf	\$135.99 /lf	\$15,095
LSA 2.5 foot linear Fixture per foot(1)	2.50 lf	\$135.99 /lf	\$340
LSA 24 foot linear Fixture per foot(3)	72 lf	\$135.99 /lf	\$9,792
LSA 26 foot linear Fixture per foot(2)	52 lf	\$135.99 /lf	\$7,072
LSA 26.11 foot linear Fixture per foot	26 lf	\$135.99 /lf	\$3,551
LSA 26.11 foot linear Fixture per foot(2)	52 lf	\$135.99 /lf	\$7,102
LSA 7 foot linear Fixture per foot(1)	7.00 lf	\$135.99 /lf	\$952
LSA 7.3 foot linear Fixture per foot(5)	36 lf	\$135.99 /lf	\$4,964
LSA 9.6 foot linear Fixture per foot(6)	48 lf	\$135.99 /lf	\$6,528
LSA 9.9 foot linear Fixture per foot(4)	40 lf	\$135.99 /lf	\$5,385
LSA 8 foot linear Fixture per foot(1)	8.00 lf	\$135.99 /lf	\$1,088
LSB 18 foot linear fixture per foot (2)	36 lf	\$135.99 /lf	\$4,896
LSB 89 foot linear fixture per foot (2)	188 lf	\$135.99 /lf	\$25,567
RLA1 12 foot Light Fixture(3)	36 lf	\$135.99 /lf	\$4,896
RLA1 4 foot Light Fixture(116)	464 lf	\$135.99 /lf	\$63,102
RLA1 6 foot Light Fixture(23)	138 lf	\$135.99 /lf	\$18,767
RLA1 8 foot Light Fixture(2)	16 lf	\$135.99 /lf	\$2,176
RLA2 4 foot Lighting Fixture (7)	28 lf	\$160.99 /lf	\$4,508
RLB-1 Linear fixture per foot	178 lf	\$135.99 /lf	\$24,207
RLD1 18 foot Light fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLD1 4 foot Light fixture (2)	8.00 lf	\$135.99 /lf	\$1,088
RLD1 8 foot Light fixture (4)	32 lf	\$135.99 /lf	\$4,352
RLD3 13.9 foot Light Fixture (11)	153 lf	\$135.99 /lf	\$20,794
RLD3 22 foot Light Fixture (4)	88 lf	\$135.99 /lf	\$11,968
RLD3 25.6 foot Light Fixture (2)	51 lf	\$135.99 /lf	\$6,963
RLD3 38.2 foot Light Fixture (2)	76 lf	\$135.99 /lf	\$10,390
GPL2 4 foot	17 ea	\$508.96 /ea	\$8,652
LPB Light Fixture 4 foot	41 ea	\$608.96 /ea	\$24,967
LPE4 Lighting Fixture	19 ea	\$608.96 /ea	\$11,570
LPB8 Light Fixture	130 ea	\$608.96 /ea	\$79,165
GPL1 8 foot	20 ea	\$817.96 /ea	\$16,359
LPA Light Fixture 8 foot (3)	24 lf	\$234.96 /lf	\$5,639
LPA1 Light Fixture 10 foot(214)	2,140 lf	\$234.96 /lf	\$502,804
LPA1 Light Fixture 12 foot (13)	156 lf	\$234.96 /lf	\$36,653
LPA1 Light Fixture 14 foot (5)	70 lf	\$234.96 /lf	\$16,447

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
LPA1 Light Fixture 16 foot (4)	64 lf	\$234.96 /lf	\$15,037
LPA1 Light Fixture 18 foot (7)	126 lf	\$234.96 /lf	\$29,604
LPA1 Light Fixture 20 foot (2)	40 lf	\$234.96 /lf	\$9,398
LPA1 Light Fixture 4 foot (60)	240 lf	\$234.96 /lf	\$56,389
LPA1 Light Fixture 6 foot (24)	144 lf	\$234.96 /lf	\$33,834
LPA1 Light Fixture 8 foot (61)	488 lf	\$234.96 /lf	\$114,658
LPA2 per linear 4 foot (2)	17 lf	\$190.99 /lf	\$3,287
LPC Lighting Fixture 20 foot (2)	40 lf	\$135.99 /lf	\$5,440
LPC Lighting Fixture 25 foot (1)	25 lf	\$135.99 /lf	\$3,400
LPC Lighting Fixture 36 foot (1)	216 lf	\$135.99 /lf	\$29,375
LPC Lighting Fixture 42 foot (1)	42 lf	\$135.99 /lf	\$5,712
LPC Lighting Fixture 49 foot (1)	50 lf	\$135.99 /lf	\$6,800
LPC Lighting Fixture 53 foot (3)	162 lf	\$135.99 /lf	\$22,031
LPC Lighting Fixture 6foot (15)	90 lf	\$135.99 /lf	\$12,240
LPC Lighting Fixture 8 foot (41)	328 lf	\$135.99 /lf	\$44,606
LPC Lighting Fixture 10 foot (45)	450 lf	\$135.99 /lf	\$61,198
LPD Lighting Fixture 4 foot (46)	184 lf	\$135.99 /lf	\$25,023
LPD Lighting Fixture 6 foot (1)	6.00 lf	\$135.99 /lf	\$816
LPG Light Fixture 12 foot (2)	24 lf	\$135.99 /lf	\$3,264
LPG Light Fixture 18 foot (2)	36 lf	\$135.99 /lf	\$4,896
LPG Light Fixture 4 foot (3)	12 lf	\$135.99 /lf	\$1,632
LPH3A per linear foot	80 lf	\$135.99 /lf	\$10,880
LPK 12 foot (10) composite Unit	120 lf	\$135.99 /lf	\$16,319
LPK 16 foot (10) composite Unit	160 lf	\$135.99 /lf	\$21,759
LPK 8 foot (1) composite Unit	8.00 lf	\$135.99 /lf	\$1,088
LPL 10 foot Pendant (9)	90 lf	\$135.99 /lf	\$12,240
LPL 12 foot Pendant (3)	36 lf	\$135.99 /lf	\$4,896
LPL 15 foot Pendant (1)	15 lf	\$135.99 /lf	\$2,040
LPL 16 foot Pendant (5)	80 lf	\$135.99 /lf	\$10,880
LPL4 foot Pendant	48 lf	\$135.99 /lf	\$6,528
LPM1 4 foot (7)Lighting Fixture	28 lf	\$135.99 /lf	\$3,808
LPM1 8 foot (6)Lighting Fixture	48 lf	\$135.99 /lf	\$6,528
LPM2 4 foot (14)Lighting Fixture	56 lf	\$135.99 /lf	\$7,616
LPM2 6 foot (3)Lighting Fixture	18 lf	\$135.99 /lf	\$2,448
LPM2 8foot (9)Lighting Fixture	72 lf	\$135.99 /lf	\$9,792
GWD4 Wall Mounted Fixture	32 ea	\$391.71 /ea	\$12,535
GWE1 Light Fixture	39 ea	\$561.71 /ea	\$21,907
GWE2 Light Fixture	31 ea	\$561.71 /ea	\$17,413
GWF Fixture	24 ea	\$391.71 /ea	\$9,401
LSG1 Lighting Fixture 4 foot fixture 04-20-2023	84 ea	\$561.71 /ea	\$47,184
LSH 4 Foot	24 ea	\$561.71 /ea	\$13,481
LSG2 Light Fixture 8 foot fixture	54 ea	\$706.21 /ea	\$38,135
LSH 2 foot per linear foot(10)	20 lf	\$135.99 /lf	\$2,720
LSH 30 foot per linear foot(10)	60 lf	\$135.99 /lf	\$8,160
LSH 8 foot per linear foot(29)	232 lf	\$135.99 /lf	\$31,551

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
LSH 8.3 foot per linear foot(7)	58 lf	\$135.99 /lf	\$7,901
LSJ 7.7 foot Light Fixture(1)	7.70 lf	\$135.99 /lf	\$1,047
LSJ 8 foot Light Fixture(1)	8.00 lf	\$135.99 /lf	\$1,088
LSJ 10 foot Light Fixture(1)	10 lf	\$135.99 /lf	\$1,360
LSJ 10.4 foot Light Fixture(1)	10 lf	\$135.99 /lf	\$1,414
LSJ 10.7 foot Light Fixture(3)	32 lf	\$135.99 /lf	\$4,365
RLB2 10.8 foot Lighting Fixture (2)	22 lf	\$135.99 /lf	\$2,937
RLB2 12.3 foot Lighting Fixture (1)	12 lf	\$135.99 /lf	\$1,673
RLB2 15.5 foot Lighting Fixture (1)	16 lf	\$135.99 /lf	\$2,108
RLB2 16.9 foot Lighting Fixture (3)	51 lf	\$135.99 /lf	\$6,895
RLB2 18 foot Lighting Fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLB2 19.1 foot Lighting Fixture (1)	19 lf	\$135.99 /lf	\$2,598
RLB2 23.6 foot Lighting Fixture (1)	24 lf	\$135.99 /lf	\$3,209
RLB2 40.85 foot Lighting Fixture (1)	41 lf	\$135.99 /lf	\$5,555
RLB2 6.1 foot Lighting Fixture (2)	12 lf	\$135.99 /lf	\$1,659
RLB2 6.6 foot Lighting Fixture (2)	13 lf	\$135.99 /lf	\$1,795
RLB2 68 foot Lighting Fixture (4)	272 lf	\$135.99 /lf	\$36,991
RLB2 8 foot Lighting Fixture (2)	16 lf	\$135.99 /lf	\$2,176
RLB2 86.4 foot Lighting Fixture (1)	86 lf	\$135.99 /lf	\$11,750
RLB3 18 foot Lighting Fixture (1)	18 lf	\$135.99 /lf	\$2,448
RLB3 23 foot Lighting Fixture (1)	23 lf	\$135.99 /lf	\$3,128
RLB3 23.4 foot Lighting Fixture (1)	23 lf	\$135.99 /lf	\$3,182
RLB3 29.9 foot Lighting Fixture (1)	30 lf	\$135.99 /lf	\$4,066
RLB3 37.3 foot Lighting Fixture (1)	37 lf	\$135.99 /lf	\$5,073
RLB4 15.2 foot Lighting Fixture(1)	15 lf	\$135.99 /lf	\$2,067
RLB4 29.9 foot Lighting Fixture(2)	60 lf	\$135.99 /lf	\$8,132
RLD2 10.3 foot Light Fixture (1)	10 lf	\$135.99 /lf	\$1,401
RLD2 4 foot Light Fixture (11)	44 lf	\$135.99 /lf	\$5,984
RLD2 7.1 foot Light Fixture (2)	14 lf	\$135.99 /lf	\$1,918
RLD2 8 foot Light Fixture (1)	8.00 lf	\$135.99 /lf	\$1,088
GWC Exterior Wall mounted Light	19 ea	\$668.96 /ea	\$12,710
RLF Lighti Fixture	9.00 lf	\$135.99 /lf	\$1,224
RLG Lighting Fixture	3.00 ea	\$818.96 /ea	\$2,457
RLH Lighting Fixture	9.00 ea	\$818.96 /ea	\$7,371
RM Light Fixture	6.00 ea	\$448.96 /ea	\$2,694
SWA Lighting Fixture	14 ea	\$618.96 /ea	\$8,665
DPA Light Fixutre	12 ea	\$618.96 /ea	\$7,428
DPB Lighting Fixture	12 ea	\$718.96 /ea	\$8,628
GPB Fixture	145 ea	\$818.96 /ea	\$118,749
GPK Light Fixture	23 ea	\$1,240.98 /ea	\$28,543
GSA Light Fixture	56 ea	\$718.96 /ea	\$40,262
PB Lighting Fixture	36 ea	\$618.96 /ea	\$22,283
PD1 Lighting Fixture	97 ea	\$618.96 /ea	\$60,039
PF1 Lighting Fixture	84 ea	\$618.96 /ea	\$51,993
RP Lighting Fixture	10 ea	\$448.96 /ea	\$4,490

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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	19 ea	\$207.21 /ea	\$3,937
EC1	87 ea	\$391.71 /ea	\$34,079
EW1	8.00 ea	\$391.71 /ea	\$3,134
Exit Sign	2.00 ea	\$391.71 /ea	\$783
F1 Lighting Fixture 4 foot	9.00 ea	\$200.00 /ea	\$1,800
F1 Lighting Fixture 6 foot	81 ea	\$200.00 /ea	\$16,200
12/2 MC Cable Composite Unit	72,000 lf	\$3.70 /lf	\$266,292
D5044 Lighting Controls & Wiring		\$2.34 / SF	\$890,669
S (1) Single pole Switch Composite unit	1.00 ea	\$78.72 /ea	\$79
ST Single Pole Switch	57 ea	\$78.72 /ea	\$4,487
SD (1) Dimmer Switch composite unit	329 ea	\$155.59 /ea	\$51,188
S3 (1) 3 way switch composite unit	18 ea	\$85.00 /ea	\$1,530
SLC for projection Screen (1) Low voltage Switch Composite unit	3.00 ea	\$92.22 /ea	\$277
SLV (1) Low voltage Switch Composite unit	111 ea	\$92.22 /ea	\$10,236
SLV (1) Low voltage Switch Composite unit for projection Screen	5.00 ea	\$92.22 /ea	\$461
Occupancy sensor Wall mounted Composite unit	79 ea	\$255.70 /ea	\$20,200
SVSD Vacancy Sensor Dimmer	70 ea	\$286.76 /ea	\$20,073
Vacancy sensor Wall mounted Composite unit	69 ea	\$286.76 /ea	\$19,787
OS1 Occupancy sensor Ceiling mounted Composite unit	434 ea	\$289.42 /ea	\$125,609
Lighting Control Panel composite unit q qscamps-0 quantuam management system	1.00 ea	\$4,964.04 /ea	\$4,964
Lighting Control Panel composite unit qp2-2posce`120	1.00 ea	\$4,964.04 /ea	\$4,964
Lighting Control Panel composite unit qp3 1 pl 100-240	2.00 ea	\$4,964.04 /ea	\$9,928
Lighting Control Panel composite unit qsn-4s20	3.00 ea	\$4,964.04 /ea	\$14,892
Lighting Control Panel composite unit qsn-4t-16-s	14 ea	\$4,964.04 /ea	\$69,497
Lighting Control Panel composite unit xp48dr	3.00 ea	\$4,964.04 /ea	\$14,892
Recptacle Control Panel composite unit	9.00 ea	\$4,964.04 /ea	\$44,676
VS1 Vacancy sensor Ceiling mounted Composite unit	260 ea	\$250.32 /ea	\$65,084
Daylight Sensor Ceiling Mounted Composite unit	154 ea	\$278.70 /ea	\$42,919
20 AMP EMT Composite feeders copper - Large Power	15,000 lf	\$16.93 /lf	\$253,970
12/2 MC Cable Composite Unit	30,000 lf	\$3.70 /lf	\$110,955
D5046 Theatrical Lighting		\$0.33 / SF	\$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		\$3.80 / SF	\$1,446,403
D5094 Grounding & Lightning Protection Sys.		\$0.70 / SF	\$264,651
Ground Rod - Copperclad 3/4" x 10'	27 ea	\$126.99 /ea	\$3,429
Ground Surface Mounted Electrode	1.00 ea	\$500.00 /ea	\$500
Lightening Protection Air Terminal	244 ea	\$465.25 /ea	\$113,521
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

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Copper Ground Bus Bar .25"x 2" x 4 foot	2.00 ea	\$729.00 /ea	\$1,458
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	82 ea	\$74.99 /ea	\$6,149
Lp Cadweld	44 ea	\$96.26 /ea	\$4,235
Grouounding Cable Copper Bare Stranded # 4/0	3,297 lf	\$7.41 /lf	\$24,440
Grouounding Cable Copper Bare Stranded # 500	1,500 lf	\$12.00 /lf	\$18,000
Lightening Protection Cable Copper Bare Stranded # 4/0	8,487 lf	\$7.41 /lf	\$62,914
D5095 Miscellaneous Electrical Systems		\$3.11 / SF	\$1,181,752
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	382,610 gsf	\$0.72 /gsf	\$275,000
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	\$100,000.00 /ea	\$100,000
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 zones per classroom to three zones per classroom.	0.00 ls		\$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		\$0
VE03 Provide aluminum feeders for those within the main building 200Amps and larger. This does not include feeders run to the satellite buildings	0.00 ls		\$0
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 Viper - https://hubbellcdn.com/specsheet/BEA_VIPERSPEC.pdf	0.00 ls		\$0
VE06 Shorten Duct Bank Primary, Telcom and Generator to more in the range of to in the range of 500 lf	0.00 ls		\$0
VE07 Move All Transformer closer to their prospective Switchboards in the range of 50 linear feet per run currently 200+ feet away	0.00 ls		\$0
VE08 Utilize Aluminum Feeders 100 amps can be added to above	0.00 ls		\$0
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 NOW VE07 ACCEPTED - TARGET REDUCTION VIA COORDINATION	0.00 ls		\$0
VE14 Utilize Lightning Preventor System in lieu of Lightening Protection cannot be take with E12 - NOW VE E02 ACCEPTED	0.00 ls		\$0

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
VE15 Move Class Speech Reinforcement to tech Budget Wireless 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 Secondaries and remove Secondary Duct Bank reduces redundancy NOW VE EO4 ACCEPTED	0.00 ls		\$0
VE18 Eliminate panels and transformers for Parking EV charging Stations conduit, wire ,panels transformer and charging station	0.00 ls		\$0
VE19 Re-evaluate conduit and Service going from Maintenance Building to Main Building(reduce spares and shorter conduits)	0.00 ls		\$0
VE20 Eliminate Theatrical Dimming and rough in(eliminates all Electrical Scope associated with Theater) - NOW VE E03A ACCEPTED	0.00 ls		\$0
VE21 Revaluate Conduit and how site Lighting is powered for entrance near School Sign and power and communication for sign potentially wirless NOW VE E11 ACCEPTED	0.00 ls		\$0
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		\$7.71 / SF	\$2,933,945
D5090 OTHER ELECTRICAL SYSTEMS		\$0.45 / SF	\$172,408
D5092 Clock Systems		\$0.45 / SF	\$172,408
Clock Single Face Battery or 110 clock	238 ea	\$447.15 /ea	\$106,422
Clock Single Face Battery or 110 clock 16"	26 ea	\$496.84 /ea	\$12,918
Clock Rough in and Backboxes	1.00 ls	\$32,791.18 /ls	\$32,791
LV Cabling (included in overall)	7,920 lf	\$2.56 /lf	\$20,277
D6010 COMMUNICATIONS & SECURITY		\$3.75 / SF	\$1,426,114
D6013 Tel/Data System		\$3.75 / SF	\$1,426,114
Wiremold D2 Data Jack Only Composite Unit	6.00 ea	\$305.03 /ea	\$1,830
Floor Box D2/VPL data con. - Composite Unit	3.00 ea	\$1,251.56 /ea	\$3,755
Poke thru D2/VPL data con. - Composite Unit	7.00 ea	\$1,251.56 /ea	\$8,761
Poke Thru D3 data con. - Composite Unit	4.00 ea	\$1,251.56 /ea	\$5,006
Poke Thru D2 data con. - Composite Unit	65 ea	\$1,077.79 /ea	\$70,056
IDF Room Fit-Out composite unit	11 ea	\$17,163.42 /ea	\$188,798
MDF Room Fit-Out composite unit	1.00 ea	\$54,651.93 /ea	\$54,652
Tel/data Backbone Cabling , additional Devices and Testing	2,000 lf	\$39.75 /lf	\$79,494
D1 Telephone jack with 3/4" Stub to accessible ceiling composite unit 30 feet	1.00 ea	\$609.22 /ea	\$609
DPI - D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
E jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
F jack with 3/4" Stub to accessible ceiling composite unit 30 feet	2.00 ea	\$609.22 /ea	\$1,218
Vape D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	76 ea	\$609.22 /ea	\$46,301
VH - D1 Data jack... at additional TVs and Displays not labeled	14 ea	\$609.22 /ea	\$8,529

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Water Heat Detection D1 Data jack with 3/4" Stub to accessible ceiling composite unit 30 feet	3.00 ea	\$609.22 /ea	\$1,828
WE WAP Enclosure	31 ea	\$609.22 /ea	\$18,886
WP - "VOIP" Wall Telephone Outlet	19 ea	\$609.22 /ea	\$11,575
WPIP - "VOIP" Wall Telephone Outlet	69 ea	\$609.22 /ea	\$42,036
EMP - Empty back box for Simman Cabling by Owner	13 ea	\$419.03 /ea	\$5,447
S2 Data jack with 3/4" Stub up to accessible ceiling composite unit 30 feet	10 ea	\$735.71 /ea	\$7,357
TD2 TelData jack with 3/4" Stub up to accessible ceiling composite unit 30 feet	9.00 ea	\$735.71 /ea	\$6,621
D2 Data jack with 1/2" Stub to accessible ceiling composite unit 30 feet _2_	666 ea	\$693.75 /ea	\$462,036
VPL - Low Video Presentation Outlet composite unit 10 feet _1_	102 ea	\$599.94 /ea	\$61,194
VPH - High Video Presentation Outlet composite unit 10 feet	140 ea	\$751.68 /ea	\$105,235
D4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet	1.00 ea	\$988.70 /ea	\$989
S4 Data jack with 3/4" stub up to accessible ceiling composite unit 30 feet	2.00 ea	\$988.70 /ea	\$1,977
Audio Visual Cabling Overall Value	1.00 ea	\$98,373.49 /ea	\$98,373
IPTV and Video on Demand(overal IPTV and Video Demand) - shift to Tech Budget	0.00 excl		\$0
WAP jack ceiling mounted composite unit	236 ea	\$488.67 /ea	\$115,326
Telcom not Defined in Media Center	2,648 gsf	\$5.96 /gsf	\$15,787
55" Signage - Wall Mtd Display - Composite Assembly	2.00 excl	\$0.00 /excl	\$0
65" Signage - Wall Mtd Display - Composite Assembly	23 excl	\$0.00 /excl	\$0
75" Wall Mtd Display - Composite Assembly	120 excl	\$0.00 /excl	\$0
Additional telcom Adjustment	0.00 ea		\$0
D6030 SOUND AND A/V		\$3.51 / SF	\$1,335,424
D6031 Audio-Video Systems		\$2.79 / SF	\$1,061,452
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	\$313.01 /ea	\$2,504
Speech Reinforcement System	111 ea	\$2,327.18 /ea	\$258,317
Fitness Center Audio Visual System	1.00 ea	\$15,401.91 /ea	\$15,402
IC - Intercom Wall Plate, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$245.92 /ea	\$246
Weight Audio Visual System	1.00 ea	\$17,389.25 /ea	\$17,389
Gym Audio Visual System RACK	1.00 ea	\$23,777.14 /ea	\$23,777
Studen Commons Audio Visual System	1.00 ea	\$89,004.49 /ea	\$89,004
TP - AV Sys. Control Touch Plate, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$219.48 /ea	\$219
Auditorium ALS Assisted Listening System Antenna	1.00 ea	\$3,296.40 /ea	\$3,296
Auditorium VPO Video Projector with 1" to AV rack	1.00 ea	\$2,354.57 /ea	\$2,355
Auditorium AV Rack	2.00 ea	\$23,545.69 /ea	\$47,091
Auditorium Dante Input Plate with 1" to AV rack	4.00 ea	\$1,412.74 /ea	\$5,651
Auditorium Fill Speaker	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Intercom Wall Plate with 1" to AV rack	4.00 ea	\$1,412.74 /ea	\$5,651

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Auditorium Local Speakr in Hall Way	3.00 ea	\$470.91 /ea	\$1,413
Auditorium LSS Loud Speaker	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Mon with Wall Plate with 1" to AV rack	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium Motorized Projection Screen	1.00 ea	\$14,127.42 /ea	\$14,127
Auditorium Projector	1.00 ea	\$47,091.39 /ea	\$47,091
Auditorium Sub Woofer	2.00 ea	\$2,354.57 /ea	\$4,709
Auditorium TP Touch Control Plate with 1" to AV rack	5.00 ea	\$3,296.40 /ea	\$16,482
Auditorium/Stage Video	1.00 ea	\$58,626.62 /ea	\$58,627
Cafeteria Local Speaker	16 ea	\$470.91 /ea	\$7,535
Class Room and Conference Room Interactive Flat Panel excluded shifted to tech Budget	0.00 excl		\$0
Gym Local Speaker	24 ea	\$1,417.50 /ea	\$34,020
DAN - Dante Input Wall Panel, backbox w/ 1" Conduit to AV Rack	1.00 ea	\$502.41 /ea	\$502
Video Projector	1.00 ea	\$144.20 /ea	\$144
Instructional AV Excluded part of tech budget	1.00 ea	\$0.00 /ea	\$0
Large AV Allowance	1.00 ea	\$554,230.20 /ea	\$554,230
Scoreboards Exterior Connection	1.00 ea	\$1,495.89 /ea	\$1,496
VE E01 - ADJUST BASED ON TECH / SECURITY FEEDBACK	-1.00 ea	\$163,955.79 /ea	(\$163,956)
D6032 Sound/PA Systems		\$0.72 / SF	\$273,972
Public Address Speaker	713 ea	\$183.83 /ea	\$131,070
Sound Chime	9.00 ea	\$149.05 /ea	\$1,341
PA Horn Speaker	63 ea	\$298.10 /ea	\$18,780
Sound AES	1.00 ea	\$397.47 /ea	\$397
Sound AV floor box	1.00 ea	\$1,192.41 /ea	\$1,192
Sound Exterior Speaker	1.00 ea	\$397.47 /ea	\$397
VCE	2.00 ea	\$1,192.41 /ea	\$2,385
VC - PA Speaker Volume Control	73 ea	\$149.05 /ea	\$10,881
LV Cabling for Speaker	42,000 lf	\$2.56 /lf	\$107,527
28 ELECTRONIC SAFETY & SECURITY		\$7.45 / SF	\$2,835,722
D6010 COMMUNICATIONS & SECURITY		\$5.03 / SF	\$1,914,206
D6011 Fire Alarm System		\$1.48 / SF	\$563,056
Fire Alarm Manual pull station composite unit	57 ea	\$271.61 /ea	\$15,482
Fire Alarm Bell Exterior - WP composite unit	1.00 ea	\$278.99 /ea	\$279
Fire Alarm Smoke detector composite unit	143 ea	\$338.62 /ea	\$48,422
Fire Alarm Duct smoke detector with relay base composite unit	23 ea	\$707.94 /ea	\$16,283
Fire Alarm Flow switch composite unit	7.00 ea	\$242.39 /ea	\$1,697
Fire Alarm Tamper switch composite unit	14 ea	\$242.39 /ea	\$3,393
Fire Alarm Sounder composite unit	60 ea	\$274.64 /ea	\$16,479
Fire Alarm Strobe Wall composite unit	68 ea	\$268.00 /ea	\$18,224
Fire Alarm BDA	2.00 ea	\$509.44 /ea	\$1,019
Fire Alarm Remote indicating light composite unit	38 ea	\$203.70 /ea	\$7,741
Fire Alarm Knox Box composite unit	3.00 ea	\$500.00 /ea	\$1,500
Fire Alarm Speaker strobe composite unit	494 ea	\$327.46 /ea	\$161,763
FACP	1.00 ea	\$23,643.21 /ea	\$23,643
Fire Alarm Terminal cabinet composite unit	9.00 ea	\$1,395.43 /ea	\$12,559

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Control Relay	42 ea	\$335.17 /ea	\$14,077
Fire Alarm Monitor module composite unit	56 ea	\$335.17 /ea	\$18,770
Fire Alarm Relay Monitor composite unit	10 ea	\$335.17 /ea	\$3,352
FDS Fire Alarm	25 ea	\$2,377.21 /ea	\$59,430
SD smoke Damper Fire Alarm	3.00 ea	\$2,377.21 /ea	\$7,132
Ventalation Control Panels	1.00 ea	\$3,500.00 /ea	\$3,500
ARM Two Way Fire Dept Communcation Station	2.00 ea	\$3,436.21 /ea	\$6,872
BP Fire Booster Panel	10 ea	\$3,436.21 /ea	\$34,362
Fire Alarm Annunciator large composite unit	19 ea	\$4,425.21 /ea	\$84,079
Fire Alarm Misc connection Fire Pump , Gas Shut off to FACP	2.00 ea	\$1,500.00 /ea	\$3,000
D6016 Surveillance CCTV System		\$2.47 / SF	\$939,423
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 Exterior 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	69 ea	\$330.99 /ea	\$22,838
CCTV Camera D1 Data jack with 1/2" Stub to accessible ceiling composite unit 10 feet _1_	183 ea	\$356.76 /ea	\$65,288
Security CCTV Head End - Medium Composite Unit	1.00 ea	\$36,689.00 /ea	\$36,689
CCTV Video Camera - PTZ Dome Camera, Interior Assembly Composite Unit	202 ea	\$1,893.00 /ea	\$382,386
CCTV Video Camera - PTZ Dome Camera, Exterior WP Assembly Composite Unit	69 ea	\$2,101.00 /ea	\$144,969
D6017 Security Access Control		\$1.08 / SF	\$411,726
(1) 2" Empty PVC Conduit with pull string composite unit - Large 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 SA - Siren	15 ea	\$186.75 /ea	\$2,801
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 included LR	69 ea	\$179.28 /ea	\$12,370
Security Card Reader Composite Unit	72 ea	\$259.29 /ea	\$18,669
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	61 ea	\$198.77 /ea	\$12,125
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 Unit	8.00 ea	\$1,319.70 /ea	\$10,558
Security Reconciliation Adjustment	1.00 ea	\$160,000.00 /ea	\$160,000
Security Intercom Station With Video Interior / Exterior WP Composite Unit	6.00 ea	\$684.76 /ea	\$4,109
Security VES - Security Stantion with airphone intercom	7.00 ea	\$684.76 /ea	\$4,793
Security VMS - Security Stantion with airphone intercom	5.00 ea	\$684.76 /ea	\$3,424
Security Head End and Testing	1.00 ea	\$125,000.00 /ea	\$125,000

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
D7050 DETECTION & ALARM		\$2.42 / SF	\$921,516
D6011 Fire Alarm System		\$2.42 / SF	\$921,516
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
Fire Alarm CO detector composite unit	50 ea	\$341.54 /ea	\$17,077
Fire Alarm Heat detector composite unit	102 ea	\$341.54 /ea	\$34,837
Area of Refuge ESC	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
05 MAINTENANCE BLDG	380,570 SF	\$0.00 / SF	\$0
26 ELECTRICAL		\$0.00 / SF	\$0
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$0.00 / SF	\$0
D5023 Large Power & Distribution		\$0.00 / SF	\$0
112.5 KVA NEMA 1 Transformer composite unit	0.00 ea		\$0
400 AMP 120/208 Panel board surface mounted composite unit	0.00 ea		\$0
225 AMP 277/480 Panel board surface mounted composite unit	0.00 ea		\$0
D5024 Large Power Feeder Conduit		\$0.00 / SF	\$0
#333 400 AMP EMT Composite feeders Aluminum - Large Power	0.00 lf		\$0
#331 225 AMP PVC Composite feeder aluminum - Large Power	0.00 lf		\$0
06 SITEWORK	380,570 SF	\$8.22 / SF	\$3,130,051
26 ELECTRICAL		\$7.44 / SF	\$2,831,520
D5020 ELECTRICAL SERVICE & DISTRIBUTION		\$4.09 / SF	\$1,557,969
D5021 Medium Voltage Conduit and Cabling		\$1.82 / SF	\$692,100
Primary Above Ground Enclosures- 07/01/22 Main Distribution	12 ea	\$5,806.14 /ea	\$69,674
Ground Manholes and above Ground Enclosures	12 ea	\$740.48 /ea	\$8,886
Ground Transformer Pads - 07/01/22 Main Distribution	3.00 ea	\$2,683.37 /ea	\$8,050
Layout Transformer Pads - 07/01/22 Main Distribution	3.00 ea	\$2,683.37 /ea	\$8,050
Duct Bank B (2) 4" Empty PVC Conduit with pull string composite unit Spares	1,528 lf	\$38.00 /lf	\$58,064
Duct Bank C (8) 4" Empty PVC Conduit with pull string composite unit Spares	1,247 lf	\$152.00 /lf	\$189,544
Duct Bank D (4) 4" Empty PVC Conduit with pull string composite unit Spares	1,527 lf	\$76.00 /lf	\$116,052
Duct Bank F (4) 4" Empty PVC Conduit with pull string composite unit Spares	90 lf	\$76.00 /lf	\$6,840
Duct Bank H (4) 4" Empty PVC Conduit with pull string composite unit Spares	713 lf	\$76.00 /lf	\$54,188
Duct Bank K (2) 4" Empty PVC Conduit with pull string composite unit Spares	34 lf	\$38.00 /lf	\$1,292
Duct Bank N (6) 4" Empty PVC Conduit with pull string composite unit Spares	824 lf	\$114.00 /lf	\$93,936
Duct Bank O (3) 4" Empty PVC Conduit with pull string composite unit Spares	263 lf	\$51.00 /lf	\$13,413

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Existing overhead Services Removed	312 ea	\$19.84 /ea	\$6,191
Feeder #001 (2) 5" Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Feeder #079 (4) 5" Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Feeder #086 (4) 5" Emergency Empty PVC Conduit Spares for primary with pull string composite unit - Large Power	0.00 lf		\$0
Telcom Cable Overhead	99 lf	\$76.55 /lf	\$7,579
Duct Bank M (6) 2" Empty PVC Conduit with pull string composite unit - Large Power	771 lf	\$54.08 /lf	\$41,698
Site Duct Bank (2) 2" Empty PVC Conduit with pull string composite unit - Large Power	339 lf	\$18.00 /lf	\$6,102
Site Duct Bank (6) 2" Empty PVC Conduit with pull string composite unit - Large Power	47 lf	\$54.08 /lf	\$2,542
D5022 Medium Voltage Switchgear and Panelboard		\$0.00 / SF	\$0
Generator by Utility Company	1.00 ea	\$0.00 /ea	\$0
D5023 Large Power & Distribution		\$0.11 / SF	\$42,420
75 KVA NEMA 1 Transformer composite unit at Site	1.00 ea	\$9,961.68 /ea	\$9,962
75 kva and combined Panelboard for ev charging	3.00 ea	\$3,500.00 /ea	\$10,500
225 AMP 120/208 Panel board surface mounted composite unit at Site	1.00 ea	\$3,989.84 /ea	\$3,990
300 AMP 277/480 Panel board surface mounted composite unit Site	1.00 ea	\$5,556.76 /ea	\$5,557
800 AMP 277/480 Distribution Panel board surface mounted composite unit - LPH in site lighting pedestal cabinet	1.00 ea	\$12,411.87 /ea	\$12,412
D5024 Large Power Feeder Conduit		\$2.07 / SF	\$787,812
100 AMP PVC Composite feeders Copper - Large Power EV charging Station	839 lf	\$102.06 /lf	\$85,629
#343 125 AMP PVC Composite feeder aluminum - Large Power	700 lf	\$38.22 /lf	\$26,756
#345 300 AMP PVC Composite feeder aluminum - Large Power	700 lf	\$73.97 /lf	\$51,776
250 AMP PVC Composite feeder copper - Large Power to sports field lighting	650 lf	\$98.13 /lf	\$63,787
Feeder #085 600 AMP PVC Composite feeder copper - Large Power	220 lf	\$243.95 /lf	\$53,669
#339 800 AMP PVC Composite feeder copper - Large Power	60 lf	\$283.47 /lf	\$17,008
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 Power	169 lf	\$1,464.53 /lf	\$247,506
Feeder #080 4000 AMP PVC Composite feeder copper - Large Power	191 lf	\$1,464.53 /lf	\$279,726
Reduce Secondary Lenth 4000 AMP PVC Composite feeder copper - Large Power per recon 05-08-2023	-100.00 lf	\$1,464.53 /lf	(\$146,453)
Site Duct Bank (1) 1" Empty PVC Conduit with pull string composite unit - Large Power	115 lf	\$15.77 /lf	\$1,814
D5029 Small Power Devices & Wiring		\$0.05 / SF	\$19,718
Power to field Scoreboards	2.00 gsf	\$1,521.43 /gsf	\$3,043

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
60 AMP PVC Composite feeder copper - Large Power for transh compactors	652 lf	\$25.57 /lf	\$16,675
D5049 Site Lighting		\$0.04 / SF	\$15,919
30 AMP EMT Composite feeders copper - Large Power Site Wall Lighting	806 lf	\$19.75 /lf	\$15,919
D5040 LIGHTING		\$3.33 / SF	\$1,266,531
D5048 Sports Lighting		\$1.20 / SF	\$456,378
Site Lighting Branch	2,000 ea	\$25.69 /ea	\$51,378
Sport Lighting S1 thru @4 for Football includes base install and rigging	4.00 ea	\$100,000.00 /ea	\$400,000
Sprts Lighting Cabinet	1.00 ea	\$5,000.00 /ea	\$5,000
D5049 Site Lighting		\$2.13 / SF	\$810,154
120 Votl Cirucit for all Site Pole may need small tranformer	90 ea	\$800.00 /ea	\$72,000
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 Pedistal Cabinet	1.00 ea	\$2,500.00 /ea	\$2,500
Sitel Lighting Pedistal Cabinet for digital sign out near street	1.00 ea	\$2,500.00 /ea	\$2,500
Sitel Lighting Pole Base	112 ea	\$993.66 /ea	\$111,290
Quazite Handhole Enclosure Composite Unit - Cover included	132 ea	\$918.52 /ea	\$121,244
1" for EV chaging Pedstalls	2,403 ea	\$25.00 /ea	\$60,075
2" PVC Gas Storage to building	918 ea	\$16.45 /ea	\$15,103
Site Branch to Digital Sign 2"	918 ea	\$14.77 /ea	\$13,556
Site Lighting Branch 1" for Sign Floor Light	23 ea	\$14.77 /ea	\$340
Site Lighting Branch 2" branch	8,873 ea	\$14.77 /ea	\$131,027
Electrical Vehicle Charging Station Charging Station @ Site VE 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)	1.00 ls	\$6,121.62 /ls	\$6,122
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	24 ea	\$1,886.51 /ea	\$45,276
Site Lighting EXP3	10 ea	\$2,200.00 /ea	\$22,000
EXP1BC Light Fixture Site Pole Single Head Composite Unit	2.00 ea	\$2,017.98 /ea	\$4,036
Exp4 Light Fixture Site Pole Single Head Composite Unit	2.00 ea	\$2,017.98 /ea	\$4,036
Site Lighting EXF1	18 ea	\$1,600.00 /ea	\$28,800
Site Lighting EXP1	40 ea	\$2,017.98 /ea	\$80,719
Site Lighting EXP2	14 ea	\$2,017.98 /ea	\$28,252
D5090 OTHER ELECTRICAL SYSTEMS		\$0.02 / SF	\$7,020
D5095 Miscellaneous Electrical Systems		\$0.02 / SF	\$7,020
Quad Shak Lighting Power and Teldata	1.00 ea	\$7,020.00 /ea	\$7,020
27 COMMUNICATIONS		\$0.72 / SF	\$273,531
D6010 COMMUNICATIONS & SECURITY		\$0.72 / SF	\$273,531
D6013 Tel/Data System		\$0.72 / SF	\$273,531
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

26A ELECTRICAL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
(1) 1" Empty PVC Conduit with pull String composite unit with 2 Stand Fiber	439 lf	\$20.00 /lf	\$8,780
(1) 2" Empty PVC Conduit with pull String composite unit with 2 Stand Fiber	494 lf	\$28.00 /lf	\$13,832
(1) 4" Empty PVC Conduit with pull String composite unit with 12 Stand Fiber	5,871 lf	\$34.00 /lf	\$199,614
28 ELECTRONIC SAFETY & SECURITY		\$0.07 / SF	\$25,000
D7050 DETECTION & ALARM		\$0.07 / SF	\$25,000
D6017 Security Access Control		\$0.07 / SF	\$25,000
Security Gate and Power added during Recon 12-20-2022	1.00 ea	\$25,000.00 /ea	\$25,000
TOTAL 26A ELECTRICAL		\$65.72 / SF	\$25,010,715

31A EXCAVATION AND FILL

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$5.84 / SF	\$2,221,798
31 EARTHWORK		\$5.31 / SF	\$2,021,520
A1010 STANDARD FOUNDATIONS		\$3.38 / SF	\$1,285,770
A9011 Backfill & Compaction		\$3.38 / SF	\$1,285,770
BP 31A - Excav. Column Footings	7,763 cy	\$20.00 /cy	\$155,260
BP 31A - Excav. Continuous & Retaining Wall Footings	16,675 cy	\$20.00 /cy	\$333,500
BP 31A - Excav. Pits	150 cy	\$20.00 /cy	\$3,000
BP 31A - Backfill & Compact Column Footings	5,655 cy	\$38.00 /cy	\$214,890
BP 31A - Backfill Pits	125 cy	\$38.00 /cy	\$4,750
BP 31A - Backfill Wall / Footings	15,115 cy	\$38.00 /cy	\$574,370
A6010 BUILDING SUBDRAINAGE		\$1.93 / SF	\$735,750
A6011 Foundation Drainage		\$1.93 / SF	\$735,750
BP 31A - Building Foundation Drainage - Perforated PVC (F&I) - Perimeter	3,400 lf	\$35.00 /lf	\$119,000
BP 31A - Building Foundation Drainage - Perforated PVC (F&I) - underslab	10,000 lf	\$35.00 /lf	\$350,000
BP 31A - E&B for Electrical within footprint	1.00 ls	\$50,000.00 /ls	\$50,000
BP 31A - E&B for Plumbing within footprint	3,150 lf	\$45.00 /lf	\$141,750
BP 31A - Radon Mitigation - 20 drops / 60' each	1.00 ls	\$75,000.00 /ls	\$75,000
32 EXTERIOR IMPROVEMENTS		\$0.53 / SF	\$200,278
A4090 SLAB-ON-GRADE SUPPLEMENTARY COMPONENTS		\$0.53 / SF	\$200,278
A4096 Slab-On-Grade Supplementary Components		\$0.53 / SF	\$200,278
BP 31A - Compacted Base Under - ONSITE PROCESSED,@ 12" - Place & Compact	5,295 cy	\$10.00 /cy	\$52,950
BP 31A - Fine Grade Base	128,111 sf	\$0.75 /sf	\$96,083
BP 31A - Rough Grade Base	128,111 sf	\$0.40 /sf	\$51,244
05 MAINTENANCE BLDG	380,570 SF	\$0.03 / SF	\$10,000
33 UTILITIES		\$0.03 / SF	\$10,000
A1010 STANDARD FOUNDATIONS		\$0.03 / SF	\$10,000
A1010 Standard Foundations		\$0.03 / SF	\$10,000
BP 31A - F&I Building Foundation Drainage - Perforated PVC	1.00 ls	\$10,000.00 /ls	\$10,000
06 SITEWORK	380,570 SF	\$61.20 / SF	\$23,290,203
01 GENERAL REQUIREMENTS		\$3.33 / SF	\$1,267,000
Z1050 TEMPORARY FACILITIES & CONTROLS		\$3.33 / SF	\$1,267,000
Z1055 Temporary Construction		\$3.33 / SF	\$1,267,000
BP 31A - Emergency Spill Kit	1.00 ea	\$2,000.00 /ea	\$2,000
BP 31A - Temporary Water and Electric Service - Hook-up & Maintenance	1.00 ls	\$35,000.00 /ls	\$35,000
BP 31A - Temporary Walkways	1.00 ls	\$50,000.00 /ls	\$50,000
BP 31A - Water Truck / Dust Control	1.00 ls	\$30,000.00 /ls	\$30,000
BP 31A - Dewatering - Pumps / Maintenance - Demo/Foundation	1.00 ls	\$400,000.00 /ls	\$400,000

31A EXCAVATION AND FILL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Temporary Access Roads - Farm Rd & Existing Campus Path	4,600 sy	\$32.50 /sy	\$149,500
BP 31A - Temporary Laydown Area - Prep / Maintain	14,275 sy	\$20.00 /sy	\$285,500
BP 31A - Repair Existing Streets, Sidewalks	1.00 allw	\$50,000.00 /allw	\$50,000
BP 31A - Temporary Barriers & Public Safety	1.00 ls	\$40,000.00 /ls	\$40,000
BP 31A - Temporary Bridge Crossing	1.00 ls	\$150,000.00 /ls	\$150,000
BP 31A - Traffic Control - Install & Maintain	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Snow Removal	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Street Sweeping	1.00 ls	\$25,000.00 /ls	\$25,000
02 EXISTING CONDITIONS		\$1.72 / SF	\$656,181
G1020 SITE ELEMENTS DEMOLITION		\$0.84 / SF	\$320,181
G1023 Infrastructure Demolition		\$0.84 / SF	\$320,181
BP 31A - R&D Elec Conduit	581 lf	\$27.00 /lf	\$15,687
BP 31A - R&D Elec DB	1,173 lf	\$43.00 /lf	\$50,439
BP 31A - R&D Gas	132 lf	\$27.00 /lf	\$3,564
BP 31A - R&D Sewer/Drain Pipe	4,122 lf	\$28.00 /lf	\$115,416
BP 31A - R&D Water	2,859 lf	\$25.00 /lf	\$71,475
BP 31A - Cut & Cap Water Service	2.00 ea	\$16,500.00 /ea	\$33,000
BP 31A - R&D Sewer Drain Structure	51 ea	\$600.00 /ea	\$30,600
Z1050 TEMPORARY FACILITIES & CONTROLS		\$0.88 / SF	\$336,000
Z1055 Temporary Construction		\$0.88 / SF	\$336,000
BP 31A - Temp Construction Fence w Rock Cores	7,000 lf	\$48.00 /lf	\$336,000
31 EARTHWORK		\$35.81 / SF	\$13,628,184
G1010 SITE CLEARING		\$2.44 / SF	\$930,412
G1011 Clearing & Grubbing		\$2.44 / SF	\$930,412
BP 31A - Bulk Site Clearing & Grubbing	35 acre	\$5,600.00 /acre	\$196,000
BP 31A - Strip Forest Mat P1 - Offsite Disposal - P1	10,000 cy	\$42.00 /cy	\$420,000
BP 31A - Strip topsoil & screen & stockpile for re-use P1 - P2	8,274 cy	\$38.00 /cy	\$314,412
G1030 SITE ELEMENT RELOCATIONS		\$23.02 / SF	\$8,761,605
G1033 Rock Excavation		\$20.80 / SF	\$7,916,599
BP 31A - Mass Rock Blasting	138,361 cy	\$17.35 /cy	\$2,400,563
BP 31A - Mass Rock Excavation	138,361 cy	\$13.00 /cy	\$1,798,693
BP 31A - Mass Rock Processing	138,361 cy	\$11.00 /cy	\$1,521,971
BP 31A - ROCK EXCAVATION TO SUBSURFACE SYTEM #2	5,327 cy	\$36.00 /cy	\$191,760
BP 31A - Allow for additional material handling due to logistics	148,632 cy	\$3.00 /cy	\$445,896
BP 31A - Allow for Rock Scaling	1.00 ls	\$154,300.00 /ls	\$154,300
BP 31A - TO 5' BELOW SLAB FOR OVERBLAST	16,667 cy	\$35.00 /cy	\$583,333
BP 31A - Trench Rock Blasting	10,001 cy	\$55.00 /cy	\$550,055
BP 31A - Trench Rock Excavation	10,001 cy	\$15.00 /cy	\$150,015
BP 31A - Trench Rock Processing	10,001 cy	\$12.00 /cy	\$120,012
G1034 Fill & Borrow		\$1.59 / SF	\$606,088
BP 31A - Fill to get to sub grade elev - phase 1 - from onsite processed rock	49,222 cy	\$8.00 /cy	\$393,776

31A EXCAVATION AND FILL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Fill to get to sub grade elev - phase 2 - from onsite processed rock	26,539 cy	\$8.00 /cy	\$212,312
G1035 Temporary Erosion & Sediment Control		\$0.63 / SF	\$238,918
BP 31A - Antitracking Pads	6.00 ea	\$5,000.00 /ea	\$30,000
BP 31A - Erosion Control Hay Bales / Silt Fence	8,377 lf	\$9.00 /lf	\$75,393
BP 31A - Erosion Control Blankets & Mats	1.00 ls	\$25,000.00 /ls	\$25,000
BP 31A - Erosion Control - CB Inlet Protection	149 ls	\$225.00 /ls	\$33,525
BP 31A - Erosion Control - Maintain / remove	1.00 ls	\$75,000.00 /ls	\$75,000
G1070 SITE EARTHWORK		\$7.84 / SF	\$2,985,212
G1072 Excavation & Fill		\$7.84 / SF	\$2,985,212
BP31A - Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 1	20,386 cy	\$32.00 /cy	\$652,352
BP31A - Bulk Excavation Offsite Disposal - Fill (assumed clean, less than RCS1) - Phase 2	39,376 cy	\$32.00 /cy	\$1,260,032
BP31A - Bulk Excavation Offsite Disposal - processed rock Phase 1 (sell)	62,601 cy	\$3.00 /cy	\$187,803
BP31A - Excavate & Backfill for Site Improvements items (pads / stairs, etc)	20,000 cy	\$32.00 /cy	\$640,000
BP31A - Rip Rap Slopes	3,267 cy	\$75.00 /cy	\$245,025
G2010 ROADWAYS		\$0.62 / SF	\$236,077
G2011 Roadway Pavement		\$0.62 / SF	\$236,077
BP31A - Fine Grade Pavement Base	316,791 sf	\$0.35 /sf	\$110,877
BP31A - Backfill Pavement Base Mat'l. - processed material	15,650 cy	\$8.00 /cy	\$125,200
G2030 PEDESTRIAN PLAZAS & WALKWAYS		\$0.17 / SF	\$64,878
G2031 Pedestrian Pavement		\$0.17 / SF	\$64,878
BP31A - Prepare & Compact Subbase	78,756 sf	\$0.50 /sf	\$39,378
BP31A - Backfill Pavement Base Mat'l. - processed material	2,550 cy	\$10.00 /cy	\$25,500
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$1.71 / SF	\$650,000
G2057 Playing Fields		\$1.71 / SF	\$650,000
BP 31A - Prepare & Compact Subbase	130,000 sf	\$1.00 /sf	\$130,000
BP 31A - Subgrade layer @ Natural Playing surfaces, FB & Track	130,000 sf	\$4.00 /sf	\$520,000
BP 31A - Subgrade layer @ Synthetic Playing surfaces	0.00 sf		\$0
32 EXTERIOR IMPROVEMENTS		\$5.70 / SF	\$2,170,949
G2010 ROADWAYS		\$4.21 / SF	\$1,601,659
G2011 Roadway Pavement		\$2.52 / SF	\$959,080
BP 31A - Bituminious Paving - Parking Lot Pavement	16,957 sy	\$28.00 /sy	\$474,796
BP 31A - Bituminious Paving - Roadway Pavement	17,073 sy	\$28.00 /sy	\$478,044
BP 31A - Raised Crosswalks @ Bit Pavement	208 sy	\$30.00 /sy	\$6,240
G2012 Roadway Curbs & Gutters		\$1.69 / SF	\$642,579
BP 31A - Granite Curbing - Vertical (Straight & Radius)	10,994 lf	\$56.00 /lf	\$615,664
BP 31A - Bituminous Curbing (Cape Cod Berm)	5,383 lf	\$5.00 /lf	\$26,915
G2030 PEDESTRIAN PLAZAS & WALKWAYS		\$0.38 / SF	\$146,340
G2031 Pedestrian Pavement		\$0.38 / SF	\$146,340
BP 31A - Asphalt Walkway Paving	5,420 sy	\$27.00 /sy	\$146,340

31A EXCAVATION AND FILL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$0.00 / SF	\$0
G2057 Playing Fields		\$0.00 / SF	\$0
Asphalt Surface w top coating / striping @ Tennis Courts	0.00 alt		\$0
G2060 SITE DEVELOPMENT		\$0.59 / SF	\$222,950
G2052 Retaining Walls		\$0.59 / SF	\$222,950
BP 31A - Retaining Walls Complete \$/lf - segmental	492 lf	\$350.00 /lf	\$172,200
BP 31A - Retaining Walls - Crushed Stone Base	725 cy	\$70.00 /cy	\$50,750
G5010 SITE COMMUNICATIONS SYSTEMS		\$0.53 / SF	\$200,000
X9770 Conceptual Budget		\$0.53 / SF	\$200,000
BP 31A - Traffic Signal Work - allow moved to G40	1.00 ls		\$200,000
33 UTILITIES		\$14.63 / SF	\$5,567,889
G3010 WATER UTILITIES		\$2.00 / SF	\$761,310
G3011 Site Domestic Water Distribution		\$2.00 / SF	\$761,310
BP 31A - Excav / Bkfl / Install - 2" Copper Water Line	72 lf	\$75.00 /lf	\$5,400
BP 31A - Excav / Bkfl / Install - 4" DI Water Line	236 lf	\$85.00 /lf	\$20,060
BP 31A - Excav / Bkfl / Install - 6" DI run out to hydrant	353 lf	\$90.00 /lf	\$31,770
BP 31A - Excav / Bkfl / Install - 6" DI water service to bldg	52 lf	\$90.00 /lf	\$4,680
BP 31A - Excav / Bkfl / Install - 8" DICL Water Line - fire service to bldg	190 lf	\$100.00 /lf	\$19,000
BP 31A - Excav / Bkfl / Install - 8" DICL Water Line - loop	5,954 lf	\$100.00 /lf	\$595,400
BP 31A - Excav / Bkfl GAS PIPING - (INSTALL BY UTILITIES	1,500 lf	\$15.00 /lf	\$22,500
BP 31A - Tap Existing Water Main	3.00 cond	\$10,000.00 /cond	\$30,000
BP 31A - Test / Flush-out	1.00 ls	\$5,000.00 /ls	\$5,000
BP 31A - Fire Hydrants	11 ea	\$2,500.00 /ea	\$27,500
G3020 SANITARY SEWERAGE UTILITIES		\$1.49 / SF	\$567,025
G3020 Sanitary Sewerage Utilities		\$1.49 / SF	\$567,025
BP 31A - Relining existing sewer (videotape by others to confirm need)	0.00 nic		\$0
BP 31A - Sanitary Sewerage Piping, PVC, New 4" PVC	87 lf	\$50.00 /lf	\$4,350
BP 31A - Sanitary Sewerage Piping, PVC, New 4" PVC Vent pipe	145 lf	\$50.00 /lf	\$7,250
BP 31A - Sanitary Sewerage Piping, PVC, New 6" Cast Iron	174 lf	\$90.00 /lf	\$15,660
BP 31A - Sanitary Sewerage Piping, PVC, New 6" PVC	949 lf	\$65.00 /lf	\$61,685
BP 31A - Sanitary Sewerage Piping, PVC, New 6" PVC, Forced Main	0.00 nic		\$0
BP 31A - Sanitary Sewerage Piping, PVC, New 8"	3,144 lf	\$70.00 /lf	\$220,080
BP 31A - Sanitary Sewerage Pump Station	0.00 nic		\$0
BP 31A - Oil/ Gas Separator	3.00 ea	\$5,000.00 /ea	\$15,000
BP 31A - Sanitary Manhole	39 ea	\$4,500.00 /ea	\$175,500
BP 31A - Tie-in to Existing Manholes / Pipe	1.00 cond	\$10,000.00 /cond	\$10,000
BP 31A - Grease Trap - Installed - 1,000 gal	1.00 ea	\$7,500.00 /ea	\$7,500
BP 31A - Grease Trap - Installed - 10,000 gal	1.00 ea	\$50,000.00 /ea	\$50,000
G3030 STORM DRAINAGE UTILITIES		\$8.86 / SF	\$3,371,339
G3032 Storm Drainage Piping		\$2.59 / SF	\$984,395
BP 31A - Excav / Bkfl / Install - 06" CPP Storm Drainage	345 lf	\$55.00 /lf	\$18,975

31A EXCAVATION AND FILL [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
BP 31A - Excav / Bkfl / Install - 06" CPP Storm Drainage , underdrain	940 lf	\$55.00 /lf	\$51,700
BP 31A - Excav / Bkfl / Install - 08" CPP Storm Drainage	237 lf	\$65.00 /lf	\$15,405
BP 31A - Excav / Bkfl / Install - 10" CPP Storm Drainage	164 lf	\$68.00 /lf	\$11,152
BP 31A - Excav / Bkfl / Install - 12" CPP Storm Drainage	7,844 lf	\$72.00 /lf	\$564,768
BP 31A - Excav / Bkfl / Install - 12" CPP Storm Drainage, perforated	458 lf	\$75.00 /lf	\$34,350
BP 31A - Excav / Bkfl / Install - 15" CPP Storm Drainage	213 lf	\$90.00 /lf	\$19,170
BP 31A - Excav / Bkfl / Install - 18" CPP Storm Drainage	971 lf	\$110.00 /lf	\$106,810
BP 31A - Excav / Bkfl / Install - 24" CPP Storm Drainage	1,112 lf	\$120.00 /lf	\$133,440
BP 31A - Excav / Bkfl / Install - 30" CPP Storm Drainage	75 lf	\$130.00 /lf	\$9,750
BP 31A - Excav / Bkfl / Install - 36" CPP Storm Drainage	0.00 nic		\$0
BP 31A - Trench Drain	151 lf	\$125.00 /lf	\$18,875
G3033 Storm Sewer Structures		\$2.38 / SF	\$907,600
BP 31A - Storm Septors Water Quality Unit - Installed (WQS & WQI)	18 ea	\$8,000.00 /ea	\$144,000
BP 31A - Precast Storm Manholes 4'- 6" - Installed	78 ea	\$4,500.00 /ea	\$351,000
BP 31A - Precast Culvert - installed	1.00 ls	\$60,000.00 /ls	\$60,000
BP 31A - Precast Storm Catch Basins - Installed	70 ea	\$4,000.00 /ea	\$280,000
BP 31A - Storm Structures - Connect new pipe to Existing	2.00 ea	\$5,000.00 /ea	\$10,000
BP 31A - Precast Storm Oil/Water Separator Tank - Installed (OCS)	6.00 ea	\$4,200.00 /ea	\$25,200
BP 31A - Area Drains - Installed	17 ea	\$2,200.00 /ea	\$37,400
G3036.4 Site Subdrainage		\$0.26 / SF	\$100,000
BP 31A - Maintain Groundwater System Operation through construction (temp swales, etc)	1.00 allw	\$100,000.00 /allw	\$100,000
G3037 Storm Drainage Ponds & Reservoirs		\$3.62 / SF	\$1,379,344
BP 31A - Underground Storm Water Retention System - #1	11,440 sf	\$32.00 /sf	\$366,080
BP 31A - Underground Storm Water Retention System - #2	14,063 sf	\$32.00 /sf	\$450,016
BP 31A - Underground Storm Water Retention System - #3	12,665 sf	\$32.00 /sf	\$405,280
BP 31A - Underground Storm Water Retention System - #4	3,921 sf	\$32.00 /sf	\$125,472
BP 31A - Underground Storm Water Retention System - #5	703 sf	\$32.00 /sf	\$22,496
BP 31A - Flared End / Swale	4.00 cond	\$2,000.00 /cond	\$8,000
BP 31A - Headwall	1.00 ea	\$2,000.00 /ea	\$2,000
G3060 SITE FUEL DISTRIBUTION		\$0.00 / SF	\$0
G3066.2 Gas Distribution Piping (Natural & Propane)		\$0.00 / SF	\$0
BP 31A - Excav / Bkfl / Install - 6" Natural Gas Line	0.00 lf		\$0
G4020 SITE ELECTRICAL		\$2.28 / SF	\$868,215
G4025 Ductbanks, Manholes, & Handholes		\$2.28 / SF	\$868,215
BP 31A - Exavate / Backfill / Install Elec MH	14 ea	\$7,500.00 /ea	\$105,000
BP 31A - Excavate / Backfill / Concrete Encasement	4,271 lf	\$75.00 /lf	\$320,325
BP 31A - Excavate / Backfill / Install- Precast Light pole / Bollard Base	107 ea	\$1,500.00 /ea	\$160,500
BP 31A - Excavate / Backfill site lighting conduit	9,413 lf	\$30.00 /lf	\$282,390
TOTAL 31A EXCAVATION AND FILL		\$67.06 / SF	\$25,522,000

32A LANDSCAPING & IRRIGATION

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
01 MAIN BUILDING	380,570 SF	\$0.44 / SF	\$168,825
32 EXTERIOR IMPROVEMENTS		\$0.44 / SF	\$168,825
B3020 ROOF APPURTENANCES		\$0.44 / SF	\$168,825
G2061.4 Site Furnishings		\$0.44 / SF	\$168,825
Roof Deck - Fiberglass Planters	0.00 nic		\$0
Roof Deck - Raised Stacked 4x4 Wood Platers w Semi-intensive green rf - deleted per VE	0.00 nic		\$0
Roof Deck - Roof Pavers not on pedestals - changed at 90CD	0.00 nic		\$0
Roof Deck - Synthetic Turf @ Central Roof Deck	7,085 sf	\$15.00 /sf	\$106,275
Roof Deck - Synthetic Turf @ Media Center	1,600 sf	\$18.00 /sf	\$28,800
Roof Deck - Synthetic Turf @ Play Equipment	2,250 sf	\$15.00 /sf	\$33,750
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	0.00 nic		\$0
Roof Deck - Wood Seatwalls, stacked	0.00 nic		\$0
05 MAINTENANCE BLDG	380,570 SF	\$0.04 / SF	\$15,000
03 CONCRETE		\$0.04 / SF	\$15,000
A6010 BUILDING SUBDRAINAGE		\$0.04 / SF	\$15,000
A6011 Foundation Drainage		\$0.04 / SF	\$15,000
BP 31A - Building Foundation Drainage - Perforated PVC (F&I)	332 lf	\$45.18 /lf	\$15,000
06 SITEWORK	380,570 SF	\$18.01 / SF	\$6,854,594
32 EXTERIOR IMPROVEMENTS		\$18.01 / SF	\$6,854,594
G2010 ROADWAYS		\$0.21 / SF	\$80,000
G2013 Marking & Signage		\$0.21 / SF	\$80,000
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		\$0.00 / SF	\$1,790
G2031 Pedestrian Pavement		\$0.00 / SF	\$1,790
Stone Dust Walk - stabilized	179 sf	\$10.00 /sf	\$1,790
Unit Pavers - Granite / Precast	0.00 excl		\$0
G2050 ATHLETIC, RECREATIONAL, & PLAYFIELD AREAS		\$5.07 / SF	\$1,930,098
G2057 Playing Fields		\$5.07 / SF	\$1,930,098
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	0.00 alt		\$0
FB Field Natural Turf FB Field	78,524 ls	\$4.00 /ls	\$314,096
FB Field Synthetic Turf FB Field - Alternate	0.00 alt		\$0

32A LANDSCAPING & IRRIGATION [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
Poured in place Safety Surfacing	0.00 alt		\$0
Resilient Track	31,852 sf	\$25.00 /sf	\$796,300
Resilient Track D Zone (FB Endzone)	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		\$6.93 / SF	\$2,635,620
G2059 Other Site Improvements		\$0.43 / SF	\$164,950
Metal Guard Railing, Vehicular	3,295 lf	\$45.00 /lf	\$148,275
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		\$5.96 / SF	\$2,267,170
Backless Wood Bench w Perforated Metal Skirting & LED Lighting	31 lf	\$2,000.00 /lf	\$62,000
Pre-engineered Boardwalk Ramp System	8,424 sf	\$150.00 /sf	\$1,263,600
Pre-engineered Boardwalk Stairs System	421 sf	\$170.00 /sf	\$71,570
Pre-engineered Boardwalk System - detail change from 60CD on railing	1.00 ls	\$750,000.00 /ls	\$750,000
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	\$53,500.00 /ls	(\$53,500)
Metal Shipping containers - excluded - still shown but previous VE / FFE	0.00 ea		\$0
G2062 Fences & Gates		\$0.53 / SF	\$203,500
Site Fencing - Ornamental - metal stair w integrated guardrail - 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		\$5.80 / SF	\$2,207,086
G2061.4 Site Furnishings		\$0.53 / SF	\$203,250
Seating Boulder - Furnish and Set, assume imported (ave weight > 2 tons ea)	30 ea	\$6,775.00 /ea	\$203,250
G2081 Planting Irrigation		\$0.52 / SF	\$199,141

32A LANDSCAPING & IRRIGATION [CONTINUED]

DESCRIPTION	QUANTITY	UNIT COST	TOTAL COST
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 - not at athletic fields - excluded	0.00 nic		\$0
G2082 Turf & Grasses		\$3.90 / SF	\$1,482,860
Topsoil / Loam	2,000 cy	\$38.00 /cy	\$76,000
Topsoil / Loam - From Stockpile - F&I	4,250 cy	\$15.00 /cy	\$63,750
Topsoil / Loam - Off-Site - F&I	17,894 cy	\$65.00 /cy	\$1,163,110
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		\$0.85 / SF	\$321,835
Groundcover - Pennsylvania Sedge - 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	\$4,650
02 - Red Maple - 1" cal	7.00 ea	\$650.00 /ea	\$4,550
03 - Sugar Maple - 2.5" cal	3.00 ea	\$1,000.00 /ea	\$3,000
04 - Clump Paper Birch - 7-8' ht	7.00 ea	\$750.00 /ea	\$5,250
05 - Heritage Birch - 10-12' ht	6.00 ea	\$750.00 /ea	\$4,500
06 - Whitespire Birch - 12-14' ht	6.00 ea	\$1,100.00 /ea	\$6,600
07 - Renaissance Upright Paper Birch - 12' - 14'	9.00 ea	\$1,000.00 /ea	\$9,000
08 - American Beech - 2.5" cal	5.00 ea	\$1,000.00 /ea	\$5,000
09 - Dawn Redwood - 3" cal	6.00 ea	\$1,200.00 /ea	\$7,200
11 - Black Gum - 2.5" cal	8.00 ea	\$1,000.00 /ea	\$8,000
11- White Oak - 1.5" cal	8.00 ea	\$650.00 /ea	\$5,200
12 - Swamp White Oak - 3" cal	4.00 ea	\$1,200.00 /ea	\$4,800
13 - Burr Oak - 2-2.5" cal	9.00 ea	\$1,400.00 /ea	\$12,600
14 - Red Oak - 2.5" - 3" cal	12 ea	\$1,300.00 /ea	\$15,600
15 - American Elm - 2.5-3" cal	17 ea	\$1,300.00 /ea	\$22,100
21 - Eastern Red Cedar - 7-8'	7.00 ea	\$785.00 /ea	\$5,495
22 - Pitch Pine - 6-7' ht	7.00 ea	\$900.00 /ea	\$6,300
23 - White Pine - 8-10' ht	15 ea	\$950.00 /ea	\$14,250
24 - White Pine - 5-6' ht	6.00 ea	\$675.00 /ea	\$4,050
25 - Autumn Brilliance Serviceberry - 7-8' ht	17 ea	\$750.00 /ea	\$12,750
26 - Donald Wyman Crabapple - 2"-2.5" cal	6.00 ea	\$750.00 /ea	\$4,500
27 - Autumn Flowering Cherry - 3" cal	1.00 ea	\$1,400.00 /ea	\$1,400
28 - Downy Serviceberry - 4.5-5' ht	6.00 ea	\$575.00 /ea	\$3,450
50 - Temporary Wetland Impacts	1.00 ls	\$50,000.00 /ls	\$50,000
60 - Invasive Planting Areas Plantings - #1 through #4	280 ea	\$150.00 /ea	\$42,000
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
TOTAL 32A LANDSCAPING & IRRIGATION		\$18.49 / SF	\$7,038,419

PROJECT SCOPE & BUDGET
COST ESTIMATE - DESIGNER

6C.2.3 - 04

6B.2.3 – 04

UNIFORMAT

**COST ESTIMATE
DESIGNER**

90% CONSTRUCTION DOCUMENTS COST ESTIMATE – R2

19 MAY 2023

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL

WAKEFIELD, MA



Bid/GMP Date: November 2023
Project Number: DRA No. 20202
MSBA ID: 2017-085-30605

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

GFAR: Gross Floor Area
Rates Current At May 2023

LOCATION SUMMARY

Ref	Location	GFAR SF	GFAR USD/SF	Total Cost USD
BD	BASE DESIGN			
A	Building			
A1	New School Building	380,570.00	422.20	160,676,975
A3	Maintenance Building			501,114
	A - Building	380,570.00	423.52	161,178,089
B	Sitework			35,149,711
C	Demolition & Abatement			
C1F	Facility Remediation			2,300,000
C2D	Demolition			2,836,093
	C - Demolition & Abatement			5,136,093
	BD - BASE DESIGN	380,570.0	529.37	201,463,893
ESTIMATED NET COST		380,570	529.37	201,463,893
MARGINS & ADJUSTMENTS				
	Design & Estimating Contingency	1.5 %		3,021,959
	Escalation Allowance up to mid-point of Construction (3/2025)	3 %		6,134,575
	Sub-contractor Bonds	1.2 %		2,527,443
	Insurance - CCIP (Change from GL)			6,835,919
	Cost of Traditional Insurance (Trade + GL) - Savings			Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)			365,272
	Payment & Performance Bond (per CM Pricing Exhibit 1)			1,850,710
	General Conditions (per CM Pricing Exhibit 1)			9,687,591
	Field Office Support			1,694,300
	General Requirements (per CM Pricing Exhibit 1)			5,034,190
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1			850,000
	CM Construction Contingency (per CM Pricing Exhibit 1)	2.5 %		5,384,096
	CM Fee (per CM Pricing Exhibit 1)			4,205,160
ESTIMATED TOTAL COST		380,570	654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

UNIFORMAT II - LEVEL 2 SUMMARY

Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
A10	Foundations	7.00	2,664,753
A20	Basement Construction Subgrade Enclosures	8.39	3,191,717
A40	Slabs-on-Grade	5.40	2,053,841
A60	Water and Gas Mitigation	1.93	735,750
A90	Substructure Related Activities	3.38	1,285,770
B10	Superstructure	67.54	25,705,534
B20	Exterior Vertical Enclosures	51.72	19,682,478
B30	Exterior Horizontal Enclosures	15.43	5,871,317
C10	Interior Construction	48.32	18,388,418
C20	Interior Finishes	30.81	11,725,771
D10	Conveying	2.51	955,775
D20	Plumbing	21.14	8,043,655
D30	HVAC	77.81	29,610,372
D40	Fire Protection	10.31	3,922,083
D50	Electrical	40.91	15,570,902
D60	Communications	7.79	2,964,963
D70	Electronic Safety and Security	7.47	2,843,393
E10	Equipment	14.78	5,623,888
E20	Furnishings	0.88	334,365
F20	Facility Remediation	6.05	2,303,344
F30	Demolition	7.45	2,836,093
G10	Site Preparation	33.51	12,752,385
G20	Site Improvements	30.87	11,748,234
G30	Liquid and Gas Site Utilities	12.35	4,699,674
G40	Electrical Site Improvements	10.04	3,820,576
G50	Site Communications	0.86	325,842
G90	Miscellaneous Site Construction		Excl.
Z10	General Requirements	4.74	1,803,000
ESTIMATED NET COST		529.37	201,463,893

NORTHEAST METROPOLITAN REGIONAL
TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE -
REVISION 2

UNIFORMAT II - LEVEL 2 SUMMARY

Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS			
	Design & Estimating Contingency		3,021,959
	Escalation Allowance up to mid-point of Construction (3/2025)		6,134,575
	Sub-contractor Bonds		2,527,443
	Insurance - CCIP (Change from GL)		6,835,919
	Cost of Traditional Insurance (Trade + GL) - Savings		Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		365,272
	Payment & Performance Bond (per CM Pricing Exhibit 1)		1,850,710
	General Conditions (per CM Pricing Exhibit 1)		9,687,591
	Field Office Support		1,694,300
	General Requirements (per CM Pricing Exhibit 1)		5,034,190
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		850,000
	CM Construction Contingency (per CM Pricing Exhibit 1)		5,384,096
	CM Fee (per CM Pricing Exhibit 1)		4,205,160
ESTIMATED TOTAL COST		654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

PHASING SUMMARY

Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
P1	Phase 1 - Establish Site & Ledge Removal	27.15	10,334,022
P2	Phase 2 - Construction of New Building	431.82	164,338,353
P3	Phase 3 - Demolition & Fields	70.40	26,791,518
ESTIMATED NET COST		529.37	201,463,893
MARGINS & ADJUSTMENTS			
Design & Estimating Contingency			3,021,959
Escalation Allowance up to mid-point of Construction (3/2025)			6,134,575
Sub-contractor Bonds			2,527,443
Insurance - CCIP (Change from GL)			6,835,919
Cost of Traditional Insurance (Trade + GL) - Savings			Incl.
Builder's Risk Insurance (per CM Pricing Exhibit 1)			365,272
Payment & Performance Bond (per CM Pricing Exhibit 1)			1,850,710
General Conditions (per CM Pricing Exhibit 1)			9,687,591
Field Office Support			1,694,300
General Requirements (per CM Pricing Exhibit 1)			5,034,190
Allowance for Additional Requirements not included in CM Pricing Exhibit 1			850,000
CM Construction Contingency (per CM Pricing Exhibit 1)			5,384,096
CM Fee (per CM Pricing Exhibit 1)			4,205,160
ESTIMATED TOTAL COST		654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

FILED SUB-BIDS SUMMARY

Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
1	Non-Filed Sub-Bids Trade	277.46	105,593,842
2	Masonry	20.58	7,833,370
3	Miscellaneous & Ornamental Metals	9.77	3,717,660
4	Waterproofing, Dampproofing & Caulking	4.55	1,729,852
5	Roofing & Flashing	14.54	5,533,913
6	Metal Windows	19.54	7,435,624
7	Glass & Glazing	1.79	680,549
8	Tile	4.54	1,726,596
9	Acoustical Tile	6.50	2,475,228
10	Resilient Floors	6.00	2,282,623
11	Terrazzo		Excl.
12	Painting	3.59	1,364,575
13	Elevators	2.63	999,215
14	Fire Suppression	10.77	4,100,341
15	Plumbing	22.11	8,412,738
16	Heating, Ventilating & Air Conditioning	81.34	30,956,166
17	Electrical	67.74	25,778,135
ESTIMATED NET COST		553.43	210,620,427
MARGINS & ADJUSTMENTS			
	Sub-contractor Bonds		2,527,443
	Insurance - CCIP (Change from GL)		6,835,919
	Cost of Traditional Insurance (Trade + GL) - Savings		Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		365,272
	Payment & Performance Bond (per CM Pricing Exhibit 1)		1,850,710
	General Conditions (per CM Pricing Exhibit 1)		9,687,591
	Field Office Support		1,694,300
	General Requirements (per CM Pricing Exhibit 1)		5,034,190
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		850,000
	CM Construction Contingency (per CM Pricing Exhibit 1)		5,384,096

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



Gross Floor Area: 380,570 SF
Rates Current At May 2023

FILED SUB-BIDS SUMMARY

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS (continued)			
	CM Fee (per CM Pricing Exhibit 1)		4,205,160
	ESTIMATED TOTAL COST	654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2 SUMMARY BD BASE DESIGN

A Building

A1 New School Building

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
A10	Foundations	6.80	2,588,373
A20	Basement Construction Subgrade Enclosures	7.61	2,896,141
A40	Slabs-on-Grade	5.06	1,924,683
A60	Water and Gas Mitigation	1.93	735,750
A90	Substructure Related Activities	3.38	1,285,770
B10	Superstructure	67.54	25,705,534
B20	Exterior Vertical Enclosures	51.72	19,682,478
B30	Exterior Horizontal Enclosures	15.43	5,871,317
C10	Interior Construction	48.32	18,388,418
C20	Interior Finishes	30.81	11,725,771
D10	Conveying	2.51	955,775
D20	Plumbing	21.14	8,043,655
D30	HVAC	77.81	29,610,372
D40	Fire Protection	10.31	3,922,083
D50	Electrical	40.91	15,570,902
D60	Communications	7.79	2,964,963
D70	Electronic Safety and Security	7.47	2,843,393
E10	Equipment	14.78	5,623,888
E20	Furnishings	0.88	334,365
F20	Facility Remediation	0.01	3,344
G30	Liquid and Gas Site Utilities		Incl.
NEW SCHOOL BUILDING		422.20	160,676,975

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



A1 New School Building

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS			
	Design & Estimating Contingency		2,410,155
	Escalation Allowance up to mid-point of Construction (3/2025)		4,892,614
	Sub-contractor Bonds		2,015,756
	Insurance - CCIP (Change from GL)		5,451,969
	Cost of Traditional Insurance (Trade + GL) - Savings		Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		291,322
	Payment & Performance Bond (per CM Pricing Exhibit 1)		1,476,028
	General Conditions (per CM Pricing Exhibit 1)		7,726,312
	Field Office Support		1,351,285
	General Requirements (per CM Pricing Exhibit 1)		4,015,004
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		677,915
	CM Construction Contingency (per CM Pricing Exhibit 1)		4,294,072
	CM Fee (per CM Pricing Exhibit 1)		3,353,814
ESTIMATED TOTAL COST		521.94	198,633,221

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
A10	FOUNDATIONS				
A1010	Standard Foundations				
996	Concrete to isolated spread footings, 4500 PSI	CY	1,830.20	313.60	573,996
529	Concrete to perimeter strip footings - 1' thick, 4500 PSI	CY	114.70	313.60	35,972
2751	Concrete to perimeter strip footings - 1'-6" thick, 4500 PSI	CY	27.00	313.60	8,468
2403	Concrete to perimeter strip footings - 3' thick, 4500 PSI	CY	923.00	313.60	289,476
1000	Concrete to interior strip footings, 4500 PSI	CY	178.18	313.60	55,881
588	Concrete to elevator mat footings - 3' thick, 4500 PSI	CY	15.30	313.70	4,799
2633	Concrete to mat footings - 1' thick, 4500 PSI	CY	31.00	313.60	9,722
1117	Concrete to piers, 4500 PSI	CY	137.90	313.60	43,248
521	Form isolated spread footings	SF	22,957.90	19.30	443,087
530	Form strip footings	SF	10,417.02	19.30	201,048
589	Form elevator mat footings	SF	140.10	19.30	2,704
2634	Form mat footings	SF	203.00	19.30	3,918
1118	Form piers	SF	8,741.20	24.10	210,881
522	Bar reinforcement to isolated spread footings	Lb	178,617.20	1.70	310,258
587	Bar reinforcement to strip footings, allow 100 PCY	Lb	170,915.61	1.70	296,881
590	Bar reinforcement to elevator mat footings	Lb	1,871.30	1.70	3,250
2635	Bar reinforcement to mat footings, allow 165 PCY	Lb	5,074.00	1.70	8,813
1119	Bar reinforcement to piers, allow	Lb	49,493.70	1.70	85,971
A1010 - Standard Foundations				6.80/SF	2,588,373
A10 - FOUNDATIONS				6.80/SF	2,588,373
A20	BASEMENT CONSTRUCTIONSUBGRADE ENCLOSURES				
A2010	Walls for Subgrade Enclosures				
597	Concrete to basement retaining walls, 4500 PSI	CY	879.00	313.60	275,676
599	Concrete to buttressed walls, 4500 PSI	CY	44.00	313.60	13,800
598	Concrete to perimeter frost walls, 4500 PSI	CY	489.71	313.60	153,585
1122	Concrete to interior foundation walls, 4500 PSI	CY	165.59	313.60	51,933

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
615	Concrete to elevator pit walls, 4500 PSI	CY	12.80	313.60	4,014
603	Form basement retaining walls	SF	25,290.00	24.10	610,121
604	Form buttressed walls	SF	2,790.00	24.10	67,309
605	Form perimeter frost walls	SF	19,982.65	24.10	482,081
1123	Form interior foundation walls	SF	11,480.37	24.10	276,964
616	Form elevator pit walls	SF	666.80	24.10	16,087
606	Bar reinforcement to basement retaining walls	Lb	171,364.00	1.70	297,659
607	Bar reinforcement to buttressed walls, allow 10 PSF	Lb	13,949.00	1.70	24,229
608	Bar reinforcement to perimeter frost walls	Lb	34,940.19	1.70	60,692
1124	Bar reinforcement to interior foundation walls	Lb	42,072.45	1.70	73,080
613	Bar reinforcement to elevator pit walls	Lb	3,261.90	1.70	5,666
614	Waterproofing to basement retaining walls and footings and elevator pit walls and footings	SF	21,069.90	14.50	304,986
617	Dampproofing to frost wall	SF	9,991.64	5.80	57,852
618	Rigid insulation - 2" thick	SF	31,060.86	4.30	134,882
2825	Water proofing adjustemnt	SF	1,000.00	-14.50	-14,475
A2010 - Walls for Subgrade Enclosures				7.61/SF	2,896,141
A20 - BASEMENT CONSTRUCTIONSUBGRADE ENCLOSURES				7.61/SF	2,896,141
A40	SLABS-ON-GRADE				
A4010	Standard Slabs-on-Grade				
500	Concrete to slab on grade - 4" thick, 4500 PSI	CY	797.00	313.60	249,959
501	Concrete to slab on grade - 6" thick, 4500 PSI	CY	1,204.20	313.60	377,667
502	Form slab on grade	SF	3,523.74	17.40	61,207
503	WWF reinforcement to slab on grade (Loading dock)	SF	830.00	1.70	1,442
2585	Fiber reinforcement to slab on grade	CY	1,997.91	57.90	115,679
698	Allowance for bar reinforcement	Lb	64,643.23	1.70	112,285
796	Allowance for thicken slab under CMU	LF	1,058.00	120.60	127,621
504	Float finish to slab on grade	SF	129,285.73	1.40	187,141
505	Control joints	SF	129,285.73	0.80	99,809
506	Air and vapor barrier	SF	129,285.73	0.90	112,285

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
508	Excavation for slab on grade	CY	7,584.42		Incl.
2777	BP 31A - Recommended amount	LS	1.00	200,277.00	200,277
509	Remove and dispose of excavated material	CY	7,584.42		Incl.
510	Prepare and compact sub-base	SF	129,285.73		Incl.
513	Re-use materials ILO Imported sand gravel fill - 12" thick	CY	4,788.78		Incl.
703	Winter conditions	LS	1.00		Excl.
707	Mechanical pads	Item			50,663
710	Engineering, layout, safety, cleaning, etc.	Item			207,475
A4010 - Standard Slabs-on-Grade				5.00/SF	1,903,510
A4090	Slab-on-Grade Supplementary Components				
507	Rigid insulation - 2" thick	SF	4,875.90	4.30	21,173
514	Extruded polystyrene insulation, perimeter only 2' wide - 2" thick	SF	4,901.00		Excl.
A4090 - Slab-on-Grade Supplementary Components				0.06/SF	21,173
A40 - SLABS-ON-GRADE				5.06/SF	1,924,683
A60	WATER AND GAS MITIGATION				
A6010	Building Subdrainage				
2779	BP 31A - Recommended amount	LS	1.00	735,750.00	735,750
619	Perimeter drain	LF	2,463.00		Incl.
686	Under-slab drainage system	SF	129,285.73		Incl.
1835	Allowance for Electrical and Plumbing earth work within footprint	LS	1.00		Incl.
A6010 - Building Subdrainage				1.93/SF	735,750
A6020	Off-Gassing Mitigation				
702	Allowance for radon mitigation - 20 drops x 60'	LS	1.00		Incl.
A6020 - Off-Gassing Mitigation					Incl.
A60 - WATER AND GAS MITIGATION				1.93/SF	735,750
A90	SUBSTRUCTURE RELATED ACTIVITIES				
A9010	Substructure Excavation				
2804	BP 31A - Recommended amount	LS	1.00	1,285,770.00	1,285,770

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
591	Excavation for foundation footings including spoils removal	CY	12,549.31		Incl.
593	Prepare and compact foundation sub-base	SF	35,031.74		Incl.
594	Imported sand gravel fill below foundations - 12" thick	CY	1,451.45		Incl.
595	Basement mass excavation	CY	32,666.00		Incl.
654	Excavation for elevator pit including spoils removal	CY	72.00		Incl.
620	Imported foundation backfill	CY	7,247.56		Incl.
691	Imported backfill to basement excavation	CY	6,534.00		Incl.
A9010 - Substructure Excavation				3.38/SF	1,285,770
A90 - SUBSTRUCTURE RELATED ACTIVITIES				3.38/SF	1,285,770
B10	SUPERSTRUCTURE				
B1010	Floor Construction				
2746	Galvanized composite metal floor deck - 1-1/2" deep, 20 GA	SF	1,143.00	5.80	6,618
535	Galvanized composite metal floor deck - 2" deep, 20 GA	SF	247,501.80	5.80	1,433,035
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	T	1,794.1050	5,211.00	9,349,075
997	Prestressed precast concrete hollow core plank, 10" thick	SF	1,383.00	43.40	60,057
2632	Prestressed precast concrete hollow core plank, 8" thick	SF	13,566.00	38.60	523,648
2747	Light weight concrete topping, overall 4" thick, 4500 PSI	CY	15.00	434.30	6,514
538	Light weight concrete topping, overall 5-1/4" thick, 4500 PSI	CY	4,011.20	434.20	1,741,863
998	Normal weight concrete topping to precast planks, 2" thick, 4500 PSI	CY	93.00	337.80	31,411
539	WWF reinforcement to floor deck	SF	263,591.80	1.30	330,676
540	Float finish to concrete topping	SF	263,591.80	2.90	763,097
572	Moment connection	EA	242.00	723.80	175,148
648	Expansion joint	LF	459.00	120.60	55,367

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
748	Wood floor deck - 2 layers 3/4" FRT plywood subfloor on 2x12 floor joists (Mezz)	SF	1,738.00	57.90	100,630
749	Geofoam rigid insulation (Auditorium stage) - 2'-0" 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 framings	T	179.4180	5,211.00	934,946
543	Allowance for spray applied fireproofing (members only)	SF	248,643.80	3.70	911,775
1647	Allowance for intumescent paint to round HSS columns	SF	944.00	48.30	45,548
2530	Allowance for intumescent paint to bracing	SF	727.00	48.30	35,078
720	Allowance for shear studs	EA	61,875.90	6.30	388,116
722	Allowance for pour stops and bent plates	LF	10,473.00	24.10	252,661
809	Allowance for miscellaneous equipment pads (above ground)	LS	1.00	48,250.00	48,250
2621	Anticipated concrete savings due to Subcontractor input	LS	1.00	-250,000.00	-250,000
2622	Target tonnage reduction (0.25 PSF)	T	-48.7500	5,211.00	-254,036
2623	Anticipated structural steel savings due to Subcontractor input	LS	1.00	-500,000.00	-500,000
2805	Temporary stair and scaffolding	LS	1.00	193,000.00	193,000
B1010 - Floor Construction				43.05/SF	16,382,477
B1020	Roof Construction				
546	Galvanized corrugated roof deck - 3" deep, type N	SF	107,259.50	6.80	724,536
562	Acoustic galvanized corrugated roof deck - 3" deep, type NA (Gym)	SF	11,269.00	14.50	163,119
2386	Acoustic galvanized composite roof deck - 3" deep, type NA (Gym)	SF	876.00	14.50	12,680
558	Galvanized composite metal roof deck - 2" deep, 20GA	SF	15,567.00	5.80	90,133
2387	Galvanized composite metal roof deck - 3" deep, 18GA	SF	2,954.00	7.20	21,380

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2384	Galvanized steel roof deck - 1 1/2" deep, type B, 20 GA	SF	3,154.00	4.80	15,218
2385	Galvanized steel roof deck - 9/16" deep, 20 GA	SF	6,143.00	3.40	20,748
2391	Structural steel roof joist - 68DLHSP1	LF	167.00	178.50	29,814
2390	Structural steel roof joist - 68DLHSP2	LF	1,246.00	178.50	222,442
2389	Structural steel roof joist - 68DLHSP3	LF	416.00	178.50	74,266
2392	Structural steel roof joist - 68DLHSP5	LF	423.00	178.50	75,516
2393	Structural steel roof joist - 68DLHSP4	LF	212.00	178.50	37,847
2735	Structural steel roof joist - 68DLHSP6	LF	845.00	178.50	150,854
2734	Structural steel roof joist - 68DLHSP7	LF	212.00	178.50	37,847
547	Structural steel framing, including beams, columns, bracing	T	802.1710	5,211.00	4,180,110
2394	Galvanized structural steel framing, including beams, columns (Roof Mechanical Equipment)	T	29.1600	5,790.00	168,836
548	Light weight concrete topping, overall 5-1/4" thick, 4500 PSI	CY	215.00	434.30	93,364
2745	Normal weight concrete topping, overall 4-1/2" thick, 4500 PSI	CY	33.00	414.90	13,693
2388	Normal weight concrete topping, overall 7" thick, 4500 PSI	CY	83.00	415.00	34,441
549	WWF reinforcement to floor deck	SF	19,396.00	1.30	24,332
550	Float finish to concrete topping	SF	19,396.00	2.90	56,151
567	Moment connection	EA	425.00	723.80	307,594
551	Allowance for miscellaneous connections and framings	T	83.1320	5,211.00	433,201
688	Allowance for structural framing to roof screen, 8 PSF (none indicated)	T	8.0800		Excl.
649	Expansion joint	LF	177.00	120.60	21,351
719	Allowance for spray applied fireproofing (members only)	SF	147,218.50	3.70	539,850
721	Allowance for shear studs	EA	3,027.00	6.30	18,987
1838	Miscellaneous roof blocking	LS	1.00	77,200.00	77,200
B1020 - Roof Construction				20.09/SF	7,645,510

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
B1080	Stairs				
182	1'-6" High metal guardrail at Rotunda balcony	LF	195.00	96.50	18,818
183	8'-0" High metal guardrail / gate at rooftop playground	LF	96.00	193.00	18,528
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'-6" wide	FT/R	30.00	2,750.30	82,508
2446	Metal stairs with concrete filled pans and landing - 4'-9" wide	FT/R	48.00	2,846.80	136,644
661	Metal stairs with concrete filled pans and landing - 5'-0" wide	FT/R	97.00	3,377.50	327,618
2748	Metal stairs with concrete filled pans and landing - 5'-9" wide	FT/R	20.00	3,860.00	77,200
663	Metal stairs with concrete filled pans and landing - 8'-0" wide	FT/R	51.00	6,127.70	312,515
665	Metal stairs with concrete filled pans and landing - 10'-0" wide	FT/R	96.00	7,237.50	694,799
1135	Metal stairs with concrete filled pans and landing - 5'-3" wide (none indicated)	FT/R	97.00		Excl.
662	Metal stairs with concrete filled pans and landing - 5'-6" wide (none indicated)	FT/R	20.00		Excl.
2447	Metal stairs with concrete filled pans and landing - 6'-4" wide (none indicated)	FT/R	20.00		Excl.
2448	Metal stairs with concrete filled pans and landing - 7'-9" wide (none indicated)	FT/R	48.00		Excl.
1134	Metal stairs with concrete filled pans and landing - 8'-3" wide (none indicate)	FT/R	48.00		Excl.
2445	Metal stairs with concrete filled pans and landing - 9'-9" wide (none indicated)	FT/R	48.00		Excl.
1133	Metal stairs with concrete filled pans and landing - 10'-3" wide (none indicated)	FT/R	48.00		Excl.
664	Metal stairs with concrete filled pans and landing - 10'-6" wide (none indicated)	FT/R	48.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
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	106.20	8,917
	B1080 - Stairs			4.41/SF	1,677,547
	B10 - SUPERSTRUCTURE			67.54/SF	25,705,534
B20	EXTERIOR VERTICAL ENCLOSURES				
B2010	Exterior Walls				
22	2" Thick Granite veneer - other than South Main Entry walls	SF	2,912.00		Excl.
2582	Cast stone ILO Granite veneer	SF	2,912.00	48.30	140,504
1651	4" Thick Cast stone veneer	SF	8,752.00	48.30	422,284
29	4" Thick Split face CMU Veneer	SF	36,262.30	38.60	1,399,724
30	Insulated metal panel	SF	15,291.00	86.80	1,328,022
23	Flat-lock metal tile	SF	5,893.00	96.50	568,675
44	Corrugated metal panel	SF	4,181.00	57.90	242,080
1652	Brick veneer	SF	21,855.00	46.30	1,012,323
2562	Extend roof membrane to perimeter wall	SF	2,584.00	11.60	29,923
128	Ceramic steel cladding to entrance columns	SF	178.00	144.80	25,766
1777	8" thick CMU shear walls	SF	14,241.00	38.60	549,703
1137	12" thick CMU shear walls	SF	1,296.00	48.30	62,532
72	8" Thick CMU back-up	SF	411.70	33.80	13,906
71	12" Thick CMU back-up	SF	49.00	43.40	2,128
27	ACM rainscreen system to crown ribs, including back-up	SF	4,198.00	86.80	364,596
150	ACM rainscreen system	SF	5,164.00	86.80	448,493
25	ACM Panel system at cornice	SF	11,052.00	168.90	1,866,406
1663	ACM Band	SF	2,721.00	86.90	236,319
2771	5/8" Thick FRP plywood	SF	2,584.00	6.30	16,208
2546	5/8" Thick gypsum sheathing	SF	92,789.00	3.40	313,395
2543	2" Thick rigid insulation	SF	61,449.90	4.80	296,495

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2544	3" Thick rigid insulation	SF	10,915.90	6.80	73,737
2559	3" Thick batt insulation	SF	32,250.00	3.90	124,485
2555	2 1/2" Thick mineral fiber insulation	SF	8,351.00	3.20	26,593
2563	3 1/2" Thick mineral fiber insulation	SF	13,149.00	3.90	50,755
2556	3 1/2" Thick mineral wool insulation	SF	10,074.00	3.90	38,886
2557	2" Thick closed cell spray foam	SF	54,471.00	3.20	173,463
2558	6" Thick closed cell spray foam	SF	5,161.00	5.80	29,882
2547	8" Light gauge metal stud back-up	SF	2,334.00	15.40	36,037
2548	6" Light gauge metal stud back-up	SF	86,186.00	13.50	1,164,372
2549	4" Light gauge metal stud back-up	SF	10,333.00	10.60	109,685
2550	3 5/8" Light gauge metal stud back-up	SF	10,681.00	10.10	108,226
2551	2 1/2" Light gauge metal stud back-up	SF	5,860.00	8.70	50,894
2560	5/8" Thick gypsum board lining	SF	75,088.00	4.30	326,070
2545	Fluid applied air and vapor barrier	SF	103,937.90	6.30	651,949
190	Allowance for miscellaneous sealing and caulking	SF	166,540.90	1.90	321,424
2853	Granite veneer to main entry South Walls	SF	1,922.00	183.30	352,398
2854	Deduct cast stone veneer	SF	-1,922.00	48.20	-92,736
B2010 - Exterior Walls				33.86/SF	12,885,602
B2020	Exterior Windows				
48	Aluminum curtain wall system, with insulating glass	SF	25,157.60	149.60	3,762,946
49	Aluminum storefront system, with insulating glass	SF	6,248.30	120.60	753,700
212	Aluminum storefront system - none indicated	SF	3,337.00		Excl.
98	Insulated translucent wall panel system with glazed operable sashes	SF	2,891.00	168.90	488,218
1627	Aluminum window system, with insulating glass	SF	8,643.00	120.60	1,042,561
1645	Premium for spandrel glass	SF	4,239.00	9.60	40,906
2575	Premium for bullet resistant glazing	LS	1.00	115,800.00	115,800
2752	Premium for louver	SF	389.00	48.20	18,769
B2020 - Exterior Windows				16.35/SF	6,222,900

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
B2050	Exterior Doors and Grilles				
1227	16'-0" x 13'-4" Motor operated overhead door with insulating glass	EA	1.00	22,195.00	22,195
100	14'-0" x 13'-4" Motor operated overhead door with insulating glass	EA	2.00	18,335.00	36,670
101	12'-0" x 13'-4" Motor operated overhead door with insulating glass	EA	8.00	15,440.00	123,520
1214	8'-0" x 10'-0" Motor operated overhead insulated rolling door	EA	1.00	9,650.00	9,650
2723	9'-4" x 8'-0" Motor operated overhead insulated rolling door	EA	1.00	9,168.00	9,168
134	3'-0" x 7'-0" Single leaf hollow metal door, including frame, finish, and hardware	EA	14.00	1,302.80	18,239
2722	3'-0" x 7'-0" Single leaf hollow metal door w/ 1'-0" x 1'-0" safety glass panel, including frame, finish, and hardware	EA	1.00	1,448.00	1,448
1230	3'-0" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware (at curtain wall)	EA	4.00	5,597.00	22,388
2728	3'-6" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware (at curtain wall)	EA	2.00	6,562.00	13,124
2729	3'-6" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware (at storefront)	EA	2.00	6,562.00	13,124
2727	3'-0" x 7'-10" Single leaf wire mesh door, including frame, finish, and hardware (Rooftop Playground)	EA	1.00		Incl.
1239	2@ 3'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	3.00	11,580.00	34,740
1234	2@ 3'-0" x 7'-4" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	4.00	12,062.50	48,250
2452	2@ 3'-0" x 8'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	2.00	12,545.00	25,090
1235	2@ 3'-4" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	3.00	12,062.70	36,188
1240	2@ 3'-6" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	6.00	12,303.80	73,823
2453	2@ 4'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	1.00	12,545.00	12,545

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
135	2@ 3'-0" x 7'-2" Double leaf hollow metal door, including frame, finish, and hardware	Pair	1.00	2,413.00	2,413
2477	Exterior door sidelight	SF	181.00	96.50	17,467
	B2050 - Exterior Doors and Grilles			1.37/SF	520,042
B2070	Exterior Louvers and Vents				
99	Louver	SF	558.90	96.50	53,934
	B2070 - Exterior Louvers and Vents			0.14/SF	53,934
	B20 - EXTERIOR VERTICAL ENCLOSURES			51.72/SF	19,682,478
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	28.90	2,075,309
1479	TPO Membrane roofing - Type B; single ply membrane over cover board on 4 1/2" min. tapered roof insulation	SF	68,665.00	28.90	1,987,851
169	Tapered insulation cricket (premium over PVC roofing)	SF	18,047.00	6.80	121,907
158	Metal coping on top of exterior wall (building signage wall)	SF	298.00	72.40	21,568
159	Metal coping on top of exterior wall (Rotunda balcony wall)	SF	770.00	72.40	55,729
174	Metal coping on top of exterior wall (rooftop playground perimeter wall)	SF	257.00	72.40	18,600
349	Extensive green roof	SF	5,059.20	57.90	292,928
354	Rubber roof pavers - none indicated	SF	1,439.00		Excl.
353	Rubber roof tiles (none indicated)	SF	3,823.00		Excl.
191	Allowance for miscellaneous trims and flashings	SF	140,351.00	0.80	108,351
2773	Allowance for temporary roofing	LS	1.00	100,000.00	100,000
2840	Protection board	SF	120,351.00	2.70	325,189
	B3010 - Roofing			13.42/SF	5,107,432
B3020	Roof Appurtenances				
168	Roof hatch	EA	2.00	5,307.50	10,615
1485	Smoke hatch	EA	3.00		Excl.
2782	Synthetic turf	SF	10,834.00	14.50	156,822

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1491	Roof access ladder, 2'-0" wide	LF	18.00	337.80	6,080
181	7'-6" High RTU screen - none indicated	LF	270.00		Excl.
1492	Painted steel protection guardrail, 3'-6" high	LF	238.00	193.00	45,934
1715	Walkway pad	SF	12,312.00	7.70	95,049
	B3020 - Roof Appurtenances			0.83/SF	314,500
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.
B3080	Overhead Exterior Enclosures				
154	ACM Panel system at horizontal entrance soffit / window bay soffit	SF	2,564.00	101.30	259,797
1452	Exterior gypsum board soffit	SF	1,932.00	26.10	50,338
2783	Linear metal ceiling	SF	1,443.00	96.50	139,250
	B3080 - Overhead Exterior Enclosures			1.18/SF	449,385
	B30 - EXTERIOR HORIZONTAL ENCLOSURES			15.43/SF	5,871,317
C10	INTERIOR CONSTRUCTION				
C1010	Interior Partitions				
129	Wire mesh partition - 8'-0" high	LF	214.00	241.30	51,628
2700	Single leaf wire mesh gate	EA	5.00		Incl.
2701	Double leaf wire mesh gate	Pair	7.00		Incl.
1561	CMU partition, 4" thick (Type 4.0)	SF	6,986.20	24.10	168,542
267	CMU partition, 8" thick (Type 8.0)	SF	75,060.50	27.00	2,028,134
2410	CMU partition, 8" thick, 1 hour fire rated (Type 8.1)	SF	5,429.00	33.80	183,364
1562	CMU partition, 8" thick, 2 hour fire rated (Type 8.2)	SF	21,471.00	38.60	828,780
268	CMU partition, 12" thick (Type 12.0)	SF	1,831.00	28.90	53,007
2670	CMU partition, 12" thick, 1 hour fire rated (Type 12.1)	SF	4,012.00	31.40	125,826
1563	CMU partition, 12" thick, 2 hour fire rated (Type 12.2)	SF	649.00	33.80	21,920
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	874.00	16.40	14,338

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
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	60,763.00	18.80	1,143,407
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	50,927.00	20.30	1,032,035
412	Gypsum board partition - 6" metal stud with 2 layer 5/8" GWB on both sides with 5" acoustic batt insulation (Type G6.0B)	SF	54,444.00	22.00	1,197,876
2412	Gypsum board partition - 6" metal stud staggered in 8" metal track with 2 layer 5/8" GWB on both sides with 5" acoustic batt insulation (Type G6.0C)	SF	717.00	26.10	18,681
2413	Gypsum board partition - 6" metal stud with 1 layer 5/8" GWB on both sides with 5" acoustic batt insulation, 1 hour fire rated (Type G6.1)	SF	115.00	21.00	2,419
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	3,111.00	24.60	76,554
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	19,584.00	27.50	538,609
2684	Gypsum board partition - 8" metal stud with 1 layer 5/8" abuse resistant GWB on both side (Type G8.0)	SF	260.00	22.20	5,771
459	Gypsum board furring - 7/8" metal stud with 1 layer 5/8" GWB (Type F1.0)	SF	2,045.00	7.20	14,801
2411	Gypsum board furring - 1-5/8" metal stud with 1 layer 5/8" GWB (Type F2.0)	SF	2,878.00	8.20	23,607
1552	Gypsum board furring - 2-1/2" metal stud with 1 layer 5/8" GWB (Type F3.0)	SF	2,675.00	9.20	24,524
410	Gypsum board furring - 3-5/8" metal stud with 1 layer 5/8" GWB (Type F4.0)	SF	34,755.90	10.60	368,934
432	Gypsum board furring - 3-5/8" metal stud with 2 layer 5/8" GWB (Type F4.0A)	SF	8,734.00	13.00	113,782
411	Gypsum board furring - 6" metal stud with 1 layer 5/8" GWB (Type F6.0)	SF	59,252.00	12.10	714,726
413	Gypsum board furring - 6" metal stud with 2 layer 5/8" GWB (Type F6.0A)	SF	40,878.00	14.50	591,709

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2687	Shaft wall - 4" CH stud with 1" Gypsum liner panel one side and 1 layer 5/8" type X GWB another side with 4" acoustic batt insulation, 2 hour fire rated (Type S4.2)	SF	989.00	17.40	17,179
1565	Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" type X GWB another side with 5 -1/2" acoustic batt insulation, 1 hour fire rated (Type S6.1)	SF	1,236.00	27.50	33,993
433	Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" type X GWB another side with 5 -1/2" acoustic batt insulation, 2 hour fire rated (Type S6.2)	SF	38,223.00	28.90	1,106,555
1571	Student booth / training wall - 2x4 FRT wood stud with 1 layer 1/2" FRT plywood sheathing on one side	SF	10,803.00	12.10	130,312
488	Allowance for miscellaneous sealing and caulking	SF	409,877.00	0.50	197,766
489	Allowance for miscellaneous fire stopping	SF	409,877.00	0.30	118,659
806	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Masonry Trade)	SF	409,877.00	0.50	197,766
808	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Drywall Trade)	SF	409,877.00	0.40	158,213
C1010 - Interior Partitions				29.70/SF	11,303,417
C1020	Interior Windows				
112	Interior door sidelights with safety glass	SF	4,240.00	57.90	245,496
153	Interior storefront	SF	4,409.00	106.10	468,015
166	Interior fixed borrowed lights	SF	1,045.00	62.70	65,548
137	Interior security transaction window - 4'-0" x 6'-0"	EA	1.00	1,930.00	1,930
155	Interior curtain wall - 2 hour fire rated	SF	1,722.00	241.30	415,433
2808	Interior curtain wall	SF	2,018.00	139.90	282,369
794	Premium for color art glass panels - none indicated	SF	177.00		Excl.
2824	Interior ballistic premium	LS	1.00	25,000.00	25,000
C1020 - Interior Windows				3.95/SF	1,503,791
C1030	Interior Doors				
102	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware	EA	49.00	1,515.00	74,237

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2455	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	EA	5.00	1,688.80	8,444
1287	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	EA	6.00	1,785.30	10,712
2454	3'-6"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware	EA	1.00	1,785.00	1,785
2731	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware with 1'-0"x1'-0" safety glass vision panel (45 min fire-rated)	EA	4.00	1,881.80	7,527
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	2,774.40	22,195
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	3,160.50	6,321
1263	3'-0"x4'-0" Single leaf wooden doors, including frame, finish and hardware	EA	2.00	1,013.50	2,027
106	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware	EA	292.00	1,780.40	519,884
2456	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (45 min fire-rated)	EA	1.00	1,882.00	1,882
1262	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (90 min fire-rated)	EA	23.00	2,026.50	46,610
1270	3'-6"x7'-0" Single leaf wooden doors, including frame, finish and hardware	EA	3.00	2,074.70	6,224
1275	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware with 2'-0"x2'-11" safety glass vision panel	EA	6.00	2,364.30	14,186
1283	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel	EA	1.00	2,364.00	2,364
1215	3'-0"x7'-0" Single leaf wooden safety glazed doors, including frame, finish and hardware	EA	1.00	2,364.00	2,364
2459	3'-0"x7'-0" Single leaf wire mesh doors, including frame, finish and hardware	EA	1.00	1,448.00	1,448
1339	3'-4"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware	EA	1.00	1,641.00	1,641

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1338	4'-0"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware	EA	2.00	1,978.50	3,957
2462	3'-0" x 3'-6" Glass rail gate (Multi-Purpose RM Balcony)	EA	2.00	820.50	1,641
103	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware	Pair	12.00	2,895.00	34,740
1289	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware	Pair	5.00	2,991.60	14,958
2469	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	Pair	1.00	3,185.00	3,185
1288	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	Pair	10.00	3,377.50	33,775
2467	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	Pair	3.00	3,474.00	10,422
2736	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	Pair	2.00	3,281.00	6,562
1291	2@3'-6"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware	Pair	1.00	3,378.00	3,378
2474	2@3'-6"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware	Pair	1.00	3,474.00	3,474
1292	2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware	Pair	1.00	3,715.00	3,715
2470	2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	Pair	1.00	4,101.00	4,101
2737	2@3'-10"x8'-0" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	Pair	2.00	4,873.50	9,747
2740	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware with 2'-0"x4" safety glass vision panel (90 min fire-rated)	Pair	2.00	6,948.00	13,896
2475	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware with 2'-0"x2'-11" safety glass vision panel	Pair	1.00	4,101.00	4,101

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2476	2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware with 2'-0"x2'-11" safety glass vision panel	Pair	1.00	5,549.00	5,549
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	5,548.70	16,646
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	9,264.00	18,528
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	Pair	2.00	5,790.00	11,580
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	5,790.00	5,790
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	6,272.50	25,090
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	9,650.00	19,300
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	10,470.50	20,941
2739	2@2'-4"x7'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	1.00	2,606.00	2,606
107	2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	23.00	3,377.50	77,683
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	4,584.00	9,168
1266	2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)	Pair	7.00	3,860.00	27,020
2738	2@3'-6"x7'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	5.00	3,932.40	19,662
2468	2@3'-6"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)	Pair	2.00	4,342.50	8,685

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2472	2@3'-10"x7'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated)	Pair	2.00	2,171.50	4,343
1271	2@3'-0"x7'-2" Double leaf wooden doors, including frame, finish and hardware	Pair	3.00	3,459.70	10,379
1272	2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	6.00	3,860.00	23,160
2471	2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated)	Pair	1.00	4,053.00	4,053
2741	2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware with 2'-0"x4" safety glass vision panel (90 min fire-rated)	Pair	1.00	3,715.00	3,715
2742	2@3'-0"x7'-2" Double leaf wooden doors, including frame, finish and hardware with 2'-0"x4" safety glass vision panel (90 min fire-rated)	Pair	2.00	3,812.00	7,624
2743	2@3'-0"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	2.00	3,136.50	6,273
2744	2@3'-0"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware	Pair	2.00	3,136.50	6,273
1341	2@3'-6"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	3.00	3,039.70	9,119
1342	2@3'-6"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware	Pair	2.00	3,136.50	6,273
1344	2@3'-7"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	1.00	3,136.00	3,136
1343	2@3'-7"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware	Pair	1.00	3,136.00	3,136
1345	2@3'-8"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	1.00	3,233.00	3,233
C1030 - Interior Doors				3.26/SF	1,240,468
C1040	Interior Grilles and Gates				
2458	6'-0" x 10'-0" Rolling security grille door	EA	4.00	14,475.00	57,900
113	4'-6" x 3'-10" Overhead coiling stainless steel counter door	EA	1.00	3,860.00	3,860
2732	10'-0" x 9'-0" Fire-rated partition / door (2-hr fire-rated)	EA	8.00	28,950.00	231,600
2733	10'-0" x 10'-0" Fire-rated partition / door (2-hr fire-rated)	EA	2.00	32,810.00	65,620

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2463	8'-3" x 12'-0" Fire-rated folding partition / door (2-hr fire-rated)	EA	2.00	33,775.00	67,550
2460	14'-8" x 10'-0" Fire-rated partition / door (2-hr fire-rated)	EA	1.00	48,250.00	48,250
2464	42'-0" x 15'-0" Curved fire-rated folding partition / door (2-hr fire-rated)	EA	1.00	289,500.00	289,500
C1040 - Interior Grilles and Gates				2.01/SF	764,280
C1090	Interior Specialties				
277	Restroom accessories - Toilet partition	EA	31.00	1,254.50	38,890
287	Restroom accessories - Toilet partition, ADA	EA	14.00	1,640.50	22,967
302	Restroom accessories - Urinal partition	EA	15.00	675.50	10,133
280	Restroom accessories - Tissue paper dispenser	EA	88.00	120.60	10,615
281	Restroom accessories - Grab bar	EA	57.00	173.70	9,901
305	Restroom accessories - Shower grab bar	Set	10.00	434.30	4,343
282	Restroom accessories - Napkin disposal	EA	69.00	482.50	33,293
283	Restroom accessories - Robe hook	EA	88.00	96.50	8,492
284	Restroom accessories - Soap dispenser	EA	65.00	144.80	9,409
285	Restroom accessories - Shower curtain and rod	EA	10.00	193.00	1,930
304	Restroom accessories - Shower seat	EA	10.00	579.00	5,790
291	Restroom accessories - Framed mirror	EA	65.00	772.00	50,180
292	Restroom accessories - Towel dispenser/waste receptacle	EA	69.00	820.20	56,597
303	Restroom accessories - Baby changing table - none indicated	EA	5.00		Excl.
1815	Wire mesh guardrail to Shop Mezz	LF	252.00	308.80	77,818
1537	Metal guardrail to Mezzanine	LF	363.00	289.50	105,089
802	Metal railing to auditorium - none indicated	LF	167.00		Excl.
301	Glass guardrail (Second Floor Corridor)	LF	231.00	559.70	129,291
754	Allowance for elevator pit ladder, cover, etc	EA	2.00	4,825.00	9,650
319	Allowance for markerboards - 4'x4'	EA	37.00	217.10	8,034
339	Allowance for markerboards - 6'x4'	EA	39.00	337.70	13,172
1533	Allowance for markerboards - 8'x4'	EA	3.00	453.70	1,361

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1534	Allowance for markerboards - 10'x4'	EA	12.00	559.70	6,716
320	Allowance for tackboards - 4'x4'	EA	41.00	164.00	6,726
335	Allowance for tackboards - 8'x4'	EA	4.00	318.50	1,274
1535	Allowance for tackboards - 12'x4'	EA	2.00	482.50	965
321	Allowance for visual display rails	Item			9,650
329	Metal lockers - 2 tier 15"x15" (Corridors)	EA	354.00	772.00	273,288
2509	Metal lockers - 2 tier 15"x15" (Team Locker / Auto Collision)	EA	255.00	772.00	196,860
2510	Metal lockers - 3 tier 15"x15" (Locker / Shops)	EA	481.00	675.50	324,916
2478	Mirror (Fitness)	SF	462.00	33.80	15,604
2772	Mirror (Dressing)	SF	93.00	33.80	3,141
753	Allowance for janitor accessories	EA	12.00	723.80	8,685
327	Allowance for cubicle curtain at nurse's area	EA	2.00	1,737.00	3,474
1547	Allowance for cubicle curtain at Health /Medical Assisting	EA	15.00	1,737.00	26,055
328	Allowance for corner guards	Item			7,720
331	Allowance for closet and utility shelving	Item			5,790
332	Allowance for AED with cabinets	EA	12.00	1,930.00	23,160
293	Allowance for miscellaneous metals	SF	409,877.00	1.00	395,531
294	Allowance for rough carpentry	SF	409,877.00	0.80	316,425
295	Allowance for wood blocking	SF	409,877.00	1.30	514,191
296	Allowance for fire extinguisher and cabinets	EA	163.90	820.30	134,439
297	Allowance for interior signage	SF	409,877.00	0.90	355,978
298	Allowance for exterior signage	Item			14,475
807	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade)	SF	409,877.00	0.40	158,213
2505	Glass guardrail (Stair 1)	LF	108.00	559.70	60,448
2508	Glass guardrail (Multi-purpose RM)	LF	189.00	559.70	105,783
C1090 - Interior Specialties				9.40/SF	3,576,462
C10 - INTERIOR CONSTRUCTION				48.32/SF	18,388,418

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
C20	INTERIOR FINISHES				
C2010	Wall Finishes				
2750	Hardwood pilaster cap (Gym)	LF	67.00	48.30	3,233
141	Ceramic tile	SF	25,414.30	21.20	539,546
142	Thin porcelain tile	SF	21,279.00	24.10	513,356
144	Wood veneer panels (Media Center)	SF	4,760.00	62.70	298,571
1678	Phenolic resin panel system	SF	1,685.00	82.00	138,212
1810	Wood fiber acoustical panels	SF	4,542.00	82.00	372,558
782	Fabric wrap acoustical panel (Multi-Purpose RM)	SF	2,269.00	48.20	109,479
147	Decorative fabric metal panels (Stage) - none indicated	SF	474.00		Excl.
2479	2" Granite veneer panel	SF	214.00	106.10	22,716
148	FRP panels	SF	6,573.00	24.10	158,574
170	Prepare and apply epoxy paint	SF	204,186.10	3.40	689,637
172	Prepare and apply paint to GWB	SF	323,094.90	1.30	405,323
841	Plastic laminate window sills	LF	2,334.60	72.40	168,967
1670	Metal column cover	SF	304.00	130.30	39,604
C2010 - Wall Finishes				9.09/SF	3,459,776
C2030	Flooring				
2	ASF, Rubber athletic flooring	SF	2,595.00	19.30	50,084
3	CPT-1, Carpet	SY	644.00	67.50	43,502
2375	CPT-2, Carpet	SY	905.00	67.60	61,133
1418	RC, Resilient carpet	SF	2,936.00	5.80	16,999
1398	PP, Porcelain floor tiles	SF	15,115.00	28.90	437,579
4	CMT, Ceramic mosaic tile	SF	4,429.00	19.30	85,480
5	SCONC, Sealed concrete	SF	87,611.40	1.40	126,817
6	EF, Epoxy flooring and base	SF	10,980.40	14.50	158,941
8	FGC, Foot grille carpet	SF	923.00	67.60	62,349
9	LIN, Linoleum	SF	124,004.00	9.60	1,196,638
2380	SV, Sheet vinyl	SF	11,496.00	11.60	133,124
2376	MULT, Sheet vinyl - multipurpose	SF	10,037.00	11.60	116,228

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
18	SV-SR, Sheet vinyl - slip resistant	SF	402.00	11.60	4,655
1401	LVT, Luxury vinyl tile	SF	2,373.00	7.70	18,320
19	WOC1, Walk off carpet	SY	310.00	62.70	19,445
20	WAF, Wood athletic flooring	SF	10,116.00	19.30	195,239
10	Resilient base	LF	38,445.30	4.80	185,499
1744	Sheet vinyl base	LF	2,844.00	4.80	13,722
1707	Porcelain tile base	LF	835.00	24.10	20,144
11	Ceramic tile base	LF	2,872.00	19.30	55,430
2482	6" Tall pre-cast terrazzo base - excluded	LF	933.00		Excl.
2483	Millwork base	LF	191.00	28.90	5,529
815	High performance adhesive, resilient flooring	SF	150,905.00	1.40	218,435
2631	High performance adhesive, non-resilient flooring	SF	29,768.00	1.40	43,089
C2030 - Flooring				8.59/SF	3,268,381
C2040	Stair Finishes				
15	RR-L, Photoluminescent rubber stair treads, risers, and landings	SF	9,996.00	24.10	241,154
2660	Terrazzo stair treads, risers, and landings - excluded	SF	1,024.00		Excl.
2665	Concrete sealer (Mezz. stairs)	SF	181.00	4.80	873
C2040 - Stair Finishes				0.64/SF	242,027
C2050	Ceiling Finishes				
31	Acoustic ceiling (ACT-1) - 2' x 2' NRC acoustic ceiling tile	SF	174,259.30	7.70	1,345,280
32	Acoustic ceiling (ACT-2) - 2' x 2' Washable acoustic ceiling tile	SF	5,633.00	7.70	43,487
33	Acoustic ceiling (ACT-3) - 2' x 2' NRC tegular acoustic ceiling tile	SF	12,940.90	7.70	99,904
34	Acoustic ceiling (ACT-4) - 2' x 6' NRC tegular acoustic ceiling tile	SF	4,685.00	11.60	54,252
1447	Acoustic ceiling (ACT-5)	SF	4,499.00	11.60	52,098
46	Acoustic preformed ceiling panels at Media Center	SF	1,852.00	62.70	116,167
1455	Acoustic ceiling reflector at Stage	SF	332.00	91.70	30,436
37	Gypsum board ceiling	SF	18,292.30	19.30	353,041

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
41	Gypsum board ceiling, moisture resistant	SF	6,915.70	24.10	166,841
38	LMC-2, Linear metal ceiling with wood appearance	SF	9,980.00	62.70	625,995
2669	Wood paneling ceiling (IWP)	SF	647.00	62.70	40,583
39	Paint to gypsum board ceiling	SF	35,970.20	1.40	52,067
2407	Suspended pipe rail ceiling system (Multi Purpose RM)	SF	3,290.00	14.50	47,623
40	Paint to exposed ceiling	SF	71,288.70	2.20	158,225
42	Sound isolator ceiling - 2 layer 5/8" GWB over 7/8" metal furring and 1-1/2" cold rolled channels with 3-1/2" batt insulation	SF	54,534.00	24.60	1,341,944
75	Allowance for gypsum board soffit - allow 20% of GWB	SF	8,580.00	24.10	206,993
2406	4" Metal suspension trim	LF	428.00	48.30	20,651
C2050 - Ceiling Finishes				12.50/SF	4,755,587
C20 - INTERIOR FINISHES				30.81/SF	11,725,771
D10	CONVEYING				
D1010	Vertical Conveying Systems				
687	Traction passenger elevator, 5 stops, open both sides, 3500 pounds	EA	1.00	458,375.00	458,375
2511	Traction service elevator, 4 stops, 5000 pounds	EA	1.00	347,400.00	347,400
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
2807	Operator time/fees for other trades	LS	1.00	100,000.00	100,000
D1010 - Vertical Conveying Systems				2.51/SF	955,775
D10 - CONVEYING				2.51/SF	955,775
D20	PLUMBING				
D2010	Domestic Water Distribution				
1886	Plumbing Fixtures	Note			
2072	P-1, Water Closet - Flush Valve - Wall Mounted	EA	33.00	1,640.50	54,137
2073	P-1A, Water Closet - Flush Valve - Wall Mounted, accessible	EA	57.00	1,785.20	101,759
2074	P-2, Urinal - Wall Hung	EA	8.00	1,544.00	12,352

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2075	P-2A, Urinal - Wall Hung, accessible	EA	7.00	1,640.60	11,484
2076	P-3A, Lavatory - Rectangular - Wall Mounted 19X17	EA	54.00	1,399.30	75,560
2077	P-3B, Basin Type Lavatory - Oval	EA	7.00	1,206.30	8,444
2078	P-3C, Restroom Lavatory - Oval	EA	9.00	1,206.20	10,856
2636	P-3D, Circular Lavatory	EA	1.00	6,273.00	6,273
2079	P-4, Mop Receptor	EA	10.00	1,544.00	15,440
2404	P-4A, Mop Receptor, accessible	EA	2.00	1,640.50	3,281
2080	P-5, Drinking Fountain - Recessed	EA	10.00	2,702.00	27,020
2081	P-5A, Drinking Fountain - Bi-Level - Wall Mounted	EA	8.00	3,667.00	29,336
2082	P-6, Shower Base	EA	7.00	2,412.60	16,888
2381	P-6A, Shower, accessible	EA	4.00	3,377.50	13,510
2083	P-7, Emergency Eye Wash	EA	9.00	1,447.60	13,028
2084	P-8, Emergency Eyewash-Shower	EA	4.00	2,123.00	8,492
2637	P-8A, Emergency Eyewash-Shower	EA	10.00	3,377.50	33,775
2638	P-9, Emergency Eyewash-Shower	EA	9.00	3,860.00	34,740
2639	P-10, Utility sink	EA	3.00	1,447.70	4,343
2640	P-11, Hand sink	EA	2.00	1,158.00	2,316
2085	PX-1, Sink - Casework Sink - Furnished by others - Install only	EA	49.00	434.20	21,278
2086	PX-2, Sink - Casework Sink with Eyewash- Furnished by others - Install only	EA	6.00	434.30	2,606
2087	PX-3, Sink - Cosmetology Sink - Furnished by others - Install only	EA	15.00	434.30	6,514
2088	PX-4, Sink - Science Room Sink - Furnished by others - Install only	EA	45.00	434.20	19,541
2089	PX-5, Sink - Lab Sink - Furnished by others - Install only	EA	31.00	434.30	13,462
2090	PX-6, Dental Station - Furnished by others - Install only	EA	18.00	579.00	10,422
2095	Allowance for missing/ miscellaneous plumbing fixtures(Main building building)	SF	409,877.00	0.20	79,106
447	Water Distribution and Components	Note			
2099	Connection to main(6")- (Main building)	EA	1.00	1,158.00	1,158

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2103	Capped-HW & CW connection(pg-9/note-5)	EA	2.00	289.50	579
2104	Plumbing fixture- hook up(domestic water)	EA	254.00	386.00	98,044
2105	Kitchen equipment - hook up(water)	EA	118.00	482.50	56,935
2106	Laboratory sink- hook up(water)	EA	146.00	579.00	84,534
2107	PX-6, Dental station- hook up(1/2" CW)	EA	18.00	579.00	10,422
2108	RB07, Water -hook up c/w BFP(1")	EA	1.00	772.00	772
2112	6", water meter and backflow preventer assembly	EA	1.00	12,545.00	12,545
2113	DWP-1, Domestic water triplex booster pump (Syncroflo)	EA	1.00	82,025.00	82,025
453	Chlorine/PH monitor system with 100 gal. tanks - (allowance) - none indicated	EA	1.00	9,650.00	9,650
458	Chlorine/PH monitor system with 200 gal. tanks - (allowance) - none indicated	EA	1.00	17,370.00	17,370
2685	Chlorine/PH monitor system with 400 gal. reactor tanks	EA	2.00	33,775.00	67,550
2686	Chemical storage tanks, 30 gal.	EA	2.00	2,412.50	4,825
2115	Backflow preventer(for NPCW to science rooms)	EA	1.00	1,448.00	1,448
2116	1/2", Stacked reduced pressure backflow preventer(to serve janitors sink)(pg-21)	EA	2.00	579.00	1,158
2117	1/2", Stacked reduced pressure backflow preventer (allowance)(pg-13)	EA	4.00	772.00	3,088
2644	3/4", Stacked reduced pressure backflow preventer	EA	2.00	3,377.50	6,755
2118	2", Stacked reduced pressure backflow preventer (allowance)(pg-12) - none indicated	EA	2.00		Excl.
2119	2", Stacked reduced pressure backflow preventer (allowance)(pg-16) - none indicated	EA	2.00		Excl.
2646	1", Reduced pressure backflow preventer	EA	2.00	1,447.50	2,895
2120	EWB-1, Electric storage water heater(Durawatt-460), 90 kW	EA	2.00	79,612.50	159,225
2121	EWB-2, Electric storage water heater(Durawatt-270), 54 kW	EA	2.00	40,530.00	81,060
2122	EWB-3, Electric storage water heater(DSE-120), 54 kW	EA	1.00	25,341.00	25,341

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2123	EWB-4, Electric storage water heater(Durawatt-550), 108 kW	EA	2.00	79,547.00	159,094
2124	EWB-5, Electric storage water heater(DSE-30), 6 kW	EA	1.00	6,273.00	6,273
2641	EWB-6, Electric storage water heater(DSE-40), 3 kW	EA	1.00	3,860.00	3,860
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	2.00	38,285.00	76,570
2642	Gas fired water heater(serving HVAC Tech shop), 150 CFH, Navien #NPE-180A2	EA	1.00	5,018.00	5,018
2131	Temperature maintenance re-heater for NPHW system - none indicated	EA	1.00		Excl.
2132	HWRP, Recirculation pump	EA	12.00	2,412.50	28,950
2133	ET, Expansion tank	EA	12.00	482.50	5,790
2134	Mixing valve(serving water heaters)	EA	12.00	482.50	5,790
2135	Dual mixing valve assembly - none indicated	EA	1.00		Excl.
2645	TX mixing valve assembly	EA	1.00	965.00	965
2136	Triple mixing valve assembly	EA	1.00	965.00	965
2137	Thermostatic mixing valve(serving kitchen- hand sink) (pg-29- fixture schedule)	EA	11.00	386.00	4,246
2138	Emergency mixing valve(serving emergency eye wash)	EA	2.00	386.00	772
2139	Emergency mixing valve(serving emergency shower/ eye wash) - none indicated	EA	2.00		Excl.
2140	Housekeeping pad(to be carried elsewhere in this estimate)	Note			Excl.
2513	Trap seal primer c/w tubing	EA	114.00	289.50	33,003
2141	HB, Hose bib	EA	24.00	289.50	6,948
2142	WH, Non freeze wall hydrant	EA	14.00	482.50	6,755
2145	1/2" to 1", copper distribution c/w fittings, supports etc.	LF	11,690.00	22.20	259,460

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2146	1-1/4" to 1-1/2", copper distribution c/w fittings, supports etc.	LF	1,935.00	38.60	74,691
2147	2" to 3",copper distribution c/w fittings, supports etc.	LF	3,499.00	99.40	347,783
2148	4",copper distribution c/w fittings, supports etc.	LF	407.00	207.50	84,442
2149	6",copper distribution c/w fittings, supports etc.	LF	91.00	453.50	41,273
2150	Thermal pipe insulation - 1/2" to 1" copper pipe	LF	11,690.00	6.30	73,326
2151	Thermal pipe insulation - 1-1/4" to 1-1/2" copper pipe	LF	1,935.00	12.50	24,275
2152	Thermal pipe insulation - 2" to 3",copper distribution	LF	3,499.00	19.30	67,531
2153	Thermal pipe insulation - 4",copper distribution	LF	407.00	24.10	9,819
2154	Thermal pipe insulation - 6",copper distribution	LF	91.00	33.80	3,074
2158	Water meter c/w bfp assembly- c/w service bypass hook up(6")	EA	1.00	9,168.00	9,168
2159	Triplex booster pump- hook up	EA	1.00	3,860.00	3,860
2514	Chlorine/PH monitor system- hook up	EA	4.00	723.80	2,895
2160	Neutralization system- hook up	EA		8,000.00	0
2161	Gas fired water heater- hook up	EA	3.00	723.70	2,171
2162	Electric water heater- hook up(small)	EA	2.00	531.00	1,062
2164	Electric water heater- hook up(large)	EA	7.00	723.70	5,066
2166	NPHW temperature maintenance station- hook up - none indicated	EA	1.00		Excl.
2167	Circulating pump - hook up	EA	12.00	723.80	8,685
2168	Expansion tank - hook up	EA	12.00	289.50	3,474
2169	Mixing valve - hook up	EA	27.00	482.50	13,028
2170	RBFP- hook up	EA	11.00	530.70	5,838
1373	Hookup - plumbing	EA	38.00	627.30	23,836
2171	Student plumbing booth- hook up(water)(pg-9/note-4) (allowance)	EA	2.00	386.00	772
2172	Allowance for missing/ miscellaneous domestic water system c/w fixture rough in, hot & cold water piping, non-potable piping, tempered piping etc.(Main building)	SF	409,877.00	0.30	118,659
2176	Subcontractor GCs/GRs	Item			201,685
D2010 - Domestic Water Distribution				8.13/SF	3,094,214

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
D2020	Sanitary Drainage				
2177	Connection to main	EA	17.00	723.80	12,304
2178	Plumbing fixture - hook-ups(sanitary & vent)	EA	254.00	482.50	122,555
2179	Kitchen equipment - hook up(sanitary/indirect waste & vent)	EA	68.00	386.00	26,248
2180	Laboratory sink- hook up(acid waste & vent)	EA	146.00	579.00	84,534
2181	PX-6, Dental station- hook up(waste & vent)	EA	18.00	386.00	6,948
2187	Local grease trap GT-1, 35/50 gpm	EA	3.00	10,615.00	31,845
2317	Local grease trap GT-2, 50/75 gpm	EA	1.00	21,230.00	21,230
2186	Local grease trap, 35 gpm	EA	3.00		Incl.
2183	Grease trap for triple sink, 50 gpm	EA	3.00		Incl.
2185	Gas/ oil interceptor (for garage drainage system)	EA	5.00	19,300.00	96,500
2647	Oil/ water separator	EA	1.00	9,650.00	9,650
2191	Gas/ oil separator	EA	3.00	7,720.00	23,160
2480	Condensate pump (assumed one per each FCU and AC units)	EA	316.00	289.50	91,482
2192	Trench drain(serving auto collision/auto technology & metal fabrication areas)	LF	190.00	337.80	64,173
2194	FD, Floor drain	EA	136.00	434.30	59,058
2195	Condensate receptor	EA	25.00	482.50	12,063
2196	Kitchen grate	EA	30.00		Incl.
2197	CO, Clean out	EA	110.00	337.80	37,153
2198	Clean out (serving acid waste)	EA	10.00	434.30	4,343
2205	1-1/2", Sanitary piping c/w fittings - Ag	LF	75.00	36.70	2,750
2206	2", Sanitary piping c/w fittings - Ag	LF	1,225.90	38.60	47,320
2207	3", Sanitary piping c/w fittings - Ag	LF	826.10	43.40	35,874
2208	4", Sanitary piping c/w fittings - Ag	LF	1,859.00	48.30	89,697
2676	5", Sanitary piping c/w fittings - Ag	LF	71.00	53.10	3,768
2212	2", Sanitary piping c/w fittings - Bg	LF	69.70	38.60	2,690
2213	3", Sanitary piping c/w fittings - Bg	LF	131.60	43.40	5,715
2214	4", Sanitary piping c/w fittings - Bg	LF	4,050.80	48.20	195,451

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2680	5", Sanitary piping c/w fittings - Bg	LF	96.00	53.10	5,095
2215	6", Sanitary piping c/w fittings - Bg	LF	817.40	57.90	47,327
2217	2", Acid waste drainage PP piping- Single containment c/w fittings-Ag	LF	423.00	62.70	26,533
2218	3", Acid waste drainage PP piping- Single containment c/w fittings-Ag	LF	71.00	86.80	6,166
2219	4", Acid waste drainage PP piping- Single containment c/w fittings-Ag	LF	243.00	115.80	28,139
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	16.00		Incl.
2225	Allowance for vent piping	LS	1.00	231,600.00	231,600
1296	1-1/2" to 2", Vent c/w fittings, supports, etc, ag	LF	2,863.70	43.40	124,357
2683	3", Vent c/w fittings, supports, etc, ag	LF	4,423.00	43.40	192,069
2682	4", Vent c/w fittings, supports, etc, ag	LF	2,306.60	48.20	111,293
2681	8", Vent c/w fittings, supports, etc, ag	LF	193.00	72.40	13,968
1304	1-1/2" to 2", Vent piping, bg	LF	711.20	48.20	34,315
2673	3", Vent piping, bg	LF	657.90	43.40	28,569
2674	4", Vent piping, bg	LF	261.70	48.20	12,627
2229	8", Vent piping c/w fitting, support, etc (radon mitigation) (Riser from lower slab till roof serving every 10,000 SF)	LF	1,092.00	62.70	68,496
2230	Allowance for acid vent piping	LS	1.00	135,100.00	135,100
2671	2", Acid vent piping c/w fittings - Ag	LF	937.00	62.70	58,773
2672	4", Acid vent piping c/w fittings - Ag	LF	77.00	115.80	8,917
2400	Student plumbing booth- hook up(drain)(pg-9/note-4) - none indicated	EA	3.00		Excl.
2234	Allowance for missing/ miscellaneous sanitary drainage system c/w piping, vents, ejectors, clean-out, acid waste, etc.(Main building)	SF	409,877.00	0.30	118,659
2238	Subcontractor GCs/GRs	Item			120,625
2749	PH-1, Neutralization system for science rooms	EA	1.00	77,200.00	77,200
D2020 - Sanitary Drainage				6.66/SF	2,536,339

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
D2030	Building Support Plumbing Systems				
1883	Connection to main	EA	11.00	723.70	7,961
1884	SP-1, Simplex elevator pit sump pump, 50 gpm	EA	1.00	7,238.00	7,238
1885	SP-2, Simplex elevator pit sump pump, 50 gpm	EA	1.00	7,238.00	7,238
2240	Scupper type drains(at low roof)/(pg-24/note-1)	EA	10.00	482.50	4,825
2241	3" TD, Terrace drain c/w grate (none indicated)	EA	4.00		Excl.
2242	4" RD/OFD, Roof Drain/ Overflow drain	EA	108.00	1,158.00	125,064
2243	6" RD/OFD, Roof Drain/ Overflow drain	EA	1.00	1,255.00	1,255
2244	Flat grate under pavers(serving roof drains)(pg-10)	EA	2.00	193.00	386
2245	Clean out	EA	120.00	337.80	40,530
2246	4", Storm drain piping c/w fittings, supports - Ag	LF	4,041.40	48.30	194,998
2247	6", Storm drain piping c/w fittings, supports - Ag	LF	2,495.00	106.10	264,844
2248	8", Storm drain piping c/w fittings, supports - Ag	LF	266.00	173.70	46,204
2250	4", Storm drain piping c/w fittings, supports - Bg	LF	156.00	55.00	8,581
2251	6", Storm drain piping c/w fittings, supports - Bg	LF	475.80	96.50	45,915
2252	8", Storm drain piping c/w fittings, supports - Bg	LF	618.00	137.00	84,685
2253	10", Storm drain piping c/w fittings, supports - Bg	LF	304.00	179.50	54,565
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	1,447.50	2,895
2257	Allowance for missing/ miscellaneous storm water drainage system(Main building)	SF	409,877.00	0.20	79,106
2261	Subcontractor GCs/GRs	Item			68,515
	D2030 - Building Support Plumbing Systems			2.75/SF	1,044,805
D2050	General Service Compressed-Air				
1893	AC-1, Air compressor(auto collision/ metal fabrication) c/w receiver & dryer	EA	1.00	51,577.00	51,577
1898	AC-2, Air compressor c/w tank (Votech shops)	EA	1.00	31,876.00	31,876
1900	AC-3, Air compressor c/w tank (Biotech shops)	EA	1.00	37,461.00	37,461
2265	AC-4, Air compressor c/w tank (Robotics)	EA	1.00	18,335.00	18,335
2264	AC-5, Air compressor c/w tank (Dental)	EA	1.00	75,753.00	75,753

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1901	AC-4, Air compressor c/w tank (Draft and design) - none indicated	EA	2.00		Excl.
2266	400 gal, Air receiver tank(serving AC-1)	EA	1.00		Incl.
2657	200 gal, Air receiver tank(serving AC-2)	EA	1.00	4,198.00	4,198
2658	200 gal, Air receiver tank(serving AC-4)	EA	1.00	4,198.00	4,198
2267	Air dryer(serving AC-1)	EA	1.00		Incl.
2653	Air dryer(serving AC-2)	EA	1.00	3,513.00	3,513
2654	Air dryer(serving AC-3)	EA	1.00	483.00	483
2655	Air dryer(serving AC-4)	EA	1.00	3,513.00	3,513
2268	Master compressed air shut-off(for auto collision area) (allowance)	EA	1.00	2,413.00	2,413
2271	Compressed air - 1/2 to 1" piping	LF	3,419.00	38.60	131,973
2272	Compressed air - 1 1/4" piping	LF	699.00	45.40	31,703
2663	Compressed air - 1 1/2" piping	LF	89.00	48.20	4,294
2273	Compressed air- hook up c/w pressure gauge, air filter, condensate filter, pressure regulator (none indicated)	EA	44.00		Excl.
2274	Compressed air- hook up c/w shutoff valve, pressure gauge, air filter, condensate filter, pressure regulator (pg-21/note-1)	EA	6.00	530.80	3,185
2275	Compressed air- hook up c/w shut off valve, pressure gauge, air filter, air pressure regulator, 50' hose reel (Carpentry shop)	EA	43.00	1,737.00	74,691
2397	Compressed air- hook up c/w shut off valve, pressure gauge, air filter, air pressure regulator, 50' hose reel (pg-9/note-1)(HVAC technology shop)	EA	10.00	1,737.00	17,370
2276	Compressed air- paint booth- hook up	EA	2.00	531.00	1,062
2277	Compressed air- hook up(to equipment)	EA	1.00	531.00	531
2278	Air compressor - hook up	EA	5.00	530.80	2,654
2279	Air compressor tank- hook up	EA	5.00	530.80	2,654
2280	Air receiver - hook up	EA	3.00	530.70	1,592
2281	Air dryer - hook up	EA	4.00	530.80	2,123
2282	Dust collector- hook up	EA	1.00	531.00	531
2283	Dental station- hook up(CA)	EA	18.00	530.80	9,554

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2284	Biotech labs- ceiling panels- hook up(CA)(allowance) - none indicated	EA	5.00		Excl.
2285	Allowance for missing/ miscellaneous compressed air system(Main building)	SF	409,877.00	0.50	197,766
2289	Subcontractor GCs/GRs	Item			50,180
	D2050 - General Service Compressed-Air			2.01/SF	765,183
D2060	Process Support Plumbing Systems				
1895	VAC-1, Vacuum pump(biotech lab)	EA	1.00	19,011.00	19,011
2290	VAC-2, Vacuum pump(dental)	EA	1.00	52,110.00	52,110
2291	Gas meter assembly(to be by others)	EA	1.00		Excl.
2398	Kitchen emergency gas shut-off system c/w main control panel, shut-off switch, gas solenoid valve, CO detectors, etc(allowance)	EA	4.00	4,825.00	19,300
2664	Auto shop emergency gas shut-off system c/w main control panel, shut-off switch, gas solenoid valve, etc (allowance)	EA	1.00	3,378.00	3,378
2293	Vacuum piping c/w fittings, support, etc- main	LF	558.00	53.10	29,616
2295	1-1/4" to 1-1/2", Sch.40 steel natural gas distribution c/w fittings, supports etc. (none indicated)	LF	6.00		Excl.
2296	2" to 2-1/2",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	88.00	77.20	6,794
2297	3",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	8.00	96.50	772
2298	4",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	281.00	115.80	32,540
2668	5",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	9.00	139.90	1,259
2667	6",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	352.00	149.60	52,650
2666	8",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	84.00	164.00	13,780
2301	Argon piping c/w fittings, support, etc	LF	333.00	53.10	17,674
1747	Allowances for argon piping	LF	713.00	53.10	37,842
2302	Acetylene piping c/w fittings, support, etc - none indicated	LF	168.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2300	Oxygen piping c/w fittings, support, etc - none indicated	LF	167.00		Excl.
2304	Welding booth -hook up(Ar)	EA	27.00	530.70	14,330
2305	Welding booth -hook up(C2H2- acetylene) - none indicated	EA	22.00		Excl.
1757	Allowances for miscellaneous argon hookups	LS	1.00	24,125.00	24,125
2303	Welding booth -hook up(O2) - none indicated	EA	22.00		Excl.
2307	Argon storage tank- hook up c/w manifolds, shutoff valves, etc	EA	1.00	9,650.00	9,650
2308	Acetylene storage tank- hook up c/w manifolds, shutoff valves, etc	EA	1.00	9,650.00	9,650
2306	Oxygen storage tank- hook up c/w manifolds, shutoff valves, etc	EA	1.00	9,650.00	9,650
2517	Vacuum pump- hook up	EA	2.00	1,447.50	2,895
2309	Biotech labs- ceiling panels- hook up(Vacuum) (allowance) - none indicated	EA	5.00		Excl.
2310	Dental station- hook up(Vacuum)	EA	18.00	530.80	9,554
2399	Kitchen emergency gas shut-off system- hook up	EA	4.00	530.80	2,123
2311	Water heater - hook up(NG)	EA	3.00	530.70	1,592
2312	Paint booth- hook up(NG)	EA	2.00	531.00	1,062
2313	Kitchen equipment - hook up(natural gas)	EA	24.00	530.80	12,738
2314	Biotech labs- ceiling panels- hook up(NG)(allowance) - none indicated	EA	5.00		Excl.
2531	Student plumbing booth- hook up(NG) - none indicated	EA	3.00		Excl.
1756	Allowances for misc NG valves and accessories	LS	1.00	14,475.00	14,475
1746	Main control panel at each gas hood - allow	No	8.00	3,860.00	30,880
2315	Allowances for additional main building gas system (natural gas/Ar)	SF	409,877.00	0.30	118,659
2316	Subcontractor GCs/GRs	Item			55,005
	D2060 - Process Support Plumbing Systems			1.58/SF	603,114
	D20 - PLUMBING			21.14/SF	8,043,655

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
D30	HVAC				
D3020	Heat Systems				
1847	EUH-1, Electric unit heater, 15 kW	EA	12.00	2,653.80	31,845
1865	EUH-2, Electric unit heater, 1.5 kW	EA	3.00	1,158.00	3,474
1866	EUH-3, Electric unit heater, 3 kW	EA	6.00	1,544.00	9,264
1867	EUH-4 & 5, Electric unit heater, 10 kW	EA	6.00	2,171.30	13,028
D3020 - Heat Systems				0.15/SF	57,611
D3030	Cooling Systems				
1667	LG HVAC equipments consisting of DX-split units, FCU c/w condenser units, branch circuit controllers, VCU's (serving RTU's, MAU's, AHU's, HRU's), etc.	LS	1.00	3,425,748.00	3,425,748
1189	AC- 0-4-5, 1-5-6/10, DX split system air conditioning unit 3 ton, 36 mbh cooling capacity c/w outdoor air-cooled condensing unit	EA	5.00		Incl.
1190	AC- 0-2 to 0-3, 0-6 to 0-8, 1-1 to 4, 1-7 to 9, 1-11 to 14, 2-1 to 6, 3-1 to 5, 4-1 to 5, CB-3 & LB-1, 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 ton, 48 mbh cooling capacity c/w outdoor air-cooled condensing unit	EA	3.00		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	19.00		Incl.
1195	FCU, DX-cooled fan coil units 0.8 ton	EA	23.00		Incl.
1197	FCU, DX-cooled fan coil units 1 ton	EA	7.00		Incl.
1196	FCU, DX-cooled fan coil units 1.3 ton	EA	5.00		Incl.
1198	FCU, DX-cooled fan coil units 1.5 ton	EA	25.00		Incl.
1200	FCU, DX-cooled fan coil units 2 ton	EA	40.00		Incl.
1202	FCU, DX-cooled fan coil units 2.3 ton	EA	13.00		Incl.
1203	FCU, DX-cooled fan coil units 3 ton	EA	64.00		Incl.
1204	FCU, DX-cooled fan coil units 3.5 ton	EA	18.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1205	FCU, DX-cooled fan coil units 4 ton	EA	12.00		Incl.
1206	FCU, DX-cooled fan coil units 4.5 ton	EA	2.00		Incl.
1568	Refrigeration piping c/w fittings,supports, etc.	LF	52,802.00	43.40	2,292,925
1684	Allowance for refrigerant	Lb	12,700.00	24.10	306,388
1709	RTU - hook ups	EA	2.00	724.00	1,448
1710	MAU - hook ups	EA	2.00	724.00	1,448
1711	HRU - hook ups	EA	5.00	723.80	3,619
1712	AHU - hook ups	EA	10.00	723.80	7,238
1713	ERV - hook ups	EA	5.00	723.80	3,619
1974	FCU - hook ups	EA	269.00	482.50	129,793
1975	AC units - hook ups	EA	47.00	482.50	22,678
2481	Allowance for missing/ miscellaneous	SF	491,852.90	0.40	189,855
D3030 - Cooling Systems				16.78/SF	6,384,759
D3050	Facility HVAC Distribution Systems				
1677	YORK HVAC equipments consisting of RTU's, AHU's, MAU's and HRU's	LS	1.00	6,856,910.00	6,856,910
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 cfm c/w air-cooled VRF condensing units (3 x 16 ton), electric pre heat, etc.	EA	1.00		Incl.
1157	MAU-1, DX-cooled make-up air unit, 6,510 cfm c/w air-cooled VRF condensing units (2 x 18 ton), electric pre heat, etc.	EA	1.00		Incl.
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, DX-cooled indoor air handling unit, 20,000 cfm c/w air-cooled VRF condensing units (3 x 22 ton), electric pre heat, etc.	EA	1.00		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.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2648	AHU-2, DX-cooled indoor air handling unit, 15,465 cfm c/w air-cooled VRF condensing units (2 x 22 ton & 1 x 12 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-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	20,265.00	20,265
1143	ERV-2, Energy recovery ventilator, 285 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	8,685.00	8,685
1144	ERV-3, Energy recovery ventilator, 1,100 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	30,880.00	30,880
1145	ERV-4, Energy recovery ventilator, 1,795 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	50,180.00	50,180
1840	ERV-7, Energy recovery ventilator, 250 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	7,720.00	7,720
1150	HRU-1, DX-cooled dedicated outdoor air roof-top units, 19,640 cfm c/w air-cooled VRF condensing units (2 x 24 ton & 1 x 26 ton), electric pre heat, etc.	EA	1.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2649	HRU-2, DX-cooled dedicated outdoor air roof-top units, 18,735 cfm c/w air-cooled VRF condensing units (3 x 24 ton & 1 x 28 ton), electric pre heat, etc.	EA	1.00		Incl.
2650	HRU-3, DX-cooled dedicated outdoor air roof-top units, 19,395 cfm c/w air-cooled VRF condensing units (3 x 24 ton & 1 x 28 ton), electric pre heat, etc.	EA	1.00		Incl.
1151	HRU-4, DX-cooled dedicated outdoor air roof-top units, 7,070 cfm c/w air-cooled VRF condensing units (2 x18 ton & 1 x 28 ton), electric pre heat, etc.	EA	1.00		Incl.
1153	HRU-5, DX-cooled dedicated outdoor air roof-top units, 2,760 cfm c/w air-cooled VRF condensing units (2 x 6 ton), electric pre heat, etc.	EA	1.00		Incl.
2775	Dehumidifiers	EA	35.00	13,510.00	472,850
1168	F-1 & 8, Exhaust fan, 600 cfm	EA	2.00	1,206.50	2,413
1178	F-2, 11 & 12, Exhaust fan, 360 cfm	EA	3.00	723.70	2,171
1170	F-3, Exhaust fan, 1,000 cfm	EA	1.00	2,413.00	2,413
1169	F-4, Exhaust fan, 150 cfm	EA	1.00	483.00	483
1171	F-5, Exhaust fan, 2,600 cfm	EA	1.00	5,308.00	5,308
1174	F-7, Exhaust fan, 2,100 cfm	EA	1.00	4,217.00	4,217
1175	F-9, Exhaust fan, 500 cfm	EA	1.00	1,013.00	1,013
2659	F-10, Exhaust fan, 210 cfm	EA	1.00	425.00	425
1180	F-13, Exhaust fan, 18,400 cfm	EA	1.00	36,935.00	36,935
1181	F-15 & 16, Exhaust fan, 15,000 cfm	EA	2.00	30,108.00	60,216
2656	F-17, Exhaust fan, 900 cfm	EA	1.00	1,809.00	1,809
1182	F-18, Exhaust fan, 885 cfm	EA	1.00	1,780.00	1,780
1849	F-20, Exhaust fan, 450 cfm	EA	1.00	917.00	917
2661	F-22, Exhaust fan, 130 cfm	EA	1.00	483.00	483
1183	KEF-1, Kitchen exhaust fan, 2,800 cfm	EA	1.00	5,621.00	5,621
1184	KEF-2, Kitchen exhaust fan, 3,300 cfm	EA	1.00	5,665.00	5,665
1185	KEF-3, Kitchen exhaust fan, 1,850 cfm	EA	1.00	3,715.00	3,715
1186	KEF-4, Kitchen exhaust fan, 2,365 cfm	EA	1.00	4,753.00	4,753
1188	KEF-5, Kitchen exhaust fan, 9,390 cfm	EA	1.00	10,350.00	10,350
1878	DF-1, Destratification fan, 18' blade dia	EA	2.00	18,866.00	37,732

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1872	FTU-1 to 3, Fan terminal unit - electric heating, 1025 cfm, 12 kW	EA	3.00	965.00	2,895
1873	FTU-4, Fan terminal unit - electric heating, 945 cfm, 12 kW	EA	1.00	869.00	869
2662	FTU-5, Fan terminal unit - electric heating, 1220 cfm, 12 kW	EA	1.00	1,110.00	1,110
1874	FTU-6, Fan terminal unit - electric heating, 1100 cfm, 12 kW	EA	1.00	1,110.00	1,110
1875	FTU-7, Fan terminal unit - electric heating, 1500 cfm, 15 kW	EA	1.00	1,206.00	1,206
1876	FTU-8 & 9, Fan terminal unit - electric heating, 2250 cfm, 22 kW	EA	2.00	1,689.00	3,378
1191	Relocation of existing Dust collector including fan and abort gate	EA	1.00	4,825.00	4,825
1982	Kitchen exhaust hood	EA	2.00	2,412.50	4,825
1877	Sound attenuators	EA	24.00	7,720.00	185,280
1192	BS, VRF branch circuit selector	EA	45.00		Incl.
1209	Air cleaners (Airboss 2500)	EA	3.00	3,860.00	11,580
1972	VAV box (small)	EA	141.00	1,302.80	183,688
1305	VAV box (medium)	EA	51.00	1,688.70	86,126
1306	VAV box (large)	EA	6.00	2,412.50	14,475
1216	Galvanized duct work c/w fittings, supports, etc.	Lb	348,433.70	15.40	5,379,814
1217	Thermal insulation	SF	365,982.70	6.30	2,295,625
2774	Black welded kitchen exhaust system	Lb	10,500.00	19.80	207,716
1243	4" to 6", Round galvanized duct work c/w fittings, supports, etc	LF	3,230.80	62.70	202,652
1242	7" to 8", Round galvanized duct work c/w fittings, supports, etc	LF	900.00	67.60	60,795
1346	10" to 12", Round galvanized duct work c/w fittings, supports, etc	LF	1,411.60	77.20	108,976
1241	14" to 16", Round galvanized duct work c/w fittings, supports, etc	LF	995.00	82.00	81,615
1245	18" to 20", Round galvanized duct work c/w fittings, supports, etc	LF	73.00	86.80	6,340

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1317	22" to 24", Round galvanized duct work c/w fittings, supports, etc	LF	326.00	91.70	29,886
1968	26" to 28", Round galvanized duct work c/w fittings, supports, etc	LF	640.00	106.20	67,936
1220	30" to 32", Round galvanized duct work c/w fittings, supports, etc	LF	825.00	120.60	99,516
1223	34" to 36", Round galvanized duct work c/w fittings, supports, etc	LF	786.00	125.50	98,604
1225	38" to 40", Round galvanized duct work c/w fittings, supports, etc	LF	408.00	144.80	59,058
1226	42" to 44", Round galvanized duct work c/w fittings, supports, etc	LF	547.00	149.60	81,818
1978	46", Round galvanized duct work c/w fittings, supports, etc	LF	71.00	154.40	10,962
1397	48" to 50", Round galvanized duct work c/w fittings, supports, etc	LF	362.00	159.20	57,639
2070	52" to 54", Round galvanized duct work c/w fittings, supports, etc	LF	29.00	164.00	4,757
1228	60", Round SS duct work c/w fittings, supports, etc	LF	76.00	173.70	13,201
2677	44"/20", Oval galvanized duct work c/w fittings, supports, etc	LF	155.00	183.30	28,419
2678	58"/30", Oval galvanized duct work c/w fittings, supports, etc	LF	44.00	207.50	9,129
2679	60"/32", Oval galvanized duct work c/w fittings, supports, etc	LF	165.00	241.20	39,806
1302	Diffusers (small)	EA	8.00	144.80	1,158
1218	A & A1, Diffusers (medium)	EA	218.00	193.00	42,074
1301	A3, Side-wall diffuser	EA	9.00	289.60	2,606
1969	D/D1/D2, Linear slot diffuser c/w plenum	EA	83.00	482.50	40,048
1970	E/H, Linear slot diffuser c/w plenum	EA	61.00	482.50	29,433
1971	F/G, Linear slot diffuser c/w plenum	EA	179.00	530.70	95,004
1290	Grilles (small)	EA	2.00	77.00	154
1300	C/C1, Grilles (medium)	EA	257.00	144.80	37,201
1303	C2, Side-wall grilles	EA	21.00	265.40	5,573

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1236	Louver	SF	1,093.00	82.00	89,653
2699	B, Grille	EA	4.00	96.50	386
2692	Plenum, 12"x10"x60"	EA	8.00	965.00	7,720
2421	Plenum, 48"x12"x8"	EA	16.00	1,254.50	20,072
2071	Plenum, 84"x6"	EA	1.00		Excl.
2695	Plenum, 84"x48"	EA	1.00	4,825.00	4,825
1399	Plenum, 60"x10"	EA	11.00	4,825.00	53,075
1321	Plenum, 36"	EA	1.00	1,689.00	1,689
2691	Plenum, 48"x4"	EA	17.00	2,412.50	41,013
1979	Plenum, 90"x78"	EA	2.00	2,412.50	4,825
1247	Plenum, 96"x50"x44' long	EA	3.00	2,171.30	6,514
2690	Plenum, 104"x60"x48"	EA	1.00	9,650.00	9,650
2693	Plenum, 256"x6"	EA	1.00	7,238.00	7,238
1246	Tubing storage reel (CAR-MON TSR-S32)	EA	6.00	1,737.00	10,422
1248	Tubing storage reel (CAR-MON TSR-S24)	EA	2.00	1,447.50	2,895
1980	LTX flex hose, 4" dia x 15' type c/w RYA dual adaptor, tube sling, spring balancer and flahe set	EA	6.00	1,206.30	7,238
1299	BD, Balancing damper	EA	514.00	482.50	248,005
1976	BD, Balancing damper (large)	EA	5.00	820.20	4,101
1572	Combination fire/smoke damper	EA	26.00	723.80	18,818
1977	FD, Fire damper	EA	6.00	530.80	3,185
2689	Automatic electric dampers	EA	9.00	4,825.00	43,425
1983	Bryant OVM096 oil fired furnace	EA	2.00	11,097.50	22,195
1984	York TL8E 95% efficient furnace	EA	5.00	9,650.00	48,250
1981	Relocate and installation of spark detection and suppression system	EA	1.00	2,895.00	2,895
1567	Allowance for miscellaneous/missing items	SF	409,877.00	0.30	118,659
2199	1/2" to 1", Condensate piping c/w fittings - Ag	LF	8,473.00	33.80	286,176
2200	1-1/4" to 1-1/2", Condensate piping c/w fittings- Ag	LF	2,141.00	38.60	82,643
2201	2", Condensate piping c/w fittings - Ag	LF	127.00	43.40	5,515
2203	Condensate piping from walk-in cooler/ walk-in freezer	LF	30.00	33.80	1,013

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2540	Equipment cost adjustment, confirmed in meeting	LS	1.00		Excl.
	D3050 - Facility HVAC Distribution Systems			48.58/SF	18,486,886
D3060	Controls & Instrumentations				
1708	BAS control system c/w computer station, graphics, wiring, testing etc.	Pt	1,500.00	1,447.50	2,171,248
	D3060 - Controls & Instrumentations			5.71/SF	2,171,248
D3070	Special Purpose HVAC Systems				
783	Testing, balancing and commissioning	SF	409,877.00	0.80	316,425
1560	General requirements: supervision, shop drawings, asbuilt, tags, markers, tools, rentals, BIM, cleaning, storage, material handling, seismic restraints, permits, fees etc.	Item			2,193,443
	D3070 - Special Purpose HVAC Systems			6.60/SF	2,509,868
	D30 - HVAC			77.81/SF	29,610,372
D40	FIRE PROTECTION				
D4010	Fire Suppression				
787	General requirements: supervision, shop drawings, asbuilt, tags, markers, tools, rentals, BIM, cleaning, storage, material handling, seismic restraints, permits, fees etc.	Item			290,465
1510	Fire pump, 1000 gpm c/w Control Panel	EA	1.00	96,500.00	96,500
1515	JP, Jockey pump c/w Control Panel	EA	1.00	8,203.00	8,203
1513	8" (ERW), Fire specialty piping c/w fittings, supports, etc.	LF	496.00	164.10	81,369
1497	6" (ERW), Fire specialty piping c/w fittings, supports, etc.	LF	2,191.00	115.80	253,718
1504	4" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	5,731.00	62.70	359,477
2704	3" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	2,607.00	57.90	150,945
1899	2-1/2" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	3,547.00	48.30	171,143
1523	2" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	8,915.00	57.90	516,179
2606	1/2" to 1-1/2" Fire specialty piping c/w fittings, supports, etc.	LF	27,858.00	38.60	1,075,318
1507	Double check valve backflow preventor assembly, 8"	EA	1.00	9,650.00	9,650

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1498	Zone control valve assembly, 4"	EA	28.00	4,342.50	121,590
1844	Post Indicator/Isolation valve, 8"	EA	7.00	2,412.60	16,888
1845	Post Indicator/Isolation valve, 6"	EA	8.00	1,930.00	15,440
1870	Post Indicator/Isolation valve, 4" (none indicated)	EA	17.00		Excl.
2702	Bypass valve, 6"	EA	1.00	2,413.00	2,413
1521	Check valve, 8"	EA	4.00	2,895.00	11,580
1905	Check valve, 6"	EA	1.00	1,737.00	1,737
1869	Check valve, 4" (none indicated)	EA	2.00		Excl.
1904	Check valve, 2"	EA	1.00	869.00	869
1846	Drain valve 3"	EA	8.00	627.30	5,018
1906	OS&Y Gate valve, 8"	EA	1.00	3,088.00	3,088
1907	OS&Y Gate valve with tamper switch, 6"	EA	16.00	3,377.50	54,040
2698	OS&Y Gate valve with tamper switch, 4"	EA	2.00	2,895.00	5,790
2706	OS&Y Gate valve with tamper switch, 3"	EA	1.00	2,654.00	2,654
1908	OS&Y Gate valve with tamper switch, 2-1/2"	EA	2.00	1,254.50	2,509
2688	Main alarm check valve, 8"	EA	1.00	4,343.00	4,343
1512	Main alarm check valve, 6"	EA	3.00	2,123.00	6,369
1540	Fire department valve assembly, 2-1/2"	EA	36.00	1,158.00	41,688
1881	Fire hose cabinet	EA	11.00	2,123.00	23,353
1843	Fire department connection 4x4" c/w chain and cap	EA	2.00	3,860.00	7,720
1508	FP water service connection, 8"	EA	1.00	9,650.00	9,650
1514	FPTH, Fire protection test header	EA	1.00	1,448.00	1,448
1559	Roof hydrant assembly-allow	EA	4.00	1,447.50	5,790
1502	Sprinkler heads c/w drop piping	EA	3,551.00	154.40	548,274
1940	Hookup for Fire pump	EA	1.00	1,930.00	1,930
1939	Hookup for Jockey pump	EA	1.00	965.00	965
2726	Cap, 1" to 1-1/2"	EA	3.00	96.70	290
2725	Cap, 2"	EA	45.00	120.60	5,428
1525	Cap, 2.5"	EA	18.00	144.80	2,606
2724	Cap, 3"	EA	13.00	144.80	1,882
1516	Cap, 4"	EA	37.00	96.50	3,571

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1517	Cap, 6"	EA	1.00	193.00	193
	D4010 - Fire Suppression			10.31/SF	3,922,083
	D40 - FIRE PROTECTION			10.31/SF	3,922,083
D50	ELECTRICAL				
D5020	Electrical Service and Distribution				
2409	System grounding grid and tie ins to building	SF	409,877.00	0.60	237,319
945	Main switchboard 4000 amps MSB-1A & 1B	EA	2.00	212,300.00	424,600
946	Primary 4000 amp service #1	EA	1.00	18,094.00	18,094
947	Primary 4000 amp service #2	EA	1.00	18,094.00	18,094
948	Emergency generator 300 kva (by utility company)	Note			Excl.
950	Transfer switch 400 amps	EA	3.00	13,992.70	41,978
952	Panel SB-DPH-LLA 800 amps	EA	1.00	31,652.00	31,652
953	Panel EM-DPH-LLA 400 amps	EA	1.00	22,774.00	22,774
954	Panel EM-DPH-ELEV-LLA 400 amps	EA	1.00	22,774.00	22,774
955	Elev #1 200 amps	EA	1.00	2,200.00	2,200
956	Elev #2 200 amps	EA	1.00	2,200.00	2,200
957	ELEV disconnect 200 amps	EA	2.00	2,123.00	4,246
958	Fire pump connection & controller connection	EA	1.00	1,423.00	1,423
960	DPH-LLA 1200 amps	EA	1.00	37,153.00	37,153
961	DPH-LLB 1200 amps	EA	1.00	37,153.00	37,153
962	DPH-LLC 1200 amps	EA	1.00	37,153.00	37,153
963	DPH-LLD 1200 amps	EA	1.00	37,153.00	37,153
964	DSH-4A 2000 amps	EA	1.00	37,153.00	37,153
965	DSH--4B 1600 amps	EA	1.00	31,652.00	31,652
966	MPH-2A & 2B 1200 amps	EA	1.00	31,652.00	31,652
967	Disconnect switches 60 amps	EA	4.00	603.30	2,413
968	Disconnect switches 100 amps	EA	12.00	916.80	11,001
969	Disconnect switches 200 amps	EA	12.00	1,785.30	21,423
970	EWB #1 & #2 200 amp connection	EA	2.00	2,268.00	4,536
971	Disconnects 400 amps	EA	9.00	2,267.80	20,410

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
972	System metering	EA	1.00	140,697.00	140,697
974	Coordination Study	EA	1.00	34,161.00	34,161
975	Arc Flash	EA	1.00	21,713.00	21,713
977	Panels 225 amps	EA	18.00	4,487.30	80,771
978	Panels 400 amps	EA	19.00	5,259.30	99,926
979	Panels 100 amps	EA	12.00	3,136.30	37,635
986	Panel GEN-EM-DPH-LLA 800 amps	EA	1.00	44,149.00	44,149
987	Generator emergency grounding	EA	1.00	8,241.00	8,241
989	Dry transformer - 30kVA	EA	12.00	3,739.40	44,873
991	Dry transformer - 75kVA	EA	2.00	5,066.50	10,133
992	Dry transformer - 115kVA	EA	19.00	8,274.90	157,223
993	Dry transformer - 225kVA	EA	2.00	12,062.50	24,125
1717	Feeders 60 amps CU	LF	12,400.00	21.20	263,252
1718	Feeders 90 amps CU	LF	6,220.00	31.70	196,875
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	22,678.00	22,678
1730	Emergency generator communication conduit & wire	EA	1.00	17,853.00	17,853
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.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1823	Panel Sub-Metering 2000 amps	EA	1.00		Excl.
1824	Panel Sub-Metering misc add ons computer 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	25.50	105,980
2519	Feeders 150 amps AL	LF	960.00	32.00	30,756
2520	Feeder 200 amps AL	LF	3,600.00	46.80	168,489
2521	Feeders 225 amps AL	LF	4,860.00	51.00	248,096
2522	Feeders 400 amps AL	LF	6,120.00	93.70	573,453
2523	Feeders 600 amps AL	LF	640.00	141.00	90,231
2524	Feeders 800 amps AL	LF	840.00	211.50	177,684
2525	Feeders 1200 amps AL	LF	1,920.00	388.80	746,492
2526	Feeders 4000 amps AL	LF	460.00	1,165.50	536,142
2778	Feeders: Added pricing adjustment per reconciliation	LS	1.00	950,524.00	950,524
2780	Mechanical connections-Reheat coils/branch selectors	EA	209.00	772.00	161,348
2781	Mechanical connections Fancoil units	EA	271.00	636.90	172,600
D5020 - Electrical Service and Distribution				16.56/SF	6,302,306
D5030	General Purpose Electrical Power				
768	Interior electronic scoreboard & shot clock	EA	1.00	8,318.00	8,318
1001	Mechanical connections (VFD) 30 amps	EA	51.00	4,207.40	214,577
1002	Mechanical connections (VFD) 60 amps	EA	53.00	6,179.90	327,533
1003	Mechanical connections (VFD) 100 amps	EA	5.00	6,818.60	34,093
1004	Mechanical connections (VFD) 200 amps	EA	5.00	17,680.80	88,404
1005	Mechanical connections (VFD) 400 amps	EA	1.00	33,196.00	33,196
1528	Rec exp proof	EA	6.00	5,447.50	32,685
1529	Rec and cord drop	EA	246.00	1,785.30	439,172
1530	Power floor box	EA	75.00	699.60	52,472
1531	Rec power	EA	728.00	120.60	87,815
1532	Rec GFI	EA	533.00	313.60	167,162
1551	Rec power Special rec 30 amps	EA	43.00	627.30	26,972
1556	Rec quad	EA	210.00	275.00	57,755

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1557	Misc. mechanical equipment and equipment connection	EA	80.00	4,810.50	384,842
2373	EV Chargers in auto shop	EA	4.00	12,014.30	48,057
1731	Power conduit & wire	EA	1,216.00	168.90	205,352
1781	Kitchen & Culinary equipment rough-in & connections	EA	149.00	410.10	61,109
1783	Shop equipment connections & dust collector	EA	1.00	12,063.00	12,063
1784	Vehicle Co2 system connection (power)	EA	1.00	1,568.00	1,568
D5030 - General Purpose Electrical Power				6.00/SF	2,283,145
D5040	Lighting				
2503	School stage rigging (refer to Equipment section)	EA	1.00		Incl.
764	School stage lighting	EA	1.00	96,500.00	96,500
2504	School stage lighting & control	EA	1.00	31,363.00	31,363
1014	Lighting type DPA - 32" decorative pendant	EA	10.00	675.50	6,755
2320	Lighting type DPB - 4' long x 6" dia. pendant	EA	12.00	752.70	9,032
2321	Lighting type DPB-2 - 4' long x 6" dia. pendant	EA	30.00	1,206.30	36,188
1016	Lighting type GPB - 15.1" dia. pendant	EA	126.00	791.30	99,704
1019	Lighting type GPE - 26' dia. direct/indirect ring pendant	EA	1.00	579.00	579
2322	Lighting type GPK - 60" dia. direct/indirect ring pendant	EA	20.00	723.80	14,475
2323	Lighting type GPL-1 - 8' long linear pendant	EA	20.00	791.30	15,826
2324	Lighting type GPL-2 - 4' long linear pendant	EA	17.00	603.10	10,253
1023	Lighting type GSA - 24" dia. surface pendant	EA	56.00	723.80	40,530
1024	Lighting type GSB - 11" dia. surface downlight	EA	19.00	445.80	8,471
1025	Lighting type GSC - surface linear	LF	100.00	445.80	44,583
2326	Lighting type GSD - 2" dia. surface round cylinder downlight	EA	22.00	397.60	8,747
2325	Lighting type GSE - 2"x8" wall indirect	LF	161.00	188.20	30,296
1027	Lighting type GWB - 8"x9" surface wall sconce exterior	EA	11.00	540.40	5,944
1028	Lighting type GWC - 8"x12" adjustable direct/indirect wall cylinder exterior	EA	14.00	694.80	9,727
2327	Lighting type GWD - 2' long indirect/direct wall sconce	EA	32.00	434.30	13,896
2328	Lighting type GWE-1 - 25" long wall linear	EA	40.00	608.00	24,318

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2329	Lighting type GWE-2 - 25" long wall linear	EA	32.00	636.90	20,381
2330	Lighting type GWF - 6" dia. adjustable wall cylinder	EA	24.00	405.30	9,727
1029	Lighting type LPA-1 - pendant linear	LF	3,527.00	304.00	1,072,119
2331	Lighting type LPA-2 - pendant linear	LF	26.00	120.60	3,136
1030	Lighting type LPB - pendant linear	LF	161.00	593.50	95,549
1031	Lighting type LPC - pendant linear	LF	1,408.00	135.10	190,221
2332	Lighting type LPD - pendant linear	LF	285.00	168.90	48,129
1032	Lighting type LPE - pendant linear	LF	81.00	149.60	12,116
2333	Lighting type LPG - pendant linear	LF	73.00	97.50	7,115
2336	Lighting type LPH - 8' long pendant linear	EA	133.00	579.00	77,007
2337	Lighting type LPJ - pendant linear	LF	549.00	135.10	74,170
2335	Lighting type LPK - pendant linear	LF	289.00	135.10	39,044
2334	Lighting type LPL - pendant linear	LF	295.00	135.10	39,855
2338	Lighting type LPM-1 - pendant linear	LF	79.00	63.70	5,032
2339	Lighting type LPM-2 - pendant linear	LF	149.00	72.40	10,784
1035	Lighting type LSA - undercabinet	LF	858.00	53.10	45,538
1036	Lighting type LSB - linear cove	LF	217.00	82.00	17,799
2341	Lighting type LSG-1 - 4' long linear	EA	74.00	542.30	40,132
2342	Lighting type LSG-2 - 8' long linear	EA	54.00	685.10	36,998
2340	Lighting type LSH - strip light	LF	541.00	542.30	293,401
1044	Lighting type LSJ - wall linear	LF	29.00	202.70	5,877
2343	Lighting type PB - 16.24" dia. pendant	EA	36.00	636.90	22,928
2345	Lighting type PD - 4" dia. pendant cylinder	EA	76.00	661.00	50,238
2344	Lighting type PD-1 - 4" dia. pendant cylinder	EA	21.00	661.00	13,882
2347	Lighting type PF - 4" dia. pendant cylinder	EA	60.00	559.70	33,582
2346	Lighting type PF-1 - 4" dia. pendant cylinder	EA	24.00	569.30	13,664
1052	Lighting type RA-1 - 2 X 2 recessed troffer	EA	185.00	395.60	73,195
2349	Lighting type RA-2 - 2 X 2 recessed troffer	EA	6.00	405.30	2,432
2348	Lighting type RA-3 - 2 X 2 recessed troffer	EA	19.00	405.30	7,701
1053	Lighting type RB-1 - 2 X 2 recessed troffer	EA	207.00	405.30	83,897
2350	Lighting type RB-2 - 2 X 4 recessed troffer	EA	6.00	453.50	2,721

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1054	Lighting type RC-1 - 2.5x2.5 recessed downlight	EA	288.00	386.00	111,168
2351	Lighting type RC-2 - 2.5x2.5 recessed downlight	EA	16.00	386.00	6,176
1055	Lighting type RDA - 24"x48" recessed food downlight	EA	31.00	395.60	12,265
2352	Lighting type RDB - 24"x24" recessed food downlight	EA	13.00	395.60	5,143
1056	Lighting type RE - 4" dia. recessed downlight	EA	31.00	378.30	11,727
1057	Lighting type RF - 2.5" dia. recessed wall wash	EA	73.00	376.40	27,474
1061	Lighting type RJ - 6"x6" recessed downlight	EA	36.00	410.10	14,765
2353	Lighting type RK - 2.5"x2.5" recessed downlight	EA	8.00	492.10	3,937
2356	Lighting type RL-1 - 2x4 recessed troffer	EA	191.00	395.60	75,569
2358	Lighting type RL-2 - 2x4 recessed troffer	EA	62.00	400.50	24,829
2357	Lighting type RM - 4" dia. recessed downlight	EA	6.00	453.50	2,721
2359	Lighting type RN-1 - 4" dia. recessed downlight	EA	15.00	395.70	5,935
2355	Lighting type RN-2 - 4" dia. recessed downlight	EA	42.00	405.30	17,023
2354	Lighting type RP - 4" dia. recessed wall wash	EA	11.00	443.90	4,883
2360	Lighting type RQ - 4" dia. recessed downlight	EA	25.00	405.30	10,133
1063	Lighting type RLA-1 - recessed linear wall wash	LF	665.00	202.60	134,762
2361	Lighting type RLA-2 - recessed linear wall wash	LF	41.00	231.60	9,496
1064	Lighting type RLB-1 - indirect wall wash	LF	259.00	144.70	37,490
2364	Lighting type RLB-2 - indirect wall wash	LF	653.00	159.20	103,974
2363	Lighting type RLB-3 - indirect wall wash	LF	135.00	164.10	22,147
2362	Lighting type RLB-4 - indirect wall wash	LF	76.00	159.20	12,101
2369	Lighting type RLC - indirect reflector	LF	1,841.00	193.00	355,313
1066	Lighting type RLD-1 - recessed linear	LF	59.00	139.90	8,256
2366	Lighting type RLD-2 - recessed linear	LF	76.00	139.90	10,634
2367	Lighting type RLD-3 - recessed linear	LF	272.00	139.90	38,060
1067	Lighting type RLE - 4' long recessed linear	EA	32.00	403.40	12,908
1068	Lighting type RLF - 48" long in ground linear	EA	10.00	733.40	7,334
2368	Lighting type RLG-1 - indirect wall wash	LF	10.00	820.30	8,203
1070	Lighting type RLH - 3' long semi recessed wall wash	EA	8.00	820.30	6,562
1071	Lighting type SA - 8" dia in-grade uplight wall wash	EA	34.00	810.60	27,560
1072	Lighting type SWA - wall sconce exterior	EA	16.00	820.30	13,124

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1073	Lighting type T1 - pendant rack	LF	65.00	35.70	2,321
1074	Lighting type TA - 3.5" dia. rack spot	EA	25.00	434.20	10,856
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	EA	25.00	542.30	13,558
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	308.80	46,629
1527	Lighting type F1 - 4' long linear	EA	44.00	111.00	4,883
1732	Lighting conduit & wire	EA	1,746.00	178.50	311,705
1743	Lighting control	SF	409,877.00	1.30	514,191
1786	Theater lighting control interface	EA	1.00	5,308.00	5,308
1787	Stage lighting control interface	EA	1.00	4,343.00	4,343

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1788	Lighting control classroom 2 zone control	EA	106.00	1,683.90	178,496
	D5040 - Lighting			13.64/SF	5,189,519
D5080	Miscellaneous Electrical Systems				
647	Lightning protection	SF	409,877.00	0.60	237,319
763	P.V System 249 kw (rough in conduit for future)	EA	1.00	73,147.00	73,147
767	Seismic restraints electrical	SF	409,877.00	0.40	158,213
777	Owner independent testing agency	EA	1.00		Excl.
1738	Electrical permits	SF	409,877.00		Excl.
1739	Electrical testing, documentation & commissioning	SF	409,877.00	1.80	755,991
1740	Electrical firestopping	SF	409,877.00	0.30	118,659
1785	Electrical access panel	EA	1.00	9,245.00	9,245
2565	Temp power	SF	409,877.00	0.70	276,872
2823	BIM	LS	1.00	96,500.00	96,500
	D5080 - Miscellaneous Electrical Systems			4.54/SF	1,725,946
D6060	Distributed Communications and Monitoring				
1737	Clocks backbone wiring	EA	1.00	7,575.00	7,575
1742	Clocks conduit & wire	EA	199.00	313.60	62,411
	D6060 - Distributed Communications and Monitoring			0.18/SF	69,986
	D50 - ELECTRICAL			40.91/SF	15,570,902
D60	COMMUNICATIONS				
D6010	Data Communications				
1676	WAP wireless access point	EA	180.00	820.30	147,645
1736	Data backbone cabling	EA	1.00	82,411.00	82,411
	D6010 - Data Communications			0.60/SF	230,056
D6020	Voice Communications				
640	TV & Video (rough in & equipment) - move to FF&E	SF	409,877.00		Excl.
	D6020 - Voice Communications				Excl.
D6030	Audio-Video Communication				
643	Inst. AV System (rough in & equipment) - move to FF&E	SF	409,877.00		Excl.
1691	Speech reinforcement system SFR rough in	EA	93.00	554.90	51,603

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1695	Video presentation screen outlet (flat screen) rough in	EA	94.00	1,447.50	136,065
1741	Sound conduit & wire	EA	696.00	603.10	419,775
2532	Tel/Data A/V cabling system rough in	SF	409,877.00	1.90	771,999
2533	IPTV and Video on demand system	EA	1.00		Excl.
2534	Large venue A/V system	EA	1.00	482,983.00	482,983
2535	Classroom speech reinforcement system	EA	1.00	214,423.00	214,423
2536	Inst. A/V system	EA	1.00		Excl.
2537	P.A. system	EA	1.00	291,430.00	291,430
	D6030 - Audio-Video Communication			6.22/SF	2,368,278
D6060	Distributed Communications and Monitoring				
2538	Clock system	EA	1.00	129,310.00	129,310
2828	Supervision and documentation	SF	409,877.00	0.60	237,319
	D6060 - Distributed Communications and Monitoring			0.96/SF	366,629
	D60 - COMMUNICATIONS			7.79/SF	2,964,963
D70	ELECTRONIC SAFETY AND SECURITY				
D7010	Access Controls and Intrusion Detection				
1733	Security conduit & wire	EA	273.00	265.40	72,447
	D7010 - Access Controls and Intrusion Detection			0.19/SF	72,447
D7030	Electronic Surveillance				
760	Vape detection system rough in	EA	1.00	35,666.00	35,666
1685	CCTV cameras rough in	EA	160.00	1,626.00	260,164
1778	Security conduit & wire	EA	160.00	723.80	115,800
1779	Security backbone cabling	EA	1.00	7,961.00	7,961
2539	Security system & CCTV	EA	1.00	771,999.00	771,999
	D7030 - Electronic Surveillance			3.13/SF	1,191,590
D7050	Detection and Alarm				
1628	Fire Alarm-Head end, mapping, programming and integration	LS	1.00	268,270.00	268,270
1629	Fire alarm control panel	EA	1.00	11,773.00	11,773
1630	Fire alarm annunciator	EA	17.00	9,505.20	161,589
1631	Fire alarm pull station	EA	40.00	627.30	25,090

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1632	Fire alarm smoke detector	EA	228.00	313.60	71,507
1636	Fire alarm audio/visual alarm	EA	487.00	395.70	192,682
1637	Fire alarm audio only alarm	EA	45.00	371.50	16,719
1640	Fire alarm flow and tamper switch	EA	126.00	540.40	68,090
1643	Fire alarm testing & commissioning	EA	972.00	241.30	234,495
1734	Fire alarm conduit & wire	EA	943.00	265.40	250,249
1780	Fire alarm communication system interface	EA	1.00	4,420.00	4,420
1782	Kitchen fire suppression connection (sbo)	EA	1.00	8,203.00	8,203
2827	Low voltage systems supervision and documentation	SF	409,877.00	0.60	237,319
D7050 - Detection and Alarm				4.07/SF	1,550,406
D7090	Electronic Safety and Security Supplementary Components				
761	Visitor management system rough in	EA	1.00	4,825.00	4,825
810	Gun/gunshot detection system	EA	1.00	24,125.00	24,125
D7090 - Electronic Safety and Security Supplementary Components				0.08/SF	28,950
D70 - ELECTRONIC SAFETY AND SECURITY				7.47/SF	2,843,393
E10	EQUIPMENT				
E1040	Institutional Equipment				
340	Fixed audience seating (Multipurpose Room)	EA	546.00	579.00	316,134
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	14,475.00	86,850
E1040 - Institutional Equipment				1.06/SF	402,984
E1070	Entertainment and Recreational Equipment				
2506	Rooftop playground equipment; Composite sensory panel	LS	1.00		Excl.
2507	Rooftop playground equipment; Rhapsody vibra chimes	EA	3.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
363	Rooftop playground equipment; 2-5 spinner - none indicated	EA	1.00		Excl.
365	Rooftop playground equipment; 2-5 main play 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.
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 Kitchen)	LS	1.00	2,315,998.00	2,315,998
2583	Food service equipment - adjustment per reconciliation	LS	1.00	-48,250.00	-48,250
1799	Loading dock equipment	EA	1.00	2,413.00	2,413
1800	Extended scissor alignment lift rack (12,000 lbs.)	EA	1.00	16,646.00	16,646
890	Move Automotive Refinishing, Automotive Technology Lifts, HVAC & Plumbing Equipment, Dental, and Carpentry (FF&E)	LS	1.00		Excl.
322	Custom display cases	Item			48,250
729	Custom bench with solid surface bench top	LF	298.00	482.50	143,785
730	Custom reception desk with solid surface top	LF	28.00	965.00	27,020
2491	Custom desk (Media Center)	LF	40.00	965.00	38,600
2490	Custom cafe counter with quartz countertop	LF	27.00	965.00	26,055
1700	Base cabinet with solid surface counter (School Store)	LF	11.00	772.00	8,492
2489	Base cabinet with solid surface island (School Store)	LF	11.00	965.00	10,615
1699	HAVC workstation countertop	EA	48.00	482.50	23,160
1703	Workshop countertop (Robotics)	LF	29.00	96.50	2,799
1698	Locker bench, 10" deep	LF	69.00	120.60	8,323
2756	Locker bench, 2'-0" deep	LF	31.00	144.70	4,487
1704	Dish return counter	LF	4.80	265.40	1,274

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2571	Furnish and install Cosmetology equipment, etc.	LS	1.00	255,725.00	255,725
2572	Install owner furnished equipment	LS	1.00	95,535.00	95,535
1809	Workshop equipment (with FF&E)	LS	1.00		Excl.
1762	Casework: Solid surface countertop, plastic laminate	LF	1,148.00	193.00	221,564
1769	Casework: Stainless steel countertop	LF	597.00	434.20	259,247
1763	Casework: Full height cabinet	LF	380.00	723.80	275,025
1765	Casework: Base cabinet with solid surface countertop	LF	1,569.00	434.20	681,337
1766	Casework: Upper cabinet	LF	988.00	241.30	238,355
2493	Casework; Mail slots cabinet	LF	12.00	1,447.50	17,370
1770	Casework; 2-Layer shelf	LF	79.00	289.50	22,871
2494	Casework; Full height 3-layer locker	LF	3.00	965.00	2,895
2497	Casework; 1-layer locker	LF	5.00	482.60	2,413
2758	Casework; 6'-10" high 3-layer cosmetology locker	LF	36.00	482.50	17,370
2495	Casework; 4'-0" high cubicle	LF	30.00	772.00	23,160
2496	Casework; File cabinet	LF	14.00	1,158.00	16,212
2499	Casework; Full height storage cabinet with glass door	LF	4.00	1,447.50	5,790
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.
2584	Casework reconciliation adjustment	LS	1.00	-231,600.00	-231,600
1808	Residential equipment	Set	4.00	4,825.00	19,300
1801	Theater rigging	LS	1.00	193,000.00	193,000
1802	Gymnasium wall padding	SF	1,035.00	28.90	29,963
1803	Gymnasium batting cage	EA	1.00	5,308.00	5,308
1811	Gymnasium flexible stainless steel safety netting	SF	2,491.00	28.90	72,114
1804	Gymnasium dividers	SF	2,582.00	19.30	49,833
1805	Gymnasium basketball backdrop	EA	6.00	9,650.00	57,900
1806	Electronic scoreboards and shot clocks	LS	1.00	38,600.00	38,600

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1807	Telescoping bleachers (Gymnasium)	LS	1.00	221,950.00	221,950
	E1090 - Other Equipment			13.72/SF	5,220,904
	E10 - EQUIPMENT			14.78/SF	5,623,888
E20	FURNISHINGS				
E2010	Fixed Furnishings				
323	Window roller shades, manual operated (Classrooms, Science Labs, Art rooms)	SF	27,761.20	9.70	267,896
803	Window roller shades, manual operated	EA	174.00		Incl.
324	Window roller shades, electrically operated (Media Center)	SF	2,314.00	19.30	44,660
325	Vertical blinds, manual operated (Administration)	SF	588.00	11.60	6,809
326	Tension shade system, electrically operated (Dome skylight) - none indicated	SF	750.00		Excl.
2826	Additional furnishing allowance	LS	1.00	15,000.00	15,000
	E2010 - Fixed Furnishings			0.88/SF	334,365
	E20 - FURNISHINGS			0.88/SF	334,365
F20	FACILITY REMEDIATION				
D2030	Building Support Plumbing Systems				
2651	5", Storm drain piping c/w fittings, supports - Ag	LF	63.00	53.10	3,344
	D2030 - Building Support Plumbing Systems			0.01/SF	3,344
	F20 - FACILITY REMEDIATION			0.01/SF	3,344
G30	LIQUID AND GAS SITE UTILITIES				
G3010	Water Utilities				
1381	6", Ductile iron pipe	LF	95.99		Incl.
1448	Cleaning, testing, trace wiring etc.	LF	95.82		Incl.
569	Excavation and backfill (with site preparation)	LF	95.82		Incl.
	G3010 - Water Utilities				Incl.

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
G3090	Liquid and Gas Site Utilities Supplementary Components				
1798	General requirements: supervision, shop drawings, as-built drawings, equipment rentals, fees, permits, etc.	Item			Incl.
	G3090 - Liquid and Gas Site Utilities Supplementary Components				Incl.
	G30 - LIQUID AND GAS SITE UTILITIES				Incl.
NEW SCHOOL BUILDING				422.20/SF	160,676,975

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2 SUMMARY

BD BASE DESIGN

A Building

A3 Maintenance Building

Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
A10	Foundations		76,380
A20	Basement Construction Subgrade Enclosures		295,576
A40	Slabs-on-Grade		129,158
A60	Water and Gas Mitigation		Incl.
A90	Substructure Related Activities		Incl.
MAINTENANCE BUILDING			501,114

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2 SUMMARY

BD BASE DESIGN

A Building

A3 Maintenance Building

Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS			
	Design & Estimating Contingency		7,517
	Escalation Allowance up to mid-point of Construction (3/2025)		15,259
	Sub-contractor Bonds		6,287
	Insurance - CCIP (Change from GL)		17,003
	Cost of Traditional Insurance (Trade + GL) - Savings		Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		909
	Payment & Performance Bond (per CM Pricing Exhibit 1)		4,603
	General Conditions (per CM Pricing Exhibit 1)		24,097
	Field Office Support		4,214
	General Requirements (per CM Pricing Exhibit 1)		12,522
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		2,114
	CM Construction Contingency (per CM Pricing Exhibit 1)		13,392
	CM Fee (per CM Pricing Exhibit 1)		10,460
ESTIMATED TOTAL COST			619,491

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A3 Maintenance Building

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
A10	FOUNDATIONS				
A1010	Standard Foundations				
529	Concrete to perimeter strip footings - 1' thick, 4500 PSI	CY	33.20	313.60	10,412
1000	Concrete to interior strip footings, 4500 PSI	CY	32.82	313.70	10,294
530	Form strip footings	SF	1,774.88	19.30	34,256
587	Bar reinforcement to strip footings, allow 100 PCY	Lb	6,573.19	1.70	11,418
2776	BP 31A - Perforated PVC foundation drainage	LS	1.00	10,000.00	10,000
	A1010 - Standard Foundations				76,380
	A10 - FOUNDATIONS				76,380
A20	BASEMENT CONSTRUCTIONSUBGRADE ENCLOSURES				
A2010	Walls for Subgrade Enclosures				
598	Concrete to perimeter frost walls, 4500 PSI	CY	90.99	313.60	28,537
1122	Concrete to interior foundation walls, 4500 PSI	CY	57.41	313.60	18,005
605	Form perimeter frost walls	SF	4,908.15	24.10	118,408
1123	Form interior foundation walls	SF	3,088.43	24.10	74,508
608	Bar reinforcement to perimeter frost walls	Lb	8,957.21	1.70	15,559
1124	Bar reinforcement to interior foundation walls	Lb	9,034.05	1.70	15,692
617	Dampproofing to frost wall	SF	2,454.16	5.80	14,210
618	Rigid insulation - 2" thick	SF	2,454.04	4.30	10,657
	A2010 - Walls for Subgrade Enclosures				295,576
	A20 - BASEMENT CONSTRUCTIONSUBGRADE ENCLOSURES				295,576
A40	SLABS-ON-GRADE				
A4010	Standard Slabs-on-Grade				
933	Concrete to slab on grade - 5" thick, 4500 PSI	CY	154.30	313.60	48,392
502	Form slab on grade	SF	184.26	17.40	3,201
2585	Fiber reinforcement to slab on grade	CY	153.79	57.90	8,904
698	Allowance for bar reinforcement	Lb	4,981.27	1.70	8,652
504	Float finish to slab on grade	SF	9,962.47	1.40	14,421
505	Control joints	SF	9,962.47	0.80	7,691
506	Air and vapor barrier	SF	9,962.47	0.90	8,652

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

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

A Building

A3 Maintenance Building (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
508	Excavation for slab on grade	CY	584.28		Incl.
509	Remove and dispose of excavated material	CY	584.28		Incl.
510	Prepare and compact sub-base	SF	9,962.47		Incl.
513	Re-use materials ILO Imported sand gravel fill - 12" thick	CY	369.02		Incl.
710	Engineering, layout, safety, cleaning, etc.	Item			2,325
	A4010 - Standard Slabs-on-Grade				102,238
A4090	Slab-on-Grade Supplementary Components				
656	Rigid insulation - 1" thick	SF	9,962.80	2.70	26,920
	A4090 - Slab-on-Grade Supplementary Components				26,920
	A40 - SLABS-ON-GRADE				129,158
A60	WATER AND GAS MITIGATION				
A6010	Building Subdrainage				
2806	BP 31A - Recommended amount	LS	1.00		Incl.
619	Perimeter drain	LF	454.20		Incl.
686	Under-slab drainage system	SF	9,962.47		Incl.
	A6010 - Building Subdrainage				Incl.
	A60 - WATER AND GAS MITIGATION				Incl.
A90	SUBSTRUCTURE RELATED ACTIVITIES				
A9010	Substructure Excavation				
591	Excavation for foundation footings including spoils removal	CY	625.79		Incl.
593	Prepare and compact foundation sub-base	SF	1,774.76		Incl.
594	Imported sand gravel fill below foundations - 12" thick	CY	65.75		Incl.
620	Imported foundation backfill	CY	346.24		Incl.
	A9010 - Substructure Excavation				Incl.
	A90 - SUBSTRUCTURE RELATED ACTIVITIES				Incl.
MAINTENANCE BUILDING					501,114

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2 SUMMARY

BD Base Design

B Sitework

Rates Current At May 2023

Ref	Description	Total Cost USD
D10	Conveying	Excl.
D20	Plumbing	Excl.
G10	Site Preparation	12,752,385
G20	Site Improvements	11,748,234
G30	Liquid and Gas Site Utilities	4,699,674
G40	Electrical Site Improvements	3,820,576
G50	Site Communications	325,842
G90	Miscellaneous Site Construction	Excl.
Z10	General Requirements	1,803,000
SITEWORK		35,149,711

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2 SUMMARY

BD Base Design

B Sitework

Rates Current At May 2023

Ref	Description	Total Cost USD
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	527,246
	Escalation Allowance up to mid-point of Construction (3/2025)	1,070,308
	Sub-contractor Bonds	440,966
	Insurance - CCIP (Change from GL)	1,192,673
	Cost of Traditional Insurance (Trade + GL) - Savings	Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)	63,729
	Payment & Performance Bond (per CM Pricing Exhibit 1)	322,897
	General Conditions (per CM Pricing Exhibit 1)	1,690,208
	Field Office Support	295,607
	General Requirements (per CM Pricing Exhibit 1)	878,323
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1	148,301
	CM Construction Contingency (per CM Pricing Exhibit 1)	939,371
	CM Fee (per CM Pricing Exhibit 1)	733,680
ESTIMATED TOTAL COST		43,453,020

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost 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.
G10	SITE PREPARATION				
G1010	Site Clearing				
2767	BP 31A - Recommended amount - clearing and grubbing (Phase 1 allowance)	LS	1.00	117,600.00	117,600
2847	BP 31A - Recommended amount - clearing and grubbing (Phase 2 allowance)	LS	1.00	78,400.00	78,400
676	Clearing and grubbing	Acre	34.900		Incl.
677	Tree removal	EA	100.00		Incl.
2848	BP 31A - Recommended amount - strip site including disposal (Phase 1)	LS	1.00	420,000.00	420,000
2849	BP 31A - Recommended amount - strip site including disposal (Phase 2)	LS	1.00	314,412.00	314,412
	G1010 - Site Clearing				930,412
G1020	Site Elements Demolition				
2768	BP 31A - Recommended amount	LS	1.00	320,181.00	320,181
523	Remove and dispose of existing catch basins	EA	33.00		Incl.
524	Remove and dispose of existing manholes	EA	23.00		Incl.
1841	Remove and dispose of existing hydrant	EA	3.00		Incl.
525	Remove and dispose existing utilities piping including excavation and backfill	LF	7,868.00		Incl.
526	Protect and maintain existing hydrant	EA	1.00		Incl.
1839	Maintain and protect manhole/catch basin/drain line/water line	EA	19.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
527	Cap water main	EA	3.00		Incl.
1842	Allowances for plugging pipes	EA	4.00		Incl.
533	Break-out and remove existing pavements	SF	261,335.00		Incl.
534	Break-out and remove existing basketball courts	SF	12,883.00		Incl.
536	Remove and dispose existing light poles and associated wiring	EA	16.00		Incl.
541	Remove and dispose existing light sconces and associated wiring	EA	25.00		Incl.
544	Remove and dispose of existing fencing	LF	1,920.00		Incl.
545	Remove and dispose of existing metal guardrail	LF	741.00		Incl.
555	Remove and dispose of buried fuel tanks	EA	2.00		Incl.
556	Remove and dispose of above grade gas tanks	EA	4.00		Incl.
557	Remove and dispose of sliding gate	EA	6.00		Incl.
559	Remove and dispose of jersey barrier	LF	40.00		Incl.
560	Remove and dispose of trailers	EA	4.00		Incl.
1439	Remove and dispose backstop	LF	196.00		Incl.
561	Allowance for miscellaneous site demolition not indicated on plans	SF	1,517,556.00		Incl.
762	Existing building electrical demolition (phased)	EA	1.00		Incl.
1442	Remove and dispose benches	EA	2.00		Incl.
1443	Demolish concrete retaining walls	LF	66.00		Incl.
1444	Remove and dispose of recreational equipment	LS	1.00		Incl.
G1020 - Site Elements Demolition					320,181
G1070	Site Earthwork				
2784	BP 31A - Recommended amount - rock excavation	LS	1.00	7,916,599.00	7,916,599
2785	BP 31A - Recommended amount - fill and borrow (Phase 1)	LS	1.00	393,776.00	393,776
2850	BP 31A - Recommended amount - fill and borrow (Phase 2)	LS	1.00	212,312.00	212,312
2786	BP 31A - Recommended amount - erosion & sediment control (Phase 2)	LS	1.00	138,000.00	138,000
2851	BP 31A - Recommended amount - erosion & sediment control (Phase 3)	LS	1.00	100,918.00	100,918

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2787	BP 31A - Recommended amount - excavation and backfill	LS	1.00	2,100,187.00	2,100,187
2852	BP 31A - Recommended amount - excavation and backfill (site improvements)	LS	1.00	640,000.00	640,000
666	Excavate to proposed level	CY	59,189.00		Incl.
667	Excavate to proposed level, rock excavation including survey, drilling, stockpile, striping, etc.	CY	162,710.00		Incl.
1813	Miscellaneous trenching, etc.	CY	14,666.00		Incl.
668	Fill to proposed level using excavated materials	CY	108,316.00		Incl.
1697	Remove excess materials from site	CY	96,724.00		Incl.
2568	Striping including spoil removal (Phase 1)	CY	10,000.00		Incl.
2569	Strip and stockpile for re-use (Phase 2)	CY	7,600.00		Incl.
669	Allowance for fine grading	SF	1,451,369.00		Incl.
673	Inlet protection	EA	143.00		Incl.
674	Construction entrance	EA	3.00		Incl.
675	Haybale and silt fencing including maintenance	LF	10,585.00		Incl.
1828	Erosion control blankets and mats	LS	1.00		Incl.
1829	Additional erosion control maintenance and removal	LS	1.00		Incl.
733	Excavate for roadway paving	CY	3,758.00		Incl.
1482	Remove spoils from site (roadway)	CY	3,758.00		Incl.
738	Excavate for parking lot paving	CY	11,646.00		Incl.
1476	Remove spoils from site (parking lot paving)	CY	11,646.00		Incl.
743	Excavate for walkways paving	CY	2,758.40		Incl.
1518	Remove spoils from site (walkways paving)	CY	2,758.40		Incl.
755	Excavate athletic fields	CY	4,890.70		Incl.
1826	Remove spoils from site (athletic fields)	CY	4,890.70		Incl.
1814	Allowance for rock scaling	LS	1.00		Incl.
2618	Raise dropped footing to within 5' depth	LS	1.00		Incl.
G1070 - Site Earthwork					11,501,792
G10 - SITE PREPARATION					12,752,385

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
G20	SITE IMPROVEMENTS				
G2010	Roadways				
2788	BP 31A - Recommended amount - rip rap slopes	LS	1.00	245,025.00	245,025
2789	BP 31A - Recommended amount - bituminous bedding	LS	1.00	236,077.00	236,077
2793	BP 31A - Recommended amount - bituminous paving	LS	1.00	959,080.00	959,080
734	Prepare and compact subbase	SF	96,239.00		Incl.
2790	BP 31A - Recommended amount - curbs	LS	1.00	642,579.00	642,579
736	Granular fill, 12" thick, re-use excavated materials	CY	3,565.00		Incl.
247	Vehicular asphalt paving, 4" overall thickness	SY	10,694.00		Incl.
1483	Imported compacted gravel borrow	CY	2,377.00		Excl.
1484	Imported dense grade crushed stone	CY	1,189.00		Excl.
248	Vertical granite curb	LF	6,479.00		Incl.
828	Cape cod berm	LF	851.00		Incl.
258	Riprap swale (re-use existing or blasted materials)	SF	62,683.00		Incl.
737	Pavement markings	SF	96,239.00		Incl.
G2010 - Roadways					2,082,761
G2020	Parking Lots				
740	Prepare and compact subbase	SF	244,704.00		Incl.
742	Granular fill, re-use excavated materials	CY	9,064.00		Incl.
1480	Imported compacted gravel borrow	CY	6,141.00		Excl.
1481	Imported dense grade crushed stone	CY	2,923.00		Excl.
253	Asphalt paving, 4" overall thickness	SY	26,303.00		Incl.
290	Vehicular concrete paving, 6" thick	SY	888.00	111.00	98,546
255	Vertical granite curb	LF	4,359.00		Incl.
671	Cape cod berm	LF	5,174.00		Incl.
262	Accessible pavement markings	SF	5,025.00	3.20	16,003
263	Crosswalk markings	SF	1,282.00	3.20	4,083
265	EV pavement markings	EA	10.00	579.00	5,790
266	Electric vehicle charging station (refer to Site Electrical)	EA	5.00		Incl.
261	Green vehicle pavement markings	EA	22.00	820.20	18,045

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
257	Handicap vehicle pavement markings	EA	19.00	627.30	11,918
357	Parking line marking	LF	8,476.00	5.50	46,622
G2020 - Parking Lots					201,007
G2030	Pedestrian Plazas and Walkways				
2791	BP 31A - Recommended amount - bituminous bedding	LS	1.00	64,878.00	64,878
2792	BP 31A - Recommended amount - bituminous paving	LS	1.00	146,340.00	146,340
745	Prepare and compact subbase	SF	76,453.10		Incl.
746	Granular fill, re-use excavated materials	CY	1,939.20		Incl.
1519	Imported compacted gravel borrow	CY	1,188.20		Excl.
1520	Imported dense grade crushed stone	CY	599.00		Excl.
256	Asphalt walkway pavement	SY	5,389.00		Incl.
718	Vehicular concrete walkway	SY	456.00	111.00	50,605
264	Accessible curb ramp	SF	1,423.00		Incl.
362	Concrete walkway paving	SF	23,864.10	12.50	299,375
367	Detectable warning	SF	377.00	43.40	16,371
G2030 - Pedestrian Plazas and Walkways					577,569
G2050	Athletic, Recreational, and Playfield Areas				
2794	BP 31A - Recommended amount - athletic fields subbase	LS	1.00	650,000.00	650,000
757	Prepare and compact subbase	SF	135,609.00		Incl.
758	Granular base to athletic fields, re-use excavated materials	CY	2,511.30		Incl.
1573	Imported compacted gravel borrow	CY	66.50		Incl.
1574	Imported dense grade crushed stone	CY	2,445.30		Incl.
2567	Repair existing irrigation affected by infiltration construction	SF	80,549.20	1.00	77,730
389	Natural grass to Football Court/Field	SF	78,287.50	3.90	302,190
2396	Irrigation to Football Court/Field natural grass turf	SF	78,287.50	1.40	113,321
405	Urethane resilient track surfacing (D-Zone)	SF	21,811.00	24.10	526,191
404	Urethane resilient track surfacing on asphalt (6-Lane Track)	SF	31,943.00	24.10	770,626
693	6'-0" High BVC chainlink fence	LF	413.10	91.70	37,870

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
397	4'-0" High BVC chainlink fence	LF	1,505.20	57.90	87,151
398	4'-0" High BVC chainlink fence single leaf gate	EA	3.00	337.70	1,013
694	4'-0" High BVC chainlink fence double leaf gate	EA	2.00	675.50	1,351
697	Shotput cage - allow 20' high	LF	69.00	168.90	11,652
406	Trench drain	LF	1,307.00	96.50	126,125
396	Electronic scoreboard - steel posts with concrete footing	EA	1.00	7,720.00	7,720
417	Football goal post and footing	EA	2.00	19,300.00	38,600
416	20'-0" high sports netting	LF	397.80	482.50	191,938
418	Long jump runway	SF	1,908.00		Incl.
419	Long jump pit	SF	755.00	62.70	47,357
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	820.30	19,686
2484	Cast-in-place slab on grade for grandstand, 4" deep	SF	3,072.10	6.80	20,752
2485	Cast-in-place slab on grade for grandstand, 5" deep	SF	496.50	10.60	5,270
2486	Cast-in-place grade beam for grandstand, 1'-0" wide x 3'-6" deep	LF	135.00	202.70	27,358
2487	Galvanized structural steel supporting framing	T	24.7200		Incl.
690	Asphalt pad	SY	46.00	57.90	2,663
695	Pole vault runway	SF	633.00		Incl.
696	Pole vault box	EA	1.00	1,930.00	1,930
699	Aluminum bleacher system including and ramp - Football field, 500 person	LS	1.00	332,925.00	332,925
701	Outdoor fitness equipment - by Owner	EA	5.00		Excl.
770	Exterior scoreboard football	EA	1.00	96,500.00	96,500
G2050 - Athletic, Recreational, and Playfield Areas					3,497,919
G2060	Site Development				
2795	BP 31A - Recommended amount - segmental retaining wall	LS	1.00	172,200.00	172,200
2796	BP 31A - Recommended amount - retaining wall stone base	LS	1.00	50,750.00	50,750
259	Steel guardrail along access ways	LF	4,302.00	67.50	290,600
260	Segmented retaining wall	LF	495.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2762	Curved Gabion seat with wall mount wood topper, 18" x 18" W	LF	36.00	1,061.50	38,214
271	Curved Gabion seat with wall mount wood topper, 18" x 24" W	LF	48.00	1,061.50	50,952
2763	Straight recycled plastic bench, 2' x 5'	EA	3.00	2,123.00	6,369
2764	Cafe wood stools, 18"H x 15" square	EA	28.00	772.00	21,616
1583	Cafe wood back chair	EA	24.00		Excl.
289	Dumpster - by Owner	EA	2.00		Excl.
369	Exterior steel bollard	EA	56.00	723.80	40,530
2419	Metal roof screen panel and gate, 8'-0" high	LF	97.00	144.80	14,041
372	4'-0" High ornamental fence	LF	16.00	337.80	5,404
377	8'-0" High chain link double leaf gate	Pair	6.00	916.70	5,500
378	8'-0" High BVC chainlink fence	LF	116.00	115.80	13,433
2416	6'-0" High BVC chainlink fence	LF	35.00	91.70	3,209
2417	6'-0" High chain link double leaf gate	Pair	1.00	868.00	868
2420	4'-0" High chainlink fence at top of rock face cut	LF	760.00	72.40	55,005
2759	8'-0" High horizontal wood slat fence	LF	177.00	144.80	25,621
380	Equipment concrete pad	SF	579.00	28.90	16,762
381	Wood deck	SF	401.00		Excl.
399	Pre-engineered elevated boardwalk ramping system	SF	8,731.70	115.80	1,011,132
1575	Pre-engineered stairs	SF	424.40	154.40	65,527
402	Handrail to stairs / ramps	LF	100.00	144.80	14,475
2753	Boardwalk guardrail comprising of welded wiremesh and steel post and framing	LF	2,499.50	337.80	844,207
373	CIP Retaining wall/ bench shelf	CY	74.00	1,737.00	128,538
728	CIP strip footing for retaining walls/bench shelf	CY	89.00	965.00	85,885
1584	Backless straight inline bench, 23.5" x 87.5" L	EA	5.00		Excl.
1585	Backed straight inline bench, 23.5" x 87.5" L	EA	3.00		Excl.
1586	Cafe table, 36" square	EA	13.00	2,702.00	35,126
2765	Cafe metal chairs	EA	24.00	675.50	16,212
2766	Cafe counter height table	EA	3.00	2,702.00	8,106
1588	Playground picnic table/bench	EA	1.00	4,439.00	4,439

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1589	Trash receptacle, 50 liter capacity	EA	6.00	1,737.00	10,422
1590	"Flo" bike racks	EA	3.00	1,447.30	4,342
2414	Sliding vehicular metal gate, 46' L x 3' Ht.	EA	1.00	24,125.00	24,125
2415	Swing vehicular swing gate, 22' long	EA	2.00	4,825.00	9,650
2754	Swing vehicular swing gate, 26' long	EA	1.00	5,790.00	5,790
2418	Flush cast-in-place concrete wall	LF	42.00	241.20	10,132
2755	Allowance for free-standing wildlife barrier	LF	692.00	28.90	20,033
G2060 - Site Development					3,109,215
G2080	Landscaping				
789	Imported planting mix	CY	5,181.40	57.90	300,003
2542	Use stockpile material	CY	5,181.40		Excl.
2809	Additional planting materials per reconciliation	CY	18,961.00	57.90	1,097,844
407	Low mow lawn	SF	310,127.50	0.50	149,637
1646	Restoration seed mix	SF	36,418.00	0.40	14,057
791	Lawn irrigation system - not required	SF	310,127.50		Excl.
2760	Reclaim granite seat block/tailings, various weights (per section 323000)	EA	20.00	1,447.50	28,950
2761	On-site salvage landscape boulder	EA	30.00	6,272.50	188,175
2401	Seeding lawn prospect athletic fields	SF	199,762.90	1.00	192,771
1595	Trees	Note			
1596	October glory red maple, 3.0-3.5" Cal.	EA	3.00	1,158.00	3,474
1597	Red maple, 1" Cal.	EA	7.00	675.40	4,728
1598	Dawn redwood, 3" Cal.	EA	6.00	1,158.00	6,948
1599	White oak, 1.5" Cal.	EA	8.00	675.50	5,404
1600	Burr oak, 2-2.5" Cal.	EA	9.00	965.00	8,685
1601	Deciduous Trees	Note			
1602	Redpointe maple, 2.5-3" Cal.	EA	7.00	965.00	6,755
1603	Sugar maple, 2.5" Cal.	EA	3.00	965.00	2,895
1604	Clump paper birch, 7-8' Ht.	EA	7.00	772.00	5,404
1605	Dura heat river birch, 6-7' Ht.	EA	2.00		Excl.
1606	Heritage birch, 10-12' Ht.	EA	6.00	1,158.00	6,948
1607	Whitespire birch, 12-14' Ht.	EA	6.00	1,158.00	6,948

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1608	Renaissance upright paper birch, 10-12' Ht.	EA	9.00	1,158.00	10,422
1609	American beech, 2-2.5" Cal.	EA	5.00	965.00	4,825
1610	Black gum, 2.5" Cal.	EA	8.00	965.00	7,720
1611	Swamp white oak, 3" Cal.	EA	4.00	1,158.00	4,632
1612	Red oak, 2.5-3" Cal.	EA	12.00	965.00	11,580
1613	American elm, 2.5-3" Cal.	EA	17.00	965.00	16,405
1614	Evergreen Trees	Note			
1615	Eastern red cedar, 7-8' Ht.	EA	7.00	772.00	5,404
1616	Pitch pine, 6-7' Ht.	EA	7.00	772.00	5,404
1617	White pine, 8-10' Ht.	EA	15.00	772.00	11,580
1618	White pine, 5-6' Ht.	EA	6.00	482.50	2,895
1619	Ornamental Trees	Note			
1620	Downy serviceberry, 4.5-5' Ht.	EA	6.00		Excl.
1621	"Autumn Brilliance" serviceberry, 7-8' Ht.	EA	17.00	772.00	13,124
1622	Donald wyman crabapple, 2-2.5" Cal.	EA	6.00	965.00	5,790
2705	Autumn flowering cherry, 3" Cal.	EA	1.00	1,158.00	1,158
1623	Ground Covers	Note			
1624	Pennsylvania sedge, plugs	EA	2,592.00	9.70	25,013
1625	Shrubs	Note			
1626	Gro-low fragrant sumac, 1 Gal.	EA	202.00	19.30	3,899
2425	Invasive Species Management and/or Buffer Zone Planting	Note			
2426	Red maple, 3-4' Ht.	EA	17.00	434.20	7,382
2427	Yellow birch, 3-4' Ht.	EA	4.00		Excl.
2428	Winterberry, 3-4' Ht.	EA	6.00		Excl.
2429	Common spicebush, 3-4' Ht.	EA	6.00		Excl.
2430	Sweet pepperbush, 3-4' Ht.	EA	8.00		Excl.
2431	Cinnamon fern, 1#	EA	20.00		Excl.
2432	Skunk cabbage, 1#	EA	20.00		Excl.
2433	Tussock sedge, 2" plug	EA	40.00		Excl.
2434	Soft rush, 2" plug	EA	20.00		Excl.
2435	Cardinal flower, 2" plug	EA	20.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2436	White wood aster, 2" plug	EA	20.00		Excl.
2437	Great blue lobelia, 2" plug	EA	20.00		Excl.
2439	Red oak, 3-4' Ht.	EA	12.00	434.30	5,211
2440	Pignut hickory, 3-4' Ht.	EA	4.00		Excl.
2441	Eastern white pine, 3-4' Ht.	EA	4.00		Excl.
2442	Witch hazel, 3-4' Ht.	EA	8.00	434.30	3,474
2443	Sassafras, 3-4' Ht.	EA	5.00		Excl.
2444	Nannyberry, 3-4' Ht.	EA	5.00		Excl.
2707	Speckled alder, 3-4' Ht.	EA	8.00	434.30	3,474
2708	Serviceberry, 3-4' Ht.	EA	5.00	434.20	2,171
2709	Northern arrowwood, 3-4' Ht.	EA	8.00	434.30	3,474
2710	Red-Osler dogwood, 3-4' Ht.	EA	5.00	434.20	2,171
2711	Black chokeberry, 3-4' Ht.	EA	5.00	434.20	2,171
2712	Highbush blueberry, 3-4' Ht.	EA	21.00	434.20	9,119
2713	White oak, 3-4' Ht.	EA	9.00	434.20	3,908
2714	Sugar maple, 3-4' Ht.	EA	7.00	434.30	3,040
2715	Nannyberry, 3-4' Ht.	EA	15.00	434.30	6,514
2716	Maple leaf viburnum, 3-4' Ht.	EA	11.00	434.30	4,777
2717	Common with hazel, #2	EA	44.00	434.30	19,107
2718	White pine, 2' Ht.	EA	33.00	434.20	14,330
2719	White oak, 0.75" Cal.	EA	11.00	434.30	4,777
2720	Red oak, 1" Cal.	EA	21.00	434.20	9,119
2721	Highbush blueberry, #2	EA	37.00	434.20	16,067
G2080 - Landscaping					2,279,763
G20 - SITE IMPROVEMENTS					11,748,234
G30	LIQUID AND GAS SITE UTILITIES				
G3010	Water Utilities				
2797	BP 31A - Recommended amount	LS	1.00	761,310.00	761,310
1967	Connect proposed water main to existing 1/2" water line	EA	1.00		Incl.
1375	Connect to existing water line on old Nahant road - allow 100ft	EA	1.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1386	Remove existing fitting and connect to main existing	EA	1.00		Incl.
1383	Connection to building	EA	2.00		Incl.
1374	8", Ductile iron pipe	LF	6,155.00		Incl.
1381	6", Ductile iron pipe	LF	403.01		Incl.
1951	6", bend	EA	3.00		Incl.
1950	8", bend	EA	52.00		Incl.
1953	Tee 8"x8"x6"	EA	12.00		Incl.
1954	Tee 8"x8"x8"	EA	5.00		Incl.
1962	Reducer 8"x4"	EA	1.00		Incl.
1376	8", Water valve	EA	42.00		Incl.
1379	6", Water valve	EA	13.00		Incl.
1385	4", Water valve	EA	1.00		Incl.
1378	6", Hydrant	EA	12.00		Incl.
1377	Trust block	EA	73.00		Incl.
1448	Cleaning, testing, trace wiring etc.	LF	6,557.68		Incl.
569	Excavation and backfill (with site preparation)	LF	6,557.68		Incl.
G3010 - Water Utilities					761,310
G3020	Sanitary Sewerage Utilities				
2798	BP 31A - Recommended amount	LS	1.00	567,025.00	567,025
1391	Connection to building sanitary service	EA	22.00		Incl.
1388	SMH, Sanitary manhole	EA	30.00		Incl.
1941	6",sanitary sewer, cast iron	LF	183.80		Incl.
1387	6",sanitary sewer, PVC	LF	1,110.90		Incl.
1943	4",sanitary sewer, PVC	LF	253.50		Incl.
1392	6",sanitary sewer, PVC	LF	427.40		Incl.
1949	8",sanitary sewer, PVC	LF	2,960.00		Incl.
1393	Thrust block	EA	2.00		Incl.
1964	Replace existing sewer manhole with drop sewer manhole and connect to existing sewer line	EA	1.00		Incl.
2318	Cleaning, testing, trace wiring etc.	LF	4,934.30		Incl.
1963	Clean and line existing 1550 LF of 8" sewer main	LF	1,550.00		Excl.
577	Excavation and backfill (with site preparation)	LF	4,934.30		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2184	Exterior grease trap(serving kitchen waste), 10,000 gal(allowance)	EA	1.00		Incl.
2570	Exterior grease trap(serving kitchen waste), 1000 gal (allowance)	EA	1.00		Incl.
2589	6",sanitary sewer, PVC, forcemain	LF	-480.00		Incl.
2590	Excavation and backfill	LF	-480.00		Incl.
G3020 - Sanitary Sewerage Utilities					567,025
G3030	Storm Drainage Utilities				
2799	BP 31A - Recommended amount - drainage piping	LS	1.00	984,395.00	984,395
2800	BP 31A - Recommended amount - drainage structure	LS	1.00	907,600.00	907,600
2801	BP 31A - Recommended amount - groundwater maintenance system	LS	1.00	100,000.00	100,000
2802	BP 31A - Recommended amount - subsurface detention system	LS	1.00	1,379,344.00	1,379,344
1862	6", PVC underdrain	LF	454.00		Incl.
1863	8", PVC underdrain	LF	63.00		Incl.
1879	8", PVC	LF	32.00		Incl.
1858	4", HDPE underdrain for subsurface system 1 to 5	LF	324.00		Incl.
1433	6", HDPE underdrain for subsurface system 1 to 5	LF	916.00		Incl.
1910	12", perforated CPP, Corrugated HDPE storm drain pipe	LF	468.00		Incl.
1411	6", HDPE storm drain pipe	LF	261.00		Incl.
1909	6", CPP, Underdrain, Corrugated HDPE storm drain pipe	LF	728.00		Incl.
1861	6", CPP, Corrugated HDPE storm drain pipe	LF	157.00		Incl.
1864	8", CPP, Corrugated HDPE storm drain pipe	LF	160.00		Incl.
1409	10", CPP, Corrugated HDPE storm drain pipe	LF	187.00		Incl.
1400	12", CPP, Corrugated HDPE storm drain pipe	LF	8,462.70		Incl.
1403	15", CCP, Corrugated HDPE storm drain pipe	LF	298.00		Incl.
1405	18", CCP, Corrugated HDPE storm drain pipe	LF	1,165.00		Incl.
1406	24", CCP, Corrugated HDPE storm drain pipe	LF	1,240.00		Incl.
1412	Area drain	EA	16.00		Incl.
1413	Catch basins	EA	76.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1414	Curb inlet	EA	5.00		Incl.
1431	12", clean out	EA	1.00		Incl.
1415	DMH - Drain manhole - 4'	EA	67.00		Incl.
1416	DMH - Drain manhole - 5'	EA	11.00		Incl.
1417	DMH - Drain manhole - 6'	EA	2.00		Incl.
1422	Remove and replace existing DMH	EA	1.00		Incl.
1419	FES - Flared End Section	EA	2.00		Incl.
1420	Headwall	EA	3.00		Incl.
1421	OCS, Outlet control structure	EA	5.00		Incl.
1423	WQS, Water quality structure	EA	19.00		Incl.
1425	Trench drain	LF	152.00		Incl.
1424	Connection to building	EA	17.00		Incl.
1426	Connect to existing CB and convert the existing CB to DMH	EA	1.00		Incl.
1427	Connect to existing manhole	EA	2.00		Incl.
1432	Precast concrete culvert - assumed 20'x3'	LF	40.00		Incl.
1434	Subsurface#1 - 210 MC-3500 c/w 14 c/w manifold	EA	1.00		Incl.
1435	Subsurface#2 - 279 MC-3500 c/w manifold	EA	1.00		Incl.
1436	Subsurface#3 - 238 MC-3500 c/w manifold	EA	1.00		Incl.
1437	Subsurface#4 - 104 SC-740 c/w manifold	EA	1.00		Incl.
1438	Subsurface#5 - 16 SC-740 c/w outlet manifold	EA	1.00		Incl.
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		Incl.
1774	Allowances for non-woven geotextile	LS	1.00		Incl.
602	Excavation and backfill (refer to site preparation)	LF	14,907.70		Incl.
1773	Excavation and backfill for subsurface system	CY	14,450.00		Incl.
2319	Cleaning, testing, trace wiring etc.	LF	14,907.70		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
611	Bioretention basin including piping, bedding, planting mix, excavation, etc.	SF	3,848.00		Incl.
681	Allowance for temporary retention basin including piping, etc.	LS	1.00		Incl.
G3030 - Storm Drainage Utilities					3,371,339
G3050	Site Energy Distribution				
1958	Proposed gas meter - install only - supply by others	EA	1.00		Incl.
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		Incl.
1966	Connect to the main service	EA	1.00		Incl.
1965	Excavation and backfill (with site preparation)	LF	1,511.00		Incl.
G3050 - Site Energy Distribution					0
G3090	Liquid and Gas Site Utilities Supplementary 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			Incl.
G3090 - Liquid and Gas Site Utilities Supplementary Components					0
G30 - LIQUID AND GAS SITE UTILITIES					4,699,674
G40	ELECTRICAL SITE IMPROVEMENTS				
G4010	Site Electric Distribution Systems				
811	Secondary 4000 amp feeder to school electrical room	LF	267.00	1,930.00	515,311
187	Secondary generator feeder (4-400 amp feeds)	LF	83.00	723.70	60,071
2812	Ductbank B (2-4" conduits) pull string only primary cabling by Others	LF	1,451.00	40.50	58,809
184	Ductbank C (8-4" conduits) pull string only primary cabling by Others	LF	1,211.00	159.20	192,821
2813	Ductbank D/F/H (4-4" conduits) pull string only primary cabling by Others	LF	2,240.00	82.00	183,736
2814	Ductbank K (2-4" conduits) pull string only primary cabling by Others	LF	134.00	40.50	5,431

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
185	Ductbank N (6-4" conduits) pull string only primary cabling by Others	LF	321.00	120.60	38,721
2815	Ductbank O (3-4" conduits) pull string only primary cabling by Others	LF	206.00	59.80	12,325
2816	Ductbank M (6-2" conduits) pull string only primary cabling by Others	LF	736.00	57.90	42,614
2817	Ductbank (2-4" conduits) pull string only primary cabling by Others	LF	50.00	40.50	2,026
2818	Ductbank (1-2" conduits) pull string only primary cabling by Others	LF	11.00	9.60	106
2819	Ductbank (2-2" conduits) pull string only primary cabling by Others	LF	291.00	19.30	5,616
2820	Ductbank (3-2" conduits) pull string only primary cabling by Others	LF	21.00	29.00	608
186	Fire Pump feeder 200 amps (2-4" conduits)	LF	376.00	54.00	20,319
2822	Ductbank A (4-2" conduits) pull string only primary cabling by Others	LF	7,944.00	38.60	306,638
188	Secondary feeder to maintenance building (400 amp service)	LF	619.00		Excl.
201	Field electrical service 75 kva transformer service EV Charging Stations	EA	2.00	40,568.50	81,137
204	Field service to concessions 250 amps	LF	329.00	62.70	20,637
205	Field service to athletic building 1200 amps	LF	106.00	121.10	12,837
208	Primary to padmount transformer for field buildings	LF	220.00	84.90	18,682
706	Secondary service manholes	EA	12.00	7,237.50	86,850
766	Utility pole modifications (not included)	EA	1.00		Excl.
1836	BP 31A - Recommended amount - ductbanks excavation and concrete encasement	LS	1.00	868,215.00	868,215
1837	Electrical (E & B) in another division of the estimate	Note			Excl.
2566	Traffic Signals	EA	1.00		Excl.
2821	Ductbank (2-1" conduits) pull string only primary cabling by Others	LF	22.00	19.30	425
G4010 - Site Electric Distribution Systems					2,533,935
G4050	Site Lighting				
214	Sports field lighting conduit & wire (pole lights)	EA	1.00	73,822.00	73,822

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
215	Sports field lighting control	EA	1.00	16,856.00	16,856
2810	Hand holes	EA	135.00	1,447.50	195,412
772	Site bench lighting	EA	1.00	8,251.00	8,251
774	Electronic gate entrance S & Install incl elect conn	EA	1.00	25,572.00	25,572
934	Type LST 11 flagpole (cluster)	EA	3.00	550.00	1,650
936	Double head 25 ft pole	EA	6.00	5,587.30	33,524
2811	Double head 24 ft pole	EA	64.00	5,307.50	339,680
937	Single head 16 ft pole	EA	23.00	4,825.00	110,975
938	Single head 14 ft pole	EA	20.00	4,511.40	90,227
940	Digital message board	EA	1.00	1,959.00	1,959
941	Monument sign lighting	EA	1.00	2,162.00	2,162
943	Musco Football lighting	EA	4.00	93,122.80	372,491
1789	Electric vehicle dual charging system	EA	1.00		Excl.
1790	Electric vehicle dual charging system distribution panels	EA	2.00	7,030.00	14,060
G4050 - Site Lighting					1,286,641
G40 - ELECTRICAL SITE IMPROVEMENTS					3,820,576
G50	SITE COMMUNICATIONS				
G5010	Site Communications				
189	Secondary communications feeder 8-4" conduits	LF	1,211.00	193.00	233,723
192	Communications to maintenance building (4-4" conduits)	LF	640.00		Excl.
209	Secondary communications feeder 4-4" conduits for Athletic fields	LF	779.00	115.80	90,208
1671	Outdoor CCTV Bullet cameras incl fiber cabling pole mtd	EA	2.00	955.50	1,911
G5010 - Site Communications					325,842
G50 - SITE COMMUNICATIONS					325,842

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost 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		Excl.
	G9010 - Other Site Construction				Excl.
	G90 - MISCELLANEOUS SITE CONSTRUCTION				Excl.
Z10	GENERAL REQUIREMENTS				
Z1050	Temporary Facilities & Controls				
2803	BP 31A - Recommended amount	LS	1.00	1,803,000.00	1,803,000
672	Dust control	LS	1.00		Incl.
678	Site fencing including maintenance	LF	7,000.00		Incl.
679	Mobilization	LS	1.00		Incl.
680	Submittals, as-builts, layout, survey, etc.	LS	1.00		Incl.
813	Temporary access road and repairs	LS	1.00		Incl.
814	Temporary walkways	LS	1.00		Incl.
670	Allowance for dewatering	LS	1.00		Incl.
	Z1050 - Temporary Facilities & Controls				1,803,000
	Z10 - GENERAL REQUIREMENTS				1,803,000
SITework					35,149,711

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



C Demolition & Abatement

Rates Current At May 2023

Ref	Description	Total Cost USD
F20	Facility Remidiation	2,300,000
F30	Demolition	2,836,093
DEMOLITION & ABATEMENT		5,136,093

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2 SUMMARY

BD Base Design

C Demolition & Abatement

Rates Current At May 2023

Ref	Description	Total Cost USD
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	77,041
	Escalation Allowance up to mid-point of Construction (3/2025)	156,394
	Sub-contractor Bonds	64,434
	Insurance - CCIP (Change from GL)	174,274
	Cost of Traditional Insurance (Trade + GL) - Savings	Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)	9,312
	Payment & Performance Bond (per CM Pricing Exhibit 1)	47,182
	General Conditions (per CM Pricing Exhibit 1)	246,974
	Field Office Support	43,194
	General Requirements (per CM Pricing Exhibit 1)	128,341
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1	21,670
	CM Construction Contingency (per CM Pricing Exhibit 1)	137,261
	CM Fee (per CM Pricing Exhibit 1)	107,206
ESTIMATED TOTAL COST		6,349,376

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION UNIFORMAT II - LEVEL 2/ELEMENTS ITEM

BD Base Design

C Demolition & Abatement

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
F20	FACILITY REMEDIATION				
F2010	Hazardous Materials Remediation				
552	Allowance for hazardous materials abatement	LS	1.00	2,300,000.00	2,300,000
	F2010 - Hazardous Materials Remediation				2,300,000
	F20 - FACILITY REMEDIATION				2,300,000
F30	DEMOLITION				
F3010	Structure Demolition				
553	Demolish existing school building	SF	239,144.00	11.60	2,769,288
554	Demolish miscellaneous support/outbuildings	SF	5,769.00	11.60	66,805
	F3010 - Structure Demolition				2,836,093
	F30 - DEMOLITION				2,836,093
DEMOLITION & ABATEMENT					5,136,093

6C.2.3 – 04

CSI MASTERFORMAT

**COST ESTIMATE
DESIGNER**

90% CONSTRUCTION DOCUMENTS COST ESTIMATE – R2

19 MAY 2023

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL

WAKEFIELD, MA



Bid/GMP Date: November 2023
Project Number: DRA No. 20202
MSBA ID: 2017-085-30605

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION SUMMARY

GFAR: Gross Floor Area
Rates Current At May 2023

Ref	Location	GFAR SF	GFAR USD/SF	Total Cost USD
BD	BASE DESIGN			
A	Building			
A1	New School Building	380,570.00	422.20	160,676,975
A3	Maintenance Building			501,114
	A - Building	380,570.00	423.52	161,178,089
B	Sitework			35,149,711
C	Demolition & Abatement			
C1F	Facility Remediation			2,300,000
C2D	Demolition			2,836,093
	C - Demolition & Abatement			5,136,093
	BD - BASE DESIGN	380,570.0	529.37	201,463,893
ESTIMATED NET COST		380,570	529.37	201,463,893
MARGINS & ADJUSTMENTS				
	Design & Estimating Contingency	1.5 %		3,021,959
	Escalation Allowance up to mid-point of Construction (3/2025)	3 %		6,134,575
	Sub-contractor Bonds	1.2 %		2,527,443
	Insurance - CCIP (Change from GL)			6,835,919
	Cost of Traditional Insurance (Trade + GL) - Savings			Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)			365,272
	Payment & Performance Bond (per CM Pricing Exhibit 1)			1,850,710
	General Conditions (per CM Pricing Exhibit 1)			9,687,591
	Field Office Support			1,694,300
	General Requirements (per CM Pricing Exhibit 1)			5,034,190
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1			850,000
	CM Construction Contingency (per CM Pricing Exhibit 1)	2.5 %		5,384,096
	CM Fee (per CM Pricing Exhibit 1)			4,205,160
ESTIMATED TOTAL COST		380,570	654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



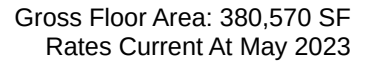
90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

DIVISIONS SUMMARY

Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
01	General Requirements	4.74	1,803,000
02	Existing Conditions	14.34	5,456,274
03	Concrete	29.98	11,408,837
04	Masonry	19.69	7,492,821
05	Metals	57.81	21,999,997
06	Wood, Plastics, and Composites	8.05	3,064,761
07	Thermal and Moisture Protection	41.99	15,981,455
08	Openings	26.74	10,174,962
09	Finishings	54.72	20,823,131
10	Specialties	4.48	1,704,023
11	Equipment	10.65	4,051,304
12	Furnishings	2.32	881,423
14	Conveying Equipment	2.51	955,775
21	Fire Suppression	10.31	3,922,083
22	Plumbing	21.14	8,046,999
23	Heating, Ventilating, and Air Conditioning	77.81	29,610,372
26	Electrical	48.49	18,453,277
27	Communications	8.92	3,394,546
28	Electronic Safety and Security	7.38	2,809,638
31	Earthwork	44.09	16,778,946
32	Exterior Improvements	20.89	7,950,595
33	Utilities	12.35	4,699,674
ESTIMATED NET COST		529.37	201,463,893
MARGINS & ADJUSTMENTS			
Design & Estimating Contingency			3,021,959
Escalation Allowance up to mid-point of Construction (3/2025)			6,134,575
Sub-contractor Bonds			2,527,443
Insurance - CCIP (Change from GL)			6,835,919
Cost of Traditional Insurance (Trade + GL) - Savings			Incl.

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS (continued)			
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		365,272
	Payment & Performance Bond (per CM Pricing Exhibit 1)		1,850,710
	General Conditions (per CM Pricing Exhibit 1)		9,687,591
	Field Office Support		1,694,300
	General Requirements (per CM Pricing Exhibit 1)		5,034,190
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		850,000
	CM Construction Contingency (per CM Pricing Exhibit 1)		5,384,096
	CM Fee (per CM Pricing Exhibit 1)		4,205,160
ESTIMATED TOTAL COST		654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

PHASING SUMMARY

Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
P1	Phase 1 - Establish Site & Ledge Removal	27.15	10,334,022
P2	Phase 2 - Construction of New Building	431.82	164,338,353
P3	Phase 3 - Demolition & Fields	70.40	26,791,518
ESTIMATED NET COST		529.37	201,463,893
MARGINS & ADJUSTMENTS			
Design & Estimating Contingency			3,021,959
Escalation Allowance up to mid-point of Construction (3/2025)			6,134,575
Sub-contractor Bonds			2,527,443
Insurance - CCIP (Change from GL)			6,835,919
Cost of Traditional Insurance (Trade + GL) - Savings			Incl.
Builder's Risk Insurance (per CM Pricing Exhibit 1)			365,272
Payment & Performance Bond (per CM Pricing Exhibit 1)			1,850,710
General Conditions (per CM Pricing Exhibit 1)			9,687,591
Field Office Support			1,694,300
General Requirements (per CM Pricing Exhibit 1)			5,034,190
Allowance for Additional Requirements not included in CM Pricing Exhibit 1			850,000
CM Construction Contingency (per CM Pricing Exhibit 1)			5,384,096
CM Fee (per CM Pricing Exhibit 1)			4,205,160
ESTIMATED TOTAL COST		654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

FILED SUB-BIDS SUMMARY

Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
1	Non-Filed Sub-Bids Trade	277.46	105,593,842
2	Masonry	20.58	7,833,370
3	Miscellaneous & Ornamental Metals	9.77	3,717,660
4	Waterproofing, Dampproofing & Caulking	4.55	1,729,852
5	Roofing & Flashing	14.54	5,533,913
6	Metal Windows	19.54	7,435,624
7	Glass & Glazing	1.79	680,549
8	Tile	4.54	1,726,596
9	Acoustical Tile	6.50	2,475,228
10	Resilient Floors	6.00	2,282,623
11	Terrazzo		Excl.
12	Painting	3.59	1,364,575
13	Elevators	2.63	999,215
14	Fire Suppression	10.77	4,100,341
15	Plumbing	22.11	8,412,738
16	Heating, Ventilating & Air Conditioning	81.34	30,956,166
17	Electrical	67.74	25,778,135
ESTIMATED NET COST		553.43	210,620,427
MARGINS & ADJUSTMENTS			
	Sub-contractor Bonds		2,527,443
	Insurance - CCIP (Change from GL)		6,835,919
	Cost of Traditional Insurance (Trade + GL) - Savings		Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		365,272
	Payment & Performance Bond (per CM Pricing Exhibit 1)		1,850,710
	General Conditions (per CM Pricing Exhibit 1)		9,687,591
	Field Office Support		1,694,300
	General Requirements (per CM Pricing Exhibit 1)		5,034,190
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		850,000
	CM Construction Contingency (per CM Pricing Exhibit 1)		5,384,096

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



Gross Floor Area: 380,570 SF
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS (continued)			
	CM Fee (per CM Pricing Exhibit 1)		4,205,160
ESTIMATED TOTAL COST		654.43	249,055,108

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD BASE DESIGN

A Building

A1 New School Building

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
03	Concrete	26.81	10,204,596
04	Masonry	19.69	7,492,821
05	Metals	55.39	21,081,340
06	Wood, Plastics, and Composites	8.05	3,064,761
07	Thermal and Moisture Protection	41.86	15,931,673
08	Openings	26.74	10,174,962
09	Finishings	54.72	20,823,131
10	Specialties	4.48	1,704,023
11	Equipment	8.88	3,377,759
12	Furnishings	1.80	685,625
14	Conveying Equipment	2.51	955,775
21	Fire Suppression	10.31	3,922,083
22	Plumbing	21.14	8,046,999
23	Heating, Ventilating, and Air Conditioning	77.81	29,610,372
26	Electrical	40.73	15,500,916
27	Communications	8.07	3,070,615
28	Electronic Safety and Security	7.38	2,807,727
31	Earthwork	5.84	2,221,797
33	Utilities		Incl.
NEW SCHOOL BUILDING		422.20	160,676,975

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD BASE DESIGN

A Building

A1 New School Building

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS			
	Design & Estimating Contingency		2,410,155
	Escalation Allowance up to mid-point of Construction (3/2025)		4,892,614
	Sub-contractor Bonds		2,015,756
	Insurance - CCIP (Change from GL)		5,451,969
	Cost of Traditional Insurance (Trade + GL) - Savings		Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		291,322
	Payment & Performance Bond (per CM Pricing Exhibit 1)		1,476,028
	General Conditions (per CM Pricing Exhibit 1)		7,726,312
	Field Office Support		1,351,285
	General Requirements (per CM Pricing Exhibit 1)		4,015,004
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		677,915
	CM Construction Contingency (per CM Pricing Exhibit 1)		4,294,072
	CM Fee (per CM Pricing Exhibit 1)		3,353,814
ESTIMATED TOTAL COST		521.94	198,633,221

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
03	CONCRETE				
A1010	Standard Foundations				
996	Concrete to isolated spread footings, 4500 PSI	CY	1,830.20	313.60	573,996
529	Concrete to perimeter strip footings - 1' thick, 4500 PSI	CY	114.70	313.60	35,972
2751	Concrete to perimeter strip footings - 1'-6" thick, 4500 PSI	CY	27.00	313.60	8,468
2403	Concrete to perimeter strip footings - 3' thick, 4500 PSI	CY	923.00	313.60	289,476
1000	Concrete to interior strip footings, 4500 PSI	CY	178.18	313.60	55,881
588	Concrete to elevator mat footings - 3' thick, 4500 PSI	CY	15.30	313.70	4,799
2633	Concrete to mat footings - 1' thick, 4500 PSI	CY	31.00	313.60	9,722
1117	Concrete to piers, 4500 PSI	CY	137.90	313.60	43,248
521	Form isolated spread footings	SF	22,957.90	19.30	443,087
530	Form strip footings	SF	10,417.02	19.30	201,048
589	Form elevator mat footings	SF	140.10	19.30	2,704
2634	Form mat footings	SF	203.00	19.30	3,918
1118	Form piers	SF	8,741.20	24.10	210,881
522	Bar reinforcement to isolated spread footings	Lb	178,617.20	1.70	310,258
587	Bar reinforcement to strip footings, allow 100 PCY	Lb	170,915.61	1.70	296,881
590	Bar reinforcement to elevator mat footings	Lb	1,871.30	1.70	3,250
2635	Bar reinforcement to mat footings, allow 165 PCY	Lb	5,074.00	1.70	8,813
1119	Bar reinforcement to piers, allow	Lb	49,493.70	1.70	85,971
A1010 - Standard Foundations				6.80/SF	2,588,373
A2010	Walls for Subgrade Enclosures				
597	Concrete to basement retaining walls, 4500 PSI	CY	879.00	313.60	275,676
599	Concrete to buttressed walls, 4500 PSI	CY	44.00	313.60	13,800
598	Concrete to perimeter frost walls, 4500 PSI	CY	489.71	313.60	153,585
1122	Concrete to interior foundation walls, 4500 PSI	CY	165.59	313.60	51,933
615	Concrete to elevator pit walls, 4500 PSI	CY	12.80	313.60	4,014
603	Form basement retaining walls	SF	25,290.00	24.10	610,121

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
604	Form buttressed walls	SF	2,790.00	24.10	67,309
605	Form perimeter frost walls	SF	19,982.65	24.10	482,081
1123	Form interior foundation walls	SF	11,480.37	24.10	276,964
616	Form elevator pit walls	SF	666.80	24.10	16,087
606	Bar reinforcement to basement retaining walls	Lb	171,364.00	1.70	297,659
607	Bar reinforcement to buttressed walls, allow 10 PSF	Lb	13,949.00	1.70	24,229
608	Bar reinforcement to perimeter frost walls	Lb	34,940.19	1.70	60,692
1124	Bar reinforcement to interior foundation walls	Lb	42,072.45	1.70	73,080
613	Bar reinforcement to elevator pit walls	Lb	3,261.90	1.70	5,666
618	Rigid insulation - 2" thick	SF	31,060.86	4.30	134,882
A2010 - Walls for Subgrade Enclosures				6.69/SF	2,547,778
A4010	Standard Slabs-on-Grade				
500	Concrete to slab on grade - 4" thick, 4500 PSI	CY	797.00	313.60	249,959
501	Concrete to slab on grade - 6" thick, 4500 PSI	CY	1,204.20	313.60	377,667
502	Form slab on grade	SF	3,523.74	17.40	61,207
503	WWF reinforcement to slab on grade (Loading dock)	SF	830.00	1.70	1,442
2585	Fiber reinforcement to slab on grade	CY	1,997.91	57.90	115,679
698	Allowance for bar reinforcement	Lb	64,643.23	1.70	112,285
796	Allowance for thicken slab under CMU	LF	1,058.00	120.60	127,621
504	Float finish to slab on grade	SF	129,285.73	1.40	187,141
505	Control joints	SF	129,285.73	0.80	99,809
703	Winter conditions	LS	1.00		Excl.
707	Mechanical pads	Item			50,663
710	Engineering, layout, safety, cleaning, etc.	Item			207,475
A4010 - Standard Slabs-on-Grade				4.18/SF	1,590,948
B1010	Floor Construction				
997	Prestressed precast concrete hollow core plank, 10" thick	SF	1,383.00	43.40	60,057
2632	Prestressed precast concrete hollow core plank, 8" thick	SF	13,566.00	38.60	523,648

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2747	Light weight concrete topping, overall 4" thick, 4500 PSI	CY	15.00	434.30	6,514
538	Light weight concrete topping, overall 5-1/4" thick, 4500 PSI	CY	4,011.20	434.20	1,741,863
998	Normal weight concrete topping to precast planks, 2" thick, 4500 PSI	CY	93.00	337.80	31,411
539	WWF reinforcement to floor deck	SF	263,591.80	1.30	330,676
540	Float finish to concrete topping	SF	263,591.80	2.90	763,097
809	Allowance for miscellaneous equipment pads (above ground)	LS	1.00	48,250.00	48,250
2621	Anticipated concrete savings due to Subcontractor input	LS	1.00	-250,000.00	-250,000
B1010 - Floor Construction				8.55/SF	3,255,516
B1020	Roof Construction				
548	Light weight concrete topping, overall 5-1/4" thick, 4500 PSI	CY	215.00	434.30	93,364
2745	Normal weight concrete topping, overall 4-1/2" thick, 4500 PSI	CY	33.00	414.90	13,693
2388	Normal weight concrete topping, overall 7" thick, 4500 PSI	CY	83.00	415.00	34,441
549	WWF reinforcement to floor deck	SF	19,396.00	1.30	24,332
550	Float finish to concrete topping	SF	19,396.00	2.90	56,151
B1020 - Roof Construction				0.58/SF	221,981
B1080	Stairs				
1679	Concrete stair to Auditorium - 4'-1" wide (none indicated)	FT/R	35.00		Excl.
B1080 - Stairs					Excl.
03 - CONCRETE				26.81/SF	10,204,596
04	MASONRY				
B2010	Exterior Walls				
22	2" Thick Granite veneer - other than South Main Entry walls	SF	2,912.00		Excl.
2582	Cast stone ILO Granite veneer	SF	2,912.00	48.30	140,504

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1651	4" Thick Cast stone veneer	SF	8,752.00	48.30	422,284
29	4" Thick Split face CMU Veneer	SF	36,262.30	38.60	1,399,724
1652	Brick veneer	SF	21,855.00	46.30	1,012,323
1777	8" thick CMU shear walls	SF	14,241.00	38.60	549,703
1137	12" thick CMU shear walls	SF	1,296.00	48.30	62,532
72	8" Thick CMU back-up	SF	411.70	33.80	13,906
71	12" Thick CMU back-up	SF	49.00	43.40	2,128
2853	Granite veneer to main entry South Walls	SF	1,922.00	183.30	352,398
2854	Deduct cast stone veneer	SF	-1,922.00	48.20	-92,736
B2010 - Exterior Walls				10.15/SF	3,862,766
C1010	Interior Partitions				
1561	CMU partition, 4" thick (Type 4.0)	SF	6,986.20	24.10	168,542
267	CMU partition, 8" thick (Type 8.0)	SF	75,060.50	27.00	2,028,134
2410	CMU partition, 8" thick, 1 hour fire rated (Type 8.1)	SF	5,429.00	33.80	183,364
1562	CMU partition, 8" thick, 2 hour fire rated (Type 8.2)	SF	21,471.00	38.60	828,780
268	CMU partition, 12" thick (Type 12.0)	SF	1,831.00	28.90	53,007
2670	CMU partition, 12" thick, 1 hour fire rated (Type 12.1)	SF	4,012.00	31.40	125,826
1563	CMU partition, 12" thick, 2 hour fire rated (Type 12.2)	SF	649.00	33.80	21,920
806	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Masonry Trade)	SF	409,877.00	0.50	197,766
C1010 - Interior Partitions				9.48/SF	3,607,339
C2010	Wall Finishes				
2479	2" Granite veneer panel	SF	214.00	106.10	22,716
C2010 - Wall Finishes				0.06/SF	22,716
04 - MASONRY				19.69/SF	7,492,821
05	METALS				
B1010	Floor Construction				
2746	Galvanized composite metal floor deck - 1-1/2" deep, 20 GA	SF	1,143.00	5.80	6,618
535	Galvanized composite metal floor deck - 2" deep, 20 GA	SF	247,501.80	5.80	1,433,035

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
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	T	1,794.1050	5,211.00	9,349,075
572	Moment connection	EA	242.00	723.80	175,148
542	Allowance for miscellaneous connections and framings	T	179.4180	5,211.00	934,946
720	Allowance for shear studs	EA	61,875.90	6.30	388,116
722	Allowance for pour stops and bent plates	LF	10,473.00	24.10	252,661
2622	Target tonnage reduction (0.25 PSF)	T	-48.7500	5,211.00	-254,036
2623	Anticipated structural steel savings due to Subcontractor input	LS	1.00	-500,000.00	-500,000
2805	Temporary stair and scaffolding	LS	1.00	193,000.00	193,000
B1010 - Floor Construction				31.48/SF	11,978,563
B1020	Roof Construction				
546	Galvanized corrugated roof deck - 3" deep, type N	SF	107,259.50	6.80	724,536
562	Acoustic galvanized corrugated roof deck - 3" deep, type NA (Gym)	SF	11,269.00	14.50	163,119
2386	Acoustic galvanized composite roof deck - 3" deep, type NA (Gym)	SF	876.00	14.50	12,680
558	Galvanized composite metal roof deck - 2" deep, 20GA	SF	15,567.00	5.80	90,133
2387	Galvanized composite metal roof deck - 3" deep, 18GA	SF	2,954.00	7.20	21,380
2384	Galvanized steel roof deck - 1 1/2" deep, type B, 20 GA	SF	3,154.00	4.80	15,218
2385	Galvanized steel roof deck - 9/16" deep, 20 GA	SF	6,143.00	3.40	20,748
2391	Structural steel roof joist - 68DLHSP1	LF	167.00	178.50	29,814
2390	Structural steel roof joist - 68DLHSP2	LF	1,246.00	178.50	222,442
2389	Structural steel roof joist - 68DLHSP3	LF	416.00	178.50	74,266
2392	Structural steel roof joist - 68DLHSP5	LF	423.00	178.50	75,516
2393	Structural steel roof joist - 68DLHSP4	LF	212.00	178.50	37,847
2735	Structural steel roof joist - 68DLHSP6	LF	845.00	178.50	150,854

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2734	Structural steel roof joist - 68DLHSP7	LF	212.00	178.50	37,847
547	Structural steel framing, including beams, columns, bracing	T	802.1710	5,211.00	4,180,110
2394	Galvanized structural steel framing, including beams, columns (Roof Mechanical Equipment)	T	29.1600	5,790.00	168,836
567	Moment connection	EA	425.00	723.80	307,594
551	Allowance for miscellaneous connections and framings	T	83.1320	5,211.00	433,201
688	Allowance for structural framing to roof screen, 8 PSF (none indicated)	T	8.0800		Excl.
721	Allowance for shear studs	EA	3,027.00	6.30	18,987
B1020 - Roof Construction				17.83/SF	6,785,128
B1080	Stairs				
182	1'-6" High metal guardrail at Rotunda balcony	LF	195.00	96.50	18,818
183	8'-0" High metal guardrail / gate at rooftop playground	LF	96.00	193.00	18,528
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'-6" wide	FT/R	30.00	2,750.30	82,508
2446	Metal stairs with concrete filled pans and landing - 4'-9" wide	FT/R	48.00	2,846.80	136,644
661	Metal stairs with concrete filled pans and landing - 5'-0" wide	FT/R	97.00	3,377.50	327,618
2748	Metal stairs with concrete filled pans and landing - 5'-9" wide	FT/R	20.00	3,860.00	77,200
663	Metal stairs with concrete filled pans and landing - 8'-0" wide	FT/R	51.00	6,127.70	312,515
665	Metal stairs with concrete filled pans and landing - 10'-0" wide	FT/R	96.00	7,237.50	694,799
1135	Metal stairs with concrete filled pans and landing - 5'-3" wide (none indicated)	FT/R	97.00		Excl.
662	Metal stairs with concrete filled pans and landing - 5'-6" wide (none indicated)	FT/R	20.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2447	Metal stairs with concrete filled pans and landing - 6'-4" wide (none indicated)	FT/R	20.00		Excl.
2448	Metal stairs with concrete filled pans and landing - 7'-9" wide (none indicated)	FT/R	48.00		Excl.
1134	Metal stairs with concrete filled pans and landing - 8'-3" wide (none indicate)	FT/R	48.00		Excl.
2445	Metal stairs with concrete filled pans and landing - 9'-9" wide (none indicated)	FT/R	48.00		Excl.
1133	Metal stairs with concrete filled pans and landing - 10'-3" wide (none indicated)	FT/R	48.00		Excl.
664	Metal stairs with concrete filled pans and landing - 10'-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.
1680	Access ladder	LF	84.00	106.20	8,917
	B1080 - Stairs			4.41/SF	1,677,547
B3020	Roof Appurtenances				
1491	Roof access ladder, 2'-0" wide	LF	18.00	337.80	6,080
181	7'-6" High RTU screen - none indicated	LF	270.00		Excl.
1492	Painted steel protection guardrail, 3'-6" high	LF	238.00	193.00	45,934
	B3020 - Roof Appurtenances			0.14/SF	52,014
C1090	Interior Specialties				
1815	Wire mesh guardrail to Shop Mezz	LF	252.00	308.80	77,818
1537	Metal guardrail to Mezzanine	LF	363.00	289.50	105,089
802	Metal railing to auditorium - none indicated	LF	167.00		Excl.
754	Allowance for elevator pit ladder, cover, etc	EA	2.00	4,825.00	9,650
293	Allowance for miscellaneous metals	SF	409,877.00	1.00	395,531
	C1090 - Interior Specialties			1.55/SF	588,088
	05 - METALS			55.39/SF	21,081,340

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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
06	WOOD, PLASTICS, AND COMPOSITES				
B1010	Floor Construction				
748	Wood floor deck - 2 layers 3/4" FRT plywood subfloor on 2x12 floor joists (Mezz)	SF	1,738.00	57.90	100,630
	B1010 - Floor Construction			0.26/SF	100,630
B1020	Roof Construction				
1838	Miscellaneous roof blocking	LS	1.00	77,200.00	77,200
	B1020 - Roof Construction			0.20/SF	77,200
C1090	Interior Specialties				
294	Allowance for rough carpentry	SF	409,877.00	0.80	316,425
295	Allowance for wood blocking	SF	409,877.00	1.30	514,191
807	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade)	SF	409,877.00	0.40	158,213
	C1090 - Interior Specialties			2.60/SF	988,829
C2010	Wall Finishes				
2750	Hardwood pilaster cap (Gym)	LF	67.00	48.30	3,233
	C2010 - Wall Finishes			0.01/SF	3,233
E1090	Other Equipment				
322	Custom display cases	Item			48,250
729	Custom bench with solid surface bench top	LF	298.00	482.50	143,785
730	Custom reception desk with solid surface top	LF	28.00	965.00	27,020
2491	Custom desk (Media Center)	LF	40.00	965.00	38,600
2490	Custom cafe counter with quartz countertop	LF	27.00	965.00	26,055
1700	Base cabinet with solid surface counter (School Store)	LF	11.00	772.00	8,492
2489	Base cabinet with solid surface island (School Store)	LF	11.00	965.00	10,615
1699	HAVC workstation countertop	EA	48.00	482.50	23,160
1703	Workshop countertop (Robotics)	LF	29.00	96.50	2,799
1698	Locker bench, 10" deep	LF	69.00	120.60	8,323
2756	Locker bench, 2'-0" deep	LF	31.00	144.70	4,487
1704	Dish return counter	LF	4.80	265.40	1,274
1762	Casework: Solid surface countertop, plastic laminate	LF	1,148.00	193.00	221,564

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1769	Casework: Stainless steel countertop	LF	597.00	434.20	259,247
1763	Casework: Full height cabinet	LF	380.00	723.80	275,025
1765	Casework: Base cabinet with solid surface countertop	LF	1,569.00	434.20	681,337
1766	Casework: Upper cabinet	LF	988.00	241.30	238,355
2493	Casework; Mail slots cabinet	LF	12.00	1,447.50	17,370
1770	Casework; 2-Layer shelf	LF	79.00	289.50	22,871
2494	Casework; Full height 3-layer locker	LF	3.00	965.00	2,895
2497	Casework; 1-layer locker	LF	5.00	482.60	2,413
2758	Casework; 6'-10" high 3-layer cosmetology locker	LF	36.00	482.50	17,370
2495	Casework; 4'-0" high cubicle	LF	30.00	772.00	23,160
2496	Casework; File cabinet	LF	14.00	1,158.00	16,212
2499	Casework; Full height storage cabinet with glass door	LF	4.00	1,447.50	5,790
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.
2584	Casework reconciliation adjustment	LS	1.00	-231,600.00	-231,600
E1090 - Other Equipment				4.98/SF	1,894,869
06 - WOOD, PLASTICS, AND COMPOSITES				8.05/SF	3,064,761
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	21,069.90	14.50	304,986
617	Dampproofing to frost wall	SF	9,991.64	5.80	57,852
2825	Water proofing adjustemnt	SF	1,000.00	-14.50	-14,475
A2010 - Walls for Subgrade Enclosures				0.92/SF	348,363
A4010	Standard Slabs-on-Grade				
506	Air and vapor barrier	SF	129,285.73	0.90	112,285
A4010 - Standard Slabs-on-Grade				0.30/SF	112,285
A4090	Slab-on-Grade Supplementary Components				
507	Rigid insulation - 2" thick	SF	4,875.90	4.30	21,173

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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
514	Extruded polystyrene insulation, perimeter only 2' wide - 2" thick	SF	4,901.00		Excl.
	A4090 - Slab-on-Grade Supplementary Components			0.06/SF	21,173
B1010	Floor Construction				
648	Expansion joint	LF	459.00	120.60	55,367
749	Geofoam rigid insulation (Auditorium stage) - 2'-0" high (none indicated)	SF	2,490.00		Excl.
750	Geofoam rigid insulation (Auditorium slope flooring) (none indicated)	SF	2,755.00		Excl.
543	Allowance for spray applied fireproofing (members only)	SF	248,643.80	3.70	911,775
1647	Allowance for intumescent paint to round HSS columns	SF	944.00	48.30	45,548
2530	Allowance for intumescent paint to bracing	SF	727.00	48.30	35,078
	B1010 - Floor Construction			2.75/SF	1,047,768
B1020	Roof Construction				
649	Expansion joint	LF	177.00	120.60	21,351
719	Allowance for spray applied fireproofing (members only)	SF	147,218.50	3.70	539,850
	B1020 - Roof Construction			1.47/SF	561,201
B2010	Exterior Walls				
30	Insulated metal panel	SF	15,291.00	86.80	1,328,022
23	Flat-lock metal tile	SF	5,893.00	96.50	568,675
44	Corrugated metal panel	SF	4,181.00	57.90	242,080
2562	Extend roof membrane to perimeter wall	SF	2,584.00	11.60	29,923
128	Ceramic steel cladding to entrance columns	SF	178.00	144.80	25,766
27	ACM rainscreen system to crown ribs, including back- up	SF	4,198.00	86.80	364,596
150	ACM rainscreen system	SF	5,164.00	86.80	448,493
25	ACM Panel system at cornice	SF	11,052.00	168.90	1,866,406
1663	ACM Band	SF	2,721.00	86.90	236,319
2771	5/8" Thick FRP plywood	SF	2,584.00	6.30	16,208
2546	5/8" Thick gypsum sheathing	SF	92,789.00	3.40	313,395

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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2543	2" Thick rigid insulation	SF	61,449.90	4.80	296,495
2544	3" Thick rigid insulation	SF	10,915.90	6.80	73,737
2559	3" Thick batt insulation	SF	32,250.00	3.90	124,485
2555	2 1/2" Thick mineral fiber insulation	SF	8,351.00	3.20	26,593
2563	3 1/2" Thick mineral fiber insulation	SF	13,149.00	3.90	50,755
2556	3 1/2" Thick mineral wool insulation	SF	10,074.00	3.90	38,886
2557	2" Thick closed cell spray foam	SF	54,471.00	3.20	173,463
2558	6" Thick closed cell spray foam	SF	5,161.00	5.80	29,882
2545	Fluid applied air and vapor barrier	SF	103,937.90	6.30	651,949
190	Allowance for miscellaneous sealing and caulking	SF	166,540.90	1.90	321,424
B2010 - Exterior Walls				18.99/SF	7,227,552
B2020	Exterior Windows				
98	Insulated translucent wall panel system with glazed operable sashes	SF	2,891.00	168.90	488,218
B2020 - Exterior Windows				1.28/SF	488,218
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	28.90	2,075,309
1479	TPO Membrane roofing - Type B; single ply membrane over cover board on 4 1/2" min. tapered roof insulation	SF	68,665.00	28.90	1,987,851
169	Tapered insulation cricket (premium over PVC roofing)	SF	18,047.00	6.80	121,907
158	Metal coping on top of exterior wall (building signage wall)	SF	298.00	72.40	21,568
159	Metal coping on top of exterior wall (Rotunda balcony wall)	SF	770.00	72.40	55,729
174	Metal coping on top of exterior wall (rooftop playground perimeter wall)	SF	257.00	72.40	18,600
349	Extensive green roof	SF	5,059.20	57.90	292,928
354	Rubber roof pavers - none indicated	SF	1,439.00		Excl.
353	Rubber roof tiles (none indicated)	SF	3,823.00		Excl.
191	Allowance for miscellaneous trims and flashings	SF	140,351.00	0.80	108,351
2773	Allowance for temporary roofing	LS	1.00	100,000.00	100,000

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LOCATION DIVISIONS/ELEMENTS ITEM

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A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2840	Protection board	SF	120,351.00	2.70	325,189
	B3010 - Roofing			13.42/SF	5,107,432
B3020	Roof Appurtenances				
2782	Synthetic turf	SF	10,834.00	14.50	156,822
1715	Walkway pad	SF	12,312.00	7.70	95,049
	B3020 - Roof Appurtenances			0.66/SF	251,871
B3080	Overhead Exterior Enclosures				
154	ACM Panel system at horizontal entrance soffit / window bay soffit	SF	2,564.00	101.30	259,797
1452	Exterior gypsum board soffit	SF	1,932.00	26.10	50,338
2783	Linear metal ceiling	SF	1,443.00	96.50	139,250
	B3080 - Overhead Exterior Enclosures			1.18/SF	449,385
C1010	Interior Partitions				
488	Allowance for miscellaneous sealing and caulking	SF	409,877.00	0.50	197,766
489	Allowance for miscellaneous fire stopping	SF	409,877.00	0.30	118,659
	C1010 - Interior Partitions			0.83/SF	316,425
	07 - THERMAL AND MOISTURE PROTECTION			41.86/SF	15,931,673
08	OPENINGS				
B2020	Exterior Windows				
48	Aluminum curtain wall system, with insulating glass	SF	25,157.60	149.60	3,762,946
49	Aluminum storefront system, with insulating glass	SF	6,248.30	120.60	753,700
212	Aluminum storefront system - none indicated	SF	3,337.00		Excl.
1627	Aluminum window system, with insulating glass	SF	8,643.00	120.60	1,042,561
1645	Premium for spandrel glass	SF	4,239.00	9.60	40,906
2575	Premium for bullet resistant glazing	LS	1.00	115,800.00	115,800
2752	Premium for louver	SF	389.00	48.20	18,769
	B2020 - Exterior Windows			15.07/SF	5,734,682
B2050	Exterior Doors and Grilles				
1227	16'-0" x 13'-4" Motor operated overhead door with insulating glass	EA	1.00	22,195.00	22,195

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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
100	14'-0" x 13'-4" Motor operated overhead door with insulating glass	EA	2.00	18,335.00	36,670
101	12'-0" x 13'-4" Motor operated overhead door with insulating glass	EA	8.00	15,440.00	123,520
1214	8'-0" x 10'-0" Motor operated overhead insulated rolling door	EA	1.00	9,650.00	9,650
2723	9'-4" x 8'-0" Motor operated overhead insulated rolling door	EA	1.00	9,168.00	9,168
134	3'-0" x 7'-0" Single leaf hollow metal door, including frame, finish, and hardware	EA	14.00	1,302.80	18,239
2722	3'-0" x 7'-0" Single leaf hollow metal door w/ 1'-0" x 1'-0" safety glass panel, including frame, finish, and hardware	EA	1.00	1,448.00	1,448
1230	3'-0" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware (at curtain wall)	EA	4.00	5,597.00	22,388
2728	3'-6" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware (at curtain wall)	EA	2.00	6,562.00	13,124
2729	3'-6" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware (at storefront)	EA	2.00	6,562.00	13,124
2727	3'-0" x 7'-10" Single leaf wire mesh door, including frame, finish, and hardware (Rooftop Playground)	EA	1.00		Incl.
1239	2@ 3'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	3.00	11,580.00	34,740
1234	2@ 3'-0" x 7'-4" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	4.00	12,062.50	48,250
2452	2@ 3'-0" x 8'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	2.00	12,545.00	25,090
1235	2@ 3'-4" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	3.00	12,062.70	36,188
1240	2@ 3'-6" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	6.00	12,303.80	73,823
2453	2@ 4'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	1.00	12,545.00	12,545
135	2@ 3'-0" x 7'-2" Double leaf hollow metal door, including frame, finish, and hardware	Pair	1.00	2,413.00	2,413

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2477	Exterior door sidelight	SF	181.00	96.50	17,467
	B2050 - Exterior Doors and Grilles			1.37/SF	520,042
B2070	Exterior Louvers and Vents				
99	Louver	SF	558.90	96.50	53,934
	B2070 - Exterior Louvers and Vents			0.14/SF	53,934
B3020	Roof Appurtenances				
168	Roof hatch	EA	2.00	5,307.50	10,615
1485	Smoke hatch	EA	3.00		Excl.
	B3020 - Roof Appurtenances			0.03/SF	10,615
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	214.00	241.30	51,628
2700	Single leaf wire mesh gate	EA	5.00		Incl.
2701	Double leaf wire mesh gate	Pair	7.00		Incl.
	C1010 - Interior Partitions			0.14/SF	51,628
C1020	Interior Windows				
112	Interior door sidelights with safety glass	SF	4,240.00	57.90	245,496
153	Interior storefront	SF	4,409.00	106.10	468,015
166	Interior fixed borrowed lights	SF	1,045.00	62.70	65,548
137	Interior security transaction window - 4'-0" x 6'-0"	EA	1.00	1,930.00	1,930
155	Interior curtain wall - 2 hour fire rated	SF	1,722.00	241.30	415,433
2808	Interior curtain wall	SF	2,018.00	139.90	282,369
794	Premium for color art glass panels - none indicated	SF	177.00		Excl.
2824	Interior ballistic premium	LS	1.00	25,000.00	25,000
	C1020 - Interior Windows			3.95/SF	1,503,791
C1030	Interior Doors				
102	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware	EA	49.00	1,515.00	74,237

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2455	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	EA	5.00	1,688.80	8,444
1287	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	EA	6.00	1,785.30	10,712
2454	3'-6"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware	EA	1.00	1,785.00	1,785
2731	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware with 1'-0"x1'-0" safety glass vision panel (45 min fire-rated)	EA	4.00	1,881.80	7,527
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	2,774.40	22,195
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	3,160.50	6,321
1263	3'-0"x4'-0" Single leaf wooden doors, including frame, finish and hardware	EA	2.00	1,013.50	2,027
106	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware	EA	292.00	1,780.40	519,884
2456	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (45 min fire-rated)	EA	1.00	1,882.00	1,882
1262	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware (90 min fire-rated)	EA	23.00	2,026.50	46,610
1270	3'-6"x7'-0" Single leaf wooden doors, including frame, finish and hardware	EA	3.00	2,074.70	6,224
1275	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware with 2'-0"x2'-11" safety glass vision panel	EA	6.00	2,364.30	14,186
1283	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware with 2'-0"x(2'-9"+1'-11") safety glass vision panel	EA	1.00	2,364.00	2,364
1215	3'-0"x7'-0" Single leaf wooden safety glazed doors, including frame, finish and hardware	EA	1.00	2,364.00	2,364
2459	3'-0"x7'-0" Single leaf wire mesh doors, including frame, finish and hardware	EA	1.00	1,448.00	1,448
1339	3'-4"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware	EA	1.00	1,641.00	1,641

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1338	4'-0"x7'-7" Single leaf wire mesh doors, including frame, finish and hardware	EA	2.00	1,978.50	3,957
2462	3'-0" x 3'-6" Glass rail gate (Multi-Purpose RM Balcony)	EA	2.00	820.50	1,641
103	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware	Pair	12.00	2,895.00	34,740
1289	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware	Pair	5.00	2,991.60	14,958
2469	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	Pair	1.00	3,185.00	3,185
1288	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	Pair	10.00	3,377.50	33,775
2467	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	Pair	3.00	3,474.00	10,422
2736	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	Pair	2.00	3,281.00	6,562
1291	2@3'-6"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware	Pair	1.00	3,378.00	3,378
2474	2@3'-6"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware	Pair	1.00	3,474.00	3,474
1292	2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware	Pair	1.00	3,715.00	3,715
2470	2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware (45 min fire-rated)	Pair	1.00	4,101.00	4,101
2737	2@3'-10"x8'-0" Double leaf hollow metal doors, including frame, finish and hardware (90 min fire-rated)	Pair	2.00	4,873.50	9,747
2740	2@3'-0"x7'-2" Double leaf hollow metal doors, including frame, finish and hardware with 2'-0"x4" safety glass vision panel (90 min fire-rated)	Pair	2.00	6,948.00	13,896
2475	2@3'-0"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware with 2'-0"x2'-11" safety glass vision panel	Pair	1.00	4,101.00	4,101

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2476	2@3'-10"x7'-0" Double leaf hollow metal doors, including frame, finish and hardware with 2'-0"x2'-11" safety glass vision panel	Pair	1.00	5,549.00	5,549
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	5,548.70	16,646
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	9,264.00	18,528
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	Pair	2.00	5,790.00	11,580
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	5,790.00	5,790
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	6,272.50	25,090
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	9,650.00	19,300
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	10,470.50	20,941
2739	2@2'-4"x7'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	1.00	2,606.00	2,606
107	2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	23.00	3,377.50	77,683
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	4,584.00	9,168
1266	2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)	Pair	7.00	3,860.00	27,020
2738	2@3'-6"x7'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	5.00	3,932.40	19,662
2468	2@3'-6"x7'-0" Double leaf wooden doors, including frame, finish and hardware (90 min fire-rated)	Pair	2.00	4,342.50	8,685

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LOCATION DIVISIONS/ELEMENTS ITEM

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2472	2@3'-10"x7'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated)	Pair	2.00	2,171.50	4,343
1271	2@3'-0"x7'-2" Double leaf wooden doors, including frame, finish and hardware	Pair	3.00	3,459.70	10,379
1272	2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware	Pair	6.00	3,860.00	23,160
2471	2@3'-0"x8'-0" Double leaf wooden doors, including frame, finish and hardware (45 min fire-rated)	Pair	1.00	4,053.00	4,053
2741	2@3'-0"x7'-0" Double leaf wooden doors, including frame, finish and hardware with 2'-0"x4" safety glass vision panel (90 min fire-rated)	Pair	1.00	3,715.00	3,715
2742	2@3'-0"x7'-2" Double leaf wooden doors, including frame, finish and hardware with 2'-0"x4" safety glass vision panel (90 min fire-rated)	Pair	2.00	3,812.00	7,624
2743	2@3'-0"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	2.00	3,136.50	6,273
2744	2@3'-0"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware	Pair	2.00	3,136.50	6,273
1341	2@3'-6"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	3.00	3,039.70	9,119
1342	2@3'-6"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware	Pair	2.00	3,136.50	6,273
1344	2@3'-7"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	1.00	3,136.00	3,136
1343	2@3'-7"x7'-2" Double leaf wire mesh doors, including frame, finish and hardware	Pair	1.00	3,136.00	3,136
1345	2@3'-8"x7'-0" Double leaf wire mesh doors, including frame, finish and hardware	Pair	1.00	3,233.00	3,233
C1030 - Interior Doors				3.26/SF	1,240,468
C1040	Interior Grilles and Gates				
2458	6'-0" x 10'-0" Rolling security grille door	EA	4.00	14,475.00	57,900
113	4'-6" x 3'-10" Overhead coiling stainless steel counter door	EA	1.00	3,860.00	3,860
2732	10'-0" x 9'-0" Fire-rated partition / door (2-hr fire-rated)	EA	8.00	28,950.00	231,600
2733	10'-0" x 10'-0" Fire-rated partition / door (2-hr fire-rated)	EA	2.00	32,810.00	65,620

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2463	8'-3" x 12'-0" Fire-rated folding partition / door (2-hr fire-rated)	EA	2.00	33,775.00	67,550
2460	14'-8" x 10'-0" Fire-rated partition / door (2-hr fire-rated)	EA	1.00	48,250.00	48,250
2464	42'-0" x 15'-0" Curved fire-rated folding partition / door (2-hr fire-rated)	EA	1.00	289,500.00	289,500
C1040 - Interior Grilles and Gates				2.01/SF	764,280
C1090	Interior Specialties				
301	Glass guardrail (Second Floor Corridor)	LF	231.00	559.70	129,291
2505	Glass guardrail (Stair 1)	LF	108.00	559.70	60,448
2508	Glass guardrail (Multi-purpose RM)	LF	189.00	559.70	105,783
C1090 - Interior Specialties				0.78/SF	295,522
08 - OPENINGS				26.74/SF	10,174,962
09	FINISHINGS				
B2010	Exterior Walls				
2547	8" Light gauge metal stud back-up	SF	2,334.00	15.40	36,037
2548	6" Light gauge metal stud back-up	SF	86,186.00	13.50	1,164,372
2549	4" Light gauge metal stud back-up	SF	10,333.00	10.60	109,685
2550	3 5/8" Light gauge metal stud back-up	SF	10,681.00	10.10	108,226
2551	2 1/2" Light gauge metal stud back-up	SF	5,860.00	8.70	50,894
2560	5/8" Thick gypsum board lining	SF	75,088.00	4.30	326,070
B2010 - Exterior Walls				4.72/SF	1,795,284
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	874.00	16.40	14,338
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	60,763.00	18.80	1,143,407
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	50,927.00	20.30	1,032,035

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
412	Gypsum board partition - 6" metal stud with 2 layer 5/8" GWB on both sides with 5" acoustic batt insulation (Type G6.0B)	SF	54,444.00	22.00	1,197,876
2412	Gypsum board partition - 6" metal stud staggered in 8" metal track with 2 layer 5/8" GWB on both sides with 5" acoustic batt insulation (Type G6.0C)	SF	717.00	26.10	18,681
2413	Gypsum board partition - 6" metal stud with 1 layer 5/8" GWB on both sides with 5" acoustic batt insulation, 1 hour fire rated (Type G6.1)	SF	115.00	21.00	2,419
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	3,111.00	24.60	76,554
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	19,584.00	27.50	538,609
2684	Gypsum board partition - 8" metal stud with 1 layer 5/8" abuse resistant GWB on both side (Type G8.0)	SF	260.00	22.20	5,771
459	Gypsum board furring - 7/8" metal stud with 1 layer 5/8" GWB (Type F1.0)	SF	2,045.00	7.20	14,801
2411	Gypsum board furring - 1-5/8" metal stud with 1 layer 5/8" GWB (Type F2.0)	SF	2,878.00	8.20	23,607
1552	Gypsum board furring - 2-1/2" metal stud with 1 layer 5/8" GWB (Type F3.0)	SF	2,675.00	9.20	24,524
410	Gypsum board furring - 3-5/8" metal stud with 1 layer 5/8" GWB (Type F4.0)	SF	34,755.90	10.60	368,934
432	Gypsum board furring - 3-5/8" metal stud with 2 layer 5/8" GWB (Type F4.0A)	SF	8,734.00	13.00	113,782
411	Gypsum board furring - 6" metal stud with 1 layer 5/8" GWB (Type F6.0)	SF	59,252.00	12.10	714,726
413	Gypsum board furring - 6" metal stud with 2 layer 5/8" GWB (Type F6.0A)	SF	40,878.00	14.50	591,709
2687	Shaft wall - 4" CH stud with 1" Gypsum liner panel one side and 1 layer 5/8" type X GWB another side with 4" acoustic batt insulation, 2 hour fire rated (Type S4.2)	SF	989.00	17.40	17,179
1565	Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" type X GWB another side with 5-1/2" acoustic batt insulation, 1 hour fire rated (Type S6.1)	SF	1,236.00	27.50	33,993

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
433	Shaft wall - 6" CH stud with 1" Gypsum liner panel on side and 2 layers 5/8" type X GWB another side with 5 -1/2" acoustic batt insulation, 2 hour fire rated (Type S6.2)	SF	38,223.00	28.90	1,106,555
1571	Student booth / training wall - 2x4 FRT wood stud with 1 layer 1/2" FRT plywood sheathing on one side	SF	10,803.00	12.10	130,312
808	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Drywall Trade)	SF	409,877.00	0.40	158,213
C1010 - Interior Partitions				19.26/SF	7,328,025
C2010	Wall Finishes				
141	Ceramic tile	SF	25,414.30	21.20	539,546
142	Thin porcelain tile	SF	21,279.00	24.10	513,356
144	Wood veneer panels (Media Center)	SF	4,760.00	62.70	298,571
1678	Phenolic resin panel system	SF	1,685.00	82.00	138,212
1810	Wood fiber acoustical panels	SF	4,542.00	82.00	372,558
782	Fabric wrap acoustical panel (Multi-Purpose RM)	SF	2,269.00	48.20	109,479
147	Decorative fabric metal panels (Stage) - none indicated	SF	474.00		Excl.
148	FRP panels	SF	6,573.00	24.10	158,574
170	Prepare and apply epoxy paint	SF	204,186.10	3.40	689,637
172	Prepare and apply paint to GWB	SF	323,094.90	1.30	405,323
841	Plastic laminate window sills	LF	2,334.60	72.40	168,967
1670	Metal column cover	SF	304.00	130.30	39,604
C2010 - Wall Finishes				9.02/SF	3,433,827
C2030	Flooring				
2	ASF, Rubber athletic flooring	SF	2,595.00	19.30	50,084
3	CPT-1, Carpet	SY	644.00	67.50	43,502
2375	CPT-2, Carpet	SY	905.00	67.60	61,133
1418	RC, Resilient carpet	SF	2,936.00	5.80	16,999
1398	PP, Porcelain floor tiles	SF	15,115.00	28.90	437,579
4	CMT, Ceramic mosaic tile	SF	4,429.00	19.30	85,480
5	SCONC, Sealed concrete	SF	87,611.40	1.40	126,817

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
6	EF, Epoxy flooring and base	SF	10,980.40	14.50	158,941
8	FGC, Foot grille carpet	SF	923.00	67.60	62,349
9	LIN, Linoleum	SF	124,004.00	9.60	1,196,638
2380	SV, Sheet vinyl	SF	11,496.00	11.60	133,124
2376	MULT, Sheet vinyl - multipurpose	SF	10,037.00	11.60	116,228
18	SV-SR, Sheet vinyl - slip resistant	SF	402.00	11.60	4,655
1401	LVT, Luxury vinyl tile	SF	2,373.00	7.70	18,320
19	WOC1, Walk off carpet	SY	310.00	62.70	19,445
20	WAF, Wood athletic flooring	SF	10,116.00	19.30	195,239
10	Resilient base	LF	38,445.30	4.80	185,499
1744	Sheet vinyl base	LF	2,844.00	4.80	13,722
1707	Porcelain tile base	LF	835.00	24.10	20,144
11	Ceramic tile base	LF	2,872.00	19.30	55,430
2482	6" Tall pre-cast terrazzo base - excluded	LF	933.00		Excl.
2483	Millwork base	LF	191.00	28.90	5,529
815	High performance adhesive, resilient flooring	SF	150,905.00	1.40	218,435
2631	High performance adhesive, non-resilient flooring	SF	29,768.00	1.40	43,089
C2030 - Flooring				8.59/SF	3,268,381
C2040	Stair Finishes				
15	RR-L, Photoluminescent rubber stair treads, risers, and landings	SF	9,996.00	24.10	241,154
2660	Terrazzo stair treads, risers, and landings - excluded	SF	1,024.00		Excl.
2665	Concrete sealer (Mezz. stairs)	SF	181.00	4.80	873
C2040 - Stair Finishes				0.64/SF	242,027
C2050	Ceiling Finishes				
31	Acoustic ceiling (ACT-1) - 2' x 2' NRC acoustic ceiling tile	SF	174,259.30	7.70	1,345,280
32	Acoustic ceiling (ACT-2) - 2' x 2' Washable acoustic ceiling tile	SF	5,633.00	7.70	43,487
33	Acoustic ceiling (ACT-3) - 2' x 2' NRC tegular acoustic ceiling tile	SF	12,940.90	7.70	99,904

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
34	Acoustic ceiling (ACT-4) - 2' x 6' NRC tegular acoustic ceiling tile	SF	4,685.00	11.60	54,252
1447	Acoustic ceiling (ACT-5)	SF	4,499.00	11.60	52,098
46	Acoustic preformed ceiling panels at Media Center	SF	1,852.00	62.70	116,167
1455	Acoustic ceiling reflector at Stage	SF	332.00	91.70	30,436
37	Gypsum board ceiling	SF	18,292.30	19.30	353,041
41	Gypsum board ceiling, moisture resistant	SF	6,915.70	24.10	166,841
38	LMC-2, Linear metal ceiling with wood appearance	SF	9,980.00	62.70	625,995
2669	Wood paneling ceiling (IWP)	SF	647.00	62.70	40,583
39	Paint to gypsum board ceiling	SF	35,970.20	1.40	52,067
2407	Suspended pipe rail ceiling system (Multi Purpose RM)	SF	3,290.00	14.50	47,623
40	Paint to exposed ceiling	SF	71,288.70	2.20	158,225
42	Sound isolator ceiling - 2 layer 5/8" GWB over 7/8" metal furring and 1-1/2" cold rolled channels with 3-1/2" batt insulation	SF	54,534.00	24.60	1,341,944
75	Allowance for gypsum board soffit - allow 20% of GWB	SF	8,580.00	24.10	206,993
2406	4" Metal suspension trim	LF	428.00	48.30	20,651
C2050 - Ceiling Finishes				12.50/SF	4,755,587
09 - FINISHINGS				54.72/SF	20,823,131
10	SPECIALTIES				
C1090	Interior Specialties				
277	Restroom accessories - Toilet partition	EA	31.00	1,254.50	38,890
287	Restroom accessories - Toilet partition, ADA	EA	14.00	1,640.50	22,967
302	Restroom accessories - Urinal partition	EA	15.00	675.50	10,133
280	Restroom accessories - Tissue paper dispenser	EA	88.00	120.60	10,615
281	Restroom accessories - Grab bar	EA	57.00	173.70	9,901
305	Restroom accessories - Shower grab bar	Set	10.00	434.30	4,343
282	Restroom accessories - Napkin disposal	EA	69.00	482.50	33,293
283	Restroom accessories - Robe hook	EA	88.00	96.50	8,492
284	Restroom accessories - Soap dispenser	EA	65.00	144.80	9,409
285	Restroom accessories - Shower curtain and rod	EA	10.00	193.00	1,930

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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
304	Restroom accessories - Shower seat	EA	10.00	579.00	5,790
291	Restroom accessories - Framed mirror	EA	65.00	772.00	50,180
292	Restroom accessories - Towel dispenser/waste receptacle	EA	69.00	820.20	56,597
303	Restroom accessories - Baby changing table - none indicated	EA	5.00		Excl.
319	Allowance for markerboards - 4'x4'	EA	37.00	217.10	8,034
339	Allowance for markerboards - 6'x4'	EA	39.00	337.70	13,172
1533	Allowance for markerboards - 8'x4'	EA	3.00	453.70	1,361
1534	Allowance for markerboards - 10'x4'	EA	12.00	559.70	6,716
320	Allowance for tackboards - 4'x4'	EA	41.00	164.00	6,726
335	Allowance for tackboards - 8'x4'	EA	4.00	318.50	1,274
1535	Allowance for tackboards - 12'x4'	EA	2.00	482.50	965
321	Allowance for visual display rails	Item			9,650
329	Metal lockers - 2 tier 15"x15" (Corridors)	EA	354.00	772.00	273,288
2509	Metal lockers - 2 tier 15"x15" (Team Locker / Auto Collision)	EA	255.00	772.00	196,860
2510	Metal lockers - 3 tier 15"x15" (Locker / Shops)	EA	481.00	675.50	324,916
2478	Mirror (Fitness)	SF	462.00	33.80	15,604
2772	Mirror (Dressing)	SF	93.00	33.80	3,141
753	Allowance for janitor accessories	EA	12.00	723.80	8,685
327	Allowance for cubicle curtain at nurse's area	EA	2.00	1,737.00	3,474
1547	Allowance for cubicle curtain at Health /Medical Assisting	EA	15.00	1,737.00	26,055
328	Allowance for corner guards	Item			7,720
331	Allowance for closet and utility shelving	Item			5,790
332	Allowance for AED with cabinets	EA	12.00	1,930.00	23,160
296	Allowance for fire extinguisher and cabinets	EA	163.90	820.30	134,439
297	Allowance for interior signage	SF	409,877.00	0.90	355,978
298	Allowance for exterior signage	Item			14,475
C1090 - Interior Specialties				4.48/SF	1,704,023
10 - SPECIALTIES				4.48/SF	1,704,023

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
11	EQUIPMENT				
E1040	Institutional Equipment				
340	Fixed audience seating (Multipurpose Room)	EA	546.00	579.00	316,134
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	14,475.00	86,850
E1040 - Institutional Equipment				1.06/SF	402,984
E1070	Entertainment and Recreational Equipment				
2506	Rooftop playground equipment; Composite sensory 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 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.
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 Kitchen)	LS	1.00	2,315,998.00	2,315,998
2583	Food service equipment - adjustment per reconciliation	LS	1.00	-48,250.00	-48,250
1799	Loading dock equipment	EA	1.00	2,413.00	2,413
1800	Extended scissor alignment lift rack (12,000 lbs.)	EA	1.00	16,646.00	16,646

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LOCATION DIVISIONS/ELEMENTS ITEM

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
890	Move Automotive Refinishing, Automotive Technology Lifts, HVAC & Plumbing Equipment, Dental, and Carpentry (FF&E)	LS	1.00		Excl.
1809	Workshop equipment (with FF&E)	LS	1.00		Excl.
1808	Residential equipment	Set	4.00	4,825.00	19,300
1801	Theater rigging	LS	1.00	193,000.00	193,000
1802	Gymnasium wall padding	SF	1,035.00	28.90	29,963
1803	Gymnasium batting cage	EA	1.00	5,308.00	5,308
1811	Gymnasium flexible stainless steel safety netting	SF	2,491.00	28.90	72,114
1804	Gymnasium dividers	SF	2,582.00	19.30	49,833
1805	Gymnasium basketball backdrop	EA	6.00	9,650.00	57,900
1806	Electronic scoreboards and shot clocks	LS	1.00	38,600.00	38,600
1807	Telescoping bleachers (Gymnasium)	LS	1.00	221,950.00	221,950
E1090 - Other Equipment				7.82/SF	2,974,775
11 - EQUIPMENT				8.88/SF	3,377,759
12	FURNISHINGS				
E1090	Other Equipment				
2571	Furnish and install Cosmetology equipment, etc.	LS	1.00	255,725.00	255,725
2572	Install owner furnished equipment	LS	1.00	95,535.00	95,535
E1090 - Other Equipment				0.92/SF	351,260
E2010	Fixed Furnishings				
323	Window roller shades, manual operated (Classrooms, Science Labs, Art rooms)	SF	27,761.20	9.70	267,896
803	Window roller shades, manual operated	EA	174.00		Incl.
324	Window roller shades, electrically operated (Media Center)	SF	2,314.00	19.30	44,660
325	Vertical blinds, manual operated (Administration)	SF	588.00	11.60	6,809
326	Tension shade system, electrically operated (Dome skylight) - none indicated	SF	750.00		Excl.
2826	Additional furnishing allowance	LS	1.00	15,000.00	15,000
E2010 - Fixed Furnishings				0.88/SF	334,365
12 - FURNISHINGS				1.80/SF	685,625

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LOCATION DIVISIONS/ELEMENTS ITEM

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A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
14	CONVEYING EQUIPMENT				
D1010	Vertical Conveying Systems				
687	Traction passenger elevator, 5 stops, open both sides, 3500 pounds	EA	1.00	458,375.00	458,375
2511	Traction service elevator, 4 stops, 5000 pounds	EA	1.00	347,400.00	347,400
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
2807	Operator time/fees for other trades	LS	1.00	100,000.00	100,000
	D1010 - Vertical Conveying Systems			2.51/SF	955,775
	14 - CONVEYING EQUIPMENT			2.51/SF	955,775
21	FIRE SUPPRESSION				
D4010	Fire Suppression				
787	General requirements: supervision, shop drawings, asbuilt, tags, markers, tools, rentals, BIM, cleaning, storage, material handling, seismic restraints, permits, fees etc.	Item			290,465
1510	Fire pump, 1000 gpm c/w Control Panel	EA	1.00	96,500.00	96,500
1515	JP, Jockey pump c/w Control Panel	EA	1.00	8,203.00	8,203
1513	8" (ERW), Fire specialty piping c/w fittings, supports, etc.	LF	496.00	164.10	81,369
1497	6" (ERW), Fire specialty piping c/w fittings, supports, etc.	LF	2,191.00	115.80	253,718
1504	4" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	5,731.00	62.70	359,477
2704	3" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	2,607.00	57.90	150,945
1899	2-1/2" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	3,547.00	48.30	171,143
1523	2" (CS), Fire specialty piping c/w fittings, supports, etc.	LF	8,915.00	57.90	516,179
2606	1/2" to 1-1/2" Fire specialty piping c/w fittings, supports, etc.	LF	27,858.00	38.60	1,075,318
1507	Double check valve backflow preventor assembly, 8"	EA	1.00	9,650.00	9,650
1498	Zone control valve assembly, 4"	EA	28.00	4,342.50	121,590
1844	Post Indicator/Isolation valve, 8"	EA	7.00	2,412.60	16,888

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1845	Post Indicator/Isolation valve, 6"	EA	8.00	1,930.00	15,440
1870	Post Indicator/Isolation valve, 4" (none indicated)	EA	17.00		Excl.
2702	Bypass valve, 6"	EA	1.00	2,413.00	2,413
1521	Check valve, 8"	EA	4.00	2,895.00	11,580
1905	Check valve, 6"	EA	1.00	1,737.00	1,737
1869	Check valve, 4" (none indicated)	EA	2.00		Excl.
1904	Check valve, 2"	EA	1.00	869.00	869
1846	Drain valve 3"	EA	8.00	627.30	5,018
1906	OS&Y Gate valve, 8"	EA	1.00	3,088.00	3,088
1907	OS&Y Gate valve with tamper switch, 6"	EA	16.00	3,377.50	54,040
2698	OS&Y Gate valve with tamper switch, 4"	EA	2.00	2,895.00	5,790
2706	OS&Y Gate valve with tamper switch, 3"	EA	1.00	2,654.00	2,654
1908	OS&Y Gate valve with tamper switch, 2-1/2"	EA	2.00	1,254.50	2,509
2688	Main alarm check valve, 8"	EA	1.00	4,343.00	4,343
1512	Main alarm check valve, 6"	EA	3.00	2,123.00	6,369
1540	Fire department valve assembly, 2-1/2"	EA	36.00	1,158.00	41,688
1881	Fire hose cabinet	EA	11.00	2,123.00	23,353
1843	Fire department connection 4x4" c/w chain and cap	EA	2.00	3,860.00	7,720
1508	FP water service connection, 8"	EA	1.00	9,650.00	9,650
1514	FPTH, Fire protection test header	EA	1.00	1,448.00	1,448
1559	Roof hydrant assembly-allow	EA	4.00	1,447.50	5,790
1502	Sprinkler heads c/w drop piping	EA	3,551.00	154.40	548,274
1940	Hookup for Fire pump	EA	1.00	1,930.00	1,930
1939	Hookup for Jockey pump	EA	1.00	965.00	965
2726	Cap, 1" to 1-1/2"	EA	3.00	96.70	290
2725	Cap, 2"	EA	45.00	120.60	5,428
1525	Cap, 2.5"	EA	18.00	144.80	2,606
2724	Cap, 3"	EA	13.00	144.80	1,882
1516	Cap, 4"	EA	37.00	96.50	3,571

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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1517	Cap, 6"	EA	1.00	193.00	193
	D4010 - Fire Suppression			10.31/SF	3,922,083
	21 - FIRE SUPPRESSION			10.31/SF	3,922,083
22	PLUMBING				
D2010	Domestic Water Distribution				
1886	Plumbing Fixtures	Note			
2072	P-1, Water Closet - Flush Valve - Wall Mounted	EA	33.00	1,640.50	54,137
2073	P-1A, Water Closet - Flush Valve - Wall Mounted, accessible	EA	57.00	1,785.20	101,759
2074	P-2, Urinal - Wall Hung	EA	8.00	1,544.00	12,352
2075	P-2A, Urinal - Wall Hung, accessible	EA	7.00	1,640.60	11,484
2076	P-3A, Lavatory - Rectangular - Wall Mounted 19X17	EA	54.00	1,399.30	75,560
2077	P-3B, Basin Type Lavatory - Oval	EA	7.00	1,206.30	8,444
2078	P-3C, Restroom Lavatory - Oval	EA	9.00	1,206.20	10,856
2636	P-3D, Circular Lavatory	EA	1.00	6,273.00	6,273
2079	P-4, Mop Receptor	EA	10.00	1,544.00	15,440
2404	P-4A, Mop Receptor, accessible	EA	2.00	1,640.50	3,281
2080	P-5, Drinking Fountain - Recessed	EA	10.00	2,702.00	27,020
2081	P-5A, Drinking Fountain - Bi-Level - Wall Mounted	EA	8.00	3,667.00	29,336
2082	P-6, Shower Base	EA	7.00	2,412.60	16,888
2381	P-6A, Shower, accessible	EA	4.00	3,377.50	13,510
2083	P-7, Emergency Eye Wash	EA	9.00	1,447.60	13,028
2084	P-8, Emergency Eyewash-Shower	EA	4.00	2,123.00	8,492
2637	P-8A, Emergency Eyewash-Shower	EA	10.00	3,377.50	33,775
2638	P-9, Emergency Eyewash-Shower	EA	9.00	3,860.00	34,740
2639	P-10, Utility sink	EA	3.00	1,447.70	4,343
2640	P-11, Hand sink	EA	2.00	1,158.00	2,316
2085	PX-1, Sink - Casework Sink - Furnished by others - Install only	EA	49.00	434.20	21,278
2086	PX-2, Sink - Casework Sink with Eyewash- Furnished by others - Install only	EA	6.00	434.30	2,606

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2087	PX-3, Sink - Cosmetology Sink - Furnished by others - Install only	EA	15.00	434.30	6,514
2088	PX-4, Sink - Science Room Sink - Furnished by others - Install only	EA	45.00	434.20	19,541
2089	PX-5, Sink - Lab Sink - Furnished by others - Install only	EA	31.00	434.30	13,462
2090	PX-6, Dental Station - Furnished by others - Install only	EA	18.00	579.00	10,422
2095	Allowance for missing/ miscellaneous plumbing fixtures(Main building building)	SF	409,877.00	0.20	79,106
447	Water Distribution and Components	Note			
2099	Connection to main(6")- (Main building)	EA	1.00	1,158.00	1,158
2103	Capped-HW & CW connection(pg-9/note-5)	EA	2.00	289.50	579
2104	Plumbing fixture- hook up(domestic water)	EA	254.00	386.00	98,044
2105	Kitchen equipment - hook up(water)	EA	118.00	482.50	56,935
2106	Laboratory sink- hook up(water)	EA	146.00	579.00	84,534
2107	PX-6, Dental station- hook up(1/2" CW)	EA	18.00	579.00	10,422
2108	RB07, Water -hook up c/w BFP(1")	EA	1.00	772.00	772
2112	6", water meter and backflow preventer assembly	EA	1.00	12,545.00	12,545
2113	DWP-1, Domestic water triplex booster pump (Syncroflo)	EA	1.00	82,025.00	82,025
453	Chlorine/PH monitor system with 100 gal. tanks - (allowance) - none indicated	EA	1.00	9,650.00	9,650
458	Chlorine/PH monitor system with 200 gal. tanks - (allowance) - none indicated	EA	1.00	17,370.00	17,370
2685	Chlorine/PH monitor system with 400 gal. reactor tanks	EA	2.00	33,775.00	67,550
2686	Chemical storage tanks, 30 gal.	EA	2.00	2,412.50	4,825
2115	Backflow preventer(for NPCW to science rooms)	EA	1.00	1,448.00	1,448
2116	1/2", Stacked reduced pressure backflow preventer(to serve janitors sink)(pg-21)	EA	2.00	579.00	1,158
2117	1/2", Stacked reduced pressure backflow preventer (allowance)(pg-13)	EA	4.00	772.00	3,088
2644	3/4", Stacked reduced pressure backflow preventer	EA	2.00	3,377.50	6,755

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LOCATION DIVISIONS/ELEMENTS ITEM

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2118	2", Stacked reduced pressure backflow preventer (allowance)(pg-12) - none indicated	EA	2.00		Excl.
2119	2", Stacked reduced pressure backflow preventer (allowance)(pg-16) - none indicated	EA	2.00		Excl.
2646	1", Reduced pressure backflow preventer	EA	2.00	1,447.50	2,895
2120	EWB-1, Electric storage water heater(Durawatt-460), 90 kW	EA	2.00	79,612.50	159,225
2121	EWB-2, Electric storage water heater(Durawatt-270), 54 kW	EA	2.00	40,530.00	81,060
2122	EWB-3, Electric storage water heater(DSE-120), 54 kW	EA	1.00	25,341.00	25,341
2123	EWB-4, Electric storage water heater(Durawatt-550), 108 kW	EA	2.00	79,547.00	159,094
2124	EWB-5, Electric storage water heater(DSE-30), 6 kW	EA	1.00	6,273.00	6,273
2641	EWB-6, Electric storage water heater(DSE-40), 3 kW	EA	1.00	3,860.00	3,860
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	2.00	38,285.00	76,570
2642	Gas fired water heater(serving HVAC Tech shop), 150 CFH, Navien #NPE-180A2	EA	1.00	5,018.00	5,018
2131	Temperature maintenance re-heater for NPHW system - none indicated	EA	1.00		Excl.
2132	HWRP, Recirculation pump	EA	12.00	2,412.50	28,950
2133	ET, Expansion tank	EA	12.00	482.50	5,790
2134	Mixing valve(serving water heaters)	EA	12.00	482.50	5,790
2135	Dual mixing valve assembly - none indicated	EA	1.00		Excl.
2645	TX mixing valve assembly	EA	1.00	965.00	965
2136	Triple mixing valve assembly	EA	1.00	965.00	965
2137	Thermostatic mixing valve(serving kitchen- hand sink) (pg-29- fixture schedule)	EA	11.00	386.00	4,246

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LOCATION DIVISIONS/ELEMENTS ITEM

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2138	Emergency mixing valve(serving emergency eye wash)	EA	2.00	386.00	772
2139	Emergency mixing valve(serving emergency shower/ eye wash) - none indicated	EA	2.00		Excl.
2140	Housekeeping pad(to be carried elsewhere in this estimate)	Note			Excl.
2513	Trap seal primer c/w tubing	EA	114.00	289.50	33,003
2141	HB, Hose bib	EA	24.00	289.50	6,948
2142	WH, Non freeze wall hydrant	EA	14.00	482.50	6,755
2145	1/2" to 1", copper distribution c/w fittings, supports etc.	LF	11,690.00	22.20	259,460
2146	1-1/4" to 1-1/2", copper distribution c/w fittings, supports etc.	LF	1,935.00	38.60	74,691
2147	2" to 3",copper distribution c/w fittings, supports etc.	LF	3,499.00	99.40	347,783
2148	4",copper distribution c/w fittings, supports etc.	LF	407.00	207.50	84,442
2149	6",copper distribution c/w fittings, supports etc.	LF	91.00	453.50	41,273
2150	Thermal pipe insulation - 1/2" to 1" copper pipe	LF	11,690.00	6.30	73,326
2151	Thermal pipe insulation - 1-1/4" to 1-1/2" copper pipe	LF	1,935.00	12.50	24,275
2152	Thermal pipe insulation - 2" to 3",copper distribution	LF	3,499.00	19.30	67,531
2153	Thermal pipe insulation - 4",copper distribution	LF	407.00	24.10	9,819
2154	Thermal pipe insulation - 6",copper distribution	LF	91.00	33.80	3,074
2158	Water meter c/w bfp assembly- c/w service bypass hook up(6")	EA	1.00	9,168.00	9,168
2159	Triplex booster pump- hook up	EA	1.00	3,860.00	3,860
2514	Chlorine/PH monitor system- hook up	EA	4.00	723.80	2,895
2160	Neutralization system- hook up	EA		8,000.00	0
2161	Gas fired water heater- hook up	EA	3.00	723.70	2,171
2162	Electric water heater- hook up(small)	EA	2.00	531.00	1,062
2164	Electric water heater- hook up(large)	EA	7.00	723.70	5,066
2166	NPHW temperature maintenance station- hook up - none indicated	EA	1.00		Excl.
2167	Circulating pump - hook up	EA	12.00	723.80	8,685
2168	Expansion tank - hook up	EA	12.00	289.50	3,474

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2169	Mixing valve - hook up	EA	27.00	482.50	13,028
2170	RBFP- hook up	EA	11.00	530.70	5,838
1373	Hookup - plumbing	EA	38.00	627.30	23,836
2171	Student plumbing booth- hook up(water)(pg-9/note-4) (allowance)	EA	2.00	386.00	772
2172	Allowance for missing/ miscellaneous domestic water system c/w fixture rough in, hot & cold water piping, non-potable piping, tempered piping etc.(Main building)	SF	409,877.00	0.30	118,659
2176	Subcontractor GCs/GRs	Item			201,685
	D2010 - Domestic Water Distribution			8.13/SF	3,094,214
D2020	Sanitary Drainage				
2177	Connection to main	EA	17.00	723.80	12,304
2178	Plumbing fixture - hook-ups(sanitary & vent)	EA	254.00	482.50	122,555
2179	Kitchen equipment - hook up(sanitary/indirect waste & vent)	EA	68.00	386.00	26,248
2180	Laboratory sink- hook up(acid waste & vent)	EA	146.00	579.00	84,534
2181	PX-6, Dental station- hook up(waste & vent)	EA	18.00	386.00	6,948
2187	Local grease trap GT-1, 35/50 gpm	EA	3.00	10,615.00	31,845
2317	Local grease trap GT-2, 50/75 gpm	EA	1.00	21,230.00	21,230
2186	Local grease trap, 35 gpm	EA	3.00		Incl.
2183	Grease trap for triple sink, 50 gpm	EA	3.00		Incl.
2185	Gas/ oil interceptor (for garage drainage system)	EA	5.00	19,300.00	96,500
2647	Oil/ water separator	EA	1.00	9,650.00	9,650
2191	Gas/ oil separator	EA	3.00	7,720.00	23,160
2480	Condensate pump (assumed one per each FCU and AC units)	EA	316.00	289.50	91,482
2192	Trench drain(serving auto collision/auto technology & metal fabrication areas)	LF	190.00	337.80	64,173
2194	FD, Floor drain	EA	136.00	434.30	59,058
2195	Condensate receptor	EA	25.00	482.50	12,063
2196	Kitchen grate	EA	30.00		Incl.
2197	CO, Clean out	EA	110.00	337.80	37,153

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BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2198	Clean out (serving acid waste)	EA	10.00	434.30	4,343
2205	1-1/2", Sanitary piping c/w fittings - Ag	LF	75.00	36.70	2,750
2206	2", Sanitary piping c/w fittings - Ag	LF	1,225.90	38.60	47,320
2207	3", Sanitary piping c/w fittings - Ag	LF	826.10	43.40	35,874
2208	4", Sanitary piping c/w fittings - Ag	LF	1,859.00	48.30	89,697
2676	5", Sanitary piping c/w fittings - Ag	LF	71.00	53.10	3,768
2212	2", Sanitary piping c/w fittings - Bg	LF	69.70	38.60	2,690
2213	3", Sanitary piping c/w fittings - Bg	LF	131.60	43.40	5,715
2214	4", Sanitary piping c/w fittings - Bg	LF	4,050.80	48.20	195,451
2680	5", Sanitary piping c/w fittings - Bg	LF	96.00	53.10	5,095
2215	6", Sanitary piping c/w fittings - Bg	LF	817.40	57.90	47,327
2217	2", Acid waste drainage PP piping- Single containment c/w fittings-Ag	LF	423.00	62.70	26,533
2218	3", Acid waste drainage PP piping- Single containment c/w fittings-Ag	LF	71.00	86.80	6,166
2219	4", Acid waste drainage PP piping- Single containment c/w fittings-Ag	LF	243.00	115.80	28,139
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	16.00		Incl.
2225	Allowance for vent piping	LS	1.00	231,600.00	231,600
1296	1-1/2" to 2", Vent c/w fittings, supports, etc, ag	LF	2,863.70	43.40	124,357
2683	3", Vent c/w fittings, supports, etc, ag	LF	4,423.00	43.40	192,069
2682	4", Vent c/w fittings, supports, etc, ag	LF	2,306.60	48.20	111,293
2681	8", Vent c/w fittings, supports, etc, ag	LF	193.00	72.40	13,968
1304	1-1/2" to 2", Vent piping, bg	LF	711.20	48.20	34,315
2673	3", Vent piping, bg	LF	657.90	43.40	28,569
2674	4", Vent piping, bg	LF	261.70	48.20	12,627
2229	8", Vent piping c/w fitting, support, etc (radon mitigation) (Riser from lower slab till roof serving every 10,000 SF)	LF	1,092.00	62.70	68,496
2230	Allowance for acid vent piping	LS	1.00	135,100.00	135,100

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2671	2", Acid vent piping c/w fittings - Ag	LF	937.00	62.70	58,773
2672	4", Acid vent piping c/w fittings - Ag	LF	77.00	115.80	8,917
2400	Student plumbing booth- hook up(drain)(pg-9/note-4) - none indicated	EA	3.00		Excl.
2234	Allowance for missing/ miscellaneous sanitary drainage system c/w piping, vents, ejectors, clean-out, acid waste, etc.(Main building)	SF	409,877.00	0.30	118,659
2238	Subcontractor GCs/GRs	Item			120,625
2749	PH-1, Neutralization system for science rooms	EA	1.00	77,200.00	77,200
D2020 - Sanitary Drainage				6.66/SF	2,536,339
D2030	Building Support Plumbing Systems				
1883	Connection to main	EA	11.00	723.70	7,961
1884	SP-1, Simplex elevator pit sump pump, 50 gpm	EA	1.00	7,238.00	7,238
1885	SP-2, Simplex elevator pit sump pump, 50 gpm	EA	1.00	7,238.00	7,238
2240	Scupper type drains(at low roof)/(pg-24/note-1)	EA	10.00	482.50	4,825
2241	3" TD, Terrace drain c/w grate (none indicated)	EA	4.00		Excl.
2242	4" RD/OFD, Roof Drain/ Overflow drain	EA	108.00	1,158.00	125,064
2243	6" RD/OFD, Roof Drain/ Overflow drain	EA	1.00	1,255.00	1,255
2244	Flat grate under pavers(serving roof drains)(pg-10)	EA	2.00	193.00	386
2245	Clean out	EA	120.00	337.80	40,530
2246	4", Storm drain piping c/w fittings, supports - Ag	LF	4,041.40	48.30	194,998
2651	5", Storm drain piping c/w fittings, supports - Ag	LF	63.00	53.10	3,344
2247	6", Storm drain piping c/w fittings, supports - Ag	LF	2,495.00	106.10	264,844
2248	8", Storm drain piping c/w fittings, supports - Ag	LF	266.00	173.70	46,204
2250	4", Storm drain piping c/w fittings, supports - Bg	LF	156.00	55.00	8,581
2251	6", Storm drain piping c/w fittings, supports - Bg	LF	475.80	96.50	45,915
2252	8", Storm drain piping c/w fittings, supports - Bg	LF	618.00	137.00	84,685
2253	10", Storm drain piping c/w fittings, supports - Bg	LF	304.00	179.50	54,565
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	1,447.50	2,895

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A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2257	Allowance for missing/ miscellaneous storm water drainage system(Main building)	SF	409,877.00	0.20	79,106
2261	Subcontractor GCs/GRs	Item			68,515
	D2030 - Building Support Plumbing Systems			2.75/SF	1,048,149
D2050	General Service Compressed-Air				
1893	AC-1, Air compressor(auto collision/ metal fabrication) c/w receiver & dryer	EA	1.00	51,577.00	51,577
1898	AC-2, Air compressor c/w tank (Votech shops)	EA	1.00	31,876.00	31,876
1900	AC-3, Air compressor c/w tank (Biotech shops)	EA	1.00	37,461.00	37,461
2265	AC-4, Air compressor c/w tank (Robotics)	EA	1.00	18,335.00	18,335
2264	AC-5, Air compressor c/w tank (Dental)	EA	1.00	75,753.00	75,753
1901	AC-4, Air compressor c/w tank (Draft and design) - none indicated	EA	2.00		Excl.
2266	400 gal, Air receiver tank(serving AC-1)	EA	1.00		Incl.
2657	200 gal, Air receiver tank(serving AC-2)	EA	1.00	4,198.00	4,198
2658	200 gal, Air receiver tank(serving AC-4)	EA	1.00	4,198.00	4,198
2267	Air dryer(serving AC-1)	EA	1.00		Incl.
2653	Air dryer(serving AC-2)	EA	1.00	3,513.00	3,513
2654	Air dryer(serving AC-3)	EA	1.00	483.00	483
2655	Air dryer(serving AC-4)	EA	1.00	3,513.00	3,513
2268	Master compressed air shut-off(for auto collision area) (allowance)	EA	1.00	2,413.00	2,413
2271	Compressed air - 1/2 to 1" piping	LF	3,419.00	38.60	131,973
2272	Compressed air - 1 1/4" piping	LF	699.00	45.40	31,703
2663	Compressed air - 1 1/2" piping	LF	89.00	48.20	4,294
2273	Compressed air- hook up c/w pressure gauge, air filter, condensate filter, pressure regulator (none indicated)	EA	44.00		Excl.
2274	Compressed air- hook up c/w shutoff valve, pressure gauge, air filter, condensate filter, pressure regulator (pg-21/note-1)	EA	6.00	530.80	3,185
2275	Compressed air- hook up c/w shut off valve, pressure gauge, air filter, air pressure regulator, 50' hose reel (Carpentry shop)	EA	43.00	1,737.00	74,691

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A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2397	Compressed air- hook up c/w shut off valve, pressure gauge, air filter, air pressure regulator, 50' hose reel (pg-9/note-1)(HVAC technology shop)	EA	10.00	1,737.00	17,370
2276	Compressed air- paint booth- hook up	EA	2.00	531.00	1,062
2277	Compressed air- hook up(to equipment)	EA	1.00	531.00	531
2278	Air compressor - hook up	EA	5.00	530.80	2,654
2279	Air compressor tank- hook up	EA	5.00	530.80	2,654
2280	Air receiver - hook up	EA	3.00	530.70	1,592
2281	Air dryer - hook up	EA	4.00	530.80	2,123
2282	Dust collector- hook up	EA	1.00	531.00	531
2283	Dental station- hook up(CA)	EA	18.00	530.80	9,554
2284	Biotech labs- ceiling panels- hook up(CA)(allowance) - none indicated	EA	5.00		Excl.
2285	Allowance for missing/ miscellaneous compressed air system(Main building)	SF	409,877.00	0.50	197,766
2289	Subcontractor GCs/GRs	Item			50,180
	D2050 - General Service Compressed-Air			2.01/SF	765,183
D2060	Process Support Plumbing Systems				
1895	VAC-1, Vacuum pump(biotech lab)	EA	1.00	19,011.00	19,011
2290	VAC-2, Vacuum pump(dental)	EA	1.00	52,110.00	52,110
2291	Gas meter assembly(to be by others)	EA	1.00		Excl.
2398	Kitchen emergency gas shut-off system c/w main control panel, shut-off switch, gas solenoid valve, CO detectors, etc(allowance)	EA	4.00	4,825.00	19,300
2664	Auto shop emergency gas shut-off system c/w main control panel, shut-off switch, gas solenoid valve, etc (allowance)	EA	1.00	3,378.00	3,378
2293	Vacuum piping c/w fittings, support, etc- main	LF	558.00	53.10	29,616
2295	1-1/4" to 1-1/2", Sch.40 steel natural gas distribution c/w fittings, supports etc. (none indicated)	LF	6.00		Excl.
2296	2" to 2-1/2",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	88.00	77.20	6,794
2297	3",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	8.00	96.50	772

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A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2298	4",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	281.00	115.80	32,540
2668	5",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	9.00	139.90	1,259
2667	6",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	352.00	149.60	52,650
2666	8",Sch.40 steel natural gas distribution c/w fittings, supports etc.	LF	84.00	164.00	13,780
2301	Argon piping c/w fittings, support, etc	LF	333.00	53.10	17,674
1747	Allowances for argon piping	LF	713.00	53.10	37,842
2302	Acetylene piping c/w fittings, support, etc - none indicated	LF	168.00		Excl.
2300	Oxygen piping c/w fittings, support, etc - none indicated	LF	167.00		Excl.
2304	Welding booth -hook up(Ar)	EA	27.00	530.70	14,330
2305	Welding booth -hook up(C2H2- acetylene) - none indicated	EA	22.00		Excl.
1757	Allowances for miscellaneous argon hookups	LS	1.00	24,125.00	24,125
2303	Welding booth -hook up(O2) - none indicated	EA	22.00		Excl.
2307	Argon storage tank- hook up c/w manifolds, shutoff valves, etc	EA	1.00	9,650.00	9,650
2308	Acetylene storage tank- hook up c/w manifolds, shutoff valves, etc	EA	1.00	9,650.00	9,650
2306	Oxygen storage tank- hook up c/w manifolds, shutoff valves, etc	EA	1.00	9,650.00	9,650
2517	Vacuum pump- hook up	EA	2.00	1,447.50	2,895
2309	Biotech labs- ceiling panels- hook up(Vacuum) (allowance) - none indicated	EA	5.00		Excl.
2310	Dental station- hook up(Vacuum)	EA	18.00	530.80	9,554
2399	Kitchen emergency gas shut-off system- hook up	EA	4.00	530.80	2,123
2311	Water heater - hook up(NG)	EA	3.00	530.70	1,592
2312	Paint booth- hook up(NG)	EA	2.00	531.00	1,062
2313	Kitchen equipment - hook up(natural gas)	EA	24.00	530.80	12,738

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LOCATION DIVISIONS/ELEMENTS ITEM

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2314	Biotech labs- ceiling panels- hook up(NG)(allowance) - none indicated	EA	5.00		Excl.
2531	Student plumbing booth- hook up(NG) - none indicated	EA	3.00		Excl.
1756	Allowances for misc NG valves and accessories	LS	1.00	14,475.00	14,475
1746	Main control panel at each gas hood - allow	No	8.00	3,860.00	30,880
2315	Allowances for additional main building gas system (natural gas/Ar)	SF	409,877.00	0.30	118,659
2316	Subcontractor GCs/GRs	Item			55,005
	D2060 - Process Support Plumbing Systems			1.58/SF	603,114
	22 - PLUMBING			21.14/SF	8,046,999
23	HEATING, VENTILATING, AND AIR CONDITIONING				
D3020	Heat Systems				
1847	EUH-1, Electric unit heater, 15 kW	EA	12.00	2,653.80	31,845
1865	EUH-2, Electric unit heater, 1.5 kW	EA	3.00	1,158.00	3,474
1866	EUH-3, Electric unit heater, 3 kW	EA	6.00	1,544.00	9,264
1867	EUH-4 & 5, Electric unit heater, 10 kW	EA	6.00	2,171.30	13,028
	D3020 - Heat Systems			0.15/SF	57,611
D3030	Cooling Systems				
1667	LG HVAC equipments consisting of DX-split units, FCU c/w condenser units, branch circuit controllers, VCU's (serving RTU's, MAU's, AHU's, HRU's), etc.	LS	1.00	3,425,748.00	3,425,748
1189	AC- 0-4-5, 1-5-6/10, DX split system air conditioning unit 3 ton, 36 mbh cooling capacity c/w outdoor air-cooled condensing unit	EA	5.00		Incl.
1190	AC- 0-2 to 0-3, 0-6 to 0-8, 1-1 to 4, 1-7 to 9, 1-11 to 14, 2-1 to 6, 3-1 to 5, 4-1 to 5, CB-3 & LB-1, 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 ton, 48 mbh cooling capacity c/w outdoor air-cooled condensing unit	EA	3.00		Incl.

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A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
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	19.00		Incl.
1195	FCU, DX-cooled fan coil units 0.8 ton	EA	23.00		Incl.
1197	FCU, DX-cooled fan coil units 1 ton	EA	7.00		Incl.
1196	FCU, DX-cooled fan coil units 1.3 ton	EA	5.00		Incl.
1198	FCU, DX-cooled fan coil units 1.5 ton	EA	25.00		Incl.
1200	FCU, DX-cooled fan coil units 2 ton	EA	40.00		Incl.
1202	FCU, DX-cooled fan coil units 2.3 ton	EA	13.00		Incl.
1203	FCU, DX-cooled fan coil units 3 ton	EA	64.00		Incl.
1204	FCU, DX-cooled fan coil units 3.5 ton	EA	18.00		Incl.
1205	FCU, DX-cooled fan coil units 4 ton	EA	12.00		Incl.
1206	FCU, DX-cooled fan coil units 4.5 ton	EA	2.00		Incl.
1568	Refrigeration piping c/w fittings,supports, etc.	LF	52,802.00	43.40	2,292,925
1684	Allowance for refrigerant	Lb	12,700.00	24.10	306,388
1709	RTU - hook ups	EA	2.00	724.00	1,448
1710	MAU - hook ups	EA	2.00	724.00	1,448
1711	HRU - hook ups	EA	5.00	723.80	3,619
1712	AHU - hook ups	EA	10.00	723.80	7,238
1713	ERV - hook ups	EA	5.00	723.80	3,619
1974	FCU - hook ups	EA	269.00	482.50	129,793
1975	AC units - hook ups	EA	47.00	482.50	22,678
2481	Allowance for missing/ miscellaneous	SF	491,852.90	0.40	189,855
D3030 - Cooling Systems				16.78/SF	6,384,759
D3050	Facility HVAC Distribution Systems				
1677	YORK HVAC equipments consisting of RTU's, AHU's, MAU's and HRU's	LS	1.00	6,856,910.00	6,856,910
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 cfm c/w air-cooled VRF condensing units (3 x 16 ton), electric pre heat, etc.	EA	1.00		Incl.

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A1 New School Building (continued)

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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1157	MAU-1, DX-cooled make-up air unit, 6,510 cfm c/w air-cooled VRF condensing units (2 x 18 ton), electric pre heat, etc.	EA	1.00		Incl.
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, DX-cooled indoor air handling unit, 20,000 cfm c/w air-cooled VRF condensing units (3 x 22 ton), electric pre heat, etc.	EA	1.00		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.
2648	AHU-2, DX-cooled indoor air handling unit, 15,465 cfm c/w air-cooled VRF condensing units (2 x 22 ton & 1 x 12 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-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	20,265.00	20,265

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A1 New School Building (continued)

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Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1143	ERV-2, Energy recovery ventilator, 285 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	8,685.00	8,685
1144	ERV-3, Energy recovery ventilator, 1,100 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	30,880.00	30,880
1145	ERV-4, Energy recovery ventilator, 1,795 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	50,180.00	50,180
1840	ERV-7, Energy recovery ventilator, 250 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	7,720.00	7,720
1150	HRU-1, DX-cooled dedicated outdoor air roof-top units, 19,640 cfm c/w air-cooled VRF condensing units (2 x 24 ton & 1 x 26 ton), electric pre heat, etc.	EA	1.00		Incl.
2649	HRU-2, DX-cooled dedicated outdoor air roof-top units, 18,735 cfm c/w air-cooled VRF condensing units (3 x 24 ton & 1 x 28 ton), electric pre heat, etc.	EA	1.00		Incl.
2650	HRU-3, DX-cooled dedicated outdoor air roof-top units, 19,395 cfm c/w air-cooled VRF condensing units (3 x 24 ton & 1 x 28 ton), electric pre heat, etc.	EA	1.00		Incl.
1151	HRU-4, DX-cooled dedicated outdoor air roof-top units, 7,070 cfm c/w air-cooled VRF condensing units (2 x18 ton & 1 x 28 ton), electric pre heat, etc.	EA	1.00		Incl.
1153	HRU-5, DX-cooled dedicated outdoor air roof-top units, 2,760 cfm c/w air-cooled VRF condensing units (2 x 6 ton), electric pre heat, etc.	EA	1.00		Incl.
2775	Dehumidifiers	EA	35.00	13,510.00	472,850
1168	F-1 & 8, Exhaust fan, 600 cfm	EA	2.00	1,206.50	2,413
1178	F-2, 11 & 12, Exhaust fan, 360 cfm	EA	3.00	723.70	2,171
1170	F-3, Exhaust fan, 1,000 cfm	EA	1.00	2,413.00	2,413
1169	F-4, Exhaust fan, 150 cfm	EA	1.00	483.00	483
1171	F-5, Exhaust fan, 2,600 cfm	EA	1.00	5,308.00	5,308
1174	F-7, Exhaust fan, 2,100 cfm	EA	1.00	4,217.00	4,217
1175	F-9, Exhaust fan, 500 cfm	EA	1.00	1,013.00	1,013
2659	F-10, Exhaust fan, 210 cfm	EA	1.00	425.00	425
1180	F-13, Exhaust fan, 18,400 cfm	EA	1.00	36,935.00	36,935
1181	F-15 & 16, Exhaust fan, 15,000 cfm	EA	2.00	30,108.00	60,216
2656	F-17, Exhaust fan, 900 cfm	EA	1.00	1,809.00	1,809

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1182	F-18, Exhaust fan, 885 cfm	EA	1.00	1,780.00	1,780
1849	F-20, Exhaust fan, 450 cfm	EA	1.00	917.00	917
2661	F-22, Exhaust fan, 130 cfm	EA	1.00	483.00	483
1183	KEF-1, Kitchen exhaust fan, 2,800 cfm	EA	1.00	5,621.00	5,621
1184	KEF-2, Kitchen exhaust fan, 3,300 cfm	EA	1.00	5,665.00	5,665
1185	KEF-3, Kitchen exhaust fan, 1,850 cfm	EA	1.00	3,715.00	3,715
1186	KEF-4, Kitchen exhaust fan, 2,365 cfm	EA	1.00	4,753.00	4,753
1188	KEF-5, Kitchen exhaust fan, 9,390 cfm	EA	1.00	10,350.00	10,350
1878	DF-1, Destratification fan, 18' blade dia	EA	2.00	18,866.00	37,732
1872	FTU-1 to 3, Fan terminal unit - electric heating, 1025 cfm, 12 kW	EA	3.00	965.00	2,895
1873	FTU-4, Fan terminal unit - electric heating, 945 cfm, 12 kW	EA	1.00	869.00	869
2662	FTU-5, Fan terminal unit - electric heating, 1220 cfm, 12 kW	EA	1.00	1,110.00	1,110
1874	FTU-6, Fan terminal unit - electric heating, 1100 cfm, 12 kW	EA	1.00	1,110.00	1,110
1875	FTU-7, Fan terminal unit - electric heating, 1500 cfm, 15 kW	EA	1.00	1,206.00	1,206
1876	FTU-8 & 9, Fan terminal unit - electric heating, 2250 cfm, 22 kW	EA	2.00	1,689.00	3,378
1191	Relocation of existing Dust collector including fan and abort gate	EA	1.00	4,825.00	4,825
1982	Kitchen exhaust hood	EA	2.00	2,412.50	4,825
1877	Sound attenuators	EA	24.00	7,720.00	185,280
1192	BS, VRF branch circuit selector	EA	45.00		Incl.
1209	Air cleaners (Airboss 2500)	EA	3.00	3,860.00	11,580
1972	VAV box (small)	EA	141.00	1,302.80	183,688
1305	VAV box (medium)	EA	51.00	1,688.70	86,126
1306	VAV box (large)	EA	6.00	2,412.50	14,475
1216	Galvanized duct work c/w fittings, supports, etc.	Lb	348,433.70	15.40	5,379,814
1217	Thermal insulation	SF	365,982.70	6.30	2,295,625
2774	Black welded kitchen exhaust system	Lb	10,500.00	19.80	207,716

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1243	4" to 6", Round galvanized duct work c/w fittings, supports, etc	LF	3,230.80	62.70	202,652
1242	7" to 8", Round galvanized duct work c/w fittings, supports, etc	LF	900.00	67.60	60,795
1346	10" to 12", Round galvanized duct work c/w fittings, supports, etc	LF	1,411.60	77.20	108,976
1241	14" to 16", Round galvanized duct work c/w fittings, supports, etc	LF	995.00	82.00	81,615
1245	18" to 20", Round galvanized duct work c/w fittings, supports, etc	LF	73.00	86.80	6,340
1317	22" to 24", Round galvanized duct work c/w fittings, supports, etc	LF	326.00	91.70	29,886
1968	26" to 28", Round galvanized duct work c/w fittings, supports, etc	LF	640.00	106.20	67,936
1220	30" to 32", Round galvanized duct work c/w fittings, supports, etc	LF	825.00	120.60	99,516
1223	34" to 36", Round galvanized duct work c/w fittings, supports, etc	LF	786.00	125.50	98,604
1225	38" to 40", Round galvanized duct work c/w fittings, supports, etc	LF	408.00	144.80	59,058
1226	42" to 44", Round galvanized duct work c/w fittings, supports, etc	LF	547.00	149.60	81,818
1978	46", Round galvanized duct work c/w fittings, supports, etc	LF	71.00	154.40	10,962
1397	48" to 50", Round galvanized duct work c/w fittings, supports, etc	LF	362.00	159.20	57,639
2070	52" to 54", Round galvanized duct work c/w fittings, supports, etc	LF	29.00	164.00	4,757
1228	60", Round SS duct work c/w fittings, supports, etc	LF	76.00	173.70	13,201
2677	44"/20", Oval galvanized duct work c/w fittings, supports, etc	LF	155.00	183.30	28,419
2678	58"/30", Oval galvanized duct work c/w fittings, supports, etc	LF	44.00	207.50	9,129
2679	60"/32", Oval galvanized duct work c/w fittings, supports, etc	LF	165.00	241.20	39,806
1302	Diffusers (small)	EA	8.00	144.80	1,158

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1218	A & A1, Diffusers (medium)	EA	218.00	193.00	42,074
1301	A3, Side-wall diffuser	EA	9.00	289.60	2,606
1969	D/D1/D2, Linear slot diffuser c/w plenum	EA	83.00	482.50	40,048
1970	E/H, Linear slot diffuser c/w plenum	EA	61.00	482.50	29,433
1971	F/G, Linear slot diffuser c/w plenum	EA	179.00	530.70	95,004
1290	Grilles (small)	EA	2.00	77.00	154
1300	C/C1, Grilles (medium)	EA	257.00	144.80	37,201
1303	C2, Side-wall grilles	EA	21.00	265.40	5,573
1236	Louver	SF	1,093.00	82.00	89,653
2699	B, Grille	EA	4.00	96.50	386
2692	Plenum, 12"x10"x60"	EA	8.00	965.00	7,720
2421	Plenum, 48"x12"x8"	EA	16.00	1,254.50	20,072
2071	Plenum, 84"x6"	EA	1.00		Excl.
2695	Plenum, 84"x48"	EA	1.00	4,825.00	4,825
1399	Plenum, 60"x10"	EA	11.00	4,825.00	53,075
1321	Plenum, 36"	EA	1.00	1,689.00	1,689
2691	Plenum, 48"x4"	EA	17.00	2,412.50	41,013
1979	Plenum, 90"x78"	EA	2.00	2,412.50	4,825
1247	Plenum, 96"x50"x44' long	EA	3.00	2,171.30	6,514
2690	Plenum, 104"x60"x48"	EA	1.00	9,650.00	9,650
2693	Plenum, 256"x6"	EA	1.00	7,238.00	7,238
1246	Tubing storage reel (CAR-MON TSR-S32)	EA	6.00	1,737.00	10,422
1248	Tubing storage reel (CAR-MON TSR-S24)	EA	2.00	1,447.50	2,895
1980	LTX flex hose, 4" dia x 15' type c/w RYA dual adaptor, tube sling, spring balancer and flahe set	EA	6.00	1,206.30	7,238
1299	BD, Balancing damper	EA	514.00	482.50	248,005
1976	BD, Balancing damper (large)	EA	5.00	820.20	4,101
1572	Combination fire/smoke damper	EA	26.00	723.80	18,818
1977	FD, Fire damper	EA	6.00	530.80	3,185
2689	Automatic electric dampers	EA	9.00	4,825.00	43,425
1983	Bryant OVM096 oil fired furnace	EA	2.00	11,097.50	22,195

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



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LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1984	York TL8E 95% efficient furnace	EA	5.00	9,650.00	48,250
1981	Relocate and installation of spark detection and suppression system	EA	1.00	2,895.00	2,895
1567	Allowance for miscellaneous/missing items	SF	409,877.00	0.30	118,659
2199	1/2" to 1", Condensate piping c/w fittings - Ag	LF	8,473.00	33.80	286,176
2200	1-1/4" to 1-1/2", Condensate piping c/w fittings- Ag	LF	2,141.00	38.60	82,643
2201	2", Condensate piping c/w fittings - Ag	LF	127.00	43.40	5,515
2203	Condensate piping from walk-in cooler/ walk-in freezer	LF	30.00	33.80	1,013
2540	Equipment cost adjustment, confirmed in meeting	LS	1.00		Excl.
	D3050 - Facility HVAC Distribution Systems			48.58/SF	18,486,886
D3060	Controls & Instrumentations				
1708	BAS control system c/w computer station, graphics, wiring, testing etc.	Pt	1,500.00	1,447.50	2,171,248
	D3060 - Controls & Instrumentations			5.71/SF	2,171,248
D3070	Special Purpose HVAC Systems				
783	Testing, balancing and commissioning	SF	409,877.00	0.80	316,425
1560	General requirements: supervision, shop drawings, asbuilt, tags, markers, tools, rentals, BIM, cleaning, storage, material handling, seismic restraints, permits, fees etc.	Item			2,193,443
	D3070 - Special Purpose HVAC Systems			6.60/SF	2,509,868
	23 - HEATING, VENTILATING, AND AIR CONDITIONING			77.81/SF	29,610,372
26	ELECTRICAL				
D5020	Electrical Service and Distribution				
2409	System grounding grid and tie ins to building	SF	409,877.00	0.60	237,319
945	Main switchboard 4000 amps MSB-1A & 1B	EA	2.00	212,300.00	424,600
946	Primary 4000 amp service #1	EA	1.00	18,094.00	18,094
947	Primary 4000 amp service #2	EA	1.00	18,094.00	18,094
948	Emergency generator 300 kva (by utility company)	Note			Excl.
950	Transfer switch 400 amps	EA	3.00	13,992.70	41,978
952	Panel SB-DPH-LLA 800 amps	EA	1.00	31,652.00	31,652

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
953	Panel EM-DPH-LLA 400 amps	EA	1.00	22,774.00	22,774
954	Panel EM-DPH-ELEV-LLA 400 amps	EA	1.00	22,774.00	22,774
955	Elev #1 200 amps	EA	1.00	2,200.00	2,200
956	Elev #2 200 amps	EA	1.00	2,200.00	2,200
957	ELEV disconnect 200 amps	EA	2.00	2,123.00	4,246
958	Fire pump connection & controller connection	EA	1.00	1,423.00	1,423
960	DPH-LLA 1200 amps	EA	1.00	37,153.00	37,153
961	DPH-LLB 1200 amps	EA	1.00	37,153.00	37,153
962	DPH-LLC 1200 amps	EA	1.00	37,153.00	37,153
963	DPH-LLD 1200 amps	EA	1.00	37,153.00	37,153
964	DSH-4A 2000 amps	EA	1.00	37,153.00	37,153
965	DSH--4B 1600 amps	EA	1.00	31,652.00	31,652
966	MPH-2A & 2B 1200 amps	EA	1.00	31,652.00	31,652
967	Disconnect switches 60 amps	EA	4.00	603.30	2,413
968	Disconnect switches 100 amps	EA	12.00	916.80	11,001
969	Disconnect switches 200 amps	EA	12.00	1,785.30	21,423
970	EWB #1 & #2 200 amp connection	EA	2.00	2,268.00	4,536
971	Disconnects 400 amps	EA	9.00	2,267.80	20,410
972	System metering	EA	1.00	140,697.00	140,697
974	Coordination Study	EA	1.00	34,161.00	34,161
975	Arc Flash	EA	1.00	21,713.00	21,713
977	Panels 225 amps	EA	18.00	4,487.30	80,771
978	Panels 400 amps	EA	19.00	5,259.30	99,926
979	Panels 100 amps	EA	12.00	3,136.30	37,635
986	Panel GEN-EM-DPH-LLA 800 amps	EA	1.00	44,149.00	44,149
987	Generator emergency grounding	EA	1.00	8,241.00	8,241
989	Dry transformer - 30kVA	EA	12.00	3,739.40	44,873
991	Dry transformer - 75kVA	EA	2.00	5,066.50	10,133
992	Dry transformer - 115kVA	EA	19.00	8,274.90	157,223
993	Dry transformer - 225kVA	EA	2.00	12,062.50	24,125
1717	Feeders 60 amps CU	LF	12,400.00	21.20	263,252

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1718	Feeders 90 amps CU	LF	6,220.00	31.70	196,875
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	22,678.00	22,678
1730	Emergency generator communication conduit & wire	EA	1.00	17,853.00	17,853
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 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	25.50	105,980
2519	Feeders 150 amps AL	LF	960.00	32.00	30,756
2520	Feeder 200 amps AL	LF	3,600.00	46.80	168,489
2521	Feeders 225 amps AL	LF	4,860.00	51.00	248,096
2522	Feeders 400 amps AL	LF	6,120.00	93.70	573,453
2523	Feeders 600 amps AL	LF	640.00	141.00	90,231
2524	Feeders 800 amps AL	LF	840.00	211.50	177,684
2525	Feeders 1200 amps AL	LF	1,920.00	388.80	746,492
2526	Feeders 4000 amps AL	LF	460.00	1,165.50	536,142

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2778	Feeders: Added pricing adjustment per reconciliation	LS	1.00	950,524.00	950,524
2780	Mechanical connections-Reheat coils/branch selectors	EA	209.00	772.00	161,348
2781	Mechanical connections Fancoil units	EA	271.00	636.90	172,600
	D5020 - Electrical Service and Distribution			16.56/SF	6,302,306
D5030	General Purpose Electrical Power				
768	Interior electronic scoreboard & shot clock	EA	1.00	8,318.00	8,318
1001	Mechanical connections (VFD) 30 amps	EA	51.00	4,207.40	214,577
1002	Mechanical connections (VFD) 60 amps	EA	53.00	6,179.90	327,533
1003	Mechanical connections (VFD) 100 amps	EA	5.00	6,818.60	34,093
1004	Mechanical connections (VFD) 200 amps	EA	5.00	17,680.80	88,404
1005	Mechanical connections (VFD) 400 amps	EA	1.00	33,196.00	33,196
1528	Rec exp proof	EA	6.00	5,447.50	32,685
1529	Rec and cord drop	EA	246.00	1,785.30	439,172
1530	Power floor box	EA	75.00	699.60	52,472
1531	Rec power	EA	728.00	120.60	87,815
1532	Rec GFI	EA	533.00	313.60	167,162
1551	Rec power Special rec 30 amps	EA	43.00	627.30	26,972
1556	Rec quad	EA	210.00	275.00	57,755
1557	Misc. mechanical equipment and equipment connection	EA	80.00	4,810.50	384,842
2373	EV Chargers in auto shop	EA	4.00	12,014.30	48,057
1731	Power conduit & wire	EA	1,216.00	168.90	205,352
1781	Kitchen & Culinary equipment rough-in & connections	EA	149.00	410.10	61,109
1783	Shop equipment connections & dust collector	EA	1.00	12,063.00	12,063
1784	Vehicle Co2 system connection (power)	EA	1.00	1,568.00	1,568
	D5030 - General Purpose Electrical Power			6.00/SF	2,283,145
D5040	Lighting				
2503	School stage rigging (refer to Equipment section)	EA	1.00		Incl.
764	School stage lighting	EA	1.00	96,500.00	96,500
2504	School stage lighting & control	EA	1.00	31,363.00	31,363
1014	Lighting type DPA - 32" decorative pendant	EA	10.00	675.50	6,755

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2320	Lighting type DPB - 4' long x 6" dia. pendant	EA	12.00	752.70	9,032
2321	Lighting type DPB-2 - 4' long x 6" dia. pendant	EA	30.00	1,206.30	36,188
1016	Lighting type GPB - 15.1" dia. pendant	EA	126.00	791.30	99,704
1019	Lighting type GPE - 26' dia. direct/indirect ring pendant	EA	1.00	579.00	579
2322	Lighting type GPK - 60" dia. direct/indirect ring pendant	EA	20.00	723.80	14,475
2323	Lighting type GPL-1 - 8' long linear pendant	EA	20.00	791.30	15,826
2324	Lighting type GPL-2 - 4' long linear pendant	EA	17.00	603.10	10,253
1023	Lighting type GSA - 24" dia. surface pendant	EA	56.00	723.80	40,530
1024	Lighting type GSB - 11" dia. surface downlight	EA	19.00	445.80	8,471
1025	Lighting type GSC - surface linear	LF	100.00	445.80	44,583
2326	Lighting type GSD - 2" dia. surface round cylinder downlight	EA	22.00	397.60	8,747
2325	Lighting type GSE - 2"x8" wall indirect	LF	161.00	188.20	30,296
1027	Lighting type GWB - 8"x9" surface wall sconce exterior	EA	11.00	540.40	5,944
1028	Lighting type GWC - 8"x12" adjustable direct/indirect wall cylinder exterior	EA	14.00	694.80	9,727
2327	Lighting type GWD - 2' long indirect/direct wall sconce	EA	32.00	434.30	13,896
2328	Lighting type GWE-1 - 25" long wall linear	EA	40.00	608.00	24,318
2329	Lighting type GWE-2 - 25" long wall linear	EA	32.00	636.90	20,381
2330	Lighting type GWF - 6" dia. adjustable wall cylinder	EA	24.00	405.30	9,727
1029	Lighting type LPA-1 - pendant linear	LF	3,527.00	304.00	1,072,119
2331	Lighting type LPA-2 - pendant linear	LF	26.00	120.60	3,136
1030	Lighting type LPB - pendant linear	LF	161.00	593.50	95,549
1031	Lighting type LPC - pendant linear	LF	1,408.00	135.10	190,221
2332	Lighting type LPD - pendant linear	LF	285.00	168.90	48,129
1032	Lighting type LPE - pendant linear	LF	81.00	149.60	12,116
2333	Lighting type LPG - pendant linear	LF	73.00	97.50	7,115
2336	Lighting type LPH - 8' long pendant linear	EA	133.00	579.00	77,007
2337	Lighting type LPJ - pendant linear	LF	549.00	135.10	74,170
2335	Lighting type LPK - pendant linear	LF	289.00	135.10	39,044

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



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LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2334	Lighting type LPL - pendant linear	LF	295.00	135.10	39,855
2338	Lighting type LPM-1 - pendant linear	LF	79.00	63.70	5,032
2339	Lighting type LPM-2 - pendant linear	LF	149.00	72.40	10,784
1035	Lighting type LSA - undercabinet	LF	858.00	53.10	45,538
1036	Lighting type LSB - linear cove	LF	217.00	82.00	17,799
2341	Lighting type LSG-1 - 4' long linear	EA	74.00	542.30	40,132
2342	Lighting type LSG-2 - 8' long linear	EA	54.00	685.10	36,998
2340	Lighting type LSH - strip light	LF	541.00	542.30	293,401
1044	Lighting type LSJ - wall linear	LF	29.00	202.70	5,877
2343	Lighting type PB - 16.24" dia. pendant	EA	36.00	636.90	22,928
2345	Lighting type PD - 4" dia. pendant cylinder	EA	76.00	661.00	50,238
2344	Lighting type PD-1 - 4" dia. pendant cylinder	EA	21.00	661.00	13,882
2347	Lighting type PF - 4" dia. pendant cylinder	EA	60.00	559.70	33,582
2346	Lighting type PF-1 - 4" dia. pendant cylinder	EA	24.00	569.30	13,664
1052	Lighting type RA-1 - 2 X 2 recessed troffer	EA	185.00	395.60	73,195
2349	Lighting type RA-2 - 2 X 2 recessed troffer	EA	6.00	405.30	2,432
2348	Lighting type RA-3 - 2 X 2 recessed troffer	EA	19.00	405.30	7,701
1053	Lighting type RB-1 - 2 X 2 recessed troffer	EA	207.00	405.30	83,897
2350	Lighting type RB-2 - 2 X 4 recessed troffer	EA	6.00	453.50	2,721
1054	Lighting type RC-1 - 2.5x2.5 recessed downlight	EA	288.00	386.00	111,168
2351	Lighting type RC-2 - 2.5x2.5 recessed downlight	EA	16.00	386.00	6,176
1055	Lighting type RDA - 24"x48" recessed food downlight	EA	31.00	395.60	12,265
2352	Lighting type RDB - 24"x24" recessed food downlight	EA	13.00	395.60	5,143
1056	Lighting type RE - 4" dia. recessed downlight	EA	31.00	378.30	11,727
1057	Lighting type RF - 2.5" dia. recessed wall wash	EA	73.00	376.40	27,474
1061	Lighting type RJ - 6"x6" recessed downlight	EA	36.00	410.10	14,765
2353	Lighting type RK - 2.5"x2.5" recessed downlight	EA	8.00	492.10	3,937
2356	Lighting type RL-1 - 2x4 recessed troffer	EA	191.00	395.60	75,569
2358	Lighting type RL-2 - 2x4 recessed troffer	EA	62.00	400.50	24,829
2357	Lighting type RM - 4" dia. recessed downlight	EA	6.00	453.50	2,721
2359	Lighting type RN-1 - 4" dia. recessed downlight	EA	15.00	395.70	5,935

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2355	Lighting type RN-2 - 4" dia. recessed downlight	EA	42.00	405.30	17,023
2354	Lighting type RP - 4" dia. recessed wall wash	EA	11.00	443.90	4,883
2360	Lighting type RQ - 4" dia. recessed downlight	EA	25.00	405.30	10,133
1063	Lighting type RLA-1 - recessed linear wall wash	LF	665.00	202.60	134,762
2361	Lighting type RLA-2 - recessed linear wall wash	LF	41.00	231.60	9,496
1064	Lighting type RLB-1 - indirect wall wash	LF	259.00	144.70	37,490
2364	Lighting type RLB-2 - indirect wall wash	LF	653.00	159.20	103,974
2363	Lighting type RLB-3 - indirect wall wash	LF	135.00	164.10	22,147
2362	Lighting type RLB-4 - indirect wall wash	LF	76.00	159.20	12,101
2369	Lighting type RLC - indirect reflector	LF	1,841.00	193.00	355,313
1066	Lighting type RLD-1 - recessed linear	LF	59.00	139.90	8,256
2366	Lighting type RLD-2 - recessed linear	LF	76.00	139.90	10,634
2367	Lighting type RLD-3 - recessed linear	LF	272.00	139.90	38,060
1067	Lighting type RLE - 4' long recessed linear	EA	32.00	403.40	12,908
1068	Lighting type RLF - 48" long in ground linear	EA	10.00	733.40	7,334
2368	Lighting type RLG-1 - indirect wall wash	LF	10.00	820.30	8,203
1070	Lighting type RLH - 3' long semi recessed wall wash	EA	8.00	820.30	6,562
1071	Lighting type SA - 8" dia in-grade uplight wall wash	EA	34.00	810.60	27,560
1072	Lighting type SWA - wall sconce exterior	EA	16.00	820.30	13,124
1073	Lighting type T1 - pendant rack	LF	65.00	35.70	2,321
1074	Lighting type TA - 3.5" dia. rack spot	EA	25.00	434.20	10,856
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	EA	25.00	542.30	13,558
1040	Lighting type LSF linear (none indicated)	EA	4.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
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	308.80	46,629
1527	Lighting type F1 - 4' long linear	EA	44.00	111.00	4,883
1732	Lighting conduit & wire	EA	1,746.00	178.50	311,705
1743	Lighting control	SF	409,877.00	1.30	514,191
1786	Theater lighting control interface	EA	1.00	5,308.00	5,308
1787	Stage lighting control interface	EA	1.00	4,343.00	4,343
1788	Lighting control classroom 2 zone control	EA	106.00	1,683.90	178,496
D5040 - Lighting				13.64/SF	5,189,519
D5080	Miscellaneous Electrical Systems				
647	Lightning protection	SF	409,877.00	0.60	237,319
763	P.V System 249 kw (rough in conduit for future)	EA	1.00	73,147.00	73,147
767	Seismic restraints electrical	SF	409,877.00	0.40	158,213
777	Owner independent testing agency	EA	1.00		Excl.
1738	Electrical permits	SF	409,877.00		Excl.
1739	Electrical testing, documentation & commissioning	SF	409,877.00	1.80	755,991
1740	Electrical firestopping	SF	409,877.00	0.30	118,659
1785	Electrical access panel	EA	1.00	9,245.00	9,245
2565	Temp power	SF	409,877.00	0.70	276,872

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2823	BIM	LS	1.00	96,500.00	96,500
	D5080 - Miscellaneous Electrical Systems			4.54/SF	1,725,946
	26 - ELECTRICAL			40.73/SF	15,500,916
27	COMMUNICATIONS				
D6010	Data Communications				
1676	WAP wireless access point	EA	180.00	820.30	147,645
1736	Data backbone cabling	EA	1.00	82,411.00	82,411
	D6010 - Data Communications			0.60/SF	230,056
D6020	Voice Communications				
640	TV & Video (rough in & equipment) - move to FF&E	SF	409,877.00		Excl.
	D6020 - Voice Communications				Excl.
D6030	Audio-Video Communication				
643	Inst. AV System (rough in & equipment) - move to FF&E	SF	409,877.00		Excl.
1691	Speech reinforcement system SFR rough in	EA	93.00	554.90	51,603
1695	Video presentation screen outlet (flat screen) rough in	EA	94.00	1,447.50	136,065
1741	Sound conduit & wire	EA	696.00	603.10	419,775
2532	Tel/Data A/V cabling system rough in	SF	409,877.00	1.90	771,999
2533	IPTV and Video on demand system	EA	1.00		Excl.
2534	Large venue A/V system	EA	1.00	482,983.00	482,983
2535	Classroom speech reinforcement system	EA	1.00	214,423.00	214,423
2536	Inst. A/V system	EA	1.00		Excl.
2537	P.A. system	EA	1.00	291,430.00	291,430
	D6030 - Audio-Video Communication			6.22/SF	2,368,278
D6060	Distributed Communications and Monitoring				
1737	Clocks backbone wiring	EA	1.00	7,575.00	7,575
1742	Clocks conduit & wire	EA	199.00	313.60	62,411
2538	Clock system	EA	1.00	129,310.00	129,310
2828	Supervision and documentation	SF	409,877.00	0.60	237,319
	D6060 - Distributed Communications and Monitoring			1.15/SF	436,615

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
D7030	Electronic Surveillance				
760	Vape detection system rough in	EA	1.00	35,666.00	35,666
	D7030 - Electronic Surveillance			0.09/SF	35,666
	27 - COMMUNICATIONS			8.07/SF	3,070,615
28	ELECTRONIC SAFETY AND SECURITY				
D7010	Access Controls and Intrusion Detection				
1733	Security conduit & wire	EA	273.00	265.40	72,447
	D7010 - Access Controls and Intrusion Detection			0.19/SF	72,447
D7030	Electronic Surveillance				
1685	CCTV cameras rough in	EA	160.00	1,626.00	260,164
1778	Security conduit & wire	EA	160.00	723.80	115,800
1779	Security backbone cabling	EA	1.00	7,961.00	7,961
2539	Security system & CCTV	EA	1.00	771,999.00	771,999
	D7030 - Electronic Surveillance			3.04/SF	1,155,924
D7050	Detection and Alarm				
1628	Fire Alarm-Head end, mapping, programming and integration	LS	1.00	268,270.00	268,270
1629	Fire alarm control panel	EA	1.00	11,773.00	11,773
1630	Fire alarm annunciator	EA	17.00	9,505.20	161,589
1631	Fire alarm pull station	EA	40.00	627.30	25,090
1632	Fire alarm smoke detector	EA	228.00	313.60	71,507
1636	Fire alarm audio/visual alarm	EA	487.00	395.70	192,682
1637	Fire alarm audio only alarm	EA	45.00	371.50	16,719
1640	Fire alarm flow and tamper switch	EA	126.00	540.40	68,090
1643	Fire alarm testing & commissioning	EA	972.00	241.30	234,495
1734	Fire alarm conduit & wire	EA	943.00	265.40	250,249
1780	Fire alarm communication system interface	EA	1.00	4,420.00	4,420
1782	Kitchen fire suppression connection (sbo)	EA	1.00	8,203.00	8,203
2827	Low voltage systems supervision and documentation	SF	409,877.00	0.60	237,319
	D7050 - Detection and Alarm			4.07/SF	1,550,406

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
D7090	Electronic Safety and Security Supplementary Components				
761	Visitor management system rough in	EA	1.00	4,825.00	4,825
810	Gun/gunshot detection system	EA	1.00	24,125.00	24,125
	D7090 - Electronic Safety and Security Supplementary Components			0.08/SF	28,950
	28 - ELECTRONIC SAFETY AND SECURITY			7.38/SF	2,807,727
31	EARTHWORK				
A4010	Standard Slabs-on-Grade				
508	Excavation for slab on grade	CY	7,584.42		Incl.
2777	BP 31A - Recommended amount	LS	1.00	200,277.00	200,277
509	Remove and dispose of excavated material	CY	7,584.42		Incl.
510	Prepare and compact sub-base	SF	129,285.73		Incl.
513	Re-use materials ILO Imported sand gravel fill - 12" thick	CY	4,788.78		Incl.
	A4010 - Standard Slabs-on-Grade			0.53/SF	200,277
A6010	Building Subdrainage				
2779	BP 31A - Recommended amount	LS	1.00	735,750.00	735,750
619	Perimeter drain	LF	2,463.00		Incl.
686	Under-slab drainage system	SF	129,285.73		Incl.
1835	Allowance for Electrical and Plumbing earth work within footprint	LS	1.00		Incl.
	A6010 - Building Subdrainage			1.93/SF	735,750
A6020	Off-Gassing Mitigation				
702	Allowance for radon mitigation - 20 drops x 60'	LS	1.00		Incl.
	A6020 - Off-Gassing Mitigation				Incl.
A9010	Substructure Excavation				
2804	BP 31A - Recommended amount	LS	1.00	1,285,770.00	1,285,770
591	Excavation for foundation footings including spoils removal	CY	12,549.31		Incl.
593	Prepare and compact foundation sub-base	SF	35,031.74		Incl.
594	Imported sand gravel fill below foundations - 12" thick	CY	1,451.45		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A1 New School Building (continued)

GFAR: 380,570.00 SF Cost/SF: 422.20
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
595	Basement mass excavation	CY	32,666.00		Incl.
654	Excavation for elevator pit including spoils removal	CY	72.00		Incl.
620	Imported foundation backfill	CY	7,247.56		Incl.
691	Imported backfill to basement excavation	CY	6,534.00		Incl.
	A9010 - Substructure Excavation			3.38/SF	1,285,770
	31 - EARTHWORK			5.84/SF	2,221,797
33	UTILITIES				
G3010	Water Utilities				
1381	6", Ductile iron pipe	LF	95.99		Incl.
1448	Cleaning, testing, trace wiring etc.	LF	95.82		Incl.
569	Excavation and backfill (with site preparation)	LF	95.82		Incl.
	G3010 - Water Utilities				Incl.
G3090	Liquid and Gas Site Utilities Supplementary Components				
1798	General requirements: supervision, shop drawings, as-built drawings, equipment rentals, fees, permits, etc.	Item			Incl.
	G3090 - Liquid and Gas Site Utilities Supplementary Components				Incl.
	33 - UTILITIES				Incl.
NEW SCHOOL BUILDING				422.20/SF	160,676,975

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD BASE DESIGN

A Building

A3 Maintenance Building

Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
03	Concrete		441,332
07	Thermal and Moisture Protection		49,782
31	Earthwork		10,000
MAINTENANCE BUILDING			501,114

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD BASE DESIGN

A Building

A3 Maintenance Building

Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS			
	Design & Estimating Contingency		7,517
	Escalation Allowance up to mid-point of Construction (3/2025)		15,259
	Sub-contractor Bonds		6,287
	Insurance - CCIP (Change from GL)		17,003
	Cost of Traditional Insurance (Trade + GL) - Savings		Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)		909
	Payment & Performance Bond (per CM Pricing Exhibit 1)		4,603
	General Conditions (per CM Pricing Exhibit 1)		24,097
	Field Office Support		4,214
	General Requirements (per CM Pricing Exhibit 1)		12,522
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1		2,114
	CM Construction Contingency (per CM Pricing Exhibit 1)		13,392
	CM Fee (per CM Pricing Exhibit 1)		10,460
ESTIMATED TOTAL COST			619,491

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A3 Maintenance Building

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
03	CONCRETE				
A1010	Standard Foundations				
529	Concrete to perimeter strip footings - 1' thick, 4500 PSI	CY	33.20	313.60	10,412
1000	Concrete to interior strip footings, 4500 PSI	CY	32.82	313.70	10,294
530	Form strip footings	SF	1,774.88	19.30	34,256
587	Bar reinforcement to strip footings, allow 100 PCY	Lb	6,573.19	1.70	11,418
	A1010 - Standard Foundations				66,380
A2010	Walls for Subgrade Enclosures				
598	Concrete to perimeter frost walls, 4500 PSI	CY	90.99	313.60	28,537
1122	Concrete to interior foundation walls, 4500 PSI	CY	57.41	313.60	18,005
605	Form perimeter frost walls	SF	4,908.15	24.10	118,408
1123	Form interior foundation walls	SF	3,088.43	24.10	74,508
608	Bar reinforcement to perimeter frost walls	Lb	8,957.21	1.70	15,559
1124	Bar reinforcement to interior foundation walls	Lb	9,034.05	1.70	15,692
618	Rigid insulation - 2" thick	SF	2,454.04	4.30	10,657
	A2010 - Walls for Subgrade Enclosures				281,366
A4010	Standard Slabs-on-Grade				
933	Concrete to slab on grade - 5" thick, 4500 PSI	CY	154.30	313.60	48,392
502	Form slab on grade	SF	184.26	17.40	3,201
2585	Fiber reinforcement to slab on grade	CY	153.79	57.90	8,904
698	Allowance for bar reinforcement	Lb	4,981.27	1.70	8,652
504	Float finish to slab on grade	SF	9,962.47	1.40	14,421
505	Control joints	SF	9,962.47	0.80	7,691
710	Engineering, layout, safety, cleaning, etc.	Item			2,325
	A4010 - Standard Slabs-on-Grade				93,586
	03 - CONCRETE				441,332
07	THERMAL AND MOISTURE PROTECTION				
A2010	Walls for Subgrade Enclosures				
617	Dampproofing to frost wall	SF	2,454.16	5.80	14,210
	A2010 - Walls for Subgrade Enclosures				14,210

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD BASE DESIGN

A Building

A3 Maintenance Building (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
A4010	Standard Slabs-on-Grade				
506	Air and vapor barrier	SF	9,962.47	0.90	8,652
	A4010 - Standard Slabs-on-Grade				8,652
A4090	Slab-on-Grade Supplementary Components				
656	Rigid insulation - 1" thick	SF	9,962.80	2.70	26,920
	A4090 - Slab-on-Grade Supplementary Components				26,920
	07 - THERMAL AND MOISTURE PROTECTION				49,782
31	EARTHWORK				
A1010	Standard Foundations				
2776	BP 31A - Perforated PVC foundation drainage	LS	1.00	10,000.00	10,000
	A1010 - Standard Foundations				10,000
A4010	Standard Slabs-on-Grade				
508	Excavation for slab on grade	CY	584.28		Incl.
509	Remove and dispose of excavated material	CY	584.28		Incl.
510	Prepare and compact sub-base	SF	9,962.47		Incl.
513	Re-use materials ILO Imported sand gravel fill - 12" thick	CY	369.02		Incl.
	A4010 - Standard Slabs-on-Grade				Incl.
A6010	Building Subdrainage				
2806	BP 31A - Recommended amount	LS	1.00		Incl.
619	Perimeter drain	LF	454.20		Incl.
686	Under-slab drainage system	SF	9,962.47		Incl.
	A6010 - Building Subdrainage				Incl.
A9010	Substructure Excavation				
591	Excavation for foundation footings including spoils removal	CY	625.79		Incl.
593	Prepare and compact foundation sub-base	SF	1,774.76		Incl.
594	Imported sand gravel fill below foundations - 12" thick	CY	65.75		Incl.
620	Imported foundation backfill	CY	346.24		Incl.
	A9010 - Substructure Excavation				Incl.
	31 - EARTHWORK				10,000
MAINTENANCE BUILDING					501,114

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD Base Design

B Sitework

Rates Current At May 2023

Ref	Description	Total Cost USD
01	General Requirements	1,803,000
02	Existing Conditions	320,181
03	Concrete	762,909
05	Metals	918,657
11	Equipment	673,545
12	Furnishings	195,798
14	Conveying Equipment	Excl.
22	Plumbing	Excl.
26	Electrical	2,952,361
27	Communications	323,931
28	Electronic Safety and Security	1,911
31	Earthwork	14,547,149
32	Exterior Improvements	7,950,595
33	Utilities	4,699,674
SITEWORK		35,149,711

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD Base Design

B Sitework

Rates Current At May 2023

Ref	Description	Total Cost USD
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	527,246
	Escalation Allowance up to mid-point of Construction (3/2025)	1,070,308
	Sub-contractor Bonds	440,966
	Insurance - CCIP (Change from GL)	1,192,673
	Cost of Traditional Insurance (Trade + GL) - Savings	Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)	63,729
	Payment & Performance Bond (per CM Pricing Exhibit 1)	322,897
	General Conditions (per CM Pricing Exhibit 1)	1,690,208
	Field Office Support	295,607
	General Requirements (per CM Pricing Exhibit 1)	878,323
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1	148,301
	CM Construction Contingency (per CM Pricing Exhibit 1)	939,371
	CM Fee (per CM Pricing Exhibit 1)	733,680
ESTIMATED TOTAL COST		43,453,020

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
01	GENERAL REQUIREMENTS				
Z1050	Temporary Facilities & Controls				
2803	BP 31A - Recommended amount	LS	1.00	1,803,000.00	1,803,000
672	Dust control	LS	1.00		Incl.
678	Site fencing including maintenance	LF	7,000.00		Incl.
679	Mobilization	LS	1.00		Incl.
680	Submittals, as-builts, layout, survey, etc.	LS	1.00		Incl.
813	Temporary access road and repairs	LS	1.00		Incl.
814	Temporary walkways	LS	1.00		Incl.
670	Allowance for dewatering	LS	1.00		Incl.
	Z1050 - Temporary Facilities & Controls				1,803,000
	01 - GENERAL REQUIREMENTS				1,803,000
02	EXISTING CONDITIONS				
G1020	Site Elements Demolition				
2768	BP 31A - Recommended amount	LS	1.00	320,181.00	320,181
523	Remove and dispose of existing catch basins	EA	33.00		Incl.
524	Remove and dispose of existing manholes	EA	23.00		Incl.
1841	Remove and dispose of existing hydrant	EA	3.00		Incl.
525	Remove and dispose existing utilities piping including excavation and backfill	LF	7,868.00		Incl.
526	Protect and maintain existing hydrant	EA	1.00		Incl.
1839	Maintain and protect manhole/catch basin/drain line/water line	EA	19.00		Incl.
527	Cap water main	EA	3.00		Incl.
1842	Allowances for plugging pipes	EA	4.00		Incl.
533	Break-out and remove existing pavements	SF	261,335.00		Incl.
534	Break-out and remove existing basketball courts	SF	12,883.00		Incl.
536	Remove and dispose existing light poles and associated wiring	EA	16.00		Incl.
541	Remove and dispose existing light sconces and associated wiring	EA	25.00		Incl.
544	Remove and dispose of existing fencing	LF	1,920.00		Incl.
545	Remove and dispose of existing metal guardrail	LF	741.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
555	Remove and dispose of buried fuel tanks	EA	2.00		Incl.
556	Remove and dispose of above grade gas tanks	EA	4.00		Incl.
557	Remove and dispose of sliding gate	EA	6.00		Incl.
559	Remove and dispose of jersey barrier	LF	40.00		Incl.
560	Remove and dispose of trailers	EA	4.00		Incl.
1439	Remove and dispose backstop	LF	196.00		Incl.
561	Allowance for miscellaneous site demolition not indicated on plans	SF	1,517,556.00		Incl.
762	Existing building electrical demolition (phased)	EA	1.00		Incl.
1442	Remove and dispose benches	EA	2.00		Incl.
1443	Demolish concrete retaining walls	LF	66.00		Incl.
1444	Remove and dispose of recreational equipment	LS	1.00		Incl.
G1020 - Site Elements Demolition					320,181
02 - EXISTING CONDITIONS					320,181
03	CONCRETE				
G2020	Parking Lots				
290	Vehicular concrete paving, 6" thick	SY	888.00	111.00	98,546
G2020 - Parking Lots					98,546
G2030	Pedestrian Plazas and Walkways				
718	Vehicular concrete walkway	SY	456.00	111.00	50,605
264	Accessible curb ramp	SF	1,423.00		Incl.
362	Concrete walkway paving	SF	23,864.10	12.50	299,375
G2030 - Pedestrian Plazas and Walkways					349,980
G2050	Athletic, Recreational, and Playfield Areas				
1706	Cast-in-place grandstand footings, 2' dia x 5' deep	EA	24.00	820.30	19,686
2484	Cast-in-place slab on grade for grandstand, 4" deep	SF	3,072.10	6.80	20,752
2485	Cast-in-place slab on grade for grandstand, 5" deep	SF	496.50	10.60	5,270
2486	Cast-in-place grade beam for grandstand, 1'-0" wide x 3'-6" deep	LF	135.00	202.70	27,358
G2050 - Athletic, Recreational, and Playfield Areas					73,066
G2060	Site Development				
380	Equipment concrete pad	SF	579.00	28.90	16,762

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
373	CIP Retaining wall/ bench shelf	CY	74.00	1,737.00	128,538
728	CIP strip footing for retaining walls/bench shelf	CY	89.00	965.00	85,885
2418	Flush cast-in-place concrete wall	LF	42.00	241.20	10,132
	G2060 - Site Development				241,317
	03 - CONCRETE				762,909
05	METALS				
G2050	Athletic, Recreational, and Playfield Areas				
2487	Galvanized structural steel supporting framing	T	24.7200		Incl.
	G2050 - Athletic, Recreational, and Playfield Areas				Incl.
G2060	Site Development				
369	Exterior steel bollard	EA	56.00	723.80	40,530
2419	Metal roof screen panel and gate, 8'-0" high	LF	97.00	144.80	14,041
372	4'-0" High ornamental fence	LF	16.00	337.80	5,404
402	Handrail to stairs / ramps	LF	100.00	144.80	14,475
2753	Boardwalk guardrail comprising of welded wiremesh and steel post and framing	LF	2,499.50	337.80	844,207
	G2060 - Site Development				918,657
	05 - METALS				918,657
11	EQUIPMENT				
G2050	Athletic, Recreational, and Playfield Areas				
697	Shotput cage - allow 20' high	LF	69.00	168.90	11,652
417	Football goal post and footing	EA	2.00	19,300.00	38,600
416	20'-0" high sports netting	LF	397.80	482.50	191,938
696	Pole vault box	EA	1.00	1,930.00	1,930
699	Aluminum bleacher system including and ramp - Football field, 500 person	LS	1.00	332,925.00	332,925
770	Exterior scoreboard football	EA	1.00	96,500.00	96,500
	G2050 - Athletic, Recreational, and Playfield Areas				673,545
	11 - EQUIPMENT				673,545

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
12	FURNISHINGS				
G2060	Site Development				
2762	Curved Gabion seat with wall mount wood topper, 18" x 18" W	LF	36.00	1,061.50	38,214
271	Curved Gabion seat with wall mount wood topper, 18" x 24" W	LF	48.00	1,061.50	50,952
2763	Straight recycled plastic bench, 2' x 5'	EA	3.00	2,123.00	6,369
2764	Cafe wood stools, 18"H x 15" square	EA	28.00	772.00	21,616
1583	Cafe wood back chair	EA	24.00		Excl.
1586	Cafe table, 36" square	EA	13.00	2,702.00	35,126
2765	Cafe metal chairs	EA	24.00	675.50	16,212
2766	Cafe counter height table	EA	3.00	2,702.00	8,106
1588	Playground picnic table/bench	EA	1.00	4,439.00	4,439
1589	Trash receptacle, 50 liter capacity	EA	6.00	1,737.00	10,422
1590	"Flo" bike racks	EA	3.00	1,447.30	4,342
	G2060 - Site Development				195,798
	12 - FURNISHINGS				195,798
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	267.00	1,930.00	515,311
187	Secondary generator feeder (4-400 amp feeds)	LF	83.00	723.70	60,071

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2812	Ductbank B (2-4" conduits) pull string only primary cabling by Others	LF	1,451.00	40.50	58,809
184	Ductbank C (8-4" conduits) pull string only primary cabling by Others	LF	1,211.00	159.20	192,821
2813	Ductbank D/F/H (4-4" conduits) pull string only primary cabling by Others	LF	2,240.00	82.00	183,736
2814	Ductbank K (2-4" conduits) pull string only primary cabling by Others	LF	134.00	40.50	5,431
185	Ductbank N (6-4" conduits) pull string only primary cabling by Others	LF	321.00	120.60	38,721
2815	Ductbank O (3-4" conduits) pull string only primary cabling by Others	LF	206.00	59.80	12,325
2816	Ductbank M (6-2" conduits) pull string only primary cabling by Others	LF	736.00	57.90	42,614
2817	Ductbank (2-4" conduits) pull string only primary cabling by Others	LF	50.00	40.50	2,026
2818	Ductbank (1-2" conduits) pull string only primary cabling by Others	LF	11.00	9.60	106
2819	Ductbank (2-2" conduits) pull string only primary cabling by Others	LF	291.00	19.30	5,616
2820	Ductbank (3-2" conduits) pull string only primary cabling by Others	LF	21.00	29.00	608
186	Fire Pump feeder 200 amps (2-4" conduits)	LF	376.00	54.00	20,319
2822	Ductbank A (4-2" conduits) pull string only primary cabling by Others	LF	7,944.00	38.60	306,638
188	Secondary feeder to maintenance building (400 amp service)	LF	619.00		Excl.
201	Field electrical service 75 kva transformer service EV Charging Stations	EA	2.00	40,568.50	81,137
204	Field service to concessions 250 amps	LF	329.00	62.70	20,637
205	Field service to athletic building 1200 amps	LF	106.00	121.10	12,837
208	Primary to padmount transformer for field buildings	LF	220.00	84.90	18,682
706	Secondary service manholes	EA	12.00	7,237.50	86,850
766	Utility pole modifications (not included)	EA	1.00		Excl.
1837	Electrical (E & B) in another division of the estimate	Note			Excl.
2566	Traffic Signals	EA	1.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2821	Ductbank (2-1" conduits) pull string only primary cabling by Others	LF	22.00	19.30	425
G4010 - Site Electric Distribution Systems					1,665,720
G4050	Site Lighting				
214	Sports field lighting conduit & wire (pole lights)	EA	1.00	73,822.00	73,822
215	Sports field lighting control	EA	1.00	16,856.00	16,856
2810	Hand holes	EA	135.00	1,447.50	195,412
772	Site bench lighting	EA	1.00	8,251.00	8,251
774	Electronic gate entrance S & Install incl elect conn	EA	1.00	25,572.00	25,572
934	Type LST 11 flagpole (cluster)	EA	3.00	550.00	1,650
936	Double head 25 ft pole	EA	6.00	5,587.30	33,524
2811	Double head 24 ft pole	EA	64.00	5,307.50	339,680
937	Single head 16 ft pole	EA	23.00	4,825.00	110,975
938	Single head 14 ft pole	EA	20.00	4,511.40	90,227
940	Digital message board	EA	1.00	1,959.00	1,959
941	Monument sign lighting	EA	1.00	2,162.00	2,162
943	Musco Football lighting	EA	4.00	93,122.80	372,491
1789	Electric vehicle dual charging system	EA	1.00		Excl.
1790	Electric vehicle dual charging system distribution panels	EA	2.00	7,030.00	14,060
G4050 - Site Lighting					1,286,641
26 - ELECTRICAL					2,952,361
27	COMMUNICATIONS				
G5010	Site Communications				
189	Secondary communications feeder 8-4" conduits	LF	1,211.00	193.00	233,723
192	Communications to maintenance building (4-4" conduits)	LF	640.00		Excl.
209	Secondary communications feeder 4-4" conduits for Athletic fields	LF	779.00	115.80	90,208
G5010 - Site Communications					323,931
27 - COMMUNICATIONS					323,931

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
28	ELECTRONIC SAFETY AND SECURITY				
G5010	Site Communications				
1671	Outdoor CCTV Bullet cameras incl fiber cabling pole mtd	EA	2.00	955.50	1,911
	G5010 - Site Communications				1,911
	28 - ELECTRONIC SAFETY AND SECURITY				1,911
31	EARTHWORK				
G1010	Site Clearing				
2767	BP 31A - Recommended amount - clearing and grubbing (Phase 1 allowance)	LS	1.00	117,600.00	117,600
2847	BP 31A - Recommended amount - clearing and grubbing (Phase 2 allowance)	LS	1.00	78,400.00	78,400
676	Clearing and grubbing	Acre	34.900		Incl.
677	Tree removal	EA	100.00		Incl.
2848	BP 31A - Recommended amount - strip site including disposal (Phase 1)	LS	1.00	420,000.00	420,000
2849	BP 31A - Recommended amount - strip site including disposal (Phase 2)	LS	1.00	314,412.00	314,412
	G1010 - Site Clearing				930,412
G1070	Site Earthwork				
2784	BP 31A - Recommended amount - rock excavation	LS	1.00	7,916,599.00	7,916,599
2785	BP 31A - Recommended amount - fill and borrow (Phase 1)	LS	1.00	393,776.00	393,776
2850	BP 31A - Recommended amount - fill and borrow (Phase 2)	LS	1.00	212,312.00	212,312
2786	BP 31A - Recommended amount - erosion & sediment control (Phase 2)	LS	1.00	138,000.00	138,000
2851	BP 31A - Recommended amount - erosion & sediment control (Phase 3)	LS	1.00	100,918.00	100,918
2787	BP 31A - Recommended amount - excavation and backfill	LS	1.00	2,100,187.00	2,100,187
2852	BP 31A - Recommended amount - excavation and backfill (site improvements)	LS	1.00	640,000.00	640,000
666	Excavate to proposed level	CY	59,189.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
667	Excavate to proposed level, rock excavation including survey, drilling, stockpile, striping, etc.	CY	162,710.00		Incl.
1813	Miscellaneous trenching, etc.	CY	14,666.00		Incl.
668	Fill to proposed level using excavated materials	CY	108,316.00		Incl.
1697	Remove excess materials from site	CY	96,724.00		Incl.
2568	Striping including spoil removal (Phase 1)	CY	10,000.00		Incl.
2569	Strip and stockpile for re-use (Phase 2)	CY	7,600.00		Incl.
669	Allowance for fine grading	SF	1,451,369.00		Incl.
673	Inlet protection	EA	143.00		Incl.
674	Construction entrance	EA	3.00		Incl.
675	Haybale and silt fencing including maintenance	LF	10,585.00		Incl.
1828	Erosion control blankets and mats	LS	1.00		Incl.
1829	Additional erosion control maintenance and removal	LS	1.00		Incl.
733	Excavate for roadway paving	CY	3,758.00		Incl.
1482	Remove spoils from site (roadway)	CY	3,758.00		Incl.
738	Excavate for parking lot paving	CY	11,646.00		Incl.
1476	Remove spoils from site (parking lot paving)	CY	11,646.00		Incl.
743	Excavate for walkways paving	CY	2,758.40		Incl.
1518	Remove spoils from site (walkways paving)	CY	2,758.40		Incl.
755	Excavate athletic fields	CY	4,890.70		Incl.
1826	Remove spoils from site (athletic fields)	CY	4,890.70		Incl.
1814	Allowance for rock scaling	LS	1.00		Incl.
2618	Raise dropped footing to within 5' depth	LS	1.00		Incl.
G1070 - Site Earthwork					11,501,792
G2010	Roadways				
2788	BP 31A - Recommended amount - rip rap slopes	LS	1.00	245,025.00	245,025
2789	BP 31A - Recommended amount - bituminous bedding	LS	1.00	236,077.00	236,077
734	Prepare and compact subbase	SF	96,239.00		Incl.
736	Granular fill, 12" thick, re-use excavated materials	CY	3,565.00		Incl.
1483	Imported compacted gravel borrow	CY	2,377.00		Excl.
1484	Imported dense grade crushed stone	CY	1,189.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
258	Riprap swale (re-use existing or blasted materials)	SF	62,683.00		Incl.
	G2010 - Roadways				481,102
G2020	Parking Lots				
740	Prepare and compact subbase	SF	244,704.00		Incl.
742	Granular fill, re-use excavated materials	CY	9,064.00		Incl.
1480	Imported compacted gravel borrow	CY	6,141.00		Excl.
1481	Imported dense grade crushed stone	CY	2,923.00		Excl.
	G2020 - Parking Lots				0
G2030	Pedestrian Plazas and Walkways				
2791	BP 31A - Recommended amount - bituminous bedding	LS	1.00	64,878.00	64,878
745	Prepare and compact subbase	SF	76,453.10		Incl.
746	Granular fill, re-use excavated materials	CY	1,939.20		Incl.
1519	Imported compacted gravel borrow	CY	1,188.20		Excl.
1520	Imported dense grade crushed stone	CY	599.00		Excl.
	G2030 - Pedestrian Plazas and Walkways				64,878
G2050	Athletic, Recreational, and Playfield Areas				
2794	BP 31A - Recommended amount - athletic fields subbase	LS	1.00	650,000.00	650,000
757	Prepare and compact subbase	SF	135,609.00		Incl.
758	Granular base to athletic fields, re-use excavated materials	CY	2,511.30		Incl.
1573	Imported compacted gravel borrow	CY	66.50		Incl.
1574	Imported dense grade crushed stone	CY	2,445.30		Incl.
	G2050 - Athletic, Recreational, and Playfield Areas				650,000
G2060	Site Development				
2796	BP 31A - Recommended amount - retaining wall stone base	LS	1.00	50,750.00	50,750
	G2060 - Site Development				50,750

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
G4010	Site Electric Distribution Systems				
1836	BP 31A - Recommended amount - ductbanks excavation and concrete encasement	LS	1.00	868,215.00	868,215
	G4010 - Site Electric Distribution Systems				868,215
	31 - EARTHWORK				14,547,149
32	EXTERIOR IMPROVEMENTS				
G2010	Roadways				
2793	BP 31A - Recommended amount - bituminous paving	LS	1.00	959,080.00	959,080
2790	BP 31A - Recommended amount - curbs	LS	1.00	642,579.00	642,579
247	Vehicular asphalt paving, 4" overall thickness	SY	10,694.00		Incl.
248	Vertical granite curb	LF	6,479.00		Incl.
828	Cape cod berm	LF	851.00		Incl.
737	Pavement markings	SF	96,239.00		Incl.
	G2010 - Roadways				1,601,659
G2020	Parking Lots				
253	Asphalt paving, 4" overall thickness	SY	26,303.00		Incl.
255	Vertical granite curb	LF	4,359.00		Incl.
671	Cape cod berm	LF	5,174.00		Incl.
262	Accessible pavement markings	SF	5,025.00	3.20	16,003
263	Crosswalk markings	SF	1,282.00	3.20	4,083
265	EV pavement markings	EA	10.00	579.00	5,790
266	Electric vehicle charging station (refer to Site Electrical)	EA	5.00		Incl.
261	Green vehicle pavement markings	EA	22.00	820.20	18,045
257	Handicap vehicle pavement markings	EA	19.00	627.30	11,918
357	Parking line marking	LF	8,476.00	5.50	46,622
	G2020 - Parking Lots				102,461
G2030	Pedestrian Plazas and Walkways				
2792	BP 31A - Recommended amount - bituminous paving	LS	1.00	146,340.00	146,340
256	Asphalt walkway pavement	SY	5,389.00		Incl.
367	Detectable warning	SF	377.00	43.40	16,371
	G2030 - Pedestrian Plazas and Walkways				162,711

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
G2050	Athletic, Recreational, and Playfield Areas				
2567	Repair existing irrigation affected by infiltration construction	SF	80,549.20	1.00	77,730
389	Natural grass to Football Court/Field	SF	78,287.50	3.90	302,190
2396	Irrigation to Football Court/Field natural grass turf	SF	78,287.50	1.40	113,321
405	Urethane resilient track surfacing (D-Zone)	SF	21,811.00	24.10	526,191
404	Urethane resilient track surfacing on asphalt (6-Lane Track)	SF	31,943.00	24.10	770,626
693	6'-0" High BVC chainlink fence	LF	413.10	91.70	37,870
397	4'-0" High BVC chainlink fence	LF	1,505.20	57.90	87,151
398	4'-0" High BVC chainlink fence single leaf gate	EA	3.00	337.70	1,013
694	4'-0" High BVC chainlink fence double leaf gate	EA	2.00	675.50	1,351
406	Trench drain	LF	1,307.00	96.50	126,125
396	Electronic scoreboard - steel posts with concrete footing	EA	1.00	7,720.00	7,720
418	Long jump runway	SF	1,908.00		Incl.
419	Long jump pit	SF	755.00	62.70	47,357
420	Shotput throwing pad and landing sector	SF	200.00		Incl.
690	Asphalt pad	SY	46.00	57.90	2,663
695	Pole vault runway	SF	633.00		Incl.
701	Outdoor fitness equipment - by Owner	EA	5.00		Excl.
	G2050 - Athletic, Recreational, and Playfield Areas				2,101,308
G2060	Site Development				
2795	BP 31A - Recommended amount - segmental retaining wall	LS	1.00	172,200.00	172,200
259	Steel guardrail along access ways	LF	4,302.00	67.50	290,600
260	Segmented retaining wall	LF	495.00		Incl.
289	Dumpster - by Owner	EA	2.00		Excl.
377	8'-0" High chain link double leaf gate	Pair	6.00	916.70	5,500
378	8'-0" High BVC chainlink fence	LF	116.00	115.80	13,433
2416	6'-0" High BVC chainlink fence	LF	35.00	91.70	3,209
2417	6'-0" High chain link double leaf gate	Pair	1.00	868.00	868
2420	4'-0" High chainlink fence at top of rock face cut	LF	760.00	72.40	55,005

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2759	8'-0" High horizontal wood slat fence	LF	177.00	144.80	25,621
381	Wood deck	SF	401.00		Excl.
399	Pre-engineered elevated boardwalk ramping system	SF	8,731.70	115.80	1,011,132
1575	Pre-engineered stairs	SF	424.40	154.40	65,527
1584	Backless straight inline bench, 23.5" x 87.5" L	EA	5.00		Excl.
1585	Backed straight inline bench, 23.5" x 87.5" L	EA	3.00		Excl.
2414	Sliding vehicular metal gate, 46' L x 3' Ht.	EA	1.00	24,125.00	24,125
2415	Swing vehicular swing gate, 22' long	EA	2.00	4,825.00	9,650
2754	Swing vehicular swing gate, 26' long	EA	1.00	5,790.00	5,790
2755	Allowance for free-standing wildlife barrier	LF	692.00	28.90	20,033
G2060 - Site Development					1,702,693
G2080	Landscaping				
789	Imported planting mix	CY	5,181.40	57.90	300,003
2542	Use stockpile material	CY	5,181.40		Excl.
2809	Additional planting materials per reconciliation	CY	18,961.00	57.90	1,097,844
407	Low mow lawn	SF	310,127.50	0.50	149,637
1646	Restoration seed mix	SF	36,418.00	0.40	14,057
791	Lawn irrigation system - not required	SF	310,127.50		Excl.
2760	Reclaim granite seat block/tailings, various weights (per section 323000)	EA	20.00	1,447.50	28,950
2761	On-site salvage landscape boulder	EA	30.00	6,272.50	188,175
2401	Seeding lawn prospect athletic fields	SF	199,762.90	1.00	192,771
1595	Trees	Note			
1596	October glory red maple, 3.0-3.5" Cal.	EA	3.00	1,158.00	3,474
1597	Red maple, 1" Cal.	EA	7.00	675.40	4,728
1598	Dawn redwood, 3" Cal.	EA	6.00	1,158.00	6,948
1599	White oak, 1.5" Cal.	EA	8.00	675.50	5,404
1600	Burr oak, 2-2.5" Cal.	EA	9.00	965.00	8,685
1601	Deciduous Trees	Note			
1602	Redpointe maple, 2.5-3" Cal.	EA	7.00	965.00	6,755
1603	Sugar maple, 2.5" Cal.	EA	3.00	965.00	2,895
1604	Clump paper birch, 7-8' Ht.	EA	7.00	772.00	5,404

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1605	Dura heat river birch, 6-7' Ht.	EA	2.00		Excl.
1606	Heritage birch, 10-12' Ht.	EA	6.00	1,158.00	6,948
1607	Whitespire birch, 12-14' Ht.	EA	6.00	1,158.00	6,948
1608	Renaissance upright paper birch, 10-12' Ht.	EA	9.00	1,158.00	10,422
1609	American beech, 2-2.5" Cal.	EA	5.00	965.00	4,825
1610	Black gum, 2.5" Cal.	EA	8.00	965.00	7,720
1611	Swamp white oak, 3" Cal.	EA	4.00	1,158.00	4,632
1612	Red oak, 2.5-3" Cal.	EA	12.00	965.00	11,580
1613	American elm, 2.5-3" Cal.	EA	17.00	965.00	16,405
1614	Evergreen Trees	Note			
1615	Eastern red cedar, 7-8' Ht.	EA	7.00	772.00	5,404
1616	Pitch pine, 6-7' Ht.	EA	7.00	772.00	5,404
1617	White pine, 8-10' Ht.	EA	15.00	772.00	11,580
1618	White pine, 5-6' Ht.	EA	6.00	482.50	2,895
1619	Ornamental Trees	Note			
1620	Downy serviceberry, 4.5-5' Ht.	EA	6.00		Excl.
1621	"Autumn Brilliance" serviceberry, 7-8' Ht.	EA	17.00	772.00	13,124
1622	Donald wyman crabapple, 2-2.5" Cal.	EA	6.00	965.00	5,790
2705	Autumn flowering cherry, 3" Cal.	EA	1.00	1,158.00	1,158
1623	Ground Covers	Note			
1624	Pennsylvania sedge, plugs	EA	2,592.00	9.70	25,013
1625	Shrubs	Note			
1626	Gro-low fragrant sumac, 1 Gal.	EA	202.00	19.30	3,899
2425	Invasive Species Management and/or Buffer Zone Planting	Note			
2426	Red maple, 3-4' Ht.	EA	17.00	434.20	7,382
2427	Yellow birch, 3-4' Ht.	EA	4.00		Excl.
2428	Winterberry, 3-4' Ht.	EA	6.00		Excl.
2429	Common spicebush, 3-4' Ht.	EA	6.00		Excl.
2430	Sweet pepperbush, 3-4' Ht.	EA	8.00		Excl.
2431	Cinnamon fern, 1#	EA	20.00		Excl.
2432	Skunk cabbage, 1#	EA	20.00		Excl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2433	Tussock sedge, 2" plug	EA	40.00		Excl.
2434	Soft rush, 2" plug	EA	20.00		Excl.
2435	Cardinal flower, 2" plug	EA	20.00		Excl.
2436	White wood aster, 2" plug	EA	20.00		Excl.
2437	Great blue lobelia, 2" plug	EA	20.00		Excl.
2439	Red oak, 3-4' Ht.	EA	12.00	434.30	5,211
2440	Pignut hickory, 3-4' Ht.	EA	4.00		Excl.
2441	Eastern white pine, 3-4' Ht.	EA	4.00		Excl.
2442	Witch hazel, 3-4' Ht.	EA	8.00	434.30	3,474
2443	Sassafras, 3-4' Ht.	EA	5.00		Excl.
2444	Nannyberry, 3-4' Ht.	EA	5.00		Excl.
2707	Speckled alder, 3-4' Ht.	EA	8.00	434.30	3,474
2708	Serviceberry, 3-4' Ht.	EA	5.00	434.20	2,171
2709	Northern arrowwood, 3-4' Ht.	EA	8.00	434.30	3,474
2710	Red-Osler dogwood, 3-4' Ht.	EA	5.00	434.20	2,171
2711	Black chokeberry, 3-4' Ht.	EA	5.00	434.20	2,171
2712	Highbush blueberry, 3-4' Ht.	EA	21.00	434.20	9,119
2713	White oak, 3-4' Ht.	EA	9.00	434.20	3,908
2714	Sugar maple, 3-4' Ht.	EA	7.00	434.30	3,040
2715	Nannyberry, 3-4' Ht.	EA	15.00	434.30	6,514
2716	Maple leaf viburnum, 3-4' Ht.	EA	11.00	434.30	4,777
2717	Common with hazel, #2	EA	44.00	434.30	19,107
2718	White pine, 2' Ht.	EA	33.00	434.20	14,330
2719	White oak, 0.75" Cal.	EA	11.00	434.30	4,777
2720	Red oak, 1" Cal.	EA	21.00	434.20	9,119
2721	Highbush blueberry, #2	EA	37.00	434.20	16,067
G2080 - Landscaping					2,279,763

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
G9010	Other Site Construction				
167	Farm street driveway intersection improvement including paving milling and overall, granite curbs, traffic signal, etc.	LS	1.00		Excl.
	G9010 - Other Site Construction				Excl.
	32 - EXTERIOR IMPROVEMENTS				7,950,595
33	UTILITIES				
G3010	Water Utilities				
2797	BP 31A - Recommended amount	LS	1.00	761,310.00	761,310
1967	Connect proposed water main to existing 1/2" water line	EA	1.00		Incl.
1375	Connect to existing water line on old Nahant road - allow 100ft	EA	1.00		Incl.
1386	Remove existing fitting and connect to main existing	EA	1.00		Incl.
1383	Connection to building	EA	2.00		Incl.
1374	8", Ductile iron pipe	LF	6,155.00		Incl.
1381	6", Ductile iron pipe	LF	403.01		Incl.
1951	6", bend	EA	3.00		Incl.
1950	8", bend	EA	52.00		Incl.
1953	Tee 8"x8"x6"	EA	12.00		Incl.
1954	Tee 8"x8"x8"	EA	5.00		Incl.
1962	Reducer 8"x4"	EA	1.00		Incl.
1376	8", Water valve	EA	42.00		Incl.
1379	6", Water valve	EA	13.00		Incl.
1385	4", Water valve	EA	1.00		Incl.
1378	6", Hydrant	EA	12.00		Incl.
1377	Trust block	EA	73.00		Incl.
1448	Cleaning, testing, trace wiring etc.	LF	6,557.68		Incl.
569	Excavation and backfill (with site preparation)	LF	6,557.68		Incl.
	G3010 - Water Utilities				761,310
G3020	Sanitary Sewerage Utilities				
2798	BP 31A - Recommended amount	LS	1.00	567,025.00	567,025
1391	Connection to building sanitary service	EA	22.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1388	SMH, Sanitary manhole	EA	30.00		Incl.
1941	6",sanitary sewer, cast iron	LF	183.80		Incl.
1387	6",sanitary sewer, PVC	LF	1,110.90		Incl.
1943	4",sanitary sewer, PVC	LF	253.50		Incl.
1392	6",sanitary sewer, PVC	LF	427.40		Incl.
1949	8",sanitary sewer, PVC	LF	2,960.00		Incl.
1393	Thrust block	EA	2.00		Incl.
1964	Replace existing sewer manhole with drop sewer manhole and connect to existing sewer line	EA	1.00		Incl.
2318	Cleaning, testing, trace wiring etc.	LF	4,934.30		Incl.
1963	Clean and line existing 1550 LF of 8" sewer main	LF	1,550.00		Excl.
577	Excavation and backfill (with site preparation)	LF	4,934.30		Incl.
2184	Exterior grease trap(serving kitchen waste), 10,000 gal(allowance)	EA	1.00		Incl.
2570	Exterior grease trap(serving kitchen waste), 1000 gal (allowance)	EA	1.00		Incl.
2589	6",sanitary sewer, PVC, forcemain	LF	-480.00		Incl.
2590	Excavation and backfill	LF	-480.00		Incl.
G3020 - Sanitary Sewerage Utilities					567,025
G3030	Storm Drainage Utilities				
2799	BP 31A - Recommended amount - drainage piping	LS	1.00	984,395.00	984,395
2800	BP 31A - Recommended amount - drainage structure	LS	1.00	907,600.00	907,600
2801	BP 31A - Recommended amount - groundwater maintenance system	LS	1.00	100,000.00	100,000
2802	BP 31A - Recommended amount - subsurface detention system	LS	1.00	1,379,344.00	1,379,344
1862	6", PVC underdrain	LF	454.00		Incl.
1863	8", PVC underdrain	LF	63.00		Incl.
1879	8", PVC	LF	32.00		Incl.
1858	4", HDPE underdrain for subsurface system 1 to 5	LF	324.00		Incl.
1433	6", HDPE underdrain for subsurface system 1 to 5	LF	916.00		Incl.
1910	12", perforated CPP, Corrugated HDPE storm drain pipe	LF	468.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1411	6", HDPE storm drain pipe	LF	261.00		Incl.
1909	6", CPP, Underdrain, Corrugated HDPE storm drain pipe	LF	728.00		Incl.
1861	6", CPP, Corrugated HDPE storm drain pipe	LF	157.00		Incl.
1864	8", CPP, Corrugated HDPE storm drain pipe	LF	160.00		Incl.
1409	10", CPP, Corrugated HDPE storm drain pipe	LF	187.00		Incl.
1400	12", CPP, Corrugated HDPE storm drain pipe	LF	8,462.70		Incl.
1403	15", CCP, Corrugated HDPE storm drain pipe	LF	298.00		Incl.
1405	18", CCP, Corrugated HDPE storm drain pipe	LF	1,165.00		Incl.
1406	24", CCP, Corrugated HDPE storm drain pipe	LF	1,240.00		Incl.
1412	Area drain	EA	16.00		Incl.
1413	Catch basins	EA	76.00		Incl.
1414	Curb inlet	EA	5.00		Incl.
1431	12", clean out	EA	1.00		Incl.
1415	DMH - Drain manhole - 4'	EA	67.00		Incl.
1416	DMH - Drain manhole - 5'	EA	11.00		Incl.
1417	DMH - Drain manhole - 6'	EA	2.00		Incl.
1422	Remove and replace existing DMH	EA	1.00		Incl.
1419	FES - Flared End Section	EA	2.00		Incl.
1420	Headwall	EA	3.00		Incl.
1421	OCS, Outlet control structure	EA	5.00		Incl.
1423	WQS, Water quality structure	EA	19.00		Incl.
1425	Trench drain	LF	152.00		Incl.
1424	Connection to building	EA	17.00		Incl.
1426	Connect to existing CB and convert the existing CB to DMH	EA	1.00		Incl.
1427	Connect to existing manhole	EA	2.00		Incl.
1432	Precast concrete culvert - assumed 20'x3'	LF	40.00		Incl.
1434	Subsurface#1 - 210 MC-3500 c/w 14 c/w manifold	EA	1.00		Incl.
1435	Subsurface#2 - 279 MC-3500 c/w manifold	EA	1.00		Incl.
1436	Subsurface#3 - 238 MC-3500 c/w manifold	EA	1.00		Incl.
1437	Subsurface#4 - 104 SC-740 c/w manifold	EA	1.00		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

BD Base Design

B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1438	Subsurface#5 - 16 SC-740 c/w outlet manifold	EA	1.00		Incl.
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		Incl.
1774	Allowances for non-woven geotextile	LS	1.00		Incl.
602	Excavation and backfill (refer to site preparation)	LF	14,907.70		Incl.
1773	Excavation and backfill for subsurface system	CY	14,450.00		Incl.
2319	Cleaning, testing, trace wiring etc.	LF	14,907.70		Incl.
611	Bioretention basin including piping, bedding, planting mix, excavation, etc.	SF	3,848.00		Incl.
681	Allowance for temporary retention basin including piping, etc.	LS	1.00		Incl.
G3030 - Storm Drainage Utilities					3,371,339
G3050	Site Energy Distribution				
1958	Proposed gas meter - install only - supply by others	EA	1.00		Incl.
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		Incl.
1966	Connect to the main service	EA	1.00		Incl.
1965	Excavation and backfill (with site preparation)	LF	1,511.00		Incl.
G3050 - Site Energy Distribution					0
G3090	Liquid and Gas Site Utilities Supplementary Components				
793	Allowance for miscellaneous site utilities not yet designed	LS	1.00		Excl.

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



B Sitework (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1798	General requirements: supervision, shop drawings, as -built drawings, equipment rentals, fees, permits, etc.	Item			Incl.
	G3090 - Liquid and Gas Site Utilities Supplementary Components				0
	33 - UTILITIES				4,699,674
SITework					35,149,711

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD Base Design

C Demolition & Abatement

Rates Current At May 2023

Ref	Description	Total Cost USD
02	Existing Conditions	5,136,093
DEMOLITION & ABATEMENT		5,136,093

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

BD Base Design

C Demolition & Abatement

Rates Current At May 2023

Ref	Description	Total Cost USD
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	77,041
	Escalation Allowance up to mid-point of Construction (3/2025)	156,394
	Sub-contractor Bonds	64,434
	Insurance - CCIP (Change from GL)	174,274
	Cost of Traditional Insurance (Trade + GL) - Savings	Incl.
	Builder's Risk Insurance (per CM Pricing Exhibit 1)	9,312
	Payment & Performance Bond (per CM Pricing Exhibit 1)	47,182
	General Conditions (per CM Pricing Exhibit 1)	246,974
	Field Office Support	43,194
	General Requirements (per CM Pricing Exhibit 1)	128,341
	Allowance for Additional Requirements not included in CM Pricing Exhibit 1	21,670
	CM Construction Contingency (per CM Pricing Exhibit 1)	137,261
	CM Fee (per CM Pricing Exhibit 1)	107,206
ESTIMATED TOTAL COST		6,349,376

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



C Demolition & Abatement

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
02	EXISTING CONDITIONS				
F2010	Hazardous Materials Remediation				
552	Allowance for hazardous materials abatement	LS	1.00	2,300,000.00	2,300,000
	F2010 - Hazardous Materials Remediation				2,300,000
F3010	Structure Demolition				
553	Demolish existing school building	SF	239,144.00	11.60	2,769,288
554	Demolish miscellaneous support/outbuildings	SF	5,769.00	11.60	66,805
	F3010 - Structure Demolition				2,836,093
	02 - EXISTING CONDITIONS				5,136,093
DEMOLITION & ABATEMENT					5,136,093

6C.2.3 – 04

ALTERNATES

**COST ESTIMATE
DESIGNER**

90% CONSTRUCTION DOCUMENTS COST ESTIMATE – ALTERNATES

19 MAY 2023

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL

WAKEFIELD, MA



Bid/GMP Date: November 2023
Project Number: DRA No. 20202
MSBA ID: 2017-085-30605

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



Ref	Location	Total Cost USD
ALT90	Alternate - 90% Construction Documents	
A2	Add Locker/Athletic Support Building	3,361,548
A72	Additional Seating Capacity (add 500 seats)	344,819
A4	Add Concessions/Toilet Building	1,436,510
A64	Add Irrigated Softball Field	810,462
A65	Add Irrigated Softball/Multi-Purpose Field	1,184,585
A73	Add Maintenance Building	2,386,751

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION SUMMARY

GFAR: Gross Floor Area
Rates Current At May 2023

Ref	Location	G FAR SF	G FAR USD/SF	Total Cost USD
ALT90	Alternate - 90% Construction Documents			
A2	Add Locker/Athletic Support Building	6,060.00	501.49	3,039,004
	ALT90 - Alternate - 90% Construction Documents	6,060.0	501.49	3,039,004
ESTIMATED NET COST		6,060	501.49	3,039,004
MARGINS & ADJUSTMENTS				
Design & Estimating Contingency		1.5 %		45,585
Escalation Allowance up to mid-point of Construction (3/2025)		3 %		92,538
Sub-contractor Bonds		1.2 %		38,126
CM Construction Contingency (per CM Pricing Exhibit 1)		2.5 %		80,381
CM Fee				65,914
ESTIMATED TOTAL COST		6,060	554.71	3,361,548

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
03	Concrete	89.47	542,205
04	Masonry	79.81	483,660
05	Metals	16.36	99,164
06	Wood, Plastics, and Composites	6.94	42,076
07	Thermal and Moisture Protection	60.00	363,591
08	Openings	34.63	209,829
09	Finishings	34.56	209,463
10	Specialties	43.80	265,418
14	Conveying Equipment	30.40	184,224
22	Plumbing	35.42	214,661
23	Heating, Ventilating, and Air Conditioning	49.86	302,131
26	Electrical	31.26	189,416
27	Communications	9.59	58,118
28	Electronic Safety and Security	9.47	57,364
31	Earthwork	23.93	145,000
32	Exterior Improvements	-54.01	-327,316
33	Utilities		Incl.
ADD LOCKER/ATHLETIC SUPPORT BUILDING		501.49	3,039,004

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



A2 Add Locker/Athletic Support Building

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

90% Construction Documents Cost Estimate - Revision 2
BOS20013-503

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
03	CONCRETE				
A1010	Standard Foundations				
996	Concrete to isolated spread footings, 4500 PSI	CY	26.67	313.60	8,365
529	Concrete to perimeter strip footings - 1' thick, 4500 PSI	CY	5.86	313.70	1,838
586	Concrete to perimeter strip footings - 2' thick, 4500 PSI	CY	135.00	313.60	42,339
1000	Concrete to interior strip footings, 4500 PSI	CY	4.32	313.70	1,355
588	Concrete to elevator mat footings - 3' thick, 4500 PSI	CY	17.70	313.60	5,551
1117	Concrete to piers, 4500 PSI	CY	1.60	313.80	502
521	Form isolated spread footings	SF	504.05	19.30	9,728
530	Form strip footings	SF	928.29	19.30	17,916
589	Form elevator mat footings	SF	151.90	19.30	2,932
1118	Form piers	SF	112.28	24.10	2,709
522	Bar reinforcement to isolated spread footings	Lb	2,168.93	1.70	3,767
587	Bar reinforcement to strip footings, allow 100 PCY	Lb	14,480.73	1.70	25,153
590	Bar reinforcement to elevator mat footings	Lb	2,193.70	1.70	3,811
1119	Bar reinforcement to piers, allow	Lb	561.27	1.70	975
A1010 - Standard Foundations				20.95/SF	126,941
A2010	Walls for Subgrade Enclosures				
598	Concrete to perimeter frost walls, 4500 PSI	CY	23.34	313.60	7,320
1122	Concrete to interior foundation walls, 4500 PSI	CY	7.25	313.70	2,274
615	Concrete to elevator pit walls, 4500 PSI	CY	6.20	313.50	1,944
658	Concrete to retaining walls, 4500 PSI	CY	187.00	313.60	58,648
605	Form perimeter frost walls	SF	943.76	24.10	22,768
1123	Form interior foundation walls	SF	543.59	24.10	13,114
616	Form elevator pit walls	SF	320.20	24.10	7,725
659	Form retaining walls	SF	5,047.00	24.10	121,758
608	Bar reinforcement to perimeter frost walls	Lb	1,509.98	1.70	2,623
1124	Bar reinforcement to interior foundation walls	Lb	1,614.72	1.70	2,804
613	Bar reinforcement to elevator pit walls	Lb	1,610.10	1.70	2,797
660	Bar reinforcement to retaining walls	Lb	26,018.00	1.70	45,193

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
618	Rigid insulation - 2" thick	SF	3,630.90	4.30	15,767
	A2010 - Walls for Subgrade Enclosures			50.29/SF	304,735
A4010	Standard Slabs-on-Grade				
501	Concrete to slab on grade - 6" thick, 4500 PSI	CY	54.45	313.60	17,077
502	Form slab on grade	SF	140.00	17.40	2,432
2585	Fiber reinforcement to slab on grade	CY	54.39	57.90	3,149
698	Allowance for bar reinforcement	Lb	1,468.13	1.70	2,550
504	Float finish to slab on grade	SF	2,936.16	1.40	4,250
505	Control joints	SF	2,936.16	0.80	2,267
707	Mechanical pads	Item			14,475
710	Engineering, layout, safety, cleaning, etc.	Item			7,238
	A4010 - Standard Slabs-on-Grade			8.82/SF	53,438
B1010	Floor Construction				
538	Light weight concrete topping, overall 5-1/4" thick, 4500 PSI	CY	44.80	434.20	19,454
539	WWF reinforcement to floor deck	SF	2,761.20	1.30	3,464
540	Float finish to concrete topping	SF	2,761.20	2.90	7,994
	B1010 - Floor Construction			5.10/SF	30,912
G2030	Pedestrian Plazas and Walkways				
362	Concrete walkway paving	SF	1,689.90	12.50	21,200
2829	Concrete stairs	SF	129.00	38.60	4,979
	G2030 - Pedestrian Plazas and Walkways			4.32/SF	26,179
	03 - CONCRETE			89.47/SF	542,205
04	MASONRY				
B2010	Exterior Walls				
29	4" Thick Split face CMU Veneer	SF	3,994.01	38.60	154,168
72	8" Thick CMU back-up	SF	3,994.12	33.80	134,900
	B2010 - Exterior Walls			47.70/SF	289,068
C1010	Interior Partitions				
1561	CMU partition, 4" thick (Type 4.0)	SF	657.80	24.10	15,869
267	CMU partition, 8" thick (Type 8.0)	SF	6,165.49	27.00	166,591

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90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2839	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Masonry Trade)	SF	6,286.00	1.90	12,132
	C1010 - Interior Partitions			32.11/SF	194,592
	04 - MASONRY			79.81/SF	483,660
05	METALS				
B1010	Floor Construction				
535	Galvanized composite metal floor deck - 2" deep, 20 GA	SF	2,761.20	5.80	15,987
537	Structural steel framing, including beams, columns, bracing	T	7.7150	5,211.00	40,203
542	Allowance for miscellaneous connections and framings	T	0.7720	5,211.10	4,023
720	Allowance for shear studs	EA	434.10	6.30	2,723
722	Allowance for pour stops and bent plates	LF	283.00	24.10	6,827
	B1010 - Floor Construction			11.51/SF	69,763
B1020	Roof Construction				
546	Galvanized corrugated roof deck - 3" deep, type N	SF	3,640.50	6.80	24,592
547	Structural steel framing, including beams, columns, bracing	T	16.5790	5,211.00	86,393
567	Moment connection	EA	12.00	723.80	8,685
551	Allowance for miscellaneous connections and framings	T	1.6580	5,211.10	8,640
	B1020 - Roof Construction			21.17/SF	128,310
B1080	Stairs				
299	Wire mesh guardrail	LF	32.60		Incl.
759	Metal handrail	LF	28.10		Incl.
1136	Metal stairs with concrete filled pans and landing - 4'-3" wide	FT/R	15.00	2,750.30	41,254
	B1080 - Stairs			6.81/SF	41,254
C1090	Interior Specialties				
754	Allowance for elevator pit ladder, cover, etc	EA	1.00	4,825.00	4,825
2835	Allowance for miscellaneous metals	SF	6,286.00	4.80	30,330
	C1090 - Interior Specialties			5.80/SF	35,155
G2060	Site Development				
2753	Boardwalk guardrail comprising of welded wiremesh and steel post and framing	LF	-718.50	337.80	-242,675

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90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2830	Locker ramp handrails	LF	349.00	193.00	67,357
	G2060 - Site Development			-28.93/SF	-175,318
	05 - METALS			16.36/SF	99,164
06	WOOD, PLASTICS, AND COMPOSITES				
C1090	Interior Specialties				
2838	Allowance for rough carpentry	SF	6,286.00	1.90	12,132
2837	Allowance for wood blocking	SF	6,286.00	2.70	16,985
2836	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade)	SF	6,286.00	1.40	9,099
	C1090 - Interior Specialties			6.31/SF	38,216
E1090	Other Equipment				
1698	Locker bench, 10" deep	LF	32.00	120.60	3,860
	E1090 - Other Equipment			0.64/SF	3,860
	06 - WOOD, PLASTICS, AND COMPOSITES			6.94/SF	42,076
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	3,159.10	14.50	45,728
617	Dampproofing to frost wall	SF	471.91	5.80	2,732
	A2010 - Walls for Subgrade Enclosures			8.00/SF	48,460
A4010	Standard Slabs-on-Grade				
506	Air and vapor barrier	SF	2,936.16	0.90	2,550
	A4010 - Standard Slabs-on-Grade			0.42/SF	2,550
A4090	Slab-on-Grade Supplementary Components				
507	Rigid insulation - 2" thick	SF	527.97	4.30	2,293
	A4090 - Slab-on-Grade Supplementary Components			0.38/SF	2,293
B1010	Floor Construction				
543	Allowance for spray applied fireproofing (members only)	SF	2,761.20	3.70	10,126
	B1010 - Floor Construction			1.67/SF	10,126
B1020	Roof Construction				
719	Allowance for spray applied fireproofing (members only)	SF	3,640.50	3.70	13,350
	B1020 - Roof Construction			2.20/SF	13,350

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LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
B2010	Exterior Walls				
2544	3" Thick rigid insulation	SF	3,994.08	6.80	26,980
2545	Fluid applied air and vapor barrier	SF	3,993.99	6.30	25,052
190	Allowance for miscellaneous sealing and caulking	SF	5,275.00	1.90	10,181
	B2010 - Exterior Walls			10.27/SF	62,213
B3010	Roofing				
199	Locker Building roof assembly, assumes PVC membrane roofing	SF	3,041.00	28.90	88,036
1477	Locker Building roof assembly, assumes metal roofing	SF	464.00	29.00	13,433
349	Extensive green roof	SF	2,042.80	57.90	118,277
	B3010 - Roofing			36.26/SF	219,746
C1010	Interior Partitions				
488	Allowance for miscellaneous sealing and caulking	SF	6,286.00	0.50	3,033
489	Allowance for miscellaneous fire stopping	SF	6,286.00	0.30	1,820
	C1010 - Interior Partitions			0.80/SF	4,853
	07 - THERMAL AND MOISTURE PROTECTION			60.00/SF	363,591
08	OPENINGS				
B2020	Exterior Windows				
48	Aluminum curtain wall system, with insulating glass	SF	252.40	149.60	37,753
49	Aluminum storefront system, with insulating glass	SF	1,028.70	120.60	124,086
	B2020 - Exterior Windows			26.71/SF	161,839
B2050	Exterior Doors and Grilles				
236	10'-0" x 10'-0" Motor operated overhead door with insulating panels	EA	2.00	9,650.00	19,300
120	3'-0" x 7'-0" Single leaf aluminum glazed door, including frame, finish, and hardware	EA	1.00	3,571.00	3,571
134	3'-0" x 7'-0" Single leaf hollow metal door, including frame, finish, and hardware	EA	2.00	1,303.00	2,606
1231	3'-2" x 7'-10" Single leaf aluminum glazed door, including frame, finish, and hardware	EA	1.00	6,755.00	6,755
97	2@ 3'-0" x 7'-0" Double leaf aluminum glazed door, including frame, finish, and hardware	Pair	1.00		Excl.
	B2050 - Exterior Doors and Grilles			5.32/SF	32,232

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ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
C1030	Interior Doors				
102	3'-0"x7'-0" Single leaf hollow metal doors, including frame, finish and hardware	EA	1.00	1,515.00	1,515
106	3'-0"x7'-0" Single leaf wooden doors, including frame, finish and hardware	EA	8.00	1,780.40	14,243
	C1030 - Interior Doors			2.60/SF	15,758
	08 - OPENINGS			34.63/SF	209,829
09	FINISHINGS				
C1010	Interior Partitions				
808	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Drywall Trade)	SF	6,286.00	0.40	2,426
	C1010 - Interior Partitions			0.40/SF	2,426
C2010	Wall Finishes				
141	Ceramic tile	SF	366.70	21.20	7,785
170	Prepare and apply epoxy paint	SF	15,239.92	3.40	51,473
841	Plastic laminate window sills	LF	86.40	72.40	6,253
	C2010 - Wall Finishes			10.81/SF	65,511
C2030	Flooring				
5	SCONC, Sealed concrete	SF	1,467.92	1.40	2,125
6	EF, Epoxy flooring and base	SF	2,617.45	14.50	37,888
10	Resilient base	LF	392.27	4.80	1,892
2831	Rubber floor tiles	SF	316.00	15.40	4,879
2832	Cleat resistant rubber tiles	SF	538.00	20.70	11,162
	C2030 - Flooring			9.56/SF	57,946
C2050	Ceiling Finishes				
37	Gypsum board ceiling	SF	3,099.40	19.30	59,818
41	Gypsum board ceiling, moisture resistant	SF	649.15	24.10	15,661
39	Paint to gypsum board ceiling	SF	3,748.48	1.40	5,426
40	Paint to exposed ceiling	SF	1,205.17	2.20	2,675
	C2050 - Ceiling Finishes			13.79/SF	83,580
	09 - FINISHINGS			34.56/SF	209,463

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A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
10	SPECIALTIES				
C1090	Interior Specialties				
287	Restroom accessories - Toilet partition, ADA	EA	3.00	1,640.70	4,922
280	Restroom accessories - Tissue paper dispenser	EA	6.00	120.70	724
281	Restroom accessories - Grab bar	EA	12.00	173.70	2,084
305	Restroom accessories - Shower grab bar	Set	5.00	434.20	2,171
282	Restroom accessories - Napkin disposal	EA	6.00	482.50	2,895
283	Restroom accessories - Robe hook	EA	6.00	96.50	579
284	Restroom accessories - Soap dispenser	EA	6.00	144.80	869
285	Restroom accessories - Shower curtain and rod	EA	5.00	193.00	965
304	Restroom accessories - Shower seat	EA	5.00	579.00	2,895
291	Restroom accessories - Framed mirror	EA	6.00	772.00	4,632
292	Restroom accessories - Towel dispenser/waste receptacle	EA	6.00	820.30	4,922
1538	Football style lockers (Locker building)	EA	184.00	1,254.50	230,827
296	Allowance for fire extinguisher and cabinets	EA	2.57	820.20	2,108
298	Allowance for exterior signage	Item			4,825
	C1090 - Interior Specialties			43.80/SF	265,418
	10 - SPECIALTIES			43.80/SF	265,418
14	CONVEYING EQUIPMENT				
D1010	Vertical Conveying Systems				
751	Traction passenger elevator, 2 stops, 3500 pounds	EA	1.00	159,224.00	159,224
752	Passenger elevator, 2 stops	EA	1.00		Excl.
2512	Elevator car allowance (per section 14150)	EA	1.00	25,000.00	25,000
	D1010 - Vertical Conveying Systems			30.40/SF	184,224
	14 - CONVEYING EQUIPMENT			30.40/SF	184,224
22	PLUMBING				
D2010	Domestic Water Distribution				
1886	Plumbing Fixtures	Note			
2073	P-1A, Water Closet - Flush Valve - Wall Mounted, accessible	EA	6.00	1,785.30	10,712
2076	P-3A, Lavatory - Rectangular - Wall Mounted 19X17	EA	6.00	1,399.30	8,396
2079	P-4, Mop Receptor	EA	1.00	1,544.00	1,544

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A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2080	P-5, Drinking Fountain - Recessed	EA	2.00	2,702.00	5,404
2082	P-6, Shower Base	EA	5.00	2,412.60	12,063
1255	Janitor sink - (Locker building)	EA	1.00		Incl.
2098	Allowance for missing/ miscellaneous plumbing fixtures (Locker building)	SF	2,515.00	1.90	4,854
447	Water Distribution and Components	Note			
2100	Connection to main(4")-(Locker building)	EA	1.00	772.00	772
2104	Plumbing fixture- hook up(domestic water)	EA	21.00	386.00	8,106
2111	4", water meter and backflow preventer assembly - Locker building (allowance)	EA	1.00	10,615.00	10,615
2130	EWB-8, Electric water heater(DSE-120), 60 kw, 150 Gal (Locker building)	EA	1.00	16,405.00	16,405
2132	HWRP, Recirculation pump	EA	1.00	2,413.00	2,413
2133	ET, Expansion tank	EA	1.00	483.00	483
2134	Mixing valve(serving water heaters)	EA	1.00	483.00	483
2140	Housekeeping pad(to be carried elsewhere in this estimate)	Note			Excl.
2141	HB, Hose bib	EA	5.00	289.60	1,448
1101	WH, Wall Hydrant - Mild Climate	EA	1.00	1,689.00	1,689
465	Domestic water piping, copper L, 1" - ag	LF	210.20	28.90	6,085
463	Domestic water piping, copper L, 3" - ag (none indicated)	LF	220.00		Excl.
1280	Domestic water piping, copper L, 4" - ag	LF	50.00	207.50	10,374
1281	Domestic water piping, copper K, 4" - bg	LF	31.00	173.70	5,385
1365	Thermal pipe insulation - 1/2" to 1" copper pipe	LF	210.20	6.30	1,318
1371	Thermal pipe insulation - 4" copper pipe	LF	80.89	24.10	1,951
2157	Water meter c/w bfp assembly- c/w service bypass hook up (4")	EA	1.00	7,238.00	7,238
2164	Electric water heater- hook up(large)	EA	1.00	724.00	724
2167	Circulating pump - hook up	EA	1.00	724.00	724
2168	Expansion tank - hook up	EA	1.00	290.00	290
2169	Mixing valve - hook up	EA	1.00	483.00	483
1373	Hookup - plumbing	EA	6.00	627.30	3,764
2175	Allowance for missing/ miscellaneous domestic water system(Locker building)	SF	6,286.00	0.50	3,033

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LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2176	Subcontractor GCs/GRs	Item			8,685
	D2010 - Domestic Water Distribution			22.35/SF	135,441
D2020	Sanitary Drainage				
2177	Connection to main	EA	2.00	724.00	1,448
2178	Plumbing fixture - hook-ups(sanitary & vent)	EA	21.00	482.50	10,133
2190	Gas/ oil separator (Locker building)	EA	1.00	7,720.00	7,720
2480	Condensate pump (assumed one per each FCU and AC units)	EA	8.00	289.50	2,316
1265	Trench drain c/w steel grate(serving Locker building)	LF	20.00	289.50	5,790
2194	FD, Floor drain	EA	5.00	434.20	2,171
2197	CO, Clean out	EA	3.00	337.70	1,013
1570	Condensate drain piping c/w fittings,supports, etc.	LF	35.00	33.80	1,182
2206	2", Sanitary piping c/w fittings - Ag	LF	60.08	38.60	2,319
2207	3", Sanitary piping c/w fittings - Ag	LF	20.04	43.40	870
2208	4", Sanitary piping c/w fittings - Ag	LF	90.71	48.20	4,376
2214	4", Sanitary piping c/w fittings - Bg	LF	28.96	48.20	1,397
2215	6", Sanitary piping c/w fittings - Bg	LF	78.58	57.90	4,550
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	85.27	43.40	3,703
1304	1-1/2" to 2", Vent piping, bg	LF	4.79	48.40	232
2237	Allowance for missing/ miscellaneous sanitary drainage system(Locker building)	SF	6,286.00	0.50	3,033
2238	Subcontractor GCs/GRs	Item			2,895
	D2020 - Sanitary Drainage			9.10/SF	55,148
D2030	Building Support Plumbing Systems				
1883	Connection to main	EA	1.00	724.00	724
2239	Elevator sump pump system(Locker building)	EA	1.00	6,273.00	6,273
2242	4" RD/OFD, Roof Drain/ Overflow drain	EA	4.00	1,158.00	4,632
2245	Clean out	EA	1.00	338.00	338
2246	4", Storm drain piping c/w fittings, supports - Ag	LF	39.60	48.30	1,911
2251	6", Storm drain piping c/w fittings, supports - Bg	LF	39.20	96.50	3,783

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A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2254	No excavation & backfill- assumed	Note			Excl.
2255	No cutting and patching assumed	Note			Excl.
2256	Elevator pit sump pump- hook up	EA	1.00	1,448.00	1,448
2260	Allowance for missing/ miscellaneous storm water drainage system(Locker building)	SF	6,286.00	0.50	3,033
2261	Subcontractor GCs/GRs	Item			1,930
	D2030 - Building Support Plumbing Systems			3.97/SF	24,072
D2060	Process Support Plumbing Systems				
2528	Allowance for locker building gas system (assumed not required)	Note			Excl.
2316	Subcontractor GCs/GRs	Item			0
	D2060 - Process Support Plumbing Systems				0
	22 - PLUMBING			35.42/SF	214,661
23	HEATING, VENTILATING, AND AIR CONDITIONING				
D3020	Heat Systems				
1847	EUH-1, Electric unit heater, 15 kW	EA	2.00	2,654.00	5,308
1866	EUH-3, Electric unit heater, 3 kW	EA	1.00	1,544.00	1,544
1867	EUH-4 & 5, Electric unit heater, 10 kW	EA	1.00	2,171.00	2,171
1868	EUH-6, Electric unit heater, 5 kW - none indicated	EA	2.00		Excl.
2643	EUH-7, Electric unit heater, 6 kW	EA	3.00	2,026.70	6,080
	D3020 - Heat Systems			2.49/SF	15,103
D3030	Cooling Systems				
1668	LG HVAC equipments consisting of DX-split units, FCU c/w condenser units, etc.	LS	1.00	50,663.00	50,663
1190	AC- 0-2 to 0-3, 0-6 to 0-8, 1-1 to 4, 1-7 to 9, 1-11 to 14, 2-1 to 6, 3-1 to 5, 4-1 to 5, CB-3 & LB-1, DX split system air conditioning unit 2 ton, 24 mbh cooling capacity c/w outdoor air-cooled condensing unit	EA	1.00		Incl.
1194	FCU, DX-cooled fan coil units 0.6 ton	EA	2.00		Incl.
1197	FCU, DX-cooled fan coil units 1 ton	EA	2.00		Incl.
1200	FCU, DX-cooled fan coil units 2 ton	EA	3.00		Incl.
1568	Refrigeration piping c/w fittings,supports, etc.	LF	200.00	43.40	8,685
1684	Allowance for refrigerant	Lb	85.00	24.10	2,051

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1713	ERV - hook ups	EA	1.00	724.00	724
1974	FCU - hook ups	EA	7.00	482.60	3,378
1975	AC units - hook ups	EA	1.00	483.00	483
2481	Allowance for missing/ miscellaneous	SF	6,286.08	0.40	2,426
D3030 - Cooling Systems				11.29/SF	68,410
D3050	Facility HVAC Distribution Systems				
1148	ERV-6, Energy recovery ventilator, 1,590 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	53,075.00	53,075
1850	F-21, Exhaust fan, 1,100 cfm	EA	1.00	2,220.00	2,220
1216	Galvanized duct work c/w fittings, supports, etc.	Lb	4,702.20	15.40	72,602
1217	Thermal insulation	SF	4,323.28	6.30	27,117
1243	4" to 6", Round galvanized duct work c/w fittings, supports, etc	LF	34.20	62.70	2,145
1346	10" to 12", Round galvanized duct work c/w fittings, supports, etc	LF	25.40	77.20	1,961
1218	A & A1, Diffusers (medium)	EA	5.00	193.00	965
1300	C/C1, Grilles (medium)	EA	7.00	144.70	1,013
1236	Louver	SF	14.00	82.00	1,148
1299	BD, Balancing damper	EA	9.00	482.60	4,343
2422	Motorized damper	EA	2.00	724.00	1,448
1567	Allowance for miscellaneous/missing items	SF	6,286.00	0.30	1,820
D3050 - Facility HVAC Distribution Systems				28.03/SF	169,857
D3060	Controls & Instrumentations				
1708	BAS control system c/w computer station, graphics, wiring, testing etc.	Pt	15.00	1,447.50	21,713
D3060 - Controls & Instrumentations				3.58/SF	21,713
D3070	Special Purpose HVAC Systems				
783	Testing, balancing and commissioning	SF	6,286.00	0.80	4,853
1560	General requirements: supervision, shop drawings, asbuilt, tags, markers, tools, rentals, BIM, cleaning, storage, material handling, seismic restraints, permits, fees etc.	Item			22,195
D3070 - Special Purpose HVAC Systems				4.46/SF	27,048
23 - HEATING, VENTILATING, AND AIR CONDITIONING				49.86/SF	302,131

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
26	ELECTRICAL				
D5020	Electrical Service and Distribution				
223	Distribution Athletic building	SF	6,286.00	20.70	130,418
	D5020 - Electrical Service and Distribution			21.52/SF	130,418
D5030	General Purpose Electrical Power				
1531	Rec power	EA	10.00	120.60	1,206
	D5030 - General Purpose Electrical Power			0.20/SF	1,206
D5040	Lighting				
1526	Lighting Exits	EA	2.00	309.00	618
1527	Lighting type F1 - 4' long linear	EA	10.00	111.00	1,110
1732	Lighting conduit & wire	EA	30.00	178.50	5,356
1743	Lighting control	SF	6,286.00	1.30	7,886
	D5040 - Lighting			2.47/SF	14,970
D5080	Miscellaneous Electrical Systems				
1738	Electrical permits	SF	6,286.00		Excl.
1739	Electrical testing, documentation & commissioning	SF	6,286.00	2.50	16,008
1740	Electrical firestopping	SF	6,286.00	0.30	1,820
2833	BIM	LS	1.00	24,994.00	24,994
	D5080 - Miscellaneous Electrical Systems			7.07/SF	42,822
	26 - ELECTRICAL			31.26/SF	189,416
27	COMMUNICATIONS				
D6010	Data Communications				
1676	WAP wireless access point	EA	55.00	820.30	45,114
	D6010 - Data Communications			7.44/SF	45,114
D6030	Audio-Video Communication				
1741	Sound conduit & wire	EA	20.00	603.20	12,063
	D6030 - Audio-Video Communication			1.99/SF	12,063
D6060	Distributed Communications and Monitoring				
1742	Clocks conduit & wire	EA	3.00	313.70	941
	D6060 - Distributed Communications and Monitoring			0.16/SF	941
	27 - COMMUNICATIONS			9.59/SF	58,118

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
28	ELECTRONIC SAFETY AND SECURITY				
D7010	Access Controls and Intrusion Detection				
1733	Security conduit & wire	EA	35.00	265.40	9,288
	D7010 - Access Controls and Intrusion Detection			1.53/SF	9,288
D7030	Electronic Surveillance				
1685	CCTV cameras rough in	EA	8.00	1,626.00	13,008
1778	Security conduit & wire	EA	8.00	723.80	5,790
	D7030 - Electronic Surveillance			3.10/SF	18,798
D7050	Detection and Alarm				
1630	Fire alarm annunciator	EA	1.00	9,505.00	9,505
1631	Fire alarm pull station	EA	2.00	627.50	1,255
1632	Fire alarm smoke detector	EA	3.00	313.70	941
1636	Fire alarm audio/visual alarm	EA	19.00	395.60	7,517
1637	Fire alarm audio only alarm	EA	2.00	371.50	743
1640	Fire alarm flow and tamper switch	EA	3.00	540.30	1,621
1734	Fire alarm conduit & wire	EA	29.00	265.40	7,696
	D7050 - Detection and Alarm			4.83/SF	29,278
	28 - ELECTRONIC SAFETY AND SECURITY			9.47/SF	57,364
31	EARTHWORK				
A4010	Standard Slabs-on-Grade				
508	Excavation for slab on grade	CY	181.26		Incl.
509	Remove and dispose of excavated material	CY	181.26		Incl.
510	Prepare and compact sub-base	SF	2,936.16		Incl.
513	Re-use materials ILO Imported sand gravel fill - 12" thick	CY	108.77		Incl.
	A4010 - Standard Slabs-on-Grade				Incl.
A6010	Building Subdrainage				
619	Perimeter drain	LF	257.89		Incl.
686	Under-slab drainage system	SF	2,936.16		Incl.
	A6010 - Building Subdrainage				Incl.
A9010	Substructure Excavation				
591	Excavation for foundation footings including spoils removal	CY	807.04		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
593	Prepare and compact foundation sub-base	SF	2,621.57		Incl.
594	Imported sand gravel fill below foundations - 12" thick	CY	97.15		Incl.
654	Excavation for elevator pit including spoils removal	CY	53.00		Incl.
620	Imported foundation backfill	CY	488.90		Incl.
	A9010 - Substructure Excavation				Incl.
G1070	Site Earthwork				
743	Excavate for walkways paving	CY	62.60		Incl.
1518	Remove spoils from site (walkways paving)	CY	62.60		Incl.
2842	Sitework associated with Locker Building	LS	1.00	145,000.00	145,000
	G1070 - Site Earthwork			23.93/SF	145,000
G2030	Pedestrian Plazas and Walkways				
745	Prepare and compact subbase	SF	1,689.90		Incl.
746	Granular fill, re-use excavated materials	CY	41.80		Incl.
1519	Imported compacted gravel borrow	CY	41.80		Excl.
	G2030 - Pedestrian Plazas and Walkways				0
	31 - EARTHWORK			23.93/SF	145,000
32	EXTERIOR IMPROVEMENTS				
G2060	Site Development				
399	Pre-engineered elevated boardwalk ramping system	SF	-3,211.70	115.80	-371,917
1575	Pre-engineered stairs	SF	176.60	154.40	27,267
	G2060 - Site Development			-56.87/SF	-344,650
G2080	Landscaping				
789	Imported planting mix	CY	6.03	57.90	349
2542	Use stockpile material	CY	6.03		Excl.
1599	White oak, 1.5" Cal.	EA	3.00	675.70	2,027
1604	Clump paper birch, 7-8' Ht.	EA	6.00	772.00	4,632
1612	Red oak, 2.5-3" Cal.	EA	5.00	965.00	4,825
1617	White pine, 8-10' Ht.	EA	4.00	772.00	3,088
1618	White pine, 5-6' Ht.	EA	5.00	482.60	2,413
	G2080 - Landscaping			2.86/SF	17,334
	32 - EXTERIOR IMPROVEMENTS			-54.01/SF	-327,316

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A2 Add Locker/Athletic Support Building (continued)

GFAR: 6,060.00 SF Cost/SF: 501.49
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
33	UTILITIES				
G3010	Water Utilities				
1383	Connection to building	EA	1.00		Incl.
1384	4", Ductile iron pipe	LF	29.82		Incl.
1382	2", copper	LF	98.11		Incl.
1955	Tee 8"x8"x2"	EA	1.00		Incl.
1380	2", Water valve - allow	EA	1.00		Incl.
1448	Cleaning, testing, trace wiring etc.	LF	127.89		Incl.
569	Excavation and backfill (with site preparation)	LF	127.89		Incl.
	G3010 - Water Utilities				Incl.
G3020	Sanitary Sewerage Utilities				
1391	Connection to building sanitary service	EA	2.00		Incl.
1388	SMH, Sanitary manhole	EA	1.00		Incl.
1941	6",sanitary sewer, cast iron	LF	17.60		Incl.
1387	6",sanitary sewer, PVC	LF	115.62		Incl.
1943	4",sanitary sewer, PVC	LF	38.38		Incl.
1392	6",sanitary sewer, PVC	LF	49.28		Incl.
2318	Cleaning, testing, trace wiring etc.	LF	220.63		Incl.
577	Excavation and backfill (with site preparation)	LF	220.63		Incl.
	G3020 - Sanitary Sewerage Utilities				Incl.
G3030	Storm Drainage Utilities				
1861	6", CPP, Corrugated HDPE storm drain pipe	LF	21.00		Incl.
1400	12", CPP, Corrugated HDPE storm drain pipe	LF	168.30		Incl.
1415	DMH - Drain manhole - 4'	EA	1.00		Incl.
1424	Connection to building	EA	1.00		Incl.
602	Excavation and backfill (refer to site preparation)	LF	189.30		Incl.
2319	Cleaning, testing, trace wiring etc.	LF	189.30		Incl.
	G3030 - Storm Drainage Utilities				Incl.
	33 - UTILITIES				Incl.
ADD LOCKER/ATHLETIC SUPPORT BUILDING				501.49/SF	3,039,004

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION SUMMARY

Rates Current At May 2023

Ref	Location	Total Cost USD
ALT90	Alternate - 90% Construction Documents	
A72	Additional Seating Capacity (add 500 seats)	311,734
	ALT90 - Alternate - 90% Construction Documents	311,734
ESTIMATED NET COST		311,734
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	1.5 % 4,676
	Escalation Allowance up to mid-point of Construction (3/2025)	3 % 9,492
	Sub-contractor Bonds	1.2 % 3,911
	CM Construction Contingency (per CM Pricing Exhibit 1)	2.5 % 8,245
	CM Fee	6,761
ESTIMATED TOTAL COST		344,819

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

ALT90 Alternate - 90% Construction Documents

A72 Additional Seating Capacity (add 500 seats)

Rates Current At May 2023

Ref	Description	Total Cost USD
03	Concrete	31,884
11	Equipment	279,850
31	Earthwork	Incl.
ADDITIONAL SEATING CAPACITY (ADD 500 SEATS)		311,734

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

ALT90 Alternate - 90% Construction Documents

A72 Additional Seating Capacity (add 500 seats)

Rates Current At May 2023

Ref	Description	Total Cost USD
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	4,676
	Escalation Allowance up to mid-point of Construction (3/2025)	9,492
	Sub-contractor Bonds	3,911
	CM Construction Contingency (per CM Pricing Exhibit 1)	8,245
	CM Fee	6,761
ESTIMATED TOTAL COST		344,819

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A72 Additional Seating Capacity (add 500 seats)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
03	CONCRETE				
G2050	Athletic, Recreational, and Playfield Areas				
1706	Cast-in-place grandstand footings, 2' dia x 5' deep	EA	16.00	820.30	13,124
2484	Cast-in-place slab on grade for grandstand, 4" deep	SF	1,996.90	6.80	13,489
2485	Cast-in-place slab on grade for grandstand, 5" deep	SF	496.50	10.60	5,271
	G2050 - Athletic, Recreational, and Playfield Areas				31,884
	03 - CONCRETE				31,884
11	EQUIPMENT				
G2050	Athletic, Recreational, and Playfield Areas				
2855	Additional bleacher seating to Football field (500 seats)	LS	1.00	279,850.00	279,850
	G2050 - Athletic, Recreational, and Playfield Areas				279,850
	11 - EQUIPMENT				279,850
31	EARTHWORK				
G2050	Athletic, Recreational, and Playfield Areas				
757	Prepare and compact subbase	SF	2,492.74		Incl.
758	Granular base to athletic fields, re-use excavated materials	CY	46.17		Incl.
1573	Imported compacted gravel borrow	CY	46.50		Incl.
	G2050 - Athletic, Recreational, and Playfield Areas				Incl.
	31 - EARTHWORK				Incl.
ADDITIONAL SEATING CAPACITY (ADD 500 SEATS)					311,734

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION SUMMARY

GFAR: Gross Floor Area
Rates Current At May 2023

Ref	Location	GFAR SF	GFAR USD/SF	Total Cost USD
ALT90	Alternate - 90% Construction Documents			
A4	Add Concessions/Toilet Building	1,730.00	750.68	1,298,676
	ALT90 - Alternate - 90% Construction Documents	1,730.0	750.68	1,298,676
ESTIMATED NET COST		1,730	750.68	1,298,676
MARGINS & ADJUSTMENTS				
Design & Estimating Contingency		1.5 %		19,480
Escalation Allowance up to mid-point of Construction (3/2025)		3 %		39,545
Sub-contractor Bonds		1.2 %		16,292
CM Construction Contingency (per CM Pricing Exhibit 1)		2.5 %		34,350
CM Fee				28,167
ESTIMATED TOTAL COST		1,730	830.35	1,436,510

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
03	Concrete	42.95	74,296
04	Masonry	93.10	161,056
05	Metals	3.58	6,195
06	Wood, Plastics, and Composites	84.99	147,031
07	Thermal and Moisture Protection	71.89	124,373
08	Openings	13.03	22,544
09	Finishings	35.69	61,744
10	Specialties	15.51	26,826
11	Equipment	13.94	24,124
22	Plumbing	98.15	169,796
23	Heating, Ventilating, and Air Conditioning	59.16	102,346
26	Electrical	94.20	162,959
27	Communications	1.05	1,809
28	Electronic Safety and Security	16.64	28,782
31	Earthwork	66.47	115,000
32	Exterior Improvements	9.67	16,722
33	Utilities	30.68	53,073
ADD CONCESSIONS/TOILET BUILDING		750.68	1,298,676

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



A4 Add Concessions/Toilet Building

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	GFAR USD/SF	Total Cost USD
MARGINS & ADJUSTMENTS			
	Design & Estimating Contingency		19,480
	Escalation Allowance up to mid-point of Construction (3/2025)		39,545
	Sub-contractor Bonds		16,292
	CM Construction Contingency (per CM Pricing Exhibit 1)		34,350
	CM Fee		28,167
ESTIMATED TOTAL COST		830.35	1,436,510

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
03	CONCRETE				
A1010	Standard Foundations				
529	Concrete to perimeter strip footings - 1' thick, 4500 PSI	CY	12.59	313.70	3,949
1000	Concrete to interior strip footings, 4500 PSI	CY	1.68	313.70	527
530	Form strip footings	SF	334.69	19.30	6,460
587	Bar reinforcement to strip footings, allow 100 PCY	Lb	1,418.42	1.70	2,464
	A1010 - Standard Foundations			7.75/SF	13,400
A2010	Walls for Subgrade Enclosures				
598	Concrete to perimeter frost walls, 4500 PSI	CY	26.45	313.60	8,295
1122	Concrete to interior foundation walls, 4500 PSI	CY	1.75	313.70	549
605	Form perimeter frost walls	SF	1,069.95	24.10	25,812
1123	Form interior foundation walls	SF	139.61	24.10	3,368
608	Bar reinforcement to perimeter frost walls	Lb	1,717.23	1.70	2,983
1124	Bar reinforcement to interior foundation walls	Lb	387.78	1.70	674
618	Rigid insulation - 2" thick	SF	534.96	4.30	2,323
	A2010 - Walls for Subgrade Enclosures			25.44/SF	44,004
A4010	Standard Slabs-on-Grade				
933	Concrete to slab on grade - 5" thick, 4500 PSI	CY	16.70	313.70	5,238
502	Form slab on grade	SF	77.28	17.40	1,342
2585	Fiber reinforcement to slab on grade	CY	16.60	57.90	961
698	Allowance for bar reinforcement	Lb	537.31	1.70	933
504	Float finish to slab on grade	SF	1,074.58	1.40	1,556
505	Control joints	SF	1,074.58	0.80	830
707	Mechanical pads	Item			3,619
710	Engineering, layout, safety, cleaning, etc.	Item			2,413
	A4010 - Standard Slabs-on-Grade			9.76/SF	16,892
	03 - CONCRETE			42.95/SF	74,296
04	MASONRY				
B2010	Exterior Walls				
29	4" Thick Split face CMU Veneer	SF	373.68	38.60	14,424

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
72	8" Thick CMU back-up	SF	1,748.15	33.80	59,043
	B2010 - Exterior Walls			42.47/SF	73,467
C1010	Interior Partitions				
1776	CMU shear walls, 8" thick	SF	1,764.00	48.20	85,111
2839	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Masonry Trade)	SF	1,284.00	1.90	2,478
	C1010 - Interior Partitions			50.63/SF	87,589
	04 - MASONRY			93.10/SF	161,056
05	METALS				
C1090	Interior Specialties				
2835	Allowance for miscellaneous metals	SF	1,284.00	4.80	6,195
	C1090 - Interior Specialties			3.58/SF	6,195
	05 - METALS			3.58/SF	6,195
06	WOOD, PLASTICS, AND COMPOSITES				
B1020	Roof Construction				
1013	Pre-fabricated wood truss	SF	1,401.00	46.30	64,893
1012	Plywood sheathing - 5/8" thick	SF	1,401.00	4.10	5,813
	B1020 - Roof Construction			40.87/SF	70,706
B2010	Exterior Walls				
1648	Mineral fiber reinforcement cementitious panels	SF	1,375.00	48.20	66,343
	B2010 - Exterior Walls			38.35/SF	66,343
C1090	Interior Specialties				
2838	Allowance for rough carpentry	SF	1,284.00	1.90	2,478
2837	Allowance for wood blocking	SF	1,284.00	2.70	3,469
2836	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Carpentry Trade)	SF	1,284.00	1.40	1,859
	C1090 - Interior Specialties			4.51/SF	7,806
E1090	Other Equipment				
1704	Dish return counter	LF	8.20	265.40	2,176
	E1090 - Other Equipment			1.26/SF	2,176
	06 - WOOD, PLASTICS, AND COMPOSITES			84.99/SF	147,031

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
07	THERMAL AND MOISTURE PROTECTION				
A2010	Walls for Subgrade Enclosures				
617	Dampproofing to frost wall	SF	535.01	5.80	3,098
	A2010 - Walls for Subgrade Enclosures			1.79/SF	3,098
A4010	Standard Slabs-on-Grade				
506	Air and vapor barrier	SF	1,074.58	0.90	933
	A4010 - Standard Slabs-on-Grade			0.54/SF	933
A4090	Slab-on-Grade Supplementary Components				
507	Rigid insulation - 2" thick	SF	280.13	4.30	1,217
	A4090 - Slab-on-Grade Supplementary Components			0.70/SF	1,217
B2010	Exterior Walls				
2543	2" Thick rigid insulation	SF	1,748.10	4.80	8,435
2545	Fluid applied air and vapor barrier	SF	1,748.10	6.30	10,965
190	Allowance for miscellaneous sealing and caulking	SF	1,748.09	1.90	3,374
	B2010 - Exterior Walls			13.16/SF	22,774
B3010	Roofing				
800	Concession Building roof assembly, Pre-finished standing seam metal roofing, including rosin paper, ice and water shield	SF	1,401.00	57.90	81,116
	B3010 - Roofing			46.89/SF	81,116
B3020	Roof Appurtenances				
1488	Gutter	LF	51.00	28.90	1,476
1490	Downspout	LF	24.00	19.30	463
1489	Snow fence	LF	51.00	241.30	12,304
	B3020 - Roof Appurtenances			8.23/SF	14,243
C1010	Interior Partitions				
488	Allowance for miscellaneous sealing and caulking	SF	1,284.00	0.50	620
489	Allowance for miscellaneous fire stopping	SF	1,284.00	0.30	372
	C1010 - Interior Partitions			0.57/SF	992
	07 - THERMAL AND MOISTURE PROTECTION			71.89/SF	124,373

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
08	OPENINGS				
B2050	Exterior Doors and Grilles				
1210	4'-0" x 7'-0" Overhead coiling insulated stainless steel door	EA	1.00	3,378.00	3,378
1211	8'-0" x 4'-4 3/8" Overhead coiling insulated stainless steel counter door	EA	1.00	4,343.00	4,343
1212	3'-0" x 7'-0" Single leaf stainless steel door, including frame, finish, and hardware	EA	3.00	2,653.70	7,961
1213	2@3'-0" x 7'-0" Double leaf stainless steel door, including frame, finish, and hardware	Pair	1.00	5,308.00	5,308
	B2050 - Exterior Doors and Grilles			12.13/SF	20,990
B2070	Exterior Louvers and Vents				
99	Louver	SF	16.10	96.50	1,554
	B2070 - Exterior Louvers and Vents			0.90/SF	1,554
	08 - OPENINGS			13.03/SF	22,544
09	FINISHINGS				
B2010	Exterior Walls				
2769	2" metal z-girt back-up	SF	1,749.00	7.70	13,502
	B2010 - Exterior Walls			7.80/SF	13,502
C1010	Interior Partitions				
808	Allowance for miscellaneous clean-up, additional labor, safety, etc. (Drywall Trade)	SF	1,284.00	0.40	496
	C1010 - Interior Partitions			0.29/SF	496
C2010	Wall Finishes				
170	Prepare and apply epoxy paint	SF	2,709.65	3.40	9,152
	C2010 - Wall Finishes			5.29/SF	9,152
C2030	Flooring				
5	SCONC, Sealed concrete	SF	42.68	1.50	62
6	EF, Epoxy flooring and base	SF	930.15	14.50	13,464
10	Resilient base	LF	66.39	4.80	320
	C2030 - Flooring			8.00/SF	13,846
C2050	Ceiling Finishes				
41	Gypsum board ceiling, moisture resistant	SF	967.80	24.10	23,347

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
39	Paint to gypsum board ceiling	SF	967.68	1.40	1,401
	C2050 - Ceiling Finishes			14.31/SF	24,748
	09 - FINISHINGS			35.69/SF	61,744
10	SPECIALTIES				
C1090	Interior Specialties				
277	Restroom accessories - Toilet partition	EA	5.00	1,254.60	6,273
287	Restroom accessories - Toilet partition, ADA	EA	2.00	1,640.50	3,281
302	Restroom accessories - Urinal partition	EA	3.00	675.70	2,027
280	Restroom accessories - Tissue paper dispenser	EA	7.00	120.60	844
281	Restroom accessories - Grab bar	EA	4.00	173.80	695
282	Restroom accessories - Napkin disposal	EA	5.00	482.60	2,413
283	Restroom accessories - Robe hook	EA	7.00	96.60	676
284	Restroom accessories - Soap dispenser	EA	4.00	144.80	579
291	Restroom accessories - Framed mirror	EA	4.00	772.00	3,088
1503	Restroom accessories - Hand dryer	EA	2.00	724.00	1,448
753	Allowance for janitor accessories	EA	1.00	724.00	724
332	Allowance for AED with cabinets	EA	1.00	1,930.00	1,930
296	Allowance for fire extinguisher and cabinets	EA	0.53	820.80	435
298	Allowance for exterior signage	Item			2,413
	C1090 - Interior Specialties			15.51/SF	26,826
	10 - SPECIALTIES			15.51/SF	26,826
11	EQUIPMENT				
E1090	Other Equipment				
801	Food service equipment (Concession)	LS	1.00	24,124.00	24,124
	E1090 - Other Equipment			13.94/SF	24,124
	11 - EQUIPMENT			13.94/SF	24,124
22	PLUMBING				
D2010	Domestic Water Distribution				
1886	Plumbing Fixtures	Note			
2072	P-1, Water Closet - Flush Valve - Wall Mounted	EA	10.00	1,640.50	16,405
2073	P-1A, Water Closet - Flush Valve - Wall Mounted, accessible	EA	4.00	1,785.30	7,141

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2074	P-2, Urinal - Wall Hung	EA	4.00	1,544.00	6,176
2075	P-2A, Urinal - Wall Hung, accessible	EA	2.00	1,640.50	3,281
2076	P-3A, Lavatory - Rectangular - Wall Mounted 19X17	EA	8.00	1,399.30	11,194
2079	P-4, Mop Receptor	EA	2.00	1,544.00	3,088
2081	P-5A, Drinking Fountain - Bi-Level - Wall Mounted	EA	1.00	3,667.00	3,667
1146	Triple sink - (Concessions building)	EA	1.00	2,413.00	2,413
1149	Hand sink - (Concessions building)	EA	2.00	1,351.00	2,702
1364	Water cooler- (Concessions building)	EA	1.00		Incl.
2096	Allowance for missing/ miscellaneous plumbing fixtures (Concessions building)	SF	1,284.00	1.90	2,478
447	Water Distribution and Components	Note			
2101	Connection to main(3")-(Concessions building)	EA	1.00	579.00	579
2104	Plumbing fixture- hook up(domestic water)	EA	35.00	386.00	13,510
2110	3", water meter and backflow preventer assembly - Concessions building (allowance)	EA	1.00	6,755.00	6,755
1140	EWB-7, Wall hung - storage type water heater(DSE-30), 30 Gal, 15 kW (Concessions building)	EA	1.00	9,264.00	9,264
2132	HWRP, Recirculation pump	EA	1.00	2,413.00	2,413
2133	ET, Expansion tank	EA	1.00	483.00	483
2134	Mixing valve(serving water heaters)	EA	1.00	483.00	483
2140	Housekeeping pad(to be carried elsewhere in this estimate)	Note			Excl.
2141	HB, Hose bib	EA	2.00	289.50	579
1101	WH, Wall Hydrant - Mild Climate	EA	1.00	1,689.00	1,689
465	Domestic water piping, copper L, 1" - ag	LF	130.13	28.90	3,767
1280	Domestic water piping, copper L, 4" - ag	LF	20.00	207.50	4,150
1173	Domestic water piping, copper K, 3" - bg	LF	24.00	120.60	2,895
1365	Thermal pipe insulation - 1/2" to 1" copper pipe	LF	130.13	6.30	816
1370	Thermal pipe insulation - 3" copper pipe	LF	24.00	19.30	463
1371	Thermal pipe insulation - 4" copper pipe	LF	20.11	24.10	485
2156	Water meter c/w bfp assembly- c/w service bypass hook up (3")	EA	1.00	4,343.00	4,343
2163	Electric water heater- hook up(medium)	EA	1.00	531.00	531
2167	Circulating pump - hook up	EA	1.00	724.00	724

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
2168	Expansion tank - hook up	EA	1.00	290.00	290
2169	Mixing valve - hook up	EA	1.00	483.00	483
1373	Hookup - plumbing	EA	3.00	627.30	1,882
2173	Allowance for missing/ miscellaneous domestic water system (Concessions building)	SF	1,284.00	1.90	2,478
2176	Subcontractor GCs/GRs	Item			8,685
D2010 - Domestic Water Distribution				73.00/SF	126,292
D2020	Sanitary Drainage				
2177	Connection to main	EA	1.00	724.00	724
2178	Plumbing fixture - hook-ups(sanitary & vent)	EA	35.00	482.50	16,888
1152	Grease trap, 35 gpm (Concessions building)	EA	1.00	7,720.00	7,720
2480	Condensate pump (assumed one per each FCU and AC units)	EA	1.00	290.00	290
2194	FD, Floor drain	EA	3.00	434.30	1,303
2197	CO, Clean out	EA	3.00	337.70	1,013
2206	2", Sanitary piping c/w fittings - Ag	LF	10.02	38.60	387
2207	3", Sanitary piping c/w fittings - Ag	LF	20.05	43.40	870
2208	4", Sanitary piping c/w fittings - Ag	LF	20.02	48.30	966
2209	6", Sanitary piping c/w fittings - Ag	LF	13.00	57.90	753
2212	2", Sanitary piping c/w fittings - Bg	LF	6.30	38.60	243
2213	3", Sanitary piping c/w fittings - Bg	LF	15.28	43.50	664
2214	4", Sanitary piping c/w fittings - Bg	LF	45.94	48.30	2,217
2215	6", Sanitary piping c/w fittings - Bg	LF	20.02	57.90	1,159
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	40.03	43.40	1,738
1304	1-1/2" to 2", Vent piping, bg	LF	10.01	48.30	483
2673	3", Vent piping, bg	LF	10.10	43.50	439
2235	Allowance for missing/ miscellaneous sanitary drainage system(Concessions building)	SF	1,284.00	1.90	2,478
2238	Subcontractor GCs/GRs	Item			1,930
D2020 - Sanitary Drainage				24.43/SF	42,265

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
D2030	Building Support Plumbing Systems				
2254	No excavation & backfill- assumed	Note			Excl.
2255	No cutting and patching assumed	Note			Excl.
2258	Allowance for missing/ miscellaneous storm water drainage system(Concessions building)	SF	1,284.00	1.00	1,239
2261	Subcontractor GCs/GRs	Item			0
	D2030 - Building Support Plumbing Systems			0.72/SF	1,239
D2060	Process Support Plumbing Systems				
2527	Allowance for concession/restroom building gas system (assumed not required)	Note			Excl.
2316	Subcontractor GCs/GRs	Item			0
	D2060 - Process Support Plumbing Systems				0
	22 - PLUMBING			98.15/SF	169,796
23	HEATING, VENTILATING, AND AIR CONDITIONING				
D3020	Heat Systems				
1868	EUH-6, Electric unit heater, 5 kW - none indicated	EA	1.00		Excl.
2643	EUH-7, Electric unit heater, 6 kW	EA	2.00	2,026.50	4,053
	D3020 - Heat Systems			2.34/SF	4,053
D3030	Cooling Systems				
1673	LG HVAC equipments consisting of DX-split units, etc.	LS	1.00	15,440.00	15,440
1190	AC- 0-2 to 0-3, 0-6 to 0-8, 1-1 to 4, 1-7 to 9, 1-11 to 14, 2-1 to 6, 3-1 to 5, 4-1 to 5, CB-3 & LB-1, DX split system air conditioning unit 2 ton, 24 mbh cooling capacity c/w outdoor air-cooled condensing unit	EA	1.00		Incl.
1568	Refrigeration piping c/w fittings,supports, etc.	LF	100.00	43.40	4,343
1684	Allowance for refrigerant	Lb	40.00	24.10	965
1713	ERV - hook ups	EA	1.00	724.00	724
1975	AC units - hook ups	EA	1.00	483.00	483
2481	Allowance for missing/ miscellaneous	SF	1,284.02	0.40	496
	D3030 - Cooling Systems			12.98/SF	22,451
D3050	Facility HVAC Distribution Systems				
1147	ERV-5, Energy recovery ventilator, 1,545 cfm, c/w air-cooled VRF condensing unit, electric pre heat, etc.	EA	1.00	43,424.00	43,424

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1216	Galvanized duct work c/w fittings, supports, etc.	Lb	996.20	15.40	15,381
1217	Thermal insulation	SF	907.21	6.30	5,691
1218	A & A1, Diffusers (medium)	EA	5.00	193.00	965
1300	C/C1, Grilles (medium)	EA	5.00	144.80	724
1236	Louver	SF	7.00	82.00	574
1567	Allowance for miscellaneous/missing items	SF	1,284.00	0.30	372
	D3050 - Facility HVAC Distribution Systems			38.80/SF	67,131
D3070	Special Purpose HVAC Systems				
783	Testing, balancing and commissioning	SF	1,284.00	0.80	991
1560	General requirements: supervision, shop drawings, asbuilt, tags, markers, tools, rentals, BIM, cleaning, storage, material handling, seismic restraints, permits, fees etc.	Item			7,720
	D3070 - Special Purpose HVAC Systems			5.04/SF	8,711
	23 - HEATING, VENTILATING, AND AIR CONDITIONING			59.16/SF	102,346
26	ELECTRICAL				
D5020	Electrical Service and Distribution				
229	Distribution Concessions building	SF	1,284.00	113.90	146,206
	D5020 - Electrical Service and Distribution			84.51/SF	146,206
D5030	General Purpose Electrical Power				
1531	Rec power	EA	12.00	120.70	1,448
1532	Rec GFI	EA	2.00	313.50	627
	D5030 - General Purpose Electrical Power			1.20/SF	2,075
D5040	Lighting				
1526	Lighting Exits	EA	2.00	309.00	618
1527	Lighting type F1 - 4' long linear	EA	14.00	111.00	1,554
1732	Lighting conduit & wire	EA	16.00	178.50	2,856
	D5040 - Lighting			2.91/SF	5,028
D5080	Miscellaneous Electrical Systems				
2834	BIM	LS	1.00	9,650.00	9,650
	D5080 - Miscellaneous Electrical Systems			5.58/SF	9,650
	26 - ELECTRICAL			94.20/SF	162,959

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
27	COMMUNICATIONS				
D6030	Audio-Video Communication				
1741	Sound conduit & wire	EA	3.00	603.00	1,809
	D6030 - Audio-Video Communication			1.05/SF	1,809
	27 - COMMUNICATIONS			1.05/SF	1,809
28	ELECTRONIC SAFETY AND SECURITY				
D7010	Access Controls and Intrusion Detection				
1733	Security conduit & wire	EA	12.00	265.40	3,185
	D7010 - Access Controls and Intrusion Detection			1.84/SF	3,185
D7030	Electronic Surveillance				
1685	CCTV cameras rough in	EA	3.00	1,626.00	4,878
1778	Security conduit & wire	EA	3.00	723.70	2,171
	D7030 - Electronic Surveillance			4.07/SF	7,049
D7050	Detection and Alarm				
1630	Fire alarm annunciator	EA	1.00	9,505.00	9,505
1631	Fire alarm pull station	EA	3.00	627.30	1,882
1632	Fire alarm smoke detector	EA	2.00	313.50	627
1636	Fire alarm audio/visual alarm	EA	3.00	395.70	1,187
1640	Fire alarm flow and tamper switch	EA	4.00	540.50	2,162
1734	Fire alarm conduit & wire	EA	12.00	265.40	3,185
	D7050 - Detection and Alarm			10.72/SF	18,548
	28 - ELECTRONIC SAFETY AND SECURITY			16.64/SF	28,782
31	EARTHWORK				
A4010	Standard Slabs-on-Grade				
508	Excavation for slab on grade	CY	63.03		Incl.
509	Remove and dispose of excavated material	CY	63.03		Incl.
510	Prepare and compact sub-base	SF	1,074.58		Incl.
513	Re-use materials ILO Imported sand gravel fill - 12" thick	CY	39.82		Incl.
	A4010 - Standard Slabs-on-Grade				Incl.
A6010	Building Subdrainage				
619	Perimeter drain	LF	153.63		Incl.

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
686	Under-slab drainage system	SF	1,074.58		Incl.
	A6010 - Building Subdrainage				Incl.
A9010	Substructure Excavation				
591	Excavation for foundation footings including spoils removal	CY	143.67		Incl.
593	Prepare and compact foundation sub-base	SF	382.98		Incl.
594	Imported sand gravel fill below foundations - 12" thick	CY	14.20		Incl.
620	Imported foundation backfill	CY	87.16		Incl.
	A9010 - Substructure Excavation				Incl.
G1070	Site Earthwork				
2843	Sitework associated with Concessions Building	LS	1.00	115,000.00	115,000
	G1070 - Site Earthwork			66.47/SF	115,000
	31 - EARTHWORK			66.47/SF	115,000
32	EXTERIOR IMPROVEMENTS				
G2050	Athletic, Recreational, and Playfield Areas				
422	Stabilized stonedust	SF	176.00	2.90	510
	G2050 - Athletic, Recreational, and Playfield Areas			0.29/SF	510
G2060	Site Development				
1587	Concession table/bench	EA	4.00	4,053.00	16,212
	G2060 - Site Development			9.37/SF	16,212
	32 - EXTERIOR IMPROVEMENTS			9.67/SF	16,722
33	UTILITIES				
G3010	Water Utilities				
1383	Connection to building	EA	1.00		Incl.
1384	4", Ductile iron pipe	LF	243.18		Incl.
1448	Cleaning, testing, trace wiring etc.	LF	242.69		Incl.
569	Excavation and backfill (with site preparation)	LF	242.69		Incl.
2856	Provision for increase capacity	LS	1.00	24,124.00	24,124
	G3010 - Water Utilities			13.94/SF	24,124
G3020	Sanitary Sewerage Utilities				
1391	Connection to building sanitary service	EA	1.00		Incl.
1388	SMH, Sanitary manhole	EA	2.00		Incl.

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



A4 Add Concessions/Toilet Building (continued)

GFAR: 1,730.00 SF Cost/SF: 750.68
Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1392	6",sanitary sewer, PVC	LF	300.56		Incl.
2318	Cleaning, testing, trace wiring etc.	LF	300.31		Incl.
577	Excavation and backfill (with site preparation)	LF	300.31		Incl.
2857	Provision for increase capacity	LS	1.00	28,949.00	28,949
	G3020 - Sanitary Sewerage Utilities			16.73/SF	28,949
	33 - UTILITIES			30.68/SF	53,073
	ADD CONCESSIONS/TOILET BUILDING			750.68/SF	1,298,676

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION SUMMARY

Rates Current At May 2023

Ref	Location	Total Cost USD
ALT90	Alternate - 90% Construction Documents	
A64	Add Irrigated Softball Field	732,698
ALT90 - Alternate - 90% Construction Documents		732,698
ESTIMATED NET COST		732,698
MARGINS & ADJUSTMENTS		
Design & Estimating Contingency		1.5 % 10,990
Escalation Allowance up to mid-point of Construction (3/2025)		3 % 22,311
Sub-contractor Bonds		1.2 % 9,192
CM Construction Contingency (per CM Pricing Exhibit 1)		2.5 % 19,380
CM Fee		15,891
ESTIMATED TOTAL COST		810,462

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

ALT90 Alternate - 90% Construction Documents

A64 Add Irrigated Softball Field

Rates Current At May 2023

Ref	Description	Total Cost USD
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	10,990
	Escalation Allowance up to mid-point of Construction (3/2025)	22,311
	Sub-contractor Bonds	9,192
	CM Construction Contingency (per CM Pricing Exhibit 1)	19,380
	CM Fee	15,891
ESTIMATED TOTAL COST		810,462

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A64 Add Irrigated Softball Field

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
03	CONCRETE				
G2050	Athletic, Recreational, and Playfield Areas				
689	Reinforcement concrete pad	SF	1,242.16	27.00	33,563
	G2050 - Athletic, Recreational, and Playfield Areas				33,563
	03 - CONCRETE				33,563
11	EQUIPMENT				
G2050	Athletic, Recreational, and Playfield Areas				
684	Chainlink fence backstop	LF	60.22	337.70	20,339
429	Team bench	LF	60.15	91.70	5,515
726	Foul pole including footing	EA	2.00	6,755.00	13,510
704	Aluminum bleacher system - Baseball field, 50 person	LS	1.00	36,188.00	36,188
769	Exterior scoreboard baseball	EA	1.00	57,900.00	57,900
	G2050 - Athletic, Recreational, and Playfield Areas				133,452
	11 - EQUIPMENT				133,452
31	EARTHWORK				
G1070	Site Earthwork				
755	Excavate athletic fields	CY	5,971.63		Incl.
1826	Remove spoils from site (athletic fields)	CY	5,971.63		Incl.
2845	Sitework associated with Baseball Field (L305)	LS	1.00	60,000.00	60,000
	G1070 - Site Earthwork				60,000
G2050	Athletic, Recreational, and Playfield Areas				
757	Prepare and compact subbase	SF	109,981.69		Incl.
758	Granular base to athletic fields, re-use excavated materials	CY	2,983.30		Incl.
1574	Imported dense grade crushed stone	CY	2,983.38		Incl.
	G2050 - Athletic, Recreational, and Playfield Areas				Incl.
	31 - EARTHWORK				60,000
32	EXTERIOR IMPROVEMENTS				
G2050	Athletic, Recreational, and Playfield Areas				
388	Natural grass turf (Baseball Courts and Soccer Field)	SF	80,549.39	4.30	349,785
1522	Irrigation to natural grass turf	SF	80,549.39	1.60	132,141
2567	Repair existing irrigation affected by infiltration construction	SF	-80,549.20	1.00	-77,730

NORTHEAST METROPOLITAN REGIONAL
TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE -
REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A64 Add Irrigated Softball Field (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
391	Engineered infield mix (Baseball Courts)	SF	29,432.77	4.30	127,812
723	10'-0" High BVC chainlink fence	LF	36.15	154.40	5,582
693	6'-0" High BVC chainlink fence	LF	312.15	91.70	28,616
725	6'-0" High BVC chainlink fence single leaf gate	EA	2.00	434.50	869
724	10'-0" High BVC chainlink fence double leaf gate	EA	1.00	965.00	965
396	Electronic scoreboard - steel posts with concrete footing	EA	1.00	7,720.00	7,720
692	Overhead shade structure	SF	512.00	48.30	24,704
G2050 - Athletic, Recreational, and Playfield Areas					600,464
G2080	Landscaping				
2401	Seeding lawn prospect athletic fields	SF	-98,218.50	1.00	-94,781
G2080 - Landscaping					-94,781
32 - EXTERIOR IMPROVEMENTS					505,683
ADD IRRIGATED SOFTBALL FIELD					732,698

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION SUMMARY

Rates Current At May 2023

Ref	Location	Total Cost USD
ALT90	Alternate - 90% Construction Documents	
A65	Add Irrigated Softball/Multi-Purpose Field	1,070,923
ALT90 - Alternate - 90% Construction Documents		1,070,923
ESTIMATED NET COST		1,070,923
MARGINS & ADJUSTMENTS		
Design & Estimating Contingency		1.5 % 16,064
Escalation Allowance up to mid-point of Construction (3/2025)		3 % 32,610
Sub-contractor Bonds		1.2 % 13,435
CM Construction Contingency (per CM Pricing Exhibit 1)		2.5 % 28,326
CM Fee		23,227
ESTIMATED TOTAL COST		1,184,585

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

ALT90 Alternate - 90% Construction Documents

A65 Add Irrigated Softball/Multi-Purpose Field

Rates Current At May 2023

Ref	Description	Total Cost USD
03	Concrete	27,691
11	Equipment	226,224
31	Earthwork	270,000
32	Exterior Improvements	547,008
ADD IRRIGATED SOFTBALL/MULTI-PURPOSE FIELD		1,070,923

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS SUMMARY

ALT90 Alternate - 90% Construction Documents

A65 Add Irrigated Softball/Multi-Purpose Field

Rates Current At May 2023

Ref	Description	Total Cost USD
MARGINS & ADJUSTMENTS		
	Design & Estimating Contingency	16,064
	Escalation Allowance up to mid-point of Construction (3/2025)	32,610
	Sub-contractor Bonds	13,435
	CM Construction Contingency (per CM Pricing Exhibit 1)	28,326
	CM Fee	23,227
ESTIMATED TOTAL COST		1,184,585

NORTHEAST METROPOLITAN REGIONAL TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A65 Add Irrigated Softball/Multi-Purpose Field

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
03	CONCRETE				
G2050	Athletic, Recreational, and Playfield Areas				
689	Reinforcement concrete pad	SF	1,024.81	27.00	27,691
	G2050 - Athletic, Recreational, and Playfield Areas				27,691
	03 - CONCRETE				27,691
11	EQUIPMENT				
G2050	Athletic, Recreational, and Playfield Areas				
684	Chainlink fence backstop	LF	40.39	337.70	13,641
416	20'-0" high sports netting	LF	220.20	482.50	106,247
429	Team bench	LF	59.92	91.70	5,493
726	Foul pole including footing	EA	1.00	6,755.00	6,755
705	Aluminum bleacher system - Softball field, 50 person	LS	1.00	36,188.00	36,188
771	Exterior scoreboard softball	EA	1.00	57,900.00	57,900
	G2050 - Athletic, Recreational, and Playfield Areas				226,224
	11 - EQUIPMENT				226,224
31	EARTHWORK				
G1070	Site Earthwork				
755	Excavate athletic fields	CY	5,542.25		Incl.
1826	Remove spoils from site (athletic fields)	CY	5,542.25		Incl.
2846	Sitework associated with Softball and Soccer Field (L304)	LS	1.00	270,000.00	270,000
	G1070 - Site Earthwork				270,000
G2050	Athletic, Recreational, and Playfield Areas				
757	Prepare and compact subbase	SF	89,781.49		Incl.
758	Granular base to athletic fields, re-use excavated materials	CY	3,325.23		Incl.
1574	Imported dense grade crushed stone	CY	3,325.32		Incl.
	G2050 - Athletic, Recreational, and Playfield Areas				Incl.
	31 - EARTHWORK				270,000
32	EXTERIOR IMPROVEMENTS				
G2050	Athletic, Recreational, and Playfield Areas				
388	Natural grass turf (Baseball Courts and Soccer Field)	SF	89,781.61	4.30	389,876

NORTHEAST METROPOLITAN REGIONAL
TECHNICAL HIGH SCHOOL



90% CONSTRUCTION DOCUMENTS COST ESTIMATE -
REVISION 2

LOCATION DIVISIONS/ELEMENTS ITEM

ALT90 Alternate - 90% Construction Documents

A65 Add Irrigated Softball/Multi-Purpose Field (continued)

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
1522	Irrigation to natural grass turf	SF	89,781.61	1.60	147,287
693	6'-0" High BVC chainlink fence	LF	147.87	91.70	13,556
397	4'-0" High BVC chainlink fence	LF	1,050.80	57.90	60,841
398	4'-0" High BVC chainlink fence single leaf gate	EA	1.00	338.00	338
694	4'-0" High BVC chainlink fence double leaf gate	EA	1.00	676.00	676
396	Electronic scoreboard - steel posts with concrete footing	EA	1.00	7,720.00	7,720
692	Overhead shade structure	SF	512.00	48.30	24,704
2841	Miscellaneous base preparation and making good	SF	89,782.00		Incl.
G2050 - Athletic, Recreational, and Playfield Areas					644,998
G2080	Landscaping				
2401	Seeding lawn prospect athletic fields	SF	-101,544.40	1.00	-97,990
G2080 - Landscaping					-97,990
32 - EXTERIOR IMPROVEMENTS					547,008
ADD IRRIGATED SOFTBALL/MULTI-PURPOSE FIELD					1,070,923

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2

LOCATION SUMMARY

Rates Current At May 2023

Ref	Location	Total Cost USD
ALT90	Alternate - 90% Construction Documents	
A73	Add Maintenance Building	2,157,740
	ALT90 - Alternate - 90% Construction Documents	2,157,740
ESTIMATED NET COST		2,157,740
MARGINS & ADJUSTMENTS		
Design & Estimating Contingency		1.5 % 32,366
Escalation Allowance up to mid-point of Construction (3/2025)		3 % 65,703
Sub-contractor Bonds		1.2 % 27,070
CM Construction Contingency (per CM Pricing Exhibit 1)		2.5 % 57,072
CM Fee		46,800
ESTIMATED TOTAL COST		2,386,751

90% CONSTRUCTION DOCUMENTS COST ESTIMATE - REVISION 2



A73 Add Maintenance Building

Rates Current At May 2023

Ref	Description	Unit	Qty	Rate USD	Total Cost USD
13	SPECIAL CONSTRUCTION				
F1020	Special Structures				
2858	Allowance for Maintenance Building enclosure, interior construction, services, etc.	SF	10,400.00	207.50	2,157,740
	F1020 - Special Structures				2,157,740
	13 - SPECIAL CONSTRUCTION				2,157,740
ADD MAINTENANCE BUILDING					2,157,740

PROJECT SCOPE & BUDGET

UPDATED PROJECT BUDGET

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

**90%CD Total Project
Budget
1/20/2023**

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 / Modulares	\$0
Other Project Costs	\$850,000
Misc. Project Costs Subtotal	\$1,850,000
Furnishings and Equipment	
Furniture, Fixtures, and Equipment	\$6,661,000
Technology	\$4,155,500
FF&E Subtotal	\$10,816,500
Soft Costs that exceed 20% of Construction Cost	
Project Budget	\$299,170,541

Total Project Budget (excluding Contingencies)	\$299,170,541	
Third Party Funding (Ineligible)	\$7,499,922	See OPM Cover Letter
Construction Contingency	\$14,650,000	
Owner's Contingency	\$3,602,079	
Total Project Budget	\$324,922,542	

PROJECT SCOPE & BUDGET
EARLY-BID PACKAGE

6C.2.3 - 06

6C.2.3 – 06a

**DESCRIPTION OF
PACKAGES**

Early-Bid Packages

EARLY-BID PACKAGES | DESCRIPTION OF PACKAGES

On May 1, 2023, the District executed Amendment 003 which included a Request to Award (RTA) from Gilbane Building Company for an early phase 1 sitework package. Additionally, on May 16, 2023, the District executed Amendment 004 that included an RTA for the structural steel package. Gilbane Amendment 003 and Amendment 004 have been included in this submittal for reference which includes the contract award amounts and have been submitted to the MSBA under separate cover for record. Gilbane is in the process of drafting subcontractor agreements with J.R. Vinagro for the early sitework and Norgate for structural steel. Please see below for a description of the scope of work awarded within both the early sitework and structural steel packages.

Early Site Preparation

This 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.

Anticipated start of early sitework: June 5, 2023

Anticipated completion of early sitework: October 13, 2023

Early Structural Bid Package

This bid package includes labor, materials, equipment, and services required to complete the structural steel and metal decking work. This includes, but is not limited to, installation of structural steel beams, columns, joists, metal decking, misc. angles, etc. for a complete building superstructure.

Anticipated start of structural steel: March 5, 2024

Anticipated completion of structural steel: August 5, 2024

In addition to the above awarded packages, Gilbane is also actively soliciting proposals for the concrete foundations/slabs and precast concrete plank scopes of work. The project team anticipates an RTA for both bid packages will be submitted to the project team and District for review and approval in late May/early June 2023.

6C.2.3 – 06b

BID TABLES

Early-Bid Packages

Gilbane Building Company
10 Channel Center Street
Boston, Ma. 02210



April 28, 2023

Mr. David DiBarri
Superintendent
Northeast Metropolitan Regional Vocational High School
100 Hemlock Road
Wakefield, MA 01880

Re: NEMT High School Project- Amendment #3

Dear Mr. DiBarri:

Gilbane Building Company respectfully requests that our *Agreement for Construction Management At Risk Services* for the Northeast Metropolitan Regional Vocational High School Project (NEMT) dated August 25th, 2021, be amended to include costs for Gilbane General Conditions and General Requirements for the Early Site Enabling Phase 1 Work. We also request funding approval for the Sitework Recommendation to Award Letter included herein. Should you need any additional information or have any questions, please feel free to contact me at 617-839-6157

Thank you.

Sincerely,

GILBANE BUILDING COMPANY

Michael D. Mallett

Digitally signed by Michael D. Mallett
DN: C=US, E=mallett@gilbane.com,
O=Gilbane, OU=Operations, CN=Michael D.
Mallett
Reason: Amendment #3 NEMT
Date: 2023.04.28 13:15:50-04'00'

Michael D. Mallett
Sr. Project Executive

NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT
AGREEMENT FOR CONSTRUCTION
MANAGER AT RISK SERVICES
OWNER-CONSTRUCTION MANAGER AGREEMENT
NEMT HIGH SCHOOL PROJECT

CONTRACT AMENDMENT
NO. 3

WHEREAS, the Northeast Metropolitan Regional Vocational School District (the "Owner") with a principal place of business at 100 Hemlock Road, Wakefield, MA 01880 and Gilbane Building Company (the "Construction Manager" or "CM") with a principal place of business at 10 Channel Center, Suite 100, Boston, MA 02210, (collectively, the "Parties") entered into an Owner-Construction Manager Agreement (the "Contract") for the performance of pre-construction services and construction services, as described in the Contract Documents, during the design and construction of the NEMT High School Project (the "Project") on August 25, 2021; and

WHEREAS, the parties executed Contract Amendments 1 and 2, summarized in the following table:

Contract Amendment	Execution Date	Summary of Contract Amendment Contents
1	4/7/22	Preconstruction CC & CD Phases
2	3/1/23	Contractor Controlled Insurance Program and Subcontract Default Insurance Program

; and,

WHEREAS, pursuant to Article 4 of the Contract, Paragraph 4.1 Commencement Date, the CM shall begin construction phase services pursuant to the terms and conditions included in written Notice to Proceed (NTP); and,

WHEREAS, pursuant to Article 4 of the Contract, Paragraph 4.1.2 Construction Services, the Owner may issue a NTP to perform an initial phase of construction services, prior to the issuance of the Guaranteed Maximum Price (GMP) Amendment, as described in the Request for Proposals; and,

WHEREAS, Article 4 of the Contract, Paragraph 4.5 Phasing of the Work, identifies Phase 1 Early Site Enabling; and,

NOW THEREFORE, in consideration of the promises and the mutual covenants contained in this Amendment, and other good and valuable consideration, the receipt and legal sufficiency of

which are hereby acknowledged, the Parties intending to be legally bound, hereby agree as follows:

- (1) Phase 1 Early Site Enabling, Gilbane General Conditions & General Requirements. Refer to Exhibit 3A, which is incorporated by reference herein.
- (2) The CM shall perform the indicated scope of the Recommendation to Award (RTA), which is considered executed and approved with the execution of this Amendment 3, in the following table:

RTA	Scope of Work	Recommended Trade Contractor	Recommended Trade Contract Value	Reference Exhibit for RTA Document
31A	Sitework	JR Vinagro Corporation	\$25,522,000.00	Exhibit 3B-RTA-31A

Additionally, the CM markups for Subcontractor Default Insurance ("SDI"), CM GRs/GCs, Builder's Risk Insurance (Exhibit 3B-2), Contractor-Controlled Insurance Program ("CCIP"), and CM Fee are approved as indicated in Exhibit 3B-1, all of which are incorporated by reference and are summarized below:

Item	Value	Notes
Total Direct Costs	\$25,522,000.00	See Exhibit 3B-1 for all Details
SDI	\$306,264.00	See Exhibit 3B-1 for all Details
CM GRs	\$249,471.61	See Exhibit 3B-1 for all Details
CM GCs	\$375,836.15	See Exhibit 3B-1 for all Details
Builder's Risk	\$404,485.00	See Exhibit 3B-2 for all Details
CCIP	\$782,053.68	See Exhibit 3B-1 for all Details
CM Fee	\$451,994.62	See Exhibit 3B-1 for all Details
Total	\$28,092,105.06	See Exhibit 3B-1 for all Details

~~\$26,905,566.38~~ (J.D. 5/1/23)

- (3) The Owner shall pay the CM for the scope of work authorized under this Contract Amendment, the amount not to exceed an add of **\$28,092,105.06** in addition to the Contract Amount and previously approved Contract Amendments. The Owner shall make all such payments in accordance with Article 8, Paragraph 8.1 of the Contract.
- (4) Following execution of this Contract Amendment, the new total contract value will be as follows:

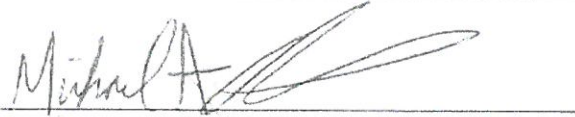
Original Contract	\$50,000
Amendment #1	\$400,000
Amendment #2	\$0
Total Contract through Amendment #2	\$450,000
Amendment #3	\$28,092,105.06 \$26,905,566.38
Total Contract Following Execution of Amendment #3	\$28,542,105.06 \$27,355,566.38

- (5) Notice to Proceed shall commence immediately upon execution of this Contract Amendment.
- (6) All other terms of the Contract not expressly altered hereunder shall remain in full force and effect.

(J.P./23) 2

IN WITNESS WHEREOF, the parties hereto have caused this instrument, Contract Amendment No. 3, to be executed in triplicate as of April 28, 2023.

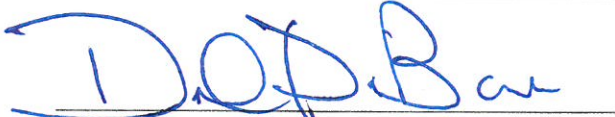
CONSTRUCTION MANAGER (Gilbane Building Company)


Name: Michael O'Brien

Title: Senior Vice President

Date: 4/28/2023

OWNER – NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT


Name: David DiBarri

Title: Superintendent

Date: 5/1/23

NORTHEAST METROPOLITAN VOCATIONAL TECHNICAL HIGH SCHOOL

AMENDMENT SUMMARY - Exhibit 3B-1

4.28.23

	ORIGINAL CONTRACT	AMENDMENT 1	AMENDMENT 2	AMENDMENT 3	Grand Total
	000	001	002	003	
COST ITEM					
02A - DEMOLITION & ABATEMENT					\$0.00
03A - CONCRETE					\$0.00
03B - PRECAST CONCRETE PLANKS					\$0.00
TRADE BID 04A - MASONRY					\$0.00
05A - STRUCTURAL STEEL					\$0.00
TRADE BID 05B - MISC. METALS					\$0.00
06A - MILLWORK					\$0.00
TRADE BID 07A - EARLY WATERPROOFING, DAMPPROOFING					\$0.00
TRADE BID 07B - WATERPROOFING, DAMPPROOFING AND CAULKING					\$0.00
TRADE BID 07C - ROOFING AND FLASHING					\$0.00
07D - SPRAY FIREPROOFING					\$0.00
07E - METAL PANELS					\$0.00
08A - DOORS/FRAMES/HARDWARE					\$0.00
TRADE BID 08B - GLASS & GLAZING					\$0.00
08C - SPECIAL DOORS, LOADING DOCK EQUIPMENT					\$0.00
TRADE BID 08D - METAL WINDOWS					\$0.00
09A - GENERAL TRADES					\$0.00
TRADE BID 09B - TILING					\$0.00
TRADE BID 09C - ACOUSTICAL CEILINGS					\$0.00
TRADE BID 09D - RESILIENT FLOORING					\$0.00
TRADE BID 09E - TERRAZZO					\$0.00
TRADE BID 09F - PAINTING					\$0.00
09G - RESINOUS FLOORING					\$0.00
09H - CARPETING					\$0.00
09I - WOOD FLOORING					\$0.00
09J - ATHLETIC WOOD FLOORING					\$0.00
10A - SIGNAGE					\$0.00
10B - SPECIALTIES					\$0.00
11A - FOOD SERVICE EQUIPMENT					\$0.00
11B - GYM EQUIPMENT					\$0.00
11C - VOCATIONAL EQUIPMENT					\$0.00
11D - AUDITORIUM EQUIPMENT					\$0.00
11E - ATHLETIC EQUIPMENT					\$0.00
12A - WINDOW TREATMENTS					\$0.00
12B - LABORATORY CASEWORK					\$0.00
13A - PRE-ENGINEERED BUILDING SYSTEMS					\$0.00
TRADE BID 14A - ELEVATORS					\$0.00
TRADE BID 21A - FIRE PROTECTION					\$0.00
TRADE BID 22A - PLUMBING					\$0.00
TRADE BID 23A - HVAC					\$0.00
TRADE BID 26A - EARLY SITE ELECTRICAL					\$0.00
TRADE BID 26B - ELECTRICAL					\$0.00
31A - SITEWORK				\$25,522,000.00	\$25,522,000.00
32A - SITE IMPROVEMENTS & LANDSCAPING					\$0.00
SUBTOTALS OF ABOVE DETAIL					
SUBTOTAL DIRECT COSTS - TRADE BID BPs	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
SUBTOTAL DIRECT COSTS - SUBCONTRACT BPs	\$0.00	\$0.00	\$0.00	\$25,522,000.00	\$25,522,000.00
SDI for SUBCONTRACT BPs (1.2%)	\$0.00	\$0.00	\$0.00	\$306,264.00	\$306,264.00
GMP ALLOWANCES	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
COST OF THE WORK	\$0.00	\$0.00	\$0.00	\$25,828,264.00	\$25,828,264.00
DESIGN & ESTIMATING CONTINGENCY	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
ESCLATION/MARKET CONTINGENCY	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
CM GENERAL REQUIREMENTS	\$0.00	\$0.00	\$0.00	\$249,471.61	\$249,471.61
CM GENERAL CONDITIONS	\$0.00	\$0.00	\$0.00	\$375,836.15	\$375,836.15
PERFORMANCE & PAYMENT BOND	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
BUILDERS RISK INS. (Cost to be finalized at GMP, See Ex. 3B-2 For Current Cost)	\$0.00	\$0.00	\$0.00	\$404,485.00	\$404,485.00
CONTRACTOR-CONTROLLED INSURANCE PROGRAM (\$25.45+ \$1.95/1000)	\$0.00	\$0.00	\$0.00	\$782,093.68	\$782,093.68
CM CONTINGENCY (To be realized at GMP)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
CM FEE (1.75% of C.O.W.)	\$0.00	\$0.00	\$0.00	\$451,994.62	\$451,994.62
TOTAL CONSTRUCTION COSTS	\$0.00	\$0.00	\$0.00	\$28,842,105.06	\$28,842,105.06
TOTAL PRE-CONSTRUCTION COSTS	\$50,000.00	\$400,000.00	\$0.00	\$450,000.00	\$900,000.00
CUMULATIVE TOTAL CONTRACT VALUE	\$50,000.00	\$400,000.00	\$0.00	\$28,842,105.06	\$29,292,105.06

J.D. (5/1/23)

\$1,077,302.38 (J.D. 5/1/23)

\$27,355,566.38 (J.D. 5/1/23)

Gilbane Building Company
10 Channel Center Street
Boston, Ma. 02210



May 11, 2023

Mr. David DiBarri
Superintendent
Northeast Metropolitan Regional Vocational High School
100 Hemlock Road
Wakefield, MA 01880

Re: NEMT High School Project- Amendment #4

Dear Mr. DiBarri:

Gilbane Building Company respectfully requests that our *Agreement for Construction Management At Risk Services* for the Northeast Metropolitan Regional Vocational High School Project (NEMT) dated August 25th, 2021, be amended to include costs for Gilbane General Conditions and General Requirements for the Early Structural Steel Work, Builder's Risk, and a portion of the CCIP costs for Sitework and Steel Bid Packages as detailed in Exhibit 4B-3. We also request funding approval for the Structural Steel Recommendation to Award Letter included herein. Should you need any additional information or have any questions, please feel free to contact me at 603-969-3426.

Thank you.

Sincerely,

GILBANE BUILDING COMPANY

Tripp McElroy

Digitally signed by Tripp McElroy
DN: c=US, e=trippm@gilbane.com,
o=Gilbane Building Company, CN=Tripp
McElroy
Date: 2023.05.11 08:20:40-0400

Tripp McElroy
Sr. Project Executive

NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT
AGREEMENT FOR CONSTRUCTION
MANAGER AT RISK SERVICES
OWNER-CONSTRUCTION MANAGER AGREEMENT
NEMT HIGH SCHOOL PROJECT

CONTRACT AMENDMENT
NO. 4

WHEREAS, the Northeast Metropolitan Regional Vocational School District (the “Owner”) with a principal place of business at 100 Hemlock Road, Wakefield, MA 01880 and Gilbane Building Company (the “Construction Manager” or “CM”) with a principal place of business at 10 Channel Center, Suite 100, Boston, MA 02210, (collectively, the “Parties”) entered into an Owner-Construction Manager Agreement (the “Contract”) for the performance of pre-construction services and construction services, as described in the Contract Documents, during the design and construction of the NEMT High School Project (the “Project”) on August 25, 2021; and

WHEREAS, the parties executed Contract Amendments 1, 2, and 3 summarized in the following table:

Contract Amendment	Execution Date	Summary of Contract Amendment Contents
1	4/7/22	Preconstruction CC & CD Phases
2	3/1/23	Contractor Controlled Insurance Program and Subcontract Default Insurance Program
3	5/1/23	Sitework RTA & GC/GRs

; and,

WHEREAS, pursuant to Article 4 of the Contract, Paragraph 4.1 Commencement Date, the CM shall begin construction phase services pursuant to the terms and conditions included in written Notice to Proceed (NTP); and,

WHEREAS, pursuant to Article 4 of the Contract, Paragraph 4.1.2 Construction Services, the Owner may issue a NTP to perform an initial phase of construction services, prior to the issuance of the Guaranteed Maximum Price (GMP) Amendment, as described in the Request for Proposals; and,

WHEREAS, Article 4 of the Contract, Paragraph 4.5 Phasing of the Work, identifies Structural Steel as a Phase 2 Early Bid Package. For the purposes of this amendment, this shall be referred to as Phase 2A.

NOW THEREFORE, in consideration of the promises and the mutual covenants contained in this Amendment, and other good and valuable consideration, the receipt and legal sufficiency of which are hereby acknowledged, the Parties intending to be legally bound, hereby agree as follows:

- (1) Phase 2A Early Structural Steel, Gilbane General Conditions & General Requirements. Refer to Exhibit 4A, which is incorporated by reference herein.
- (2) The CM shall perform the indicated scope of the Recommendation to Award (RTA) which will be incorporated into a future Guaranteed Maximum Price (GMP) amendment. The RTA is considered executed and approved with the execution of this Amendment 4 in the following table:

RTA	Scope of Work	Recommended Trade Contractor	Recommended Trade Contract Value	Reference Exhibit for RTA Document
05A	Steel	Norgate Metal	\$17,744,525.00	Exhibit 4B-2-RTA-05A

Additionally, the CM markups for Subcontractor Default Insurance ("SDI"), CM GRs/GCs, Builder's Risk Insurance, Contractor-Controlled Insurance Program ("CCIP"), and CM Fee are approved as indicated in Exhibit 3B-1, all of which are incorporated by reference and are summarized below:

Item	Value	Notes
Total Direct Costs	\$17,744,525.00	See Exhibit 3B-1 for all Details
SDI	\$212,934.30	See Exhibit 4B-1 for all Details
CM GRs	\$141,793.06	See Exhibit 4B-1 for all Details
CM GCs	\$342,416.90	See Exhibit 4B-1 for all Details
Builder's Risk	\$365,272.00	See Exhibit 4B-1 for all Details
CCIP	\$950,000.00	See Exhibit 4B-3 for all Details
CM Fee	\$314,255.54	See Exhibit 4B-1 for all Details
Total	\$20,071,196.80	See Exhibit 4B-1 for all Details

- (3) The Owner shall pay the CM for the scope of work authorized under this Contract Amendment, the amount not to exceed an add of **\$20,071,196.80** in addition to the Contract Amount and previously approved Contract Amendments. The Owner shall make all such payments in accordance with Article 8, Paragraph 8.1 of the Contract.
- (4) Following execution of this Contract Amendment, the new total contract value will be as follows:

Original Contract Amount	\$50,000
Amendment #1	\$400,000
Amendment #2	\$0
Amendment #3	\$26,905,566.38
Total Contract through Amendment #3	\$27,355,566.38
Amendment #4	\$20,071,196.80
	\$47,426,763.18

- (5) Notice to Proceed shall commence immediately upon execution of this Contract Amendment.
- (6) All other terms of the Contract not expressly altered hereunder shall remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument, Contract Amendment No. 4, to be executed in triplicate as of May 10, 2023.

CONSTRUCTION MANAGER (Gilbane Building Company)



Name: Michael O'Brien

Title: Senior Vice President

Date: 5/11/2023

OWNER – NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT



Name: David DiBarri

Title: Superintendent

Date: 5/16/23

NORTHEAST METROPOLITAN VOCATIONAL TECHNICAL HIGH SCHOOL

AMENDMENT SUMMARY - Exhibit 4B-1

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	ORIGINAL CONTRACT	AMENDMENT 1	AMENDMENT 2	AMENDMENT 3	AMENDMENT 4	TOTAL THRU AMENDMENT 4
	000	001	002	003	004	
COST ITEM						
02A - DEMOLITION & ABATEMENT						\$0.00
03A - CONCRETE						\$0.00
03B - PRECAST CONCRETE PLANKS						\$0.00
TRADE BID 04A - MASONRY						\$0.00
05A - STRUCTURAL STEEL					\$17,744,525.00	\$17,744,525.00
TRADE BID 05B - MISC. METALS						\$0.00
06A - MILLWORK						\$0.00
TRADE BID 07A - EARLY WATERPROOFING, DAMPROOFING						\$0.00
TRADE BID 07B - WATERPROOFING, DAMPROOFING AND CAULKING						\$0.00
TRADE BID 07C - ROOFING AND FLASHING						\$0.00
07D - SPRAY FIREPROOFING						\$0.00
07E - METAL PANELS						\$0.00
08A - DOORS/FRAMES/HARDWARE						\$0.00
TRADE BID 08B - GLASS & GLAZING						\$0.00
08C - SPECIAL DOORS, LOADING DOCK EQUIPMENT						\$0.00
TRADE BID 08D - METAL WINDOWS						\$0.00
09A - GENERAL TRADES						\$0.00
TRADE BID 09B - TILING						\$0.00
TRADE BID 09C - ACOUSTICAL CEILINGS						\$0.00
TRADE BID 09D - RESILIENT FLOORING						\$0.00
TRADE BID 09E - TERRAZZO						\$0.00
TRADE BID 09F - PAINTING						\$0.00
09G - RESINOUS FLOORING						\$0.00
09H - CARPETING						\$0.00
09I - WOOD FLOORING						\$0.00
09J - ATHLETIC WOOD FLOORING						\$0.00
10A - SIGNAGE						\$0.00
10B - SPECIALTIES						\$0.00
11A - FOOD SERVICE EQUIPMENT						\$0.00
11B - GYM EQUIPMENT						\$0.00
11C - VOCATIONAL EQUIPMENT						\$0.00
11D - AUDITORIUM EQUIPMENT						\$0.00
11E - ATHLETIC EQUIPMENT						\$0.00
12A - WINDOW TREATMENTS						\$0.00
12B - LABORATORY CASEWORK						\$0.00
13A - PRE-ENGINEERED BUILDING SYSTEMS						\$0.00
TRADE BID 14A - ELEVATORS						\$0.00
TRADE BID 21A - FIRE PROTECTION						\$0.00
TRADE BID 22A - PLUMBING						\$0.00
TRADE BID 23A - HVAC						\$0.00
TRADE BID 26A - EARLY SITE ELECTRICAL						\$0.00
TRADE BID 26B - ELECTRICAL						\$0.00
31A - SITEWORK				\$25,522,000.00		\$25,522,000.00
32A - SITE IMPROVEMENTS & LANDSCAPING						\$0.00
						\$0.00
						\$0.00
						\$0.00
SUBTOTALS OF ABOVE DETAIL						\$0.00
SUBTOTAL DIRECT COSTS - TRADE BID BPs	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
SUBTOTAL DIRECT COSTS - SUBCONTRACT BPs	\$0.00	\$0.00	\$0.00	\$25,522,000.00	\$17,744,525.00	\$43,766,525.00
						\$0.00
SDI for SUBCONTRACT BPs (1.2%)	\$0.00	\$0.00	\$0.00	\$306,264.00	\$212,934.30	\$519,198.30
GMP ALLOWANCES	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00
						\$0.00
COST OF THE WORK	\$0.00	\$0.00	\$0.00	\$25,828,264.00	\$17,957,459.30	\$43,785,723.30
						\$0.00
DESIGN & ESTIMATING CONTINGENCY	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
ESCLATION/MARKET CONTINGENCY	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
CM GENERAL REQUIREMENTS	\$0.00	\$0.00	\$0.00	\$249,471.61	\$141,793.06	\$391,264.67
CM GENERAL CONDITIONS	\$0.00	\$0.00	\$0.00	\$375,836.15	\$342,416.90	\$718,253.05
PERFORMANCE & PAYMENT BOND	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
BUILDERS RISK INS. (Cost to be finalized at GMP, See Ex. 3B-2 For Current Cost)	\$0.00	\$0.00	\$0.00	\$0.00	\$365,272.00	\$365,272.00
CONTRACTOR-CONTROLLED INSURANCE PROGRAM (\$25.45+ \$1.95/1000)	\$0.00	\$0.00	\$0.00	\$0.00	\$950,000.00	\$950,000.00
CM CONTINGENCY (To be realized at GMP)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
CM FEE (1.75% of C.O.W.)	\$0.00	\$0.00	\$0.00	\$451,994.62	\$314,255.54	\$766,250.16
						\$0.00
TOTAL CONSTRUCTION COSTS	\$0.00	\$0.00	\$0.00	\$1,077,302.38	\$2,113,737.50	\$3,191,039.88
						\$0.00
TOTAL PRE-CONSTRUCTION COSTS	\$50,000.00	\$400,000.00	\$0.00	\$0.00	\$0.00	\$450,000.00
						\$0.00
TOTAL AMENDMENT VALUE	\$50,000.00	\$400,000.00	\$0.00	\$26,905,566.38	\$20,071,196.80	\$47,426,763.18

PROJECT SCOPE & BUDGET
VALUE ENGINEERING

6C.2.3 - 07

6C.2.3 – 07a

**SUMMARY
TRACKING
SHEET**

Value Engineering

Project information								
MSBA ID	Calendar Year of sub bid date	District	School	OPM	Designer	CM\GC	Procurement Type (DBB/CMR)	PS&B Executed Date
201708530605	2023	Northeast Metropolitan Regional Vocational School District	Northeast Metropolitan Regional Vocational High School	PMA Consultants	DRA Architects	Gilbane	CMR	12/15/2021

SD Submittal

SD Submittal				
PSR Construction Budget	PSR Total Budget	SD Construction Budget	SD Total Budget	Delta between PSR and SD

\$ 243,514,418 \$ 317,422,620 \$ 244,041,092 \$ 317,422,620 \$0

Includes \$450K in
Precon services

PFA or PSBA data					
PS&B/PFA Construction Estimate W\ Pre-Con & Alts -	Design & Pricing Contingency (\$)	Design & Pricing Contingency (% of Construction Budget)	Escalation to mid point of construction (\$)	Escalation to mid point of construction (%)	Total Project Budget
\$244,041,092	\$13,379,255	5.48%	\$18,218,085	7.47%	\$317,422,620

DD										
Designer Current Cost Estimate	CMR Current Cost Estimate	CMR Reconciled DD Estimate after VE	Design & Pricing Contingency (\$)	Design & Pricing Contingency (% of DD Construction Budget)	Escalation to mid point of construction (\$)	Escalation to mid point of construction (%)	Approved VE at DD since PFA (\$)	% OF approved VE since PFA (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 estimator of record RLB (unless specifically requested CMR)
Includes VE										

CD60													
Designer Current Cost Estimate	CMR Current Cost Estimate	CMR Reconciled CD60 Estimate after VE	Design & Pricing Contingency (\$)	Design & Pricing Contingency (% of CD60 Construction Budget)	Escalation to mid point of construction (\$)	Escalation to mid point of construction (%)	Approved VE at CD60 (\$)	% OF CD60 VE to PFA	Approved VE since PFA (\$)	% of approved VE since PFA (AR/P)	CD60 Total 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

All values from designers cost estimator of record RLB (unless specifically requested CMR)

CD90													
Designer Current Cost Estimate	CMR Current Cost Estimate	CMR Reconciled CD90 Estimate after VE	Design & Pricing Contingency (\$)	Design & Pricing Contingency (% of CD90 Construction Budget)	Escalation to mid point of construction (\$)	Escalation to mid point of construction (%)	Approved VE at CD90 (\$)	% OF CD90 VE to PFA	Approved VE since PFA (\$)	% of approved VE since PFA (BF/P)	CD90 Total Project Budget	CD90 Date	Comments
\$249,055,108	\$248,931,893	\$248,931,893	\$3,021,959	1.21%	\$6,134,575	2.46%	\$0	0%	\$37,100,073	15%	\$324,922,542	5/26/2023	All values from designers cost estimator of record RLB (unless specifically requested CMR)
Does not include add alternate pricing		VE not required (below construction budget)											

6C.2.3 – 07b

**VE
COMMITTEE
VOTE**

Value Engineering

6C.2.3-07b

VALUE ENGINEERING | COMMITTEE VOTE

Not Applicable – Value Engineering not conducted for the 90% CD submission.

PROJECT SCOPE & BUDGET

PRE-QUALIFIED SUBCONTRACTORS

6C.2.3 - 08

6C.2.3-08

PRE-QUALIFIED SUBCONTRACTORS

The Northeast Metro Tech Project is currently in the process of prequalifying filed sub-bid trade contractors. On April 12, 2023, a Request for Qualifications was posted to Projectdog with a deadline to submit a Statement of Qualification (SOQ's) by May 3, 2023. The project received (92) SOQ's in total across (16) filed trade categories. The Prequalification Committee is in the process of reviewing the SOQ's and assigning scoring for each firm. The Committee is targeting early-mid June 2023 for completion of the prequalification process and will then notify firms of their qualification status. For additional information regarding the anticipated timeline please refer to the PMA schedule included within this submission. Please see Exhibit A for a comprehensive list of SOQ's received for the project.

Firm	Trade Type	Name	E-Mail	Submitted SOQ?	Pre-Qual Score	Pre-Qualified?
Cheviot Corporation	Acoustical Tile	David Durfee Mai Tran	DDurfee@cheviotcorp.com mtran@cheviotcorp.com	Yes	TBD	TBD
H. Carr & Sons, Inc.	Acoustical Tile	Rebecca Kernick	rbkernick@hcar.com	Yes	TBD	TBD
Central Ceilings	Acoustical Tile	Pte Construction	bid_invites@centralceilings.com	Yes	TBD	TBD
K&K Acoustical Ceilings, Inc.	Acoustical Tile	Kevin Kontos LouAnne DeMatteo	kevinkontos@kakacousticalceilings.com louanne@kakacousticalceilings.com	Yes	TBD	TBD
Wayne J. Griffin Electric, Inc.	Electrical	Amy Foster Lisa Morton	afoster@wjef.com lmorton@wjef.com	Yes	TBD	TBD
Sullivan & McLaughlin Companies, Inc.	Electrical	Angela Lyu	allyu@slmymac.com	Yes	TBD	TBD
Castro Electric Company	Electrical	Carole Richards	carolr@castroelectric.com	Yes	TBD	TBD
LeVangie Electric Co., Inc.	Electrical	Christina Sullivan	christina@leeco-contracting.com	Yes	TBD	TBD
Annese Electric	Electrical	Cindy Micheli	cmicheli@anneseelectric.com	Yes	TBD	TBD
Delta Beckwith Elevator Company	Elevator	Mike Lee	mikec.lee@delta-beckwith.com	Yes	TBD	TBD
Johnson Controls Fire Protection LP	Fire Protection	Margaret Henley Edgar Sazo	margaret.henley@jci.com esazo@emplevprnval.com	Yes	TBD	TBD
Arden Engineering Constructors, LLC	Fire Protection	Kenneth Demers	kdemers@ardengeng.com	Yes	TBD	TBD
Rustic Fire Protection	Fire Protection	Chad Dubois Kristal Dion	cdubois@rusticfireprotection.com kdion@rusticfireprotection.com	Yes	TBD	TBD
Cogswell Sprinkler Co., Inc.	Fire Protection	Jessica Vallencourt	jess@cogswellsprinkler.com	Yes	TBD	TBD
Hampshire Fire Protection Co., LLC	Fire Protection	Karen Gill Paul DeLore	kagill@hampshirefire.com pdelore@hampshirefire.com	Yes	TBD	TBD
E M Duggan, Inc.	Fire Protection	Srey Heng Joseph Giguere	estimating@emduagan.com jgiguere@emduagan.com	Yes	TBD	TBD
Aluminum & Glass Concepts, Inc.	Glass and Glazing	Christopher Murray	cmurray@aluminumandglass.com	Yes	TBD	TBD
Lockhead Architectural Solutions	Glass and Glazing	Debbie Rich	drich@lockheadarchitect.com	Yes	TBD	TBD
Lizotte Glass, Inc.	Glass and Glazing	Peggy LeBlanc	pleblanc@lizotteglass.net	Yes	TBD	TBD
R & R Window Contractors, Inc.	Glass and Glazing	Tabby Smith	estimating@rrwindow.com	Yes	TBD	TBD
Kaploff's Glass	Glass and Glazing	Nan Kaploff	debbie@kaploffs.com	Yes	TBD	TBD
Chandler Architectural Products, Inc.	Glass and Glazing	Amarda Harwig	amarda@cap-inc.net	Yes	TBD	TBD
A & A Window Products, Inc.	Glass and Glazing	Lucy Gig	L.Gigello@aawindowproducts.com	Yes	TBD	TBD
Harry Gotsky & Co., Inc.	HVAC	Kristen Gonsalves	kzgon@harrygotsky.com	Yes	TBD	TBD
E. Amanti & Sons, Inc.	HVAC	Diane Amanti	diane@eamanti.com	Yes	TBD	TBD
TG Gallagher	HVAC	Estimating Department	bidinvites@tgallagher.com	Yes	TBD	TBD
Arden Engineering Constructors, LLC	HVAC	Kenneth Demers	estimating@ardengeng.com	Yes	TBD	TBD
General Mechanical Contractors	HVAC	Michael Tompkins	mike@genmech.com	Yes	TBD	TBD
Harold Brothers Mechanical	HVAC	Mike Smith	msmith@harcobros.com	Yes	TBD	TBD
Patrick J. Kennedy & Sons, Inc.	HVAC	Raymond Hanley	estimating@pkennedy.com	Yes	TBD	TBD
E M Duggan, Inc.	HVAC	Srey Heng Joseph Giguere	estimating@emduagan.com jgiguere@emduagan.com	Yes	TBD	TBD
Lighthouse Masonry, Inc.	Masonry	Jason Alves	javes@ldhousenmasonry.com	Yes	TBD	TBD
Empire Masonry Corp	Masonry	Kristen Hancock	khanock@empiremasonrycorp.com	Yes	TBD	TBD
Coste Brothers Masonry, Inc.	Masonry	Lisa DeCosta Lopez	lde@costebrosmasonry.com	Yes	TBD	TBD
Fernandes Masonry, Inc.	Masonry	Vera Vadeboncoeur	Estimating@fernandesmasonry.com	Yes	TBD	TBD
Commercial Masonry Corporation	Masonry	Joe Bombardier	bombardier@commercialmasonry.com	Yes	TBD	TBD
Marmelo Bros. Construction	Masonry	Steven Marmelo Kristy Correia Sandra Sousa	Stevenmarmelo@hotmail.com kristy@marmelobroconstruction.com sandy@marmelobroconstruction.com	Yes	TBD	TBD
Lockhead Architectural Solutions	Metal Windows	Debbie Rich	drich@lockheadarchitect.com	Yes	TBD	TBD
Lizotte Glass, Inc.	Metal Windows	Peggy LeBlanc	pleblanc@lizotteglass.net	Yes	TBD	TBD
R & R Window Contractors, Inc.	Metal Windows	Tabby Smith	estimating@rrwindow.com	Yes	TBD	TBD
Chandler Architectural Products, Inc.	Metal Windows	Amarda Harwig	amarda@cap-inc.net	Yes	TBD	TBD
A & A Window Products, Inc.	Metal Windows	Lucy Gig	L.Gigello@aawindowproducts.com	Yes	TBD	TBD
Capone Iron Corporation	Miscellaneous Metals and Ornamental Iron	Sean Capone	j.capone@caponeiron.com	Yes	TBD	TBD
SMJ Metal Company, Inc.	Miscellaneous Metals and Ornamental Iron	Jeff Payne	jpayne@ralphblacksmith.com	Yes	TBD	TBD
Quinn Brothers of Essex, Inc.	Miscellaneous Metals and Ornamental Iron	Stephanie Taber	stephanie@quinnbro.com	Yes	TBD	TBD
United Steel	Miscellaneous Metals and Ornamental Iron	Pam Seilhammer	pseilhammer@unitedsteel.com	Yes	TBD	TBD
Roman Iron Works, Inc.	Miscellaneous Metals and Ornamental Iron	Maddalena Amazeze	roman20@air.com	Yes	TBD	TBD
Select Paint and Finishes LLC	Painting	Manejujn Pinheiro	Manejujn@selectpaint.com	Yes	TBD	TBD
First Nick Companies	Painting	Alexander Kritikos	alex@firstnick.com	Yes	TBD	TBD
Alpha Contracting Associates, Inc.	Painting	Anthony Boualis	info@alphacontracting.com	Yes	TBD	TBD
Bello Painting Company, Inc.	Painting	Dominic Bello	info@bellopainting.com	Yes	TBD	TBD
New Generation Painting Co., Inc.	Painting	Mario Rodrigues	newgenerationpainting@hotmail.com	Yes	TBD	TBD
King Painting, Inc.	Painting	Naomi Eggs	naomi@kingpainting.com	Yes	TBD	TBD
O Byrne Painting and Contracting Inc.	Painting	Patrick Byrne	pbyrnepainting@gmail.com	Yes	TBD	TBD
Dandis Contracting, Inc.	Painting	Patty Dandis	PDandis@dandiscontracting.com	Yes	TBD	TBD
M.L. McDonald sales co.	Painting	Roger Kemmitt	rlemmitt@mlmcdonalds.com	Yes	TBD	TBD
Homer Contracting, Inc.	Painting	Stefanos Bououlis	sboulis@homercontracting.com	Yes	TBD	TBD
John W. Egan Co., Inc.	Painting	Damian Rebbaz	Drebbaz@johnwegan.com	Yes	TBD	TBD
Araujo Bros Plumbing & Heating	Plumbing	Anabela DaCosta	adacosta@araujobrosplumbing.com	Yes	TBD	TBD
E. Amanti & Sons, Inc.	Plumbing	Nathan Cordero	nathan@eamanti.com	Yes	TBD	TBD
Grasseschi Plumbing & Heating, Inc.	Plumbing	Maureen Dupre	mdupre@grasseschi.com	Yes	TBD	TBD
Harold Brothers Mechanical	Plumbing	Mike Smith	msmith@harcobros.com	Yes	TBD	TBD
Patrick J. Kennedy & Sons, Inc.	Plumbing	Raymond Hanley	estimating@pkennedy.com	Yes	TBD	TBD
P.J. Dione Co., Inc.	Plumbing	Mike Dione	mike@dione.com	Yes	TBD	TBD
E M Duggan, Inc.	Plumbing	Srey Heng Joseph Giguere	estimating@emduagan.com jgiguere@emduagan.com	Yes	TBD	TBD
Allegheny Contract Flooring Inc.	Resilient Floors	David Stachura	dastachura@alleghenycontract.com	Yes	TBD	TBD
Ayotte & King for Tile	Resilient Floors	David King	davidking@ayotteandking.com	Yes	TBD	TBD
Pavilion Floors, Inc.	Resilient Floors	Martina Langone	mlangone@pavilionfloors.com	Yes	TBD	TBD
Capital Carpet & Flooring Specialists, Inc.	Resilient Floors	Maureen Crozier	maureen@capitalcarpetandtile.com	Yes	TBD	TBD
CJM Services Inc.	Resilient Floors	Betty Polanco	bettypolanco@cmjservices.com	Yes	TBD	TBD
Young Developers LLC	Roofing and Flashing	Rob Nordman	estimating@ydcroofing.com	Yes	TBD	TBD
Greenwood Industries, Inc.	Roofing and Flashing	Greenwood Industries	bidcoordinator@greenwood-industries.com	Yes	TBD	TBD
Gateway Roofing Systems, Inc.	Roofing and Flashing	Kathie Rybecki	kathie@gatewayroofing.com	Yes	TBD	TBD
Silkdown Roofing, Inc.	Roofing and Flashing	Kim Romagna	krm@silkdownroofing.com	Yes	TBD	TBD
Stanley Roofing Company	Roofing and Flashing	Paul Stanley	kristen@stanleyroof.com	Yes	TBD	TBD
Roman Mosaic and Tile Co.	Terrazzo	Douglas Wilczek	dwilczek@romannosaic.com	Yes	TBD	TBD
DePauli Mosaic	Terrazzo	Leslie Carro	info@depaulimosaic.com	Yes	TBD	TBD
Joseph Cohn and Son Tile & Terrazzo, LLC	Terrazzo	Sue Antonucci	suzanne@josephcohnandson.com	Yes	TBD	TBD
Select Tile, Marble & Flooring	Tile	Vincent Morano Samantha Holbrook Jim Butler	vmorano@selecttile.com sholbrook@selecttile.com butler@selecttile.com	Yes	TBD	TBD
Jantile Boston LLC	Tile	Wendy Chambers	wchambers@jantileboston.com	Yes	TBD	TBD
High Point Interiors Inc.	Tile	Cheryl Becker	chbecker@highpointinteriors.com	Yes	TBD	TBD
Allegheny Contract Flooring Inc.	Tile	David Stachura	dastachura@alleghenycontract.com	Yes	TBD	TBD
Ayotte & King for Tile	Tile	David King	davidking@ayotteandking.com	Yes	TBD	TBD
Pavilion Floors, Inc.	Tile	Martina Langone	mlangone@pavilionfloors.com	Yes	TBD	TBD
Capital Carpet & Flooring Specialists, Inc.	Tile	Maureen Crozier	maureen@capitalcarpetandtile.com	Yes	TBD	TBD
Joseph Cohn and Son Tile & Terrazzo, LLC	Tile	Sue Antonucci	suzanne@josephcohnandson.com	Yes	TBD	TBD
Gieson Powers	Waterproofing, Dampproofing, Caulking	Melissa Briggs	mbriggs@gps-firestop.com	Yes	TBD	TBD
Acme Waterproofing Co. Inc.	Waterproofing, Dampproofing, Caulking	Debbie Oakley	doakley@acmewp.com	Yes	TBD	TBD
P.J. Syllane Co. Inc.	Waterproofing, Dampproofing, Caulking	Ana Rosetti	arosetti@psyllane.com	Yes	TBD	TBD
Superior Caulking & Waterproofing Co., Inc.	Waterproofing, Dampproofing, Caulking	Annette Coyer	annette@scwv.net	Yes	TBD	TBD
Folan Waterproofing	Waterproofing, Dampproofing, Caulking	Debbie Folan	office@folanwaterproofing.com	Yes	TBD	TBD
Beacon Waterproofing	Waterproofing, Dampproofing, Caulking	Frank Calciore	fcalciore@beaconwaterproofing.com	Yes	TBD	TBD

- 01** Updated Work Plan
- 02** Basis of Design Narratives
 - 02a** Civil
 - 02b** Site
 - 02c** Architectural
 - 02d** Structural
 - 02e** MEP-FP
 - 02f** Technology & Security
- 03** Building Code Analysis
- 04** Local Green Designations
- 05** LEED Score Card
- 06** Proprietary Items
- 07** Color Theory Statement
- 08** Updated Structural Calculations
- 09** Structural Peer Review
- 10** Energy Model Calculations
- 11** Life Cycle Cost Analysis – Energy & Water
- 12** HVAC Heat Gain & Loss Calculations
- 13** Total Electrical Load Calculations
- 14** Security & Visual Access Requirements
- 15** Facility & Maintenance Requirements
- 16** Quality Control Narratives

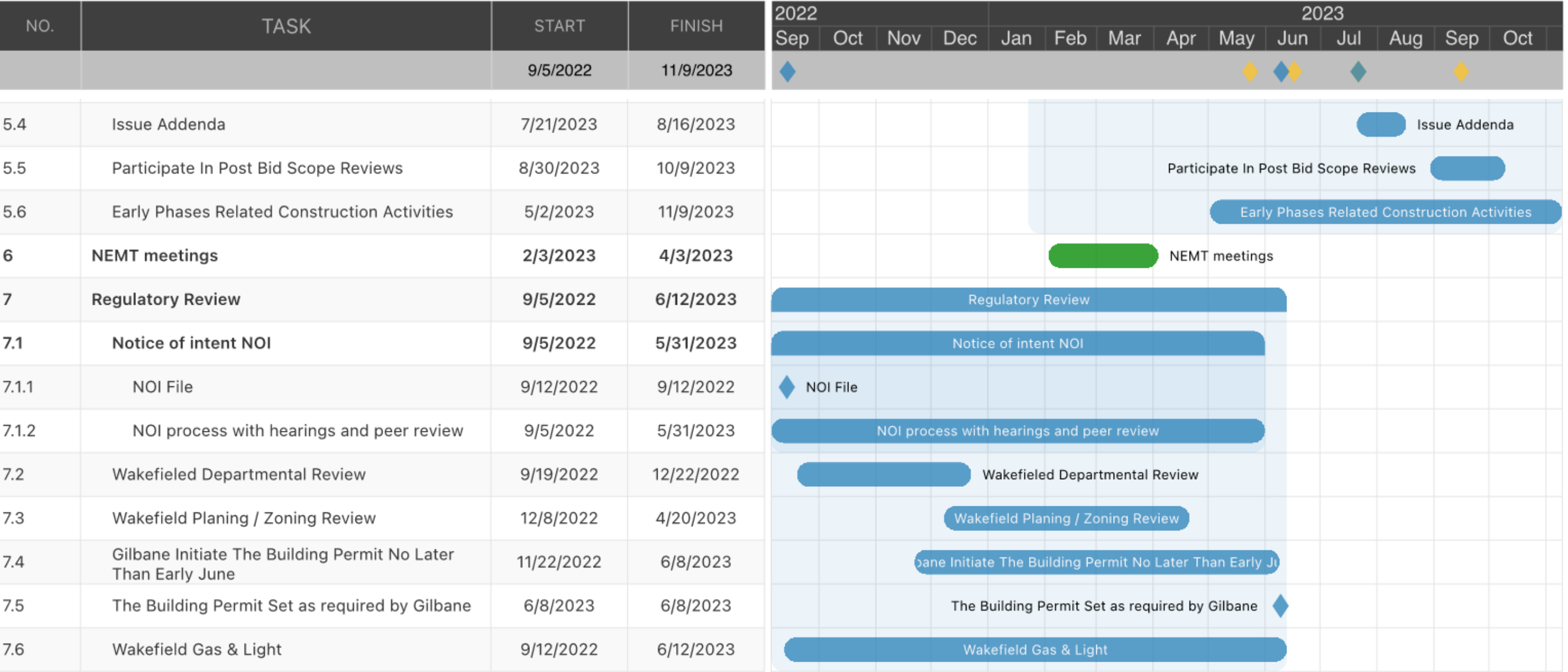
6C.3.1

GENERAL REQUIREMENTS

GENERAL REQUIREMENTS
UPDATED WORK PLAN

6C.3.1 - 01

NO.	TASK	START	FINISH	2022				2023									
				Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
		9/5/2022	11/9/2023	◆								◆	◆	◆		◆	
1	Student involvement on the Project Discussion	3/13/2023	11/1/2023														
2	Building Committee Meetings	5/22/2023	9/14/2023														
2.1	Building Committee Meeting If Required	6/15/2023	6/15/2023														
2.2	Building Committee Meeting If Required	7/20/2023	7/20/2023														
2.3	Building Committee Meeting 90% CD Approval	5/22/2023	5/22/2023														
2.4	Building Committee Meeting	9/14/2023	9/14/2023														
3	Early Structural Steel & Concrete Bid Package	3/24/2023	5/29/2023														
4	Site Early Bid Package	2/13/2023	4/14/2023														
5	Design Team Milestones	1/23/2023	11/9/2023														
5.1	Constructibility Review with CM	1/23/2023	5/15/2023														
5.2	Design Team Coordination Meetings Weekly including LEED	1/26/2023	7/6/2023														
5.3	100% CD Documents Set	7/20/2023	7/20/2023														



GENERAL REQUIREMENTS

BASIS OF DESIGN NARRATIVES

6C.3.1 - 02

6C.3.1 – 02a

CIVIL
BASIS OF DESIGN

MEMORANDUM

TO: Vladimir Lyubetsky, Drumney Rosane Anderson, Inc.
FROM: David Conway, P.E., Nitsch Engineering
DATE: May 16, 2023
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 and to approximate existing flows to groundwater. 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 stormwater detention or infiltration systems. Collected stormwater runoff from throughout the site will be directed to sub-surface systems located under a proposed parking lot, driveway, the proposed fields 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 265 SC-310 chambers in a bed of crushed stone. Additional storage is achieved in that system by installing a 138'x 27' bed of double washed stone next to the chambers, this combined system will be an infiltration system. The second system in the parking lot south of the building consists of 162 SC-310 chambers and is a detention system. Two systems located under the driveway in the vicinity of Farm Road will consist of 89 (total) SC-740 chambers with overflows directed to the wetlands to the north of the drive, one of these systems is an infiltration system. The detention system installed underneath the existing baseball field will include 210 MC-3500 chambers in a bed of crushed stone. A detention system, located under the proposed soccer field, will consist of 198 MC-3500 chambers in a bed of crushed stone with an overflow connecting to the existing outfall to the east. The last system will be located under the parking lot to the south of the football field. That system will be 189 MC-3500 chambers. The adjacent parking area will be porous pavement.

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.

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. As part of the Conservation and Zoning Board of Appeals permitting, the project and its proposed utility connections have been reviewed by the Town of Wakefield Department of Public Works, Engineering Division. Comments received as part of the Engineering Department reviews have been addressed and incorporated into the plans.

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 a perennial stream). The work in any jurisdictional areas 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 closed on May 16, 2023. A decision will be voted on within 21 days of the close of the public hearing. Peer reviews for the project have been completed by Town of Wakefield consultants and the Town of Wakefield Engineering Department, with the comment responses having been incorporated into revised plans.

6C.3.1 – 02b

SITE

BASIS OF DESIGN



WARNER LARSON
LANDSCAPE ARCHITECTS

Northeast Metro Technical High School
Wakefield, MA

MSBA 90% CD Construction Document Submittal

SITE NARRATIVE – May 12, 2023

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 a forested 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 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 boardwalk ramps will provide an accessible path to the lower parking lot, along with a series of stairs interwoven in the boardwalk ramp system. 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 and athletic fields 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 culinary program, high-bay shops, and service area. Supporting facilities such as auto repair

Northeast Metro Technical High School
MSBA 90% CD Construction Document Submittal

SITE NARRATIVE

May 12, 2023

Page 2 of 4

and body shop repair storage are located along the north side of the building. The lower parking lot is for students and will be controlled by electronic access gates. On weekends and after school hours, this parking lot will 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 will be open to the community at all times.

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 drive 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 synthetic turf football field will be installed. A 500-person grandstand structure will be installed on the west side of the track. A concession/restroom building 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. New maintenance/storage buildings will be located to the north of the softball/soccer field. 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 building configuration creates a main entrance plaza on the southern side of the school building. This courtyard provides comfortable microclimates in the spring and fall. This area can be used for gathering spaces 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 eastern side of the

Northeast Metro Technical High School
MSBA 90% CD Construction Document Submittal

SITE NARRATIVE

May 12, 2023

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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 main entrance to the school. Green roofs are proposed on various portions of the school building for sustainability and climate resiliency. There are 2 large roof decks that will provide students the ability to utilize the outdoor environment and learn about green roof technology. . There is a single non-accessible green roof that will be installed over the cafeteria area. The planting medium is an extensive green roof designed to support various sedum mixes. An outdoor playground to support the Early Childhood Education program will be located on a roof with complete safety and compliance. The need for locating this on the roof was to provide the Pre-K students a 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. Vertical granite curbs line all building adjacent sidewalks. Driveway approach angles are engineered to eliminate straight lines heading directly toward entry doors. There will be vertical obstructions at the main entry doors providing another level of security. These vertical obstructions will be bollards, stone block seat walls or changes in the topography. 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 the associated curb ramps where necessary along with striped crosswalks. Each of the main entries of the school building have extended canopies to protect the entrances and adjacent walkways. Students arriving to the school by bus are dropped off along the sidewalks on the eastern and southern driveways. They will enter the school at the main south entrance (adjacent to the High School Office) or the eastern entrance (next to the Superintendent's Office). 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 that arrive by their own vehicles will park in the southern parking lot and walk to the main entry along the main access path. Students will also be able to park in the lower parking lot at the athletic fields. These students will then walk up the hill 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 and southern driveways and along the back of the building. Students will be dismissed from their last period class/shop and leave via the most convenient exit to the front of the building. 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

Northeast Metro Technical High School
MSBA 90% CD Construction Document Submittal

SITE NARRATIVE

May 12, 2023

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to meet them. Students leaving in their own vehicles will leave via the main entrance or 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 an elevator within the athletic support building and a series of elevated boardwalk ramps. All the athletic fields, including the bleacher structure, will be fully accessible.

The planting scheme on the site intends to compliment 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 limited to high impact areas at the school building and to the natural grass baseball field. 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. Roadway and 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.

6C.3.1 – 02c

ARCHITECTURAL
BASIS OF DESIGN

Northeast Metropolitan Regional Vocational High School Project**– 90% 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”. Minimum slope for the roofing surface is 1/4" in 12". Minimum slope for the insulation crickets shall be 1/2" 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 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 corrugated 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.
- Waterproofing is required at the exterior surface and/or "blind" side of all cast-in-place retaining walls at below grade occupied 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 planned for the openings located at the Vocational Shops as indicated on the Exterior Elevations. Exterior Louvers to be integrated into insulated translucent wall panel system.
- Exterior motorized overhead panel doors at the Vocational 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. Similar 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 channels, 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, Unistrut etc., attached to the steel beams not deck. All exposed to view ceiling areas shall be painted.
- Vocational Shops – assume ACT 2x2 high NRC
- Vocational Shops spaces located below the mezzanines – assume ACT 2x2 high NRC
- Culinary 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 otherwise)
- 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 poured 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 poured epoxy floor and base
- Shops High Bay – Assume sealed concrete
- Shops – assume linoleum tile and resilient base

- Culinary Arts Kitchen Space – assume poured epoxy floor and base
- Culinary 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 steel netting 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 server assume stainless steel doors in S.S. frames. Same for Culinary 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 Vocational 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 (not freight elevator) for large equipment delivery to the upper shops. Athletic Locker Room Building assume two stop elevator.

Fireproofing:

- All structural steel columns receive spray fireproofing 2 hour rated.
- At highly visible locations where structural steel components 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 receive 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 Culinary Arts Program
- Cooking equipment with convections ovens, combi ovens, 6 burner ranges.
- Storage will include dry storage for food and paper goods and cooler and freezers.
- Two dish rooms, one for the main kitchen and another one for the Culinary arts kitchen.
- Reuse existing dishwasher at the Main Cafeteria Kitchen
- The main kitchen will include a food court style servery.
- 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 the 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 construction logistics – Refer to Equipment Drawings, Schedules and Outline Specifications.
- Plumbing and HVAC training equipment specified as part of 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 instructors' supervision) is responsible for the installation and final connections for all services (MEP) to the training equipment in the HVAC and Plumbing shops.

6C.3.1 – 02d

STRUCTURAL
BASIS OF DESIGN



Project	Northeast Metropolitan Regional Vocational High School		Job Ref.	2019-091
Section	MSBA 90% Construction Document Submission		Sheet no./rev.	1
Date	01/09/2023		App'd by	MD
			Date	12/19/2022

Project Name:

Northeast Metropolitan Regional Vocational High School

MSBA Module 6 Requirements:

MSBA 90% Construction Document – Structural Basis of Design Narrative

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1. STRUCTURE

NEW CONSTRUCTION

Structural: Designed in accordance with the 9th 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 walls supported on 16 ft. – 0 in. wide x 3 ft.-0 in. thick continuous reinforced concrete footings with 12 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



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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 'NA' acoustic 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' acoustic 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 hollow-structural 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.



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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.

6C.3.1 – 02e

MEP-FP

BASIS OF DESIGN

NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL

90% 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 pendants 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 connection. 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 required 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 standpipe and sprinkler system.

8. The fire standpipe system within a building segment consists 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 are provided on the main landing of each level within the interior stairways. Intermediate standpipes are 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 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.
- C. Specific Program requirements shall be provided in accordance with NFPA 13 as follows:
1. In general, the building is designed as a light hazard occupancy and therefore 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 are 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 are designed as ordinary hazard group 1 and therefore the sprinkler spacing shall not exceed 130 SF.
 3. The paint spray booths are designed as an extra hazard group 2 occupancy and therefore the sprinkler spacing shall not exceed approximately 100 SF. A separate zone control valve is provided for each paint spray booth to serve these sprinklers.
 4. The metal fabrication room is designed as an extra hazard group 1 occupancy due to the presence of flammable gases within the space. 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 is 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 Concessions Building. Four inch domestic water service for the Locker Room Building. Two inch domestic water service for the Maintenance 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 equipment in the HVAC and Plumbing shops, 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. Secondary roof drainage system is required for all courtyard areas in the building, but is not required on the main roof.
 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 tempered water system including master mixing valve and dedicated tempered water circulation system is to supply all emergency shower and eyewash units within the Science Classrooms in the A wing. All other eyewash units and emergency showers shall receive tempered water via a local thermostatic mixing valve.
 6. Dedicated special waste piping system serving Science Rooms and related areas susceptible to receive non-conventional waste and this system consists of:
 - a. Central pH neutralizing and monitoring system for Science Classrooms in the A wing of the school.
 7. Reduced pressure backflow preventers on cold water supply to the Science Classrooms. The Science Classrooms have a dedicated non potable water heater and non potable circulation system.
 8. 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. Four interior grease interceptors are required to support kitchen and Culinary arts.

9. Domestic hot water shall 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.
10. Compressed-Air Systems
 - a. Furnish and install an industrial grade compressed air system for each of the shop areas: Five systems are included to support the following shops: Auto shops, Carpentry shop, Biotech Lab, Robotics Lab, and Dental Suite.
 - 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.
11. 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.
12. Piping distribution to be used with portable argon gas cylinders at welding booths in Metal Fabrication and Auto Shops.
13. Complete interior sanitary, waste, vent, gas, cold water, 120°F hot water, 140°F hot water and recirculation piping systems.
14. 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.
15. 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.
16. Freezeproof wall hydrants around the perimeter of all construction.
17. Drains, hose bibbs, valves, fittings, hangers, and all miscellaneous pipeline accessories, including seismic support requirements.
18. Cleaning and testing of all fixtures, equipment, and piping systems.

19. Disinfection of all domestic water piping systems.
20. Waste outlets to accept HVAC condensate and sprinkler waste discharges.
21. Insulation of all domestic water piping, roof drain bodies, storm water piping, water cooler drain piping and all exposed piping at handicapped fixtures.
22. Floor drains shall be provided with automatic trap primers as required per the plumbing code.
23. Include allowance for floor drainage and hose bibbs in all mechanical type spaces and large toilet rooms (with two or more fixtures).
24. Elevator pits shall 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 are provided with a dedicated floor drainage system that is extended to a gas/oil separator system to be located outside the building. This requirement also applies to all other shop areas that are to allow entry of vehicles within the interior shop area, including the satellite Maintenance Building.

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 (VRF) 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:

1. 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):

1. 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.
- d. 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.
- 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.
- l. 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.
- n. 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 dual-charger 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.
 - c. Fire Pump
 - 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 cut-off/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 4 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. Advanced Energy Metering credit in the Energy and Atmosphere category will be included.
 5. Renewable Energy Production credit in the Energy and Atmosphere category will be included.
 6. 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.
18. 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. Provisions for Advanced Energy Metering with meter management software to track local energy consumption and trending of building operation. System will identify high use areas and provide information to inform strategies to reduce energy consumption.
6. Networked lighting control system for interior and exterior lighting to monitor lighting power consumption and adjust consumption levels based on time-of-day usage.
7. 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

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**TECHNOLOGY &
SECURITY**
BASIS OF DESIGN

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. Instructional Audiovisual Systems
- I. Digital Signage Monitors

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 systems 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 1/4" 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, Gymnasium, 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. Instructional Audiovisual Systems

All Classrooms and Small Group rooms shall have Interactive Projectors systems, which will include touch capabilities, wall speakers, and a large format whiteboard to provide a 100" diagonal image.

Conference rooms and office conference spaces shall have 75-inch Interactive Flat Panel systems.

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 Projector, 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 ¼" conduits stubbed above the ceiling to provide pathways for the A-V cabling.

There shall be in-wall audiovisual cabling between the teacher presentation "Low" AV outlet and the "High" outlet.

The Low AV outlet shall include the following:

- HDMI cable
- 3.5 mm Audio cable
- Cat. 6E control cable

The High AV outlet shall include:

- HDMI cable
- 3.5 mm Audio cable
- Cat. 6E control cable
- Two Cat. 6E data drops

The in-wall AV cabling shall be included in the base contract.

The Interactive Projector Flat Panel and A-V cabling shall be procured as part of the technology FF&E package.

I. Digital Signage

Digital signage monitors shall be located in lobbies, common-use spaces, and student collaborative areas. A multiple-content system will provide different signage to groups of signage monitors.

The digital signage monitors shall be interfaced with a Panic Button/Duress alert system to provide visual notifications of duress situations.

The digital signage monitors 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
- An interactive projector 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 and AV cabling shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.

Interactive projector, 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
- An interactive Projector system
- PA lay-in speaker panel on the ceiling
- A twelve-inch wireless analog secondary clock at 8'-0" AFF.

Data and AV cabling shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.



Interactive projectors, VoIP handsets, 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
- An Interactive Projector 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 and AV cabling shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.



Interactive projectors, 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 Projector 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
- An interactive projector 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 and AV cabling shall be included in the base contract.

PA speaker and secondary clock shall be in the base contract.

Interactive projectors, 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
 -



Data and AV cabling digital signage monitor, 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.

The base contract shall include PA speakers, volume controls, and wiring. 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

6C.3.1 - 03



Code

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HVAC

•

Electrical

•

Plumbing

•

Fire Protection

•

Commissioning

NE Metro Regional Vocational Technical School

Wakefield, Massachusetts

Code Report

April 28, 2023

**Sullivan Code Group
R.W. Sullivan Engineering**

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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 (Model Code Basis)
Building	780 CMR: Massachusetts State Building Code, 9 th Edition (2015 International Building Code)
Fire Prevention	527 CMR: Massachusetts Fire Prevention Regulations (2021 NFPA 1) 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 (2023 National Electrical Code)
Elevators	524 CMR: Massachusetts Elevator Code (2013 ASME A17.1)
Mechanical	2015 International Mechanical Code (IMC)
Plumbing	248 CMR: Massachusetts Plumbing Code
Energy 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 st Floor	100%
2 nd Floor	75%
3 rd Floor	50%
4 th 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	Use Group E	
	Height	Area
<u>780 CMR Tables 504.3, 504.4 & 506.2:</u> Tabular Value	6 St. (180 ft)	UL
<u>780 CMR Section 506.2</u> Frontage Increase	-	-
Allowed Height and Area	6 St. (180 ft)	UL
Actual Height and Area	5 St.	~127,000 ft²

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 ^A	2 ^{B,C}
Exterior Bearing Walls	2
Interior Bearing Walls	2 ^{B,C}
Exterior Non-Bearing Walls	Based on FSD
Interior Non-Bearing Walls	0
Floor Construction	2 ^C
Roof Construction	1 ^D

^{A.} Includes beams, trusses, floor members, etc. having a direct connection to the columns (780 CMR 202).

^{B.} 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 Rating (Hrs)	Opening Protectives (Hrs)
Exit Access Corridors (780 CMR 1020.1)		0	0
Stair Shafts (780 CMR 1023.2) ^A		2	1½
Other Shafts (780 CMR 713.4)		2	1½
Elevator Machine Room (780 CMR 3005.4)		2	1½
Emergency Electrical Room (527 CMR 12.00 700-10(D)(2))		2 ^B	1½
Emergency Generator Room – Level 1 Installation (NFPA 110 Section 7.2.1.1)		2	1½
Electrical Closets	With Sprinklers	0	
	Without Sprinklers	2	
Fuel Oil Storage > 660 gallons		2	1½
Furnace room where any piece of equipment is over 400,000 Btu per hour input		Smoke resistant ^C	
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower		Smoke resistant ^C	
Paint shops		1 hour and provide automatic fire-extinguishing system	
Laboratories and vocational shops		Smoke resistant ^C	
Laundry rooms over 100 square feet		Smoke resistant ^C	
Waste and linen collection rooms over 100 square feet		Smoke resistant ^C	
Fire pump room (780 CMR 913.2.1)		1 hour ^D	

A. 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).

B. 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.

D. 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. floor-ceiling, 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 1st and 2nd 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 3rd and 4th 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 1st and 2nd 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)

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.

Means of Egress

Floor	Occupant Load	Number of Exits		Exit Capacity (persons)
		Required	Provided	
Lower Level	666	3	7	2,113
1 st	3,044	4	19	8,133
2 nd	2,371	4	6	2,357
3 rd	1,289	4	4	1,773
4 th	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.
B	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 $\frac{1}{3}$ 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)
- Standpipe system (780 CMR 905.3.1 & 905.3.5)

- 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:

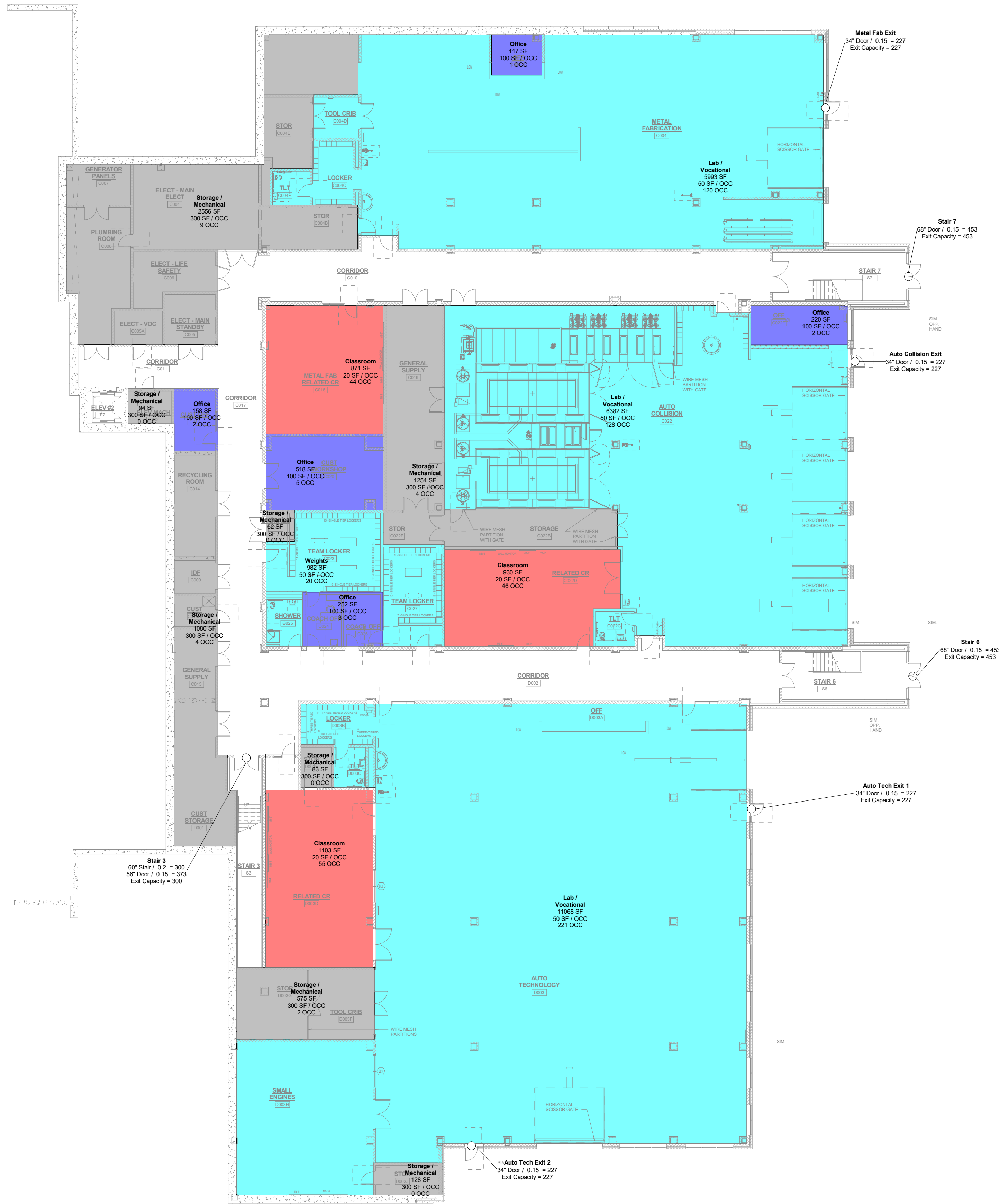
- All public entrances must be accessible (521 CMR 25.1).
- All public and common use areas must be accessible and provided with an accessible route thereto (521 CMR Section 12.2.2 and 20.1).
- Accessible toilet rooms must be provided (521 CMR 30.1).
- Where tables, study carrels, computer workstations 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.).

APPENDIX A: Egress Plans



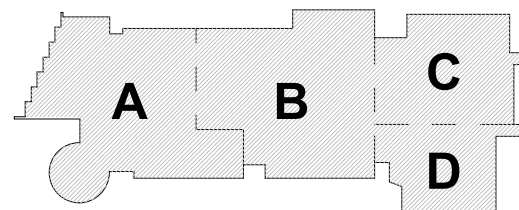
Occupant Load Lower Level			
Use	Floor Area	Floor Area Per Occupant (SF / OCC)	Occupant Load
Classroom	2904 SF	20	145.2
Lab / Vocational	23443 SF	50	468.9
Office	1266 SF	100	12.7
Storage / Mechanical	5821 SF	300	19.4
Weights	982 SF	50	19.6
	34416 SF		665.8

Exit Capacity Lower Level (780 CMR 1005.3)						
Exit	Stair Width	Stair Exit Allowance (in / person)	Stair Capacity (persons)	Door Width	Door Exit Allowance (in / person)	Door Capacity (persons)
Auto Collision Exit				34"	0.15	227
Auto Tech Exit 1				34"	0.15	227
Auto Tech Exit 2				34"	0.15	227
Metal Fab Exit				34"	0.15	227
Stair 3	60"	0.2	300	56"	0.15	373
Stair 6				68"	0.15	453
Stair 7				68"	0.15	453

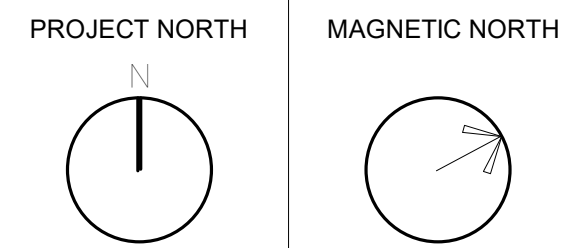
Occupant Load Densities (780 CMR TABLE 1004.1.2)	
Fixed Seating	Assembly with Fixed Seating
7 Net S.F. / Occ.	Assembly without Fixed Seating - Concentrated (Chairs Only)
15 Net S.F. / Occ.	Assembly without Fixed Seating - Unconcentrated (Tables and Chairs)
20 Net S.F. / Occ.	Classrooms
50 Gross S.F. / Occ.	Exercise and Fitness Areas, Locker Rooms
60 Net S.F. / Occ.	Educational, Shops and Laboratories
100 Gross S.F. / Occ.	Office Areas
200 Gross S.F. / Occ.	Kitchens
300 Gross S.F. / Occ.	Storage / Mechanical

PROGRESS SET

4/28/2023



KEY PLAN



EGRESS
ANALYSIS
LOWER LEVEL

Scale: As indicated

Job No.: 20022

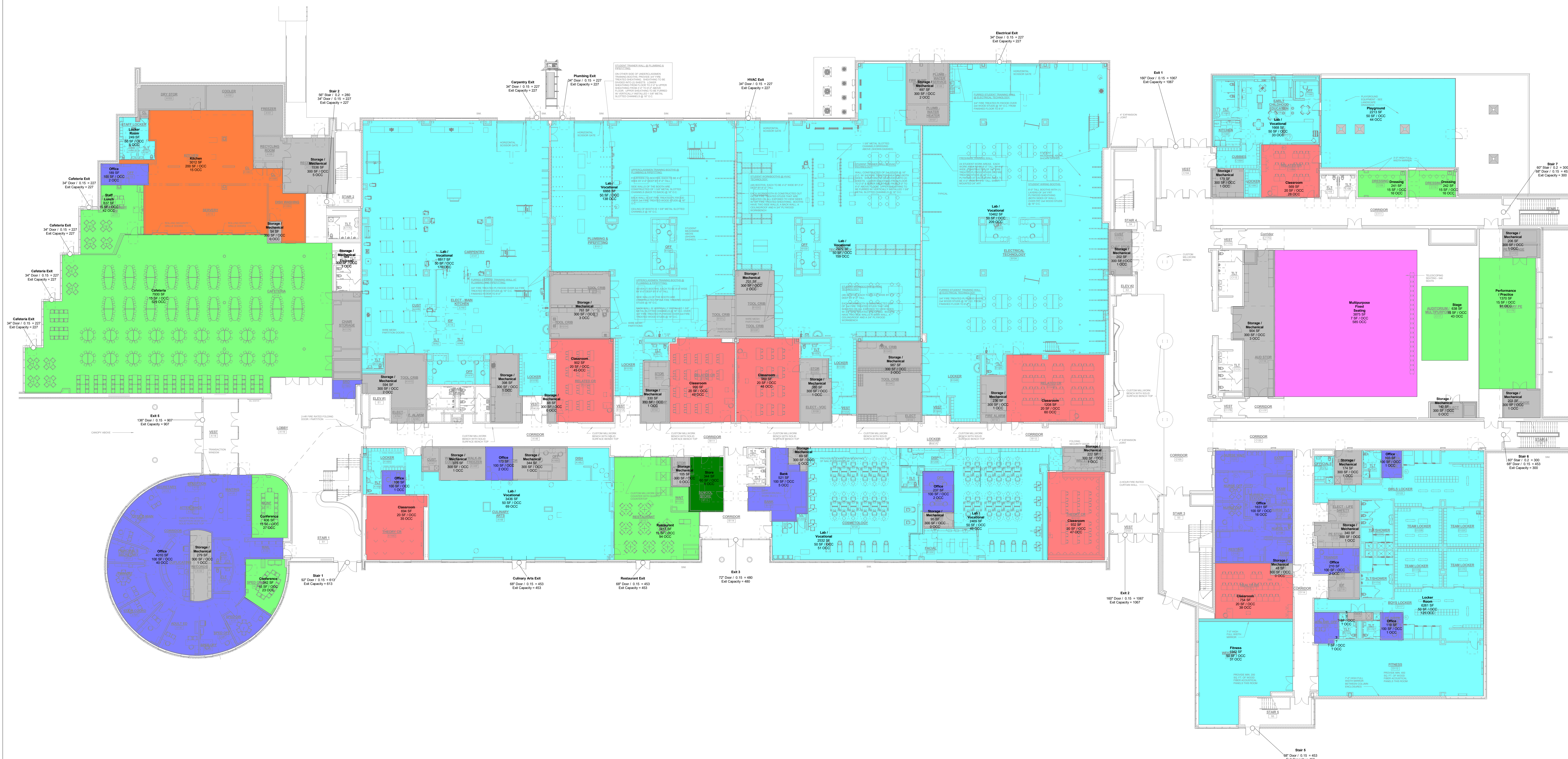
Drawn By: DEC

Date: 4/28/2023

Volume

EG1-1

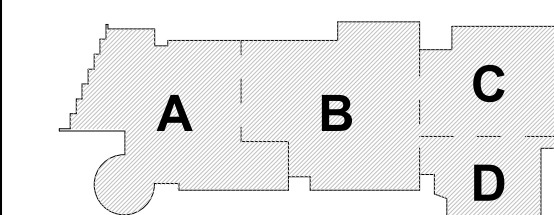
**NORTHEAST
METROPOLITAN
REGIONAL
VOCATIONAL
HIGH SCHOOL**
100 HEMLOCK RD,
WAKEFIELD, MA 01880



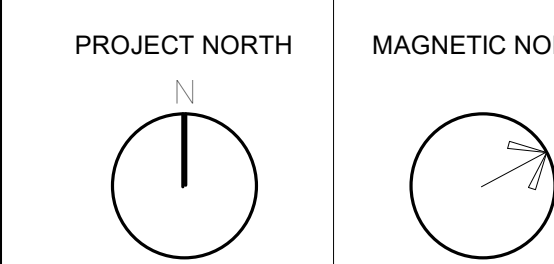
Occupant Load First Floor			
Use	Floor Area	Floor Area Per Occupant (SF / OCC)	Occupant Load
Bank	521 SF	100	5.2
Cafeteria	7930 SF	15	528.7
Classroom	7017 SF	20	350.8
Conference	748 SF	15	49.9
Dressing	483 SF	15	32.2
Kitchen	1542 SF	50	30.8
Kitchen	3012 SF	200	15.1
Lab / Vocational	44243 SF	50	884.9
Locker Room	66 SF	50	1.3
Multipurpose Fixed Seating	3875 SF	7	585.0
Office	7002 SF	100	70.0
Performance / Practice	1370 SF	15	91.3
Playground	2213 SF	50	44.3
Restaurant	1417 SF	15	94.5
Staff Lunch	637 SF	15	42.5
Stage	638 SF	15	42.4
Storage / Mechanical	11091 SF	300	40.4
Store	344 SF	60	5.7
	100594 SF		3044.0

Exit Capacity First Floor (780 CMR 1005.3)							
Exit	Stair Width	Stair Exit Allowance (in / person)	Stair Capacity (persons)	Door Width	Door Exit Allowance (in / person)	Door Capacity (persons)	Exit Capacity (persons)
Cafeteria Exit				34"	0.15	227	227
Cafeteria Exit				34"	0.15	227	227
Cafeteria Exit				34"	0.15	227	227
Cafeteria Exit				34"	0.15	227	227
Carpentry Exit				34"	0.15	227	227
Culinary Arts Exit				68"	0.15	453	453
Electrical Exit				34"	0.15	227	227
Exit 1				160"	0.15	1067	1067
Exit 2				160"	0.15	1067	1067
Exit 3				72"	0.15	480	480
Exit 5				136"	0.15	907	907
HVAC Exit				34"	0.15	227	227
Plumbing Exit				34"	0.15	227	227
Restaurant Exit				68"	0.15	453	453
Stair 1				92"	0.15	613	613
Stair 2	56"	0.2	280	34"	0.15	227	227
Stair 6				68"	0.15	453	453
Stair 6	60"	0.2	300	68"	0.15	453	300
Stair 7	60"	0.2	300	68"	0.15	453	300
							8133

Occupant Load Densities (780 CMR Table 1004.1.2)	
Fixed Seats	Assembly with Fixed Seats
7 Net S.F. / Occ.	Assembly without Fixed Seats - Concentrated (Chairs Only)
15 Net S.F. / Occ.	Assembly without Fixed Seats - Unconcentrated (Tables and Chairs)
20 Net S.F. / Occ.	Classrooms
50 Gross S.F. / Occ.	Exercise and Fitness Areas; Locker Rooms
50 Net S.F. / Occ.	Educational - Shops and Laboratories
100 Gross S.F. / Occ.	Office Areas
200 Gross S.F. / Occ.	Kitchen
300 Gross S.F. / Occ.	Storage / Mechanical



KEY PLAN

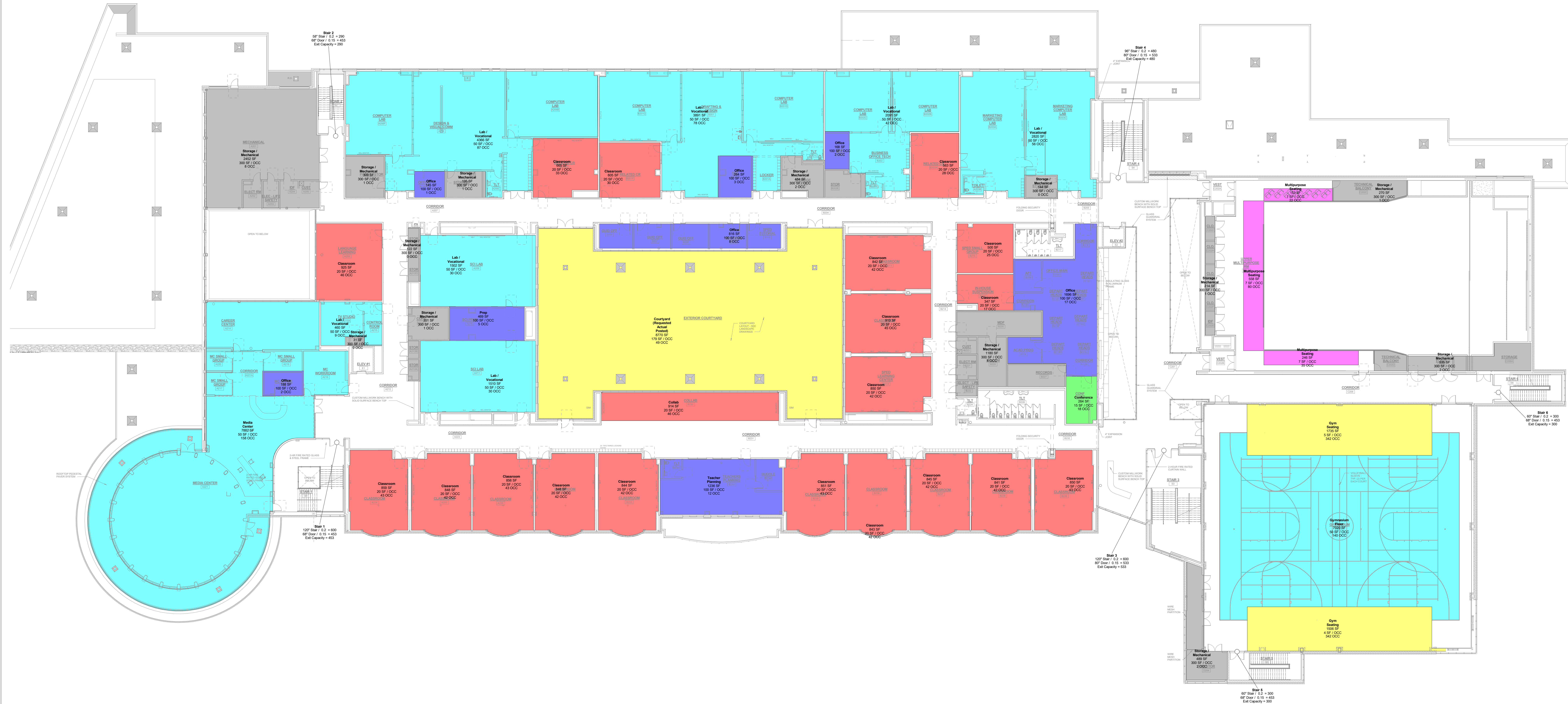


EGRESS ANALYSIS FIRST FLOOR

Scale: As indicated
Job No.: 20202
Drawn By: DE
Date: 4/28/2023
Volume

EG1-2

Volum



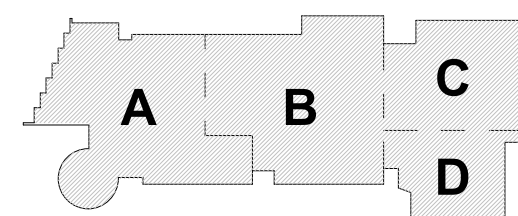
Occupant Load Second Floor			
Use	Floor Area	Floor Area Per Occupant (SF / OCC)	Occupant Load
Classroom	14691 SF	20	734.5
Collab	914 SF	20	45.7
Conference	264 SF	15	17.6
Courtyard (Requested Actual Posted)	8770 SF	179	49.0
Gym Seating	3240 SF		684.0
Gymnasium Floor	7020 SF	50	140.4
Labs / Vocational	16640 SF	50	332.8
Media Center	7882 SF	50	157.6
Multipurpose Seating	957 SF	7	136.7
Office	3277 SF	100	32.8
Prep	469 SF	100	4.7
Storage / Mechanical	6775 SF	300	22.6
Teacher Planning	1236 SF	100	12.4
	72135 SF		2370.8

Exit Capacity Second Floor (780 CMR 1005.3)							
Exit	Stair Width	Stair Exit Allowance (in / person)	Stair Capacity (persons)	Door Width	Door Exit Allowance (in / person)	Door Capacity (persons)	Exit Capacity (persons)
Stair 1	120"	0.2	600	68"	0.15	453	453
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	80"	0.15	533	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 Details (780 CMR TABLE 1004.1.5)	
Fixed Seats	Assembly with Fixed Seats
7 Net S.F. / Occ.	Assembly without Fixed Seats - Concentrated (Tables and Chairs)
15 Net S.F. / Occ.	Classrooms
20 Net S.F. / Occ.	Exercise and Fitness Areas, Locker Rooms
30 Net S.F. / Occ.	Educational - Shops and Laboratories
50 Net S.F. / Occ.	Other Areas
100 Gross S.F. / Occ.	Kitchen
200 Gross S.F. / Occ.	Storage / Mechanical

PROGRESS SET

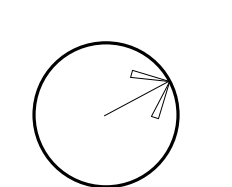
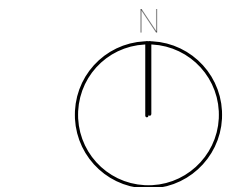
4/28/2023



KEY PLAN

PROJECT NORTH

MAGNETIC NORTH



**EGRESS
ANALYSIS
SECOND FLOOR**

Scale: As indicated

Job No.: 20022

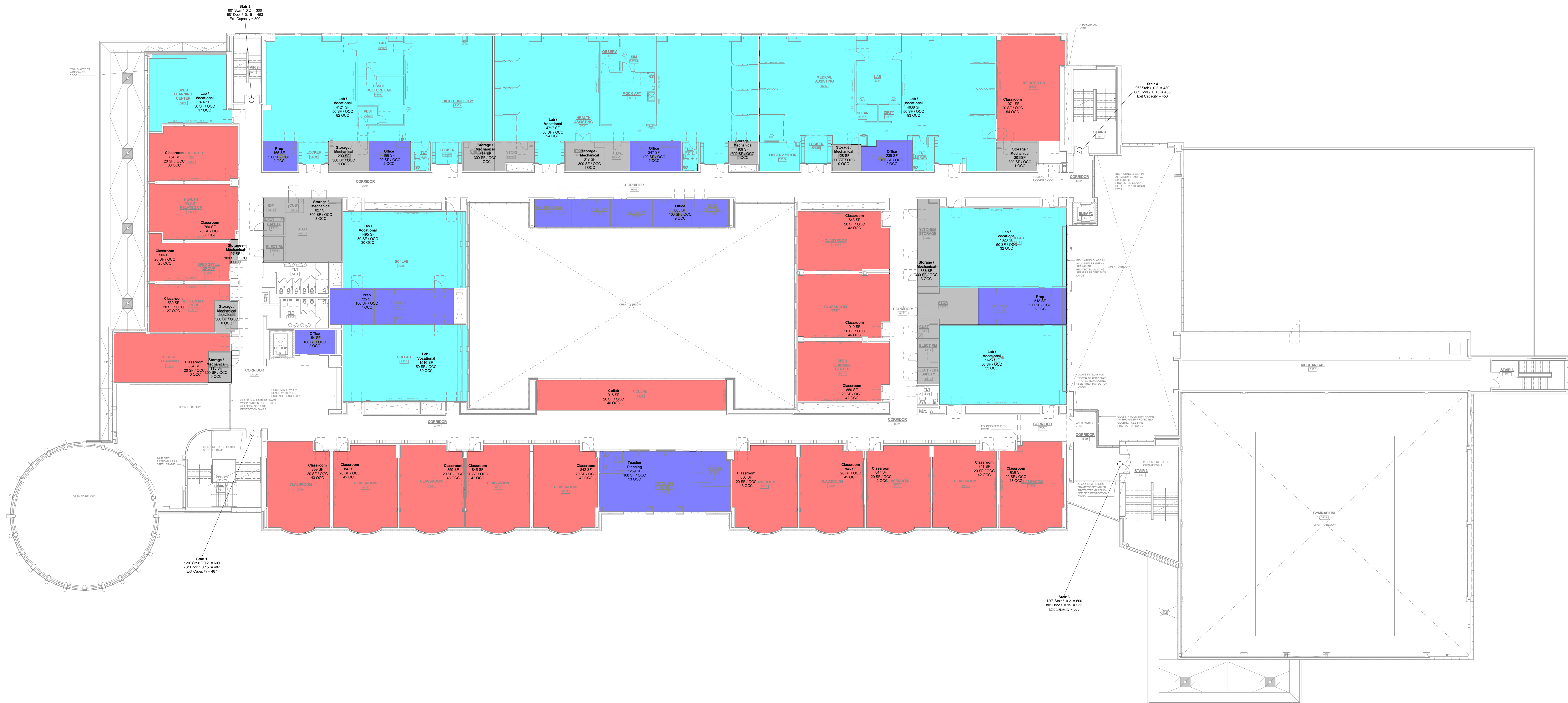
Drawn By: DEC

Date: 4/28/2023

Volume

EG1-3

**NORTHEAST
METROPOLITAN
REGIONAL
VOCATIONAL
HIGH SCHOOL**
100 HEMLOCK RD,
WAKEFIELD, MA 01880



Occupant Load Third Floor			
Use	Floor Area	Floor Area Per Occupant (SF / OCC)	Occupant Load
Classroom	15530 SF	20	776.5
Collab	916 SF	20	45.8
Lab / Vocational	20611 SF	50	412.2
Office	1704 SF	100	17.0
Prep	1409 SF	100	14.1
Storage / Mechanical	3238 SF	300	10.8
Teacher Planning	1259 SF	100	12.6
	44667 SF		1289.0

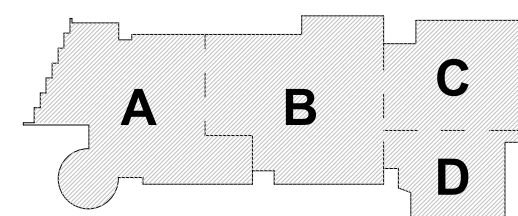
Exit Capacity Third Floor (780 CMR 1005.3)							
Exit	Stair Width	Stair Exit Allowance (in / person)	Stair Capacity (persons)	Door Width	Door Exit Allowance (in / person)	Door Capacity (persons)	Exit Capacity (persons)
Stair 1	120"	0.2	600	73"	0.15	487	487
Stair 2	60"	0.2	300	68"	0.15	453	300
Stair 3	120"	0.2	600	80"	0.15	533	533
Stair 4	96"	0.2	480	68"	0.15	453	453
							1773

Occupant Load Densities (780 CMR TABLE 1004.1.2)	
Fixed Seating	Assembly with Fixed Seats
7 Net S.F. / Occ.	Assembly without Fixed Seating - Concentrated (Tables and Chairs)
15 Net S.F. / Occ.	Assembly without Fixed Seating - Unconcentrated (Tables and Chairs)
20 Net S.F. / Occ.	Classrooms
30 Gross S.F. / Occ.	Corridor and Fitness Areas, Locker Rooms
50 Net S.F. / Occ.	Educational, Shops and Laboratories
100 Gross S.F. / Occ.	Office Areas
200 Gross S.F. / Occ.	Kitchen
300 Gross S.F. / Occ.	Storage / Mechanical

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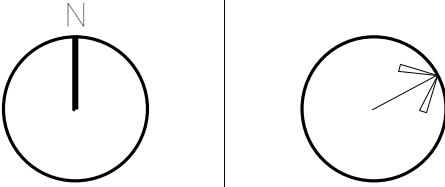
PROGRESS SET

4/28/2023



KEY PLAN

PROJECT NORTH MAGNETIC NORTH



**EGRESS
ANALYSIS THIRD
FLOOR**

Scale: As indicated

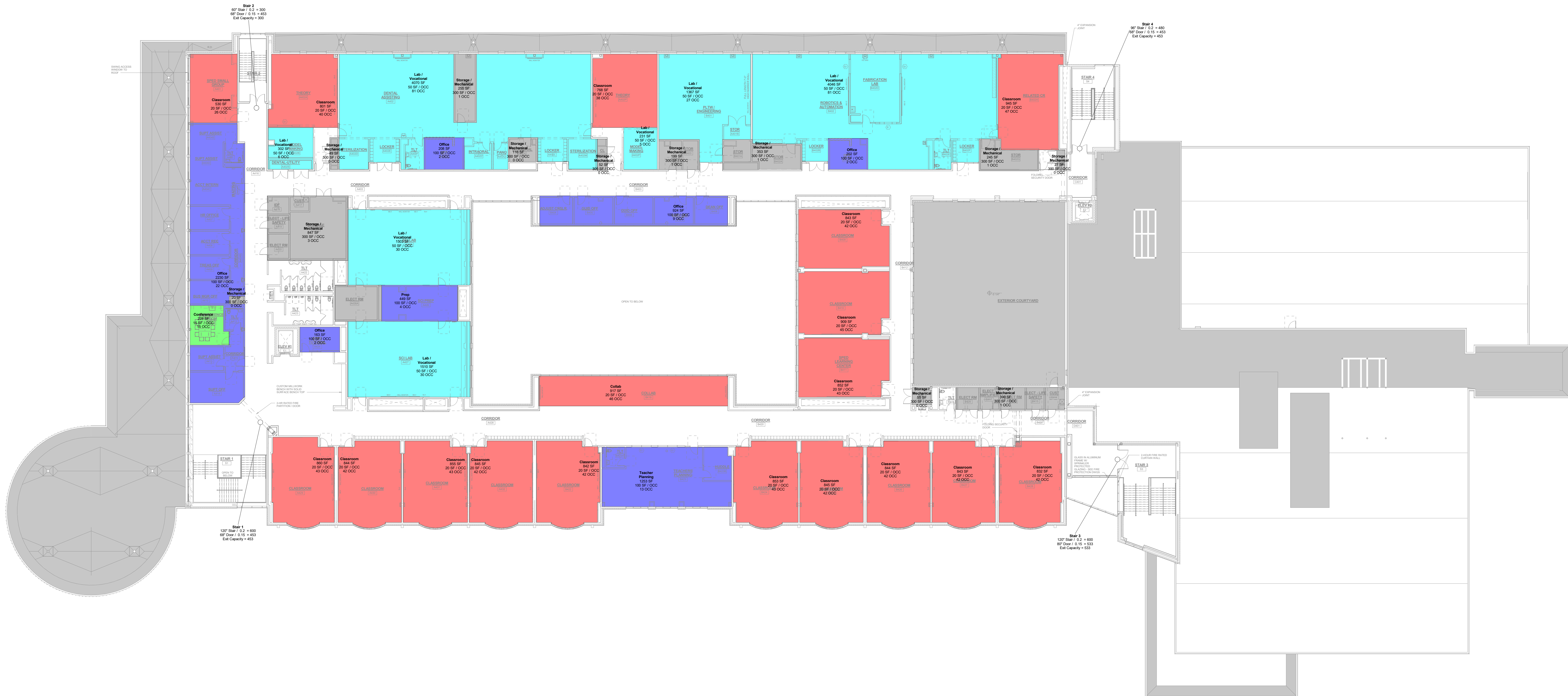
Job No.: 20202

Drawn By: DEC

Date: 4/28/2023

Volume

EG1-4



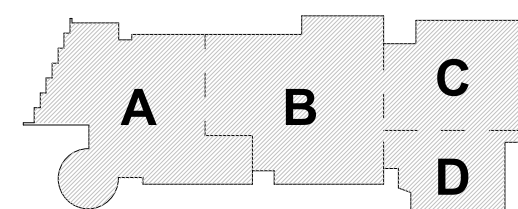
Occupant Load Fourth Floor			
Use	Floor Area	Floor Area Per Occupant (SF / OCC)	Occupant Load
Classroom	14109 SF	20	705.5
Collab	917 SF	20	45.8
Conference	228 SF	15	15.2
Lab / Vocational	13029 SF	50	260.6
Office	3728 SF	100	37.3
Prep	449 SF	100	4.5
Storage / Mechanical	2862 SF	300	9.6
Teacher Planning	1253 SF	100	12.5
	36595 SF		1091.0

Exit Capacity Fourth Floor (780 CMR 1005.3)						
Exit	Stair Width	Stair Exit Allowance (in / person)	Stair Capacity (persons)	Door Width	Door Exit Allowance (in / person)	Door Capacity (persons)
Stair 1	120"	0.2	600	73"	0.15	487
Stair 2	60"	0.2	300	68"	0.15	453
Stair 3	120"	0.2	600	80"	0.15	533
Stair 4	96"	0.2	480	68"	0.15	453
1773						

Occupant Load Descriptors (780 CMR TABLE 1004.1.3)	
Fixed Seats	Assembly with Fixed Seats
7 Net S.F. / Occ.	Assembly without Fixed Seats - Concentrated (Tables and Chairs)
15 Net S.F. / Occ.	Assembly without Fixed Seats - Unconcentrated (Tables and Chairs)
20 Net S.F. / Occ.	Classrooms
50 Gross S.F. / Occ.	Exercise and Fitness Areas, Locker Rooms
50 Net S.F. / Occ.	Educational - Shops and Laboratories
150 Gross S.F. / Occ.	Office Areas
300 Gross S.F. / Occ.	Kitchens
300 Gross S.F. / Occ.	Storage / Mechanical

PROGRESS SET

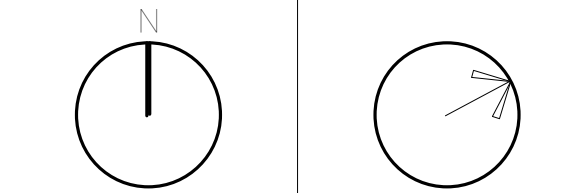
4/28/2023



KEY PLAN

PROJECT NORTH

MAGNETIC NORTH

**EGRESS
ANALYSIS
FOURTH FLOOR**

Scale: As indicated

Job No.: 20202

Drawn By: DEC

Date: 4/28/2023

Volume

EG1-5

GENERAL REQUIREMENTS

LOCAL GREEN DESIGNATIONS

6C.3.1 - 04

6C.3.1-04

LOCAL GREEN DESIGNATIONS

The Town of Wakefield follows the **Stretch Energy Code** as codified by the Massachusetts Board of Building Regulations and Standards as 780 CMR Appendix 115.AA of the Massachusetts State Building Code. Northeast Metro Tech complies with this code.

GENERAL REQUIREMENTS
LEED SCORE CARD

6C.3.1 - 05

6C.3.1-05

LEED SCORE CARD NARRATIVE

The following describes changes to the LEED Project Checklist from Schematic Design to 90% Construction Documents.

LEED Project Checklist, showing which credits we are currently pursuing, is included after this narrative.

Location and Transportation

No changes in this section.

Sustainable Sites

Rainwater Management Due to complex site issues, we are no longer pursuing this credit.

Open Space Now pursuing this credit.

Light Pollution Reduction Now pursuing this credit.

Water Efficiency

No changes in this section.

Energy and Atmosphere

Enhanced Commissioning Changed point quantity from 5 to 6. The Commissioning Agent has been contracted to perform Path 2, Enhanced and Monitoring-Based Commissioning, which gains the project an additional point. Envelope Commissioning, for 2 points, will be performed as well.

Advanced Energy Metering Value Engineered from the project.

Green Power-Carbon Offset No longer pursuing this credit.

Materials and Resources

BPDO – Enviro Product Declare and BPDO-Materials Ingredients

Reduced points from 2 to 1. The additional points associated with this credit are for exemplary performance. Although this project will most like be able to achieve the forty EPD's and forty HPD's to meet exemplary performance, we will not receive the extra point because it is awarded and contingent on certain parameters of the Innovation Category, which we will not meet.

Indoor Environmental Quality

Enhanced Indoor Air Quality Strategies

Increased points from 1 to 2. The project will be pursuing both Option 1 and 2.

Indoor Air Quality Assessment

Increased points from 1 to 2. The project is pursuing Option 2, Air Testing. This Option has 2 points associated with it.

Innovation

No changes in this heading.

Regional Priority

No changes in this heading.



LEED v4 for BD+C: Schools

Project Checklist

Y ? N

1	0	1	Credit	Integrative Process	1
---	---	---	--------	---------------------	---

1	0	14	Location and Transportation		15
			Credit	LEED for Neighborhood Development Location	15
		1	Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
		5	Credit	Surrounding Density and Diverse Uses	5
		4	Credit	Access to Quality Transit	4
		1	Credit	Bicycle Facilities	1
		1	redit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

4	0	8	Sustainable Sites		12
Y			Prereq	Construction Activity Pollution Prevention	Required
Y			Prereq	Environmental Site Assessment	Required
1			Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
1			Credit	Open Space	1
		3	Credit	Rainwater Management	3
		2	Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1
		1	Credit	Site Master Plan	1
1			Credit	Joint Use of Facilities	1

5	1	6	Water Efficiency		12
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1		1	Credit	Outdoor Water Use Reduction	2
3	1	3	Credit	Indoor Water Use Reduction	7
		2	Credit	Cooling Tower Water Use - NB:swap CT for WE pc 94 "No Cooling Tower"	2
1			Credit	Water Metering	1

22	4	5	Energy and Atmosphere		31
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
6			Credit	Enhanced Commissioning	6
14	1	1	Credit	Optimize Energy Performance	16
	1		Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
2	1		Credit	Renewable Energy Production	3
		1	Credit	Enhanced Refrigerant Management	1
	1	1	Credit	Green Power and Carbon Offsets	2

Project Name: 20202.00 Northeast Metropolitan Regional Voc. H.S

Date: 5/12/2023

6	0	7	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
2		3	Credit	Building Life-Cycle Impact Reduction	5
1		1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
		2	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1		1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

9	1	6	Indoor Environmental Quality		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
Y			Prereq	Minimum Acoustic Performance	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
2		1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
2			Credit	Indoor Air Quality Assessment	2
	1		Credit	Thermal Comfort	1
2			Credit	Interior Lighting	2
		3	Credit	Daylight	3
		1	Credit	Quality Views	1
		1	Credit	Acoustic Performance	1

3	1	2	Innovation		6
2	1	2	Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

3	0	1	Regional Priority		4
1			Credit	Optimized Energy Performance	1
1			Credit	Building Life-Cycle Impact Reduction	1
1			Credit	Renewable Energy Production	1
		1	Credit	Regional Priority	1

53	8	49	TOTALS	Possible Points: 110
----	---	----	---------------	-----------------------------

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

GENERAL REQUIREMENTS
PROPRIETARY ITEMS

6C.3.1 - 06

6C.3.1-06

PROPIETARY ITEMS

The Northeast Metro Tech School Building Committee made the following proprietary vote at the May 24, 32023 School Building Committee meeting:

- *Standardize the Genetec Security Platform as a proprietary requirement for the project for all Closed-Circuit Television and Access Controls.*

Northeast Metro Tech Building Committee Agenda

Wednesday May 24th, 2023 - 4:30 P.M.

Location: Virtual Via Zoom

Join Zoom Meeting

<https://northeastmetrotech.zoom.us/j/87096882271>

Meeting ID: 870 9688 2271

One tap mobile

+19292056099,,87096882271# US (New York)

+13017158592,,87096882271# US (Washington DC)

Meeting ID: 870 9688 2271

Find your local

number: <https://northeastmetrotech.zoom.us/j/kB40XCCZ3>

	Estimated Start Time
I. Call to Order	4:30 P.M.
II. Prior Meeting Minutes	4:35 P.M.
a. Discussion	
b. SBC to Vote to Approve 01/19/2023 meeting minutes	
III. Public Comment Period	4:40 P.M.
IV. Discussion Topics	4:55 P.M.
1.) Invoice-Reimbursement Update (PMA)	
2.) 90% Construction Document MSBA Submission Package (DRA/PMA)	
3.) Discussion/ VOTE to standardize the Genetec Security Platform as a proprietary requirement for the project for all Closed-Circuit Television and Access Controls for the project.	
4.) VOTE: School Building Committee vote to authorize the project team to submit the 90% Construction Document Package to the Massachusetts School Building Authority on behalf of the District.	
V. New Business	5:25 P.M.
VI. Vote to Adjourn	5:30 P.M.

Authorized Person: David DiBarri, Superintendent

GENERAL REQUIREMENTS
COLOR THEORY STATEMENT

6C.3.1 - 07

6C.3.1-07

COLOR THEORY STATEMENT

The key design goal for the new Northeast Metropolitan Regional Vocational High School building is to accommodate 21st 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 exterior design features and colors were inspired by its unique location. The building is surrounded by natural rock outcroppings and dense forest. The colors and textures of the adjacent Breakheart Reservation State Park, lead to the design concept the was complementary of its environment. The manufactured stone base with varying stone sizes and coursing was natural choice of material to express the idea of the structure grounded in the rock that surrounds it. The choice of warm wood like colors on the metal trim around the roof overhangs was expressing the image of the "school in the woods" that was endorsed by the School District early in the design process. The deep overhangs of the roof elements also offer great opportunities to use the shadows cast by the building elements as another design feature that fits well within its surroundings. The color of the "green" tinted glass at the exterior façade was considered as complementary to the forest adjacent to the building. The color scheme from the exterior is proposed in the key interior locations to make the building design concept consistent throughout the school.

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, and natural stone looking sheet porcelain 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 metal design elements. Several 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 and stone inspired paneling and coffered ceiling. Special attention has been given to the lighting, acoustics, and technology of this space. Timeless, durable and 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



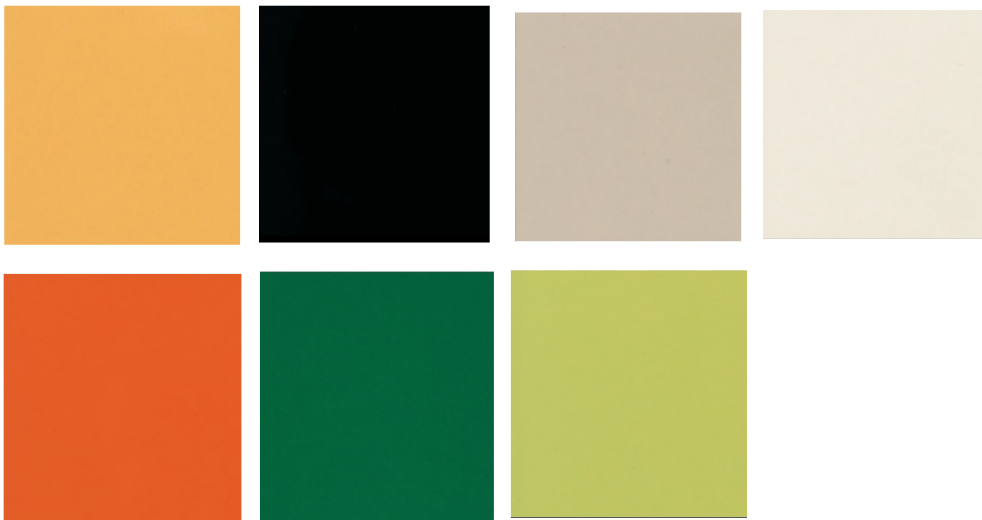
Wood Finish



Porcelain Paver



Ceramic Mosaic Tile - Floor



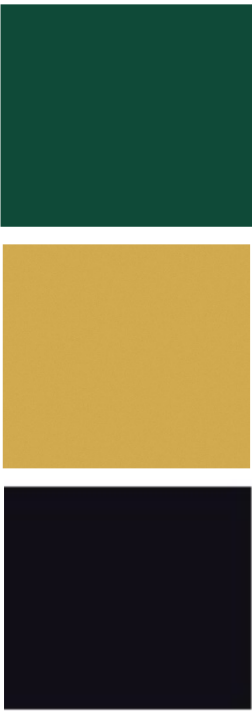
Ceramic Mosaic Tile - Wall



LINOLIUM



ROUND RUBBER TILE



LOCKER

GENERAL REQUIREMENTS

UPDATED STRUCTURAL CALCULATIONS

6C.3.1 - 08



Project Northeast Metropolitan Regional Vocational High School				Job Ref. 2019-091	
Section MSBA 90% Construction Document Submission				Sheet no./rev. 1	
Calc. by AA	Date 07/20/2022	Chk'd by MD	Date 07/27/2022	App'd by MD	Date 12/19/2022

Project Name:

Northeast Metropolitan Regional Vocational High School

MSBA Module 6 Requirements:

MSBA 90% Construction Documents – Structural Loading Calculations

Prepared For:

Drummey Rosane Anderson, Inc.

Prepared By:

Alexander Auditore, B.S.E. – Engineers Design Group, Inc.

Checked By:

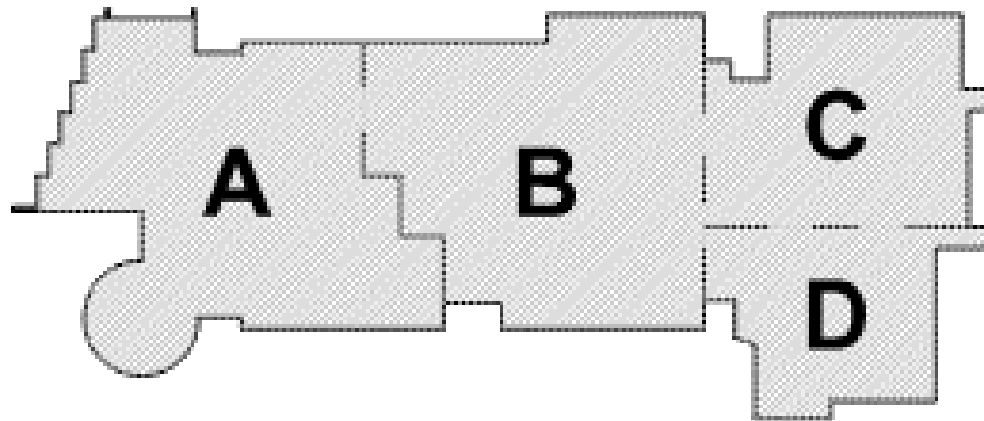
Mehul Dhruv, P.E. – Engineers Design Group, Inc.



Project Northeast Metropolitan Regional Vocational High School				Job Ref. 2019-091	
Section MSBA 90% Construction Document Submission				Sheet no./rev. 2	
Calc. by AA	Date 07/20/2022	Chk'd by MD	Date 07/27/2022	App'd by MD	Date 12/19/2022

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Dead and Live Loading Criteria	5
Snow Loading Criteria	6
Wind Loading Criteria	7
Seismic Loading Calculations	16
Sample Gravity Analysis and Design Calculations	19





Project Northeast Metropolitan Regional Vocational High School				Job Ref. 2019-091	
Section MSBA 90% Construction Document Submission				Sheet no./rev. 3	
Calc. by AA	Date 07/20/2022	Chk'd by MD	Date 07/27/2022	App'd by MD	Date 12/19/2022

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 academic rooms, Area B is the main academic 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 maintenance 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 suspended 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 maintenance 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 Northeast Metropolitan Regional Vocational High School				Job Ref. 2019-091	
Section MSBA 90% Construction Document Submission				Sheet no./rev. 4	
Calc. by AA	Date 07/20/2022	Chk'd by MD	Date 07/27/2022	App'd by MD	Date 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:

- | | |
|---------------------------------|----------|
| a. Foundations | 4500 psi |
| b. Slab-on-Grade | 4000 psi |
| c. Composite Slab-on-Steel Deck | 4000 psi |
| d. Exterior Concrete | 5000 psi |

Reinforcing Steel:

ASTM A615, Grade 60
ASTM A185 for Welded Wire Reinforcing

Structural Steel:

ASTM A992, Grade 50

Steel Channels:

ASTM A36

Steel Plates, Bars, Angles, etc.:

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



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Dead and Live Loading Criteria

Design Dead Loads:

Typical Floor Loading on Composite Deck:

5 1/4" Light-Weight Concrete	42 psf
2" x 20-Gauge Composite Steel Deck	3 psf
Mechanical/ Electrical/ Plumbing	10 psf
Miscellaneous	5 psf
	Σ60 psf

Typical Roof Loading on Steel Deck:

3" x 20-Gauge Type NS or NSA Steel Deck	3 psf
Roofing and Insulation	7 psf
Mechanical/ Electrical/ Plumbing	10 psf
Photovoltaic Panels	15 psf
Miscellaneous	5 psf
	Σ35 psf

Roof Loading on Mechanical Roof Pads:

4" Normal-Weight Concrete	67 psf
3" x 20-Gauge Composite Steel Deck	3 psf
Mechanical/ Electrical/ Plumbing	10 psf
	Σ80 psf

Design Live Loads:

Classrooms with Partitions	40 psf + 15 psf (<i>Reducible</i>)
Reading Rooms	60 psf (<i>Reducible</i>)
Corridors (First Floor)	100 psf (<i>Reducible</i>)
Corridors (Above First Floor)	80 psf (<i>Reducible</i>)
Lobbies	100 psf (<i>Non-Reducible</i>)
Assembly/Public Gathering Areas	100 psf (<i>Non-Reducible</i>)
Stairs	100 psf (<i>Non-Reducible</i>)
Storage (Light)	125 psf (<i>Non-Reducible</i>)
Storage (Mechanical Equipment)	150 psf (<i>Non-Reducible</i>)
Roof (Live)	20 psf (<i>Non-Reducible</i>)



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Snow Loading Criteria

[In accordance with ASCE7-10]

Building details

Roof type; Flat
Width of roof; b = **640.00** ft

Ground snow load

Ground snow load; $P_g = \mathbf{50.00}$ lb/ft²
Density of snow (Figure 7-1); $\gamma = \min(0.13 \times P_g / 1 \text{ ft} + 14 \text{ lb/ft}^3, 30 \text{ lb/ft}^3) = \mathbf{20.50}$ lb/ft³
Terrain typeSect. 26.7; B
Exposure condition (Table 7-2); Partially exposed
Exposure factor (Table 7-2); $C_e = \mathbf{1.00}$
Thermal condition (Table 7-3); All
Thermal factor (Table 7-3); $C_t = \mathbf{1.00}$
Importance category (Table 1.5-1); III
Importance factor (Table 1.5-2); $I_s = \mathbf{1.10}$
Min snow load for low slope roofs (Sect 7.3.4); $P_{f, \min} = I_s \times 20 \text{ lb/ft}^2 = \mathbf{22.00}$ lb/ft²
Flat roof snow load (Sect 7.3); $P_f = 0.7 \times C_e \times C_t \times I_s \times P_g = \mathbf{38.50}$ lb/ft²



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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 = 62.00 ft
Mean height;	h = 62.00 ft

General wind load requirements

Basic wind speed;	V = 137.0 mph
Risk category;	III
Velocity pressure exponent coef (Table 26.6-1);	K _d = 0.85
Exposure category (cl 26.7.3);	C
Enclosure classification (cl.26.10);	Enclosed buildings
Internal pressure coef +ve (Table 26.11-1);	G _{C_{pi}p} = 0.18
Internal pressure coef -ve (Table 26.11-1);	G _{C_{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 × K _z × K _{zt} × K _d × V ² × 1psf/mph ² ;

Velocity pressures table

z (ft)	K _z (Table 27.3-1)	q _z (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 psf
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Pressures and forces

Net pressure;	p = q × G _f × C _{pe} - q _i × G _{C_{pi}} ;
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Net force; $F_w = p \times A_{ref}$

Roof load case 1 - Wind 0, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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; $F_{w,v} = -2821.42$ kips

Total horizontal net force; $F_{w,h} = 0.00$ kips

Walls load case 1 - Wind 0, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	34.72	15.24	7050.00	107.44
A ₂	30.00	0.80	40.02	18.85	7050.00	132.90
A ₃	45.00	0.80	43.50	21.21	7050.00	149.54
A ₄	62.00	0.80	46.48	23.24	7990.00	185.68
B	62.00	-0.50	46.48	-28.12	29140.00	-819.38
C	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

Projected vertical plan area of wall;

$$A_{vert_w_0} = b \times H = 29140.00 \text{ ft}^2$$

Projected vertical area of roof;

$$A_{vert_r_0} = 0.00 \text{ ft}^2$$

Minimum overall horizontal loading;

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_0} + p_{min_r} \times A_{vert_r_0} = 466.24 \text{ kips}$$

Leeward net force;

$$F_l = F_{w,wB} = -819.4 \text{ kips}$$

Windward net force;

$$F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = 575.6 \text{ kips}$$

Overall horizontal loading;

$$F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = 1394.9 \text{ kips}$$

Roof load case 2 - Wind 0, GC_{pi} -0.18, $-0c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A (+ve)	62.00	-0.18	46.48	1.25	14570.00	18.28



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Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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

Total vertical net force; $F_{w,v} = 117.96$ kips

Total horizontal net force; $F_{w,h} = 0.00$ kips

Walls load case 2 - Wind 0, $GC_{pi} -0.18, -0c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	34.72	31.97	7050.00	225.40
A ₂	30.00	0.80	40.02	35.58	7050.00	250.86
A ₃	45.00	0.80	43.50	37.94	7050.00	267.50
A ₄	62.00	0.80	46.48	39.97	7990.00	319.37
B	62.00	-0.50	46.48	-11.39	29140.00	-331.82
C	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;

$$A_{vert_r_0} = 0.00 \text{ ft}^2$$

Minimum overall horizontal loading;

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_0} + p_{min_r} \times A_{vert_r_0} = 466.24 \text{ kips}$$

Leeward net force;

$$F_l = F_{w,wB} = -331.8 \text{ kips}$$

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;

$$F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = 1394.9 \text{ kips}$$

Roof load case 3 - Wind 90, $GC_{pi} 0.18, -c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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; $F_{w,v} = -2292.36$ kips



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Total horizontal net force; $F_{w,h} = 0.00$ kips

Walls load case 3 - Wind 90, $GC_{pi} 0.18, -c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	34.72	15.24	3000.00	45.72
A ₂	30.00	0.80	40.02	18.85	3000.00	56.55
A ₃	45.00	0.80	43.50	21.21	3000.00	63.63
A ₄	62.00	0.80	46.48	23.24	3400.00	79.01
B	62.00	-0.28	46.48	-19.53	12400.00	-242.13
C	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;

$$F_l = F_{w,WB} = -242.1 \text{ kips}$$

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. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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

Total vertical net force; $F_{w,v} = 117.96$ kips

Total horizontal net force; $F_{w,h} = 0.00$ kips

Walls load case 4 - Wind 90, $GC_{pi} -0.18, +c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	34.72	31.97	3000.00	95.92



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Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₂	30.00	0.80	40.02	35.58	3000.00	106.75
A ₃	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
B	62.00	-0.28	46.48	-2.79	12400.00	-34.65
C	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;

$$A_{vert_w_90} = d \times H = \mathbf{12400.00 \text{ ft}^2}$$

Projected vertical area of roof;

$$A_{vert_r_90} = \mathbf{0.00 \text{ ft}^2}$$

Minimum overall horizontal loading;

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_90} + p_{min_r} \times A_{vert_r_90} = \mathbf{198.40 \text{ kips}}$$

Leeward net force;

$$F_l = F_{w,wB} = \mathbf{-34.7 \text{ kips}}$$

Windward net force;

$$F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = \mathbf{452.4 \text{ kips}}$$

Overall horizontal loading;

$$F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = \mathbf{487.0 \text{ kips}}$$

Areas C and D

[In accordance with ASCE 7-10]

*Using the directional design method

Building data

Type of roof;

Flat

Length of building;

$b = \mathbf{285.00 \text{ ft}}$

Width of building;

$d = \mathbf{200.00 \text{ ft}}$

Height to eaves;

$H = \mathbf{82.00 \text{ ft}}$

Mean height;

$h = \mathbf{82.00 \text{ ft}}$

General wind load requirements

Basic wind speed;

$V = \mathbf{137.0 \text{ mph}}$

Risk category;

III

Velocity pressure exponent coef (Table 26.6-1);

$K_d = \mathbf{0.85}$

Exposure category (cl 26.7.3);

C

Enclosure classification (cl.26.10);

Enclosed buildings

Internal pressure coef +ve (Table 26.11-1);

$GC_{pi_p} = \mathbf{0.18}$

Internal pressure coef -ve (Table 26.11-1);

$GC_{pi_n} = \mathbf{-0.18}$

Gust effect factor;

$G_f = \mathbf{0.85}$



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Minimum design wind loading (cl.27.4.7); $p_{min_r} = 8 \text{ lb/ft}^2$

Topography

Topography factor not significant;

$$K_{zt} = 1.0$$

Velocity pressure equation;

$$q = 0.00256 \times K_z \times K_{zt} \times K_d \times V^2 \times 1 \text{ psf/mph}^2;$$

Velocity pressures table

z (ft)	K_z (Table 27.3-1)	q_z (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;

$$p = q \times G_f \times C_{pe} - q_i \times GC_{pi};$$

Net force;

$$F_w = p \times A_{ref};$$

Roof load case 1 - Wind 0, $GC_{pi} 0.18, -c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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

Total vertical net force; $F_{w,v} = -2020.62 \text{ kips}$

Total horizontal net force; $F_{w,h} = 0.00 \text{ kips}$

Walls load case 1 - Wind 0, $GC_{pi} 0.18, -c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	34.72	14.67	4275.00	62.70
A ₂	40.00	0.80	42.47	19.94	7125.00	142.10
A ₃	60.00	0.80	46.15	22.44	5700.00	127.93
A ₄	82.00	0.80	49.66	24.83	6270.00	155.69
B	82.00	-0.50	49.66	-30.05	23370.00	-702.18



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Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
C	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;

$$A_{vert_w_0} = b \times H = \mathbf{23370.00 \text{ ft}^2}$$

Projected vertical area of roof;

$$A_{vert_r_0} = \mathbf{0.00 \text{ ft}^2}$$

Minimum overall horizontal loading;

$$F_{w,total_min} = p_{min_w} \times A_{vert_w_0} + p_{min_r} \times A_{vert_r_0} = \mathbf{373.92 \text{ kips}}$$

Leeward net force;

$$F_l = F_{w,wB} = \mathbf{-702.2 \text{ kips}}$$

Windward net force;

$$F_w = F_{w,wA_1} + F_{w,wA_2} + F_{w,wA_3} + F_{w,wA_4} = \mathbf{488.4 \text{ kips}}$$

Overall horizontal loading;

$$F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = \mathbf{1190.6 \text{ kips}}$$

Roof load case 2 - Wind 0, $GC_{pi} -0.18, -0c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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;

$$F_{w,v} = \mathbf{76.43 \text{ kips}}$$

Total horizontal net force;

$$F_{w,h} = \mathbf{0.00 \text{ kips}}$$

Walls load case 2 - Wind 0, $GC_{pi} -0.18, -0c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	34.72	32.55	4275.00	139.13
A ₂	40.00	0.80	42.47	37.82	7125.00	269.48
A ₃	60.00	0.80	46.15	40.32	5700.00	229.83
A ₄	82.00	0.80	49.66	42.71	6270.00	267.79
B	82.00	-0.50	49.66	-12.17	23370.00	-284.35
C	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



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Overall loading

Projected vertical plan area of wall;

$$A_{\text{vert}_w_0} = b \times H = 23370.00 \text{ ft}^2$$

Projected vertical area of roof;

$$A_{\text{vert}_r_0} = 0.00 \text{ ft}^2$$

Minimum overall horizontal loading;

$$F_{w,\text{total_min}} = p_{\text{min}_w} \times A_{\text{vert}_w_0} + p_{\text{min}_r} \times A_{\text{vert}_r_0} = 373.92 \text{ kips}$$

Leeward net force;

$$F_l = F_{w,wB} = -284.4 \text{ kips}$$

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;

$$F_{w,\text{total}} = \max(F_w - F_l + F_{w,h}, F_{w,\text{total_min}}) = 1190.6 \text{ kips}$$

Roof load case 3 - Wind 90, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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;

$$F_{w,v} = -1785.24 \text{ kips}$$

Total horizontal net force;

$$F_{w,h} = 0.00 \text{ kips}$$

Walls load case 3 - Wind 90, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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 ₃	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
B	82.00	-0.41	49.66	-26.46	16400.00	-433.91
C	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;

$$A_{\text{vert}_w_{90}} = d \times H = 16400.00 \text{ ft}^2$$

Projected vertical area of roof;

$$A_{\text{vert}_r_{90}} = 0.00 \text{ ft}^2$$

Minimum overall horizontal loading;

$$F_{w,\text{total_min}} = p_{\text{min}_w} \times A_{\text{vert}_w_{90}} + p_{\text{min}_r} \times A_{\text{vert}_r_{90}} = 262.40 \text{ kips}$$

Leeward net force;

$$F_l = F_{w,wB} = -433.9 \text{ kips}$$



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Windward net force; $F_w = F_{w,WA_1} + F_{w,WA_2} + F_{w,WA_3} + F_{w,WA_4} = \mathbf{342.8}$ kips
 Overall horizontal loading; $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = \mathbf{776.7}$ kips

Roof load case 4 - Wind 90, $GC_{pi} -0.18, +c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (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; $F_{w,v} = \mathbf{76.43}$ kips
 Total horizontal net force; $F_{w,h} = \mathbf{0.00}$ kips

Walls load case 4 - Wind 90, $GC_{pi} -0.18, +c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft ²)	Net force F_w (kips)
A ₁	15.00	0.80	34.72	32.55	3000.00	97.64
A ₂	40.00	0.80	42.47	37.82	5000.00	189.11
A ₃	60.00	0.80	46.15	40.32	4000.00	161.29
A ₄	82.00	0.80	49.66	42.71	4400.00	187.93
B	82.00	-0.41	49.66	-8.58	16400.00	-140.70
C	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; $A_{vert_w_90} = d \times H = \mathbf{16400.00}$ ft²
 Projected vertical area of roof; $A_{vert_r_90} = \mathbf{0.00}$ ft²
 Minimum overall horizontal loading; $F_{w,total_min} = p_{min_w} \times A_{vert_w_90} + p_{min_r} \times A_{vert_r_90} = \mathbf{262.40}$ kips
 Leeward net force; $F_l = F_{w,WB} = \mathbf{-140.7}$ kips
 Windward net force; $F_w = F_{w,WA_1} + F_{w,WA_2} + F_{w,WA_3} + F_{w,WA_4} = \mathbf{636.0}$ kips
 Overall horizontal loading; $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total_min}) = \mathbf{776.7}$ kips



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Seismic Loading Calculations

Areas A and B

[In accordance with ASCE 7-10]

Site parameters

Site class;	D
Mapped acceleration parameters (Section 11.4.1)	
at short period;	$S_S = 0.25$
at 1 sec period;	$S_1 = 0.08$
Site coefficient at short period (Table 11.4-1);	$F_a = 1.600$
at 1 sec period (Table 11.4-2);	$F_v = 2.400$

Spectral response acceleration parameters

at short period (Eq. 11.4-1);	$S_{MS} = F_a \times S_S = 0.400$
at 1 sec period (Eq. 11.4-2);	$S_{M1} = F_v \times S_1 = 0.192$

Design spectral acceleration parameters (Sect 11.4.4)

at short period (Eq. 11.4-3);	$S_{DS} = 2 / 3 \times S_{MS} = 0.267$
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
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Seismic design category based on short period response acceleration (Table 11.6-1)

B

Seismic design category based on 1 sec period response acceleration (Table 11.6-2)

B

Seismic design category; B

Approximate fundamental period

Height above base to highest level of building;	$h_n = 62$ ft
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From Table 12.8-2:

Structure type;	All other systems
Building period parameter C_t ;	$C_t = 0.02$
Building period parameter x ;	$x = 0.75$

Approximate fundamental period (Eq 12.8-7);	$T_a = C_t \times (h_n)^x \times 1 \text{ sec} / (1 \text{ ft})^x = 0.442 \text{ sec}$
Building fundamental period (Sect 12.8.2);	$T = T_a = 0.442 \text{ sec}$
Long-period transition period;	$T_L = 12 \text{ sec}$

Seismic response coefficient

Seismic force-resisting system (Table 12.2-1);	B_BUILDING_FRAME_SYSTEMS 3. Ordinary steel concentrically braced frames
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Response modification factor (Table 12.2-1);	R = 3.25
Seismic importance factor (Table 1.5-2);	I_e = 1.250
Seismic response coefficient (Sect 12.8.1.1)	
Calculated (Eq 12.8-2);	$C_{s_calc} = S_{DS} / (R / I_e) = \mathbf{0.1026}$
Maximum (Eq 12.8-3);	$C_{s_max} = S_{D1} / ((T / 1 \text{ sec}) \times (R / I_e)) = \mathbf{0.1114}$
Minimum (Eq 12.8-5);	$C_{s_min} = \max(0.044 \times S_{DS} \times I_e, 0.01) = \mathbf{0.0147}$
Seismic response coefficient;	C_s = 0.1026
Seismic base shear (Sect 12.8.1)	
Effective seismic weight of the structure;	W = 19660.0 kips
Seismic response coefficient;	C_s = 0.1026
Seismic base shear (Eq 12.8-1);	V = C_s × W = 2016.4 kips

Areas C and D

[In accordance with ASCE 7-10]

Site parameters

Site class;	D
Mapped acceleration parameters (Section 11.4.1)	
at short period;	S_S = 0.25
at 1 sec period;	S₁ = 0.08
Site coefficient at short period (Table 11.4-1);	F_a = 1.600
at 1 sec period (Table 11.4-2);	F_v = 2.400

Spectral response acceleration parameters

at short period (Eq. 11.4-1);	S_{MS} = F_a × S_S = 0.400
at 1 sec period (Eq. 11.4-2);	S_{M1} = F_v × S₁ = 0.192

Design spectral acceleration parameters (Sect 11.4.4)

at short period (Eq. 11.4-3);	S_{DS} = 2 / 3 × S_{MS} = 0.267
at 1 sec period (Eq. 11.4-4);	S_{D1} = 2 / 3 × S_{M1} = 0.128

Seismic design category

Risk category (Table 1.5-1);	III
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Seismic design category based on short period response acceleration (Table 11.6-1)

B

Seismic design category based on 1 sec period response acceleration (Table 11.6-2)

B

Seismic design category;

B

Approximate fundamental period

Height above base to highest level of building;	h_n = 82 ft
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From Table 12.8-2:

Structure type; All other systems

Building period parameter C_t ; $C_t = 0.02$

Building period parameter x ; $x = 0.75$

Approximate fundamental period (Eq 12.8-7); $T_a = C_t \times (h_n)^x \times 1 \text{ sec} / (1 \text{ ft})^x = 0.545 \text{ sec}$

Building fundamental period (Sect 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 (Table 12.2-1); B BUILDING_FRAME_SYSTEMS
3. Ordinary steel concentrically braced frames

Response modification factor (Table 12.2-1); $R = 3.25$

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; $C_s = 0.0903$

Seismic base shear (Sect 12.8.1)

Effective seismic weight of the structure; $W = 9390.0 \text{ kips}$

Seismic response coefficient; $C_s = 0.0903$

Seismic base shear (Eq 12.8-1); $V = C_s \times W = 848.2 \text{ kips}$



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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
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Load combinations

Load combination 1 - Full	Support A	Dead $\times 1.20$ Live $\times 1.60$ Snow $\times 1.60$ Roof Live $\times 1.60$ Dead $\times 1.20$ Live $\times 1.60$ Snow $\times 1.60$ Roof Live $\times 1.60$
	Support B	Dead $\times 1.20$ Live $\times 1.60$ Snow $\times 1.60$ Roof Live $\times 1.60$

Analysis results

Maximum moment;	$M_{\max} = 234.3$ 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;	$R_{A_{\min}} = 26$ kips
Unfactored dead load reaction at support A;	$R_{A_{\text{Dead}}} = 7.3$ kips	
Unfactored snow load reaction at support A;	$R_{A_{\text{Snow}}} = 7.2$ kips	
Unfactored roof live load reaction at support A;	$R_{A_{\text{Roof Live}}} = 3.6$ kips	
Maximum reaction at support B;	$R_{B_{\max}} = 26$ kips;	$R_{B_{\min}} = 26$ kips
Unfactored dead load reaction at support B;	$R_{B_{\text{Dead}}} = 7.3$ kips	
Unfactored snow load reaction at support B;	$R_{B_{\text{Snow}}} = 7.2$ kips	



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Unfactored roof live load reaction at support B; $R_{B_Roof\ Live} = 3.6$ kips

Section details

Section type; **W 24x55 (AISC 15th Edn (v15.0))**
 ASTM steel designation; **A992**
 Steel yield stress; $F_y = 50$ ksi
 Steel tensile stress; $F_u = 65$ ksi
 Modulus of elasticity; $E = 29000$ ksi

Resistance factors

Resistance factor for tensile yielding $\phi_{ty} = 0.90$
 Resistance factor for tensile rupture $\phi_{tr} = 0.75$
 Resistance factor for compression $\phi_c = 0.90$
 Resistance factor for flexure $\phi_b = 0.90$

Lateral bracing

Span 1 has continuous lateral bracing

Classification of sections for local buckling - Section B4.1

Classification of flanges in flexure - Table B4.1b (case 10)

Width to thickness ratio; $b_f / (2 \times t_f) = 6.94$
 Limiting ratio for compact section; $\lambda_{pff} = 0.38 \times \sqrt{[E / F_y]} = 9.15$
 Limiting ratio for non-compact section; $\lambda_{rff} = 1.0 \times \sqrt{[E / F_y]} = 24.08$; 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; $\lambda_{pwf} = 3.76 \times \sqrt{[E / F_y]} = 90.55$
 Limiting ratio for non-compact section; $\lambda_{rwf} = 5.70 \times \sqrt{[E / F_y]} = 137.27$; Compact

Section is compact in flexure

Design of members for shear - Chapter G

Required shear strength $V_r = \max(\text{abs}(V_{\max}), \text{abs}(V_{\min})) = 26.031$ kips
 Web area $A_w = d \times t_w = 9.322$ in²
 Web plate buckling coefficient $k_v = 5.34$
 Web shear coefficient - eq G2-3 $C_{v1} = 1$
 Nominal shear strength – eq G6-1 $V_n = 0.6 \times F_y \times A_w \times C_{v1} = 279.660$ kips
 Resistance factor for shear $\phi_v = 0.90$
 Design shear strength $V_c = \phi_v \times V_n = 251.694$ kips

PASS - Design shear strength exceeds required shear strength

Design of members for flexure in the major axis - Chapter F

Required flexural strength; $M_r = \max(\text{abs}(M_{s1_max}), \text{abs}(M_{s1_min})) = 234.276$ kips_{_ft}



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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; $M_c = \phi_b \times M_n = 502.500 \text{ kips_ft}$

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; $\delta_{lim} = \min(1.5 \text{ in}, L_{s1} / 360) = 1.2 \text{ in}$

Maximum deflection span 1; $\delta = \max(\text{abs}(\delta_{max}), \text{abs}(\delta_{min})) = 0.97 \text{ in}$

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; $L = 36.000 \text{ ft}$

Beam spacing on one side; $b_1 = 10.000 \text{ ft}$

Beam spacing on other side; $b_2 = 10.000 \text{ ft}$

Deck orientation; **Deck ribs perpendicular to beam**

Profiles are assumed to meet all dimensional criteria in AISC 360-16

Overall depth of slab; $t = 5.250 \text{ in}$

Height of ribs; $h_r = 2.000 \text{ in}$

Centers of ribs; $\text{rib}_{ccs} = 12.000 \text{ in}$

Average width of rib; $w_r = 7.000 \text{ in}$



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Material properties

Concrete

Specified compressive strength of concrete;	$f'_c = 4.00$ ksi
Wet density of concrete;	$w_{cw} = 125$ lb/ft ³
Dry density of concrete;	$w_{cd} = 115$ lb/ft ³
Modulus of elasticity of concrete;	$E_c = w_{cd}^{1.5} \times \sqrt{(f'_c \times 1 \text{ ksi}) / (1 \text{ lb/ft}^3)^{1.5}} = 2466$ ksi

Steel

Specified minimum yield stress of steel;	$F_y = 50$ ksi
Modulus of elasticity of steel;	$E_s = 29000$ ksi

Loading – secondary beam

Weight of slab construction stage;	$w_{slab_constr} = [t - h_r \times (1 - w_r / rib_{ccs})] \times w_{cw} = 46.007$ psf
Weight of slab composite stage;	$w_{slab_comp} = [t - h_r \times (1 - w_r / rib_{ccs})] \times w_{cd} = 42.326$ psf
Weight of steel deck;	$w_{deck} = 3.000$ psf
Additional dead load;	$w_{d_add} = 0.000$ psf
Weight of steel beam;	$w_{beam_s} = 55.000$ lb/ft
Weight of construction live load;	$w_{constr} = 20.000$ psf
Superimposed dead load;	$w_{serv} = 15.000$ psf
Weight of wall parallel to span;	$w_{w_par} = 0.000$ lb/ft
Weight of wall perpendicular to span;	$w_{w_perp} = 0.000$ lb/ft ;assumed to be at mid-span.
Floor live load;	$w_{imp} = 100.000$ psf
Lightweight partition load;	$w_{part} = 0.000$ psf
Total construction stage dead load;	$w_{constr_D} = [(w_{slab_constr} + w_{deck} + w_{d_add}) \times ((b_1 + b_2) / 2)] + w_{beam_s} = 545.069$ lb/ft
Total construction stage live load;	$w_{constr_L} = w_{constr} \times (b_1 + b_2) / 2 = 200.000$ lb/ft
Total composite stage dead load(excluding walls); lb/ft	$w_{comp_D} = [(w_{slab_comp} + w_{deck} + w_{d_add} + w_{serv}) \times (b_1 + b_2) / 2] + w_{beam_s} = 658.264$
Total composite stage live load;	$w_{comp_L} = (w_{imp} + w_{part}) \times (b_1 + b_2) / 2 = 1000.000$ lb/ft;

Design forces – secondary beam

Max ultimate moment at construction stage;	$M_{constr_u} = (1.2 \times w_{constr_D} + 1.6 \times w_{constr_L}) \times L^2 / 8 = 157.801$ kips_ft
Max ultimate shear at construction stage;	$V_{constr_u} = (1.2 \times w_{constr_D} + 1.6 \times w_{constr_L}) \times L / 2 = 17.534$ kips
Maximum ultimate moment at composite stage;	$M_{comp_u} = (1.2 \times w_{comp_D} + 1.6 \times w_{comp_L}) \times L^2 / 8 + 1.2 \times w_{w_par} \times L^2 / 8 + 1.2 \times w_{w_perp} \times (b_1 + b_2) / 2 \times L / 4 = 387.166$ kips_ft
Maximum ultimate shear at composite stage;	$V_{comp_u} = (1.2 \times w_{comp_D} + 1.6 \times w_{comp_L}) \times L / 2 + 1.2 \times w_{w_par} \times L / 2 + 1.2 \times w_{w_perp} \times (b_1 + b_2) / 2 \times 1 / 2 = 43.019$ kips
Point of max. B.M. from nearest support;	$L_{BM_near} = L / 2 = 18.00$ ft

Steel section check

Trial steel section;	W24X55
Plastic modulus of steel section;	$Z_x = 134.00$ in ³
Elastic modulus of steel section;	$S_x = 114.00$ in ³
Width to thickness ratio;	$\lambda_f = b_f / (2 \times t_f) = 6.941$



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Limiting width to thickness ratio (compact); $\lambda_{pf} = 0.38 \times \sqrt{(E_s / F_y)} = \mathbf{9.152}$

Limiting width to thickness ratio (noncompact); $\lambda_{rf} = \sqrt{(E_s / F_y)} = \mathbf{24.083}$

Flange is compact

Depth to thickness ratio (h/t_w); $\lambda_w = \mathbf{54.600}$

Limiting depth to thickness ratio (compact); $\lambda_{pw} = 3.76 \times \sqrt{(E_s / F_y)} = \mathbf{90.553}$

Limiting depth to thickness ratio (noncompact); $\lambda_{rw} = 5.70 \times \sqrt{(E_s / F_y)} = \mathbf{137.274}$

Web is compact

Strength check at construction stage for flexure

Check for flexure

Plastic moment for steel section; $M_p = F_y \times Z_x = \mathbf{558.333 \text{ kip_ft}}$

Resistance factor for flexure; $\phi_b = \mathbf{0.90}$

Design flexural strength of steel section alone; $M_{constr_n} = \phi_b \times M_p = \mathbf{502.500 \text{ kip_ft}}$

Required flexural strength; $M_{constr_u} = \mathbf{157.801 \text{ kip_ft}}$

PASS - Beam bending at construction stage loading

Strength check at construction stage for shear

Web area; $A_w = d \times t_w = \mathbf{9.322 \text{ in}^2}$

Web plate buckling coefficient; $k_v = \mathbf{5.34}$

Depth to thickness ratio (h/t_w); $\lambda_w = \mathbf{54.600}$

Web shear coefficient; $C_{v1} = \mathbf{1.00}$

Resistant factor for shear; $\phi_v = \mathbf{0.9}$

Design shear strength; $V_{constr_n} = \phi_v \times (0.6 \times F_y \times A_w \times C_{v1}) = \mathbf{251.694 \text{ kips}}$

Required shear strength; $V_{constr_u} = \mathbf{17.534 \text{ kips}}$

PASS - Beam shear at construction stage loading

Design of steel anchors

Note - for non-uniform stud layouts a higher concentration of studs should be located towards the ends of the beam

Effective slab width of composite section; $b = \min(L/8, b_1/2) + \min(L/8, b_2/2) = \mathbf{108.000 \text{ in}}$

Effective area of concrete flange; $A_c = b \times (t - h_r) = \mathbf{351.00 \text{ in}^2}$

Diameter of stud anchor; $\text{dia} = \mathbf{0.750 \text{ in}}$

Length of stud anchor after weld; $H_s = \mathbf{3.50 \text{ in}}$

Specified tensile strength of stud anchor; $F_u = \mathbf{65 \text{ ksi}}$

Cross section area of one stud anchor; $A_{sa} = \pi \times \text{dia}^2 / 4 = \mathbf{0.442 \text{ in}^2}$

Maximum diameter permitted; $\text{dia}_{\max} = 2.5 \times t_f = \mathbf{1.263 \text{ in}}$

PASS - Diameter of stud anchor provided is OK

Point of max. B.M. from nearest support; $L_{BM_near} = \mathbf{18.00 \text{ ft}}$

No. of ribs from points of zero to max moment; $\text{rib}_{\text{numbers}} = \text{int}(L_{BM_near} / \text{rib}_{\text{ccs}} - 1) = \mathbf{17}$

No. of ribs with 1 stud per rib; $N_{r1} = \mathbf{17}$

No. of ribs with 2 studs per rib; $N_{r2} = \mathbf{0}$

No. of ribs with 3 studs per rib; $N_{r3} = \mathbf{0}$

Total number of studs; $N_{\text{prov}} = N_{r1} + 2 \times N_{r2} + 3 \times N_{r3} = \mathbf{17}$

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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-hi} 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;	$Q_{n1} = \min(0.5 \times A_{sa} \times \sqrt{f'_c \times E_c}, R_{g1} \times R_p \times A_{sa} \times F_u) = 17.230$ kips
Nom. strength of one stud with 2 studs per rib;	$Q_{n2} = \min(0.5 \times A_{sa} \times \sqrt{f'_c \times E_c}, R_{g2} \times R_p \times A_{sa} \times F_u) = 14.645$ kips
Nom. strength of one stud with 3 studs per rib;	$Q_{n3} = \min(0.5 \times A_{sa} \times \sqrt{f'_c \times E_c}, R_{g3} \times R_p \times A_{sa} \times F_u) = 12.061$ kips
Total strength of provided steel anchors;	$S_{sc} = N_{r1} \times Q_{n1} + 2 \times N_{r2} \times Q_{n2} + 3 \times N_{r3} \times Q_{n3} = 292.90$ kips
Resistance of concrete flange;	$C_{cf} = 0.85 \times f'_c \times A_c = 1193.400$ kips
Resistance of steel beam;	$T_{sb} = A \times F_y = 810.000$ kips
Beam/slab interface shear force;	$C = \min(C_{cf}, T_{sb}) = 810.000$ kips

Strength of studs is less than maximum interface shear force therefore partial composite action takes place

Strength check at partial composite action

Actual net tensile force ;	$V_h = C = 810.000$ kips
Assuming plastic neutral axis at the bottom of the steel beam flange.	
Resultant compressive force at flange bottom;	$P_{yf} = b_f \times t_f \times F_y = 177.003$ kips
Net force at steel and concrete interface;	$C_{net} = T_{sb} - 2 \times P_{yf} = 455.995$ kips

PNA is in the web of the I Section

Shear connection force;	$F_{shear} = S_{sc} = 292.90$ 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;	$t' = A / (2 \times t_w) - b_f \times t_f / t_w - 0.85 \times f'_c / F_y \times b \times d_c / (2 \times t_w) + t_f = 4.634$ in
Tension	
Bottom flange component;	$F_{bf} = F_y \times b_f \times t_f = 177.003$ kips
Moment capacity of bottom flange;	$M_{bf} = F_{bf} \times (d - (t_f/2) - t') = 276.030$ kip_ft
Web component;	$F_{web_t} = F_y \times (A - (2 \times b_f \times t_f) - (t' - t_f) \times t_w) = 374.450$ kips
Moment capacity of web;	$M_{web_t} = F_{web_t} \times (d - t' - t_f)/2 = 288.032$ kip_ft
Compression	
Web component;	$F_{web_c} = F_y \times (t' - t_f) \times t_w = 81.545$ kips
Moment capacity of web;	$M_{web_c} = F_{web_c} \times (t' - t_f)/2 = 14.029$ kip_ft
Top flange component;	$F_{tf} = F_y \times b_f \times t_f = 177.003$ kips
Moment capacity of top flange;	$M_{tf} = F_{tf} \times (t' - t_f/2) = 64.626$ kip_ft
Concrete flange component;	$F_{cf} = 0.85 \times f'_c \times b \times d_c = 292.904$ kips
Moment capacity of concrete flange;	$M_{cf} = F_{cf} \times (t - d_c/2 + t') = 231.518$ kip_ft
Design flexural strength of beam;	$M_{comp_n} = \phi_b \times (M_{bf} + M_{web_t} + M_{web_c} + M_{tf} + M_{cf}) = 786.811$ kip_ft
Required flexural strength;	$M_{comp_u} = 387.166$ kip_ft

PASS - Beam bending at partial composite stage

Check for shear	
Design shear strength;	$V_{comp_n} = V_{constr_n} = 251.694$ kips



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Required shear strength;

$$V_{comp_u} = 43.019 \text{ kips}$$

PASS - Beam shear at partial composite stage loading

Check for deflection (Commentary section I3.1)

Calculation of immediate construction stage deflection;

Deflection due to dead load; $\Delta_{short_D} = 5 \times w_{constr_D} \times L^4 / (384 \times E_s \times I_x) = 0.5262 \text{ in}$

Amount of beam camber; $\Delta_{camber} = 0.000 \text{ in}$

PASS - The camber is less than the construction stage dead load deflection

Deflection due to construction live load; $\Delta_2 = 5 \times w_{constr_L} \times L^4 / (384 \times E_s \times I_x) = 0.1931 \text{ in}$

Net total construction stage deflection; $\Delta_{short} = \Delta_{short_D} + \Delta_2 - \Delta_{camber} = 0.719 \text{ in}$

For short term loading:-

Short term modular ratio; $n_s = E_s / E_c = 11.8$

Depth of neutral axis from top of concrete;

$$y_s = [b \times (t - h_r) / n_s \times (t - h_r) / 2 + A \times (t + d / 2)] / [b \times (t - h_r) / n_s + A]$$

$$y_s = 7.051 \text{ in}$$

Moment of inertia of fully composite section;

$$I_s = I_x + A \times (d/2 + t - y_s)^2 + b \times (t - h_r)^3 / (12 \times n_s) + b \times (t - h_r) / n_s \times (y_s - (t - h_r) / 2)^2$$

$$I_s = 3875 \text{ in}^4$$

Effective mt of inertia for partially composite; $I_{s_eff} = 0.75 \times [I_x + \sqrt{(F_{shear} / C) \times (I_s - I_x)}] = 2151.2 \text{ in}^4$

Proportion of live load which is short term; $r_{L_s} = 67 \%$

Deflection due to short term live load; $\Delta_{L_s} = 5 \times r_{L_s} \times w_{comp_L} \times L^4 / (384 \times E_s \times I_{s_eff}) = 0.4059 \text{ in}$

For long term loading:-

Long term concrete modulus as % of short term; $r_{E_l} = 50 \%$

Long term modular ratio; $n_l = E_s / (E_c \times r_{E_l}) = 23.5$

Depth of neutral axis from top of concrete;

$$y_l = [b \times (t - h_r) / n_l \times (t - h_r) / 2 + A \times (t + d / 2)] / [b \times (t - h_r) / n_l + A]$$

$$y_l = 9.653 \text{ in}$$

Moment of inertia of fully composite section;

$$I_l = I_x + A \times (d/2 + t - y_l)^2 + b \times (t - h_r)^3 / (12 \times n_l) + b \times (t - h_r) / n_l \times (y_l - (t - h_r) / 2)^2$$

$$I_l = 3212 \text{ in}^4$$

Effective mt of inertia for partially composite; $I_{l_eff} = 0.75 \times [I_x + \sqrt{(F_{shear} / C) \times (I_l - I_x)}] = 1852.1 \text{ in}^4$

Proportion of live load which is long term; $r_{L_l} = 1 - r_{L_s} = 33 \%$

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 & superimp. 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 superimposed dead load (after concrete has cured):-

Wall parallel to span and superimposed dead; $\Delta_4 = 5 \times (w_{D_part}) \times L^4 / (384 \times E_s \times I_{l_eff}) = 0.1055 \text{ in}$

Wall perpendicular to span; $\Delta_5 = (w_{w_perp} \times (b_1 + b_2) / 2) \times L^3 / (48 \times E_s \times I_{l_eff}) = 0.0000 \text{ in}$

Combined deflections

Net total construction stage deflection; $\Delta_{short} = \Delta_{short_D} + \Delta_2 - \Delta_{camber} = 0.719 \text{ in}$

Net total long term deflection; $\Delta_{long} = \Delta_{short_D} + \Delta_{L_s} + \Delta_{L_l} + \Delta_4 + \Delta_5 - \Delta_{camber} = 1.270 \text{ in}$



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Combined short and long term live load deflectn; $\Delta_{live} = \Delta_{L_s} + \Delta_{L_l} = \mathbf{0.638}$ in
 Net long term dead and super imposed dead defln; $\Delta_{dead} = \Delta_{short_D} + \Delta_4 + \Delta_5 - \Delta_{camber} = \mathbf{0.632}$ in
 Post composite deflection; $\Delta_{comp} = \Delta_{L_s} + \Delta_{L_l} + \Delta_4 + \Delta_5 = \mathbf{0.744}$ in
 Allowable max deflection; $\Delta_{Allow} = \mathbf{1.500}$ 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

[In accordance with AISC360-10 and the LRFD method]

Column and loading details

Column details

Column section; **HSS 12x12x3/8**

Design loading

Required axial strength; $P_r = \mathbf{250}$ kips; (Compression)

Moment about x axis at end 1; $M_{x1} = \mathbf{0.0}$ kips_ft

Moment about x axis at end 2; $M_{x2} = \mathbf{0.0}$ kips_ft

Maximum moment about x axis; $M_x = \max(\text{abs}(M_{x1}), \text{abs}(M_{x2})) = \mathbf{0.0}$ kips_ft

Moment about y axis at end 1; $M_{y1} = \mathbf{0.0}$ kips_ft

Moment about y axis at end 2; $M_{y2} = \mathbf{0.0}$ kips_ft

Maximum moment about y axis; $M_y = \max(\text{abs}(M_{y1}), \text{abs}(M_{y2})) = \mathbf{0.0}$ kips_ft

Maximum shear force parallel to y axis; $V_{ry} = \mathbf{0.0}$ kips

Maximum shear force parallel to x axis; $V_{rx} = \mathbf{0.0}$ kips

Material details

Steel grade; **A500 Gr. C**

Yield strength; $F_y = \mathbf{50}$ ksi

Ultimate strength; $F_u = \mathbf{62}$ ksi

Modulus of elasticity; $E = \mathbf{29000}$ ksi

Shear modulus of elasticity; $G = \mathbf{11200}$ ksi

Unbraced lengths

For buckling about x axis; $L_x = \mathbf{240}$ in

For buckling about y axis; $L_y = \mathbf{240}$ in

For torsional buckling; $L_z = \mathbf{240}$ in



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Effective length factors

For buckling about x axis; $K_x = 1.00$
 For buckling about y axis; $K_y = 1.00$
 For torsional buckling; $K_z = 1.00$

Section classification

Section classification for local buckling (cl. B4)

Critical flange width; $b = b_f - 3 \times t = 10.953$ in
 Critical web width; $h = d - 3 \times t = 10.953$ in
 Width to thickness ratio of flange (compression); $\lambda_{f_c} = b / t = 31.384$
 Width to thickness ratio of web (compression); $\lambda_{w_c} = h / t = 31.384$
 Width to thickness ratio of flange (major flexure); $\lambda_{f_{fx}} = b / t = 31.384$
 Width to thickness ratio of web (major flexure); $\lambda_{w_{fx}} = h / t = 31.384$
 Width to thickness ratio of flange (minor flexure); $\lambda_{f_{fy}} = h / t = 31.384$
 Width to thickness ratio of web (minor flexure); $\lambda_{w_{fy}} = b / t = 31.384$

Compression

Limit for nonslender section; $\lambda_{r_c} = 1.40 \times \sqrt{(E / F_y)} = 33.716$

The section is nonslender in compression

Slenderness

Member slenderness

Slenderness ratio about x axis; $SR_x = K_x \times L_x / r_x = 50.7$
 Slenderness ratio about y axis; $SR_y = K_y \times L_y / r_y = 50.7$

Reduction factor for slender elements

Reduction factor for slender elements (E7)

The section does not contain any slender elements therefore:-

Slender element reduction factor; $Q = 1.0$

Compressive strength

Flexural buckling about x axis (cl. E3)

Elastic critical buckling stress; $F_{ex} = (\pi^2 \times E) / (SR_x)^2 = 111.2$ ksi
 Reduction factor; $Q_x = Q = 1.000$
 Flexural buckling stress about x axis; $F_{crx} = Q_x \times (0.658^{Q_x \times F_y / F_{ex}}) \times F_y = 41.4$ ksi
 Nominal flexural buckling strength; $P_{nx} = F_{crx} \times A_g = 662.7$ kips

Flexural buckling about y axis (cl. E3)

Elastic critical buckling stress; $F_{ey} = (\pi^2 \times E) / (SR_y)^2 = 111.2$ ksi
 Reduction factor; $Q_y = Q = 1.000$
 Flexural buckling stress about y axis; $F_{cry} = Q_y \times (0.658^{Q_y \times F_y / F_{ey}}) \times F_y = 41.4$ ksi



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Nominal flexural buckling strength;

$$P_{ny} = F_{cry} \times A_g = \mathbf{662.7 \text{ kips}}$$

Design compressive strength (cl.E1)

Resistance factor for compression;

$$\phi_c = \mathbf{0.90}$$

Design compressive strength;

$$P_c = \phi_c \times \min(P_{nx}, P_{ny}) = \mathbf{596.5 \text{ kips}}$$

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

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 ²	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 ²	4.147	5.400		Pass
Max.reinf.spacing, bot, y-direction	in	18.0	11.1		Pass

Pad footing details

Length of footing;

$$L_x = \mathbf{8 \text{ ft}}$$

Width of footing;

$$L_y = \mathbf{8 \text{ ft}}$$

Footing area;

$$A = L_x \times L_y = \mathbf{64 \text{ ft}^2}$$

Depth of footing;

$$h = \mathbf{24 \text{ in}}$$

Depth of soil over footing;

$$h_{soil} = \mathbf{18 \text{ in}}$$

Density of concrete;

$$\gamma_{conc} = \mathbf{150.0 \text{ lb/ft}^3}$$



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Column no.1 details

Length of column; $l_{x1} = 16.00$ in
Width of column; $l_{y1} = 16.00$ in
position in x-axis; $x_1 = 48.00$ in
position in y-axis; $y_1 = 48.00$ in

Soil Properties

Gross allowable bearing pressure; $q_{allow_Gross} = 4$ ksf;
Density of soil; $\gamma_{soil} = 120.0$ lb/ft³
Angle of internal friction; $\phi_b = 30.0$ deg
Design base friction angle; $\delta_{bb} = 30.0$ deg
Coefficient of base friction; $\tan(\delta_{bb}) = 0.577$
Design wall friction angle; $\delta_b = 15.0$ deg
Passive pressure coefficient (Coulomb); $K_p = \sin(90 - \phi_b)^2 / (\sin(90 + \delta_b) \times [1 - \sqrt{[\sin(\phi_b + \delta_b) \times \sin(\phi_b) / (\sin(90 + \delta_b))]}]^2) = 4.977$
Dead surcharge load; $F_{Dsur} = 25$ psf
Live surcharge load; $F_{Lsur} = 100$ psf
Self weight; $F_{swt} = h \times \gamma_{conc} = 300$ psf
Soil weight; $F_{soil} = h_{soil} \times \gamma_{soil} = 180$ psf

Column no.1 loads

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 + 1.0L (0.835)
1.0D + 1.0S (0.712)
1.0D + 0.75L + 0.75S (0.951)

Combination 7 results: 1.0D + 0.75L + 0.75S

Forces on footing

Force in z-axis;

$$F_{dz} = \gamma_D \times A \times (F_{swt} + F_{soil} + F_{Dsur}) + \gamma_L \times A \times F_{Lsur} + \gamma_D \times F_{Dz1} + \gamma_L \times F_{Lz1} + \gamma_S \times F_{Sz1} = 243.4$$
 kips



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Moments on footing

Moment in x-axis, about x is 0;

$$M_{dx} = \gamma_D \times (A \times (F_{swt} + F_{soil} + F_{Dsur}) \times L_x / 2) + \gamma_L \times A \times F_{Lsur} \times L_x / 2 + \gamma_D \times (F_{Dz1} \times x_1) + \gamma_L \times (F_{Lz1} \times x_1) + \gamma_S \times (F_{Sz1} \times x_1) = \mathbf{973.5 \text{ kip_ft}}$$

Moment in y-axis, about y is 0;

$$M_{dy} = \gamma_D \times (A \times (F_{swt} + F_{soil} + F_{Dsur}) \times L_y / 2) + \gamma_L \times A \times F_{Lsur} \times L_y / 2 + \gamma_D \times (F_{Dz1} \times y_1) + \gamma_L \times (F_{Lz1} \times y_1) + \gamma_S \times (F_{Sz1} \times y_1) = \mathbf{973.5 \text{ kip_ft}}$$

Uplift verification

Vertical force;

$$F_{dz} = \mathbf{243.37 \text{ kips}}$$

PASS - Footing is not subject to uplift

Bearing resistance

Eccentricity of base reaction

Eccentricity of base reaction in x-axis;

$$e_{dx} = M_{dx} / F_{dz} - L_x / 2 = \mathbf{0 \text{ in}}$$

Eccentricity of base reaction in y-axis;

$$e_{dy} = M_{dy} / F_{dz} - L_y / 2 = \mathbf{0 \text{ in}}$$

Pad base pressures

$$q_1 = F_{dz} \times (1 - 6 \times e_{dx} / L_x - 6 \times e_{dy} / L_y) / (L_x \times L_y) = \mathbf{3.803 \text{ ksf}}$$

$$q_2 = F_{dz} \times (1 - 6 \times e_{dx} / L_x + 6 \times e_{dy} / L_y) / (L_x \times L_y) = \mathbf{3.803 \text{ ksf}}$$

$$q_3 = F_{dz} \times (1 + 6 \times e_{dx} / L_x - 6 \times e_{dy} / L_y) / (L_x \times L_y) = \mathbf{3.803 \text{ ksf}}$$

$$q_4 = F_{dz} \times (1 + 6 \times e_{dx} / L_x + 6 \times e_{dy} / L_y) / (L_x \times L_y) = \mathbf{3.803 \text{ ksf}}$$

Minimum base pressure;

$$q_{min} = \min(q_1, q_2, q_3, q_4) = \mathbf{3.803 \text{ ksf}}$$

Maximum base pressure;

$$q_{max} = \max(q_1, q_2, q_3, q_4) = \mathbf{3.803 \text{ ksf}}$$

Allowable Bearing Capacity

Allowable bearing capacity;

$$q_{allow} = q_{allow_Gross} = \mathbf{4 \text{ ksf}}$$

$$q_{max} / q_{allow} = \mathbf{0.951}$$

PASS - Allowable bearing capacity exceeds design base pressure

Footing Design

[In accordance with ACI318-19]

Material details

Compressive strength of concrete;

$$f'_c = \mathbf{4000 \text{ psi}}$$

Yield strength of reinforcement;

$$f_y = \mathbf{60000 \text{ psi}}$$

Compression-controlled strain limit (21.2.2);

$$\epsilon_{ty} = \mathbf{0.00200}$$

Cover to top of footing;

$$c_{nom_t} = \mathbf{3 \text{ in}}$$

Cover to side of footing;

$$c_{nom_s} = \mathbf{3 \text{ in}}$$

Cover to bottom of footing;

$$c_{nom_b} = \mathbf{3 \text{ in}}$$

Concrete type;

Normal weight

Concrete modification factor;

$$\lambda = \mathbf{1.00}$$

Column type;

Concrete



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Analysis and design of concrete footing

Load combinations per ASCE 7-10

1.4D (0.212)

1.2D + 1.6L + 0.5Lr (0.520)

Combination 2 results: 1.2D + 1.6L + 0.5Lr

Forces on footing

Ultimate force in z-axis;

$$F_{uz} = \gamma_D \times A \times (F_{swt} + F_{soil} + F_{Dsur}) + \gamma_L \times A \times F_{Lsur} + \gamma_D \times F_{Dz1} + \gamma_L \times F_{Lz1} = \mathbf{299.0 \text{ kips}}$$

Moments on footing

Ultimate moment in x-axis, about x is 0;

$$M_{ux} = \gamma_D \times (A \times (F_{swt} + F_{soil} + F_{Dsur}) \times L_x / 2) + \gamma_L \times A \times F_{Lsur} \times L_x / 2 + \gamma_D \times (F_{Dz1} \times x_1) + \gamma_L \times (F_{Lz1} \times x_1) = \mathbf{1196.1 \text{ kip_ft}}$$

Ultimate moment in y-axis, about y is 0;

$$M_{uy} = \gamma_D \times (A \times (F_{swt} + F_{soil} + F_{Dsur}) \times L_y / 2) + \gamma_L \times A \times F_{Lsur} \times L_y / 2 + \gamma_D \times (F_{Dz1} \times y_1) + \gamma_L \times (F_{Lz1} \times y_1) = \mathbf{1196.1 \text{ kip_ft}}$$

Eccentricity of base reaction

Eccentricity of base reaction in x-axis;

$$e_{ux} = M_{ux} / F_{uz} - L_x / 2 = \mathbf{0 \text{ in}}$$

Eccentricity of base reaction in y-axis;

$$e_{uy} = M_{uy} / F_{uz} - L_y / 2 = \mathbf{0 \text{ in}}$$

Pad base pressures

$$q_{u1} = F_{uz} \times (1 - 6 \times e_{ux} / L_x - 6 \times e_{uy} / L_y) / (L_x \times L_y) = \mathbf{4.672 \text{ ksf}}$$

$$q_{u2} = F_{uz} \times (1 - 6 \times e_{ux} / L_x + 6 \times e_{uy} / L_y) / (L_x \times L_y) = \mathbf{4.672 \text{ ksf}}$$

$$q_{u3} = F_{uz} \times (1 + 6 \times e_{ux} / L_x - 6 \times e_{uy} / L_y) / (L_x \times L_y) = \mathbf{4.672 \text{ ksf}}$$

$$q_{u4} = F_{uz} \times (1 + 6 \times e_{ux} / L_x + 6 \times e_{uy} / L_y) / (L_x \times L_y) = \mathbf{4.672 \text{ ksf}}$$

Minimum ultimate base pressure;

$$q_{umin} = \min(q_{u1}, q_{u2}, q_{u3}, q_{u4}) = \mathbf{4.672 \text{ ksf}}$$

Maximum ultimate base pressure;

$$q_{umax} = \max(q_{u1}, q_{u2}, q_{u3}, q_{u4}) = \mathbf{4.672 \text{ ksf}}$$

Moment design, x direction, positive moment

Ultimate bending moment;

$$M_{u.x.max} = \mathbf{173.679 \text{ kip_ft}}$$

Tension reinforcement provided;

$$9 \text{ No.7 bottom bars (11.1 in c/c)}$$

Area of tension reinforcement provided;

$$A_{sx.bot.prov} = \mathbf{5.4 \text{ in}^2}$$

Minimum area of reinforcement (8.6.1.1);

$$A_{s.min} = 0.0018 \times L_y \times h = \mathbf{4.147 \text{ in}^2}$$

PASS - Area of reinforcement provided exceeds minimum

Maximum spacing of reinforcement (8.7.2.2);

$$s_{max} = \min(2 \times h, 18 \text{ in}) = \mathbf{18 \text{ in}}$$

PASS - Maximum permissible reinforcement spacing exceeds actual spacing

Depth to tension reinforcement;

$$d = h - c_{nom_b} - \phi_{x.bot} / 2 = \mathbf{20.562 \text{ in}}$$

Depth of compression block;

$$a = A_{sx.bot.prov} \times f_y / (0.85 \times f'_c \times L_y) = \mathbf{0.993 \text{ in}}$$

Neutral axis factor;

$$\beta_1 = \mathbf{0.85}$$

Depth to neutral axis;

$$c = a / \beta_1 = \mathbf{1.168 \text{ in}}$$

Strain in tensile reinforcement;

$$\epsilon_t = 0.003 \times d / c - 0.003 = \mathbf{0.04982}$$

Minimum tensile strain(8.3.3.1);

$$\epsilon_{min} = \epsilon_{ty} + 0.003 = \mathbf{0.00500}$$

PASS - Tensile strain exceeds minimum required



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Nominal moment capacity;

$$M_n = A_{sx,bot,prov} \times f_y \times (d - a / 2) = \mathbf{541.787 \text{ kip_ft}}$$

Flexural strength reduction factor;

$$\phi_f = \min(\max(0.65 + 0.25 \times (\epsilon_t - \epsilon_{ty}) / (0.003), 0.65), 0.9) = \mathbf{0.900}$$

Design moment capacity;

$$\phi M_n = \phi_f \times M_n = \mathbf{487.608 \text{ kip_ft}}$$

$$M_{u,x,max} / \phi M_n = \mathbf{0.356}$$

PASS - Design moment capacity exceeds ultimate moment load

One-way shear design, x direction

Ultimate shear force;

$$V_{u,x} = \mathbf{52.918 \text{ kips}}$$

Depth to reinforcement;

$$d_v = h - c_{nom_b} - \phi_{x,bot} / 2 = \mathbf{20.562 \text{ in}}$$

Size effect factor (22.5.5.1.3);

$$\lambda_s = \mathbf{1}$$

Ratio of longitudinal reinforcement;

$$\rho_w = A_{sx,bot,prov} / (L_y \times d_v) = \mathbf{0.00274}$$

Shear strength reduction factor;

$$\phi_v = \mathbf{0.75}$$

Nominal shear capacity (Eq. 22.5.5.1);

$$V_n = \min(8 \times \lambda_s \times \lambda \times (\rho_w)^{1/3} \times \sqrt{(f_c \times 1 \text{ psi})} \times L_y \times d_v, 5 \times \lambda \times \sqrt{(f_c \times 1 \text{ psi})} \times L_y \times d_v) = \mathbf{139.685 \text{ kips}}$$

Design shear capacity;

$$\phi V_n = \phi_v \times V_n = \mathbf{104.764 \text{ kips}}$$

$$V_{u,x} / \phi V_n = \mathbf{0.505}$$

PASS - Design shear capacity exceeds ultimate shear load

Moment design, y direction, positive moment

Ultimate bending moment;

$$M_{u,y,max} = \mathbf{173.679 \text{ kip_ft}}$$

Tension reinforcement provided;

$$9 \text{ No.7 bottom bars (11.1 in c/c)}$$

Area of tension reinforcement provided;

$$A_{sy,bot,prov} = \mathbf{5.4 \text{ in}^2}$$

Minimum area of reinforcement (8.6.1.1);

$$A_{s,min} = 0.0018 \times L_x \times h = \mathbf{4.147 \text{ in}^2}$$

PASS - Area of reinforcement provided exceeds minimum

Maximum spacing of reinforcement (8.7.2.2);

$$s_{max} = \min(2 \times h, 18 \text{ in}) = \mathbf{18 \text{ in}}$$

PASS - Maximum permissible reinforcement spacing exceeds actual spacing

Depth to tension reinforcement;

$$d = h - c_{nom_b} - \phi_{x,bot} - \phi_{y,bot} / 2 = \mathbf{19.687 \text{ in}}$$

Depth of compression block;

$$a = A_{sy,bot,prov} \times f_y / (0.85 \times f_c \times L_x) = \mathbf{0.993 \text{ in}}$$

Neutral axis factor;

$$\beta_1 = \mathbf{0.85}$$

Depth to neutral axis;

$$c = a / \beta_1 = \mathbf{1.168 \text{ in}}$$

Strain in tensile reinforcement;

$$\epsilon_t = 0.003 \times d / c - 0.003 = \mathbf{0.04757}$$

Minimum tensile strain(8.3.3.1);

$$\epsilon_{min} = \epsilon_{ty} + 0.003 = \mathbf{0.00500}$$

PASS - Tensile strain exceeds minimum required

Nominal moment capacity;

$$M_n = A_{sy,bot,prov} \times f_y \times (d - a / 2) = \mathbf{518.162 \text{ kip_ft}}$$

Flexural strength reduction factor;

$$\phi_f = \min(\max(0.65 + 0.25 \times (\epsilon_t - \epsilon_{ty}) / (0.003), 0.65), 0.9) = \mathbf{0.900}$$

Design moment capacity;

$$\phi M_n = \phi_f \times M_n = \mathbf{466.346 \text{ kip_ft}}$$

$$M_{u,y,max} / \phi M_n = \mathbf{0.372}$$

PASS - Design moment capacity exceeds ultimate moment load

One-way shear design, y direction

Ultimate shear force;

$$V_{u,y} = \mathbf{52.918 \text{ kips}}$$



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Depth to reinforcement;	$d_v = h - c_{nom_b} - \phi_{x.bot} - \phi_{y.bot} / 2 = \mathbf{19.687 \text{ in}}$
Size effect factor (22.5.5.1.3);	$\lambda_s = \mathbf{1}$
Ratio of longitudinal reinforcement;	$\rho_w = A_{sy.bot.prov} / (L_x \times d_v) = \mathbf{0.00286}$
Shear strength reduction factor;	$\phi_v = \mathbf{0.75}$
Nominal shear capacity (Eq. 22.5.5.1);	$V_n = \min(8 \times \lambda_s \times \lambda \times (\rho_w)^{1/3} \times \sqrt{(f'_c \times 1 \text{ psi})} \times L_x \times d_v, 5 \times \lambda \times \sqrt{(f'_c \times 1 \text{ psi})} \times L_x \times d_v) = \mathbf{135.694 \text{ kips}}$
Design shear capacity;	$\phi V_n = \phi_v \times V_n = \mathbf{101.77 \text{ kips}}$ $V_{u.y} / \phi V_n = \mathbf{0.520}$

PASS - Design shear capacity exceeds ultimate shear load

Two-way shear design at column 1

Depth to reinforcement;	$d_{v2} = \mathbf{20.125 \text{ in}}$
Shear perimeter length (22.6.4);	$l_{xp} = \mathbf{36.125 \text{ in}}$
Shear perimeter width (22.6.4);	$l_{yp} = \mathbf{36.125 \text{ in}}$
Shear perimeter (22.6.4);	$b_o = 2 \times (l_{x1} + d_{v2}) + 2 \times (l_{y1} + d_{v2}) = \mathbf{144.500 \text{ in}}$
Shear area;	$A_p = l_{x,perim} \times l_{y,perim} = \mathbf{1305.016 \text{ in}^2}$
Surcharge loaded area;	$A_{sur} = A_p - l_{x1} \times l_{y1} = \mathbf{1049.016 \text{ in}^2}$
Ultimate bearing pressure at center of shear area;	$q_{up.avg} = \mathbf{4.672 \text{ ksf}}$
Ultimate shear load;	$F_{up} = \gamma_D \times F_{Dz1} + \gamma_L \times F_{Lz1} + \gamma_D \times A_p \times F_{swt} + \gamma_D \times A_{sur} \times F_{soil} + \gamma_D \times A_{sur} \times F_{Dsur} + \gamma_L \times A_{sur} \times F_{Lsur} - q_{up.avg} \times A_p = \mathbf{213.877 \text{ kips}}$
Ultimate shear stress from vertical load;	$v_{ug} = \max(F_{up} / (b_o \times d_{v2}), 0 \text{ psi}) = \mathbf{73.546 \text{ psi}}$
Column geometry factor (Table 22.6.5.2);	$\beta = l_{y1} / l_{x1} = \mathbf{1.00}$
Column location factor (22.6.5.3);	$\alpha_s = \mathbf{40}$
Size effect factor (22.5.5.1.3);	$\lambda_s = \mathbf{1}$
Concrete shear strength (22.6.5.2);	$v_{cpa} = (2 + 4 / \beta) \times \lambda_s \times \lambda \times \sqrt{(f'_c \times 1 \text{ psi})} = \mathbf{379.473 \text{ psi}}$ $v_{cpb} = (\alpha_s \times d_{v2} / b_o + 2) \times \lambda_s \times \lambda \times \sqrt{(f'_c \times 1 \text{ psi})} = \mathbf{478.828 \text{ psi}}$ $v_{cpc} = 4 \times \lambda_s \times \lambda \times \sqrt{(f'_c \times 1 \text{ psi})} = \mathbf{252.982 \text{ psi}}$ $v_{cp} = \min(v_{cpa}, v_{cpb}, v_{cpc}) = \mathbf{252.982 \text{ psi}}$
Shear strength reduction factor;	$\phi_v = \mathbf{0.75}$
Nominal shear stress capacity (Eq. 22.6.1.2);	$v_n = v_{cp} = \mathbf{252.982 \text{ psi}}$
Design shear stress capacity (8.5.1.1(d));	$\phi v_n = \phi_v \times v_n = \mathbf{189.737 \text{ psi}}$ $v_{ug} / \phi v_n = \mathbf{0.388}$

PASS - Design shear stress capacity exceeds ultimate shear stress load



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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 ²	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

Length of footing;	$L_x = 1$ ft
Width of footing;	$L_y = 2$ ft
Footing area;	$A = L_x \times L_y = 2$ ft ²
Depth of footing;	$h = 12$ in
Depth of soil over footing;	$h_{soil} = 3.5$ in
Density of concrete;	$\gamma_{conc} = 150.0$ 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;	$q_{allow_Gross} = 4$ ksf;
Density of soil;	$\gamma_{soil} = 120.0$ lb/ft ³
Angle of internal friction;	$\phi_b = 30.0$ deg
Design base friction angle;	$\delta_{bb} = 30.0$ deg
Coefficient of base friction;	$\tan(\delta_{bb}) = 0.577$
Self weight;	$F_{swt} = h \times \gamma_{conc} = 150$ psf
Soil weight;	$F_{soil} = h_{soil} \times \gamma_{soil} = 35$ psf



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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; $F_{Sz1} = 2.0$ kips

Footing analysis for soil and stability

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; $F_{dz} = \gamma_D \times A \times (F_{swt} + F_{soil}) + \gamma_D \times F_{Dz1} + \gamma_L \times F_{Lz1} + \gamma_S \times F_{Sz1} = 6.9$ kips

Moments on footing per linear foot

Moment in y-axis, about y is 0;
 $M_{dy} = \gamma_D \times (A \times (F_{swt} + F_{soil}) \times L_y / 2) + \gamma_D \times (F_{Dz1} \times y_1) + \gamma_L \times (F_{Lz1} \times y_1) + \gamma_S \times (F_{Sz1} \times y_1) = 6.9$ kip_ft

Uplift verification

Vertical force; $F_{dz} = 6.87$ kips

PASS - Footing is not subject to uplift

Stability against sliding

Resistance due to base friction; $F_{R\text{Friction}} = \max(F_{dz}, 0 \text{ kN}) \times \tan(\delta_{bb}) = 3.966$ kips

Bearing resistance

Eccentricity of base reaction

Eccentricity of base reaction in y-axis; $e_{dy} = M_{dy} / F_{dz} - L_y / 2 = 0.000$ in

Strip base pressures

$$q_1 = F_{dz} \times (1 - 6 \times e_{dy} / L_y) / (L_y \times 1 \text{ ft}) = 3.435 \text{ ksf}$$

$$q_2 = F_{dz} \times (1 + 6 \times e_{dy} / L_y) / (L_y \times 1 \text{ ft}) = 3.435 \text{ ksf}$$

Minimum base pressure; $q_{\min} = \min(q_1, q_2) = 3.435$ ksf

Maximum base pressure; $q_{\max} = \max(q_1, q_2) = 3.435$ ksf

Allowable bearing capacity

Allowable bearing capacity; $q_{\text{allow}} = q_{\text{allow_Gross}} = 4$ ksf

$$q_{\max} / q_{\text{allow}} = 0.859$$



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PASS - Allowable bearing capacity exceeds design base pressure

Footing Design

[In accordance with ACI318-19]

Material details

Compressive strength of concrete;	$f'_c = 4000$ psi
Yield strength of reinforcement;	$f_y = 60000$ psi
Compression-controlled strain limit (21.2.2);	$\epsilon_{ty} = 0.00200$
Cover to top of footing;	$c_{nom_t} = 3$ 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;
 $F_{uz} = \gamma_D \times A \times (F_{swt} + F_{soil}) + \square_D \times F_{Dz1} + \square_L \times F_{Lz1} + \square_S \times F_{Sz1} = 10.2$
 kips

Moments on footing per linear foot

Ultimate moment in y-axis, about y is 0;
 $M_{uy} = \gamma_D \times (A \times (F_{swt} + F_{soil}) \times L_y / 2) + \gamma_D \times (F_{Dz1} \times y_1) + \gamma_L \times (F_{Lz1} \times y_1) + \gamma_S \times (F_{Sz1} \times y_1) = 10.2$ kip_ft

Eccentricity of base reaction

Eccentricity of base reaction in y-axis;
 $e_{uy} = M_{uy} / F_{uz} - L_y / 2 = 0.000$ in

Strip base pressures

$q_{u1} = F_{uz} \times (1 - 6 \times e_{uy} / L_y) / (L_y \times 1 \text{ ft}) = 5.122$ ksf
 $q_{u2} = F_{uz} \times (1 + 6 \times e_{uy} / L_y) / (L_y \times 1 \text{ ft}) = 5.122$ ksf
 Minimum ultimate base pressure;
 $q_{umin} = \min(q_{u1}, q_{u2}) = 5.122$ ksf
 Maximum ultimate base pressure;
 $q_{umax} = \max(q_{u1}, q_{u2}) = 5.122$ ksf



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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); $s_{max} = \min(3 \times h, 18 \text{ in}) = 18 \text{ in}$

PASS - Maximum permissible reinforcement spacing exceeds actual spacing

Depth to tension reinforcement; $d = h - c_{nom_b} - \phi_{y,bot} / 2 = 8.688 \text{ in}$
Depth of compression block; $a = A_{sy,bot,prov} \times f_y / (0.85 \times f'_c \times L_x) = 0.456 \text{ in}$
Neutral axis factor; $\beta_1 = 0.85$
Depth to neutral axis; $c = a / \beta_1 = 0.536 \text{ in}$
Strain in tensile reinforcement; $\epsilon_t = 0.003 \times d / c - 0.003 = 0.04559$
Minimum tensile strain(7.3.3.1); $\epsilon_{min} = \epsilon_{ty} + 0.003 = 0.00500$

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; $\phi_f = \min(\max(0.65 + 0.25 \times (\epsilon_t - \epsilon_{ty}) / (0.003), 0.65), 0.9) = 0.900$
Design moment capacity; $\phi M_n = \phi_f \times M_n = 11.801 \text{ kip_ft}$
 $M_{u,y,max} / \phi M_n = 0.052$

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

6C.3.1 - 09



May 22, 2023

Mr. Lee Deveau
Project Manager
Massachusetts School Building Authority
40 Broad Street
Boston, MA 02109

Subject: ***Structural Peer Review Process***

Mr. Deveau,

As you are aware, the Northeast Metropolitan Regional Vocational School (NEMT) project team throughout the life of the project has highlighted early construction packages to stay consistent with project timelines. One of those early packages was Structural Steel, which was a required early package to lock in factory fabrication dates to enable project schedule dates for steel erection. To stay consistent with Massachusetts School Building Authority policies, PMA solicited services from various engineering firms across the state of Massachusetts for a peer review of the Structural drawings, with the goal to capture the peer reviewer comments prior to execution of the early Structural Steel package. DM Berg was the chosen engineering firm to provide this service.

Gilbane consistently noted to DRA due to long lead times a Structural Steel package needed to be out to bid by mid-February 2023, a midway point between the 60% Steel drawings and 90% Steel drawings. To ensure proper review, PMA had DM Berg first review the 60% structural drawings to ensure the bid set would capture the comments, and then review the bid package drawings issued on 02/24/2023 for final comments to be incorporated into a revised bid set for execution with the chosen contractor. DM Berg provided both reviews stated above and confirmed in their memo dated 03/23/2023 that the structural design was in conformance with the structural and foundation requirements of the Massachusetts State Building Code. A copy of the memo from DM Berg is attached to this letter from PMA for reference. We believe this letter here explains the structural peer review process for the NEMT project.

As always, please do not hesitate to contact us with any questions.

Sincerely,

Joseph DeSantis
Director
PMA Consultants LLC

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PRINCIPALS
Thomas G. Heger, PE, LEED AP
Ali R. Borojerdi, PE, LEED AP

ASSOCIATES
William H. Barry, PE

March 23, 2023

PMA Consultants
35 Braintree Hill Office Park, Suite 300
Braintree, MA 02184

Attn: Anthony LoPresti, Senior Associate

**RE: NORTHEAST METROPOLITAN REGIONAL VOCATIONAL HIGH SCHOOL
WAKEFIELD, MASSACHUSETTS**

SUBJECT: INDEPENDENT STRUCTURAL ENGINEERING REVIEW

Dear Mr. LoPresti:

We have completed an independent structural engineering review of the above-referenced Project in accordance with the Ninth Edition of the Massachusetts State Building Code.

Purpose:

The purpose of our review was to verify that the design of the primary structure is conceptually correct and that there are no major errors in the design.

Criteria for Review:

The scope of our review was not comprehensive. We examined only representative structural and foundation systems, members, details, and specifications. We performed the following tasks:

1. Reviewed the design loads for conformance with 780 CMR;
2. Reviewed other design criteria and design assumptions for conformance with 780 CMR and generally accepted engineering practice;
3. Reviewed the organization of the structure for concept correctness; and
4. Made independent calculations for a representative fraction of systems, members, and details to review their adequacy. The number of representative systems, members, and details was sufficient to form a basis for our conclusions.

**NORTHEAST METROPOLITAN REGIONAL VOCATIONAL HIGH SCHOOL
WAKEFIELD, MASSACHUSETTS
INDEPENDENT STRUCTURAL ENGINEERING REVIEW
March 23, 2023
Page 2**

Documents Used in the Review:

We performed our review based on the following documents:

1. 60% Construction Documents set dated 01-10-2023.
2. Early Structural Bid Package dated February 24, 2023.
3. Structural specification sections for both of the above packages.
4. Our peer review comments memo on the 60% set sent to EDG on January 31, 2023 and EDG's response to our memo dated February 23, 2023 and received on February 28, 2023 (We had no comments on the early bid package).

Review Conclusions:

Based on our review, the structural design shown on the drawings submitted for review is in conformance with the structural and foundation requirements of the Massachusetts State Building Code.

If you have any questions or require additional information, please do not hesitate to call.

Sincerely,

DM BERG CONSULTANTS, P.C.



Ali R. Borojerdi, P.E., LEED AP
Vice President

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GENERAL REQUIREMENTS

ENERGY MODEL CALCULATIONS

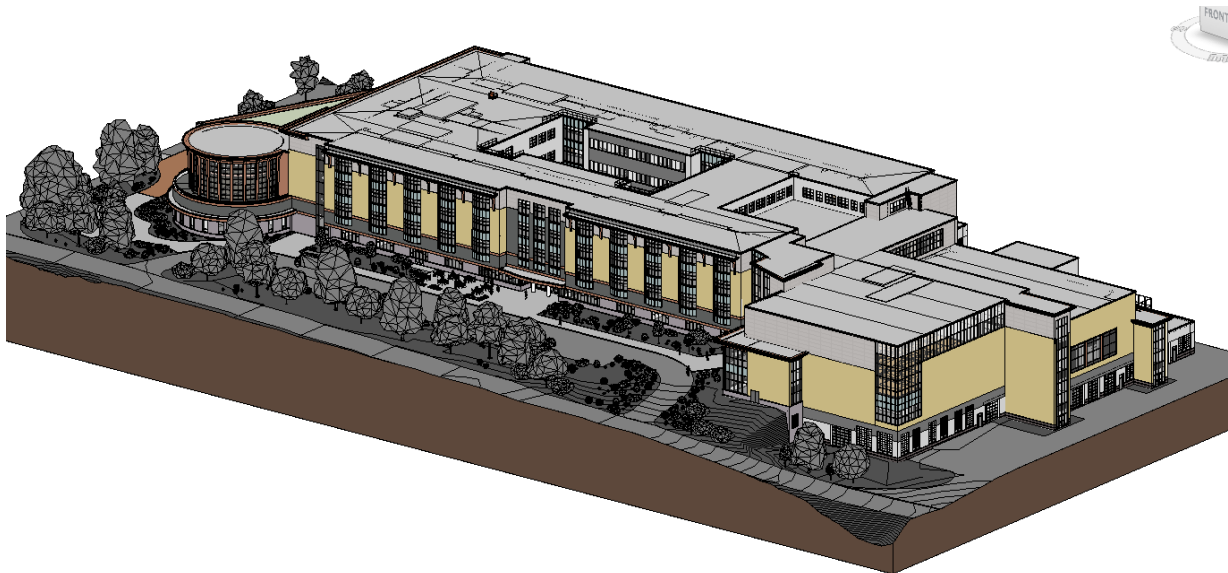
Northeast Metropolitan Vocational High School (Wakefield, MA.)

Building Energy Modeling for LEED v4 Compliance Modeling Guidelines, Inputs, and Results

May 12, 2023

90%CD Energy model Summary:

Bala has developed the 90% 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 28% 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 90%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

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 90% 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 | Unoccupied setback: 80F |
| • Winter | 70°F / No humidification | Unoccupied setback: 65F |

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_{assembly}: U-0.33 SHGC: 0.30
- Roof: R-34 / U-0.029
- Glass Area
 - 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, $U_{assembly}=0.45$, 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: 0.2 W/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

Proposed System:

The proposed building HVAC systems shall be as follows (based on 90%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 System-10 Heating and ventilation units.

EXCLUSIONS:

- Façade lighting or site lighting
- Domestic hot water heating
- Elevators

Energy Consumption Results		
Energy Consumption (MBTU=10 ⁶ btu/yr)	ASHRAE 90.1 2010	Proposed
	Energy Consumption (MBTU)	Energy Consumption (MBTU)
Lighting	3,660	2,773
Space Heating (Electric)	4,911	1,516
Space Cooling	1,517	1,831
Pumps	197	0
Heat Rejection	1,543	5
Fans	2,433	2,588
Receptacles	5,682	5,682
Total Energy (MBtu)	19,943	14,395
Total Energy Reduction (%)		27.8%
EUI (kbtu/sf)	55	39
Energy Consumption / Off-set Breakdown		
Electricity (kWh)	5,499,547	3,969,582
Electricity Renewable (kWh) (+)	0	417,453
Energy Cost Summary		
Electricity	\$ 934,923	\$ 674,829
Electricity (Renewable) Off-set (+)	\$ -	\$ 70,967
Total Cost	\$ 934,923	\$ 603,862
Total Energy Cost Reduction (%)		35.4%

GENERAL REQUIREMENTS

LIFE CYCLE COST ANALYSIS – ENERGY & WATER

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

Lifecycle Summary

Project: NEMT 90%CD
Prepared By: BALA

05/12/2023

NE Metro High School- LCCE for HVAC and Plumbing

30 year life-cycle cost estimate for HVAC system finance and operating costs.

Type of Analysis Public Sector Lifecycle Analysis
Type of Design Alternatives Independent
Length of Analysis 30 yrs
Discount Rate 3.50 %

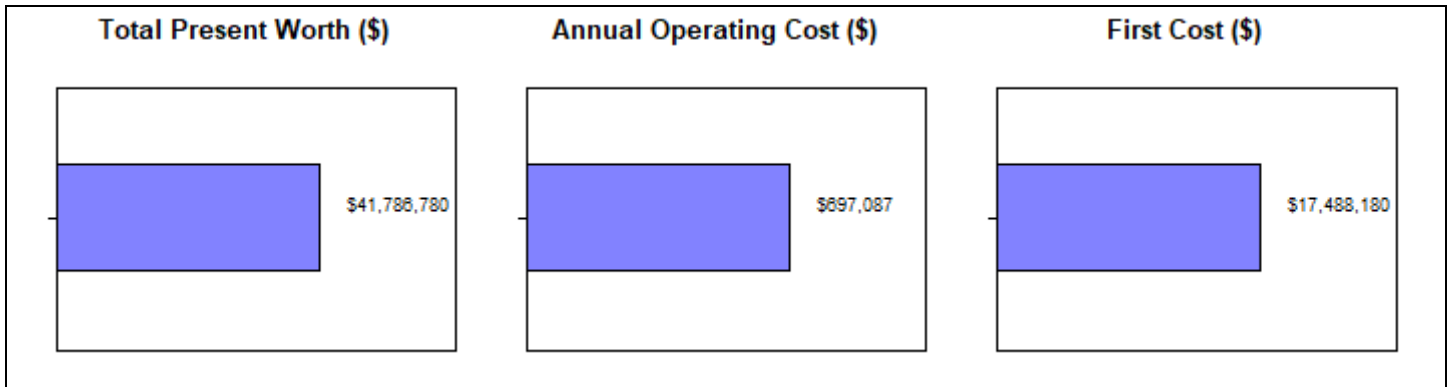


Table 1. Executive Summary

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 Short Name	Total Present Worth (\$)	Annual Operating Cost (\$/yr)	First Cost (\$)
Life Cycle Cost Estimate for HVAC and Plumbing		\$41,786,784	\$697,087	\$17,488,178

Cash Flow Details

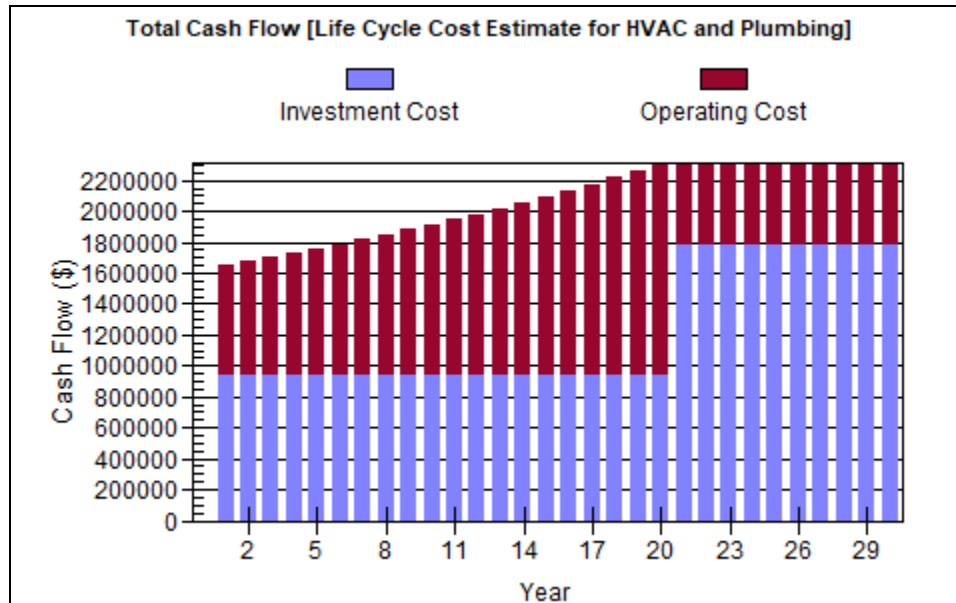
Project: NEMT 90%CD
Prepared By: BALA

05/12/2023

NE Metro High School- LCCE for HVAC and Plumbing

30 year life-cycle cost estimate for HVAC system finance and operating costs.

Type of Analysis Public Sector Lifecycle Analysis
Type of Design Alternatives Independent
Length of Analysis 30 yrs
Discount Rate 3.50 %



1A. Component Cash Flows [Life Cycle Cost Estimate for HVAC and Plumbing], Actual Value

Year	Date	Cash Investment (\$)	Loan Principal (\$)	Loan Interest (\$)	Total Investment Cost (\$)	Annual Operating Cost (\$)	Non-Annual Operating Cost (\$)	Total Operating Cost (\$)	Total Cash Flow (\$)
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

Cash Flow Details

Project: NEMT 90%CD
Prepared By: BALA

05/12/2023

Year	Date	Cash Investment (\$)	Loan Principal (\$)	Loan Interest (\$)	Total Investment Cost (\$)	Annual Operating Cost (\$)	Non-Annual Operating Cost (\$)	Total Operating Cost (\$)	Total Cash Flow (\$)
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	Total Investment Cost (\$)	Total Operating Cost (\$)	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

Cash Flow Details

Project: NEMT 90%CD
Prepared By: BALA

05/12/2023

Year	Date	Total Investment Cost (\$)	Total Operating Cost (\$)	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

Project: NEMT 90%CD

05/12/2023

Prepared By: BALA

Type of Analysis.....Public Sector Lifecycle Analysis
Length of Analysis.....30 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 (%/yr)	Salvage Value (\$)	Useful Life (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 In Start Year (\$)	Percent Financed	Term Of Loan (Years)	Interest Rate (%/yr)	Payment Method
Municipal Bond Financing for HVAC	0	\$ 24,483,449	100	30	3.50	Equal Payments
Replacement Cost 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 Inputs

Project: NEMT 90%CD
Prepared By: BALA

05/12/2023

Study Title NE Metro High School- LCCE for HVAC and Plumbing

Study Description:

30 year life-cycle cost estimate for HVAC system finance and operating costs.

Type of Analysis Public Sector Lifecycle Analysis

Type of Design Alternatives Independent

Base Year..... 2022

Currency Symbol \$

Length of Analysis 30 yrs

Discount Rate 3.50 %

GENERAL REQUIREMENTS

HVAC HEAT GAIN & LOSS CALCULATIONS

Air System Sizing Summary for AHU-1 (Metal Fab)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:27AM

Air System Information

Air System Name **AHU-1 (Metal Fab)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **6178.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

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·ft²) **47.5**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **87.0 / 74.0** °F
Leaving 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

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**

Load occurs at **Des Htg**
BTU/(hr·ft²) **224.0**
Ent. DB / Lvg DB **7.0 / 71.1** °F

Supply Fan Sizing Data

Actual max CFM **20000** CFM
Standard CFM **19978** CFM
Actual max CFM/ft² **3.24** CFM/ft²

Fan motor BHP **27.51** BHP
Fan motor kW **21.83** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **20000** CFM
Standard CFM **19978** CFM
Actual max CFM/ft² **3.24** CFM/ft²

Fan motor BHP **13.76** BHP
Fan motor kW **10.91** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **20000** CFM
CFM/ft² **3.24** CFM/ft²

CFM/person **376.65** CFM/person

Zone Sizing Summary for AHU-1 (Metal Fab)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:27AM

Air System Information

Air System Name **AHU-1 (Metal Fab)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **6178.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	20000	20000	3.24	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	48.2	Jul 1400	52.3	6178.2

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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

Ventilation Sizing Summary for AHU-1 (Metal Fab)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:27AM

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **20000** CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
C004 METAL FABRICATION	1	5716.6	55.0	19505.0	0.00	0.00	19505.0	0.0	19505.0
C004A - OFF	1	127.6	4.0	200.0	0.00	0.00	200.0	0.0	200.0
C004D TOOL CRIB	1	81.3	0.0	75.0	0.00	0.00	75.0	0.0	75.0
C004E STORAGE	1	252.7	0.0	220.0	0.00	0.00	220.0	0.0	220.0
Totals (incl. Space Multipliers)				20000.0					20000.0

Air System Design Load Summary for AHU-1 (Metal Fab)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:27AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	469 ft²	6421	-	469 ft²	-	-
Wall Transmission	2342 ft²	600	-	2342 ft²	9444	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	469 ft²	628	-	469 ft²	9752	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	354 ft²	528	-	354 ft²	5415	-
Floor Transmission	6118 ft²	0	-	6118 ft²	6733	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	798 ft²	-4308	-	798 ft²	3159	-
Overhead Lighting	3954 W	11566	-	0	0	-
Task Lighting	64 W	185	-	0	0	-
Electric Equipment	7340 W	23503	-	0	0	-
People	47	9085	7476	0	0	0
Infiltration	-	0	0	-	17750	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	48209	7476	-	52252	0
Zone Conditioning	-	60925	7476	-	52350	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	20000 CFM	37238	-	20000 CFM	-37238	-
Ventilation Load	20000 CFM	120974	-7476	20000 CFM	1443002	0
Supply Fan Load	20000 CFM	74476	-	20000 CFM	-74476	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	293614	0	-	1383638	0
Central Cooling Coil	-	293614	0	-	0	0
Central Heating Coil	-	0	-	-	1383638	-
>> Total Conditioning	-	293614	0	-	1383638	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-2 (Auto Collision)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
10:05AM

Air System Information

Air System Name **AHU-2 (Auto Collision)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **5551.7** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **18.4** Tons
Total coil load **220.7** MBH
Sensible coil load **220.7** MBH
Coil CFM at Aug 1400 **15465** CFM
Max block CFM **15465** CFM
Sum of peak zone CFM **15465** CFM
Sensible heat ratio **1.000**
CFM/Ton **840.7**
ft²/Ton **301.8**
BTU/(hr·ft²) **39.8**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Aug 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **87.0 / 74.0** °F
Leaving DB / WB **73.8 / 70.2** °F
Coil ADP **72.3** °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

Central Heating Coil Sizing Data

Max coil load **1061.4** MBH
Coil CFM at Des Htg **15465** CFM
Max coil CFM **15465** CFM
Water flow @ 30.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr·ft²) **191.2**
Ent. DB / Lvg DB **7.0 / 70.6** °F

Supply Fan Sizing Data

Actual max CFM **15465** CFM
Standard CFM **15448** CFM
Actual max CFM/ft² **2.79** CFM/ft²

Fan motor BHP **21.28** BHP
Fan motor kW **16.88** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **15465** CFM
Standard CFM **15448** CFM
Actual max CFM/ft² **2.79** CFM/ft²

Fan motor BHP **10.64** BHP
Fan motor kW **8.44** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **15465** CFM
CFM/ft² **2.79** CFM/ft²

CFM/person **419.11** CFM/person

Zone Sizing Summary for AHU-2 (Auto Collision)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
10:05AM

Air System Information

Air System Name **AHU-2 (Auto Collision)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **5551.7** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	15465	15465	2.79	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	35.2	Jul 1400	36.2	5551.7

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
C022 Auto Collision	1	30.2	Jul 1400	14905	32.8	4976.0	3.00
C022B Tool Crib	1	0.4	Jan 1400	110	0.0	127.9	0.86
C022E OFF	1	4.2	Jul 1400	250	3.4	225.0	1.11
C022F STOR	1	0.4	Jan 1100	200	0.0	222.8	0.90

Ventilation Sizing Summary for AHU-2 (Auto Collision)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
10:05AM

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **15465** CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
C022 Auto Collision	1	4976.0	37.0	14905.0	0.00	0.00	14905.0	0.0	14905.0
C022B Tool Crib	1	127.9	0.0	110.0	0.00	0.00	110.0	0.0	110.0
C022E OFF	1	225.0	4.0	250.0	0.00	0.00	250.0	0.0	250.0
C022F STOR	1	222.8	0.0	200.0	0.00	0.00	200.0	0.0	200.0
Totals (incl. Space Multipliers)				15465.0					15465.0

Air System Design Load Summary for AHU-2 (Auto Collision)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
10:05AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	110 ft²	1018	-	110 ft²	-	-
Wall Transmission	550 ft²	81	-	550 ft²	2219	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	110 ft²	147	-	110 ft²	2288	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	903 ft²	948	-	903 ft²	12558	-
Floor Transmission	5552 ft²	0	-	5552 ft²	3624	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	3553 W	10393	-	0	0	-
Task Lighting	154 W	448	-	0	0	-
Electric Equipment	4581 W	14668	-	0	0	-
People	33	7127	8648	0	0	0
Infiltration	-	0	0	-	15509	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	34832	8648	-	36198	0
Zone Conditioning	-	44037	8648	-	36392	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	15465 CFM	28794	-	15465 CFM	-28794	-
Ventilation Load	15465 CFM	90321	-8648	15465 CFM	1111409	0
Supply Fan Load	15465 CFM	57589	-	15465 CFM	-57589	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	220741	0	-	1061418	0
Central Cooling Coil	-	220741	0	-	0	0
Central Heating Coil	-	0	-	-	1061418	-
>> Total Conditioning	-	220741	0	-	1061418	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-3 (Auto Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:31AM

Air System Information

Air System Name **AHU-3 (Auto Tech)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **11267.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

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·ft²) **28.1**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Aug 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **87.0 / 74.0** °F
Leaving 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

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**

Load occurs at **Des Htg**
BTU/(hr·ft²) **101.7**
Ent. DB / Lvg DB **7.0 / 74.5** °F

Supply Fan Sizing Data

Actual max CFM **15745** CFM
Standard CFM **15728** CFM
Actual max CFM/ft² **1.40** CFM/ft²

Fan motor BHP **21.66** BHP
Fan motor kW **17.18** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **15745** CFM
Standard CFM **15728** CFM
Actual max CFM/ft² **1.40** CFM/ft²

Fan motor BHP **10.83** BHP
Fan motor kW **8.59** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **15745** CFM
CFM/ft² **1.40** CFM/ft²

CFM/person **190.16** CFM/person

Zone Sizing Summary for AHU-3 (Auto Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:31AM

Air System Information

Air System Name **AHU-3 (Auto Tech)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **11267.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	15745	15745	1.40	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	95.0	Jul 1100	106.8	11267.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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

Ventilation Sizing Summary for AHU-3 (Auto Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:31AM

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **15745** CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
D003 AUTO TECHNOLOGY	1	9245.1	69.0	13625.0	0.00	0.00	13625.0	0.0	13625.0
D003A OFF	1	164.4	3.0	100.0	0.00	0.00	100.0	0.0	100.0
D003F - TOOL CRIB	1	267.3	0.0	70.0	0.00	0.00	70.0	0.0	70.0
D003G Stor	1	283.6	0.0	75.0	0.00	0.00	75.0	0.0	75.0
D003H Small Engines	1	1200.1	20.0	1625.0	0.00	0.00	1625.0	0.0	1625.0
D003J STOR	1	106.5	0.0	250.0	0.00	0.00	250.0	0.0	250.0
Totals (incl. Space Multipliers)				15745.0					15745.0

Air System Design Load Summary for AHU-3 (Auto Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
08:31AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	672 ft²	11176	-	672 ft²	-	-
Wall Transmission	2586 ft²	1334	-	2586 ft²	10429	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	672 ft²	901	-	672 ft²	13982	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	462 ft²	579	-	462 ft²	6825	-
Floor Transmission	11267 ft²	0	-	11267 ft²	28139	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	7211 W	21092	-	0	0	-
Task Lighting	4364 W	12612	-	0	0	-
Electric Equipment	8026 W	25651	-	0	0	-
People	74	14166	11528	0	0	0
Infiltration	-	0	0	-	37737	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	4376	576	10%	9711	0
>> Total Zone Loads	-	91887	12104	-	106823	0
Zone Conditioning	-	114387	12104	-	107502	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	15745 CFM	29316	-	15745 CFM	-29316	-
Ventilation Load	15745 CFM	88546	13847	15745 CFM	1126460	0
Supply Fan Load	15745 CFM	58631	-	15745 CFM	-58631	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	290879	25951	-	1146015	0
Central Cooling Coil	-	290879	25951	-	0	0
Central Heating Coil	-	0	-	-	1146014	-
>> Total Conditioning	-	290879	25951	-	1146014	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-4 (Electrical Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:50AM

Air System Information

Air System Name **AHU-4 (Electrical Tech)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **10373.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **17.3** Tons
Total coil load **207.7** MBH
Sensible coil load **175.2** MBH
Coil CFM at Jul 1300 **9405** CFM
Max block CFM **9405** CFM
Sum of peak zone CFM **9405** CFM
Sensible heat ratio **0.843**
CFM/Ton **543.3**
ft²/Ton **599.2**
BTU/(hr·ft²) **20.0**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Jul 1300**
OA DB / WB **85.0 / 73.5** °F
Entering DB / WB **82.6 / 70.6** °F
Leaving DB / WB **65.3 / 64.2** °F
Coil ADP **63.4** °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 **0.0** °F

Central Heating Coil Sizing Data

Max coil load **135.1** MBH
Coil CFM at Des Htg **9405** CFM
Max coil CFM **9405** CFM
Water flow @ 30.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr·ft²) **13.0**
Ent. DB / Lvg DB **59.6 / 72.9** °F

Supply Fan Sizing Data

Actual max CFM **9405** CFM
Standard CFM **9395** CFM
Actual max CFM/ft² **0.91** CFM/ft²

Fan motor BHP **12.94** BHP
Fan motor kW **10.26** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **9405** CFM
Standard CFM **9395** CFM
Actual max CFM/ft² **0.91** CFM/ft²

Fan motor BHP **6.47** BHP
Fan motor kW **5.13** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **1951** CFM
CFM/ft² **0.19** CFM/ft²

CFM/person **25.21** CFM/person

Zone Sizing Summary for AHU-4 (Electrical Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:50AM

Air System Information

Air System Name **AHU-4 (Electrical Tech)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **10373.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	9405	9405	0.91	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	94.1	Jul 1400	50.7	10373.6

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
B104 ELECTRICAL TECH	1	89.2	Jul 1400	8905	50.7	9236.7	0.96
B104C TOOL CRIB	1	1.2	Jan 1100	119	0.0	588.0	0.20
B104D TOOL CRIB	1	0.6	Jan 1100	56	0.0	276.4	0.20
B104H OFF	1	3.3	Jan 1100	326	0.0	272.5	1.20

Ventilation Sizing Summary for AHU-4 (Electrical Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:50AM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Heating operation**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **1838** CFM
System Ventilation Efficiency (Ev) **0.942**
Outdoor Air Intake (Vot) **1951** CFM

2. Space Ventilation Analysis

		Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
B104 ELECTRICAL TECH	1	8905	9236.7	0.12	69.7	10.00	0.8	2257	<i>1805</i>	0.942
B104C TOOL CRIB	1	119	588.0	0.00	0.0	0.00	0.8	0	<i>0</i>	1.195
B104D TOOL CRIB	1	56	276.4	0.00	0.0	0.00	0.8	0	<i>0</i>	1.195
B104H OFF	1	326	272.5	0.06	3.3	5.00	0.8	41	<i>33</i>	1.070
Totals (incl. Space Multipliers)		9405							1838	0.942

Air System Design Load Summary for AHU-4 (Electrical Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:50AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1300 COOLING OA DB / WB 85.0 °F / 73.5 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	388 ft²	4457	-	388 ft²	-	-
Wall Transmission	1327 ft²	331	-	1327 ft²	5351	-
Roof Transmission	1762 ft²	589	-	1762 ft²	3012	-
Window Transmission	388 ft²	308	-	388 ft²	8075	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	242 ft²	304	-	242 ft²	3959	-
Floor Transmission	10374 ft²	0	-	10374 ft²	5119	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	6639 W	18979	-	0	0	-
Task Lighting	4755 W	12218	-	0	0	-
Electric Equipment	11564 W	36698	-	0	0	-
People	69	12750	10824	0	0	0
Infiltration	-	0	0	-	20579	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	4332	541	10%	4609	0
>> Total Zone Loads	-	90967	11365	-	50703	0
Zone Conditioning	-	115723	11365	-	48000	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	589	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	9405 CFM	17511	-	9405 CFM	-17511	-
Ventilation Load	1951 CFM	6367	21159	1951 CFM	139653	0
Supply Fan Load	9405 CFM	35022	-	9405 CFM	-35022	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	175213	32524	-	135120	0
Central Cooling Coil	-	175213	32529	-	0	0
Central Heating Coil	-	0	-	-	135120	-
>> Total Conditioning	-	175213	32529	-	135120	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-5 (HVAC Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:33AM

Air System Information

Air System Name **AHU-5 (HVAC Tech)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **7331.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **15.0** Tons
Total coil load **180.4** MBH
Sensible coil load **147.1** MBH
Coil CFM at Aug 1400 **7275** CFM
Max block CFM **7275** CFM
Sum of peak zone CFM **7275** CFM
Sensible heat ratio **0.815**
CFM/Ton **483.9**
ft²/Ton **487.7**
BTU/(hr·ft²) **24.6**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Aug 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **83.5 / 70.8** °F
Leaving DB / WB **64.7 / 63.5** °F
Coil ADP **62.7** °F
Bypass Factor **0.100**
Resulting RH **57** %
Design supply temp. **55.0** °F
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** °F

Central Heating Coil Sizing Data

Max coil load **154.2** MBH
Coil CFM at Des Htg **7275** CFM
Max coil CFM **7275** CFM
Water flow @ 30.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr·ft²) **21.0**
Ent. DB / Lvg DB **55.5 / 75.1** °F

Supply Fan Sizing Data

Actual max CFM **7275** CFM
Standard CFM **7267** CFM
Actual max CFM/ft² **0.99** CFM/ft²

Fan motor BHP **10.01** BHP
Fan motor kW **7.94** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **7275** CFM
Standard CFM **7267** CFM
Actual max CFM/ft² **0.99** CFM/ft²

Fan motor BHP **5.00** BHP
Fan motor kW **3.97** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **1970** CFM
CFM/ft² **0.27** CFM/ft²

CFM/person **29.98** CFM/person

Zone Sizing Summary for AHU-5 (HVAC Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:33AM

Air System Information

Air System Name **AHU-5 (HVAC Tech)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **7331.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	7275	7275	0.99	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	77.9	Aug 1400	51.8	7331.9

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
B103 HVAC TECHNOLOGY	1	73.2	Aug 1400	6885	51.3	6631.6	1.04
B103F TOOL CRIB	1	1.0	Jul 1100	82	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	27	0.0	163.9	0.16
B103I OFF	1	3.1	Jan 1100	253	0.0	236.4	1.07

Ventilation Sizing Summary for AHU-5 (HVAC Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:33AM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Heating operation**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **1823** CFM
System Ventilation Efficiency (Ev) **0.925**
Outdoor Air Intake (Vot) **1970** CFM

2. Space Ventilation Analysis

		Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
B103 HVAC TECHNOLOGY	1	6885	6631.6	0.18	59.8	10.00	0.8	2240	1792	0.925
B103F TOOL CRIB	1	82	150.0	0.00	0.0	0.00	0.8	0	0	1.251
B103G TOOL CRIB	1	28	150.0	0.00	0.0	0.00	0.8	0	0	1.251
B103H TOOL CRIB	1	27	163.9	0.00	0.0	0.00	0.8	0	0	1.251
B103I OFF	1	253	236.4	0.06	3.3	5.00	0.8	39	31	1.098
Totals (incl. Space Multipliers)		7275							1823	0.925

Air System Design Load Summary for AHU-5 (HVAC Tech)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:33AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	575 ft²	10444	-	575 ft²	-	-
Wall Transmission	1056 ft²	228	-	1056 ft²	4258	-
Roof Transmission	1603 ft²	570	-	1603 ft²	2741	-
Window Transmission	575 ft²	771	-	575 ft²	11956	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	242 ft²	436	-	242 ft²	3959	-
Floor Transmission	7332 ft²	0	-	7332 ft²	4466	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	4692 W	13726	-	0	0	-
Task Lighting	3434 W	9172	-	0	0	-
Electric Equipment	8618 W	27595	-	0	0	-
People	58	11241	9212	0	0	0
Infiltration	-	0	0	-	19691	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	3709	461	10%	4707	0
>> Total Zone Loads	-	77891	9673	-	51778	0
Zone Conditioning	-	95636	9673	-	53500	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	570	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	7275 CFM	13545	-	7275 CFM	-13545	-
Ventilation Load	1970 CFM	10259	23626	1970 CFM	141330	0
Supply Fan Load	7275 CFM	27091	-	7275 CFM	-27091	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	147101	33298	-	154194	0
Central Cooling Coil	-	147101	33304	-	0	0
Central Heating Coil	-	0	-	-	154194	-
>> Total Conditioning	-	147101	33304	-	154194	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-6 (Plumbing and Pipefitting)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:16AM

Air System Information

Air System Name .. **AHU-6 (Plumbing and Pipefitting)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **7312.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **14.9** Tons
Total coil load **179.3** MBH
Sensible coil load **140.0** MBH
Coil CFM at Jul 1400 **6570** CFM
Max block CFM **6570** CFM
Sum of peak zone CFM **6570** CFM
Sensible heat ratio **0.781**
CFM/Ton **439.6**
ft²/Ton **489.3**
BTU/(hr·ft²) **24.5**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **83.7 / 70.7** °F
Leaving DB / WB **63.9 / 62.7** °F
Coil ADP **61.7** °F
Bypass Factor **0.100**
Resulting RH **55** %
Design supply temp. **58.0** °F
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** °F

Central Heating Coil Sizing Data

Max coil load **154.8** MBH
Coil CFM at Des Htg **6570** CFM
Max coil CFM **6570** CFM
Water flow @ 30.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr·ft²) **21.2**
Ent. DB / Lvg DB **52.6 / 74.4** °F

Supply Fan Sizing Data

Actual max CFM **6570** CFM
Standard CFM **6563** CFM
Actual max CFM/ft² **0.90** CFM/ft²

Fan motor BHP **9.04** BHP
Fan motor kW **7.17** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **6570** CFM
Standard CFM **6563** CFM
Actual max CFM/ft² **0.90** CFM/ft²

Fan motor BHP **4.52** BHP
Fan motor kW **3.59** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **2068** CFM
CFM/ft² **0.28** CFM/ft²

CFM/person **25.53** CFM/person

Zone Sizing Summary for AHU-6 (Plumbing and Pipefitting)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:16AM

Air System Information

Air System Name .. **AHU-6 (Plumbing and Pipefitting)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **7312.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	6570	6570	0.90	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	72.7	Jul 1400	40.6	7312.9

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
B101 PLUMBING - PIPEFITT	1	67.6	Jul 1400	6088	40.2	6138.5	0.99
B101F OFF	1	3.3	Jan 1100	297	0.0	237.4	1.25
B101G TOOL CRIB	1	0.8	Jan 1100	73	0.0	398.8	0.18
B101H TOOL CRIB	1	0.7	Jan 1100	59	0.0	324.3	0.18
B101j TOOL CRIB	1	0.5	Jul 1400	53	0.4	214.0	0.25

Ventilation Sizing Summary for AHU-6 (Plumbing and Pipefitting)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:16AM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Heating operation**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **1877** CFM
System Ventilation Efficiency (Ev) **0.908**
Outdoor Air Intake (Vot) **2068** CFM

2. Space Ventilation Analysis

		Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
B101 PLUMBING - PIPEFITT	1	6088	6138.5	0.18	73.7	10.00	0.8	2302	<i>1842</i>	0.908
B101F OFF	1	297	237.4	0.06	4.2	5.00	0.8	44	<i>35</i>	1.138
B101G TOOL CRIB	1	73	398.8	0.00	0.0	0.00	0.8	0	<i>0</i>	1.286
B101H TOOL CRIB	1	59	324.3	0.00	0.0	0.00	0.8	0	<i>0</i>	1.286
B101j TOOL CRIB	1	53	214.0	0.00	0.0	0.00	0.8	0	<i>0</i>	1.286
Totals (incl. Space Multipliers)		6570							1877	0.908

Air System Design Load Summary for AHU-6 (Plumbing and Pipefitting)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/07/2023

08:16AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	450 ft²	6439	-	450 ft²	-	-
Wall Transmission	803 ft²	196	-	803 ft²	3239	-
Roof Transmission	280 ft²	356	-	280 ft²	881	-
Window Transmission	450 ft²	604	-	450 ft²	9367	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	242 ft²	462	-	242 ft²	3959	-
Floor Transmission	7313 ft²	0	-	7313 ft²	3745	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	4680 W	13690	-	0	0	-
Task Lighting	3188 W	8515	-	0	0	-
Electric Equipment	7846 W	25124	-	0	0	-
People	72	13858	11360	0	0	0
Infiltration	-	0	0	-	15725	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	3462	568	10%	3692	0
>> Total Zone Loads	-	72706	11928	-	40607	0
Zone Conditioning	-	92097	11928	-	43080	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	356	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	6570 CFM	12233	-	6570 CFM	-12233	-
Ventilation Load	2068 CFM	10850	27409	2068 CFM	148457	0
Supply Fan Load	6570 CFM	24465	-	6570 CFM	-24465	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	140000	39337	-	154839	0
Central Cooling Coil	-	140001	39342	-	0	0
Central Heating Coil	-	0	-	-	154839	-
>> Total Conditioning	-	140001	39342	-	154839	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-7 Carpentry

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:10AM

Air System Information

Air System Name **AHU-7 Carpentry**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **9180.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **15.6** Tons
Total coil load **187.8** MBH
Sensible coil load **156.3** MBH
Coil CFM at Jul 1400 **8265** CFM
Max block CFM **8265** CFM
Sum of peak zone CFM **8265** CFM
Sensible heat ratio **0.833**
CFM/Ton **528.2**
ft²/Ton **586.7**
BTU/(hr·ft²) **20.5**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **83.7 / 71.4** °F
Leaving DB / WB **66.1 / 65.0** °F
Coil ADP **64.2** °F
Bypass Factor **0.100**
Resulting RH **59** %
Design supply temp. **55.0** °F
Zone T-stat Check **1 of 1** OK
Max zone temperature deviation **0.0** °F

Central Heating Coil Sizing Data

Max coil load **166.8** MBH
Coil CFM at Des Htg **8265** CFM
Max coil CFM **8265** CFM
Water flow @ 30.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr·ft²) **18.2**
Ent. DB / Lvg DB **54.4 / 73.1** °F

Supply Fan Sizing Data

Actual max CFM **8265** CFM
Standard CFM **8256** CFM
Actual max CFM/ft² **0.90** CFM/ft²

Fan motor BHP **11.37** BHP
Fan motor kW **9.02** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **8265** CFM
Standard CFM **8256** CFM
Actual max CFM/ft² **0.90** CFM/ft²

Fan motor BHP **5.69** BHP
Fan motor kW **4.51** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **2396** CFM
CFM/ft² **0.26** CFM/ft²

CFM/person **35.97** CFM/person

Zone Sizing Summary for AHU-7 Carpentry

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:10AM

Air System Information

Air System Name **AHU-7 Carpentry**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **9180.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	8265	8265	0.90	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	83.0	Jul 1400	40.6	9180.2

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
A141 CARPENTRY	1	77.7	Jul 1400	7719	40.6	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	384	0.0	275.0	1.40
A141G TOOL CRIB	1	0.9	Jan 1100	92	0.0	458.8	0.20

Ventilation Sizing Summary for AHU-7 Carpentry

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:10AM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Heating operation**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **2115** CFM
System Ventilation Efficiency (Ev) **0.883**
Outdoor Air Intake (Vot) **2396** CFM

2. Space Ventilation Analysis

		Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
A141 CARPENTRY	1	7719	8103.8	0.18	59.8	10.00	0.8	2571	2057	0.923
A141E STOR	1	69	342.7	0.06	0.0	5.00	0.8	26	21	0.883
A141F OFF	1	384	275.0	0.06	4.3	5.00	0.8	48	38	1.132
A141G TOOL CRIB	1	92	458.8	0.00	0.0	0.00	0.8	0	0	1.256
Totals (incl. Space Multipliers)		8265							2115	0.883

Air System Design Load Summary for AHU-7 Carpentry

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
08:10AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	351 ft²	5017	-	351 ft²	-	-
Wall Transmission	1036 ft²	255	-	1036 ft²	4179	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	351 ft²	470	-	351 ft²	7298	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	242 ft²	462	-	242 ft²	3959	-
Floor Transmission	9180 ft²	0	-	9180 ft²	4331	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	5875 W	17186	-	0	0	-
Task Lighting	4189 W	11189	-	0	0	-
Electric Equipment	10325 W	33060	-	0	0	-
People	59	11395	9376	0	0	0
Infiltration	-	0	0	-	17130	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	3952	469	10%	3690	0
>> Total Zone Loads	-	82985	9845	-	40585	0
Zone Conditioning	-	97994	9845	-	40576	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	8265 CFM	15389	-	8265 CFM	-15389	-
Ventilation Load	2396 CFM	12186	21584	2396 CFM	172376	0
Supply Fan Load	8265 CFM	30777	-	8265 CFM	-30777	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	156347	31429	-	166786	0
Central Cooling Coil	-	156347	31410	-	0	0
Central Heating Coil	-	0	-	-	166786	-
>> Total Conditioning	-	156347	31410	-	166786	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-8 (Cafeteria)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
12:33PM

Air System Information

Air System Name **AHU-8 (Cafeteria)**
Equipment Class **SPLT AHU**
Air System Type **VAV**

Number of zones **7**
Floor Area **10899.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **36.9** Tons
Total coil load **442.3** MBH
Sensible coil load **319.8** MBH
Coil CFM at Jul 1400 **10480** CFM
Max block CFM at Jul 1400 **11091** CFM
Sum of peak zone CFM **11235** CFM
Sensible heat ratio **0.723**
CFM/Ton **284.3**
ft²/Ton **295.7**
BTU/(hr-ft²) **40.6**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **79.7 / 65.1** °F
Leaving DB / WB **51.4 / 50.2** °F
Coil ADP **48.3** °F
Bypass Factor **0.100**
Resulting RH **45** %
Design supply temp. **55.0** °F
Zone T-stat Check **5 of 7** OK
Max zone temperature deviation **0.7** °F

Preheat Coil Sizing Data

No heating coil loads occurred during this calculation.

Supply Fan Sizing Data

Actual max CFM at Jul 1400 **11091** CFM
Standard CFM **11078** CFM
Actual max CFM/ft² **1.02** CFM/ft²

Fan motor BHP **17.16** BHP
Fan motor kW **13.62** kW
Fan static **4.50** in wg

Return Fan Sizing Data

Actual max CFM at Jul 1400 **11091** CFM
Standard CFM **11078** CFM
Actual max CFM/ft² **1.02** CFM/ft²

Fan motor BHP **7.63** BHP
Fan motor kW **6.05** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **7001** CFM
CFM/ft² **0.64** CFM/ft²

CFM/person **13.74** CFM/person

Zone Sizing Summary for AHU-8 (Cafeteria)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
12:33PM

Air System Information

Air System Name **AHU-8 (Cafeteria)**
Equipment Class **SPLT AHU**
Air System Type **VAV**

Number of zones **7**
Floor Area **10899.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (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	90	90	0.20	3.9	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
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	0.9	Jan 1100	0.0	449.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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	0.5	Jan 1100	45	0.0	223.7	0.20
A117A CHAIR STORAGE	1	0.5	Jan 1100	45	0.0	225.3	0.20

Ventilation Sizing Summary for AHU-8 (Cafeteria)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
12:33PM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Minimum flow (heating)**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **5589** CFM
System Ventilation Efficiency (Ev) **0.798**
Outdoor Air Intake (Vot) **7001** CFM

2. Space Ventilation Analysis

		Minimum Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
A114 CAFE EXT	1	1261	1679.8	0.18	90.0	7.50	0.8	1222	977	0.910
Zone 2										
A114 CAFETERIA	1	5297	6469.6	0.18	389.7	7.50	0.8	5109	4087	0.798
Zone 3										
A111 STAFF LUNCH RM	1	263	616.9	0.12	22.5	5.00	0.8	233	187	1.001
Zone 4										
A104 OFF	1	27	143.0	0.06	1.7	5.00	0.8	22	17	1.104
Zone 5										
A112 SERVERY	1	300	1091.8	0.18	3.5	7.50	0.8	278	223	0.837
Zone 6										
A110 RECEIVING	1	88	449.8	0.12	1.7	10.00	0.8	88	71	0.894
Zone 7										
A117 CHAIR STORAGE	1	45	223.7	0.06	0.0	5.00	0.8	17	13	1.388
A117A CHAIR STORAGE	1	45	225.3	0.06	0.0	5.00	0.8	17	14	1.388
Totals (incl. Space Multipliers)		7327							5589	0.798

Air System Design Load Summary for AHU-8 (Cafeteria)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
12:33PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	2038 ft²	24173	-	2038 ft²	-	-
Wall Transmission	2672 ft²	7032	-	2672 ft²	18157	-
Roof Transmission	6706 ft²	6111	-	6706 ft²	11466	-
Window Transmission	2038 ft²	5993	-	2038 ft²	42390	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	126 ft²	1714	-	126 ft²	6279	-
Floor Transmission	10899 ft²	0	-	10899 ft²	7019	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	6976 W	20468	-	0	0	-
Task Lighting	1433 W	4449	-	0	0	-
Electric Equipment	16596 W	53092	-	0	0	-
People	453	81938	54984	0	0	0
Infiltration	-	0	0	-	43043	-15
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	10249	2749	10%	12835	-1
>> Total Zone Loads	-	215219	57733	-	141190	-16
Zone Conditioning	-	237677	57733	-	140149	-16
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	10480 CFM	18037	-	7356 CFM	-7763	-
Ventilation Load	7001 CFM	20701	64785	7001 CFM	148118	0
Supply Fan Load	10480 CFM	40583	-	7356 CFM	-17467	-
Space Fan Coil Fans	-	1805	-	-	-1805	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	318803	122518	-	261233	-16
Central Cooling Coil	-	319802	122542	-	0	0
Preheat Coil	-	0	-	-	0	-
Terminal Reheat Coils	-	-558	-	-	259887	-
>> Total Conditioning	-	319244	122542	-	259887	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-9 Prefunction Corridor

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
09:42AM

Air System Information

Air System Name **AHU-9 Prefunction Corridor**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **12404.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **18.3** Tons
Total coil load **220.1** MBH
Sensible coil load **157.3** MBH
Coil CFM at Jul 1000 **6397** CFM
Max block CFM **6397** CFM
Sum of peak zone CFM **6397** CFM
Sensible heat ratio **0.715**
CFM/Ton **348.8**
ft²/Ton **676.3**
BTU/(hr-ft²) **17.7**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Jul 1000**
OA DB / WB **76.1 / 70.9** °F
Entering DB / WB **77.3 / 65.2** °F
Leaving DB / WB **54.5 / 53.5** °F
Coil ADP **52.0** °F
Bypass Factor **0.100**
Resulting RH **54** %
Design supply temp. **58.0** °F
Zone T-stat Check **0 of 1** OK
Max zone temperature deviation **0.1** °F

Central Heating Coil Sizing Data

Max coil load **1.1** MBH
Coil CFM at Des Htg **6397** CFM
Max coil CFM **6397** CFM
Water flow @ 30.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr-ft²) **0.1**
Ent. DB / Lvg DB **70.8 / 71.0** °F

Preheat Coil Sizing Data

No heating coil loads occurred during this calculation.

Supply Fan Sizing Data

Actual max CFM **6397** CFM
Standard CFM **6390** CFM
Actual max CFM/ft² **0.52** CFM/ft²

Fan motor BHP **8.80** BHP
Fan motor kW **6.98** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **6397** CFM
Standard CFM **6390** CFM
Actual max CFM/ft² **0.52** CFM/ft²

Fan motor BHP **4.40** BHP
Fan motor kW **3.49** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **908** CFM
CFM/ft² **0.07** CFM/ft²

CFM/person **2.02** CFM/person

Zone Sizing Summary for AHU-9 Prefunction Corridor

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
09:42AM

Air System Information

Air System Name **AHU-9 Prefunction Corridor**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **12404.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	6205	6205	0.50	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	108.2	Jul 1400	18.6	12404.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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	1445.6	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
C201 CORRIDOR North	1	9.0	Jul 1400	530	4.0	2118.3	0.25

Ventilation Sizing Summary for AHU-9 Prefunction Corridor

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
09:42AM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Heating operation**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **744** CFM
System Ventilation Efficiency (Ev) **0.820**
Outdoor Air Intake (Vot) **908** CFM

2. Space Ventilation Analysis

		Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
C105 CORRIDOR South	1	1933	2591.1	0.06	106.9	0.00	0.8	194	155	1.019
C201 CORRIDOR South	1	781	2263.4	0.06	9.0	0.00	0.8	170	136	0.903
C206 CORRIDOR	1	361	1445.6	0.06	0.0	0.00	0.8	108	87	0.820
D201 CORRIDOR	1	649	1303.4	0.06	18.0	0.00	0.8	98	78	0.969
C105 CORRIDOR North	1	1951	2682.2	0.06	106.9	0.00	0.8	201	161	1.017
C201 CORRIDOR North	1	530	2118.3	0.06	9.0	0.00	0.8	159	127	0.820
Totals (incl. Space Multipliers)		6205							744	0.820

Air System Design Load Summary for AHU-9 Prefunction Corridor

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
09:42AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1000 COOLING OA DB / WB 76.1 °F / 70.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	227 ft²	2750	-	227 ft²	-	-
Wall Transmission	297 ft²	176	-	297 ft²	1199	-
Roof Transmission	4688 ft²	728	-	4688 ft²	8015	-
Window Transmission	227 ft²	61	-	227 ft²	4722	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	2069 ft²	0	-	2069 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	9427 W	22768	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	619 W	1846	-	0	0	-
People	450	63514	54000	0	0	0
Infiltration	-	0	0	-	2941	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	4592	2700	10%	1688	0
>> Total Zone Loads	-	96436	56700	-	18564	0
Zone Conditioning	-	121180	56700	-	17290	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	50%	728	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	6397 CFM	11910	-	6397 CFM	-11910	-
Ventilation Load	908 CFM	-368	6120	908 CFM	19575	0
Supply Fan Load	6397 CFM	23821	-	6397 CFM	-23821	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	157271	62820	-	1133	0
Central Cooling Coil	-	157271	62827	-	0	0
Central Heating Coil	-	0	-	-	1133	-
Preheat Coil	-	0	-	-	0	-
>> Total Conditioning	-	157271	62827	-	1133	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for AHU-10 (Multi Use Space)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
01:41PM

Air System Information

Air System Name **AHU-10 (Multi Use Space)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **9847.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load **39.7** Tons
Total coil load **476.6** MBH
Sensible coil load **347.6** MBH
Coil CFM at Jul 1400 **9470** CFM
Max block CFM **9470** CFM
Sum of peak zone CFM **9470** CFM
Sensible heat ratio **0.729**
CFM/Ton **238.4**
ft²/Ton **247.9**
BTU/(hr-ft²) **48.4**
Water flow @ 12.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **85.6 / 67.4** °F
Leaving DB / WB **51.5 / 50.1** °F
Coil ADP **47.8** °F
Bypass Factor **0.100**
Resulting RH **47** %
Design supply temp. **55.0** °F
Zone T-stat Check **0 of 1** OK
Max zone temperature deviation **0.5** °F

Central Heating Coil Sizing Data

Max coil load **212.8** MBH
Coil CFM at Des Htg **9470** CFM
Max coil CFM **9470** CFM
Water flow @ 30.0 °F drop **N/A**

Load occurs at **Des Htg**
BTU/(hr-ft²) **21.6**
Ent. DB / Lvg DB **60.8 / 81.6** °F

Preheat Coil Sizing Data

No heating coil loads occurred during this calculation.

Supply Fan Sizing Data

Actual max CFM **9470** CFM
Standard CFM **9460** CFM
Actual max CFM/ft² **0.96** CFM/ft²

Fan motor BHP **13.03** BHP
Fan motor kW **10.34** kW
Fan static **4.00** in wg

Return Fan Sizing Data

Actual max CFM **9470** CFM
Standard CFM **9460** CFM
Actual max CFM/ft² **0.96** CFM/ft²

Fan motor BHP **6.51** BHP
Fan motor kW **5.17** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **6591** CFM
CFM/ft² **0.67** CFM/ft²

CFM/person **9.15** CFM/person

Zone Sizing Summary for AHU-10 (Multi Use Space)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name **AHU-10 (Multi Use Space)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **9847.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 30.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 30.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	9470	9470	0.96	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	200.2	Jul 1400	148.2	9847.9

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
C117 MULTIPURPOSE ROOM	1	199.6	Jul 1400	9253	144.7	9588.7	0.96
C117C STORAGE	1	0.2	Jul 1400	66	1.1	72.4	0.91
C117D STORAGE	1	0.4	Jul 1400	151	2.4	186.8	0.81

Ventilation Sizing Summary for AHU-10 (Multi Use Space)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **6591** CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
C117 MULTIPURPOSE ROOM	1	9588.7	800.0	9252.9	7.50	0.06	0.0	0.0	6575.3
C117C STORAGE	1	72.4	0.0	66.1	5.00	0.06	0.0	0.0	4.3
C117D STORAGE	1	186.8	0.0	151.2	5.00	0.06	0.0	0.0	11.2
Totals (incl. Space Multipliers)				9470.2					6590.9

Air System Design Load Summary for AHU-10 (Multi Use Space)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	686 ft²	8493	-	686 ft²	-	-
Wall Transmission	4294 ft²	2745	-	4294 ft²	17320	-
Roof Transmission	9589 ft²	25607	-	9589 ft²	75166	-
Window Transmission	686 ft²	2018	-	686 ft²	14277	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	11672 W	23900	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	3835 W	12282	-	0	0	-
People	640	115644	76800	0	0	0
Infiltration	-	0	0	-	27942	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	9534	3840	10%	13471	0
>> Total Zone Loads	-	200224	80640	-	148177	0
Zone Conditioning	-	219833	80640	-	144276	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	70%	59749	-	0	0	-
Plenum Lighting Load	30%	11948	-	0	0	-
Return Fan Load	9470 CFM	17633	-	9470 CFM	-17633	-
Ventilation Load	6591 CFM	3216	48323	6591 CFM	121412	0
Supply Fan Load	9470 CFM	35265	-	9470 CFM	-35265	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	347644	128963	-	212790	0
Central Cooling Coil	-	347644	128968	-	0	0
Central Heating Coil	-	0	-	-	212790	-
Preheat Coil	-	0	-	-	0	-
>> Total Conditioning	-	347644	128968	-	212790	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name **ERU-1 (Admin Area A)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **15**
Floor Area **7133.3** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **0.5** Tons
Total coil load **6.6** MBH
Total coil load **1420.5** CFM/Ton
Sensible coil load **6.6** MBH
Coil CFM at Jul 1400 **780** CFM
Max coil CFM **780** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.2 / 72.1** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **10.8** MBH
Coil CFM at Des Htg **780** CFM
Max coil CFM **780** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.5 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **780** CFM
Standard CFM **779** CFM
Actual max CFM/ft² **0.11** CFM/ft²

Fan motor BHP **0.80** BHP
Fan motor kW **0.64** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **780** CFM
Standard CFM **779** CFM
Actual max CFM/ft² **0.11** CFM/ft²

Fan motor BHP **0.54** BHP
Fan motor kW **0.43** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **780** CFM
CFM/ft² **0.11** CFM/ft²

CFM/person **16.35** CFM/person

Zone Sizing Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name **ERU-1 (Admin Area A)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **15**
Floor Area **7133.3** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft²
Zone 1	14.5	14.5	75.3 / 65.3	62.2 / 60.8	-	Sep 1600	2.01
Zone 2	10.0	4.5	75.2 / 70.2	55.0 / 54.8	-	Aug 1200	0.09
Zone 3	17.9	14.6	75.5 / 65.3	59.2 / 58.2	-	Aug 1500	0.91
Zone 4	7.2	4.1	75.6 / 67.1	55.0 / 54.4	-	Jul 1200	0.46
Zone 5	8.3	6.1	75.6 / 66.4	60.0 / 59.2	-	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	5.5	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	6.6	5.7	75.6 / 64.5	58.5 / 57.4	-	Sep 1100	1.15
Zone 12	7.1	6.0	75.7 / 64.4	57.9 / 56.8	-	Jul 0900	1.02
Zone 13	9.6	6.6	76.1 / 65.2	55.0 / 54.1	-	Aug 1000	0.29
Zone 14	2.8	1.2	75.0 / 70.7	55.0 / 54.9	-	Jul 1200	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

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (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	185
Zone 3	11.6	69.3 / 82.3	-	824	0.000	0.000	125
Zone 4	0.7	69.8 / 73.3	-	186	0.000	0.000	95
Zone 5	6.6	69.3 / 86.1	-	364	0.000	0.000	90
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	69.0 / 85.5	-	307	0.000	0.000	25
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	69.2 / 85.9	-	312	0.000	0.000	30
Zone 12	5.7	69.0 / 85.7	-	313	0.000	0.000	30
Zone 13	0.0	0.0 / 0.0	0.00	292	0.000	0.000	70
Zone 14	0.0	0.0 / 0.0	0.00	55	0.000	0.000	55
Zone 15	4.3	69.1 / 85.8	-	239	0.000	0.000	15

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	74.2	6.2	70.4
Estimated Piping / Line Losses	0.0	0.0	0.0

Zone Sizing Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT
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Total Required ODU Capacity	74.2	6.2	70.4
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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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	13.9	Sep 1600	18.9	510.7
Zone 2	4.5	Jan 1100	0.0	2203.1
Zone 3	12.1	Aug 1500	11.9	908.8
Zone 4	4.0	Jul 1400	0.8	407.7
Zone 5	5.5	Jul 1400	6.7	299.0
Zone 6	2.5	Sep 1500	2.9	123.7
Zone 7	2.5	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	5.0	Jul 1100	5.7	307.4
Zone 13	6.3	Jan 1100	0.0	1015.1
Zone 14	1.2	Jan 1400	0.0	282.7
Zone 15	3.4	Jul 1000	4.4	148.6

Zone Sizing Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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	2.4	Sep 1600	171	3.1	105.6	1.62
A123 SECRETARY	1	4.1	Jul 1700	268	4.9	166.1	1.61
A124 OFFICE-MAIN	1	2.5	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	5.5	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							
A130 ADULT ED	1	5.0	Sep 1100	312	5.7	270.2	1.15
Zone 12							
A135 SPED OFF	1	2.6	Aug 1100	149	2.7	161.3	0.92
A136 SPED OFF	1	2.5	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

Ventilation Sizing Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **780** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
A118 VEST	1	510.7	0.0	1027.9	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				1027.9					0.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
A119 LOBBY	1	2203.1	0.0	206.5	0.00	0.00	185.0	0.0	185.0
Totals (incl. Space Multipliers)				206.5					185.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
A120 WAITING	1	193.0	6.0	67.2	0.00	0.00	45.0	0.0	45.0
A121 RECEPTION	1	196.0	3.0	128.4	0.00	0.00	25.0	0.0	25.0
A122 ATTENDANCE	1	105.6	2.0	170.6	0.00	0.00	15.0	0.0	15.0
A123 SECRETARY	1	166.1	1.0	268.1	0.00	0.00	15.0	0.0	15.0
A124 OFFICE-MAIN	1	138.1	1.0	178.1	0.00	0.00	15.0	0.0	15.0
A139 MAIL	1	110.0	0.0	12.0	0.00	0.00	10.0	0.0	10.0
Totals (incl. Space Multipliers)				824.4					125.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
A140 CONF	1	407.7	14.0	185.5	0.00	0.00	95.0	0.0	95.0
Totals (incl. Space Multipliers)				185.5					95.0

Ventilation Sizing Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
A138 SPED CONF	1	299.0	14.0	364.3	0.00	0.00	90.0	0.0	90.0
Totals (incl. Space Multipliers)				364.3					90.0

2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
A126 SRO	1	123.7	1.0	156.3	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				156.3					15.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
A127 PRINCIPALS SECRETAR	1	125.0	1.0	158.2	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				158.2					15.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
A128 PRIN OFF	1	258.8	1.0	307.4	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				307.4					25.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
A129 COOP COORD	1	141.2	1.0	171.7	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				171.7					15.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
A129a - COOP COORD	1	131.3	1.0	164.4	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				164.4					15.0

Ventilation Sizing Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.11 Zone: Zone 11

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 11									
A130 ADULT ED	1	270.2	2.0	311.6	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				311.6					30.0

2.12 Zone: Zone 12

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 12									
A135 SPED OFF	1	161.3	1.0	148.8	0.00	0.00	15.0	0.0	15.0
A136 SPED OFF	1	146.1	1.0	164.2	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				313.0					30.0

2.13 Zone: Zone 13

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 13									
A131 DUPLICATING	1	265.0	1.0	221.3	0.00	0.00	25.0	0.0	25.0
A125 CORRIDOR	1	750.1	0.0	70.3	0.00	0.00	45.0	0.0	45.0
Totals (incl. Space Multipliers)				291.6					70.0

2.14 Zone: Zone 14

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 14									
A132 RECORDS	1	282.7	1.0	55.0	0.00	0.00	55.0	0.0	55.0
Totals (incl. Space Multipliers)				55.0					55.0

2.15 Zone: Zone 15

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 15									
A137 SPED DIR	1	148.6	1.0	239.2	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				239.2					15.0

Air System Design Load Summary for ERU-1 (Admin Area A)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
01:43PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	944 ft²	18432	-	944 ft²	-	-
Wall Transmission	2738 ft²	2282	-	2738 ft²	10703	-
Roof Transmission	2363 ft²	1988	-	2363 ft²	3915	-
Window Transmission	944 ft²	2775	-	944 ft²	19027	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	84 ft²	2346	-	84 ft²	4234	-
Floor Transmission	7133 ft²	0	-	7133 ft²	4659	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	4565 W	13354	-	0	0	-
Task Lighting	1683 W	5260	-	0	0	-
Electric Equipment	2950 W	9364	-	0	0	-
People	42	7850	6368	0	0	0
Infiltration	-	0	0	-	22570	0
Miscellaneous	-	1200	0	-	0	0
Safety Factor	5% / 5%	3243	318	10%	6511	0
>> Total Zone Loads	-	68095	6686	-	71618	0
Zone Conditioning	-	75158	6686	-	70800	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	780 CFM	1452	-	780 CFM	-1452	-
Ventilation Load	780 CFM	2000	16429	780 CFM	14056	0
Ventilation Fan Load	780 CFM	2178	-	780 CFM	-2178	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	80789	23115	-	81225	0
Cooling Coil	-	6584	0	-	0	0
Heating Coil	-	0	-	-	10831	-
Terminal Unit Cooling	-	74205	22634	-	0	0
Terminal Unit Heating	-	0	-	-	70379	-
>> Total Conditioning	-	80789	22634	-	81210	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-2 (Dept Staff)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:53AM

Air System Information

Air System Name **ERU-2 (Dept Staff)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **5**
Floor Area **2091.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **0.2** Tons
Total coil load **2.3** MBH
Total coil load **1359.5** CFM/Ton
Sensible coil load **2.3** MBH
Coil CFM at Jul 1400 **255** CFM
Max coil CFM **255** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.6 / 72.2** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **3.4** MBH
Coil CFM at Des Htg **255** CFM
Max coil CFM **255** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.9 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **255** CFM
Standard CFM **255** CFM
Actual max CFM/ft² **0.12** CFM/ft²

Fan motor BHP **0.26** BHP
Fan motor kW **0.21** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **255** CFM
Standard CFM **255** CFM
Actual max CFM/ft² **0.12** CFM/ft²

Fan motor BHP **0.18** BHP
Fan motor kW **0.14** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **255** CFM
CFM/ft² **0.12** CFM/ft²

CFM/person **11.81** CFM/person

Zone Sizing Summary for ERU-2 (Dept Staff)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:53AM

Air System Information

Air System Name **ERU-2 (Dept Staff)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **5**
Floor Area **2091.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	3.2	2.1	76.5 / 65.9	55.0 / 54.1	-	Jul 1000	0.62
Zone 2	2.4	1.7	76.7 / 65.0	55.0 / 54.0	-	Jul 1000	0.48
Zone 3	15.5	10.5	76.5 / 65.6	55.0 / 54.1	-	Jul 1000	0.35
Zone 4	1.3	0.6	75.5 / 69.6	55.0 / 54.7	-	Jul 1000	0.12
Zone 5	5.8	3.3	75.9 / 67.6	55.0 / 54.4	-	Jul 1000	0.56

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	0.0	0.0 / 0.0	0.00	92	0.000	0.000	30
Zone 2	0.0	0.0 / 0.0	0.00	73	0.000	0.000	15
Zone 3	0.0	0.0 / 0.0	0.00	453	0.000	0.000	110
Zone 4	0.0	0.0 / 0.0	0.00	28	0.000	0.000	20
Zone 5	0.0	0.0 / 0.0	0.00	146	0.000	0.000	80

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	18.3	1.5	0.0
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	18.3	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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	2.0	Jan 1100	0.0	150.1
Zone 2	1.6	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	3.1	Jan 1400	0.0	259.9

Zone Sizing Summary for ERU-2 (Dept Staff)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:53AM

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
B219 ACAD PROG	1	2.0	Jan 1100	92	0.0	150.1	0.62
Zone 2							
B226 AP1	1	1.6	Jan 1100	73	0.0	152.3	0.48
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	28	0.0	227.0	0.12
Zone 5							
B229 CONF	1	3.1	Jan 1400	146	0.0	259.9	0.56

Ventilation Sizing Summary for ERU-2 (Dept Staff)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:53AM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows
Design Ventilation Airflow Rate 255 CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
B219 ACAD PROG	1	150.1	4.0	92.4	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				92.4					30.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
B226 AP1	1	152.3	1.0	73.2	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				73.2					15.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
B218G DEPART HEADS	1	1301.8	6.0	452.6	0.00	0.00	110.0	0.0	110.0
Totals (incl. Space Multipliers)				452.6					110.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
B227 RECORDS	1	227.0	1.0	28.2	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				28.2					20.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
B229 CONF	1	259.9	12.0	145.7	0.00	0.00	80.0	0.0	80.0
Totals (incl. Space Multipliers)				145.7					80.0

Air System Design Load Summary for ERU-2 (Dept Staff)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:53AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1000 COOLING OA DB / WB 76.1 °F / 70.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	0 ft²	0	-	0 ft²	0	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1589 W	3838	-	0	0	-
Task Lighting	885 W	2531	-	0	0	-
Electric Equipment	2071 W	6176	-	0	0	-
People	22	3248	3348	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	790	167	10%	0	0
>> Total Zone Loads	-	16583	3515	-	0	0
Zone Conditioning	-	18825	3515	-	0	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	255 CFM	475	-	255 CFM	-475	-
Ventilation Load	255 CFM	-717	6462	255 CFM	4630	0
Ventilation Fan Load	255 CFM	712	-	255 CFM	-712	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	19295	9977	-	3443	0
Cooling Coil	-	1025	0	-	0	0
Heating Coil	-	0	-	-	3443	-
Terminal Unit Cooling	-	18270	9982	-	0	0
Terminal Unit Heating	-	0	-	-	0	-
>> Total Conditioning	-	19295	9982	-	3443	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-3 (Child Dev)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

12/20/2022

10:28AM

Air System Information

Air System Name **ERU-3 (Child Dev)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **7**
Floor Area **3644.5** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **0.8** Tons
Total coil load **10.2** MBH
Total coil load **1457.2** CFM/Ton
Sensible coil load **10.2** MBH
Coil CFM at Jul 1400 **1235** CFM
Max coil CFM **1235** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.0 / 72.1** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **17.5** MBH
Coil CFM at Des Htg **1235** CFM
Max coil CFM **1235** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.2 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **1235** CFM
Standard CFM **1234** CFM
Actual max CFM/ft² **0.34** CFM/ft²

Fan motor BHP **1.27** BHP
Fan motor kW **1.01** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **1235** CFM
Standard CFM **1234** CFM
Actual max CFM/ft² **0.34** CFM/ft²

Fan motor BHP **0.85** BHP
Fan motor kW **0.67** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **1235** CFM
CFM/ft² **0.34** CFM/ft²

CFM/person **16.94** CFM/person

Zone Sizing Summary for ERU-3 (Child Dev)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
10:28AM

Air System Information

Air System Name **ERU-3 (Child Dev)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **7**
Floor Area **3644.5** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
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	19.9	9.9	75.3 / 68.8	55.0 / 54.6	-	Aug 1400	0.81
Zone 5	8.0	5.1	75.4 / 66.4	56.6 / 55.8	-	Jul 1300	1.06
Zone 6	7.7	6.6	75.2 / 69.8	67.6 / 67.1	-	Aug 1400	3.35
Zone 7	10.6	5.1	75.2 / 70.3	61.9 / 61.5	-	Jul 1300	0.24

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (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	415
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	330
Zone 5	4.5	69.5 / 86.1	-	250	0.000	0.000	90
Zone 6	14.7	69.4 / 86.2	-	811	0.000	0.000	90
Zone 7	6.1	69.7 / 85.7	-	354	0.000	0.000	255

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	43.3	3.6	54.7
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	43.3	3.6	54.7

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 Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
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 5	4.8	Jul 1400	4.6	235.6

Zone Sizing Summary for ERU-3 (Child Dev)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 6	6.6	Jul 1400	14.9	242.1
Zone 7	4.5	Jul 1400	6.5	1459.6

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
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

Ventilation Sizing Summary for ERU-3 (Child Dev)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
10:28AM

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **1235** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
C106F KITCHEN	1	123.3	1.0	171.0	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				171.0					25.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
C106 EARLY CHILDHOOD EDU	1	836.2	25.0	1141.1	0.00	0.00	415.0	0.0	415.0
Totals (incl. Space Multipliers)				1141.1					415.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
C106A CUBBIES	1	188.7	0.0	30.0	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				30.0					30.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
C106B RELATED CR	1	559.0	25.0	452.5	0.00	0.00	330.0	0.0	330.0
Totals (incl. Space Multipliers)				452.5					330.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
C109 DRESSING	1	235.6	15.0	250.2	0.00	0.00	90.0	0.0	90.0
Totals (incl. Space Multipliers)				250.2					90.0

Ventilation Sizing Summary for ERU-3 (Child Dev)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
10:28AM

2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
C110 DRESSING	1	242.1	15.0	810.7	0.00	0.00	90.0	0.0	90.0
Totals (incl. Space Multipliers)				810.7					90.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
C111 CORRIDOR	1	1459.6	0.0	353.5	0.00	0.00	255.0	0.0	255.0
Totals (incl. Space Multipliers)				353.5					255.0

Air System Design Load Summary for ERU-3 (Child Dev)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

12/20/2022
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	251 ft²	4086	-	251 ft²	-	-
Wall Transmission	2464 ft²	2698	-	2464 ft²	15702	-
Roof Transmission	3644 ft²	3321	-	3644 ft²	6039	-
Window Transmission	251 ft²	737	-	251 ft²	5056	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	77 ft²	1149	-	77 ft²	3660	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	2456 W	7177	-	0	0	-
Task Lighting	1270 W	3969	-	0	0	-
Electric Equipment	885 W	2834	-	0	0	-
People	65	12473	10084	0	0	0
Infiltration	-	0	0	-	20809	0
Miscellaneous	-	1200	0	-	0	0
Safety Factor	5% / 5%	1982	504	10%	5127	0
>> Total Zone Loads	-	41626	10588	-	56393	0
Zone Conditioning	-	44425	10588	-	55827	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1235 CFM	2299	-	1235 CFM	-2299	-
Ventilation Load	1235 CFM	3256	15911	1235 CFM	22114	0
Ventilation Fan Load	1235 CFM	3449	-	1235 CFM	-3449	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	53429	26499	-	72193	0
Cooling Coil	-	10170	0	-	0	0
Heating Coil	-	0	-	-	17549	-
Terminal Unit Cooling	-	43269	26491	-	0	0
Terminal Unit Heating	-	0	-	-	54727	-
>> Total Conditioning	-	53439	26491	-	72276	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-4 (Media Center)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/13/2023

10:54AM

Air System Information

Air System Name **ERU-4 (Media Center)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **10**
Floor Area **6710.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **1.3** Tons
Total coil load **16.0** MBH
Total coil load **1418.1** CFM/Ton
Sensible coil load **16.0** MBH
Coil CFM at Jul 1400 **1885** CFM
Max coil CFM **1885** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.3 / 72.1** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **26.4** MBH
Coil CFM at Des Htg **1885** CFM
Max coil CFM **1885** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.4 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **1885** CFM
Standard CFM **1883** CFM
Actual max CFM/ft² **0.28** CFM/ft²

Fan motor BHP **1.94** BHP
Fan motor kW **1.54** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **1885** CFM
Standard CFM **1883** CFM
Actual max CFM/ft² **0.28** CFM/ft²

Fan motor BHP **1.30** BHP
Fan motor kW **1.03** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **1885** CFM
CFM/ft² **0.28** CFM/ft²

CFM/person **13.09** CFM/person

Zone Sizing Summary for ERU-4 (Media Center)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:54AM

Air System Information

Air System Name **ERU-4 (Media Center)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **10**
Floor Area **6710.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft²
Zone 1	144.9	113.6	75.8 / 65.7	59.2 / 58.3	-	Aug 1400	2.05
Zone 2	25.7	14.4	75.5 / 67.4	55.0 / 54.4	-	Jul 1000	0.62
Zone 3	3.6	2.0	75.7 / 67.9	55.0 / 54.4	-	Aug 1000	0.64
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	76.5 / 66.8	55.0 / 54.2	-	Aug 1000	0.35
Zone 7	6.8	3.9	76.2 / 67.5	55.0 / 54.4	-	Aug 1000	0.49
Zone 8	17.9	10.7	75.9 / 66.9	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	13.2	9.3	76.4 / 65.1	55.0 / 54.0	-	Aug 1000	0.83

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	115.3	69.5 / 86.3	-	6368	0.000	0.000	1055
Zone 2	11.5	69.6 / 86.0	-	652	0.000	0.000	330
Zone 3	0.0	0.0 / 0.0	0.00	88	0.000	0.000	50
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	30
Zone 6	0.0	0.0 / 0.0	0.00	53	0.000	0.000	15
Zone 7	0.0	0.0 / 0.0	0.00	170	0.000	0.000	80
Zone 8	5.2	69.6 / 79.8	-	473	0.000	0.000	185
Zone 9	0.0	0.0 / 0.0	0.00	24	0.000	0.000	20
Zone 10	0.0	0.0 / 0.0	0.00	403	0.000	0.000	90

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	159.7	13.3	136.9
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	159.7	13.3	136.9

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 Cooling Sensible	Time of Peak Sensible	Zone Heating Load	Zone Floor Area

Zone Sizing Summary for ERU-4 (Media Center)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	(MBH)	Cooling Load	(MBH)	(ft²)
Zone 1	112.4	Aug 1400	116.8	3106.7
Zone 2	14.1	Jul 1400	11.9	1048.4
Zone 3	1.9	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	3.7	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

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space 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	1.9	Jan 1400	88	0.0	136.6	0.64
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	3.7	Jan 1400	170	0.0	350.1	0.49
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

Ventilation Sizing Summary for ERU-4 (Media Center)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **1885** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
A221 MEDIA CENTER	1	3106.7	68.0	6368.3	0.00	0.00	1055.0	0.0	1055.0
Totals (incl. Space Multipliers)				6368.3					1055.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
A221a MEDIA CENTER	1	1048.4	32.0	651.7	0.00	0.00	330.0	0.0	330.0
Totals (incl. Space Multipliers)				651.7					330.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
A219 MC Small Group	1	136.6	8.0	87.6	0.00	0.00	50.0	0.0	50.0
Totals (incl. Space Multipliers)				87.6					50.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
A220 Small Group	1	105.6	4.0	132.7	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				132.7					30.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
A217 Small Group	1	107.9	4.0	133.3	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				133.3					30.0

Ventilation Sizing Summary for ERU-4 (Media Center)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
A222 MC Office	1	150.4	1.0	52.6	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				52.6					15.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
A216 MC Workroom	1	350.1	12.0	170.3	0.00	0.00	80.0	0.0	80.0
Totals (incl. Space Multipliers)				170.3					80.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
A214 Career Center	1	959.8	25.0	473.0	0.00	0.00	185.0	0.0	185.0
Totals (incl. Space Multipliers)				473.0					185.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
A218 CORRIDOR	1	259.0	0.0	24.3	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				24.3					20.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
A215 TV Studio	1	486.1	6.0	403.4	0.00	0.00	90.0	0.0	90.0
Totals (incl. Space Multipliers)				403.4					90.0

Air System Design Load Summary for ERU-4 (Media Center)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:54AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	2965 ft²	51807	-	2965 ft²	-	-
Wall Transmission	2201 ft²	1680	-	2201 ft²	8604	-
Roof Transmission	3978 ft²	26290	-	3978 ft²	25048	-
Window Transmission	2965 ft²	8718	-	2965 ft²	59771	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	88 ft²	1471	-	88 ft²	4435	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	5539 W	16203	-	0	0	-
Task Lighting	2983 W	9322	-	0	0	-
Electric Equipment	3020 W	9670	-	0	0	-
People	128	23544	16632	0	0	0
Infiltration	-	0	0	-	28567	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	7435	832	10%	12643	0
>> Total Zone Loads	-	156139	17464	-	139068	0
Zone Conditioning	-	161964	17464	-	138097	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1885 CFM	3510	-	1885 CFM	-3510	-
Ventilation Load	1885 CFM	4834	43198	1885 CFM	33903	0
Ventilation Fan Load	1885 CFM	5265	-	1885 CFM	-5265	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	175572	60661	-	163226	0
Cooling Coil	-	15910	0	-	0	0
Heating Coil	-	0	-	-	26358	-
Terminal Unit Cooling	-	159662	60634	-	0	0
Terminal Unit Heating	-	0	-	-	136909	-
>> Total Conditioning	-	175572	60634	-	163267	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-5 (Consessions Building)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/14/2023

08:44AM

Air System Information

Air System Name **ERU-5 (Consessions Building)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **3**
Floor Area **908.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Heating Coil Sizing Data

Max coil load **29.8** MBH
Coil CFM at Des Htg **1545** CFM
Max coil CFM **1545** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **51.1 / 69.0** °F

Ventilation Fan Sizing Data

Actual max CFM **1545** CFM
Standard CFM **1543** CFM
Actual max CFM/ft² **1.70** CFM/ft²

Fan motor BHP **0.63** BHP
Fan motor kW **0.50** kW
Fan static **1.50** in wg

Exhaust Fan Sizing Data

Actual max CFM **1545** CFM
Standard CFM **1543** CFM
Actual max CFM/ft² **1.70** CFM/ft²

Fan motor BHP **0.42** BHP
Fan motor kW **0.34** kW
Fan static **1.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **1545** CFM
CFM/ft² **1.70** CFM/ft²

CFM/person **515.00** CFM/person

Zone Sizing Summary for ERU-5 (Consessions Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
08:44AM

Air System Information

Air System Name **ERU-5 (Consessions Building)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **3**
Floor Area **908.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	5.6	5.6	77.1 / 71.5	70.7 / 69.6	-	Jul 1400	2.75
Zone 2	7.6	7.6	78.3 / 71.8	70.9 / 69.7	-	Jul 1500	3.07
Zone 3	6.8	6.8	79.7 / 72.2	70.4 / 69.5	-	Jul 1400	2.23

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	14.3	69.4 / 85.9	-	805	0.000	0.000	315
Zone 2	17.0	69.8 / 86.4	-	954	0.000	0.000	615
Zone 3	11.9	69.9 / 86.2	-	680	0.000	0.000	615

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	19.2	1.6	43.3
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	19.2	1.6	43.3

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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	3.3	Aug 1400	14.8	293.1
Zone 2	3.4	Jul 1900	17.5	310.6
Zone 3	2.6	Jul 1400	12.5	305.2

Zone Sizing Summary for ERU-5 (Consessions Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
08:44AM

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
1-CB101 CONSESSIONS	1	3.3	Aug 1400	805	14.8	293.1	2.75
Zone 2							
1-CB103 WOMENS TOILET	1	3.4	Jul 1900	954	17.5	310.6	3.07
Zone 3							
1-CB104 Mens Toilet	1	2.6	Jul 1400	680	12.5	305.2	2.23

Ventilation Sizing Summary for ERU-5 (Consessions Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
08:44AM

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **1545** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
1-CB101 CONSESSIONS	1	293.1	3.0	804.6	0.00	0.00	315.0	0.0	315.0
Totals (incl. Space Multipliers)				804.6					315.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
1-CB103 WOMENS TOILET	1	310.6	0.0	953.5	0.00	0.00	615.0	0.0	615.0
Totals (incl. Space Multipliers)				953.5					615.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
1-CB104 Mens Toilet	1	305.2	0.0	680.1	0.00	0.00	615.0	0.0	615.0
Totals (incl. Space Multipliers)				680.1					615.0

Air System Design Load Summary for ERU-5 (Consessions Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
08:44AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	1587 ft²	4431	-	1587 ft²	16621	-
Roof Transmission	909 ft²	774	-	909 ft²	1506	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	98 ft²	470	-	98 ft²	3219	-
Floor Transmission	904 ft²	0	-	904 ft²	2122	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	679 W	1987	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	117 W	375	-	0	0	-
People	3	554	600	0	0	0
Infiltration	-	0	0	-	17183	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	430	30	10%	4065	0
>> Total Zone Loads	-	9020	630	-	44717	0
Zone Conditioning	-	10761	630	-	44495	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1545 CFM	1145	-	1545 CFM	-1145	-
Ventilation Load	1545 CFM	5607	-603	1545 CFM	31506	0
Ventilation Fan Load	1545 CFM	1718	-	1545 CFM	-1718	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	19232	27	-	73138	0
Heating Coil	-	0	-	-	29776	-
Terminal Unit Cooling	-	19232	0	-	0	0
Terminal Unit Heating	-	0	-	-	43319	-
>> Total Conditioning	-	19232	0	-	73095	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-6 (Locker Building)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/14/2023

11:30AM

Air System Information

Air System Name **ERU-6 (Locker Building)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **10**
Floor Area **3184.3** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Heating Coil Sizing Data

Max coil load **31.6** MBH
Coil CFM at Des Htg **1630** CFM
Max coil CFM **1630** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **51.0 / 69.0** °F

Ventilation Fan Sizing Data

Actual max CFM **1630** CFM
Standard CFM **1628** CFM
Actual max CFM/ft² **0.51** CFM/ft²

Fan motor BHP **0.67** BHP
Fan motor kW **0.53** kW
Fan static **1.50** in wg

Exhaust Fan Sizing Data

Actual max CFM **1630** CFM
Standard CFM **1628** CFM
Actual max CFM/ft² **0.51** CFM/ft²

Fan motor BHP **0.45** BHP
Fan motor kW **0.35** kW
Fan static **1.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **1630** CFM
CFM/ft² **0.51** CFM/ft²

CFM/person **34.17** CFM/person

Zone Sizing Summary for ERU-6 (Locker Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
11:30AM

Air System Information

Air System Name **ERU-6 (Locker Building)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **10**
Floor Area **3184.3** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft²
Zone 1	1.8	1.5	75.3 / 69.1	66.2 / 65.6	-	Sep 0800	1.18
Zone 2	13.9	10.0	78.7 / 69.4	63.6 / 62.7	-	Aug 1200	0.82
Zone 3	3.2	3.2	74.9 / 67.8	69.6 / 66.1	-	Aug 0700	5.57
Zone 4	2.0	2.0	75.9 / 69.4	72.1 / 68.2	-	Jul 1400	4.82
Zone 5	12.5	8.6	80.2 / 70.1	62.9 / 61.9	-	Aug 1400	0.74
Zone 6	1.3	0.8	79.4 / 69.3	58.0 / 57.2	-	Aug 1400	0.31
Zone 7	1.3	0.8	79.4 / 69.3	58.0 / 57.2	-	Aug 1400	0.31
Zone 8	3.2	2.5	75.3 / 69.4	66.5 / 65.9	-	Jul 0800	1.02
Zone 9	12.6	8.6	80.2 / 70.0	62.7 / 61.8	-	Aug 1400	0.74
Zone 10	13.3	12.2	75.8 / 68.8	66.1 / 65.4	-	Jul 1300	3.02

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @ 20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	2.8	69.2 / 86.2	-	152	0.000	0.000	0
Zone 2	10.7	69.9 / 86.1	-	612	0.000	0.000	500
Zone 3	9.9	69.3 / 86.1	-	545	0.000	0.000	40
Zone 4	8.8	69.2 / 85.8	-	489	0.000	0.000	100
Zone 5	8.0	69.9 / 86.1	-	458	0.000	0.000	420
Zone 6	0.2	69.9 / 75.3	-	35	0.000	0.000	25
Zone 7	0.2	69.9 / 75.3	-	35	0.000	0.000	25
Zone 8	4.8	68.8 / 85.6	-	264	0.000	0.000	0
Zone 9	8.0	69.9 / 86.1	-	458	0.000	0.000	420
Zone 10	21.5	69.3 / 86.3	-	1177	0.000	0.000	100

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	47.8	4.0	74.9
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	47.8	4.0	74.9

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 Cooling Sensible	Time of Peak Sensible	Zone Heating Load	Zone Floor Area

Zone Sizing Summary for ERU-6 (Locker Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
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Zone Name	(MBH)	Cooling Load	(MBH)	(ft²)
Zone 1	0.8	Aug 0900	2.8	129.1
Zone 2	6.2	Aug 1400	11.2	750.6
Zone 3	2.6	Aug 0100	10.0	97.8
Zone 4	1.1	Jul 1400	9.0	101.6
Zone 5	5.5	Aug 1400	8.4	618.7
Zone 6	0.6	Jul 1400	0.2	109.8
Zone 7	0.6	Jul 1400	0.2	109.8
Zone 8	1.8	Aug 1900	4.8	258.8
Zone 9	5.5	Aug 1400	8.4	618.7
Zone 10	11.3	Jul 1400	21.6	389.4

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
1-E7 TLT / SHOWER	1	0.8	Aug 0900	152	2.8	129.1	1.18
Zone 2							
1-LR102 TEAM ROOM	1	6.2	Aug 1400	612	11.2	750.6	0.82
Zone 3							
1-LR103 STOR	1	2.6	Aug 0100	545	10.0	97.8	5.57
Zone 4							
1-LR102 TEAM ROOM Hall	1	1.1	Jul 1400	489	9.0	101.6	4.82
Zone 5							
1-LR206 TEAM ROOM	1	5.5	Aug 1400	458	8.4	618.7	0.74
Zone 6							
1-LR204 COACH/OFFICIAL	1	0.6	Jul 1400	35	0.2	109.8	0.31
Zone 7							
1-LR205 COACH/OFFICIAL	1	0.6	Jul 1400	35	0.2	109.8	0.31
Zone 8							
1-LR207 TLT / SHOWER	1	1.2	Sep 1900	140	2.6	129.4	1.08
1-LR208 TLT / SHOWER	1	0.7	Aug 1100	124	2.3	129.4	0.96
Zone 9							
1-LR203 TEAM ROOM	1	5.5	Aug 1400	458	8.4	618.7	0.74
Zone 10							
1-LR202 Corridor	1	11.3	Jul 1400	1177	21.6	389.4	3.02

Ventilation Sizing Summary for ERU-6 (Locker Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
11:30AM

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **1630** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
1-E7 TLT / SHOWER	1	129.1	0.0	152.3	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				152.3					0.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
1-LR102 TEAM ROOM	1	750.6	20.0	612.3	0.00	0.00	500.0	0.0	500.0
Totals (incl. Space Multipliers)				612.3					500.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
1-LR103 STOR	1	97.8	0.0	545.2	0.00	0.00	40.0	0.0	40.0
Totals (incl. Space Multipliers)				545.2					40.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
1-LR102 TEAM ROOM Hall	1	101.6	0.0	489.3	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				489.3					100.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
1-LR206 TEAM ROOM	1	618.7	15.0	457.8	0.00	0.00	420.0	0.0	420.0
Totals (incl. Space Multipliers)				457.8					420.0

Ventilation Sizing Summary for ERU-6 (Locker Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
1-LR204 COACH/OFFICIAL	1	109.8	1.0	34.5	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				34.5					25.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
1-LR205 COACH/OFFICIAL	1	109.8	1.0	34.5	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				34.5					25.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
1-LR207 TLT / SHOWER	1	129.4	0.0	140.1	0.00	0.00	0.0	0.0	0.0
1-LR208 TLT / SHOWER	1	129.4	0.0	124.1	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				264.1					0.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
1-LR203 TEAM ROOM	1	618.7	15.0	457.8	0.00	0.00	420.0	0.0	420.0
Totals (incl. Space Multipliers)				457.8					420.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
1-LR202 Corridor	1	389.4	1.0	1176.7	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				1176.7					100.0

Air System Design Load Summary for ERU-6 (Locker Building)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
11:30AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	589 ft²	7287	-	589 ft²	-	-
Wall Transmission	2706 ft²	7444	-	2706 ft²	32009	-
Roof Transmission	2105 ft²	1918	-	2105 ft²	3489	-
Window Transmission	589 ft²	1732	-	589 ft²	11874	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	21 ft²	135	-	21 ft²	926	-
Floor Transmission	1079 ft²	0	-	1079 ft²	1750	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	2038 W	5961	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	88 W	281	-	0	0	-
People	42	8328	8480	0	0	0
Infiltration	-	0	0	-	19599	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	1654	424	10%	6965	0
>> Total Zone Loads	-	34741	8904	-	76612	0
Zone Conditioning	-	39192	8904	-	76268	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	1630 CFM	1208	-	1630 CFM	-1208	-
Ventilation Load	1630 CFM	5607	5249	1630 CFM	33163	0
Ventilation Fan Load	1630 CFM	1813	-	1630 CFM	-1813	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	47820	14153	-	106410	0
Heating Coil	-	0	-	-	31593	-
Terminal Unit Cooling	-	47831	14056	-	0	0
Terminal Unit Heating	-	0	-	-	74877	-
>> Total Conditioning	-	47831	14056	-	106470	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for ERU-7 (Admin Area A4)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/13/2023

01:17PM

Air System Information

Air System Name ERU-7 (Admin Area A4)
Equipment Class TERM
Air System Type VRF

Number of zones 10
Floor Area 2058.2 ft²
Location Boston, Massachusetts

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone CFM Sizing Sum of space airflow rates
Space CFM Sizing Individual peak space loads

Cooling Coil Sizing Data

Total coil load 0.2 Tons
Total coil load 2.1 MBH
Total coil load 1462.3 CFM/Ton
Sensible coil load 2.1 MBH
Coil CFM at Aug 1500 255 CFM
Max coil CFM 255 CFM
Sensible heat ratio 1.000
Water flow @ 10.0 °F rise N/A

Load occurs at Aug 1500
OA DB / WB 87.0 / 74.0 °F
Entering DB / WB 80.0 / 72.1 °F
Leaving DB / WB 72.4 / 69.8 °F
Bypass Factor 0.100

Heating Coil Sizing Data

Max coil load 3.6 MBH
Coil CFM at Des Htg 255 CFM
Max coil CFM 255 CFM
Water flow @ 20.0 °F drop N/A

Load occurs at Des Htg
Ent. DB / Lvg DB 54.2 / 67.4 °F

Ventilation Fan Sizing Data

Actual max CFM 255 CFM
Standard CFM 255 CFM
Actual max CFM/ft² 0.12 CFM/ft²

Fan motor BHP 0.26 BHP
Fan motor kW 0.21 kW
Fan static 3.00 in wg

Exhaust Fan Sizing Data

Actual max CFM 255 CFM
Standard CFM 255 CFM
Actual max CFM/ft² 0.12 CFM/ft²

Fan motor BHP 0.18 BHP
Fan motor kW 0.14 kW
Fan static 2.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM 255 CFM
CFM/ft² 0.12 CFM/ft²

CFM/person 11.81 CFM/person

Zone Sizing Summary for ERU-7 (Admin Area A4)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
01:17PM

Air System Information

Air System Name **ERU-7 (Admin Area A4)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **10**
Floor Area **2058.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft²
Zone 1	7.1	5.9	75.6 / 64.3	57.4 / 56.4	-	Jul 1400	0.91
Zone 2	1.3	0.8	76.0 / 66.4	56.1 / 55.3	-	Jul 1000	0.14
Zone 3	6.7	5.1	75.9 / 64.3	55.0 / 54.0	-	Sep 1400	0.83
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	5.9	4.3	75.4 / 65.9	58.9 / 58.0	-	Aug 1400	1.06
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 Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	5.4	69.2 / 86.1	-	298	0.000	0.000	30
Zone 2	0.5	69.3 / 82.3	-	38	0.000	0.000	0
Zone 3	3.3	69.5 / 83.0	-	225	0.000	0.000	50
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	4.2	69.1 / 85.4	-	241	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 [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	29.6	2.5	28.6
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	29.6	2.5	28.6

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 Cooling Sensible	Time of Peak Sensible	Zone Heating Load	Zone Floor Area

Zone Sizing Summary for ERU-7 (Admin Area A4)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	(MBH)	Cooling Load	(MBH)	(ft²)
Zone 1	5.4	Jul 1400	5.5	329.0
Zone 2	0.8	Jul 1400	0.5	277.4
Zone 3	4.8	Oct 1400	3.3	270.2
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	4.0	Jul 1400	4.4	227.7
Zone 9	1.8	Jul 1400	2.4	123.3
Zone 10	3.2	Jul 1400	3.0	260.2

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
A404E SUPT ASSIST	1	5.4	Jul 1400	298	5.5	329.0	0.91
Zone 2							
A404B CORRIDOR	1	0.5	Jul 1400	25	0.4	177.0	0.14
A415 CORRIDOR	1	0.3	Jul 1400	14	0.2	100.4	0.14
Zone 3							
A404A WAITING	1	4.8	Oct 1400	225	3.3	270.2	0.83
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	4.0	Jul 1400	241	4.4	227.7	1.06
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

Ventilation Sizing Summary for ERU-7 (Admin Area A4)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows
Design Ventilation Airflow Rate 255 CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
A404E SUPT ASSIST	1	329.0	2.0	298.3	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				298.3					30.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
A404B CORRIDOR	1	177.0	0.0	24.8	0.00	0.00	0.0	0.0	0.0
A415 CORRIDOR	1	100.4	0.0	13.6	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				38.4					0.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
A404A WAITING	1	270.2	3.0	224.7	0.00	0.00	50.0	0.0	50.0
Totals (incl. Space Multipliers)				224.7					50.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
A407 ACCT REC	1	129.9	1.0	132.5	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				132.5					15.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
A408 TREAS OFF	1	146.8	1.0	134.2	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				134.2					15.0

Ventilation Sizing Summary for ERU-7 (Admin Area A4)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
A409 HR OFF	1	146.8	1.0	134.2	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				134.2					15.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
A410 BUS MGR OFF	1	146.8	1.0	134.2	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				134.2					15.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
A412 CONF	1	227.7	8.0	241.0	0.00	0.00	55.0	0.0	55.0
Totals (incl. Space Multipliers)				241.0					55.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
A413 SUPT ASSIST	1	123.3	1.0	133.1	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				133.1					15.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
A414 SUPT OFF	1	260.2	6.0	165.3	0.00	0.00	45.0	0.0	45.0
Totals (incl. Space Multipliers)				165.3					45.0

Air System Design Load Summary for ERU-7 (Admin Area A4)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	528 ft²	6232	-	528 ft²	-	-
Wall Transmission	1007 ft²	676	-	1007 ft²	3934	-
Roof Transmission	2077 ft²	1750	-	2077 ft²	3441	-
Window Transmission	528 ft²	1553	-	528 ft²	10644	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1317 W	3853	-	0	0	-
Task Lighting	712 W	2238	-	0	0	-
Electric Equipment	1811 W	5799	-	0	0	-
People	19	3696	2976	0	0	0
Infiltration	-	0	0	-	8344	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	1290	149	10%	2636	0
>> Total Zone Loads	-	27086	3125	-	29000	0
Zone Conditioning	-	29764	3125	-	28823	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	255 CFM	475	-	255 CFM	-475	-
Ventilation Load	255 CFM	683	5846	255 CFM	4565	0
Ventilation Fan Load	255 CFM	712	-	255 CFM	-712	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	31634	8971	-	32201	0
Cooling Coil	-	2071	0	-	0	0
Heating Coil	-	0	-	-	3628	-
Terminal Unit Cooling	-	29563	8959	-	0	0
Terminal Unit Heating	-	0	-	-	28573	-
>> Total Conditioning	-	31634	8959	-	32201	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for Heating Only Spaces - Area A & B

Project Name: 60-20-409 NEMT

02/13/2023

Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name . **Heating Only Spaces - Area A & B**
Equipment Class **TERM**
Air System Type **2P-FC**

Number of zones **1**
Floor Area **6952.7** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for Heating Only Spaces - Area A & B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name **Heating Only Spaces - Area A & B**
Equipment Class **TERM**
Air System Type **2P-FC**

Number of zones **1**
Floor Area **6952.7** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	0.0	0.0	-1.0 / -1.0	-1.0 / -1.0	0.00	Des 0000	0.28

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @30.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	59.2	70.2 / 100.0	3.95	1935	0.286	0.227	38

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	33.4	Aug 1500	58.0	6952.7

Zone Sizing Summary for Heating Only Spaces - Area A & B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
B105 FIRE PUMP ROOM	1	0.7	Jul 1400	145	4.4	151.0	0.96
B106 PLUMB - WATER SERVI	1	0.7	Jul 1400	152	4.6	139.5	1.09
B107 PLUMB - WATER HEATE	1	0.3	Jan 1100	0	0.0	139.5	0.00
A103 DRY STOR	1	1.3	Jul 2100	299	9.0	294.3	1.02
A105 STAFF LOCKER RM	1	0.6	Jul 1700	117	3.5	109.8	1.07
A106 TLT	1	0.3	Aug 1900	54	1.6	58.9	0.92
A107 TLT	1	0.2	Jul 1400	4	0.1	58.5	0.07
A133 TLT	1	0.1	Jan 1100	0	0.0	73.3	0.00
A134 TLT	1	0.1	Jan 1100	0	0.0	73.3	0.00
A141H TLT	1	0.1	Jan 1100	0	0.0	56.8	0.00
A142 TLT	1	0.3	Jan 1100	0	0.0	147.2	0.00
A143 TLT	1	0.3	Jan 1100	0	0.0	160.3	0.00
A141B LOCKER	1	0.5	Jan 1100	0	0.0	269.8	0.00
B116 TLT	1	0.1	Jan 1100	0	0.0	59.8	0.00
B117 TLT	1	0.1	Jan 1100	0	0.0	55.2	0.00
B101B LOCKER	1	3.2	Jul 1400	90	2.7	301.3	0.30
B101C TLT	1	0.2	Jul 1400	5	0.1	76.0	0.07
B103B LOCKER	1	3.1	Jul 1400	85	2.6	285.2	0.30
B103C TLT	1	0.9	Jul 1400	24	0.7	80.4	0.30
B103D STOR	1	0.3	Jul 1400	10	0.2	91.4	0.11
B121A LOCKER	1	0.3	Jan 1100	0	0.0	147.0	0.00
B121B TLT	1	0.1	Jan 1100	0	0.0	61.6	0.00
B104B LOCKER	1	1.1	Jan 1100	0	0.0	579.4	0.00
B104E TLT	1	0.1	Jan 1100	0	0.0	69.9	0.00
B104F STOR	1	0.3	Jan 1100	10	0.0	156.5	0.06
A201 MECHANICAL	1	18.0	Sep 1500	784	23.7	2037.0	0.39
A417 CUST	1	0.1	Jul 1400	3	0.1	39.8	0.07
A405 TLT	1	0.2	Jul 1400	4	0.1	62.4	0.07
A422 TLT	1	0.8	Jul 1400	18	0.5	276.7	0.07
A423 TLT	1	0.7	Jul 1400	17	0.5	266.5	0.07
B414 CUST	1	0.4	Jul 1700	104	3.1	56.2	1.84
A117C Toilet	1	0.2	Jan 1100	0	0.0	68.9	0.00
A117D Toilet	1	0.2	Jan 1100	0	0.0	69.7	0.00
A117B Custodian	1	0.2	Jan 1100	0	0.0	73.3	0.00
A116 IDF	1	0.2	Jan 1100	0	0.0	92.6	0.00
A115 ELECT - MAIN KITCHE	1	0.2	Jan 1100	0	0.0	90.2	0.00
A109 RECYCLING ROOM	1	0.3	Jul 1400	8	0.2	123.8	0.07

Ventilation Sizing Summary for Heating Only Spaces - Area A & B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
B105 FIRE PUMP ROOM	1	151.0	0.0	145.3	0.00	0.00	0.0	0.0	0.0
B106 PLUMB - WATER SERVI	1	139.5	0.0	152.5	0.00	0.00	0.0	0.0	0.0
B107 PLUMB - WATER HEATE	1	139.5	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A103 DRY STOR	1	294.3	0.0	299.4	5.00	0.06	0.0	0.0	17.7
A105 STAFF LOCKER RM	1	109.8	0.0	117.4	0.00	0.00	0.0	0.0	0.0
A106 TLT	1	58.9	0.0	54.1	0.00	0.00	0.0	0.0	0.0
A107 TLT	1	58.5	0.0	3.8	0.00	0.00	0.0	0.0	0.0
A133 TLT	1	73.3	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A134 TLT	1	73.3	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A141H TLT	1	56.8	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A142 TLT	1	147.2	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A143 TLT	1	160.3	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A141B LOCKER	1	269.8	0.0	0.0	0.00	0.00	0.0	0.0	0.0
B116 TLT	1	59.8	0.0	0.0	0.00	0.00	0.0	0.0	0.0
B117 TLT	1	55.2	0.0	0.0	0.00	0.00	0.0	0.0	0.0
B101B LOCKER	1	301.3	0.0	89.9	0.00	0.00	0.0	0.0	0.0
B101C TLT	1	76.0	0.0	4.9	0.00	0.00	0.0	0.0	0.0
B103B LOCKER	1	285.2	0.0	85.1	0.00	0.00	0.0	0.0	0.0
B103C TLT	1	80.4	0.0	24.0	0.00	0.00	0.0	0.0	0.0
B103D STOR	1	91.4	0.0	10.0	0.00	0.00	10.0	0.0	10.0
B121A LOCKER	1	147.0	0.0	0.0	0.00	0.00	0.0	0.0	0.0
B121B TLT	1	61.6	0.0	0.0	0.00	0.00	0.0	0.0	0.0
B104B LOCKER	1	579.4	0.0	0.0	0.00	0.00	0.0	0.0	0.0
B104E TLT	1	69.9	0.0	0.0	0.00	0.00	0.0	0.0	0.0
B104F STOR	1	156.5	0.0	10.0	0.00	0.00	10.0	0.0	10.0
A201 MECHANICAL	1	2037.0	0.0	784.4	0.00	0.00	0.0	0.0	0.0
A417 CUST	1	39.8	0.0	2.6	0.00	0.00	0.0	0.0	0.0
A405 TLT	1	62.4	0.0	4.1	0.00	0.00	0.0	0.0	0.0
A422 TLT	1	276.7	0.0	18.0	0.00	0.00	0.0	0.0	0.0
A423 TLT	1	266.5	0.0	17.3	0.00	0.00	0.0	0.0	0.0
B414 CUST	1	56.2	0.0	103.6	0.00	0.00	0.0	0.0	0.0
A117C Toilet	1	68.9	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A117D Toilet	1	69.7	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A117B Custodian	1	73.3	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A116 IDF	1	92.6	0.0	0.0	0.00	0.00	0.0	0.0	0.0

Ventilation Sizing Summary for Heating Only Spaces - Area A & B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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A115 ELECT - MAIN KITCHEN	1	90.2	0.0	0.0	0.00	0.00	0.0	0.0	0.0
A109 RECYCLING ROOM	1	123.8	0.0	8.1	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				1934.6					37.7

Air System Design Load Summary for Heating Only Spaces - Area A & B

Project Name: 60-20-409 NEMT

02/13/2023

Prepared by: TMP Consulting Engineers, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	NO COOLING DATA NO COOLING OA DB / WB			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	315 ft²	-	-	315 ft²	-	-
Wall Transmission	2468 ft²	-	-	2468 ft²	9952	-
Roof Transmission	3180 ft²	-	-	3180 ft²	9524	-
Window Transmission	315 ft²	-	-	315 ft²	6552	-
Skylight Transmission	0 ft²	-	-	0 ft²	0	-
Door Loads	104 ft²	-	-	104 ft²	4732	-
Floor Transmission	4214 ft²	-	-	4214 ft²	1446	-
Partitions	0 ft²	-	-	0 ft²	0	-
Ceiling	0 ft²	-	-	0 ft²	0	-
Overhead Lighting	-	-	-	0	0	-
Task Lighting	-	-	-	0	0	-
Electric Equipment	-	-	-	0	0	-
People	-	-	-	0	0	0
Infiltration	-	-	-	-	18240	0
Miscellaneous	-	-	-	-	0	0
Safety Factor	0% / 0%	-	-	15%	7567	0
>> Total Zone Loads	-	-	-	-	58014	0
Zone Conditioning	-	-	-	-	57426	0
Plenum Wall Load	0%	-	-	0	0	-
Plenum Roof Load	0%	-	-	0	0	-
Plenum Lighting Load	0%	-	-	0	0	-
Exhaust Fan Load	-	-	-	0 CFM	0	-
Ventilation Load	-	-	-	36 CFM	2472	0
Ventilation Fan Load	-	-	-	0 CFM	0	-
Space Fan Coil Fans	-	-	-	-	-736	-
Duct Heat Gain / Loss	0%	-	-	0%	0	-
>> Total System Loads	-	-	-	-	59162	0
Terminal Unit Cooling	-	-	-	-	0	0
Terminal Unit Heating	-	-	-	-	59162	-
>> Total Conditioning	-	-	-	-	59162	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for Heating Only Spaces - Areas C and D

Project Name: 60-20-409 NEMT

02/14/2023

Prepared by: TMP Consulting Engineers, Inc.

11:28AM

Air System Information

Air System Name **Heating Only Spaces - Areas C and D**
Equipment Class **TERM**
Air System Type **2P-FC**

Number of zones **1**
Floor Area **9615.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for Heating Only Spaces - Areas C an

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
11:28AM

Air System Information

Air System Name **Heating Only Spaces - Areas C an**
Equipment Class **TERM**
Air System Type **2P-FC**

Number of zones **1**
Floor Area **9615.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	0.0	0.0	-1.0 / -1.0	-1.0 / -1.0	0.00	Des 0000	1.04

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @30.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	297.6	71.2 / 100.0	19.85	10002	1.479	1.173	30

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	55.9	Jul 1400	301.6	9615.6

Zone Sizing Summary for Heating Only Spaces - Areas C an

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
11:28AM

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
C001 ELECT - MAIN ELECT	1	0.0	Jan 0000	168	5.1	601.1	0.28
C005 ELECT - MAIN STANDB	1	0.5	Jan 1100	58	1.8	242.5	0.24
C006 ELECT - LIFE SAFETY	1	0.5	Jan 1100	0	0.0	218.6	0.00
C007 Generator Panels	1	0.0	Jan 0000	145	4.4	144.9	1.00
C008 PLUMBING ROOM	1	0.0	Jan 0000	189	5.7	430.8	0.44
C101 CUST	1	0.1	Jan 1100	0	0.0	46.9	0.00
C102 CUST STOR	1	0.1	Jan 1100	0	0.0	50.7	0.00
C112 TLT	1	0.5	Jan 1100	0	0.0	246.8	0.00
C113 TLT	1	0.5	Jan 1100	0	0.0	246.3	0.00
C104 Vest	1	9.3	Jul 1800	1886	57.0	446.6	4.22
C106K STOR	1	0.6	Jul 2100	126	3.8	70.3	1.80
C106A CUBBIES	1	0.5	Jul 1400	30	0.4	188.7	0.16
C106C LOCKERS	1	0.2	Jul 1400	5	0.1	75.1	0.07
C106G TLT	1	0.9	Aug 2000	87	2.6	155.4	0.56
C108 TLT	1	0.3	Jul 2100	60	1.8	73.6	0.81
C107 TLT	1	0.3	Jul 2100	60	1.8	73.6	0.81
D101 VEST	1	3.3	Jul 1800	682	20.6	160.3	4.26
C302 MECHANICAL	1	7.8	Jul 1400	226	6.8	2746.9	0.08
1-CB102 MAINTENANCE	1	0.5	Jul 1500	136	4.1	43.0	3.16
1-LRS1 STAIR	1	7.4	Jul 1400	1184	35.8	247.4	4.79
1-LR104 FIELD MAINT GAR	1	5.5	Jul 1400	990	29.9	1017.5	0.97
1-LR101 VEST	1	6.9	Jul 1100	416	12.6	133.6	3.11
1-LR201 VEST	1	7.1	Jul 1100	416	12.6	136.5	3.05
1-LR105 TLT	1	0.5	Aug 0800	70	2.1	53.1	1.31
1-M101 MAINT GARAGE	1	13.2	Jul 1400	2861	86.4	1680.1	1.70
1-M101a Toilet	1	1.4	Aug 0100	206	6.2	85.3	2.42

Ventilation Sizing Summary for Heating Only Spaces - Areas C and D

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
11:28AM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
C001 ELECT - MAIN ELECT	1	601.1	0.0	168.0	0.00	0.00	0.0	0.0	0.0
C005 ELECT - MAIN STANDB	1	242.5	0.0	58.1	0.00	0.00	0.0	0.0	0.0
C006 ELECT - LIFE SAFETY	1	218.6	0.0	0.0	0.00	0.00	0.0	0.0	0.0
C007 Generator Panels	1	144.9	0.0	145.5	0.00	0.00	0.0	0.0	0.0
C008 PLUMBING ROOM	1	430.8	0.0	189.1	0.00	0.00	0.0	0.0	0.0
C101 CUST	1	46.9	0.0	0.0	0.00	0.00	0.0	0.0	0.0
C102 CUST STOR	1	50.7	0.0	0.0	0.00	0.00	0.0	0.0	0.0
C112 TLT	1	246.8	0.0	0.0	0.00	0.00	0.0	0.0	0.0
C113 TLT	1	246.3	0.0	0.0	0.00	0.00	0.0	0.0	0.0
C104 Vest	1	446.6	0.0	1886.1	0.00	0.00	0.0	0.0	0.0
C106K STOR	1	70.3	0.0	126.3	0.00	0.00	0.0	0.0	0.0
C106A CUBBIES	1	188.7	0.0	30.0	0.00	0.00	30.0	0.0	30.0
C106C LOCKERS	1	75.1	0.0	4.9	0.00	0.00	0.0	0.0	0.0
C106G TLT	1	155.4	0.0	87.0	0.00	0.00	0.0	0.0	0.0
C108 TLT	1	73.6	0.0	59.6	0.00	0.00	0.0	0.0	0.0
C107 TLT	1	73.6	0.0	59.6	0.00	0.00	0.0	0.0	0.0
D101 VEST	1	160.3	0.0	682.3	0.00	0.00	0.0	0.0	0.0
C302 MECHANICAL	1	2746.9	0.0	225.9	0.00	0.00	0.0	0.0	0.0
1-CB102 MAINTENANCE	1	43.0	0.0	136.0	0.00	0.00	0.0	0.0	0.0
1-LRS1 STAIR	1	247.4	0.0	1184.2	0.00	0.00	0.0	0.0	0.0
1-LR104 FIELD MAINT GAR	1	1017.5	4.0	990.5	0.00	0.00	0.0	0.0	0.0
1-LR101 VEST	1	133.6	0.0	415.6	0.00	0.00	0.0	0.0	0.0
1-LR201 VEST	1	136.5	0.0	415.7	0.00	0.00	0.0	0.0	0.0
1-LR105 TLT	1	53.1	0.0	69.7	0.00	0.00	0.0	0.0	0.0
1-M101 MAINT GARAGE	1	1680.1	6.0	2861.3	0.00	0.00	0.0	0.0	0.0
1-M101a Toilet	1	85.3	0.0	206.2	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				10001.6					30.0

Air System Design Load Summary for Heating Only Spaces - Areas C an

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/14/2023

11:28AM

	DESIGN COOLING			DESIGN HEATING		
	NO COOLING DATA NO COOLING OA DB / WB			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	901 ft²	-	-	901 ft²	-	-
Wall Transmission	5719 ft²	-	-	5719 ft²	57936	-
Roof Transmission	6022 ft²	-	-	6022 ft²	10297	-
Window Transmission	901 ft²	-	-	901 ft²	18741	-
Skylight Transmission	0 ft²	-	-	0 ft²	0	-
Door Loads	1233 ft²	-	-	1233 ft²	29809	-
Floor Transmission	5935 ft²	-	-	5935 ft²	14589	-
Partitions	0 ft²	-	-	0 ft²	0	-
Ceiling	1761 ft²	-	-	1761 ft²	6975	-
Overhead Lighting	-	-	-	0	0	-
Task Lighting	-	-	-	0	0	-
Electric Equipment	-	-	-	0	0	-
People	-	-	-	0	0	0
Infiltration	-	-	-	-	123902	0
Miscellaneous	-	-	-	-	0	0
Safety Factor	0% / 0%	-	-	15%	39337	0
>> Total Zone Loads	-	-	-	-	301586	0
Zone Conditioning	-	-	-	-	299444	0
Plenum Wall Load	0%	-	-	0	0	-
Plenum Roof Load	0%	-	-	0	0	-
Plenum Lighting Load	0%	-	-	0	0	-
Exhaust Fan Load	-	-	-	0 CFM	0	-
Ventilation Load	-	-	-	29 CFM	1986	0
Ventilation Fan Load	-	-	-	0 CFM	0	-
Space Fan Coil Fans	-	-	-	-	-3837	-
Duct Heat Gain / Loss	0%	-	-	0%	0	-
>> Total System Loads	-	-	-	-	297593	0
Terminal Unit Cooling	-	-	-	-	0	0
Terminal Unit Heating	-	-	-	-	297593	-
>> Total Conditioning	-	-	-	-	297593	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-1 Classrooms A/B

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/13/2023

01:21PM

Air System Information

Air System Name **HRU-1 Classrooms A/B**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **39**
Floor Area **37113.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **13.5** Tons
Total coil load **161.6** MBH
Total coil load **1469.3** CFM/Ton
Sensible coil load **161.6** MBH
Coil CFM at Jul 1400 **19790** CFM
Max coil CFM **19790** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.0 / 72.0** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **275.6** MBH
Coil CFM at Des Htg **19790** CFM
Max coil CFM **19790** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.5 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **19790** CFM
Standard CFM **19769** CFM
Actual max CFM/ft² **0.53** CFM/ft²

Fan motor BHP **20.42** BHP
Fan motor kW **16.20** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **19790** CFM
Standard CFM **19769** CFM
Actual max CFM/ft² **0.53** CFM/ft²

Fan motor BHP **13.61** BHP
Fan motor kW **10.80** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **19790** CFM
CFM/ft² **0.53** CFM/ft²

CFM/person **32.24** CFM/person

Zone Sizing Summary for HRU-1 Classrooms A/B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
01:21PM

Air System Information

Air System Name HRU-1 Classrooms A/B
Equipment Class TERM
Air System Type VRF

Number of zones 39
Floor Area 37113.0 ft²
Location Boston, Massachusetts

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone CFM Sizing Sum of space airflow rates
Space CFM Sizing Individual peak space loads

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	10.8	6.0	75.0 / 70.6	66.1 / 65.7	-	Jul 0700	0.54
Zone 2	19.2	8.7	75.1 / 70.0	55.0 / 54.8	-	Jul 1200	0.46
Zone 3	29.7	17.5	75.4 / 66.9	55.4 / 54.8	-	Jul 1200	0.81
Zone 4	4.9	2.1	75.0 / 70.6	57.8 / 57.6	-	Jul 1100	0.15
Zone 5	4.1	2.1	75.6 / 68.6	55.0 / 54.5	-	Aug 1000	0.29
Zone 6	9.9	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	16.2	7.2	75.0 / 70.6	59.0 / 58.7	-	Jul 0900	1.00
Zone 10	37.7	18.1	75.0 / 70.6	63.3 / 62.9	-	Jul 0900	0.96
Zone 11	14.5	6.6	75.0 / 70.6	60.9 / 60.6	-	Jul 0900	0.22
Zone 12	26.8	15.1	75.9 / 67.6	55.0 / 54.4	-	Jul 1000	0.78
Zone 13	26.6	14.9	75.8 / 67.6	55.0 / 54.4	-	Aug 1000	0.78
Zone 14	26.7	15.0	75.9 / 67.6	55.0 / 54.4	-	Jul 1000	0.78
Zone 15	20.4	11.3	75.3 / 68.4	58.9 / 58.3	-	Jul 1400	0.73
Zone 16	19.1	8.9	75.2 / 69.7	55.0 / 54.7	-	Jul 1200	0.54
Zone 17	19.2	8.9	75.2 / 69.7	55.0 / 54.7	-	Jul 1200	0.54
Zone 18	9.3	5.9	76.0 / 66.2	55.0 / 54.2	-	Jul 1000	0.49
Zone 19	10.4	6.6	76.2 / 66.3	55.0 / 54.2	-	Jul 1000	0.44
Zone 20	20.4	10.1	75.3 / 68.9	55.5 / 55.2	-	Jul 0900	0.60
Zone 21	26.0	13.6	75.0 / 70.6	65.2 / 64.8	-	Jul 0700	0.52
Zone 22	27.1	15.4	75.8 / 67.4	55.0 / 54.4	-	Aug 1000	0.79
Zone 23	2.5	1.4	76.2 / 67.7	55.0 / 54.4	-	Aug 1000	0.41
Zone 24	38.9	18.1	75.0 / 70.6	62.2 / 61.8	-	Jul 0900	0.88
Zone 25	11.2	5.3	75.0 / 70.6	63.0 / 62.7	-	Jul 1100	1.00
Zone 26	38.9	18.1	75.0 / 70.6	62.2 / 61.8	-	Jul 0900	0.88
Zone 27	26.8	15.1	75.9 / 67.5	55.0 / 54.4	-	Jul 1000	0.78
Zone 28	26.9	15.2	75.9 / 67.6	55.0 / 54.4	-	Jul 1000	0.75
Zone 29	26.7	15.0	75.9 / 67.6	55.0 / 54.4	-	Jul 1000	0.77
Zone 30	10.8	8.0	75.4 / 67.2	61.8 / 61.0	-	Jul 1400	1.11
Zone 31	41.3	19.6	75.1 / 70.3	61.5 / 61.2	-	Jul 1300	0.53
Zone 32	2.7	1.6	76.0 / 67.2	55.0 / 54.3	-	Jul 1000	0.46
Zone 33	4.0	1.8	75.0 / 70.6	58.6 / 58.4	-	Jul 1400	0.20
Zone 34	37.9	17.8	75.0 / 70.6	62.6 / 62.2	-	Jul 0800	0.89
Zone 35	11.6	5.5	75.0 / 70.6	62.7 / 62.3	-	Jul 1100	1.00
Zone 36	39.9	18.5	75.0 / 70.6	62.1 / 61.7	-	Jul 1000	0.89
Zone 37	27.2	15.5	75.8 / 67.4	55.0 / 54.4	-	Jul 1000	0.80
Zone 38	27.1	15.3	75.8 / 67.4	55.0 / 54.4	-	Jul 1000	0.80
Zone 39	27.1	15.4	75.8 / 67.4	55.0 / 54.4	-	Aug 1000	0.79

Terminal Unit Sizing Data - Heating, Fan, Ventilation

	Heating Coil	Heating Coil Ent/Lvg	Htg Coil Water Flow	Fan Design	Fan	Fan	OA Vent Design
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Zone Sizing Summary for HRU-1 Classrooms A/B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
01:21PM

Zone Name	Load (MBH)	DB (°F)	@20.0 °F (gpm)	Airflow (CFM)	Motor (BHP)	Motor (kW)	Airflow (CFM)
Zone 1	2.2	70.0 / 73.3	-	625	0.000	0.000	625
Zone 2	1.7	70.0 / 74.0	-	401	0.000	0.000	355
Zone 3	8.2	69.7 / 79.1	-	812	0.000	0.000	370
Zone 4	0.9	70.0 / 77.4	-	115	0.000	0.000	115
Zone 5	0.0	0.0 / 0.0	0.00	94	0.000	0.000	55
Zone 6	15.9	69.2 / 85.5	-	905	0.000	0.000	205
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	415	0.000	0.000	415
Zone 10	14.8	70.0 / 79.6	-	1430	0.000	0.000	1430
Zone 11	0.0	0.0 / 0.0	0.00	430	0.000	0.000	430
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	4.6	69.9 / 80.4	-	408	0.000	0.000	340
Zone 17	4.6	69.9 / 80.4	-	410	0.000	0.000	345
Zone 18	4.7	69.4 / 86.1	-	260	0.000	0.000	80
Zone 19	4.6	69.3 / 84.2	-	286	0.000	0.000	85
Zone 20	7.3	69.7 / 84.0	-	476	0.000	0.000	345
Zone 21	0.0	0.0 / 0.0	0.00	1290	0.000	0.000	1290
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	14.7	70.0 / 80.4	-	1310	0.000	0.000	1310
Zone 25	0.0	0.0 / 0.0	0.00	410	0.000	0.000	410
Zone 26	14.4	70.0 / 80.2	-	1305	0.000	0.000	1305
Zone 27	7.5	69.7 / 80.0	-	670	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	9.9	69.3 / 86.0	-	546	0.000	0.000	100
Zone 31	12.2	70.0 / 78.4	-	1345	0.000	0.000	1205
Zone 32	0.3	69.9 / 73.5	-	69	0.000	0.000	30
Zone 33	1.1	70.0 / 80.2	-	100	0.000	0.000	100
Zone 34	22.4	70.0 / 85.6	-	1330	0.000	0.000	1330
Zone 35	1.4	70.0 / 73.2	-	410	0.000	0.000	410
Zone 36	23.0	70.0 / 86.1	-	1325	0.000	0.000	1325
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
Zone 39	8.1	69.7 / 80.6	-	685	0.000	0.000	360

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	424.8	35.4	271.2
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	424.8	35.4	271.2

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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	2.5	Jul 1400	0.4	1167.2

Zone Sizing Summary for HRU-1 Classrooms A/B

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Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 2	8.6	Jul 1400	1.6	870.0
Zone 3	17.5	Jul 1400	8.3	998.3
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	6.0	Jan 1400	0.0	413.5
Zone 10	11.1	Jul 1400	5.7	1490.2
Zone 11	4.3	Jan 1100	0.0	1923.4
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	8.8	Jul 1400	4.9	752.4
Zone 17	8.8	Jul 1400	4.9	759.4
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	5.5	Jan 1100	0.0	2494.3
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	410.8
Zone 26	11.8	Jul 1400	6.5	1490.2
Zone 27	14.5	Aug 1100	7.9	864.7
Zone 28	14.5	Aug 1100	6.8	901.3
Zone 29	14.4	Aug 1100	6.8	864.1
Zone 30	7.2	Jul 1400	10.0	493.5
Zone 31	14.9	Jul 1400	7.1	2560.6
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	3.9	Jul 1400	0.7	410.8
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 39	14.8	Aug 1100	8.5	862.1

Zone Sizing Summary for HRU-1 Classrooms A/B

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Prepared by: TMP Consulting Engineers, Inc.

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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	17.5	Jul 1400	812	8.3	998.3	0.81
Zone 4							
B111A CORRIDOR	1	1.9	Jul 1400	115	0.8	769.3	0.15
Zone 5							
B115 SCHOOL STORE	1	2.0	Jan 1400	94	0.0	326.7	0.29
Zone 6							
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	6.0	Jan 1400	415	0.0	413.5	1.00
Zone 10							
A211 SCI LAB	1	11.1	Jul 1400	1430	5.7	1490.2	0.96
Zone 11							
A212 CORRIDOR	1	4.3	Jan 1100	430	0.0	1923.4	0.22
Zone 12							
A224 CR	1	14.5	Aug 1100	670	7.9	862.2	0.78
Zone 13							
A225 CR	1	14.3	Aug 1100	665	6.8	849.4	0.78
Zone 14							
A226 CR	1	14.4	Aug 1100	666	6.8	859.6	0.78
Zone 15							
A301 SPED LEARNING CENTE	1	10.3	Jul 1400	634	11.6	864.7	0.73
Zone 16							
A302 BIO RELATED CR	1	8.8	Jul 1400	408	4.9	752.4	0.54
Zone 17							
A305 HEALTH ASSIST RELAT	1	8.8	Jul 1400	410	4.9	759.4	0.54
Zone 18							
A306 SPED SMALL GROUP	1	5.6	Jul 1400	260	4.8	531.6	0.49
Zone 19							
A307 SPED SMALL GROUP	1	6.2	Jul 1400	286	4.8	656.1	0.44
Zone 20							
A308 DIGITAL LEARNING	1	10.3	Nov 1400	476	7.9	790.3	0.60
Zone 21							
A309 CORRIDOR	1	5.5	Jan 1100	1290	0.0	2494.3	0.52
Zone 22							
A431 CR	1	14.8	Aug 1100	685	8.5	862.1	0.79
Zone 23							
A317 SPED RESOURCE	1	1.3	Jan 1400	62	0.0	149.9	0.41
Zone 24							
A318 SCI LAB	1	11.8	Jul 1400	1310	6.5	1490.3	0.88
Zone 25							
A319 SCI PREP	1	3.6	Jan 1100	410	0.0	410.8	1.00
Zone 26							
A320 SCI LAB	1	11.8	Jul 1400	1305	6.5	1490.2	0.88
Zone 27							
A322 CR	1	14.5	Aug 1100	670	7.9	864.7	0.78
Zone 28							

Zone Sizing Summary for HRU-1 Classrooms A/B

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
A323 CR	1	14.5	Aug 1100	673	6.8	901.3	0.75
Zone 29							
A324 CR	1	14.4	Aug 1100	667	6.8	864.1	0.77
Zone 30							
A401 SPED SMALL GROUP	1	7.2	Jul 1400	546	10.0	493.5	1.11
Zone 31							
A416 CORRIDOR	1	9.8	Jul 1400	1035	2.5	1389.0	0.75
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 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	1330	11.4	1496.5	0.89
Zone 35							
A426 SCI PREP	1	3.9	Jul 1400	410	0.7	410.8	1.00
Zone 36							
A427 SCI LAB	1	13.2	Jul 1400	1325	11.5	1496.5	0.89
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
Zone 39							
A431 CR	1	14.8	Aug 1100	685	8.5	862.1	0.79

Ventilation Sizing Summary for HRU-1 Classrooms A/B

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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows
Design Ventilation Airflow Rate 19790 CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
A146 CORRIDOR	1	1167.2	0.0	625.0	0.00	0.00	625.0	0.0	625.0
Totals (incl. Space Multipliers)				625.0					625.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
A141C RELATED CR	1	870.0	25.0	400.6	0.00	0.00	355.0	0.0	355.0
Totals (incl. Space Multipliers)				400.6					355.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
B101E RELATED CR	1	998.3	25.0	811.7	0.00	0.00	370.0	0.0	370.0
Totals (incl. Space Multipliers)				811.7					370.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
B111A CORRIDOR	1	769.3	0.0	115.0	0.00	0.00	115.0	0.0	115.0
Totals (incl. Space Multipliers)				115.0					115.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
B115 SCHOOL STORE	1	326.7	2.0	94.2	0.00	0.00	55.0	0.0	55.0
Totals (incl. Space Multipliers)				94.2					55.0

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
B114 CORRIDOR	1	608.8	0.0	904.5	0.00	0.00	205.0	0.0	205.0
Totals (incl. Space Multipliers)				904.5					205.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
A208 LANGUAGE LEARNING	1	918.5	25.0	368.9	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				368.9					360.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
A209 SCI LAB	1	1490.2	25.0	1430.0	0.00	0.00	1430.0	0.0	1430.0
Totals (incl. Space Multipliers)				1430.0					1430.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
A210 SCI PREP	1	413.5	25.0	415.0	0.00	0.00	415.0	0.0	415.0
Totals (incl. Space Multipliers)				415.0					415.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
A211 SCI LAB	1	1490.2	25.0	1430.0	0.00	0.00	1430.0	0.0	1430.0
Totals (incl. Space Multipliers)				1430.0					1430.0

2.11 Zone: Zone 11

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 11									
A212 CORRIDOR	1	1923.4	3.0	430.0	0.00	0.00	430.0	0.0	430.0
Totals (incl. Space Multipliers)				430.0					430.0

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2.12 Zone: Zone 12

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 12									
A224 CR	1	862.2	25.0	669.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				669.8					360.0

2.13 Zone: Zone 13

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 13									
A225 CR	1	849.4	25.0	664.6	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				664.6					360.0

2.14 Zone: Zone 14

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 14									
A226 CR	1	859.6	25.0	666.3	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				666.3					360.0

2.15 Zone: Zone 15

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 15									
A301 SPED LEARNING CENTE	1	864.7	25.0	634.3	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				634.3					360.0

2.16 Zone: Zone 16

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 16									
A302 BIO RELATED CR	1	752.4	25.0	408.5	0.00	0.00	340.0	0.0	340.0
Totals (incl. Space Multipliers)				408.5					340.0

2.17 Zone: Zone 17

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 17									
A305 HEALTH ASSIST RELAT	1	759.4	25.0	409.6	0.00	0.00	345.0	0.0	345.0
Totals (incl. Space Multipliers)				409.6					345.0

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2.18 Zone: Zone 18

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 18									
A306 SPED SMALL GROUP	1	531.6	9.0	260.0	0.00	0.00	80.0	0.0	80.0
Totals (incl. Space Multipliers)				260.0					80.0

2.19 Zone: Zone 19

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 19									
A307 SPED SMALL GROUP	1	656.1	9.0	286.2	0.00	0.00	85.0	0.0	85.0
Totals (incl. Space Multipliers)				286.2					85.0

2.20 Zone: Zone 20

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 20									
A308 DIGITAL LEARNING	1	790.3	25.0	475.6	0.00	0.00	345.0	0.0	345.0
Totals (incl. Space Multipliers)				475.6					345.0

2.21 Zone: Zone 21

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 21									
A309 CORRIDOR	1	2494.3	3.0	1290.0	0.00	0.00	1290.0	0.0	1290.0
Totals (incl. Space Multipliers)				1290.0					1290.0

2.22 Zone: Zone 22

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 22									
A431 CR	1	862.1	25.0	684.5	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				684.5					360.0

2.23 Zone: Zone 23

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 23									
A317 SPED RESOURCE	1	149.9	4.0	62.1	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				62.1					30.0

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2.24 Zone: Zone 24

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 24									
A318 SCI LAB	1	1490.3	25.0	1310.0	0.00	0.00	1310.0	0.0	1310.0
Totals (incl. Space Multipliers)				1310.0					1310.0

2.25 Zone: Zone 25

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 25									
A319 SCI PREP	1	410.8	2.0	410.0	0.00	0.00	410.0	0.0	410.0
Totals (incl. Space Multipliers)				410.0					410.0

2.26 Zone: Zone 26

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 26									
A320 SCI LAB	1	1490.2	25.0	1305.0	0.00	0.00	1305.0	0.0	1305.0
Totals (incl. Space Multipliers)				1305.0					1305.0

2.27 Zone: Zone 27

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 27									
A322 CR	1	864.7	25.0	670.2	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				670.2					360.0

2.28 Zone: Zone 28

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 28									
A323 CR	1	901.3	25.0	673.0	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				673.0					360.0

2.29 Zone: Zone 29

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 29									
A324 CR	1	864.1	25.0	667.0	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				667.0					360.0

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2.30 Zone: Zone 30

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 30									
A401 SPED SMALL GROUP	1	493.5	13.0	546.4	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				546.4					100.0

2.31 Zone: Zone 31

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 31									
A416 CORRIDOR	1	1389.0	24.0	1035.0	0.00	0.00	1035.0	0.0	1035.0
A416a CORRIDOR Ext	1	249.6	3.0	160.0	0.00	0.00	20.0	0.0	20.0
A416b CORRIDOR	1	922.0	3.0	150.0	0.00	0.00	150.0	0.0	150.0
Totals (incl. Space Multipliers)				1345.0					1205.0

2.32 Zone: Zone 32

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 32									
A424 SPED RESOURCE	1	149.9	4.0	68.8	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				68.8					30.0

2.33 Zone: Zone 33

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 33									
A421 STOR	1	496.8	1.0	100.0	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				100.0					100.0

2.34 Zone: Zone 34

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 34									
A425 SCI LAB	1	1496.5	25.0	1330.0	0.00	0.00	1330.0	0.0	1330.0
Totals (incl. Space Multipliers)				1330.0					1330.0

Ventilation Sizing Summary for HRU-1 Classrooms A/B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.35 Zone: Zone 35

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 35									
A426 SCI PREP	1	410.8	2.0	410.0	0.00	0.00	410.0	0.0	410.0
Totals (incl. Space Multipliers)				410.0					410.0

2.36 Zone: Zone 36

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 36									
A427 SCI LAB	1	1496.5	25.0	1325.0	0.00	0.00	1325.0	0.0	1325.0
Totals (incl. Space Multipliers)				1325.0					1325.0

2.37 Zone: Zone 37

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 37									
A429 CR	1	864.7	25.0	688.2	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				688.2					360.0

2.38 Zone: Zone 38

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 38									
A430 CR	1	852.0	25.0	682.7	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				682.7					360.0

2.39 Zone: Zone 39

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 39									
A431 CR	1	862.1	25.0	684.5	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				684.5					360.0

Air System Design Load Summary for HRU-1 Classrooms A/B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1000 COOLING OA DB / WB 76.1 °F / 70.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	3630 ft²	80851	-	3630 ft²	-	-
Wall Transmission	6355 ft²	3727	-	6355 ft²	24842	-
Roof Transmission	14881 ft²	10021	-	14881 ft²	30590	-
Window Transmission	3630 ft²	974	-	3630 ft²	73187	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	42 ft²	1046	-	42 ft²	2117	-
Floor Transmission	4740 ft²	0	-	4740 ft²	814	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	28206 W	68123	-	0	0	-
Task Lighting	12947 W	37019	-	0	0	-
Electric Equipment	7267 W	21655	-	0	0	-
People	614	92317	95625	0	0	0
Infiltration	-	0	2	-	61180	0
Miscellaneous	-	2400	0	-	0	0
Safety Factor	5% / 5%	15907	4781	10%	19273	0
>> Total Zone Loads	-	334039	100408	-	212002	0
Zone Conditioning	-	405911	100408	-	209779	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	19790 CFM	36847	-	19790 CFM	-36847	-
Ventilation Load	19790 CFM	-32415	287564	19790 CFM	356337	0
Ventilation Fan Load	19790 CFM	55271	-	19790 CFM	-55271	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	465613	387973	-	473999	0
Cooling Coil	-	79546	0	-	0	0
Heating Coil	-	0	-	-	275591	-
Terminal Unit Cooling	-	424792	388058	-	0	0
Terminal Unit Heating	-	0	-	-	271169	-
>> Total Conditioning	-	504338	388058	-	546760	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/13/2023

01:32PM

Air System Information

Air System Name **HRU-2 Classrooms B**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **57**
Floor Area **57127.4** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **13.0** Tons
Total coil load **155.9** MBH
Total coil load **1441.7** CFM/Ton
Sensible coil load **155.9** MBH
Coil CFM at Jul 1400 **18735** CFM
Max coil CFM **18735** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.1 / 72.1** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **261.0** MBH
Coil CFM at Des Htg **18735** CFM
Max coil CFM **18735** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.5 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **18735** CFM
Standard CFM **18715** CFM
Actual max CFM/ft² **0.33** CFM/ft²

Fan motor BHP **19.33** BHP
Fan motor kW **15.33** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **18735** CFM
Standard CFM **18715** CFM
Actual max CFM/ft² **0.33** CFM/ft²

Fan motor BHP **12.89** BHP
Fan motor kW **10.22** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **18735** CFM
CFM/ft² **0.33** CFM/ft²

CFM/person **19.53** CFM/person

Zone Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name **HRU-2 Classrooms B**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **57**
Floor Area **57127.4** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	20.4	9.4	75.2 / 69.8	55.0 / 54.8	-	Jul 1200	0.43
Zone 2	23.5	12.3	75.4 / 68.2	55.0 / 54.5	-	Aug 1400	0.67
Zone 3	8.3	3.6	75.0 / 70.7	55.0 / 54.9	-	Jul 1200	0.12
Zone 4	5.1	3.0	76.2 / 67.0	55.0 / 54.3	-	Aug 1000	0.33
Zone 5	1.5	0.9	76.3 / 66.7	55.0 / 54.2	-	Aug 1000	0.50
Zone 6	1.4	0.6	75.2 / 70.5	55.0 / 54.9	-	Jul 1200	0.13
Zone 7	24.7	12.9	75.5 / 68.3	55.0 / 54.5	-	Aug 1000	0.60
Zone 8	20.5	8.9	75.1 / 70.5	55.0 / 54.9	-	Aug 1200	0.34
Zone 9	26.7	15.0	75.8 / 67.6	55.0 / 54.4	-	Jul 1000	0.78
Zone 10	41.9	37.0	75.4 / 64.6	59.1 / 58.0	-	Jul 1800	2.05
Zone 11	26.7	15.0	75.8 / 67.6	55.0 / 54.4	-	Aug 1000	0.78
Zone 12	10.9	5.3	75.0 / 70.6	63.6 / 63.2	-	Jul 0800	0.47
Zone 13	7.7	3.9	75.8 / 68.9	55.0 / 54.6	-	Aug 1000	0.35
Zone 14	5.8	3.2	76.2 / 67.8	55.0 / 54.4	-	Aug 1000	0.41
Zone 15	22.1	11.4	75.3 / 68.5	55.9 / 55.5	-	Aug 1400	0.65
Zone 16	25.8	19.4	76.5 / 64.5	55.0 / 53.9	-	Aug 1000	0.84
Zone 17	30.8	13.4	75.0 / 70.6	55.8 / 55.6	-	Jul 0900	0.18
Zone 18	22.9	11.9	75.4 / 68.4	55.5 / 55.1	-	Aug 1400	0.62
Zone 19	22.6	11.7	75.3 / 68.4	55.6 / 55.1	-	Aug 1400	0.65
Zone 20	27.0	15.2	75.9 / 67.5	55.0 / 54.4	-	Jul 1000	0.79
Zone 21	26.6	14.9	75.8 / 67.6	55.0 / 54.4	-	Aug 1000	0.79
Zone 22	26.7	15.0	75.9 / 67.6	55.0 / 54.4	-	Aug 1000	0.78
Zone 23	26.7	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 / 67.8	55.0 / 54.4	-	Aug 1000	0.42
Zone 26	24.9	11.2	75.3 / 70.3	55.0 / 54.8	-	Jul 1000	0.13
Zone 27	13.8	6.3	75.9 / 70.5	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	-	Aug 1000	0.78
Zone 30	26.7	15.0	75.8 / 67.6	55.0 / 54.4	-	Jul 1000	0.78
Zone 31	22.2	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	12.5	6.0	75.0 / 70.7	63.3 / 62.9	-	Jul 1300	1.00
Zone 36	2.5	1.1	75.0 / 70.7	55.0 / 54.9	-	Jul 1300	0.16
Zone 37	34.8	17.1	75.0 / 70.6	63.9 / 63.6	-	Jul 1100	0.92
Zone 38	25.3	18.9	76.0 / 64.4	55.0 / 54.0	-	Jul 1000	0.84
Zone 39	2.5	1.4	76.2 / 67.8	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	26.7	15.0	75.9 / 67.6	55.0 / 54.4	-	Aug 1000	0.78
Zone 42	26.7	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
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 / 67.5	55.0 / 54.4	-	Jul 1000	0.80

Zone Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft²
Zone 46	44.4	28.2	75.4 / 68.7	62.9 / 62.3	-	Jul 1000	0.44
Zone 47	39.2	34.9	75.7 / 63.0	55.7 / 54.6	-	Jun 1800	2.45
Zone 48	27.2	15.5	75.8 / 67.4	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	2.7	1.5	76.0 / 67.3	55.0 / 54.3	-	Jul 1000	0.46
Zone 51	27.2	15.4	75.8 / 67.4	55.0 / 54.4	-	Jul 1000	0.80
Zone 52	27.1	15.3	75.8 / 67.5	55.0 / 54.4	-	Jul 1000	0.80
Zone 53	27.1	15.3	75.8 / 67.5	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

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	2.0	70.0 / 74.3	-	432	0.000	0.000	365
Zone 2	6.2	69.8 / 80.1	-	560	0.000	0.000	360
Zone 3	0.8	70.0 / 74.7	-	165	0.000	0.000	165
Zone 4	0.0	0.0 / 0.0	0.00	133	0.000	0.000	45
Zone 5	0.0	0.0 / 0.0	0.00	41	0.000	0.000	15
Zone 6	0.0	0.0 / 0.0	0.00	28	0.000	0.000	25
Zone 7	10.4	69.7 / 86.2	-	585	0.000	0.000	370
Zone 8	0.0	0.0 / 0.0	0.00	414	0.000	0.000	400
Zone 9	9.8	69.7 / 83.4	-	666	0.000	0.000	360
Zone 10	38.3	69.4 / 86.3	-	2103	0.000	0.000	185
Zone 11	6.5	69.7 / 78.8	-	665	0.000	0.000	360
Zone 12	7.1	70.0 / 85.3	-	430	0.000	0.000	430
Zone 13	0.0	0.0 / 0.0	0.00	175	0.000	0.000	115
Zone 14	0.0	0.0 / 0.0	0.00	141	0.000	0.000	70
Zone 15	5.0	69.8 / 78.3	-	547	0.000	0.000	360
Zone 16	11.2	69.3 / 81.7	-	837	0.000	0.000	135
Zone 17	8.6	70.0 / 82.4	-	645	0.000	0.000	645
Zone 18	4.7	69.8 / 77.7	-	557	0.000	0.000	360
Zone 19	4.8	69.8 / 78.0	-	548	0.000	0.000	360
Zone 20	9.4	69.6 / 82.5	-	677	0.000	0.000	360
Zone 21	6.5	69.7 / 78.8	-	664	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	5.5	69.9 / 79.8	-	512	0.000	0.000	390
Zone 27	3.4	69.8 / 81.3	-	278	0.000	0.000	180
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
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	1.6	70.0 / 73.2	-	470	0.000	0.000	470
Zone 36	0.5	70.0 / 80.2	-	50	0.000	0.000	50
Zone 37	6.4	70.0 / 74.1	-	1430	0.000	0.000	1430

Zone Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 38	15.2	69.3 / 86.3	-	834	0.000	0.000	135
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	37.2	69.1 / 85.7	-	2088	0.000	0.000	340
Zone 47	29.0	69.5 / 86.1	-	1618	0.000	0.000	160
Zone 48	9.4	69.7 / 82.5	-	688	0.000	0.000	360
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

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	676.3	56.4	440.8
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	676.3	56.4	440.8

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 Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	9.3	Jul 1400	1.8	998.3
Zone 2	12.1	Sep 1400	6.6	837.7
Zone 3	3.2	Jul 1400	0.8	1430.1
Zone 4	2.9	Jan 1100	0.0	400.3
Zone 5	0.9	Jan 1100	0.0	82.1
Zone 6	0.6	Jan 1400	0.0	220.6
Zone 7	11.5	Jul 1400	10.7	981.4
Zone 8	8.9	Jan 1400	0.0	1208.2
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	10.2	Jul 1500	7.6	3600.0

Zone Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 18	12.0	Oct 1400	5.2	904.5
Zone 19	11.8	Oct 1400	5.2	844.9
Zone 20	14.6	Aug 1100	9.7	852.4
Zone 21	14.3	Aug 1100	6.8	844.4
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	9.4	Jul 1100	5.0	4008.5
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	311.8
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	23.9	Jul 1400	38.3	4733.3
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 Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
B103E RELATED CR	1	9.3	Jul 1400	432	1.8	998.3	0.43
Zone 2							
B409 CR	1	12.1	Sep 1400	560	6.6	837.7	0.67
Zone 3							
B111 CORRIDOR	1	3.2	Jul 1400	165	0.8	1430.1	0.12
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
Zone 7							
B121E THEORY CR	1	11.5	Jul 1400	585	10.7	981.4	0.60
Zone 8							
B104G RELATED CR	1	8.9	Jan 1400	414	0.0	1208.2	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	430	4.5	907.7	0.47
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	215	0.0	922.2	0.23
B231 CORRIDOR	1	8.4	Jul 1700	430	7.6	2677.8	0.16
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	14.6	Aug 1100	677	9.7	852.4	0.79
Zone 21							
B238 CR	1	14.3	Aug 1100	664	6.8	844.4	0.79
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 26							
D301 CORRIDOR	1	1.1	Jan 1400	53	0.0	413.6	0.13
B324 CORRIDOR	1	6.0	Jul 1100	279	5.0	2672.7	0.10
B312 CORRIDOR	1	2.3	Jan 1400	180	0.0	922.2	0.20

Zone Sizing Summary for HRU-2 Classrooms B

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 27							
A321 CORRIDOR	1	6.0	Jul 1100	278	3.6	2432.8	0.11
Zone 28							
B323 COLLAB	1	34.4	Jun 1800	1594	27.7	665.8	2.39
Zone 29							
B326 CR	1	14.4	Aug 1100	665	6.8	853.0	0.78
Zone 30							
B327 CR	1	14.4	Aug 1100	666	7.6	850.1	0.78
Zone 31							
B309 CR	1	11.8	Oct 1400	546	4.9	837.7	0.65
Zone 32							
B310 CR	1	12.0	Oct 1400	557	5.1	904.5	0.62
Zone 33							
B311 SPED LEARNING CENTE	1	11.8	Oct 1400	548	5.0	846.8	0.65
Zone 34							
B315 SCI LAB	1	11.2	Jul 1400	1430	2.8	1549.7	0.92
Zone 35							
B316 SCI PREP	1	4.2	Jul 1400	470	0.9	468.8	1.00
Zone 36							
B317 STOR	1	1.1	Jul 1400	50	0.6	311.8	0.16
Zone 37							
B322 SCI LAB	1	11.0	Jul 1400	1430	2.4	1549.7	0.92
Zone 38							
B328 TEACHERS PLANNING	1	16.8	Aug 1100	834	15.3	993.4	0.84
Zone 39							
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							
B330 CR	1	14.4	Aug 1100	665	6.8	852.5	0.78
Zone 42							
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
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							
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							

Zone Sizing Summary for HRU-2 Classrooms B

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
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

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **18735** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
B103E RELATED CR	1	998.3	25.0	432.3	0.00	0.00	365.0	0.0	365.0
Totals (incl. Space Multipliers)				432.3					365.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
B409 CR	1	837.7	25.0	559.9	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				559.9					360.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
B111 CORRIDOR	1	1430.1	0.0	165.0	0.00	0.00	165.0	0.0	165.0
Totals (incl. Space Multipliers)				165.0					165.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
B118 BANK	1	400.3	4.0	133.1	0.00	0.00	45.0	0.0	45.0
Totals (incl. Space Multipliers)				133.1					45.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
B1 -2 Room - Bank Office	1	82.1	1.0	40.9	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				40.9					15.0

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
B121D STOR	1	220.6	1.0	27.6	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				27.6					25.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
B121E THEORY CR	1	981.4	25.0	584.9	0.00	0.00	370.0	0.0	370.0
Totals (incl. Space Multipliers)				584.9					370.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
B104G RELATED CR	1	1208.2	25.0	413.7	0.00	0.00	400.0	0.0	400.0
Totals (incl. Space Multipliers)				413.7					400.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
B233 CR	1	850.1	25.0	665.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				665.8					360.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
B230 COLLAB	1	1027.0	24.0	2102.9	0.00	0.00	185.0	0.0	185.0
Totals (incl. Space Multipliers)				2102.9					185.0

2.11 Zone: Zone 11

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 11									
A227 CR	1	848.5	25.0	664.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				664.8					360.0

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2.12 Zone: Zone 12

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 12									
A223 CORRIDOR	1	907.7	3.0	430.0	0.00	0.00	430.0	0.0	430.0
Totals (incl. Space Multipliers)				430.0					430.0

2.13 Zone: Zone 13

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 13									
B215 SPED SMALL GROUP	1	500.2	9.0	174.8	0.00	0.00	115.0	0.0	115.0
Totals (incl. Space Multipliers)				174.8					115.0

2.14 Zone: Zone 14

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 14									
B216 IN-HOUSE SUSPENSION	1	341.3	9.0	140.7	0.00	0.00	70.0	0.0	70.0
Totals (incl. Space Multipliers)				140.7					70.0

2.15 Zone: Zone 15

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 15									
B211 CR	1	837.7	25.0	546.6	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				546.6					360.0

2.16 Zone: Zone 16

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 16									
B234 TEACHERS PLANNING	1	991.5	15.0	836.7	0.00	0.00	135.0	0.0	135.0
Totals (incl. Space Multipliers)				836.7					135.0

2.17 Zone: Zone 17

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 17									
B214 CORRIDOR	1	922.2	3.0	215.0	0.00	0.00	215.0	0.0	215.0
B231 CORRIDOR	1	2677.8	3.0	430.0	0.00	0.00	430.0	0.0	430.0
Totals (incl. Space Multipliers)				645.0					645.0

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
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2.18 Zone: Zone 18

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 18									
B212 CR	1	904.5	25.0	556.7	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				556.7					360.0

2.19 Zone: Zone 19

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 19									
B213 SPED LEARNING CENTE	1	844.9	25.0	547.6	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				547.6					360.0

2.20 Zone: Zone 20

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 20									
B239 CR	1	852.4	25.0	676.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				676.8					360.0

2.21 Zone: Zone 21

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 21									
B238 CR	1	844.4	25.0	663.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				663.8					360.0

2.22 Zone: Zone 22

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 22									
B237 CR	1	852.5	25.0	665.1	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				665.1					360.0

2.23 Zone: Zone 23

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 23									
B236 CR	1	852.5	25.0	665.1	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				665.1					360.0

Ventilation Sizing Summary for HRU-2 Classrooms B

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2.24 Zone: Zone 24

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 24									
B235 CR	1	858.4	25.0	674.7	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				674.7					360.0

2.25 Zone: Zone 25

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 25									
B234B HUDDLE	1	144.1	4.0	60.9	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				60.9					30.0

2.26 Zone: Zone 26

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 26									
D301 CORRIDOR	1	413.6	2.0	52.7	0.00	0.00	30.0	0.0	30.0
B324 CORRIDOR	1	2672.7	3.0	278.9	0.00	0.00	180.0	0.0	180.0
B312 CORRIDOR	1	922.2	3.0	180.0	0.00	0.00	180.0	0.0	180.0
Totals (incl. Space Multipliers)				511.6					390.0

2.27 Zone: Zone 27

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 27									
A321 CORRIDOR	1	2432.8	6.0	277.7	0.00	0.00	180.0	0.0	180.0
Totals (incl. Space Multipliers)				277.7					180.0

2.28 Zone: Zone 28

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 28									
B323 COLLAB	1	665.8	24.0	1593.8	0.00	0.00	160.0	0.0	160.0
Totals (incl. Space Multipliers)				1593.8					160.0

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.29 Zone: Zone 29

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 29									
B326 CR	1	853.0	25.0	665.2	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				665.2					360.0

2.30 Zone: Zone 30

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 30									
B327 CR	1	850.1	25.0	665.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				665.8					360.0

2.31 Zone: Zone 31

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 31									
B309 CR	1	837.7	25.0	546.3	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				546.3					360.0

2.32 Zone: Zone 32

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 32									
B310 CR	1	904.5	25.0	556.6	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				556.6					360.0

2.33 Zone: Zone 33

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 33									
B311 SPED LEARNING CENTE	1	846.8	25.0	547.7	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				547.7					360.0

2.34 Zone: Zone 34

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 34									
B315 SCI LAB	1	1549.7	25.0	1430.0	0.00	0.00	1430.0	0.0	1430.0
Totals (incl. Space Multipliers)				1430.0					1430.0

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.35 Zone: Zone 35

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 35									
B316 SCI PREP	1	468.8	2.0	470.0	0.00	0.00	470.0	0.0	470.0
Totals (incl. Space Multipliers)				470.0					470.0

2.36 Zone: Zone 36

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 36									
B317 STOR	1	311.8	1.0	50.0	0.00	0.00	50.0	0.0	50.0
Totals (incl. Space Multipliers)				50.0					50.0

2.37 Zone: Zone 37

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 37									
B322 SCI LAB	1	1549.7	25.0	1430.0	0.00	0.00	1430.0	0.0	1430.0
Totals (incl. Space Multipliers)				1430.0					1430.0

2.38 Zone: Zone 38

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 38									
B328 TEACHERS PLANNING	1	993.4	15.0	833.6	0.00	0.00	135.0	0.0	135.0
Totals (incl. Space Multipliers)				833.6					135.0

2.39 Zone: Zone 39

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 39									
B328B HUDDLE	1	146.4	4.0	61.4	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				61.4					30.0

2.40 Zone: Zone 40

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 40									
B329 CR	1	858.4	25.0	667.6	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				667.6					360.0

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.41 Zone: Zone 41

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 41									
B330 CR	1	852.5	25.0	665.1	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				665.1					360.0

2.42 Zone: Zone 42

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 42									
B331 CR	1	852.5	25.0	665.1	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				665.1					360.0

2.43 Zone: Zone 43

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 43									
B332 CR	1	852.5	25.0	695.7	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				695.7					360.0

2.44 Zone: Zone 44

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 44									
B333 CR	1	836.8	25.0	664.7	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				664.7					360.0

2.45 Zone: Zone 45

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 45									
A432 CR	1	853.0	25.0	682.9	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				682.9					360.0

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.46 Zone: Zone 46

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 46									
A428 CORRIDOR	1	901.3	6.0	292.5	0.00	0.00	100.0	0.0	100.0
B420 CORRIDOR	1	3084.2	3.0	804.1	0.00	0.00	140.0	0.0	140.0
B412 CORRIDOR	1	747.8	3.0	991.6	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				2088.1					340.0

2.47 Zone: Zone 47

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 47									
B419 COLLAB	1	659.1	24.0	1617.6	0.00	0.00	160.0	0.0	160.0
Totals (incl. Space Multipliers)				1617.6					160.0

2.48 Zone: Zone 48

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 48									
B422 CR	1	850.1	25.0	688.4	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				688.4					360.0

2.49 Zone: Zone 49

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 49									
B423 TEACHERS PLANNING	1	993.2	15.0	858.0	0.00	0.00	135.0	0.0	135.0
Totals (incl. Space Multipliers)				858.0					135.0

2.50 Zone: Zone 50

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 50									
B423B HUDDLE	1	146.4	4.0	67.9	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				67.9					30.0

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.51 Zone: Zone 51

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 51									
B424 CR	1	858.4	25.0	685.4	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				685.4					360.0

2.52 Zone: Zone 52

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 52									
B425 CR	1	852.5	25.0	682.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				682.8					360.0

2.53 Zone: Zone 53

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 53									
B426 CR	1	852.5	25.0	682.8	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				682.8					360.0

2.54 Zone: Zone 54

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 54									
B427 CR	1	852.5	25.0	686.9	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				686.9					360.0

2.55 Zone: Zone 55

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 55									
B428 CR	1	836.8	25.0	690.9	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				690.9					360.0

2.56 Zone: Zone 56

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 56									
B411 SPED LEARNING CENTE	1	846.8	25.0	561.9	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				561.9					360.0

Ventilation Sizing Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.57 Zone: Zone 57

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 57									
B410 CR	1	904.8	25.0	572.4	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				572.4					360.0

Air System Design Load Summary for HRU-2 Classrooms B

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1000 COOLING OA DB / WB 76.1 °F / 70.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	8306 ft²	196616	-	8306 ft²	-	-
Wall Transmission	13569 ft²	9595	-	13569 ft²	60106	-
Roof Transmission	20141 ft²	6252	-	20141 ft²	33376	-
Window Transmission	8306 ft²	2228	-	8306 ft²	167448	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	74 ft²	542	-	74 ft²	3704	-
Floor Transmission	5321 ft²	0	-	5321 ft²	952	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	43417 W	104861	-	0	0	-
Task Lighting	17773 W	50724	-	0	0	-
Electric Equipment	11293 W	33632	-	0	0	-
People	959	144415	151263	0	0	0
Infiltration	-	0	2	-	132867	0
Miscellaneous	-	3600	0	-	0	0
Safety Factor	5% / 5%	27623	7563	10%	39845	0
>> Total Zone Loads	-	580089	158829	-	438297	0
Zone Conditioning	-	689755	158829	-	435405	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	18735 CFM	34883	-	18735 CFM	-34883	-
Ventilation Load	18735 CFM	-37408	357134	18735 CFM	337300	0
Ventilation Fan Load	18735 CFM	52324	-	18735 CFM	-52324	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	739555	515962	-	685499	0
Cooling Coil	-	75305	0	-	0	0
Heating Coil	-	0	-	-	261015	-
Terminal Unit Cooling	-	676340	516044	-	0	0
Terminal Unit Heating	-	0	-	-	440770	-
>> Total Conditioning	-	751645	516044	-	701785	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-3 Classrooms Plan North

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name **HRU-3 Classrooms Plan North**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **80**
Floor Area **53364.8** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **13.7** Tons
Total coil load **164.7** MBH
Total coil load **1412.8** CFM/Ton
Sensible coil load **164.7** MBH
Coil CFM at Jul 1400 **19395** CFM
Max coil CFM **19395** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.3 / 72.1** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **270.4** MBH
Coil CFM at Des Htg **19395** CFM
Max coil CFM **19395** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.5 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **19395** CFM
Standard CFM **19374** CFM
Actual max CFM/ft² **0.36** CFM/ft²

Fan motor BHP **20.01** BHP
Fan motor kW **15.88** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **19395** CFM
Standard CFM **19374** CFM
Actual max CFM/ft² **0.36** CFM/ft²

Fan motor BHP **13.34** BHP
Fan motor kW **10.58** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **19395** CFM
CFM/ft² **0.36** CFM/ft²

CFM/person **25.59** CFM/person

Zone Sizing Summary for HRU-3 Classrooms Plan North

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Air System Information

Air System Name **HRU-3 Classrooms Plan North**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **80**
Floor Area **53364.8** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	33.2	20.8	76.0 / 66.4	55.0 / 54.2	-	Jul 1000	0.94
Zone 2	3.7	1.8	75.5 / 69.4	55.0 / 54.7	-	Aug 1200	0.29
Zone 3	4.3	3.1	76.4 / 64.9	55.0 / 54.0	-	Aug 1000	0.91
Zone 4	39.4	23.3	76.2 / 67.1	55.0 / 54.3	-	Jul 1000	0.57
Zone 5	16.5	7.1	75.0 / 70.7	55.0 / 54.9	-	Jul 1200	0.50
Zone 6	34.6	21.7	76.1 / 66.3	55.0 / 54.2	-	Jul 1000	0.88
Zone 7	40.5	20.4	75.4 / 68.7	55.0 / 54.6	-	Jul 1000	0.38
Zone 8	16.5	7.1	75.0 / 70.7	55.0 / 54.9	-	Jul 1200	0.55
Zone 9	32.1	19.5	76.0 / 66.6	55.0 / 54.3	-	Jul 1000	0.85
Zone 10	5.5	4.8	75.7 / 64.8	59.1 / 58.1	-	Aug 1000	1.78
Zone 11	6.3	5.5	76.1 / 62.9	55.0 / 53.8	-	Aug 1000	1.52
Zone 12	53.4	27.7	75.6 / 68.5	55.0 / 54.5	-	Jul 1000	0.80
Zone 13	4.3	3.1	76.4 / 64.9	55.0 / 54.0	-	Aug 1000	0.93
Zone 14	33.5	20.8	76.0 / 66.4	55.0 / 54.2	-	Jul 1000	0.91
Zone 15	19.9	12.3	75.4 / 66.2	55.0 / 54.3	-	Jul 1200	0.78
Zone 16	18.7	11.2	76.1 / 66.9	55.0 / 54.3	-	Jul 1000	0.68
Zone 17	4.4	3.3	76.5 / 64.4	55.0 / 53.9	-	Aug 1000	0.94
Zone 18	11.1	5.8	75.9 / 68.4	55.0 / 54.5	-	Aug 1000	0.51
Zone 19	16.0	6.9	75.0 / 70.7	55.0 / 54.9	-	Jul 1200	0.57
Zone 20	3.4	2.5	76.7 / 64.8	55.0 / 54.0	-	Aug 1000	0.71
Zone 21	18.7	11.2	76.0 / 66.9	55.0 / 54.3	-	Jul 1000	0.69
Zone 22	18.8	11.3	76.0 / 66.8	55.0 / 54.3	-	Jul 1000	0.72
Zone 23	7.8	3.6	75.3 / 69.9	55.0 / 54.8	-	Aug 1200	0.34
Zone 24	15.8	6.8	75.0 / 70.7	55.0 / 54.9	-	Jul 1200	0.59
Zone 25	29.2	16.3	76.0 / 67.8	55.0 / 54.4	-	Jul 1000	0.49
Zone 26	6.6	5.6	75.5 / 64.7	58.4 / 57.3	-	Jul 1000	1.99
Zone 27	5.6	4.8	75.9 / 63.3	55.6 / 54.4	-	Aug 1000	1.35
Zone 28	6.3	5.5	76.1 / 62.9	55.0 / 53.8	-	Aug 1000	1.52
Zone 29	46.9	21.9	75.0 / 70.6	62.2 / 61.9	-	Jul 0900	1.07
Zone 30	4.3	2.0	75.0 / 70.6	62.6 / 62.2	-	Jul 1000	0.99
Zone 31	13.4	5.8	75.0 / 70.6	55.0 / 54.9	-	Jul 1500	1.00
Zone 32	12.1	5.3	75.0 / 70.7	58.6 / 58.3	-	Jul 1300	1.04
Zone 33	4.3	3.1	76.4 / 64.9	55.0 / 54.0	-	Aug 1000	0.88
Zone 34	46.5	21.7	75.0 / 70.6	62.3 / 62.0	-	Jul 0900	1.08
Zone 35	30.0	19.4	76.2 / 66.0	55.0 / 54.2	-	Jul 1000	0.41
Zone 36	5.5	4.8	75.7 / 64.8	59.1 / 58.0	-	Jul 1000	1.77
Zone 37	3.5	2.9	75.4 / 67.0	62.8 / 62.0	-	Jul 1300	1.37
Zone 38	3.0	2.4	75.5 / 63.8	55.2 / 54.2	-	Jul 1800	1.11
Zone 39	3.8	2.8	75.4 / 66.2	59.2 / 58.4	-	Jul 1700	0.83
Zone 40	9.7	5.7	76.2 / 67.2	55.0 / 54.3	-	Aug 1000	0.55
Zone 41	5.4	3.9	76.4 / 65.0	55.0 / 54.0	-	Aug 1000	0.89
Zone 42	26.8	13.0	75.4 / 69.3	55.0 / 54.7	-	Jul 1200	0.39
Zone 43	27.2	13.2	75.5 / 69.3	55.0 / 54.7	-	Jul 1200	0.36
Zone 44	1.9	1.0	75.9 / 68.7	55.0 / 54.5	-	Aug 1000	0.24
Zone 45	1.0	0.5	75.0 / 70.6	58.2 / 58.0	-	Jul 0900	0.45

Zone Sizing Summary for HRU-3 Classrooms Plan North

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft²
Zone 46	3.7	2.4	76.5 / 66.5	55.0 / 54.2	-	Aug 1000	0.49
Zone 47	19.1	8.5	75.0 / 70.6	59.7 / 59.4	-	Jul 1800	1.00
Zone 48	22.6	10.8	75.4 / 69.5	55.0 / 54.7	-	Jul 1200	0.42
Zone 49	29.6	15.4	75.8 / 68.6	55.0 / 54.5	-	Jul 1000	0.41
Zone 50	35.6	20.6	75.5 / 67.2	55.7 / 55.1	-	Jul 0900	0.57
Zone 51	23.2	17.2	76.9 / 64.8	55.0 / 53.9	-	Jul 1000	0.48
Zone 52	3.4	2.9	75.5 / 67.1	63.0 / 62.2	-	Jul 1300	1.35
Zone 53	5.5	4.7	76.2 / 63.2	55.0 / 53.8	-	Aug 1000	1.27
Zone 54	6.8	5.6	75.5 / 64.2	57.3 / 56.3	-	Aug 1000	1.91
Zone 55	3.6	1.6	75.0 / 70.6	60.2 / 59.9	-	Jul 0900	0.20
Zone 56	22.2	10.9	75.3 / 69.1	55.0 / 54.6	-	Jul 1200	0.51
Zone 57	5.2	2.7	75.7 / 68.3	55.0 / 54.5	-	Jul 1000	0.43
Zone 58	4.6	3.1	75.5 / 65.1	55.0 / 54.1	-	Aug 1000	0.98
Zone 59	38.9	17.2	75.1 / 70.4	55.0 / 54.9	-	Jul 1200	0.50
Zone 60	38.7	17.0	75.1 / 70.4	55.0 / 54.9	-	Jul 1200	0.50
Zone 61	4.9	3.5	76.3 / 65.1	55.0 / 54.0	-	Jul 1000	0.75
Zone 62	4.0	1.8	75.0 / 70.6	58.6 / 58.4	-	Jul 1400	0.20
Zone 63	4.6	2.1	75.0 / 70.6	60.2 / 59.9	-	Jul 1100	0.72
Zone 64	26.1	17.2	76.3 / 65.8	55.0 / 54.1	-	Jul 1000	0.63
Zone 65	3.5	2.1	75.4 / 66.4	55.0 / 54.3	-	Aug 1100	0.67
Zone 66	5.5	4.9	75.4 / 67.2	63.7 / 62.9	-	Aug 1000	2.58
Zone 67	6.3	5.6	75.8 / 64.3	58.2 / 57.1	-	Aug 1100	1.88
Zone 68	21.3	10.4	75.3 / 69.1	55.0 / 54.7	-	Jul 1200	0.54
Zone 69	4.5	2.3	75.5 / 68.8	55.0 / 54.6	-	Jul 1200	0.46
Zone 70	34.4	20.5	75.8 / 66.8	55.0 / 54.3	-	Jul 1000	0.69
Zone 71	31.4	17.6	75.5 / 67.4	55.0 / 54.4	-	Jul 0900	0.59
Zone 72	33.5	19.7	75.8 / 66.9	55.0 / 54.3	-	Jul 1000	0.70
Zone 73	3.3	2.5	76.3 / 64.5	55.0 / 54.0	-	Jul 1000	0.88
Zone 74	21.2	12.0	75.3 / 68.2	59.1 / 58.5	-	Aug 1000	0.72
Zone 75	40.6	31.4	75.7 / 64.7	57.0 / 56.0	-	Jul 1000	1.08
Zone 76	2.5	1.1	75.0 / 70.6	58.0 / 57.8	-	Jul 1400	0.21
Zone 77	6.3	5.5	76.0 / 62.9	55.0 / 53.8	-	Aug 1000	1.53
Zone 78	5.6	4.8	75.9 / 63.3	55.5 / 54.4	-	Aug 1000	1.36
Zone 79	6.3	5.6	75.7 / 64.5	58.8 / 57.7	-	Aug 1100	2.05
Zone 80	24.6	11.4	75.1 / 69.7	55.0 / 54.8	-	Jul 1500	0.93

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (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	80	0.000	0.000	60
Zone 3	0.0	0.0 / 0.0	0.00	135	0.000	0.000	30
Zone 4	10.9	69.8 / 79.7	-	1017	0.000	0.000	465
Zone 5	0.0	0.0 / 0.0	0.00	330	0.000	0.000	330
Zone 6	10.3	69.6 / 79.6	-	953	0.000	0.000	380
Zone 7	13.0	69.8 / 82.8	-	927	0.000	0.000	630
Zone 8	0.0	0.0 / 0.0	0.00	330	0.000	0.000	330
Zone 9	7.4	69.8 / 77.7	-	862	0.000	0.000	375
Zone 10	4.9	69.4 / 86.2	-	268	0.000	0.000	15
Zone 11	3.9	69.3 / 84.5	-	240	0.000	0.000	15
Zone 12	6.3	69.9 / 74.6	-	1244	0.000	0.000	845
Zone 13	0.0	0.0 / 0.0	0.00	133	0.000	0.000	30
Zone 14	5.6	70.0 / 75.6	-	917	0.000	0.000	375

Zone Sizing Summary for HRU-3 Classrooms Plan North

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Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 15	5.4	69.7 / 78.7	-	560	0.000	0.000	220
Zone 16	5.6	69.7 / 80.2	-	495	0.000	0.000	220
Zone 17	0.0	0.0 / 0.0	0.00	142	0.000	0.000	25
Zone 18	0.0	0.0 / 0.0	0.00	260	0.000	0.000	165
Zone 19	0.0	0.0 / 0.0	0.00	320	0.000	0.000	320
Zone 20	0.0	0.0 / 0.0	0.00	107	0.000	0.000	20
Zone 21	5.4	69.6 / 79.8	-	495	0.000	0.000	220
Zone 22	7.5	69.6 / 83.6	-	498	0.000	0.000	220
Zone 23	0.0	0.0 / 0.0	0.00	166	0.000	0.000	140
Zone 24	0.0	0.0 / 0.0	0.00	315	0.000	0.000	315
Zone 25	10.5	69.6 / 83.1	-	718	0.000	0.000	385
Zone 26	5.4	69.4 / 86.3	-	300	0.000	0.000	30
Zone 27	3.9	69.0 / 85.6	-	217	0.000	0.000	15
Zone 28	4.0	69.0 / 84.2	-	240	0.000	0.000	15
Zone 29	19.3	70.0 / 81.3	-	1585	0.000	0.000	1585
Zone 30	0.0	0.0 / 0.0	0.00	150	0.000	0.000	150
Zone 31	3.3	70.0 / 81.3	-	270	0.000	0.000	270
Zone 32	0.0	0.0 / 0.0	0.00	300	0.000	0.000	300
Zone 33	0.0	0.0 / 0.0	0.00	135	0.000	0.000	30
Zone 34	18.9	70.0 / 81.1	-	1585	0.000	0.000	1585
Zone 35	9.5	69.6 / 80.0	-	849	0.000	0.000	235
Zone 36	4.9	69.4 / 86.2	-	268	0.000	0.000	15
Zone 37	3.9	69.0 / 85.6	-	216	0.000	0.000	15
Zone 38	1.9	69.4 / 86.2	-	107	0.000	0.000	20
Zone 39	2.8	69.4 / 86.2	-	158	0.000	0.000	45
Zone 40	0.0	0.0 / 0.0	0.00	250	0.000	0.000	115
Zone 41	0.0	0.0 / 0.0	0.00	168	0.000	0.000	40
Zone 42	7.6	69.8 / 81.8	-	588	0.000	0.000	450
Zone 43	7.4	69.8 / 81.4	-	597	0.000	0.000	450
Zone 44	0.0	0.0 / 0.0	0.00	43	0.000	0.000	25
Zone 45	0.0	0.0 / 0.0	0.00	25	0.000	0.000	25
Zone 46	0.0	0.0 / 0.0	0.00	101	0.000	0.000	35
Zone 47	7.1	70.0 / 82.8	-	515	0.000	0.000	515
Zone 48	7.0	69.9 / 83.1	-	491	0.000	0.000	390
Zone 49	8.4	69.8 / 81.1	-	687	0.000	0.000	440
Zone 50	14.4	69.6 / 83.4	-	966	0.000	0.000	455
Zone 51	10.4	69.3 / 82.6	-	728	0.000	0.000	95
Zone 52	3.9	69.0 / 85.6	-	214	0.000	0.000	15
Zone 53	3.6	69.1 / 85.6	-	205	0.000	0.000	15
Zone 54	5.2	69.4 / 86.2	-	288	0.000	0.000	30
Zone 55	0.0	0.0 / 0.0	0.00	100	0.000	0.000	100
Zone 56	6.6	69.8 / 82.2	-	496	0.000	0.000	370
Zone 57	0.5	69.9 / 73.8	-	122	0.000	0.000	75
Zone 58	0.3	69.9 / 71.7	-	141	0.000	0.000	40
Zone 59	12.6	70.0 / 84.7	-	793	0.000	0.000	750
Zone 60	11.9	70.0 / 84.0	-	787	0.000	0.000	750
Zone 61	0.4	70.1 / 72.5	-	151	0.000	0.000	35
Zone 62	1.1	70.0 / 80.2	-	100	0.000	0.000	100
Zone 63	0.5	70.0 / 73.4	-	130	0.000	0.000	130
Zone 64	11.4	69.5 / 83.7	-	748	0.000	0.000	230
Zone 65	0.2	69.9 / 72.2	-	95	0.000	0.000	40
Zone 66	7.1	69.3 / 86.3	-	388	0.000	0.000	15
Zone 67	5.4	69.4 / 86.3	-	295	0.000	0.000	15
Zone 68	6.7	69.8 / 83.0	-	474	0.000	0.000	360
Zone 69	0.4	70.0 / 74.0	-	102	0.000	0.000	70

Zone Sizing Summary for HRU-3 Classrooms Plan North

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Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 70	10.4	69.7 / 80.3	-	911	0.000	0.000	410
Zone 71	14.2	69.6 / 86.1	-	798	0.000	0.000	415
Zone 72	9.9	69.6 / 80.1	-	880	0.000	0.000	410
Zone 73	0.2	69.8 / 71.3	-	108	0.000	0.000	20
Zone 74	12.2	69.6 / 86.0	-	690	0.000	0.000	360
Zone 75	27.5	69.1 / 85.4	-	1562	0.000	0.000	230
Zone 76	0.6	70.0 / 79.7	-	60	0.000	0.000	60
Zone 77	4.1	68.9 / 84.7	-	243	0.000	0.000	15
Zone 78	3.9	69.0 / 85.6	-	218	0.000	0.000	15
Zone 79	5.6	69.4 / 86.2	-	309	0.000	0.000	15
Zone 80	5.7	69.9 / 80.0	-	524	0.000	0.000	460

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	738.1	61.5	415.4
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	738.1	61.5	415.4

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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (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 4	21.9	Jul 1100	10.8	1784.1
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	6.6	Jan 1400	0.0	601.1
Zone 9	18.6	Jul 1400	7.4	1009.1
Zone 10	4.4	Aug 1100	4.9	150.5
Zone 11	5.2	Aug 1100	4.0	157.3
Zone 12	26.8	Jul 1100	6.5	1553.2
Zone 13	2.9	Jan 1100	0.0	143.7
Zone 14	19.8	Jul 1100	5.6	1007.7
Zone 15	12.1	Jul 1600	5.7	713.4
Zone 16	10.7	Jul 1400	5.7	727.3
Zone 17	3.1	Jan 1100	0.0	151.0
Zone 18	5.6	Jan 1100	0.0	510.5
Zone 19	6.5	Jan 1400	0.0	560.7
Zone 20	2.3	Jan 1100	0.0	151.0
Zone 21	10.7	Jul 1400	5.7	721.7
Zone 22	10.8	Jul 1400	7.7	696.6
Zone 23	3.6	Jan 1100	0.0	490.1
Zone 24	6.4	Jan 1400	0.0	530.1
Zone 25	15.5	Aug 1100	11.3	1452.8
Zone 26	5.2	Aug 1100	5.5	150.5

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Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 27	4.4	Aug 1100	4.0	160.7
Zone 28	5.2	Aug 1100	4.1	158.7
Zone 29	13.9	Jul 1400	8.5	1483.6
Zone 30	1.4	Jan 1400	0.0	151.1
Zone 31	5.6	Jul 1500	3.6	270.2
Zone 32	4.8	Jan 1100	0.0	287.9
Zone 33	2.9	Jan 1100	0.0	153.7
Zone 34	13.8	Jul 1400	7.8	1466.3
Zone 35	17.3	Aug 1100	9.1	2070.4
Zone 36	4.4	Aug 1100	4.9	151.3
Zone 37	2.7	Jul 1400	4.0	157.2
Zone 38	2.3	Jun 1800	2.0	96.4
Zone 39	2.7	Jun 1800	2.9	189.2
Zone 40	5.4	Jan 1100	0.0	452.1
Zone 41	3.6	Jan 1100	0.0	188.5
Zone 42	12.7	Jul 1400	8.3	1501.1
Zone 43	12.9	Jul 1400	7.7	1651.5
Zone 44	0.9	Jan 1400	0.0	181.1
Zone 45	0.3	Jan 1400	0.0	56.0
Zone 46	2.2	Jan 1100	0.0	205.3
Zone 47	8.1	Jun 1800	5.5	514.8
Zone 48	10.6	Jul 1400	7.2	1159.5
Zone 49	14.8	Jul 1400	8.6	1668.3
Zone 50	20.8	Jun 1700	14.7	1701.6
Zone 51	15.7	Aug 1100	10.7	1502.1
Zone 52	2.7	Jul 1400	3.9	158.7
Zone 53	4.4	Aug 1100	3.6	160.7
Zone 54	5.2	Aug 1100	5.3	150.5
Zone 55	1.1	Jan 1100	0.0	496.8
Zone 56	10.7	Jul 1400	7.3	981.9
Zone 57	2.6	Jul 1400	0.5	285.3
Zone 58	3.0	Jul 1400	0.3	142.9
Zone 59	17.1	Jul 1400	12.7	1584.5
Zone 60	17.0	Jul 1400	12.9	1558.1
Zone 61	3.3	Jul 1100	0.4	200.9
Zone 62	1.6	Jul 1400	0.9	496.8
Zone 63	1.6	Jul 1400	0.3	180.5
Zone 64	16.1	Aug 1100	11.6	1180.0
Zone 65	2.1	Jul 1400	0.3	142.7
Zone 66	4.5	Aug 1100	7.1	150.5
Zone 67	5.2	Aug 1100	5.4	157.2
Zone 68	10.2	Jul 1400	7.0	870.5
Zone 69	2.2	Jul 1400	0.4	223.8
Zone 70	19.7	Jul 1400	10.6	1327.5
Zone 71	14.9	Jul 1400	14.6	1360.5
Zone 72	19.0	Jul 1400	10.3	1258.4
Zone 73	2.3	Jul 1100	0.2	123.1
Zone 74	11.0	Jul 1400	12.6	961.2
Zone 75	27.7	Aug 1100	28.6	1440.4
Zone 76	1.0	Jul 1400	0.5	290.6
Zone 77	5.3	Aug 1100	4.3	158.7
Zone 78	4.5	Aug 1100	4.0	160.7
Zone 79	5.3	Aug 1100	5.7	150.5
Zone 80	11.3	Jul 1600	6.3	563.4

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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	80	0.0	278.9	0.29
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	21.9	Jul 1100	1017	10.8	1784.1	0.57
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	250	0.0	1289.0	0.19
Zone 8							
B201F RELATED CR	1	6.6	Jan 1400	330	0.0	601.1	0.55
Zone 9							
B201G COMPUTER LAB	1	18.6	Jul 1400	862	7.4	1009.1	0.85
Zone 10							
B206 GUID OFF	1	4.4	Aug 1100	268	4.9	150.5	1.78
Zone 11							
B207 GUID OFF	1	5.2	Aug 1100	240	4.0	157.3	1.52
Zone 12							
B201 DRAFTING - DESIGN	1	26.8	Jul 1100	1244	6.5	1553.2	0.80
Zone 13							
B201E OFF	1	2.9	Jan 1100	133	0.0	143.7	0.93
Zone 14							
B201D COMPUTER LAB	1	19.8	Jul 1100	917	5.6	1007.7	0.91
Zone 15							
B202C COMPUTER LAB	1	12.1	Jul 1600	560	5.7	713.4	0.78
Zone 16							
B202B COMPUTER LAB	1	10.7	Jul 1400	495	5.7	727.3	0.68
Zone 17							
B202D OFF	1	3.1	Jan 1100	142	0.0	151.0	0.94
Zone 18							
B202 BUSINESS OFFICE TEC	1	5.6	Jan 1100	260	0.0	510.5	0.51
Zone 19							
B202A RELATED CR	1	6.5	Jan 1400	320	0.0	560.7	0.57
Zone 20							
B203E OFF	1	2.3	Jan 1100	107	0.0	151.0	0.71
Zone 21							
B203D COMPUTER LAB	1	10.7	Jul 1400	495	5.7	721.7	0.69
Zone 22							
B203C COMPUTER LAB	1	10.8	Jul 1400	498	7.7	696.6	0.72
Zone 23							
B203 MARKETING	1	3.6	Jan 1100	166	0.0	490.1	0.34
Zone 24							
B203B RELATED CR	1	6.4	Jan 1400	315	0.0	530.1	0.59
Zone 25							
B204 CORRIDOR	1	15.5	Aug 1100	718	11.3	1452.8	0.49
Zone 26							
B210 SPED RESOURCE	1	5.2	Aug 1100	300	5.5	150.5	1.99
Zone 27							
B209 VOC DEAN	1	4.4	Aug 1100	217	4.0	160.7	1.35

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 28							
B208 GUID OFF	1	5.2	Aug 1100	240	4.1	158.7	1.52
Zone 29							
A303-1 BIOTECHNOLOGY-1	1	13.9	Jul 1400	1585	8.5	1483.6	1.07
Zone 30							
A303A PREP	1	1.4	Jan 1400	150	0.0	151.1	0.99
Zone 31							
A303H LAB	1	5.6	Jul 1500	270	3.6	270.2	1.00
Zone 32							
A303J TISSUE CULTURE LAB	1	4.8	Jan 1100	300	0.0	287.9	1.04
Zone 33							
A303D OFF	1	2.9	Jan 1100	135	0.0	153.7	0.88
Zone 34							
A303-3 BIOTECHNOLOGY-2	1	13.8	Jul 1400	1585	7.8	1466.3	1.08
Zone 35							
A304 CORRIDOR	1	2.1	Jan 1100	145	0.0	922.1	0.16
B303-1 CORRIDOR	1	15.2	Aug 1100	704	9.1	1148.3	0.61
Zone 36							
B304 ADJUST CNSLR	1	4.4	Aug 1100	268	4.9	151.3	1.77
Zone 37							
B305 GUID OFF	1	2.7	Jul 1400	216	4.0	157.2	1.37
Zone 38							
B301J Observ	1	2.3	Jun 1800	107	2.0	96.4	1.11
Zone 39							
B301H SIM	1	2.7	Jun 1800	158	2.9	189.2	0.83
Zone 40							
B301G MOCK APT	1	5.4	Jan 1100	250	0.0	452.1	0.55
Zone 41							
B301D OFF	1	3.6	Jan 1100	168	0.0	188.5	0.89
Zone 42							
B302-1 MEDICAL ASSISTING	1	12.7	Jul 1400	588	8.3	1501.1	0.39
Zone 43							
B302-2 MEDICAL ASSISTING	1	12.9	Jul 1400	597	7.7	1651.5	0.36
Zone 44							
B302A OBSERV / STOR	1	0.9	Jan 1400	43	0.0	181.1	0.24
Zone 45							
B302G CLEAN	1	0.3	Jan 1400	25	0.0	56.0	0.45
Zone 46							
B302D OFF	1	2.2	Jan 1100	101	0.0	205.3	0.49
Zone 47							
B302H LAB	1	8.1	Jun 1800	515	5.5	514.8	1.00
Zone 48							
B302J RELATED CR	1	10.6	Jul 1400	491	7.2	1159.5	0.42
Zone 49							
B301-1 HEALTH ASSISTING-	1	14.8	Jul 1400	687	8.6	1668.3	0.41
Zone 50							
B301-3 HEALTH ASSISTING-	1	20.8	Jun 1700	966	14.7	1701.6	0.57
Zone 51							
B303 - CORRIDOR	1	15.7	Aug 1100	728	10.7	1502.1	0.48
Zone 52							
B306 GUID OFF	1	2.7	Jul 1400	214	3.9	158.7	1.35
Zone 53							
B307 DEAN OFF	1	4.4	Aug 1100	205	3.6	160.7	1.27
Zone 54							
B308 SPED RESOURCE	1	5.2	Aug 1100	288	5.3	150.5	1.91
Zone 55							
A314 STOR	1	1.1	Jan 1100	100	0.0	496.8	0.20

Zone Sizing Summary for HRU-3 Classrooms Plan North

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 56							
A402A THEORY	1	10.7	Jul 1400	496	7.3	981.9	0.51
Zone 57							
A402B MODEL MAKING	1	2.6	Jul 1400	122	0.5	285.3	0.43
Zone 58							
A402D STERILIZATION	1	3.0	Jul 1400	141	0.3	142.9	0.98
Zone 59							
A402-1 DENTAL ASSISTING	1	17.1	Jul 1400	793	12.7	1584.5	0.50
Zone 60							
A402-2 DENTAL ASSISTING	1	17.0	Jul 1400	787	12.9	1558.1	0.50
Zone 61							
A402G OFFICE	1	3.3	Jul 1100	151	0.4	200.9	0.75
Zone 62							
A421 STOR	1	1.6	Jul 1400	100	0.9	496.8	0.20
Zone 63							
A402J X-RAY	1	1.6	Jul 1400	130	0.3	180.5	0.72
Zone 64							
A403a CORRIDOR	1	16.1	Aug 1100	748	11.6	1180.0	0.63
Zone 65							
A402M STERILIZATION	1	2.1	Jul 1400	95	0.3	142.7	0.67
Zone 66							
B404 ADJUST CNSLR	1	4.5	Aug 1100	388	7.1	150.5	2.58
Zone 67							
B405 GUID OFF	1	5.2	Aug 1100	295	5.4	157.2	1.88
Zone 68							
A402P THEORY	1	10.2	Jul 1400	474	7.0	870.5	0.54
Zone 69							
A402P MODEL MAKING	1	2.2	Jul 1400	102	0.4	223.8	0.46
Zone 70							
B402-1 ROBOTICS & AUTOMA	1	19.7	Jul 1400	911	10.6	1327.5	0.69
Zone 71							
B401 PLTW / ENGINEERING	1	14.9	Jul 1400	798	14.6	1360.5	0.59
Zone 72							
B402-2 ROBOTICS & AUTMA	1	19.0	Jul 1400	880	10.3	1258.4	0.70
Zone 73							
B402C OFFICE	1	2.3	Jul 1100	108	0.2	123.1	0.88
Zone 74							
B402H RELATED CR	1	11.0	Jul 1400	690	12.6	961.2	0.72
Zone 75							
B403 CORRIDOR	1	27.7	Aug 1100	1562	28.6	1440.4	1.08
Zone 76							
B402J STORAGE	1	1.0	Jul 1400	60	0.5	290.6	0.21
Zone 77							
B406 GUID OFF	1	5.3	Aug 1100	243	4.3	158.7	1.53
Zone 78							
B407 GUID OFF	1	4.5	Aug 1100	218	4.0	160.7	1.36
Zone 79							
B408 DEAN OFF	1	5.3	Aug 1100	309	5.7	150.5	2.05
Zone 80							
B402D FABRICATION LAB	1	11.3	Jul 1600	524	6.3	563.4	0.93

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1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **19395** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
A206F COMPUTER LAB	1	978.4	25.0	914.9	0.00	0.00	370.0	0.0	370.0
Totals (incl. Space Multipliers)				914.9					370.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
a206e photo stor	1	278.9	5.0	80.3	0.00	0.00	60.0	0.0	60.0
Totals (incl. Space Multipliers)				80.3					60.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
A148M (2nd flr. Voc. CR)	1	148.0	4.0	135.0	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				135.0					30.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
A206 DES. AND VIS. COMM.	1	1784.1	24.0	1016.9	0.00	0.00	465.0	0.0	465.0
Totals (incl. Space Multipliers)				1016.9					465.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
A206A RELATED CR	1	659.3	25.0	330.0	0.00	0.00	330.0	0.0	330.0
Totals (incl. Space Multipliers)				330.0					330.0

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
A206B COMPUTER LAB	1	1082.5	25.0	953.3	0.00	0.00	380.0	0.0	380.0
Totals (incl. Space Multipliers)				953.3					380.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
A207A CORRIDOR	1	1170.7	3.0	677.0	0.00	0.00	380.0	0.0	380.0
A207 CORRIDOR	1	1289.0	3.0	250.0	0.00	0.00	250.0	0.0	250.0
Totals (incl. Space Multipliers)				927.0					630.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
B201F RELATED CR	1	601.1	25.0	330.0	0.00	0.00	330.0	0.0	330.0
Totals (incl. Space Multipliers)				330.0					330.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
B201G COMPUTER LAB	1	1009.1	25.0	862.1	0.00	0.00	375.0	0.0	375.0
Totals (incl. Space Multipliers)				862.1					375.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
B206 GUID OFF	1	150.5	1.0	268.1	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				268.1					15.0

2.11 Zone: Zone 11

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 11									
B207 GUID OFF	1	157.3	1.0	239.8	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				239.8					15.0

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2.12 Zone: Zone 12

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 12									
B201 DRAFTING - DESIGN	1	1553.2	25.0	1243.5	0.00	0.00	845.0	0.0	845.0
Totals (incl. Space Multipliers)				1243.5					845.0

2.13 Zone: Zone 13

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 13									
B201E OFF	1	143.7	4.0	133.5	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				133.5					30.0

2.14 Zone: Zone 14

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 14									
B201D COMPUTER LAB	1	1007.7	25.0	916.9	0.00	0.00	375.0	0.0	375.0
Totals (incl. Space Multipliers)				916.9					375.0

2.15 Zone: Zone 15

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 15									
B202C COMPUTER LAB	1	713.4	13.0	559.7	0.00	0.00	220.0	0.0	220.0
Totals (incl. Space Multipliers)				559.7					220.0

2.16 Zone: Zone 16

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 16									
B202B COMPUTER LAB	1	727.3	13.0	495.1	0.00	0.00	220.0	0.0	220.0
Totals (incl. Space Multipliers)				495.1					220.0

2.17 Zone: Zone 17

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 17									
B202D OFF	1	151.0	3.0	142.2	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				142.2					25.0

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2.18 Zone: Zone 18

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 18									
B202 BUSINESS OFFICE TEC	1	510.5	10.0	260.0	0.00	0.00	165.0	0.0	165.0
Totals (incl. Space Multipliers)				260.0					165.0

2.19 Zone: Zone 19

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 19									
B202A RELATED CR	1	560.7	25.0	320.0	0.00	0.00	320.0	0.0	320.0
Totals (incl. Space Multipliers)				320.0					320.0

2.20 Zone: Zone 20

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 20									
B203E OFF	1	151.0	3.0	107.1	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				107.1					20.0

2.21 Zone: Zone 21

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 21									
B203D COMPUTER LAB	1	721.7	13.0	494.5	0.00	0.00	220.0	0.0	220.0
Totals (incl. Space Multipliers)				494.5					220.0

2.22 Zone: Zone 22

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 22									
B203C COMPUTER LAB	1	696.6	13.0	498.3	0.00	0.00	220.0	0.0	220.0
Totals (incl. Space Multipliers)				498.3					220.0

2.23 Zone: Zone 23

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 23									
B203 MARKETING	1	490.1	8.0	165.8	0.00	0.00	140.0	0.0	140.0
Totals (incl. Space Multipliers)				165.8					140.0

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2.24 Zone: Zone 24

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 24									
B203B RELATED CR	1	530.1	25.0	315.0	0.00	0.00	315.0	0.0	315.0
Totals (incl. Space Multipliers)				315.0					315.0

2.25 Zone: Zone 25

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 25									
B204 CORRIDOR	1	1452.8	3.0	718.4	0.00	0.00	385.0	0.0	385.0
Totals (incl. Space Multipliers)				718.4					385.0

2.26 Zone: Zone 26

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 26									
B210 SPED RESOURCE	1	150.5	1.0	299.6	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				299.6					30.0

2.27 Zone: Zone 27

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 27									
B209 VOC DEAN	1	160.7	1.0	217.1	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				217.1					15.0

2.28 Zone: Zone 28

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 28									
B208 GUID OFF	1	158.7	1.0	240.5	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				240.5					15.0

2.29 Zone: Zone 29

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 29									
A303-1 BIOTECHNOLOGY-1	1	1483.6	25.0	1585.0	0.00	0.00	1585.0	0.0	1585.0
Totals (incl. Space Multipliers)				1585.0					1585.0

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2.30 Zone: Zone 30

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 30									
A303A PREP	1	151.1	4.0	150.0	0.00	0.00	150.0	0.0	150.0
Totals (incl. Space Multipliers)				150.0					150.0

2.31 Zone: Zone 31

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 31									
A303H LAB	1	270.2	4.0	270.0	0.00	0.00	270.0	0.0	270.0
Totals (incl. Space Multipliers)				270.0					270.0

2.32 Zone: Zone 32

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 32									
A303J TISSUE CULTURE LAB	1	287.9	4.0	300.0	0.00	0.00	300.0	0.0	300.0
Totals (incl. Space Multipliers)				300.0					300.0

2.33 Zone: Zone 33

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 33									
A303D OFF	1	153.7	4.0	135.1	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				135.1					30.0

2.34 Zone: Zone 34

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 34									
A303-3 BIOTECHNOLOGY-2	1	1466.3	25.0	1585.0	0.00	0.00	1585.0	0.0	1585.0
Totals (incl. Space Multipliers)				1585.0					1585.0

2.35 Zone: Zone 35

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 35									
A304 CORRIDOR	1	922.1	2.0	145.0	0.00	0.00	145.0	0.0	145.0
B303-1 CORRIDOR	1	1148.3	3.0	703.7	0.00	0.00	90.0	0.0	90.0
Totals (incl. Space Multipliers)				848.7					235.0

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2.36 Zone: Zone 36

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 36									
B304 ADJUST CNSLR	1	151.3	1.0	268.1	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				268.1					15.0

2.37 Zone: Zone 37

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 37									
B305 GUID OFF	1	157.2	1.0	215.6	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				215.6					15.0

2.38 Zone: Zone 38

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 38									
B301J Observ	1	96.4	1.0	107.3	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				107.3					20.0

2.39 Zone: Zone 39

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 39									
B301H SIM	1	189.2	2.0	157.5	0.00	0.00	45.0	0.0	45.0
Totals (incl. Space Multipliers)				157.5					45.0

2.40 Zone: Zone 40

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 40									
B301G MOCK APT	1	452.1	6.0	249.9	0.00	0.00	115.0	0.0	115.0
Totals (incl. Space Multipliers)				249.9					115.0

2.41 Zone: Zone 41

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 41									
B301D OFF	1	188.5	5.0	168.3	0.00	0.00	40.0	0.0	40.0
Totals (incl. Space Multipliers)				168.3					40.0

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2.42 Zone: Zone 42

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 42									
B302-1 MEDICAL ASSISTING	1	1501.1	25.0	588.3	0.00	0.00	450.0	0.0	450.0
Totals (incl. Space Multipliers)				588.3					450.0

2.43 Zone: Zone 43

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 43									
B302-2 MEDICAL ASSISTING	1	1651.5	25.0	597.2	0.00	0.00	450.0	0.0	450.0
Totals (incl. Space Multipliers)				597.2					450.0

2.44 Zone: Zone 44

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 44									
B302A OBSERV / STOR	1	181.1	2.0	42.8	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				42.8					25.0

2.45 Zone: Zone 45

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 45									
B302G CLEAN	1	56.0	1.0	25.0	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				25.0					25.0

2.46 Zone: Zone 46

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 46									
B302D OFF	1	205.3	4.0	101.4	0.00	0.00	35.0	0.0	35.0
Totals (incl. Space Multipliers)				101.4					35.0

2.47 Zone: Zone 47

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 47									
B302H LAB	1	514.8	13.0	515.0	0.00	0.00	515.0	0.0	515.0
Totals (incl. Space Multipliers)				515.0					515.0

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2.48 Zone: Zone 48

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 48									
B302J RELATED CR	1	1159.5	25.0	490.9	0.00	0.00	390.0	0.0	390.0
Totals (incl. Space Multipliers)				490.9					390.0

2.49 Zone: Zone 49

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 49									
B301-1 HEALTH ASSISTING-	1	1668.3	25.0	686.6	0.00	0.00	440.0	0.0	440.0
Totals (incl. Space Multipliers)				686.6					440.0

2.50 Zone: Zone 50

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 50									
B301-3 HEALTH ASSISTING-	1	1701.6	26.0	965.9	0.00	0.00	455.0	0.0	455.0
Totals (incl. Space Multipliers)				965.9					455.0

2.51 Zone: Zone 51

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 51									
B303 - CORRIDOR	1	1502.1	3.0	728.0	0.00	0.00	95.0	0.0	95.0
Totals (incl. Space Multipliers)				728.0					95.0

2.52 Zone: Zone 52

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 52									
B306 GUID OFF	1	158.7	1.0	214.3	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				214.3					15.0

2.53 Zone: Zone 53

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 53									
B307 DEAN OFF	1	160.7	1.0	204.9	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				204.9					15.0

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2.54 Zone: Zone 54

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 54									
B308 SPED RESOURCE	1	150.5	1.0	288.1	0.00	0.00	30.0	0.0	30.0
Totals (incl. Space Multipliers)				288.1					30.0

2.55 Zone: Zone 55

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 55									
A314 STOR	1	496.8	1.0	100.0	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				100.0					100.0

2.56 Zone: Zone 56

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 56									
A402A THEORY	1	981.9	25.0	496.2	0.00	0.00	370.0	0.0	370.0
Totals (incl. Space Multipliers)				496.2					370.0

2.57 Zone: Zone 57

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 57									
A402B MODEL MAKING	1	285.3	4.0	121.6	0.00	0.00	75.0	0.0	75.0
Totals (incl. Space Multipliers)				121.6					75.0

2.58 Zone: Zone 58

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 58									
A402D STERILIZATION	1	142.9	2.0	140.6	0.00	0.00	40.0	0.0	40.0
Totals (incl. Space Multipliers)				140.6					40.0

2.59 Zone: Zone 59

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 59									
A402-1 DENTAL ASSISTING	1	1584.5	28.0	792.8	0.00	0.00	750.0	0.0	750.0
Totals (incl. Space Multipliers)				792.8					750.0

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2.60 Zone: Zone 60

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 60									
A402-2 DENTAL ASSISTING	1	1558.1	28.0	786.5	0.00	0.00	750.0	0.0	750.0
Totals (incl. Space Multipliers)				786.5					750.0

2.61 Zone: Zone 61

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 61									
A402G OFFICE	1	200.9	4.0	150.7	0.00	0.00	35.0	0.0	35.0
Totals (incl. Space Multipliers)				150.7					35.0

2.62 Zone: Zone 62

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 62									
A421 STOR	1	496.8	1.0	100.0	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				100.0					100.0

2.63 Zone: Zone 63

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 63									
A402J X-RAY	1	180.5	2.0	130.0	0.00	0.00	130.0	0.0	130.0
Totals (incl. Space Multipliers)				130.0					130.0

2.64 Zone: Zone 64

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 64									
A403a CORRIDOR	1	1180.0	3.0	748.3	0.00	0.00	230.0	0.0	230.0
Totals (incl. Space Multipliers)				748.3					230.0

2.65 Zone: Zone 65

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 65									
A402M STERILIZATION	1	142.7	1.0	95.4	0.00	0.00	40.0	0.0	40.0
Totals (incl. Space Multipliers)				95.4					40.0

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2.66 Zone: Zone 66

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 66									
B404 ADJUST CNSLR	1	150.5	1.0	387.5	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				387.5					15.0

2.67 Zone: Zone 67

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 67									
B405 GUID OFF	1	157.2	1.0	295.3	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				295.3					15.0

2.68 Zone: Zone 68

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 68									
A402P THEORY	1	870.5	25.0	474.3	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				474.3					360.0

2.69 Zone: Zone 69

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 69									
A402P MODEL MAKING	1	223.8	4.0	101.9	0.00	0.00	70.0	0.0	70.0
Totals (incl. Space Multipliers)				101.9					70.0

2.70 Zone: Zone 70

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 70									
B402-1 ROBOTICS & AUTOMA	1	1327.5	25.0	910.9	0.00	0.00	410.0	0.0	410.0
Totals (incl. Space Multipliers)				910.9					410.0

2.71 Zone: Zone 71

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 71									
B401 PLTW / ENGINEERING	1	1360.5	25.0	797.6	0.00	0.00	415.0	0.0	415.0
Totals (incl. Space Multipliers)				797.6					415.0

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2.72 Zone: Zone 72

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 72									
B402-2 ROBOTICS & AUTMA	1	1258.4	25.0	879.8	0.00	0.00	410.0	0.0	410.0
Totals (incl. Space Multipliers)				879.8					410.0

2.73 Zone: Zone 73

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 73									
B402C OFFICE	1	123.1	3.0	107.9	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				107.9					20.0

2.74 Zone: Zone 74

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 74									
B402H RELATED CR	1	961.2	25.0	689.7	0.00	0.00	360.0	0.0	360.0
Totals (incl. Space Multipliers)				689.7					360.0

2.75 Zone: Zone 75

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 75									
B403 CORRIDOR	1	1440.4	3.0	1562.1	0.00	0.00	230.0	0.0	230.0
Totals (incl. Space Multipliers)				1562.1					230.0

2.76 Zone: Zone 76

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 76									
B402J STORAGE	1	290.6	1.0	60.0	0.00	0.00	60.0	0.0	60.0
Totals (incl. Space Multipliers)				60.0					60.0

2.77 Zone: Zone 77

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 77									
B406 GUID OFF	1	158.7	1.0	243.4	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				243.4					15.0

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2.78 Zone: Zone 78

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 78									
B407 GUID OFF	1	160.7	1.0	218.3	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				218.3					15.0

2.79 Zone: Zone 79

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 79									
B408 DEAN OFF	1	150.5	1.0	308.9	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				308.9					15.0

2.80 Zone: Zone 80

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 80									
B402D FABRICATION LAB	1	563.4	10.0	524.0	0.00	0.00	460.0	0.0	460.0
Totals (incl. Space Multipliers)				524.0					460.0

Air System Design Load Summary for HRU-3 Classrooms Plan North

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1000 COOLING OA DB / WB 76.1 °F / 70.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	7275 ft²	152745	-	7275 ft²	-	-
Wall Transmission	13436 ft²	8908	-	13436 ft²	58311	-
Roof Transmission	17221 ft²	5346	-	17221 ft²	28537	-
Window Transmission	7275 ft²	1952	-	7275 ft²	146658	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	84 ft²	2093	-	84 ft²	4234	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	39867 W	96288	-	0	0	-
Task Lighting	14824 W	42362	-	0	0	-
Electric Equipment	57131 W	170180	-	0	0	-
People	758	113913	118746	0	0	0
Infiltration	-	0	4	-	126483	0
Miscellaneous	-	11355	0	-	0	0
Safety Factor	5% / 5%	30257	5937	10%	36422	0
>> Total Zone Loads	-	635399	124687	-	400644	0
Zone Conditioning	-	755623	124687	-	398019	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	19395 CFM	36112	-	19395 CFM	-36112	-
Ventilation Load	19395 CFM	-41599	425363	19395 CFM	349106	0
Ventilation Fan Load	19395 CFM	54168	-	19395 CFM	-54168	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	804303	550050	-	656846	0
Cooling Coil	-	77958	0	-	0	0
Heating Coil	-	0	-	-	270428	-
Terminal Unit Cooling	-	738075	550242	-	0	0
Terminal Unit Heating	-	0	-	-	415355	-
>> Total Conditioning	-	816033	550242	-	685783	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/06/2023
12:57PM

Air System Information

Air System Name **HRU-4 (B+1 C/D)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **38**
Floor Area **21304.8** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Cooling Coil Sizing Data

Total coil load **5.2** Tons
Total coil load **62.3** MBH
Total coil load **1469.0** CFM/Ton
Sensible coil load **62.3** MBH
Coil CFM at Jul 1400 **7630** CFM
Max coil CFM **7630** CFM
Sensible heat ratio **1.000**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Jul 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **80.0 / 72.0** °F
Leaving DB / WB **72.4 / 69.8** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **104.8** MBH
Coil CFM at Des Htg **7630** CFM
Max coil CFM **7630** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Des Htg**
Ent. DB / Lvg DB **54.7 / 67.4** °F

Ventilation Fan Sizing Data

Actual max CFM **7630** CFM
Standard CFM **7622** CFM
Actual max CFM/ft² **0.36** CFM/ft²

Fan motor BHP **7.87** BHP
Fan motor kW **6.25** kW
Fan static **3.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **7630** CFM
Standard CFM **7622** CFM
Actual max CFM/ft² **0.36** CFM/ft²

Fan motor BHP **5.25** BHP
Fan motor kW **4.16** kW
Fan static **2.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **7630** CFM
CFM/ft² **0.36** CFM/ft²

CFM/person **16.36** CFM/person

Zone Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/06/2023
12:57PM

Air System Information

Air System Name **HRU-4 (B+1 C/D)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **38**
Floor Area **21304.8** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	2.7	1.5	75.0 / 70.6	66.1 / 65.7	-	Jul 1000	0.45
Zone 2	32.5	16.2	75.0 / 70.6	64.3 / 63.9	-	Jul 1100	0.32
Zone 3	0.6	0.3	75.1 / 73.1	69.9 / 69.7	-	Aug 1300	0.34
Zone 4	18.2	7.9	75.1 / 70.6	55.0 / 54.9	-	Aug 1200	0.42
Zone 5	3.4	1.4	75.5 / 72.0	55.0 / 55.0	-	Jul 1000	0.09
Zone 6	8.8	5.1	75.9 / 67.2	55.0 / 54.3	-	Aug 1000	0.48
Zone 7	0.0	0.0	0.0 / 0.0	0.0 / 0.0	0.00	Des 0000	0.81
Zone 8	1.8	1.1	76.3 / 67.3	55.0 / 54.3	-	Aug 1000	0.43
Zone 9	1.8	1.1	76.3 / 67.3	55.0 / 54.3	-	Aug 1000	0.43
Zone 10	21.1	9.9	75.3 / 69.7	55.0 / 54.7	-	Aug 1200	0.49
Zone 11	20.4	8.9	75.1 / 70.5	55.0 / 54.9	-	Aug 1200	0.36
Zone 12	0.0	0.0	0.0 / 0.0	0.0 / 0.0	0.00	Des 0000	0.35
Zone 13	4.2	1.9	75.3 / 70.9	60.6 / 60.3	-	Jul 0900	0.20
Zone 14	3.3	1.8	76.1 / 68.4	55.0 / 54.5	-	Aug 1000	0.42
Zone 15	2.2	1.3	76.5 / 67.7	55.0 / 54.4	-	Aug 1000	0.34
Zone 16	1.6	0.8	75.8 / 69.3	55.0 / 54.6	-	Aug 1000	0.28
Zone 17	2.2	1.2	76.4 / 67.7	55.0 / 54.4	-	Aug 1000	0.34
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	-	Aug 1000	0.29
Zone 20	6.3	3.8	75.8 / 66.5	55.0 / 54.3	-	Aug 1000	0.46
Zone 21	17.0	7.3	75.0 / 70.7	55.0 / 54.9	-	Jul 1200	0.46
Zone 22	3.1	2.3	75.9 / 64.6	55.9 / 54.8	-	Mar 1000	0.60
Zone 23	59.1	40.7	75.8 / 65.3	55.5 / 54.6	-	Sep 1400	1.35
Zone 24	7.9	4.2	75.0 / 70.6	65.4 / 65.0	-	Jul 0900	0.41
Zone 25	2.1	1.1	76.0 / 68.5	55.0 / 54.5	-	Aug 1000	0.38
Zone 26	2.7	1.2	75.0 / 70.6	59.9 / 59.6	-	Jul 0900	0.76
Zone 27	43.9	19.5	75.0 / 70.6	59.2 / 59.0	-	Jul 1000	1.19
Zone 28	8.7	7.4	76.2 / 63.2	55.0 / 53.8	-	Feb 1400	0.95
Zone 29	6.5	5.2	76.1 / 63.6	55.0 / 53.9	-	Jul 1000	0.83
Zone 30	4.0	2.7	76.0 / 65.5	55.0 / 54.1	-	Aug 1000	0.60
Zone 31	6.5	5.3	76.2 / 63.6	55.0 / 53.9	-	Jul 1000	0.81
Zone 32	8.7	7.4	76.2 / 63.2	55.0 / 53.8	-	Feb 1400	0.94
Zone 33	44.9	19.9	75.0 / 70.6	58.9 / 58.7	-	Aug 1000	1.06
Zone 34	2.9	1.3	75.0 / 70.6	59.2 / 58.9	-	Jul 0900	0.74
Zone 35	1.7	1.0	76.5 / 67.4	55.0 / 54.3	-	Aug 1000	0.48
Zone 36	8.5	6.6	76.2 / 64.0	55.0 / 53.9	-	Dec 1400	0.60
Zone 37	55.0	34.3	75.4 / 66.5	56.4 / 55.7	-	Jul 0900	1.00
Zone 38	2.1	0.7	76.7 / 75.7	55.0 / 55.0	-	Jan 1000	0.09

Terminal Unit Sizing Data - Heating, Fan, Ventilation

	Heating Coil Load	Heating Coil Ent/Lvg DB	Htg Coil Water Flow @20.0 °F	Fan Design Airflow	Fan Motor	Fan Motor	OA Vent Design Airflow
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Zone Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	(MBH)	(°F)	(gpm)	(CFM)	(BHP)	(kW)	(CFM)
Zone 1	0.0	0.0 / 0.0	0.00	155	0.000	0.000	155
Zone 2	6.7	70.0 / 74.4	-	1400	0.000	0.000	1400
Zone 3	0.8	69.3 / 85.3	-	48	0.000	0.000	15
Zone 4	0.0	0.0 / 0.0	0.00	367	0.000	0.000	355
Zone 5	0.0	0.0 / 0.0	0.00	61	0.000	0.000	45
Zone 6	0.0	0.0 / 0.0	0.00	226	0.000	0.000	80
Zone 7	4.5	69.1 / 85.1	-	259	0.000	0.000	50
Zone 8	0.0	0.0 / 0.0	0.00	47	0.000	0.000	15
Zone 9	0.0	0.0 / 0.0	0.00	47	0.000	0.000	15
Zone 10	0.0	0.0 / 0.0	0.00	451	0.000	0.000	365
Zone 11	0.0	0.0 / 0.0	0.00	412	0.000	0.000	390
Zone 12	1.9	70.0 / 85.3	-	115	0.000	0.000	115
Zone 13	2.1	69.6 / 86.0	-	118	0.000	0.000	70
Zone 14	0.0	0.0 / 0.0	0.00	78	0.000	0.000	40
Zone 15	0.0	0.0 / 0.0	0.00	55	0.000	0.000	15
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	54	0.000	0.000	15
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	170	0.000	0.000	40
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	107	0.000	0.000	0
Zone 23	26.7	69.6 / 82.9	-	1859	0.000	0.000	565
Zone 24	0.0	0.0 / 0.0	0.00	405	0.000	0.000	405
Zone 25	0.0	0.0 / 0.0	0.00	49	0.000	0.000	25
Zone 26	0.0	0.0 / 0.0	0.00	75	0.000	0.000	75
Zone 27	6.9	70.0 / 75.6	-	1145	0.000	0.000	1145
Zone 28	0.0	0.0 / 0.0	0.00	323	0.000	0.000	0
Zone 29	3.4	69.3 / 83.0	-	230	0.000	0.000	0
Zone 30	0.0	0.0 / 0.0	0.00	119	0.000	0.000	20
Zone 31	3.3	69.1 / 82.4	-	231	0.000	0.000	0
Zone 32	0.0	0.0 / 0.0	0.00	324	0.000	0.000	0
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	15
Zone 36	0.0	0.0 / 0.0	0.00	288	0.000	0.000	0
Zone 37	29.7	69.3 / 85.7	-	1676	0.000	0.000	580
Zone 38	0.0	0.0 / 0.0	0.00	31	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	220.4	18.4	91.8
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	220.4	18.4	91.8

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 Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	0.7	Jan 1100	0.0	342.4
Zone 2	9.1	Jul 1100	2.1	4423.7
Zone 3	0.6	Jan 1100	0.9	142.2

Zone Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 4	7.9	Jan 1400	0.0	872.0
Zone 5	1.3	Jan 1100	0.0	654.1
Zone 6	4.9	Jan 1400	0.0	474.1
Zone 7	0.0	Des Htg	4.8	320.7
Zone 8	1.0	Jan 1100	0.0	108.6
Zone 9	1.0	Jan 1100	0.0	108.6
Zone 10	9.7	Jan 1400	0.0	926.2
Zone 11	8.9	Jan 1400	0.0	1143.5
Zone 12	0.0	Des Htg	1.5	332.7
Zone 13	1.4	Jul 1400	2.2	578.4
Zone 14	1.7	Jan 1400	0.0	186.1
Zone 15	1.2	Jan 1100	0.0	163.4
Zone 16	0.7	Jan 1400	0.0	122.2
Zone 17	1.2	Jan 1100	0.0	157.3
Zone 18	0.8	Jan 1400	0.0	124.1
Zone 19	0.7	Jan 1400	0.0	110.8
Zone 20	3.7	Jan 1400	0.0	371.4
Zone 21	7.3	Jan 1400	0.0	739.5
Zone 22	2.3	Jan 1100	0.0	176.6
Zone 23	40.1	Sep 1400	26.6	1372.5
Zone 24	2.0	Jan 1100	0.0	976.9
Zone 25	1.1	Jan 1100	0.0	126.7
Zone 26	1.0	Jan 1100	0.0	98.9
Zone 27	17.1	Jul 1400	4.5	958.2
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	17.3	Jul 1400	4.2	1081.9
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	29.4	Jul 1100	30.7	1671.2
Zone 38	0.7	Jan 1100	0.0	327.3

Zone Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
C004B - STOR	1	0.5	Jan 1100	80	0.0	233.1	0.34
C004D TOOL CRIB	1	0.3	Jan 1100	75	0.0	109.3	0.69
Zone 2							
C010 CORRIDOR	1	3.0	Jan 1100	475	0.0	1507.8	0.32
C017 CORRIDOR	1	2.1	Jan 1100	455	0.0	1020.3	0.45
D002 CORRIDOR	1	4.0	Jul 1100	470	2.1	1895.6	0.25
Zone 3							
C013 CUST OFF	1	0.6	Jan 1100	48	0.9	142.2	0.34
Zone 4							
C018 METAL FAB RELATED C	1	7.9	Jan 1400	367	0.0	872.0	0.42
Zone 5							
C019 GENERAL SUPPLY	1	1.3	Jan 1100	61	0.0	654.1	0.09
Zone 6							
C020 Cust Workshop	1	4.9	Jan 1400	226	0.0	474.1	0.48
Zone 7							
C015 GENERAL SUPPLY	1	0.0	Jan 0000	259	4.8	320.7	0.81
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	9.7	Jan 1400	451	0.0	926.2	0.49
Zone 11							
D003D RELATED CR	1	8.9	Jan 1400	412	0.0	1143.5	0.36
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	118	2.2	578.4	0.20
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	55	0.0	163.4	0.34
Zone 16							
D106 EXAM	1	0.7	Jan 1400	34	0.0	122.2	0.28
Zone 17							
D104 NURSE OFF	1	1.2	Jan 1100	54	0.0	157.3	0.34
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	131	0.0	269.0	0.49
D102A - CORRIDOR	1	0.8	Jan 1100	39	0.0	102.4	0.38
Zone 21							
D111 HEALTH CR	1	7.3	Jan 1400	340	0.0	739.5	0.46
Zone 22							
D120 PE STOR	1	2.3	Jan 1100	107	0.0	176.6	0.60
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	405	0.0	976.9	0.41
Zone 25							
D116 ATH DIR OFF	1	1.1	Jan 1100	49	0.0	126.7	0.38
Zone 26							

Zone Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
D117D PE INSTR OFF	1	1.0	Jan 1100	75	0.0	98.9	0.76
Zone 27							
D117 BOYS LOCKER	1	17.1	Jul 1400	1145	4.5	958.2	1.19
Zone 28							
D117B TEAM LOCKER	1	7.0	Jan 1400	323	0.0	340.5	0.95
Zone 29							
D117C TEAM LOCKER	1	5.0	Jul 1400	230	3.4	278.6	0.83
Zone 30							
D119 TRAINER	1	2.6	Jan 1100	119	0.0	197.8	0.60
Zone 31							
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	17.3	Jul 1400	1145	4.2	1081.9	1.06
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	29.4	Jul 1100	1676	30.7	1671.2	1.00
Zone 38							
C027 TEAM LOCKER	1	0.7	Jan 1100	31	0.0	327.3	0.09

Ventilation Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/06/2023
12:57PM

1. Summary

Ventilation Sizing Method **Sum of Space OA Airflows**
Design Ventilation Airflow Rate **7630** CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
C004B - STOR	1	233.1	0.0	80.0	0.00	0.00	80.0	0.0	80.0
C004D TOOL CRIB	1	109.3	0.0	75.0	0.00	0.00	75.0	0.0	75.0
Totals (incl. Space Multipliers)				155.0					155.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
C010 CORRIDOR	1	1507.8	0.0	475.0	0.00	0.00	475.0	0.0	475.0
C017 CORRIDOR	1	1020.3	0.0	455.0	0.00	0.00	455.0	0.0	455.0
D002 CORRIDOR	1	1895.6	0.0	470.0	0.00	0.00	470.0	0.0	470.0
Totals (incl. Space Multipliers)				1400.0					1400.0

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
C013 CUST OFF	1	142.2	1.0	48.0	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				48.0					15.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
C018 METAL FAB RELATED C	1	872.0	25.0	366.9	0.00	0.00	355.0	0.0	355.0
Totals (incl. Space Multipliers)				366.9					355.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
C019 GENERAL SUPPLY	1	654.1	0.0	61.3	0.00	0.00	45.0	0.0	45.0
Totals (incl. Space Multipliers)				61.3					45.0

Ventilation Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
C020 Cust Workshop	1	474.1	10.0	225.5	0.00	0.00	80.0	0.0	80.0
Totals (incl. Space Multipliers)				225.5					80.0

2.7 Zone: Zone 7

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 7									
C015 GENERAL SUPPLY	1	320.7	0.0	259.2	0.00	0.00	50.0	0.0	50.0
Totals (incl. Space Multipliers)				259.2					50.0

2.8 Zone: Zone 8

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 8									
C024 COACH OFF	1	108.6	1.0	46.7	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				46.7					15.0

2.9 Zone: Zone 9

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 9									
C026 COACH OFF	1	108.6	1.0	46.7	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				46.7					15.0

2.10 Zone: Zone 10

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 10									
C022D RELATED CR	1	926.2	25.0	451.3	0.00	0.00	365.0	0.0	365.0
Totals (incl. Space Multipliers)				451.3					365.0

2.11 Zone: Zone 11

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 11									
D003D RELATED CR	1	1143.5	25.0	412.3	0.00	0.00	390.0	0.0	390.0
Totals (incl. Space Multipliers)				412.3					390.0

Ventilation Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.12 Zone: Zone 12

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 12									
C011 CORRIDOR	1	332.7	0.0	115.0	0.00	0.00	115.0	0.0	115.0
Totals (incl. Space Multipliers)				115.0					115.0

2.13 Zone: Zone 13

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 13									
C120 CORRIDOR	1	578.4	0.0	117.6	0.00	0.00	70.0	0.0	70.0
Totals (incl. Space Multipliers)				117.6					70.0

2.14 Zone: Zone 14

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 14									
D102 NURSE WAIT	1	186.1	4.0	77.9	0.00	0.00	40.0	0.0	40.0
Totals (incl. Space Multipliers)				77.9					40.0

2.15 Zone: Zone 15

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 15									
D103 NURSE OFF	1	163.4	1.0	54.8	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				54.8					15.0

2.16 Zone: Zone 16

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 16									
D106 EXAM	1	122.2	2.0	34.5	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				34.5					20.0

2.17 Zone: Zone 17

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 17									
D104 NURSE OFF	1	157.3	1.0	53.8	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				53.8					15.0

Ventilation Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.18 Zone: Zone 18

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 18									
D109 EXAM	1	124.1	2.0	34.8	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				34.8					20.0

2.19 Zone: Zone 19

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 19									
D110 EXAM	1	110.8	2.0	32.6	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				32.6					20.0

2.20 Zone: Zone 20

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 20									
D105 RESTING	1	269.0	4.0	131.5	0.00	0.00	40.0	0.0	40.0
D102A - CORRIDOR	1	102.4	0.0	38.8	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				170.3					40.0

2.21 Zone: Zone 21

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 21									
D111 HEALTH CR	1	739.5	25.0	340.0	0.00	0.00	340.0	0.0	340.0
Totals (incl. Space Multipliers)				340.0					340.0

2.22 Zone: Zone 22

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 22									
D120 PE STOR	1	176.6	0.0	106.7	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				106.7					0.0

2.23 Zone: Zone 23

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 23									
D113 FITNESS	1	1372.5	24.0	1859.0	0.00	0.00	565.0	0.0	565.0
Totals (incl. Space Multipliers)				1859.0					565.0

Ventilation Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.24 Zone: Zone 24

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 24									
D114 CORRIDOR	1	976.9	0.0	405.0	0.00	0.00	405.0	0.0	405.0
Totals (incl. Space Multipliers)				405.0					405.0

2.25 Zone: Zone 25

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 25									
D116 ATH DIR OFF	1	126.7	1.0	48.7	0.00	0.00	25.0	0.0	25.0
Totals (incl. Space Multipliers)				48.7					25.0

2.26 Zone: Zone 26

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 26									
D117D PE INSTR OFF	1	98.9	1.0	75.0	0.00	0.00	75.0	0.0	75.0
Totals (incl. Space Multipliers)				75.0					75.0

2.27 Zone: Zone 27

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 27									
D117 BOYS LOCKER	1	958.2	92.0	1145.0	0.00	0.00	1145.0	0.0	1145.0
Totals (incl. Space Multipliers)				1145.0					1145.0

2.28 Zone: Zone 28

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 28									
D117B TEAM LOCKER	1	340.5	39.0	323.3	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				323.3					0.0

2.29 Zone: Zone 29

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 29									
D117C TEAM LOCKER	1	278.6	26.0	230.2	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				230.2					0.0

Ventilation Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.30 Zone: Zone 30

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 30									
D119 TRAINER	1	197.8	1.0	118.9	0.00	0.00	20.0	0.0	20.0
Totals (incl. Space Multipliers)				118.9					20.0

2.31 Zone: Zone 31

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 31									
D122C TEAM LOCKER	1	286.9	26.0	231.0	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				231.0					0.0

2.32 Zone: Zone 32

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 32									
D122B TEAM LOCKER	1	344.0	39.0	323.6	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				323.6					0.0

2.33 Zone: Zone 33

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 33									
D122 GIRLS LOCKER	1	1081.9	92.0	1145.0	0.00	0.00	1145.0	0.0	1145.0
Totals (incl. Space Multipliers)				1145.0					1145.0

2.34 Zone: Zone 34

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 34									
D122D PE INST OFF	1	101.2	1.0	75.0	0.00	0.00	75.0	0.0	75.0
Totals (incl. Space Multipliers)				75.0					75.0

2.35 Zone: Zone 35

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 35									
D123 OFFICIALS	1	86.7	1.0	42.0	0.00	0.00	15.0	0.0	15.0
Totals (incl. Space Multipliers)				42.0					15.0

Ventilation Sizing Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.36 Zone: Zone 36

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 36									
C023 TEAM LOCKER	1	476.9	20.0	288.5	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				288.5					0.0

2.37 Zone: Zone 37

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 37									
D115 WEIGHTS	1	1671.2	24.0	1676.2	0.00	0.00	580.0	0.0	580.0
Totals (incl. Space Multipliers)				1676.2					580.0

2.38 Zone: Zone 38

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 38									
C027 TEAM LOCKER	1	327.3	0.0	30.7	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				30.7					0.0

Air System Design Load Summary for HRU-4 (B+1 C/D)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/06/2023
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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1000 COOLING OA DB / WB 76.1 °F / 70.9 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	1430 ft²	27737	-	1430 ft²	-	-
Wall Transmission	3485 ft²	1795	-	3485 ft²	13624	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	1430 ft²	384	-	1430 ft²	28829	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	11231 ft²	0	-	11231 ft²	4041	-
Partitions	940 ft²	-4231	-	940 ft²	3385	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	16192 W	39276	-	0	0	-
Task Lighting	4884 W	14322	-	0	0	-
Electric Equipment	4876 W	14372	-	0	0	-
People	466	71496	88070	0	0	0
Infiltration	-	0	0	-	26726	0
Miscellaneous	-	4800	0	-	0	0
Safety Factor	5% / 5%	8498	4403	10%	7660	0
>> Total Zone Loads	-	178448	92473	-	84265	0
Zone Conditioning	-	213063	92473	-	84334	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	7630 CFM	14206	-	7630 CFM	-14206	-
Ventilation Load	7630 CFM	-10902	88648	7630 CFM	137903	0
Ventilation Fan Load	7630 CFM	21310	-	7630 CFM	-21310	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	237677	181121	-	186721	0
Cooling Coil	-	30669	0	-	0	0
Heating Coil	-	0	-	-	104780	-
Terminal Unit Cooling	-	220440	181283	-	0	0
Terminal Unit Heating	-	-2839	-	-	91830	-
>> Total Conditioning	-	248270	181283	-	196610	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for HRU-5 (Cosmetology)

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

01/20/2023

11:06AM

Air System Information

Air System Name **HRU-5 (Cosmetology)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **6**
Floor Area **4455.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

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 **2759** CFM
Sensible heat ratio **0.695**
Water flow @ 10.0 °F rise **N/A**

Load occurs at **Aug 1400**
OA DB / WB **87.0 / 74.0** °F
Entering DB / WB **81.4 / 66.5** °F
Leaving DB / WB **51.5 / 50.4** °F
Bypass Factor **0.100**

Heating Coil Sizing Data

Max coil load **44.6** MBH
Coil CFM at Jan 0700 **2759** CFM
Max coil CFM **2759** CFM
Water flow @ 20.0 °F drop **N/A**

Load occurs at **Jan 0700**
Ent. DB / Lvg DB **51.5 / 66.5** °F

Ventilation Fan Sizing Data

Actual max CFM **2759** CFM
Standard CFM **2756** CFM
Actual max CFM/ft² **0.62** CFM/ft²

Fan motor BHP **3.80** BHP
Fan motor kW **3.01** kW
Fan static **4.00** in wg

Exhaust Fan Sizing Data

Actual max CFM **2759** CFM
Standard CFM **2756** CFM
Actual max CFM/ft² **0.62** CFM/ft²

Fan motor BHP **2.85** BHP
Fan motor kW **2.26** kW
Fan static **3.00** in wg

Outdoor Ventilation Air Data

Design airflow CFM **2759** CFM
CFM/ft² **0.62** CFM/ft²

CFM/person **30.96** CFM/person

Zone Sizing Summary for HRU-5 (Cosmetology)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/20/2023
11:07AM

Air System Information

Air System Name **HRU-5 (Cosmetology)**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **6**
Floor Area **4455.6** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
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 Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	35.2	69.6 / 86.6	-	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 [MBH]	Cooling [Tons]	Heating [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 Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
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 Sizing Summary for HRU-5 (Cosmetology)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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

Ventilation Sizing Summary for HRU-5 (Cosmetology)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/20/2023
11:07AM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows
Design Ventilation Airflow Rate 2759 CFM

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
B120 COSMETOLOGY	1	2028.5	45.0	1917.9	0.00	0.00	1220.0	0.0	1220.0
Totals (incl. Space Multipliers)				1917.9					1220.0

2.2 Zone: Zone 2

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 2									
B120A OFF	1	123.8	2.0	89.1	5.00	0.06	0.0	0.0	17.4
Totals (incl. Space Multipliers)				89.1					17.4

2.3 Zone: Zone 3

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 3									
B120C FACIAL	1	164.9	4.0	100.0	0.00	0.00	100.0	0.0	100.0
Totals (incl. Space Multipliers)				100.0					100.0

2.4 Zone: Zone 4

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 4									
B121 COSMETOLOGY	1	1831.2	45.0	1508.8	0.00	0.00	1100.0	0.0	1100.0
Totals (incl. Space Multipliers)				1508.8					1100.0

2.5 Zone: Zone 5

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 5									
B121C OFF	1	105.6	2.0	85.6	5.00	0.06	0.0	0.0	16.3
Totals (incl. Space Multipliers)				85.6					16.3

Ventilation Sizing Summary for HRU-5 (Cosmetology)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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2.6 Zone: Zone 6

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 6									
B120B DISP	1	201.5	1.0	305.0	0.00	0.00	305.0	0.0	305.0
Totals (incl. Space Multipliers)				305.0					305.0

Air System Design Load Summary for HRU-5 (Cosmetology)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	800 ft²	11026	-	800 ft²	-	-
Wall Transmission	1618 ft²	11899	-	1618 ft²	22976	-
Roof Transmission	150 ft²	137	-	150 ft²	249	-
Window Transmission	800 ft²	2352	-	800 ft²	16128	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	4456 ft²	0	-	4456 ft²	4134	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	2852 W	8341	-	0	0	-
Task Lighting	2228 W	6848	-	0	0	-
Electric Equipment	2835 W	9079	-	0	0	-
People	79	15247	12472	0	0	0
Infiltration	-	0	0	-	13147	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	3246	624	10%	5663	0
>> Total Zone Loads	-	68176	13096	-	62298	0
Zone Conditioning	-	72311	13096	-	61537	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	2759 CFM	7705	-	2759 CFM	-7705	-
Ventilation Load	2759 CFM	7204	25956	2759 CFM	57825	0
Ventilation Fan Load	2759 CFM	10273	-	2759 CFM	-10273	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	97493	39052	-	101384	0
Cooling Coil	-	88703	39064	-	-2337	0
Heating Coil	-	-44644	-	-	44644	-
Terminal Unit Cooling	-	54671	180	-	0	0
Terminal Unit Heating	-	0	-	-	59624	-
Terminal Reheat Coils	-	0	-	-	59624	-
>> Total Conditioning	-	98730	39244	-	101931	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Press Booth

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/14/2023

08:32AM

Air System Information

Air System Name **VRF - Press Booth**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **132.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Press Booth

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
08:32AM

Air System Information

Air System Name **VRF - Press Booth**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **132.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	3.8	3.4	79.9 / 75.7	74.6 / 74.1	-	Jul 1300	4.44

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	10.6	68.8 / 85.5	-	586	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	3.4	0.3	10.6
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	3.4	0.3	10.6

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 Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	3.3	Jul 1200	10.8	132.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
1-G201 Press Booth	1	3.3	Jul 1200	586	10.8	132.0	4.44

Ventilation Sizing Summary for VRF - Press Booth

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
08:32AM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
1-G201 Press Booth	1	132.0	2.0	586.2	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				586.2					0.0

Air System Design Load Summary for VRF - Press Booth

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/14/2023
08:32AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1300 COOLING OA DB / WB 85.0 °F / 73.5 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	88 ft²	1826	-	88 ft²	-	-
Wall Transmission	233 ft²	468	-	233 ft²	2727	-
Roof Transmission	132 ft²	88	-	132 ft²	219	-
Window Transmission	88 ft²	69	-	88 ft²	1764	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	31 ft²	54	-	31 ft²	1367	-
Floor Transmission	132 ft²	-112	-	132 ft²	119	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	84 W	242	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	53 W	168	-	0	0	-
People	2	351	400	0	0	0
Infiltration	-	0	0	-	3578	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	158	20	10%	977	0
>> Total Zone Loads	-	3312	420	-	10751	0
Zone Conditioning	-	3379	420	-	10551	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	3379	420	-	10551	0
Terminal Unit Cooling	-	3379	433	-	0	0
Terminal Unit Heating	-	0	-	-	10551	-
>> Total Conditioning	-	3379	433	-	10551	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for RTU-1 (Resteraunt)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
09:08AM

Air System Information

Air System Name RTU-1 (Resteraunt)
Equipment Class SPLT AHU
Air System Type SZCAV

Number of zones 1
Floor Area 1400.0 ft²
Location Boston, Massachusetts

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone CFM Sizing Sum of space airflow rates
Space CFM Sizing Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load 3.4 Tons
Total coil load 41.3 MBH
Sensible coil load 31.7 MBH
Coil CFM at Jul 1400 1263 CFM
Max block CFM 1263 CFM
Sum of peak zone 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

Load occurs at Jul 1400
OA DB / WB 87.0 / 74.0 °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

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

Load occurs at Des Htg
BTU/(hr-ft²) 22.5
Ent. DB / Lvg DB 62.7 / 85.8 °F

Preheat Coil Sizing Data

No heating coil loads occurred during this calculation.

Supply Fan Sizing Data

Actual max CFM 1263 CFM
Standard CFM 1262 CFM
Actual max CFM/ft² 0.90 CFM/ft²

Fan motor BHP 1.30 BHP
Fan motor kW 1.03 kW
Fan static 3.00 in wg

Return Fan Sizing Data

Actual max CFM 1263 CFM
Standard CFM 1262 CFM
Actual max CFM/ft² 0.90 CFM/ft²

Fan motor BHP 0.87 BHP
Fan motor kW 0.69 kW
Fan static 2.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM 678 CFM
CFM/ft² 0.48 CFM/ft²

CFM/person 17.51 CFM/person

Zone Sizing Summary for RTU-1 (Resteraunt)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
09:08AM

Air System Information

Air System Name **RTU-1 (Resteraunt)**
Equipment Class **SPLT AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **1400.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	1225	1225	0.88	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	22.5	Jul 1400	24.9	1400.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
B113 RESTAURANT	1	22.5	Jul 1400	1225	24.9	1400.0	0.88

Ventilation Sizing Summary for RTU-1 (Resteraunt)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
09:08AM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Heating operation**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **542** CFM
System Ventilation Efficiency (Ev) **1.000**
Outdoor Air Intake (Vot) **678** CFM

2. Space Ventilation Analysis

		Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
B113 RESTAURANT	1	1225	1400.0	0.18	38.7	7.50	0.8	678	542	1.000
Totals (incl. Space Multipliers)		1225							542	1.000

Air System Design Load Summary for RTU-1 (Resteraunt)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
09:08AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	354 ft²	3629	-	354 ft²	-	-
Wall Transmission	526 ft²	600	-	526 ft²	2055	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	354 ft²	1041	-	354 ft²	7137	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	48 ft²	1307	-	48 ft²	2419	-
Floor Transmission	1333 ft²	0	-	1333 ft²	1522	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	896 W	2621	-	0	0	-
Task Lighting	1400 W	4375	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	34	6216	4128	0	0	0
Infiltration	-	0	0	-	9459	0
Miscellaneous	-	1613	538	-	0	0
Safety Factor	5% / 5%	1070	233	10%	2259	0
>> Total Zone Loads	-	22472	4899	-	24851	0
Zone Conditioning	-	24005	4899	-	25025	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	1263 CFM	2352	-	1263 CFM	-2352	-
Ventilation Load	678 CFM	1836	4687	678 CFM	12307	0
Supply Fan Load	1263 CFM	3528	-	1263 CFM	-3528	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	31721	9586	-	31453	0
Central Cooling Coil	-	31721	9586	-	0	0
Central Heating Coil	-	0	-	-	31453	-
Preheat Coil	-	0	-	-	0	-
>> Total Conditioning	-	31721	9586	-	31453	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Sizing Summary for RTU-2 (Gym)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:01AM

Air System Information

Air System Name RTU-2 (Gym)
Equipment Class SPLT AHU
Air System Type SZCAV

Number of zones 1
Floor Area 12668.7 ft²
Location Boston, Massachusetts

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone CFM Sizing Sum of space airflow rates
Space CFM Sizing Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load 35.4 Tons
Total coil load 425.3 MBH
Sensible coil load 289.0 MBH
Coil CFM at Jul 1400 11719 CFM
Max block CFM 11719 CFM
Sum of peak zone CFM 11719 CFM
Sensible heat ratio 0.679
CFM/Ton 330.7
ft²/Ton 357.5
BTU/(hr-ft²) 33.6
Water flow @ 10.0 °F rise N/A

Load occurs at Jul 1400
OA DB / WB 87.0 / 74.0 °F
Entering DB / WB 78.3 / 66.5 °F
Leaving DB / WB 55.4 / 54.4 °F
Coil ADP 52.9 °F
Bypass Factor 0.100
Resulting RH 57 %
Design supply temp. 58.0 °F
Zone T-stat Check 0 of 1 OK
Max zone temperature deviation 0.2 °F

Central Heating Coil Sizing Data

Max coil load 196.1 MBH
Coil CFM at Des Htg 11719 CFM
Max coil CFM 11719 CFM
Water flow @ 20.0 °F drop N/A

Load occurs at Des Htg
BTU/(hr-ft²) 15.5
Ent. DB / Lvg DB 65.9 / 81.4 °F

Preheat Coil Sizing Data

No heating coil loads occurred during this calculation.

Supply Fan Sizing Data

Actual max CFM 11719 CFM
Standard CFM 11706 CFM
Actual max CFM/ft² 0.93 CFM/ft²

Fan motor BHP 12.09 BHP
Fan motor kW 9.59 kW
Fan static 3.00 in wg

Return Fan Sizing Data

Actual max CFM 11719 CFM
Standard CFM 11706 CFM
Actual max CFM/ft² 0.93 CFM/ft²

Fan motor BHP 8.06 BHP
Fan motor kW 6.39 kW
Fan static 2.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM 4125 CFM
CFM/ft² 0.33 CFM/ft²

CFM/person 15.28 CFM/person

Zone Sizing Summary for RTU-2 (Gym)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:01AM

Air System Information

Air System Name RTU-2 (Gym)
Equipment Class SPLT AHU
Air System Type SZCAV

Number of zones 1
Floor Area 12668.7 ft²
Location Boston, Massachusetts

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone CFM Sizing Sum of space airflow rates
Space CFM Sizing Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	11367	11367	0.90	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	204.7	Jul 1400	171.8	12668.7

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
D202 GYMNASIUM	1	194.8	Jul 1400	10620	151.6	12194.5	0.87
D204 GYM STOR	1	10.7	Aug 1700	748	20.2	474.2	1.58

Ventilation Sizing Summary for RTU-2 (Gym)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:01AM

1. Summary

Ventilation Sizing Method **ASHRAE Std 62.1-2010**
Design Condition **Heating operation**
Occupant Diversity (D) **1.000**
Uncorrected Outdoor Air Intake (Vou) **3687** CFM
System Ventilation Efficiency (Ev) **0.894**
Outdoor Air Intake (Vot) **4125** CFM

2. Space Ventilation Analysis

		Supply Air (CFM)	Space Floor Area (ft²)	Area Outdoor Air Rate (CFM/ft²)	Time Averaged Occupancy (Occupants)	People Outdoor Air Rate (CFM/person)	Air Distribution Effectiveness	Space Outdoor Air (CFM)	Breathing Zone Outdoor Air (CFM)	Space Ventilation Efficiency
Zone Name / Space Name	Mult.	(Vpz)	(Az)	(Ra)	(Pz)	(Rp)	(Ez)	(Voz)	(Vbz)	(Evz)
Zone 1										
D202 GYMNASIUM	1	10620	12194.5	0.30	252.0	0.00	0.8	4573	<i>3658</i>	0.894
D204 GYM STOR	1	748	474.2	0.06	0.0	5.00	0.8	36	<i>28</i>	1.277
Totals (incl. Space Multipliers)		11367							3687	0.894

Air System Design Load Summary for RTU-2 (Gym)

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/13/2023
10:01AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	3723 ft²	42622	-	3723 ft²	-	-
Wall Transmission	4266 ft²	4332	-	4266 ft²	16674	-
Roof Transmission	12669 ft²	11544	-	12669 ft²	20994	-
Window Transmission	3723 ft²	10947	-	3723 ft²	75056	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	8108 W	23717	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14412 W	46148	-	0	0	-
People	240	55622	109200	0	0	0
Infiltration	-	0	0	-	43436	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	9747	5460	10%	15616	0
>> Total Zone Loads	-	204679	114660	-	171775	0
Zone Conditioning	-	223300	114660	-	175624	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	11719 CFM	21820	-	11719 CFM	-21820	-
Ventilation Load	4125 CFM	11122	21608	4125 CFM	75006	0
Supply Fan Load	11719 CFM	32730	-	11719 CFM	-32730	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	288971	136268	-	196080	0
Central Cooling Coil	-	288971	136314	-	0	0
Central Heating Coil	-	0	-	-	196080	-
Preheat Coil	-	0	-	-	0	-
>> Total Conditioning	-	288971	136314	-	196080	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Stair 1

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/06/2023

01:41PM

Air System Information

Air System Name **VRF - Stair 1**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **897.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Stair 1

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
01:41PM

Air System Information

Air System Name **VRF - Stair 1**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **897.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
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

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	66.9	69.2 / 86.2	-	3634	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	29.4	Aug 1100	66.7	897.9

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
S1 STAIR 1	1	29.4	Aug 1100	3634	66.7	897.9	4.05

Air System Design Load Summary for VRF - Stair 1

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
01:41PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1100 COOLING OA DB / WB 78.4 °F / 71.6 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	821 ft²	24955	-	821 ft²	-	-
Wall Transmission	2164 ft²	702	-	2164 ft²	8460	-
Roof Transmission	898 ft²	255	-	898 ft²	1488	-
Window Transmission	821 ft²	-660	-	821 ft²	16551	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	44 ft²	1040	-	44 ft²	2218	-
Floor Transmission	898 ft²	0	-	898 ft²	996	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	682 W	1730	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	30883	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	1401	0	10%	6060	0
>> Total Zone Loads	-	29422	0	-	66655	0
Zone Conditioning	-	29643	0	-	66903	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	29643	0	-	66903	0
Terminal Unit Cooling	-	29643	0	-	0	0
Terminal Unit Heating	-	0	-	-	66903	-
>> Total Conditioning	-	29643	0	-	66903	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Stair 2

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/06/2023

01:36PM

Air System Information

Air System Name **VRF - Stair 2**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **359.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Stair 2

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
01:36PM

Air System Information

Air System Name **VRF - Stair 2**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **359.2** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
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

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	25.4	68.6 / 85.4	-	1405	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	13.8	Aug 1800	25.6	359.2

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
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 Design Load Summary for VRF - Stair 2

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/06/2023
01:36PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1800 COOLING OA DB / WB 85.5 °F / 73.6 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	646 ft²	10708	-	646 ft²	-	-
Wall Transmission	15 ft²	10	-	15 ft²	58	-
Roof Transmission	270 ft²	147	-	270 ft²	447	-
Window Transmission	646 ft²	876	-	646 ft²	13023	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	42 ft²	1005	-	42 ft²	2117	-
Floor Transmission	359 ft²	0	-	359 ft²	494	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	101 W	441	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	7165	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	659	0	10%	2330	0
>> Total Zone Loads	-	13846	0	-	25634	0
Zone Conditioning	-	13612	0	-	25444	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	13612	0	-	25444	0
Terminal Unit Cooling	-	13612	0	-	0	0
Terminal Unit Heating	-	0	-	-	25444	-
>> Total Conditioning	-	13612	0	-	25444	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Stair 3

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/07/2023

12:55PM

Air System Information

Air System Name **VRF - Stair 3**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **1238.5** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Stair 3

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:55PM

Air System Information

Air System Name **VRF - Stair 3**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **1238.5** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	22.9	22.9	80.6 / 48.5	72.2 / 44.6	-	Sep 1200	2.05

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	45.7	68.4 / 85.0	-	2545	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	22.9	1.9	45.7
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	22.9	1.9	45.7

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 Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	23.5	Sep 1200	46.2	1238.5

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
S3 STAIR 3	1	23.0	Sep 1200	2519	46.2	938.4	2.68
S3 STAIR 3 BASEMENT	1	0.6	Jan 1100	26	0.0	300.1	0.09

Ventilation Sizing Summary for VRF - Stair 3

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:55PM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
S3 STAIR 3	1	938.4	0.0	2519.1	0.00	0.00	0.0	0.0	0.0
S3 STAIR 3 BASEMENT	1	300.1	0.0	25.6	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				2544.7					0.0

Air System Design Load Summary for VRF - Stair 3

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:55PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Sep 1200 COOLING OA DB / WB 77.0 °F / 70.3 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	491 ft²	19162	-	491 ft²	-	-
Wall Transmission	1600 ft²	274	-	1600 ft²	6256	-
Roof Transmission	938 ft²	219	-	938 ft²	1555	-
Window Transmission	491 ft²	-720	-	491 ft²	9899	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	49 ft²	1256	-	49 ft²	2470	-
Floor Transmission	300 ft²	0	-	300 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	793 W	2206	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	21821	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	1120	0	10%	4200	0
>> Total Zone Loads	-	23517	0	-	46201	0
Zone Conditioning	-	22869	0	-	45688	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	22869	0	-	45688	0
Terminal Unit Cooling	-	22869	0	-	0	0
Terminal Unit Heating	-	0	-	-	45688	-
>> Total Conditioning	-	22869	0	-	45688	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Stair 4

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/07/2023

12:00PM

Air System Information

Air System Name **VRF - Stair 4**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **578.4** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Stair 4

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:00PM

Air System Information

Air System Name **VRF - Stair 4**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **578.4** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
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

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	60.8	69.2 / 86.1	-	3334	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [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 Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	44.1	Jun 1800	61.1	578.4

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
S4 STAIR 4	1	44.1	Jun 1800	3334	61.1	578.4	5.76

Ventilation Sizing Summary for VRF - Stair 4

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:00PM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
S4 STAIR 4	1	578.4	0.0	3333.9	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				3333.9					0.0

Air System Design Load Summary for VRF - Stair 4

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:00PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1800 COOLING OA DB / WB 82.5 °F / 71.6 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	1045 ft²	38956	-	1045 ft²	-	-
Wall Transmission	1401 ft²	472	-	1401 ft²	5476	-
Roof Transmission	578 ft²	334	-	578 ft²	958	-
Window Transmission	1045 ft²	365	-	1045 ft²	21067	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	42 ft²	1115	-	42 ft²	2117	-
Floor Transmission	578 ft²	0	-	578 ft²	604	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	162 W	710	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	25363	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	2098	0	10%	5559	0
>> Total Zone Loads	-	44050	0	-	61144	0
Zone Conditioning	-	43980	0	-	60753	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	43980	0	-	60753	0
Terminal Unit Cooling	-	43980	0	-	0	0
Terminal Unit Heating	-	0	-	-	60753	-
>> Total Conditioning	-	43980	0	-	60753	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Stair 5

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

02/07/2023

12:57PM

Air System Information

Air System Name **VRF - Stair 5**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **350.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Stair 5

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:57PM

Air System Information

Air System Name **VRF - Stair 5**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **350.9** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
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

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	31.2	69.1 / 86.0	-	1703	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	6.6	Jul 1500	31.2	350.9

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
S5 STAIR 5	1	6.6	Jul 1500	1703	31.2	350.9	4.85

Ventilation Sizing Summary for VRF - Stair 5

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:57PM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
S5 STAIR 5	1	350.9	0.0	1702.8	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				1702.8					0.0

Air System Design Load Summary for VRF - Stair 5

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

02/07/2023
12:57PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1400 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	300 ft²	3712	-	300 ft²	-	-
Wall Transmission	1087 ft²	989	-	1087 ft²	4251	-
Roof Transmission	351 ft²	274	-	351 ft²	581	-
Window Transmission	300 ft²	402	-	300 ft²	6048	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	62 ft²	182	-	62 ft²	2734	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	225 W	657	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	14777	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	311	0	10%	2839	0
>> Total Zone Loads	-	6526	0	-	31230	0
Zone Conditioning	-	6731	0	-	31176	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	6731	0	-	31176	0
Terminal Unit Cooling	-	6731	0	-	0	0
Terminal Unit Heating	-	0	-	-	31176	-
>> Total Conditioning	-	6731	0	-	31176	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Stair 6

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

01/30/2023

01:37PM

Air System Information

Air System Name **VRF - Stair 6**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **334.8** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Stair 6

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
01:37PM

Air System Information

Air System Name **VRF - Stair 6**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **334.8** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	15.6	15.6	79.7 / 48.1	76.3 / 46.5	-	Jul 1500	12.48

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	75.3	68.1 / 84.8	-	4177	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	15.6	1.3	75.3
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	15.6	1.3	75.3

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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	15.1	Jul 1500	76.6	334.8

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
S6 STAIR 6	1	15.1	Jul 1500	4177	76.6	334.8	12.48

Ventilation Sizing Summary for VRF - Stair 6

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
01:37PM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
S6 STAIR 6	1	334.8	0.0	4176.8	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				4176.8					0.0

Air System Design Load Summary for VRF - Stair 6

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
01:37PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	773 ft²	9372	-	773 ft²	-	-
Wall Transmission	2993 ft²	2423	-	2993 ft²	11699	-
Roof Transmission	328 ft²	274	-	328 ft²	544	-
Window Transmission	773 ft²	1120	-	773 ft²	15584	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	44 ft²	542	-	44 ft²	2218	-
Floor Transmission	335 ft²	0	-	335 ft²	753	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	187 W	612	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	38842	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	717	0	10%	6964	0
>> Total Zone Loads	-	15056	0	-	76603	0
Zone Conditioning	-	15556	0	-	75323	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	15556	0	-	75323	0
Terminal Unit Cooling	-	15556	0	-	0	0
Terminal Unit Heating	-	0	-	-	75323	-
>> Total Conditioning	-	15556	0	-	75323	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF - Stair 7

Project Name: 60-20-409 NEMT

Prepared by: TMP Consulting Engineers, Inc.

01/30/2023

01:35PM

Air System Information

Air System Name **VRF - Stair 7**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **361.4** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF - Stair 7

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
01:35PM

Air System Information

Air System Name **VRF - Stair 7**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **1**
Floor Area **361.4** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	7.7	7.7	80.0 / 48.2	75.2 / 46.0	-	Jul 1500	4.14

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	35.4	63.9 / 85.8	-	1497	0.000	0.000	0

VRF Outdoor Unit Sizing Data

	Cooling [MBH]	Cooling [Tons]	Heating [MBH]
Peak Coincident Indoor Unit Loads	7.7	0.6	35.4
Estimated Piping / Line Losses	0.0	0.0	0.0
Total Required ODU Capacity	7.7	0.6	35.4

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 Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	7.6	Jul 1500	35.5	361.4

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
S7 STAIR 7	1	7.6	Jul 1500	1497	35.5	361.4	4.14

Ventilation Sizing Summary for VRF - Stair 7

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
01:35PM

1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: Zone 1

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
S7 STAIR 7	1	361.4	0.0	1496.8	0.00	0.00	0.0	0.0	0.0
Totals (incl. Space Multipliers)				1496.8					0.0

Air System Design Load Summary for VRF - Stair 7

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

01/30/2023
01:35PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500 COOLING OA DB / WB 87.0 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 7.0 °F / 4.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	410 ft²	4971	-	410 ft²	-	-
Wall Transmission	1305 ft²	803	-	1305 ft²	4698	-
Roof Transmission	361 ft²	302	-	361 ft²	551	-
Window Transmission	410 ft²	594	-	410 ft²	7610	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	44 ft²	542	-	44 ft²	2042	-
Floor Transmission	361 ft²	0	-	361 ft²	882	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	20 W	66	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	16513	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	5% / 5%	364	0	10%	3230	0
>> Total Zone Loads	-	7641	0	-	35526	0
Zone Conditioning	-	7742	0	-	35387	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	0 CFM	0	-	0 CFM	0	-
Ventilation Load	0 CFM	0	0	0 CFM	0	0
Ventilation Fan Load	0 CFM	0	-	0 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	7742	0	-	35387	0
Terminal Unit Cooling	-	7742	0	-	0	0
Terminal Unit Heating	-	0	-	-	35387	-
>> Total Conditioning	-	7742	0	-	35387	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Zone Sizing Summary for Heating Only Spaces - Areas C an

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/08/2023
06:50AM

Air System Information

Air System Name **Heating Only Spaces - Areas C an**
Equipment Class **TERM**
Air System Type **2P-FC**

Number of zones **1**
Floor Area **9782.0** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	0.0	0.0	-1.0 / -1.0	-1.0 / -1.0	0.00	Des 0000	1.03

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @30.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	298.7	71.2 / 100.0	19.93	10041	1.485	1.178	30

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	55.6	Jul 1400	302.8	9782.0

Zone Sizing Summary for Heating Only Spaces - Areas C and D

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/08/2023
06:50AM

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
C001 ELECT - MAIN ELECT	1	0.0	Jan 0000	168	5.1	601.1	0.28
C005 ELECT - MAIN STANDB	1	0.5	Jan 1100	58	1.8	242.5	0.24
C006 ELECT - LIFE SAFETY	1	0.5	Jan 1100	0	0.0	218.6	0.00
C007 Generator Panels	1	0.0	Jan 0000	145	4.4	144.9	1.00
C008 PLUMBING ROOM	1	0.0	Jan 0000	189	5.7	430.8	0.44
C101 CUST	1	0.1	Jan 1100	0	0.0	46.9	0.00
C102 CUST STOR	1	0.1	Jan 1100	0	0.0	50.7	0.00
C112 TLT	1	0.5	Jan 1100	0	0.0	246.8	0.00
C113 TLT	1	0.5	Jan 1100	0	0.0	246.3	0.00
C104 Vest	1	9.3	Jul 1800	1886	57.0	446.6	4.22
C106K STOR	1	0.6	Jul 2100	126	3.8	70.3	1.80
C106A CUBBIES	1	0.5	Jul 1400	30	0.4	188.7	0.16
C106C LOCKERS	1	0.2	Jul 1400	5	0.1	75.1	0.07
C106G TLT	1	0.9	Aug 2000	87	2.6	155.4	0.56
C108 TLT	1	0.3	Jul 2100	60	1.8	73.6	0.81
C107 TLT	1	0.3	Jul 2100	60	1.8	73.6	0.81
D101 VEST	1	3.3	Jul 1800	682	20.6	160.3	4.26
C302 MECHANICAL	1	7.8	Jul 1400	226	6.8	2746.9	0.08
1-CB102 MAINTENANCE	1	0.5	Jul 1500	136	4.1	43.0	3.16
1-LRS1 STAIR	1	7.4	Jul 1400	1184	35.8	247.4	4.79
1-LR104 FIELD MAINT GAR	1	5.5	Jul 1400	990	29.9	1017.5	0.97
1-LR101 VEST	1	6.9	Jul 1100	416	12.6	133.6	3.11
1-LR201 VEST	1	7.1	Jul 1100	416	12.6	136.5	3.05
1-LR105 TLT	1	0.5	Aug 0800	70	2.1	53.1	1.31
1-M101 MAINT GARAGE	1	13.2	Jul 1400	2861	86.4	1680.1	1.70
1-M101a Toilet	1	1.4	Aug 0100	206	6.2	85.3	2.42
C005A - ELECT VOC	1	0.2	Jan 1100	0	0.0	93.7	0.00
C015B CUST	1	0.0	Jan 0000	39	1.2	72.7	0.54

Zone Sizing Summary for Heating Only Spaces - Areas C an

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/13/2023
01:44PM

Air System Information

Air System Name **Heating Only Spaces - Areas C an**
Equipment Class **TERM**
Air System Type **2P-FC**

Number of zones **1**
Floor Area **10200.7** ft²
Location **Boston, Massachusetts**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
Zone 1	0.0	0.0	-1.0 / -1.0	-1.0 / -1.0	0.00	Des 0000	1.00

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @30.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
Zone 1	305.9	71.1 / 100.0	20.40	10229	1.513	1.200	55

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
Zone 1	53.3	Jul 1400	308.5	10200.7

Zone Sizing Summary for Heating Only Spaces - Areas C and D

Project Name: 60-20-409 NEMT
Prepared by: TMP Consulting Engineers, Inc.

03/13/2023
01:44PM

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
C001 ELECT - MAIN ELECT	1	0.0	Jan 0000	168	5.1	601.1	0.28
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C005A - ELECT VOC	1	0.2	Jan 1100	0	0.0	93.7	0.00
C015B CUST	1	0.0	Jan 0000	39	1.2	72.7	0.54
D001 CUST STORAGE	1	0.0	Jan 0000	189	5.7	418.7	0.45

GENERAL REQUIREMENTS

TOTAL ELECTRICAL LOAD CALCULATIONS

Main Building Services

Electrical Connected Loads

Normal Power

Lighting (0.81W/sf plus 10kW site lighting)	323 kW
Receptacles (3W/sf)	1161 kW
Electric Vehicle Charging (Separately metered)	29 kW
Mechanical:	
• Miscellaneous Electric Heat FTUs and EUHs	176 kW
• Energy Recovery Ventilators (ERVs)	73 kW
• VRF Fan Coil Units	60 kW
• VRF Condensing Units	1373 kW
• Rooftop Units RTUs (2) and HRUs (5)	578 kW
• Makeup Air Units (2)	369 kW
• Indoor Air Handling Units (11)	1597 kW
• Exhaust Fans	90 kW
• Air Cooled Condensing Units (ACCUs)	162 kW
• Miscellaneous AC Split Systems	66 kW
• Dehumidifiers	189 kW
Plumbing:	
• Electric Hot Water Heaters	646 kW
• Miscellaneous Pumps	15 kW
• Air Compressors	121 kW
• Domestic Water Booster Triplex Pump (3 at 10hp)	30 kW
• Miscellaneous	25 kW
Kitchen (Gas)	300 kW
Miscellaneous Equipment	250 kW



Normal Power Total (Before Adding EM/Standby Total): 7,633kW
8,035kVA

Emergency Power (Backed Up By Generator)

Lighting	35 kW
Fire Alarm	30 kW
Fire Pump (50 hp)	30 kW

Standby Power (Backed Up By Generator)

Elevators (two at 40 hp)	80 kW
Telecom Equipment	75 kW

Emergency/Standby Power Total: 250kW
263kVA

All Normal Power Loads Total: 7,883kW
8,298kVA

Electrical Connected Normal Power Loads with Code Applied Demand Factor:

First 1,161kVA at 100%	1,161kVA
Plus	
Next 7,137kVA at 75%	5,353kVA
Demand Total: 6,514kVA	

Site Lighting/Locker Building Service

Electrical Connected Loads

Normal Power	
Lighting	7 kW
Sports Lighting	85 kW
Receptacles (3 watt / SF)	25 kW
Electric Vehicle Charging (separately metered)	14 kW
Mechanical	84 kW



Plumbing	90 kW
Telecom	15 kW

Normal Power Total: 320kW
337kVA

Note: The locker building (120 kW of total) and concessions building (75 kW of total) are currently add alternates. Another possible future connection to this transformer is a future maintenance building planned for the eastern side of the site (estimated load 100 kVA).

Normal Power Total Without Locker and Concessions Buildings: 125kW
139kVA

Farm Road Electrical Service

Electrical Connected Loads

Normal Power	
Lighting	2 kW
Miscellaneous Telecom/Signage	10 kW

Normal Power Total: 12kW
13kVA

Based on projected connected loads with code applied demand, calculated estimated demand load is 7,835Amps 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 Company. 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 eastern portion of the site and 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

6C.3.1 – 14a

SECURITY NARRATIVE

SECURITY & VISUAL
ACCESS REQUIREMENTS

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 north, and the parent drop-off/visitor entrance is on the 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., to restrict vehicle access to the vocational shops on grade at the rear of the building. The use of proximity cards or fobs will activate the entry lift barriers. Exit barriers will be activated when the barrier senses a vehicle approaching. The gates will include siren sensors to automatically activate the lift barriers at the approach of emergency vehicles.

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, vestibule, and transaction window. Laminated glass will be utilized at the remaining entries.



Visitor Control and Routing

There are four main entrances to the school, the parent drop-off/visitor entrance at the administration wing, the main entry, 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 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 issuing visitor photo passes.

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
- A Vape Detection system
- A Gunshot Detection system

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 (if provided) for public access to deliver and pick up vehicles at the automotive shops.

Proximity/Card Readers will be installed at designated doors, including the main entry, custodial entry doors, 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 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 at 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 new Locker building.



Gunshot Detection System

The new school building will have an IP-based Power over Ethernet Gunshot Detection system. Gunshot sensors will also be installed in the new locker building.

Duress Alert System

The school will have a Duress Alert system to comply with Alyssa's Law regulation. The Duress Alert system will provide notification to the school population of a duress situation via overhead PA announcements and emergency all-call video messaging to all classrooms and digital signage monitors. Pulsing prism beacons will be installed in vocational shops and common-use areas. The system will interface with the electronic security systems, including the Access Control, Fire Alarm, and the school's handheld radio systems. The system will send an alert to the first responder command center in less than half a second. During an alert, the system will provide two-way communication between first responders and the school.

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 would normally be held open by magnetic hold-open devices. Individual security doors can be closed and locked electronically to isolate specific sections of the building.
- In case of an active shooter or duress situation, all security doors can be closed and locked automatically.



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 laminated 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 three sections by two horizontal bars, making it difficult for an intruder to enter a classroom through a sidelight if the laminated 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.
- Door chimes will be installed on the heavy vocational shop corridor doors to notify instructors when someone enters the shop during class.

6C.3.1 – 14b

FIRE DEPART. MEETING NOTES

SECURITY & VISUAL
ACCESS REQUIREMENTS

MEMO

To: Vladimir Lyubetsky/ DRA Architects

From: Richard Rivera/Zachary Barrett

Date: 05/12/2023

RE: Northeast Metropolitan Regional Technical High School
Fire Department Meeting Notes

Project #: 60-20-409

As requested, this office has met with the Wakefield Fire Prevention Department to review the design for the building fire protection and fire alarm systems for the proposed high school.

The attached meeting notes are a representation of the items discussed during this meeting. It was also noted that future meeting(s) will be planned as the systems design gets developed further.

cc: SPS; RDR; ZMB; DDB; GC - Bala

MEETING MINUTES

PROJECT: Northeast Metro Tech High School PROJECT NO.: 60-20-409

MEETING NO.: 03 MEETING DATE: April 21, 2023

LOCATION: Teams

ATTENDEES:

Deputy Chief Tom Purcell	-	Wakefield Fire Department
Paige Blanchard	-	Nitsch Engineering
Vladimir Lyubetsky	-	DRA Architects
Sarah Carda	-	DRA Architects
David Warner	-	Warner Larson
Zachary Barrett	-	Bala Consulting Engineers
Richard Rivera	-	Bala Consulting Engineers
Gilbert Castera	-	Bala Consulting Engineers

DISTRIBUTION:

All Attendees		
David Conway	-	Nitsch Engineering
Sean Sullivan	-	Bala Consulting Engineers
Dino D. Buro	-	Bala Consulting Engineers
Chief Michael Sullivan	-	Wakefield Fire Department

PURPOSE: Review of Proposed FP and FA Systems and Code Analysis

DATE ISSUED: April 28, 2023

The purpose of today's meeting was to coordinate Construction Document design items regarding Site/Civil, Fire Protection, and Fire Alarm with the Wakefield FD. Fire Protection and Fire Alarm minutes of the meeting are as follows:

New Business:

1. Confirmed location of exterior fire department connection with Wakefield FD and Nitsch. Fire hydrant located within 100 feet of fire department connection location.
2. Wakefield FD confirmed that fire department connection type shall be a 4" Storz connection with cap and chain.
3. Wakefield FD provided Bala with their official list of system requirements. Bala to comply with this list for the project Construction Documents. Any objection or question to any items on the list shall be raised with Wakefield FD.
4. Wakefield FD deferred to the Wakefield building department regarding omitting sprinklers in the main electric room. Bala to schedule a meeting with the building department prior to issuance of the Construction Documents.
5. Wakefield FD noted that each fire hose valve connection shall have iron pipe threads.
6. Wakefield FD confirmed the fire alarm design intent of remote buildings (maintenance building,

concession building) to be equipped with radio boxes so that required signals are wirelessly transmitted offsite.

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.



Richard Rivera
Plumbing & Fire Protection Engineer

GENERAL REQUIREMENTS

FACILITY & MAINTENANCE REQUIREMENTS

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 throughout the design to discuss specific building maintenance needs, including the most recent meeting on 5/5/2023. 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:

1. 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.

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. Lighting

1. Interior and exterior luminaires will be dimmable LED and the low voltage lighting control system will be integrated with the building management system. Refer to Electrical narrative for equipment requiring maintenance.

E. Building Management Systems

2. The building management system is proposed to be a direct digital control system. Refer to the HVAC and Electrical narratives for descriptions.
3. The persons responsible for maintenance were informed that the ATC subcontractor will provide pre-occupancy and post-occupancy training.

F. 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 3rd Floor courtyard roof.

FACILITY AND MAINTENANCE REQUIREMENTS

- b) Auditorium Roof: Access is direct from the 3rd 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 2nd 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.

G. Mechanical Room Access

- 1. Mechanical rooms are provided access that meets or exceeds the requirements of IMC 2018 Section 306 Access and Service Space.

H. Cleaning Procedures and Materials

- 1. The design team reviewed proposed interior finish materials with the staff responsible for maintenance.
 - a) Flooring: Porcelain / ceramic tiles, rubber tile, sheet vinyl and linoleum sheet all will be maintained by damp mopping and occasionally auto scrubbing.
 - b) Soft flooring: carpet and resilient carpeting all will be maintained by vacuuming
 - c) Wall surfaces Porcelain / ceramic tiles will be maintained by damp cloth with a neutral water-based spraying.
 - d) Wall surfaces- Painted / Epoxy Paint will be maintained by damp cloth with a neutral water-based spraying and touch up paint as necessary.

GENERAL REQUIREMENTS
QUALITY CONTROL NARRATIVE

6C.3.1 - 16

6C.3.1-16

QUALITY CONTROL NARRATIVE

The 90 % 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's). 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 90% Construction Documents submission. The documents went through an in-house Quality Control Review.

Ceiling Clearances

Regular meetings were held involving the entire design team to review all systems and their impact on the ceilings. The coordination meetings used 3D BIM models to review the requirements for key MEP systems, including air handling units on mechanical mezzanines, ductwork supply and return lines, sprinkler mains and head locations, and light fixtures. The MEP requirements were coordinated with the structural steel depths to confirm finished ceiling heights. In addition, Interdisciplinary Document Coordination, IDC, was performed by the CM-R and the findings shared with the Design Team. The resulting information was coordinated and is documented on the Reflected Ceiling Plans and Building sections.

Mechanical Room & Shaft Sizes

Prior to issuance of the Early Structural Bid documents, all major pieces of the MEP Systems were carefully coordinated. Each piece of equipment, and associated distribution components, placed within the Mechanical Rooms and on the roof were reviewed to coordinate the structural load requirements, clearances required around the units, and major shaft sizes and locations. The results of this coordination can be seen in the floor plans, the MEP drawings, and the structural framing.

Coordinate Specifications & Drawings

The Design team has been coordinating the drawings and specifications, and incorporating additional comments received from the OPM and the CM-R. The updated specifications have been included in the 90% 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 which has been awarded and will begin shortly.

Equipment & Power

Power requirements for major equipment have been reviewed and coordinated between design team members.

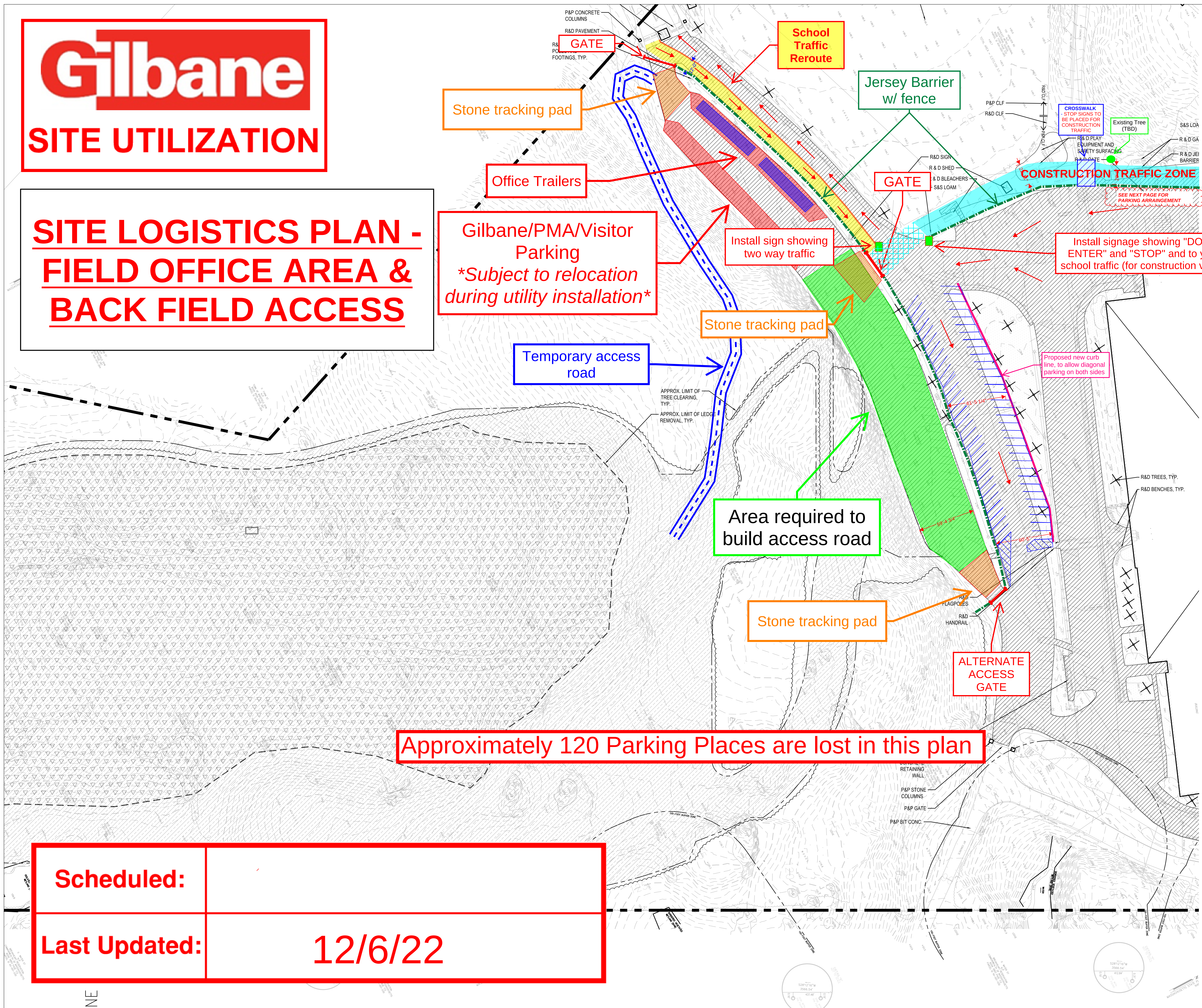
Additional coordination meetings have been held with the Career Tech Staff and School District Administration. Vocational equipment types and locations were reviewed. Base utilities have been coordinated and updated to reflect the latest equipment selections. In addition, locations for convenience utilities, mobile and benchtop equipment were reviewed, as well as locations for fume extraction arms, compressed air, 208V-3-phase power to accommodate portable MIG welders, pneumatic hand tools. These items have been incorporated into the drawings and can be seen in the Equipment plans and schedules, architectural plans, and MEP drawings.

Existing & New Construction

The existing building will be demolished as part of this project, thus the Project does not include renovation of the existing school.

Phasing

Early Site Enabling and Foundation and Structural Steel packages have been issued to the CMR for bidding. The project team continues to coordinate phasing as additional CM-R input is received. Phasing / Site utilization Diagrams, prepared by CM-R, can be found at the end of this section, 6C.3.1-16.





Drummeys Rosane Anderson, Inc.

225 Oakland Road	260 Charles Street
Studio 205	Studio 300
South Windsor, CT	Waltham, MA
06074	02453

Planning | Architecture | Interior Design

Tel: 617.954.1700
www.draws.com

100 Hemlock Rd,
Wakefield, MA 01880



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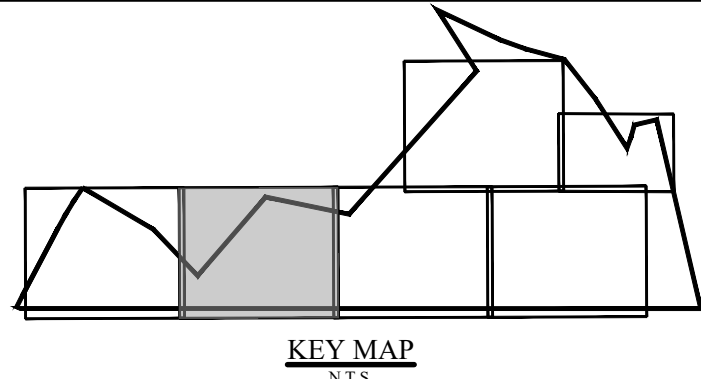
June 23, 2022



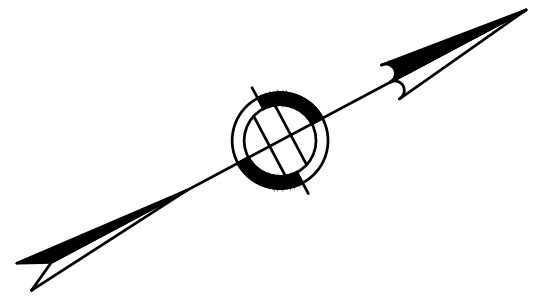
A circle with a center point. A radius line is drawn from the center to the circumference. At the point of contact, a tangent line segment is drawn, perpendicular to the radius.

Scale: 1" = 30'-0"
 Job No.: 20202.00
 Drawn By: JM
 Date: June 23, 2022

L104



- NOTES:
- 1) ALL PROPOSED AND EXISTING DRAINAGE INLETS SHALL HAVE SILT SACS/INLET PROTECTION INSTALLED DURING CONSTRUCTION
 - 2) CONTRACTOR TO LIMIT COMPACTION IN AREAS OF PROPOSED INFILTRATION
 - 3) LOCATION OF CONSTRUCTION FENCE AND EROSION CONTROL SET UP AND REMOVAL BETWEEN PHASES ARE THE CONTRACTOR'S RESPONSIBILITY

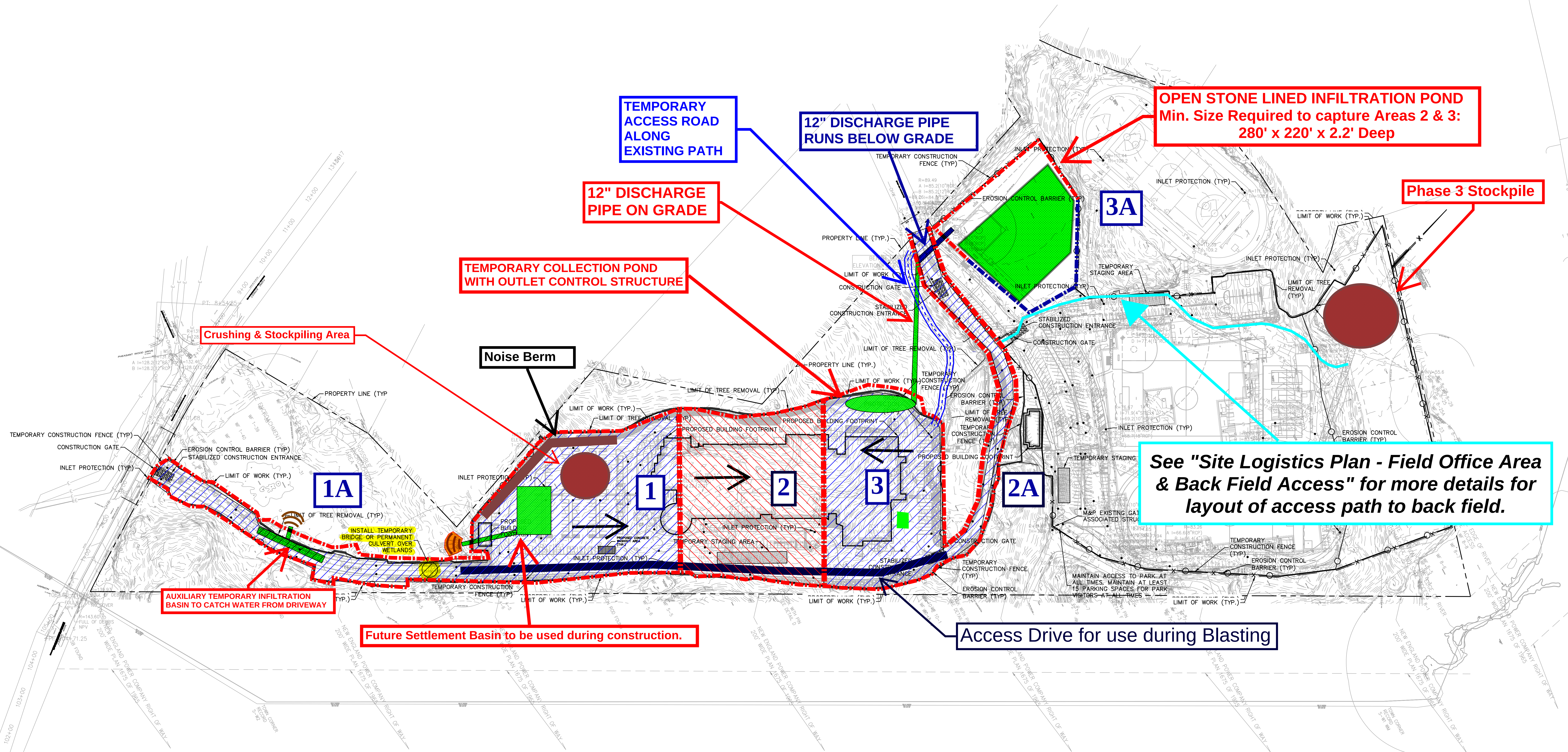


Gilbane

SITE UTILIZATION

SITE PREPARATION SEQUENCE PLAN

Sequence of Work
Refer to Scope of Work Item #3



Scheduled:	2/1/23 - 7/1/23
Last Updated:	12/6/22

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

6C.3.2

SPACE SUMMARY

SPACE SUMMARY

UPDATED SPACE SUMMARY

6C.3.2 - 01

Date: 2/12/2021 Schematic Design

[illegible]

MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines) see also accompanying Notes to Space Summary for highlighted revisions			
ROOM NFA ¹	# OF RMS	area totals	Comments
		46,670	
850	33	28,050	825 SF min - 950 SF max
100	33	3,300	
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	825-950 SF equal to surrounding classrooms
60	6	360	
500	3	1,500	1/2 size Genl. Cirm.
500	3	1,500	1/2 size Genl. Cirm.
		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	1	200	
75	4	300	
500	1	500	
		127,620	
1,440	1	1,440	Assumed use - 100% Population - 5 times/week; 825 SF - 2,000 SF
7,520	1	7,520	
12,650	1	12,650	
3,190	1	3,190	
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	
4,620	1	4,620	
2,025	1	2,025	
12,375	1	12,375	
5,875	1	5,875	
9,200	1	9,200	
7,400	1	7,400	
8,550	1	8,550	
5,170	1	5,170	
5,170	1	5,170	
2,930	1	2,930	
5,875	1	5,875	
		25,160	Excess PE Spaces Policy
12,000	1	12,000	
3,000	1	3,000	
300	1	300	

Date: 2/12/2021 Schematic Design

PROPOSED								
Existing to Remain/Renovated			New			Total		
ROOM NFA ¹	# OF RMS	area totals	ROOM NFA ¹	# OF RMS	area totals	ROOM NFA ¹	# OF RMS	area totals
		0	2,318	2	4,635		2	4,635
			1,350	2	2,700		2	2,700
		0	114	4	455		4	455
		0	195	1	195		1	195
			90	1	90		1	90
		0	165	4	660		4	660
			215	1	215		1	215
		0	930	1	930		1	930
		0			5,375			5,375
		0	4,060	1	4,060		1	4,060
		0	335	1	335			335
			155	1	155		1	155
			117	3	350		3	350
			475	1	475		1	475
		0			10,865			10,865
		0	9,295	1	9,295		1	9,295
		0		0	0		0	0
		0	575	1	575		1	575
		0	308	2	615		2	615
		0	190	2	380		2	380
		0			13,055			13,055
		0	8,015	1	8,015		1	8,015
		0	335	1	335		1	335
		0	1,090	1	1,090		1	1,090
			300	0	0		0	0
		0	3,000	1	3,000		1	3,000
			600	0	0		0	0
		0	615	1	615		1	615
		0			1,340			1,340
		0	68	2	135		2	135
		0	145	4	580		4	580
		0	118	3	355		3	355
		0	270	1	270		1	270
		0			9,380			9,380
		0	131	4	525		4	525
		0	100	1	100		1	100
		0	265	1	265		1	265
		0	275	1	275		1	275
		0	260	1	260		1	260
		0	135	1	135		1	135
		0	153	2	305		2	305
		0	142	5	710		5	710
		0	167	5	835		5	835
		0	120	7	840		7	840
		0	115	1	115		1	115
		0	340	1	340		1	340
		0	292	3	875		3	875
		0	142	12	1,705		12	1,705
		0	100	0	0		0	0
		0	100	1	100		1	100
			980	1	980		1	980
			0	0	0		0	0
			795	1	795		1	795
			220	1	220		1	220

MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines) see also accompanying Notes to Space Summary for highlighted revisions			
ROOM NFA ¹	# OF RMS	area totals	Comments
8,960	1	8,960	5.6 sf/student total
500	1	500	
150	1	150	
250	1	250	
		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
650	1	650	20 SF/Occupant
		1,410	
60	1	60	
250	1	250	
100	4	400	
100	7	700	
		5,795	
800	1	800	
100	1	100	
200	1	200	
200	1	200	
375	1	375	
125	1	125	
150	1	150	
150	2	300	
120	1	120	
450	1	450	
150	8	1,200	
100	1	100	
100	1	100	
550	1	550	
225	1	225	
800	1	800	

Proposed Space Summary - High Schools

1,600 Students

Northeast Metro Tech	Existing Conditions		
ROOM TYPE	ROOM NFA ¹	# OF RMS	area totals

PROPOSED								
Existing to Remain/Renovated			New			Total		
ROOM NFA ¹	# OF RMS	area totals	ROOM NFA ¹	# OF RMS	area totals	ROOM NFA ¹	# OF RMS	area totals

Difference to MSBA Guidelines		
ROOM NFA1	# OF RMS	area totals

Date: 2/12/2021 Schematic Design			
MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines) see also accompanying Notes to Space Summary for highlighted revisions			
ROOM NFA ¹	# OF RMS	area totals	Comments

171
172
173
174
175
176
177
178
179
180

I hereby

Name of Architect Firm: Drummey Rosane Anderson, Inc.

Name of Principal Architect: Carl Franceschi

Signature of Principal Architect:

Date: 5/26/2023

SPACE SUMMARY

SPACE MEASUREMENT ANALYSIS W/ DESIGNER CERTIFICATION

6C.3.2 - 02

SPACE MEASUREMENT ANALYSIS W/ DESIGNER CERTIFICATION

DRA has completed a space measurement analysis of the 90% 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.

The following table communicates designed square footages relative to the proposed program.

Program Area	Schematic Design SF	90 % CD SF
Core Academic Spaces	51,990	51,765
Special Education	7,070	7,070
Art & Music	0	0
Vocational & Technology	127,755	127,265
Health & Physical Education	25,750	25,715
Media Center	5,455	5,375
Auditorium / Drama	10,505	10,865
Dining & Food Services	13,180	13,055
Medical	1,340	1,340
Administration & Guidance	8,655	9,380
Custodial & Maintenance	4,150	4,160
Other	1,900	1,815
Total Net SF	257,750	257,805
Total Gross SF	386,630	386,630

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

6C.3.2 - 03

COMPARISON OF CURRENT DESIGN W/ FINAL EDUCATIONAL PROGRAM

The following provides rational for square footage deviations between the Schematic Design and 90% 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 2nd, 2021 submission.

Special Education spaces meet the square footage and location requirements as approved by DESE and included in the MSBA Schematic Design 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 90% Construction Documents.
- All the General Classrooms comply within MSBA's square footage guidelines (825 SF minimum and maximum of 950 SF).
- All the science classrooms meet MSBA minimum size requirement of 1440 square feet.
- Square footage for **Language Learning** is just below the two-percent threshold.

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 90% Construction Documents.
- The latest minor revisions are consistent with previous DESE approval of Chapter 74 Program Offerings.

Spaces that were presented at the 60% CD DESE Chapter 74 review meetings are consistent with the spaces shown in the MSBA 90% CD submission.

Layouts for Carpentry and Cosmetology have been revised based on feedback from Vocational Department Heads and industry advisory groups. Please refer 6C.3.2-07 within this submission for revised equipment layouts.

Auditorium / Drama

- Given the unique nature of a Career and Technical High School programs, the Auditorium has been re-envisioned 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 1,610 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 165 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 1,080 SF. Locker counts meet the Physical Education Department requirements.
- The **Athletic Director’s Office** has increased in square footage to accommodate the request for a shower.
- 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 257 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 90% 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 90% 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 school's need for multi-stall toilets rooms located within the cafeteria proper. School protocol is that students are not to leave the cafeteria during their lunch hour. One of the chair storage rooms has been relocated just outside of the Cafeteria.

Medical

- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 90% 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

Since the 60% CD set, additional design meetings have been held with administration and guidance. They have been forward thinking about what types of support positions will be needed for the growing student body. Additional office space has been incorporated into the building, as described below. The square footage for the Administration and Guidance category has increased by 725 sf.

Assistant Principal 's Offices – Voc. Deans, Academic Program Coordinator, Co-op

The square footage for this subcategory has increased by 92 sf to accommodate two (2) additional staff locations.

- At the first-floor Main office an office was added for **Admissions**.
- On the second floor an office was added for **Data & MCAS Coordinator**. It replaces the square footage for what was previously the **Record Room** (see notes below).
- The Co-op Coordinator has been relocated to the Career Center. Square footage related to this space was given back to this subcategory.

Supervisory & Paraprofessional Offices, Attendance, Reception

The square footage for this subcategory has increased by 352 sf to accommodate an additional open office area within the Main Office. The three desks in this area are used as "hot desks" to accommodate the numerous outside support professionals that need a temporary office area.

Guidance / Adj., Diversity Offices

The square footage for this subcategory has increased by 445 sf to accommodate four (4) additional staff locations.

- An **Administrator of Student Services** offices was added with the main office suite, on the first floor.
- On each of the academic floor (2nd, 3rd, and 4th floors) a **Counselor Reception Area** has been added adjacent to Guidance Offices.

Career Center / Classroom

A desk for the Co-op coordinator has been added to the Career Center. No shift in square footage.

Records Room

The District is digitizing all files that do not require a hard copy record. This square footage was redistributed back the Administration & Guidance Category to support additional offices spaces.

Copy & Central Supply Rm

The school utilizes a central copy center and central supply room. A new line item has been added to the Space Summary to accommodate the 220 SF needed for this function. The room is located near the Media Center on the second floor.

Custodial & Maintenance

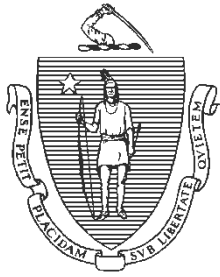
- Minor deviations of square footages to accommodate program layouts and general coordination of MEP /FP and Structural systems during 90% Construction Documents.
- The square footages for **Custodial Storage** and **Storeroom** equalize each other. **Custodial Storage** square footage is greater than 2% and **Storeroom** is below 2%.

Other

- **Adult Education Office** square footage was reduced by 230 SF. This was to accommodate layout changes at the Administration Suite.
- An **Assistant Superintendents** position has been created to help run the new high school. A line item has been added to the space summary with 145 sf assigned to it.
- **The Business Office Suite** was reorganized to have six enclosed offices, an open office and a waiting room. Room Count has changed from seven to eight.
- Square footage of the non-reimbursable **Maintenance Garage** has increased from 1,800 to 10,400.
- Square footage of the non-reimbursable **Concessions Building** has increased from 1,400 to 1,830 to increase toilet room occupant capacity. This is to accommodate the additional grandstand capacity that would come with the acceptance of Add Alternates No.2.

SPACE SUMMARY

DESE APPROVED SPED SPACES



Jeffrey C. Riley
Commissioner

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

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,

A handwritten signature in cursive script, appearing to read "Matt Deninger".

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

6C.3.2 - 05

6C.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.

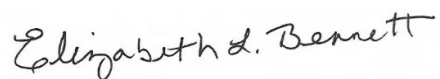
Based on our review and evidence of the completed components required of the Chapter 74 Vocational Technical Education Viability Documentation including items required for new and expanding programs, we are satisfied that the planning for the CTE program offerings the District is proposing for this school 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 Enrollment	Proposed 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 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 Enrollment	Proposed 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 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

DESE CHAPTER 74 MEETING SUMMARY

6C.3.2 – 07

DESE CHAPTER 74 MEETING SUMMARY

Meeting Dates

The project team met on two occasions with the Massachusetts Department of Elementary and Secondary Education (DESE) to discuss the Chapter 74 career/vocational technical education programs that are a part of the NE Metro Tech project.

We met on January 26th, 2023 with another meeting on February 13th, 2023 to continue discussions from the first meeting.

In Attendance

DESE	Elizabeth Bennett & Lisa Sandler
MSBA	Allison Sullivan, Nina Pappacostas, Mary Pichetti & Lee Deveau
NE Metro Tech	Superintendent David DiBarri & Principal Carla Scuzzarella
PMA	Kevin Nigro, Joe DeSantis, Anthony LoPresti & Marco Zappala
DRA Architects	Vladimir Lyubetsky & Sarah Carda
Point Line Space	Aaron Constable & Pauravi Teabo

Program Layout Changes Since DESE Meeting

Carpentry

Since our last meeting with DESE, design meetings have continued with the Carpentry department head. The layout of the shop floor has been revised to allow all the workbenches to be grouped together.

This revised layout improves the workflow from storage of materials, to cutting down materials, to refining materials and finally assembly at the worktables.

Attached is the revised equipment layout for Carpentry.

Cosmetology

Since our last meeting with DESE, design meetings have been held with the new Cosmetology department head. Layout of the shop has been revised to allow dual access the Facials and Dispensary rooms from either salon area.

Attached is the revised equipment layout for Cosmetology.

DESE Review Comments

Vocational Shop Signage

- Add an additional Fire Extinguisher Sign with a "Fire Blanket" added to the wording.

Auto Collision Repair

- Equipment Item AC14, Vinyl Printer: Concern that printer needs to be ventilated. Point Line Space confirmed with the manufacturer and the Printer does not need to be ventilated.
- Discussion that career tech programs are moving towards tool chests and not tool cribs.
- Add an E-Stop in Related Classroom that deactivates any electrified equipment in this room.

Automotive Technology

- Add a fire extinguisher with blanket in the Related Classroom and Small Engines Room.
- Add an E-Stop in Related Classroom that deactivates any electrified equipment in this room.
- Add an eye wash in the Small Engines Room.
- DESE commented that small engine work is not a large part of the framework. NE Metro responded that they are used to describe how a small combustion engine works and that there are many similarities to a vehicle's combustion engine. They use this space with Lower Classmen to provide a cursory understanding.

Business Office Technology

- No comments.

Carpentry

- Add an additional E-Stop on the shop floor near the CNC.

Cosmetology

- No Comments

Culinary Arts

- Add an E-Stop and Eyewash within the Theory Room.

Dental Assisting

- At another school project, the doors at Intraoral and Pano rooms deactivate the power at the x-ray machines when opened.
- DESE questioned should there be E-Stops in each of the X-ray rooms. The Design Team stated that they typically do not add E-Stop in these spaces. DESE will review other projects and get back to the Design Team.

Design and Visual Communications

- Add an additional E-Stop near the Hole Punch / Wire Stitcher.

Drafting and Design

- Within the Maker Space add an E-Stop that deactivates any electrified equipment in this room.
- Existing 3-D Printers that are being relocated to the Maker Space do not require ventilation. DESE has asked the Design Team to look at current 3-D Printers on the market to confirm that the trend is not to ventilate these types of printers.

Early Childhood Education

- DESE has asked the Design Team to confirm there are no protruding pipes on the Rooftop Playground.

Electrical Technology

- No comments.

Health Assisting

- No comments.

HVAC Technology

- No comments.

Metal Fabrications

- Add a fire blank to the fire extinguisher located near the corridor door.
- Add two additional fire extinguishers with blankets. One the right of the underclassmen welding booths and one to the right of the upperclassmen welding booths.

Plumbing & Pipefitting

- No comments.

Robotics & Automation

- Add a fire blanket to the fire extinguisher located in the Fabrication Lab.

Biotechnology

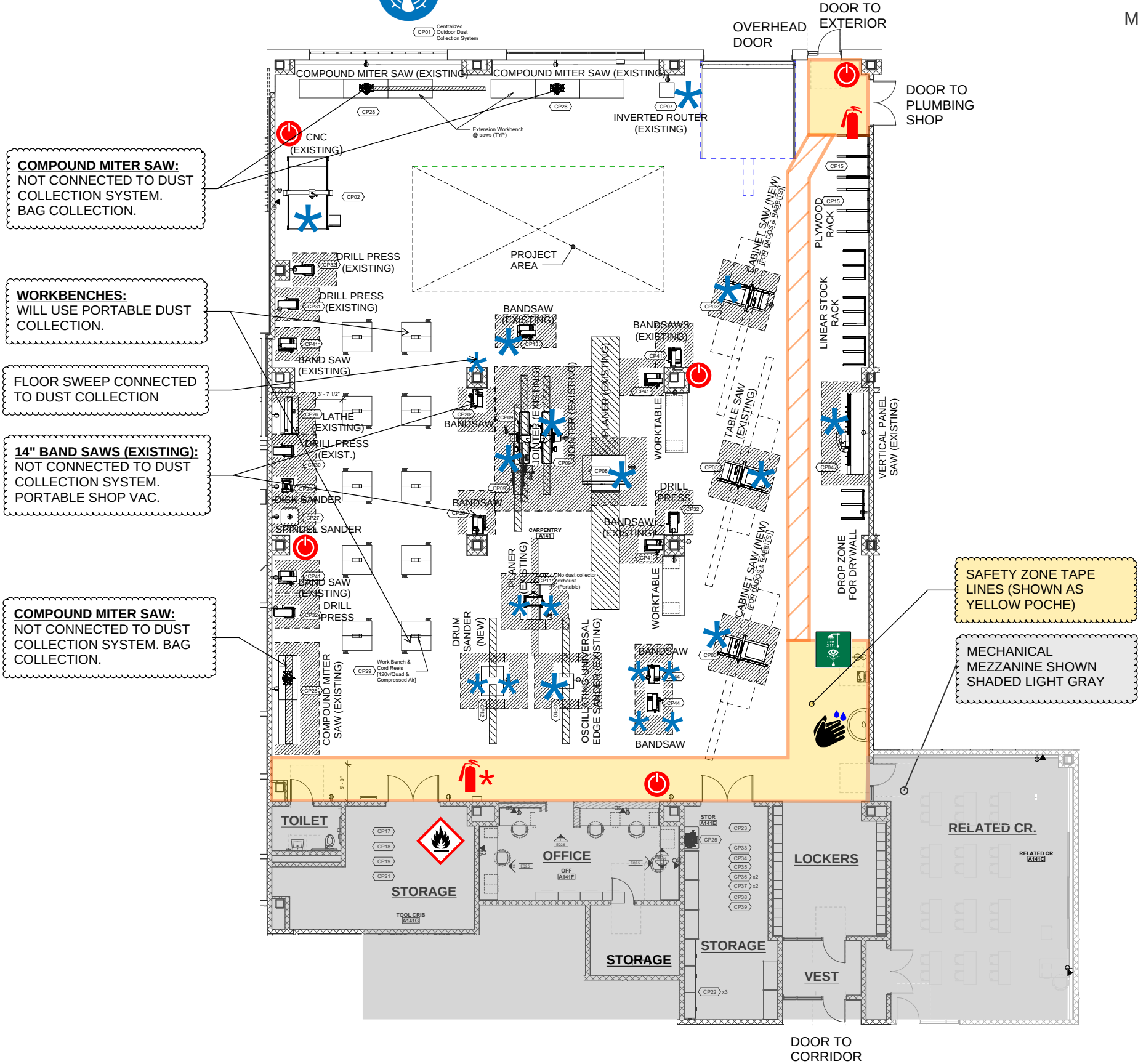
- Add eyewash in the Lab.

Marketing

- No comments.

Medical Assisting

- No comments.



Legend

Ventilation to Exterior Required

Emergency Power Off (EPO)

Emergency Shower/Eyewash Combination Unit

Emergency Eyewash

Fire Extinguisher

Flammable Storage Cabinet

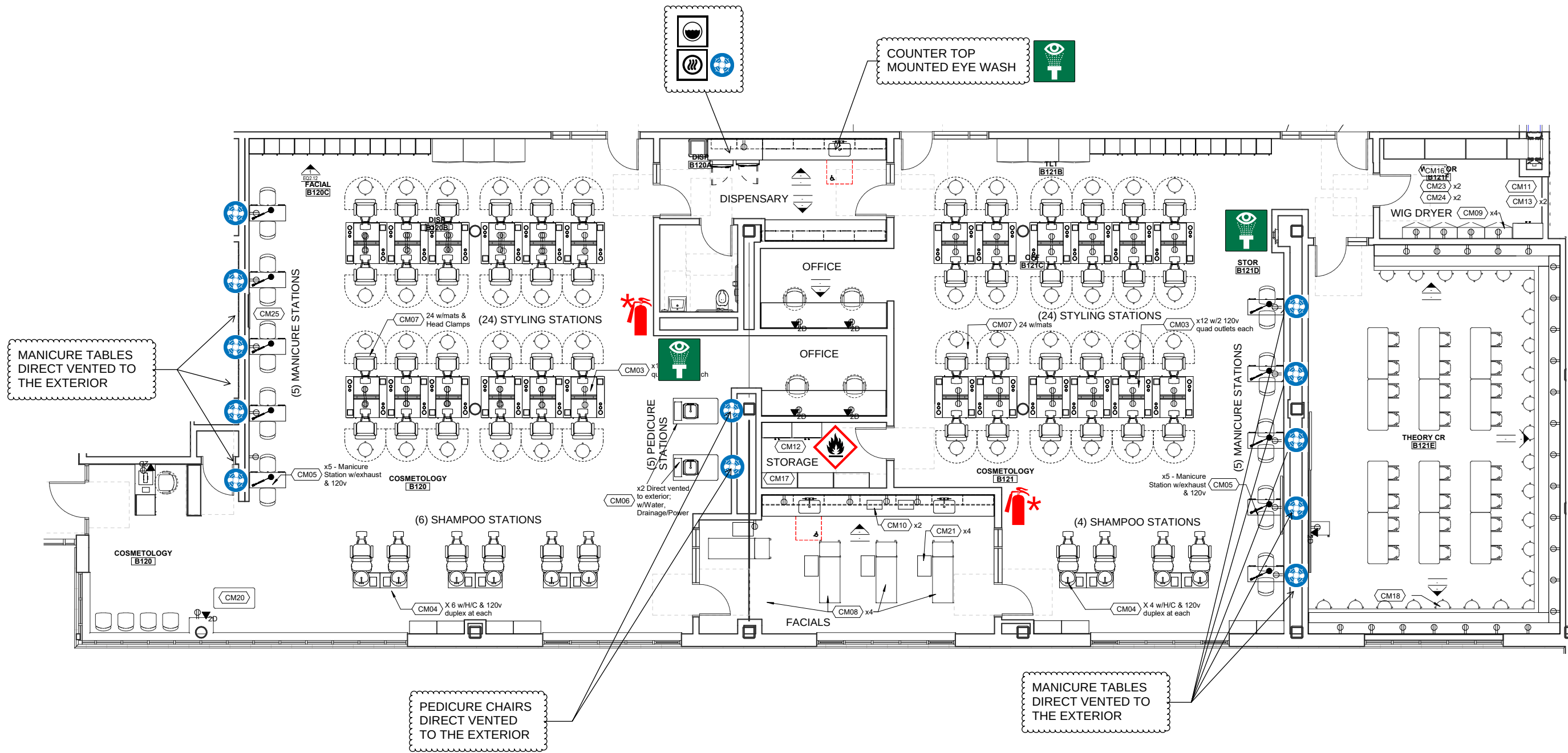
Goggle Cabinet

Hand Washing Station

Washer & Dryer

*Equipment Connected to Dust Collector

*Includes Fire Blanket



Legend



Ventilation to Exterior Required



Emergency Power Off (EPO)



Emergency Shower/Eyewash Combination Unit



Emergency Eyewash



Fire Extinguisher



Flammable Storage Cabinet



Goggle Cabinet



Hand Washing Station



Washer & Dryer



*Equipment Vented to Exhaust Hood



*Includes Fire Blanket

SPACE SUMMARY

COMPARISON OF CURRENT DESIGN W/ DESE APPROVED CHAPTER 74 PROGRAM SPACES

6C.3.2-08

COMPARISON OF CURRENT DESIGN W/ DESE APPROVED CHAPTER 74 PROGRAM SPACES

DRA has completed a space measurement analysis of the 90% 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 90% Construction Documents are less than 1.5% for each of the Chapter 74 programs.

Chapter 74 Program Offering	Schematic Design Space Summary	90% Construction Document Sq. Ft.
Automotive Collision Repair	7,580	7,605
Automotive Technology	12,615	12,530
Business Office Technology	3,180	3,200
Carpentry	10,280	10,140
Cosmetology	5,890	5,880
Culinary Arts	6,000	6,045
Dental Assisting	6,500	6,415
Design & Visual Communications	5,240	5,215
Drafting & Design	4,580	4,575
Early Childhood Education	2,060	2,065
Electrical Technology	12,335	12,225
Health Assisting	5,790	5,750
HVAC Technology	9,140	9,105
Metal Fabrication	7,400	7,410
Plumbing & Pipefitting	8,665	8,625
Robotics & Automation	5,175	5,170
Exploratory (freshmen)	0	0
Biotechnology	5,135	5,100
Marketing	2,975	2,990
Medical Assisting	5,780	5,800
Totals	126,320 Square Feet	125,845 Square Feet

01 Project Approvals Narrative

01a Zoning Board of Appeals Decision Letter

01b Traffic Letter

02 Utility Company Narrative

02a Electrical Load Letter

02b Gas Company Utility Letter

6C.3.3

PROJECT APPROVALS

PROJECT APPROVALS

PROJECT APPROVALS NARRATIVE

6C.3.3 - 01

6C.3.3-01

PROJECT APPROVALS

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. Gilbane Building Company was hired by the District.

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.

Chapter 74 programs, such as Dental, Medical & Health Technology, are not performing procedures on patients.

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.

A follow-up meeting with the Wakefield Fire Department took place on April 21, 2023. We met with Thomas Purcell, Deputy Fire Chief to follow up on earlier discussions and to confirm that design was in compliance with their earlier requests.

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.

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 closed on May 16, 2023. A decision will be voted on within 21 days of the close of the public hearing. Peer reviews for the project have been completed by Town of Wakefield consultants and the Town of Wakefield Engineering Department, with the comment responses having been incorporated into revised plans.

Town of Wakefield - Utility Connections (Sewer & Water)

The Town of Wakefield Engineering Department has provided comments regarding the sewer and water connections as part of their review of the project. The new water connection was adjusted to incorporate their comment on its location. There were no comments on the sewer connection.

Review and issuance of the connection permits to be completed by the Construction Manager during construction.

Town of Wakefield - Traffic Advisory Committee (TAC)

Recommendations from the Traffic Advisory Committee were forwarded to the Zoning Board of Appeals (ZBA). ZBA has closed their hearing.

The decision has been made that the roundabout as shown at the Farm Street intersection will be designed, funded and built by the Town of Wakefield.

A copy of TAC's recommendation can be found in section 6C.3.3-01b of this submission.

Town of Wakefield - Local Zoning

The District received a decision letter from the Town of Wakefield's Zoning Board of Appeals on May 4, 2023. A copy of this letter can be found in section 6C.3.3-01a of this submission.

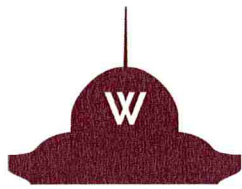
The project can be in noncompliance with the following bylaws as noted within their decision letter:

- 190-21A Parking Unregistered Vehicles
- 190-13C(1) Yard Requirements
- 190-31E Exemptions to Maximum Height Regulations
- 190-31K Substantially Irregular Lot Shape
- 190-37E Landscaping of Parking Lots

6C.3.3 – 01a

ZONING BOARD
OF APPEALS
DECISION LETTER

PROJECT
APPROVAL



TOWN OF WAKEFIELD

BOARD OF APPEALS

May 4, 2023

Attorney Adam Brillard
Prince Lobel Tye LLP
One International Place, Suite 3700
Boston, MA 02110

RE: **100 HEMLOCK ROAD**
NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT

Dear Attorney Brillard:

Enclosed is a copy of the Decision(s) of the Board of Appeals. If there were any restrictions or conditions noted in the Decision(s) it is necessary that you comply with them.

The original Decision(s) were filed with the Town Clerk on **MAY 4, 2023**. After twenty (20) days have elapsed from the date of the Decision(s) were filed in the office of the Town Clerk, and no appeal has been filed, or if such appeal has been filed and was either dismissed or denied, you shall obtain from the Town Clerk a copy of the Decision(s) with the Town Clerk's Certification. The Decision(s) certified by the Town Clerk, is to be recorded by you, at your expense, in the Registry of Deeds at Cambridge, MA and indexed in the grantor index under the name of the owner of record. No Building Permit will be issued until evidence of such recording is provided to the Building Inspector.

Please note that a building/occupancy permit must be obtained from the Building Inspector prior to the initiation of any construction work or actual occupancy.

Very truly yours,

David Hatfield, Chairman
Wakefield Zoning Board of Appeals

Cc: Town Engineer, Community & Economic Development
Planning Board, Board of Health,
Fire Chief, Fire Superintendent (Randy Hudson)



2023 MAY -4 AM 9:21

WAKEFIELD, MASS.

**DECISION OF THE WAKEFIELD BOARD OF APPEALS PURSUANT TO
M.G.L. CHAPTER 40A, SECTION 8 AND ARTICLE X, SECTION 190-65 OF
THE WAKEFIELD ZONING BYLAW AND RELATING TO PROPERTY
SHOWN AS LOT 0RS, MAP 40A ON THE TOWN OF WAKEFIELD
ASSESSORS MAP AND KNOWN AND NUMBERED AS 100 HEMLOCK ROAD,
WAKEFIELD, MASSACHUSETTS**

DECISION of the Board of Appeals (the “Board”) on the Appeal and Application of **NORTHEAST METROPOLITAN REGIONAL VOCATIONAL SCHOOL DISTRICT** (the “Applicant”) asking the Board to review a decision of the Building Inspector pursuant to MGL Chapter 40A, Section 8 and Article X, Section 190-65 of the Wakefield Zoning Bylaw (the “Bylaw”) relating to property, owned by the Applicant, known and numbered as 100 Hemlock Road, Wakefield, Massachusetts (the “Property”). The Property is shown as Lot 0RS on Map 40A of the Wakefield Assessor’s Maps and is located in the Single Residence Zoning District.

Procedural History

1. The Applicant requested a Building Permit from the Wakefield Building Inspector (the “Building Inspector”) for the construction of a new Northeast Metropolitan Vocational Technical High School (the “NEMT”) on the Property.
2. The Building Inspector issued a letter dated February 9, 2023 denying the Applicant’s request for a Building Permit due to his decision that “...the proposed project would contain zoning violations and that your client may be protected under MGL Chapter 40A, Section 3 with respect to some or all of them.” (the “Building Inspector’s Decision”)
3. The Applicant subsequently filed an appeal of the Building Inspector’s Decision with the Board as a party aggrieved on February 21, 2023.
4. Notice of a Public Hearing to the Applicant and to owners of all property affected, as they appeared in the last local tax list, was given by mail, and by advertising in the Wakefield Daily Item and by displaying in a prominent place in the Town Hall as required by Massachusetts General Laws. Attorney Adam F. Braillard of the law firm Prince Lobel Tye LLP with offices at One International Place, Suite 3700, Boston, Massachusetts represented the Applicant. Pursuant to said notice and advertisement, a public hearing on the application was opened via remote participation (Zoom) on Wednesday March 22, 2023. The hearings were continued to April 12 and then to April 26, 2023, at which time the Board closed the public hearing to further comment by the public, and the Board held its

deliberations on the question of whether to overturn the Building Inspector's Decision. A vote by five (5) members of the Board who are sitting on this case, each of whom was eligible to vote on this application, was taken on April 26, 2023. On that date, the Board unanimously voted (5 to 0) to overturn the Building Inspector's Decision, pursuant to MGL Chapter 40A, Section 8 and Article X, Section 190-65, subject to the Board's Conditions summarized below.

Materials, Documents, and Correspondence Submitted to the Board

The Applicant submitted the following materials:

1. Site Plans prepared by Drummey Rosane Anderson, Inc. entitled "Northeast Metro Technical High School, Wakefield, Massachusetts" dated January 30, 2023 and revised April 4, 2023 consisting of the sheets listed below (the "Site Plan"):
 - Zoning Site Plans & Zoning Table (Z-100, 2 pages) - dated April 4, 2023
 - Drainage Plans (C400-C405) – dated March 30, 2023
 - Utility Site Plans (C500-C505) – dated March 30, 2023
 - Driveway Layout & Grading Plans (C600-C605) – dated March 30, 2023
 - Materials Plan (L301-L305) – dated March 31, 2023
 - Grading Plans (L401-L405) – dated March 31, 2023
 - Building Elevations
 - Street Views
2. Architectural drawings prepared by Drummey Rosane Anderson, Inc. entitled "Northeast Metropolitan Regional Vocational High School, 100 Hemlock Road, Wakefield, Massachusetts, 01880" dated February 17, 2023 (the "Architectural Drawings").
3. Wetlands Delineation Plans dated December 6, 2022.
4. Proposed Space Summary – High Schools prepared by Drummey Rosane Anderson, Inc. dated June 30, 2021.
5. Northeast Metro Tech (NEMT), Wakefield, MA Zoning Analysis Table, dated April 24, 2023.
6. Traffic Impact Study prepared by Nitsch Engineering dated June 29, 2021.
7. Stormwater Report prepared by Nitsch Engineering dated September 21, 2022 and revised through April 24, 2023.

The Board also received the following correspondence:

1. Memoranda from the Wakefield Department of Public Works Engineering Division dated March 15, 2023, March 22, 2023, April 12, 2023, and April 25, 2023.

2. Memorandum from the Wakefield Commission on Disabilities dated March 22, 2023.
3. Memorandum from the Wakefield Traffic Advisory Committee (TAC) traffic consultant VHB dated March 22, 2023.
4. Memorandum from the Wakefield Planning Board dated March 21, 2023.
5. Memorandum from the Wakefield Community and Economic Development Director dated March 16, 2023.
6. E-mail from Kelly Slater dated April 26, 2023.
7. E-mail from Julie Scott dated March 22, 2023.
8. E-mails between Bob Brooks and William Renault (Town Engineer) dated March 20-21, 2023.
9. E-mail from Kenneth & Margaret Young dated March 20, 2023.
10. Memorandum from Peter Scott and Brian Thomson dated April 3, 2023.

Findings

The Applicant is proposing changes, extensions, and/or alterations to the Property including construction of a new NEMT, as shown on the Site Plan and Architectural Drawings. The Board recognized that while an educational use is allowed in the Single Residence Zoning District, even if it were not allowed, NEMT's use would be exempt from zoning pursuant to M.G.L. Chapter 40A Section 3.

The Applicant stated and the Board agreed that while pursuant to M.G.L. Chapter 40A, Section 3 the Bylaw could not restrict the use of land or structures for educational purposes, the land could, however, be subject to reasonable regulations concerning such things as bulk, height, lot area, setback, open space, parking and building coverage.

At the Public Hearing, the Site Plan, Architectural Drawings, and other materials were reviewed by the Board, and testimony was presented by the Applicant. Public testimony was also invited and received during the hearings.

The Board determined that the proposed changes, extensions, and/or alterations to the Property as shown on the Site Plan and Architectural Drawings met many of the Bylaw requirements in the Single Residence zone.

The Board also determined that under M.G.L. Chapter 40A, Section 3, the Applicant met the burden of proving to the Board that the requirements of the Bylaw, including, but not limited to, Article IV & VI and Table 2, are unreasonable as applied to the proposed changes, extensions, and/or alterations to the Property including construction of a new NEMT building as shown on the Site Plan and Architectural Drawings, and thus, said proposal as depicted on the Site Plan and Architectural Drawings is allowed to proceed notwithstanding noncompliance with the following requirements of the Bylaw:

- 190-21A - Parking Unregistered Vehicles
 - Automotive Technology is one of NEMT's programs that necessarily involves the storage of unregistered vehicles on site for students' educational use. Such NEMT vehicles are not stored between the principal building and a street line. It is unreasonable to apply this Single Family Residence zone requirement to a vocational school.
- 190-31C(1) - Yard Requirements
 - Proposed Driveway width is 24 feet. This represents two lanes to allow for safe two-way traffic. During morning arrival and afternoon dismissal, there will be significant two-way traffic of passenger vehicles and buses. The twelve-foot wide travel lanes are also reasonable and appropriate to accommodate the curved alignment of the driveway. It is unreasonable to apply this Single Family Residence zone requirement to a vocational school.
- 190-31E - Exemptions to maximum height regulations
 - Buildings with 2.5 stories are permitted in a Single Residence zone. The proposed new school is 5 stories. Required Educational Program calls for 386,000 square feet; to minimize environmental impact, design proposes compact footprint and multi-story building. It is unreasonable to apply Single Family Residence zone requirements to a 386,000 square foot vocational school on a lot of this size.
 - Buildings up to 35 feet in height are permitted in a Single Residence zone. The Proposed new school is 68 feet. Required Educational Program calls for 386,000 square feet; to minimize environmental impact, design proposes compact footprint and multi-story building. Certain Vocational spaces require 20 feet floor-to-floor height. It is unreasonable to apply this Single Family Residence zone requirement to a vocational school on a lot of this size.
- 190-31K – Substantially Irregular Lot Shape
 - The Project complies to the extent applicable. The requirements of this section for a regularity coefficient of 0.65 where the current lot has regularity coefficient of 0.43 are nonetheless met as these requirements are waivable for any lot that can contain an inscribed shape that meets the coefficient of regularity. Here, the 2.5 million square foot lot can handily contain a conforming lot of 4,000 square feet (e.g. 50'x80'), thereby

meeting this requirement in addition to being a preexisting condition on the Property. To the extent the project does not comply, it is unreasonable to apply Single Family Residence Zone requirements to a vocational school on a lot of this size.

- 190-37E – Landscaping of Parking Lots
 - Parking lots are required to include certain landscaping depending on their size. The proposed parking meets the required number of parking spaces, and the design of the parking lots accommodates the required drainage necessary for the project, while accounting for a compact footprint thereby minimizing environmental impacts. While this provision is a landscaping requirement such that NEMT is exempt from compliance pursuant to Chapter 40A, Section 3, for the avoidance of doubt, all vehicles parked on in these lots will be for educational purposes, and therefore it is unreasonable to apply this Single Family Residence Zone requirement to a vocational school.

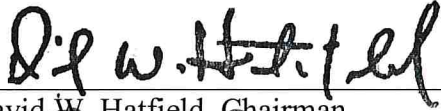
Decision

After careful review of all testimony and evidence submitted, the Board unanimously voted (5-0) to overturn the Building Inspector's Decision, pursuant to MGL Chapter 40A, Section 8 and Article X, Section 190-65 of the Bylaw, and in doing so approve the Applicant's proposed changes, extensions, and/or alterations to the Property including construction of a new NEMT building as shown on the Site Plan and Architectural Drawings.

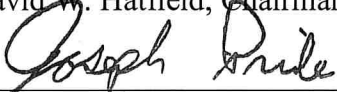
The Board's vote is based on the following and thus they shall be Conditions of this decision:

1. Conformity With Plans: The new NEMT building shall be constructed on the Property in conformance with the Site Plan and the Architectural Drawings.
2. The Board retains jurisdiction to make any necessary clarification(s) of this decision which cannot be resolved by the Building Inspector or Zoning Enforcement Officer.
3. The Board retains jurisdiction to approve any minor amendments to this decision that do not materially alter the terms of this decision. If, in the Board's judgment, a proposed change is material, then a new hearing shall be required to amend this decision.

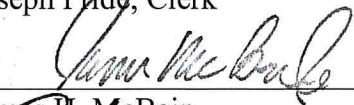
The Board certifies that this Decision has been filed with the Wakefield Town Clerk and the Planning Board. Any person aggrieved by the Decision of the Board has the right to appeal to the Land Court or Superior Court within twenty (20) days from the date of filing of this Decision with the Town Clerk under Section 17 of the Massachusetts General Law, Chapter 40(A).



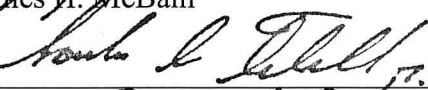
David W. Hatfield, Chairman



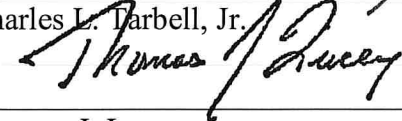
Joseph Pride, Clerk



James H. McBain



Charles L. Darbell, Jr.



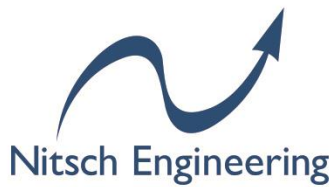
Thomas J. Lucey

**WAKEFIELD BOARD OF APPEALS
MAY 4, 2023**

6C.3.3 – 01b

TRAFFIC LETTER

**–
PROJECT
APPROVALS**



2 Center Plaza, Suite 430
Boston, MA 02108-1928
T: 617-338-0063
F: 617-338-6472
www.nitscheng.com

May 15, 2023

Mr. Vladimir Lyubetsky
Principal
Drumney Rosane Anderson, Inc.
260 Charles Street, Suite 300
Waltham, MA 02453

RE: Nitsch Proposal/Project #13872
NEMT
Traffic Permitting Summary

Dear Vladimir::

As requested Nitsch Engineering has prepared this summer of the traffic/transportation permitting for the Northeast Metro Tech Vocational School in Wakefield, MA. The project attended three public hearings with the Town of Wakefield, Traffic Advisory Committee (TAC) Those meeting were held on:

June 24, 2022;
October 21, 2022; and
February 10, 2023.

The Town of Wakefield TAC reviews all transportation related aspects of projects and provides recommendations to the Town of Wakefield Zoning Board of Appeals for their action.

On March 22, 2023 the TAC consultant, Matt Kealy, P.E., PTOE provided a memo (attached) to the Chair of the TAC indicating that the project has complied with their requests and that they take no issue with the design. A March 22, 2023 memo (also attached), from the Town of Wakefield Department of Public Works, Engineering Division to the Town of Wakefield Zoning Board of Appeals takes no issue with the transportation related aspects of the project.

On April 26, 2023, the Town of Wakefield Zoning Board of Appeals voted to approve the project, thus completing the transportation related permitting process with the Town of Wakefield.

Very truly yours,

Nitsch Engineering, Inc.



David M. Conway, P.E.
Senior Project Manager

Enclosures: Memo dated March 22, 2023 from Town of Wakefield, Department of Public Works; Mem dated March 22, 2023 from Matt Kealey, P.E., PTOE, VHB to Wakefield Traffic Advisory Committee

P:\10000-14999\13872 NEMT Study\Correspondence\Outgoing\2023-05-15 TAC Ltr\NEMT-TAC Letter.docx



Memorandum

To: Lt. Joseph Anderson, Chair
Wakefield Traffic Advisory Comm.
Mr. Steven Maio
Wakefield Town Administrator

Date: March 22, 2023

Project #: 06298.01

From: Matt Kealey, P.E., PTOE
Senior Project Manager

Re: NEMT Traffic Memo Review

As part of the Traffic Advisory Committee's (TAC) review of the proposed Northeast Metropolitan Regional Vocational High School (NEMT) VHB has reviewed materials provided by Nitsch Engineering and the NEMT project team. These materials included the Traffic Impact Study prepared by Nitsch in June 2021 as well as site plans and conceptual plans for offsite improvements. In addition to the document review, detailed discussions were held most recently at the October 21, 2022 and February 10, 2023 TAC meetings. The following provides a brief summary of the review.

- **Traffic Impact Study** – As part of the TAC's review of the NEMT and Wakefield Memorial High School (WMHS) projects, extensive review was conducted for the traffic impact studies prepared for both projects. Based on VHB's review and discussions held at past TAC meeting with the NEMT and WMHS engineering teams, VHB has no outstanding comments or questions related to the traffic analyses prepared to date.
- **Site Access** – The proposed plans for the NEMT campus include the construction of a new access driveway on Farm Street just south of the southern intersection of Farm Street and Old Nahant Road. Prior to the October 21, 2022 TAC meeting, NEMT provided two conceptual plans for traffic control at the intersection of the proposed driveway at Farm Street:
 - **Traffic Signal Control** – This plan included installation of a new traffic signal at the proposed driveway. No widening of Farm Street was proposed, but Farm Street would be restriped to provide a brief left-turn lane on the southbound approach and a brief right-turn lane on the northbound approach. The proposed site driveway approach provided exclusive left and right turn lanes. No proposed sidewalks were shown on the plan.

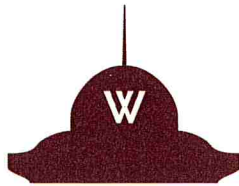
VHB and the TAC had significant concerns related to the traffic signal option. VHB noted that based on initial analyses, traffic signal warrants were not met at this intersection. Subsequent analyses provided by Nitsch demonstrated that a peak hour signal warrant could be met. However, installation of a new traffic signal solely based on a peak hour warrant is not common practice. In addition, based on discussions with the Wakefield Police, speeding on this segment of Farm Street is a significant concern with vehicles sometimes traveling over 50 mph. While installation of a signal would facilitate access to NEMT, it would not address speeding and safety concerns on Farm Street. For these primary reasons, the TAC does not support the traffic signal option.
 - **Roundabout Control** – This plan included installation of a roundabout at the proposed driveway. Widening on the west side of Farm Street is required to accommodate the roundabout layout. The conceptual layout provides single-lane approaches and a single circulating lane. The initial conceptual layout showed no proposed sidewalks on the site driveway.

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Based on subsequent discussions regarding the layout of the roundabout and the site driveway, the TAC requested sidewalks along the proposed site driveway. As part of the conceptual layout plan shown at the February 10, 2023 TAC meeting, sidewalks were shown on the east side of Farm Street and on the north side of the proposed site driveway. There was extensive discussion at the February meeting regarding sidewalks and pedestrian connectivity through the site. The TAC requested sidewalk connections to the guard shack, the rear parking lots and Breakheart Reservation.

The TAC supports the installation of the new access road with a roundabout at the intersection of Farm Street. The roundabout will provide safe operations for NEMT and will also provide traffic calming along Farm Street, which should lead to a reduction in vehicle speeds in the area. The new access road will provide a second egress to the site improving emergency services and improving operations at the Farm Street and Hemlock Road intersection.

- **Sidewalks** – The TAC requested the applicant expand the internal sidewalk network to provide pedestrian access between the end of Hemlock Road and Breakheart. Additionally the TAC recommended sidewalk network be expanded to the new parking facilities between football field, baseball field and track.
- **Recommendations** –
 - NEMT should continue to coordinate with the Town on the design of the roundabout
 - NEMT should provide updates on sidewalk connections throughout the site



TOWN OF WAKEFIELD

DEPARTMENT OF PUBLIC WORKS

Engineering Division

To: David W. Hatfield
Zoning Board of Appeals Chair

Date: March 22, 2023

From: Tim Wilson, Sr. Civil Engineer *TW 3/22/23* Project#: 10281

CC: William Renault, P.E., Town Engineer *WR 3/22/23*

Subject: Northeast Metropolitan Regional Vocational
High School

The DPW Engineering Division reviewed the material submitted to the Zoning Board of Appeals (ZBA) dated February 27, 2023 for the above referenced project and has the following comments based on information provided in the submittal:

1. *The Project Supporting Statement* letter in Section 3 of the application gives an explanation of the purpose and applicability of the Dover Amendment in regards to the project and notes that the bylaws they are requesting relief from.

The Engineering Division does not believe the appropriate supporting information has been provided to demonstrate the project complies with the other applicable Town's zoning bylaws with respect to the *bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements*.

The applicant should provide a typical set of site plans (layout, grading, landscaping and utility plans), architectural plans to allow for proper project review and provide a narrative of any mitigation measures, screening, landscaping, etc. proposed to offset impacts to the abutters and Town.

2. Article VII of the Zoning Bylaw - Parking Loading Requirements note the need for proper management of stormwater, screening and lighting for parking facilities. The applicant should provide appropriate backup to ensure these measures are being addressed within the design.

Please note the Engineering Division is concurrently working with the Conservation Commission to review project's Stormwater Management Plan. The Division's current drainage comments were provided under separate cover to the ZBA. The current design requires revisions to the layout and drainage to meet the requisite no net stormwater volume and runoff requirement.

3. The Town has requested the project implement a roundabout at the Farm Street entrance to enhance safety for all modes of transportation and implement traffic calming measures. **The Town**



has agreed to perform design, permitting and manage the construction of the roundabout. The Town has been working with the project design team to coordinate the location and design.

It is imperative that the roundabout is included as part of the project as it will create the safest environment for the entrance/exit proposed on Farm Street. The Engineering Division recommends the ZBA require the roundabout in any decision.

PROJECT APPROVALS

UTILITY COMPANY NARRATIVE

6C.3.3 - 02

6C.3.3 – 02a

ELECTRIC LOAD

LETTER

–

UTILITY

COMPANY



May 12, 2023

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 WMGLD a work order application, load letter, and site plan locating their utility feeders, manholes, and pad mounted transformers for the new electric services for Northeast Metro Technical High School. They have acknowledged receipt of this information and have also acknowledged that there will be new services for this project. Attached at the end of this load letter is our most recent e-mail correspondence regarding the loads.

Very truly yours,

Zachary M. Barrett, P.E.

BALA CONSULTING ENGINEERS

Main Building Services

Electrical Connected Loads

Normal Power

Lighting (0.81W/sf plus 10kW site lighting)	323 kW
Receptacles (3W/sf)	1161 kW
Electric Vehicle Charging (Separately metered)	29 kW
Mechanical:	
• Miscellaneous Electric Heat FTUs and EUHs	176 kW
• Energy Recovery Ventilators (ERVs)	73 kW
• VRF Fan Coil Units	60 kW
• VRF Condensing Units	1373 kW
• Rooftop Units RTUs (2) and HRUs (5)	578 kW
• Makeup Air Units (2)	369 kW
• Indoor Air Handling Units (11)	1597 kW
• Exhaust Fans	90 kW
• Air Cooled Condensing Units (ACCUs)	162 kW
• Miscellaneous AC Split Systems	66 kW
• Dehumidifiers	189 kW
Plumbing:	
• Electric Hot Water Heaters	646 kW
• Miscellaneous Pumps	15 kW
• Air Compressors	121 kW
• Domestic Water Booster Triplex Pump (3 at 10hp)	30 kW
• Miscellaneous	25 kW
Kitchen (Gas)	300 kW
Miscellaneous Equipment	250 kW



Normal Power Total (Before Adding EM/Standby Total): 7,633kW
8,035kVA

Emergency Power (Backed Up By Generator)

Lighting	35 kW
Fire Alarm	30 kW
Fire Pump (50 hp)	30 kW

Standby Power (Backed Up By Generator)

Elevators (two at 40 hp)	80 kW
Telecom Equipment	75 kW

Emergency/Standby Power Total: 250kW
263kVA

All Normal Power Loads Total: 7,883kW
8,298kVA

Electrical Connected Normal Power Loads with Code Applied Demand Factor:

First 1,161kVA at 100%	1,161kVA
Plus	
Next 7,137kVA at 75%	5,353kVA
Demand Total: 6,514kVA	

Site Lighting/Locker Building Service

Electrical Connected Loads

Normal Power

Lighting	7 kW
Sports Lighting	85 kW
Receptacles (3 watt / SF)	25 kW
Electric Vehicle Charging (separately metered)	14 kW
Mechanical	84 kW



Plumbing	90 kW
Telecom	15 kW

Normal Power Total: 320kW
337kVA

Note: The locker building (120 kW of total) and concessions building (75 kW of total) are currently add alternates. Another possible future connection to this transformer is a future maintenance building planned for the eastern side of the site (estimated load 100 kVA).

Normal Power Total Without Locker and Concessions Buildings: 125kW
139kVA

Farm Road Electrical Service

Electrical Connected Loads

Normal Power	
Lighting	2 kW
Miscellaneous Telecom/Signage	10 kW

Normal Power Total: 12kW
13kVA

Based on projected connected loads with code applied demand, calculated estimated demand load is 7,835Amps 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 Company. 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 eastern portion of the site and 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.

Zachary M. Barrett

From: Vincent McMahon <vmcmahon@wmgld.com>
Sent: Friday, April 28, 2023 7:20 AM
To: Zachary M. Barrett; Sean P. Sullivan; Dave Polson
Cc: vlyubetsky@draws.com; Dino D. Buro; Thomas R. Mehaffey
Subject: RE: BALA - Northeast Metrotech Electrical Loads

Hi Zach,

I spoke with Mark Tucker from Gilbane yesterday about temp services. I think we're all set – he will be talking to you about it. For the Eastern part of the project, which is happening in Phase 3 it seems, we'll use the athletic building transformer for temp service. The site trailers will have a separate, smaller temp service that we'll hook up sometime soon.

Vinnie

From: Zachary M. Barrett <zmb@bala.com>
Sent: Wednesday, April 26, 2023 3:27 PM
To: Vincent McMahon <vmcmahon@wmgld.com>; Sean P. Sullivan <sps@bala.com>; Dave Polson <dpolson@wmgld.com>
Cc: vlyubetsky@draws.com; Dino D. Buro <ddb@bala.com>; Thomas R. Mehaffey <trm@bala.com>
Subject: RE: BALA - Northeast Metrotech Electrical Loads

Thanks a lot Vinnie.

Since the two sides of the site are fairly far apart, the voltage drop for temp power is a consideration. It is a safe assumption right now that temp power would be needed on the eastern side of the site too, albeit probably not as much. You might want to carry a XFMR for temp on that side of the site as well, but we'll have to coordinate with others on preferred location of each of those.

Thanks again,

Zachary M. Barrett, PE

Electrical Engineer | zmb@bala.com | 857 444 8623

BALA CONSULTING ENGINEERS

52 Temple Place | Boston, MA 02111 | Main: 617 357 6060 | www.bala.com

From: Vincent McMahon <vmcmahon@wmgld.com>
Sent: Tuesday, April 25, 2023 1:05 PM
To: Zachary M. Barrett <zmb@bala.com>; Sean P. Sullivan <sps@bala.com>; Dave Polson <dpolson@wmgld.com>
Cc: vlyubetsky@draws.com; Dino D. Buro <ddb@bala.com>; Thomas R. Mehaffey <trm@bala.com>
Subject: RE: BALA - Northeast Metrotech Electrical Loads

Hi Zach,

Most of this seems to align with what we have already planned. We will be going out to bid for the main transformers soon (likely 2000kVA each and 300kVA for the emergency). I'll bump up the size of the athletic building xfmr to a 500kVA, which should be more than enough and will give us some space for future installations such as car chargers and the maintenance building. We already have the overhead transformers for Farm St in stock.

The only thing not answered here: what transformer will be providing your temp service? I'd suggest installing a pad near the edge of your site and running a primary feed directly to it from one of the manholes. This is not a transformer you'd have to pay us for, just want to make sure it's included in the plans. I'm not sure what size transformer you'll need for temp power, I am tentatively going to use a 300kVA though.

This is all fine with me!

Vinnie

From: Zachary M. Barrett <zmb@bala.com>

Sent: Monday, April 24, 2023 4:02 PM

To: Vincent McMahon <vmcmahon@wmgld.com>; Sean P. Sullivan <sps@bala.com>; Dave Polson <dpolson@wmgld.com>

Cc: vyubetsky@draws.com; Dino D. Buro <ddb@bala.com>; Thomas R. Mehaffey <trm@bala.com>

Subject: BALA - Northeast Metrotech Electrical Loads

Hi Vinnie,

Attached please find our revised electrical load estimate for the Northeast Metro Tech project. As per the attached letter, we are requesting the following utility services:

- Two (2) 2500kVA utility transformers supplying two (2) 4000Amp, 480Y/277V, 3-phase, 4-wire services to the main school building.
- A separate 300kVA utility transformer, 480Y/277V, 3-phase, 4-wire dedicated to supplying the building's emergency life safety loads.
- A 300kVA utility transformer, 480Y/277V, 3-phase, 4-wire dedicated to supplying power to the football field area (750kVA if the locker room building and concession building are constructed [currently add-alternates]).
- A 112.5kVA utility service, 480Y/277V, 3-phase, 4-wire to support the area near the school's new message board off Farm Road.

Once you have reviewed the revised loads, we would like your ruling and comments regarding the service requirements. The proposed locations and layouts of the incoming services will, of course, continue to be coordinated with your team.

Please let us know if you have any questions.

Thank you,

Zachary M. Barrett, PE

Electrical Engineer | zmb@bala.com | 857 444 8623

BALA CONSULTING ENGINEERS

52 Temple Place | Boston, MA 02111 | Main: 617 357 6060 | www.bala.com

6C.3.3 – 02b

GAS COMPANY

LETTER

–

UTILITY

COMPANY

May 12, 2023



Mr. Vladimir Lyubetsky
DRA Architects
260 Charles Street, Suite 300
Waltham, MA 02453

Re: Northeast Metro Technical High School
Bala Project No. 60-20-409

Dear Vladimir:

This is to acknowledge that Bala has sent a load letter and site plan featuring the proposed gas line routing and proposed gas meter location to WMGLD, the local gas company. They have acknowledged receipt of this information and have also acknowledged that there will be a new gas service for this project.

Very truly yours,

Richard Rivera, EIT

BALA CONSULTING ENGINEERS

Projected Connected Gas Loads

Cafeteria Cooking Loads	850
Culinary Arts Cooking Loads	2,000
Paint Spray Booth Heating Loads	3,250
Plumbing/HVAC Shop Loads	3,050

Preliminary/Anticipated Total Connected Load	9,150 CFH
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(NOTE: The gas company has stated that this proposed gas service for Design Development can handle the previous Schematic Design load of 20,950 CFH)



WMGLD

P.O. BOX 190 480 North Ave.

Wakefield, MA 01880

Tel. (781) 246-6363 Fax (781) 246-0419

Peter D. Dion, General Manager

Jennifer Kallay, Chair

Elton Prifti, Secretary

Thomas Boettcher

Philip Courcy

John J. Warchol

April 26, 2023

Richard Rivera, EIT
Plumbing & Fire Protection Designer
Bala Consulting Engineers
522 Temple Place
Boston, MA 02111

RE: Northeast Metrotech Regional High School
Gas Service Availability & Coordination
Bala Project No. 60-20-409

Dear Richard,

Wakefield Gas has reviewed the most recent Load Letter regarding the installation of a gas line to the new Northeast Metrotech Regional High School and our responses to your stated questions can be found below:

1. Confirm that the gas company will still be able to extend the gas main for this new service, as stated in previous correspondence.

Yes, Wakefield Gas is still available to extend the gas main for the service to the new high school.

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.

Yes, the proposed route is acceptable with the understanding that a final route is not able to be determined at this time and will be confirmed once a contractor is selected.

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.

The estimated cost to install this gas service is \$250,000.

4. Confirm that the total connected load of 9,150 CFH be available to supply the new school. Previous correspondence confirmed a connected load of 20,950 CFH.

Yes, the line will be able to supply the total connected load of 9,150 CFH. Additionally, the line can support the previous connected load of 20,950 CFH should it become necessary to do so.

5. Confirm that the gas company will deliver a guaranteed gas pressure of 14" w.c. at the outlet of the gas meter.

Yes, the line will maintain at least 14" W.C. at the outlet of the gas meter.

6. Confirm if vehicle access is required for the gas meter.

Vehicle access is not required but 24hr foot access is required. Additionally, the meter must also be protected from vehicle traffic.

7. Confirm size of the meter assembly based on the total connected load and delivery pressure. Provide cut sheets of meter assembly for coordination.

The approximate size of the meter assembly is 21" x 8" x 7". The CAD drawing of the meter is included at the end of this letter. The model that will be used for this project is 3M (referenced in the dimensions table). Please note – the meter assembly must be set at least three (3) feet from any other feature including vents, windows, and electric lines.

8. Confirm the size of the gas pipe to be provided at the gas meter inlet.

The size of the pipe leading up to the meter set will be 4". At the riser, the line will be reduced to 3".

If you have any further questions, please feel free to contact us.

Sincerely,



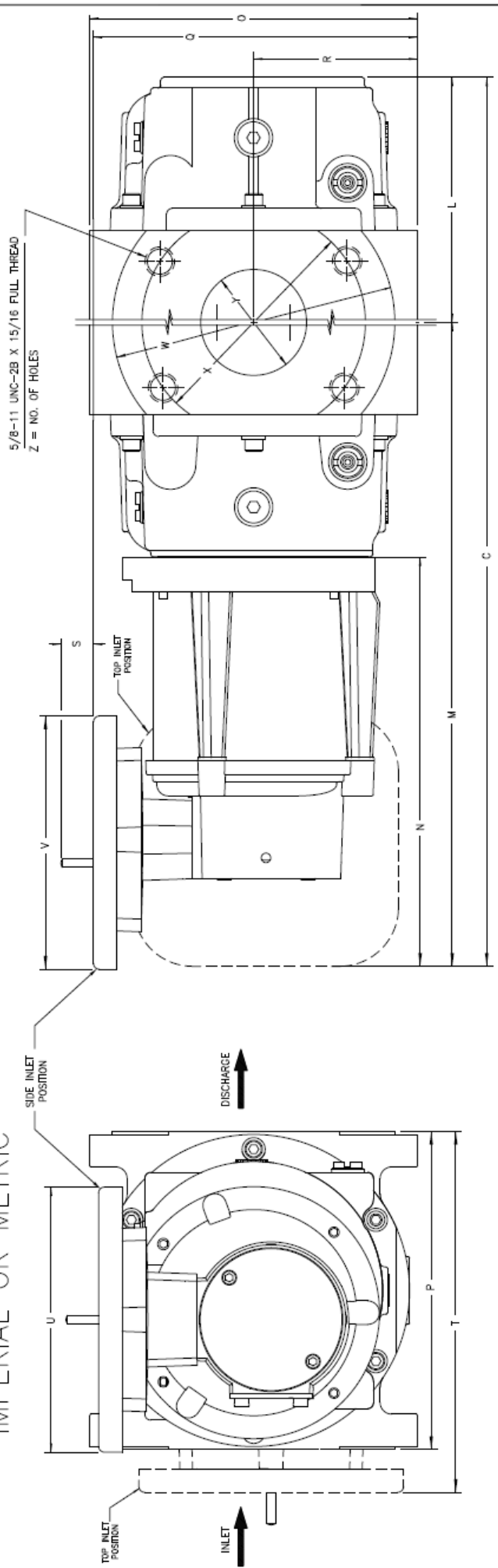
Jimmy Brown
Gas Superintendent

Cc: Raven Fournier – WMGLD
Vladimir Lubetsky – DRA
SPS, GC, DDB, Bala

MODEL	CAPACITY	UNIT	C	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	APPROX. OIL CAPACITY	APPROX. WEIGHT	MAX. WORK PRESSURE
2M	2000 cth	IN	19 25/32	5 21/32	14 1/8	8 11/16	6 31/32	6 3/4	6 7/8	3 31/64	11/16	7 21/32	5 5/8	5 3/8	6	4 3/4	2 1/4	4	1.25 oz.	28.5 lbs.	SEE NAMEPLATE
	57 m ³ /h	mm	503	144	359	221	177	172	175	88.5	17.5	195	143	137	153	120.65	57.15	4	37 ml.	12.9 kg.	
3M	3000 cth	IN	20 31/32	6 1/4	14 23/32	8 11/16	6 31/32	6 3/4	6 7/8	3 31/64	11/16	7 21/32	5 5/8	5 3/8	6	4 3/4	2 1/4	4	1.25 oz.	31.0 lbs.	SEE NAMEPLATE
	85 m ³ /h	mm	533	159	374	221	177	172	175	88.5	17.5	195	143	137	153	120.65	57.15	4	37 ml.	13.9 kg.	
5M	5000 cth	IN	23 27/32	7 11/16	16 5/32	8 11/16	6 31/32	6 3/4	6 7/8	3 31/64	11/16	7 21/32	5 5/8	5 3/8	7 1/2	6	3 5/16	4	1.25 oz.	37.0 lbs.	SEE NAMEPLATE
	141.5 m ³ /h	mm	606	195	411	221	177	172	175	88.5	17.5	195	143	137	190.5	152.4	84.14	4	37 ml.	16.8 kg.	
G40	2295 cth	IN	19 25/32	5 21/32	14 1/8	8 11/16	6 31/32	6 3/4	6 7/8	3 31/64	11/16	7 21/32	5 5/8	5 3/8	6	4 3/4	2 1/4	4	1.25 oz.	28.5 lbs.	SEE NAMEPLATE
	65 m ³ /h	mm	503	144	359	221	177	172	175	88.5	17.5	195	143	137	153	120.65	57.15	4	37 ml.	12.9 kg.	
G65	3531 cth	IN	20 31/32	6 1/4	14 23/32	8 11/16	6 31/32	6 3/4	6 7/8	3 31/64	11/16	7 21/32	5 5/8	5 3/8	6	4 3/4	2 1/4	4	1.25 oz.	31.0 lbs.	SEE NAMEPLATE
	100 m ³ /h	mm	533	159	374	221	177	172	175	88.5	17.5	195	143	137	153	120.65	57.15	4	37 ml.	13.9 kg.	
G100	5650 cth	IN	23 27/32	7 11/16	16 5/32	8 11/16	6 31/32	6 3/4	6 7/8	3 31/64	11/16	7 21/32	5 5/8	5 3/8	7 1/2	6	3 5/16	4	1.25 oz.	37.0 lbs.	SEE NAMEPLATE
	160 m ³ /h	mm	606	195	411	221	177	172	175	88.5	17.5	195	143	137	190.5	152.4	84.14	4	37 ml.	16.8 kg.	

SERIES B3
ROOTS® METER
2M(G40)/3M(G65)/5M(G100)
WITH CD* OR TD**
IMPERIAL OR METRIC

*CD = DISPLACED VOLUME COUNTER WITH INSTRUMENT DRIVE
**TD = TEMPERATURE COMPENSATED VOLUME COUNTER WITH INSTRUMENT DRIVE.



- 01** Drawing List
- 02** Project Sign
- 03** Early Bid Packages
 - 03a** Early Site Preparation
 - 03b** Early Structural Bid Package

6C.3.5

90% CONSTRUCTION DOCUMENT DRAWINGS

90% CONSTRUCTION DOCUMENT DRAWINGS
DRAWING LIST

6C.3.5 - 01

SECTION 00 01 15

LIST OF DRAWINGS

VOLUME 1 OF 4

COVER SHEET – VOLUME 1 OF 4

DRAWING LIST

01 – INFO DRAWING LIST

CIVIL – FOR REFERENCE ONLY – ISSUED WITH EARLY SITE PREPARATION CDs

EX-1	TOPOGRAPHIC SURVEY
EX-2	TOPOGRAPHIC SURVEY
EX-3	TOPOGRAPHIC SURVEY
EX-4	TOPOGRAPHIC SURVEY
EX-5	TOPOGRAPHIC SURVEY
EX-6	TOPOGRAPHIC SURVEY
EX-7	TOPOGRAPHIC SURVEY
EX-8	TOPOGRAPHIC SURVEY
EX-9	TOPOGRAPHIC SURVEY
EX-10	TOPOGRAPHIC SURVEY
EX-11	TOPOGRAPHIC SURVEY
EX-12	TOPOGRAPHIC SURVEY
EX-13	TOPOGRAPHIC SURVEY
EX-14	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-605	DRIVEWAY CROSS-SECTIONS
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

LANDSCAPE

L000	OVERALL SITE PLAN
L101	DEMO AND SITE PREPARATION PLAN – 1 - ISSUED WITH EARLY SITE PREPARATION CDs
L102	DEMO AND SITE PREPARATION PLAN – 2 - ISSUED WITH EARLY SITE PREPARATION CDs
L103	DEMO AND SITE PREPARATION PLAN – 3 - ISSUED WITH EARLY SITE PREPARATION CDs
L104	DEMO AND SITE PREPARATION PLAN – 4 - ISSUED WITH EARLY SITE PREPARATION CDs
L105	DEMO AND SITE PREPARATION PLAN – 5 - ISSUED WITH EARLY SITE PREPARATION CDs
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 - FOR REFERENCE ONLY ISSUED WITH EARLY SITE PREPARATION CDs
L402	GRADING PLAN – 2 - FOR REFERENCE ONLY ISSUED WITH EARLY SITE PREPARATION CDs
L403	GRADING PLAN – 3 - FOR REFERENCE ONLY ISSUED WITH EARLY SITE PREPARATION CDs
L404	GRADING PLAN - 4 - FOR REFERENCE ONLY ISSUED WITH EARLY SITE PREPARATION CDs
L405	GRADING PLAN - 5 - FOR REFERENCE ONLY ISSUED WITH EARLY SITE PREPARATION CDs
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
L607	BOARDWALK DETAILS
L701	ENLARGEMENT PLAN – BOARDWALK – 1
L702	ENLARGEMENT PLAN – BOARDWALK – 2

L801 ADD ALTERNATES

IRRIGATION

I101 IRRIGATION PLAN
I102 IRRIGATION PLAN
I201 IRRIGATION DETAILS

VOLUME 2 OF 4 – FOR REFERENCE ONLY

COVER SHEET – VOLUME 2 OF 4

DRAWING LIST

01 – INFO DRAWING LIST

STRUCTURAL – FOR REFERENCE ONLY – ISSUED WITH EARLY STRUCTURAL BID PACKAGE CD's

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
S0-0-9 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 - AREA A
S1-1-1MB MEZZANINE FLOOR FRAMING- 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
S2-0-5	SECTIONS
S3-0-1	SECTIONS
S3-0-2	SECTIONS
S3-0-3	SECTIONS
S3-0-4	SECTIONS
S3-0-5	SECTIONS
S3-0-6	SECTIONS
S3-0-7	SECTIONS
S3-0-8	SECTIONS
S3-0-9	SECTIONS
S4-0-1	BRACE FRAME ELEVATIONS - AREA A
S4-0-2	BRACE FRAME ELEVATION - AREAS A + B
S4-0-3	BRACE FRAME ELEVATION - AREA B
S4-0-4	BRACED FRAME ELEVATION C + D
S4-0-5	SHEAR WALLS
S4-0-6	SHEAR WALLS
S4-0-7	SHEAR WALLS
S4-0-8	BRACED FRAME DETAILS
S4-0-9	BRACED FRAME DETAILS
S5-0-1	JOIST LOADING DIAGRAMS
S5-0-2	JOIST LOADING DIAGRAMS
S5-0-3	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
SS-1-1	MAINTENANCE SITE BUILDING FOUNDATION PLANS

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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 FLOOR & SATELLITE LOCKERS NET AREA PLANS
A1-0-11	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 FLOOR PLAN - AREA A
A1-1-2B	SECOND FLOOR PLAN - AREA B
A1-1-2C	SECOND FLOOR PLAN - AREA C
A1-1-2D	SECOND FLOOR PLAN - AREA D
A1-1-3A	THIRD FLOOR PLAN - AREA A
A1-1-3B	THIRD FLOOR PLAN - AREA B
A1-1-3C	THIRD FLOOR PLAN - AREA C
A1-1-3D	THIRD FLOOR PLAN - AREA D
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
A2-1-8	BUILDING ELEVATIONS
A2-2-1	INTERIOR ELEVATIONS
A2-2-2	INTERIOR ELEVATIONS
A2-2-3	INTERIOR ELEVATIONS

A2-2-4	INTERIOR ELEVATIONS
A2-2-5	INTERIOR ELEVATIONS
A2-2-6	INTERIOR ELEVATIONS
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
A2-2-15	INTERIOR ELEVATIONS
A2-2-16	INTERIOR ELEVATIONS
A3-1-1	BUILDING SECTIONS
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	WALL SECTIONS
A3-2-12	WALL SECTIONS
A3-2-13	WALL SECTIONS
A3-2-14	WALL SECTIONS
A3-2-15	WALL SECTIONS
A3-2-16	WALL SECTIONS
A3-2-17	WALL SECTIONS
A3-2-18	WALL SECTIONS
A3-2-19	WALL SECTIONS
A3-2-20	WALL SECTIONS
A3-2-21	WALL SECTIONS
A3-2-22	WALL SECTIONS
A3-2-23	WALL SECTIONS
A3-2-24	WALL SECTIONS
A3-2-25	WALL SECTIONS
A3-2-26	WALL SECTIONS
A3-2-27	WALL SECTIONS
A3-3-1	VERTICAL DETAILS
A3-3-2	VERTICAL DETAILS
A3-3-3	VERTICAL DETAILS
A4-1-1	TOILET AND LOCKER ROOM PLANS
A4-1-2	TOILET PLANS
A4-1-3	TOILET PLANS
A4-1-4	TOILET AND LOCKER ROOM ELEVATIONS
A4-1-5	TOILET AND LOCKER ROOM ELEVATIONS

A4-1-6	TOILET ELEVATIONS
A4-1-7	TOILET ELEVATIONS
A5-1-1	EXTERIOR PLAN DETAILS
A5-1-2	EXTERIOR PLAN DETAILS
A5-1-3	EXTERIOR PLAN DETAILS
A5-1-4	EXTERIOR PLAN DETAILS
A5-2-1	INTERIOR PLAN DETAILS
A5-2-2	INTERIOR PLAN DETAILS
A5-2-3	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
A6-2-4	DOOR AND BOROWED LITE DETAILS
A6-2-5	DOOR AND BOROWED LITE DETAILS
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 AND TRANSLUCENT WALL PANEL DETAILS
A6-3-9	LOUVER DETAILS
A6-3-10	CURTAIN WALL DETAILS
A6-3-11	CURTAIN WALL DETAILS
A6-3-12	CURTAIN WALL DETAILS
A7-1-1	STAIR PLANS
A7-1-2	STAIR SECTIONS
A7-1-3	STAIR PLANS & SECTIONS
A7-1-4	STAIR PLANS
A7-1-5	STAIR SECTIONS
A7-1-6	STAIR PLANS & SECTIONS
A7-1-7	STAIR PLANS & SECTIONS
A7-1-8	STAIR PLANS & SECTIONS
A7-1-9	ELEVATOR PLANS & SECTIONS
A7-1-10	STAIR DETAILS
A7-1-11	STAIR DETAILS - ELEVATOR DETAILS, SPECIALTY DETAILS
A7-1-12	LOADING RAMP PLAN, SECTION & DETAILS
A8-1-0C	LOWER LEVEL REFLECTED CEILING PLAN - AREA C
A8-1-0D	LOWER LEVEL REFLECTED CEILING PLAN - AREA D
A8-1-0MC	LOWER LEVEL MEZZANINE REFLECTED CEILING PLAN - AREA C
A8-1-0MD	LOWER LEVEL MEZZANINE REFLECTED CEILING PLAN - AREA D
A8-1-1A	FIRST FLOOR REFLECTED CEILING PLAN - AREA A
A8-1-1B	FIRST FLOOR REFLECTED CEILING PLAN - AREA B
A8-1-1C	FIRST FLOOR REFLECTED CEILING PLAN - AREA C
A8-1-1D	FIRST FLOOR REFLECTED CEILING PLAN - AREA D
A8-1-1MA	FIRST FLOOR MEZZANINE REFLECTED CEILING PLAN - AREA A
A8-1-1MB	FIRST FLOOR MEZZANINE REFLECTED CEILING PLAN - AREA B
A8-1-2A	SECOND FLOOR REFLECTED CEILING PLAN - AREA A
A8-1-2B	SECOND FLOOR REFLECTED CEILING PLAN - AREA B

A8-1-2C	SECOND FLOOR REFLECTED CEILING PLAN - AREA C
A8-1-2D	SECOND 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
A8-1-3D	THIRD FLOOR REFLECTED CEILING PLAN - AREA D
A8-1-4A	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	MISCELLANEOUS DETAILS
A9-1-2	MISCELLANEOUS DETAILS
AC-1-1	TOILET AND CONCESSION BUILDING PLANS & ELEVATIONS
AC-1-2	WALL SECTIONS, PLAN & SCHEDULES
AC-1-3	ENLARGED DETAILS
AL-1-1	LOCKER BUILDING PLANS
AL-1-2	LOCKER BUILDING ELEVATIONS & SECTIONS
AL-1-3	LOCKER BUILDING STAIR & ELEVATOR DRAWINGS
AL-1-4	TOILET AND LOCKER ROOM PLANS
AL-1-5	LOCKER BUILDING CURTAIN WALL & STOREFRONT TYPES
AM-1-1	MAINTENANCE BUILDING DRAWINGS

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	BASE DETAILS
AF1-5-1	DECORATIVE FABRIC METAL DETAILS
AF1-6-1	PHENOLIC RESIN PANEL DETAILS
AF1-7-1	INTERIOR WALL PANEL DETAILS
AF1-8-1	CERAMIC TILES PATTERN

ARCHITECTURAL SIGNAGE

SL1-0-0	SITE SIGNAGE PLAN
SL1-1-0	LOWER LEVEL SIGNAGE PLAN
SL1-1-1a	FIRST FLOOR SIGNAGE PLAN – WEST
SL1-1-1b	FIRST FLOOR SIGNAGE PLAN - EAST
SL1-1-2a	SECOND FLOOR SIGNAGE PLAN – WEST
SL1-1-2b	SECOND FLOOR SIGNAGE PLAN - EAST
SL1-1-3a	THIRD FLOOR SIGNAGE PLAN – WEST
SL1-1-3b	THIRD FLOOR SIGNAGE PLAN - EAST
SL1-1-4a	FOURTH FLOOR SIGNAGE PLAN – WEST
SL1-1-4b	FOURTH FLOOR SIGNAGE PLAN - EAST
SL1-1-5	LOCKER BUILDING FIRST FLOOR SIGNAGE PLAN
SL1-1-6	CONCESSION BUILDING SIGNAGE PLAN

EQUIPMENT – FOR REFERENCE ONLY

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 & DETAILS

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
TE-3	THEATRE ELECTRICS DEVICE DETAILS
TD-1	HOUSE AND WINDOW TRAVELER CURTAINS

FOOD SERVICE

FS1-1-1A	FOODSERVICE EQUIPMENT OVERALL PLAN – AREA A
FS1-1-1B	FOODSERVICE EQUIPMENT OVERALL PLAN – AREA B
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
FS1-4-1	HVAC TECH FOODSERVICE EQUIPMENT PLAN
FS2-2-1	MAIN KITCHEN FOODSERVICE EQUIPMENT ROUGH-IN PLAN
FS2-3-1	CULINARY KITCHEN FOODSERVICE EQUIPMENT ROUGH-IN PLAN
FS2-4-1	HVAC TECH 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

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DRAWING LIST

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GEOTECHNICAL

GT-0-1	GEOTECHNICAL PLAN EAST
GT-0-2	GEOTECHNICAL PLAN WEST

PLUMBING – FOR REFERENCE ONLY

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
P1-1-3D	PLUMBING THIRD FLOOR PLAN - AREA D
P1-1-4A	PLUMBING FOURTH FLOOR PLAN - AREA A
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
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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
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E2-1-1C	ELECTRICAL LIGHTING FIRST FLOOR PLAN - AREA C
E2-1-1D	ELECTRICAL LIGHTING FIRST FLOOR PLAN - AREA D
E2-1-1M	ELECTRICAL LIGHTING FIRST FLOOR PLAN - MEZZANINES
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TL-1-1	ADD ALTERNATE LOCKER BUILDING TECHNOLOGY & SECURITY PLAN

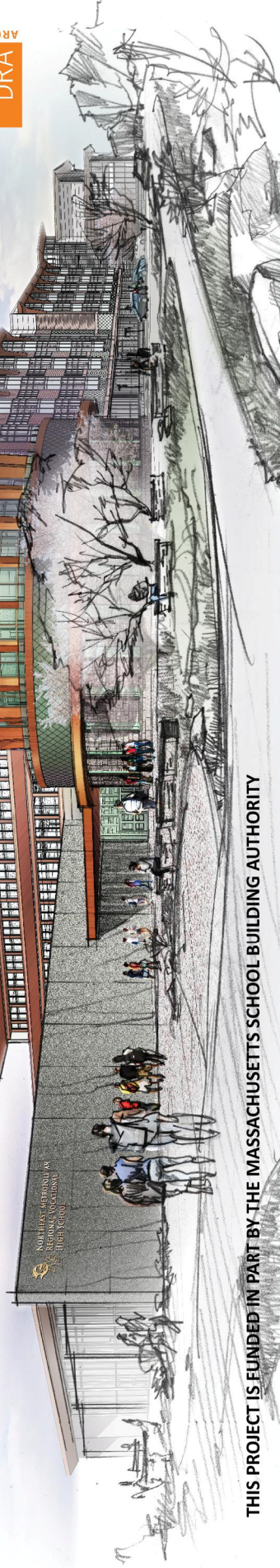
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90% CONSTRUCTION DOCUMENT DRAWINGS
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6C.3.5 - 02



Northeast Metropolitan Regional Vocational High School



THIS PROJECT IS FUNDED IN PART BY THE MASSACHUSETTS SCHOOL BUILDING AUTHORITY

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6C.3.5-02
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**90% CONSTRUCTION DOCUMENT DRAWINGS
EARLY BID PACKAGES**

6C.3.5 - 03

6C.3.5-03

EARLY BID PACKAGES

An Early Site Preparation and Early Structural Package have been bid. Below is a list of Drawings that were scoped as part of these early bids. To create one comprehensive document defining the entire scope of work for the project we will be including these drawings, for reference only, in the main bid package.

Early Site Preparation

The scope of work on the following Drawings was bid as a part of the Early Site Preparation Contract Documents. Scope drawings related to this Bid Package are in Volume 1.

Attached with this submission is Volume 1 from the Early Site Preparation. All other volumes submitted with this Bid Package were for reference only. See PDF titled "[6C.3.5-03a Early Bid Package - Early Site Preparation.pdf](#)."

CIVIL

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C-203	UTILITY DEMOLITION PLAN IV
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C-603	DRIVEWAY LAYOUT AND GRADING PLAN IV
C-604	DRIVEWAY PROFILE
C-605	DRIVEWAY CROSS-SECTIONS

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L403	GRADING PLAN – 3
L404	GRADING PLAN – 4
L405	GRADING PLAN – 5

Early Structural Bid Package

The scope of work on the following Drawings was bid as a part of the Early Structural Bid Package. Scope drawings related to this Bid Package are in Volume 2.

Attached with this submission is Volume 2 from the Early Structural Bid Package. All other volumes submitted with this Bid Package were for reference only. See PDF titled "6C.3.5-03b Early Bid Package - Early Structural Bid Package.pdf."

STRUCTURAL

<i>S0-0-1</i>	<i>GENERAL NOTES</i>	<i>S2-0-1</i>	<i>SECTIONS</i>
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<i>S0-0-3</i>	<i>TYPICAL DETAILS</i>	<i>S2-0-3</i>	<i>SECTIONS</i>
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By CM/OPM

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By CM/OPM

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**90% CONSTRUCTION DOCUMENT PROJECT MANUAL
DESCRIPTION OF ALTERNATES**

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DESCRIPTION OF ALTERNATES

Add Alternate No.1

Add Locker Room Building and associated site work.

Add Alternate No.2

Add Additional Seating Capacity at Football Field Grandstands. Add Press Box and Limited Use Limited Application Elevator to Grandstand.

Base Bid has 500 seats and alternate would bring the count to 1000 seats.

Add Alternate No.3

Add Concessions / Toilet Building.

Base Bid is concrete slab and site utilities.

Add Alternate No.4

Add Irrigated Natural Turf Softball Field. Alternate will also include field equipment, netting, backstop, dugout, and shade structures.

Base Bid condition is Seeded Lawn.

Add Alternate No.5

Add Irrigated Multipurpose Soccer / Softball Field. Alternate will also include field equipment, netting, backstop, dugout, and shade structures.

Base Bid condition is Seeded Lawn.

Add Alternate No.6

Add Maintenance Building. The building will be a pre-engineered metal building on CMU base.

Base Bid to include concrete foundations, concrete slab, and site utilities.

**90% CONSTRUCTION DOCUMENT PROJECT MANUAL
EARLY BID PACKAGES**

6C.3.6 - 03

6C.3.6-03

EARLY BID PACKAGES

An Early Site Preparation and Early Structural Package have been bid. Below is a list of the Specification Sections that were scoped as part of these early bids. To create one comprehensive document defining the entire scope of work for the project we will be including these sections, for reference only, in the main bid package. The Project Manual included in this submission includes these early bid sections as well as scope for the upcoming bid.

Early Site Preparation – Project Manual

The following Specification Sections were bid as a part of the Early Site Preparation Contract Documents. These sections will also be included in the general bid package for reference only and are identified as such in the Project Manual Table of Contents.

DIVISION 31 – EARTHWORK

Section 311000 Site Clearing And Preparation
Section 312000 Earth Moving
Section 312500 Erosion And Sedimentation Controls

DIVISION 32 - EXTERIOR IMPROVEMENTS

Section 321723 Pavement Markings

DIVISION 33 – UTILITIES

Section 330130 Relining Sewer And Drain Pipes
Section 331000 Water Utilities
Section 333000 Sanitary Sewerage Utilities
Section 334000 Storm Drainage Utilities

Early Structural Bid Package – Project Manual

The following Specification Sections were bid as a part of the Early Structural Bid Contract Documents. These sections will also be included in the general bid package for reference only and are identified as such in the Project Manual Table of Contents.

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Section 034113 Precast and Prestressed Concrete Plank

DIVISION 05 – METALS

Section 051200 Structural Steel Framing
Section 051500 Stud Shear Connectors
Section 052100 Steel Joist Framing
Section 053100 Steel Decking

**90% CONSTRUCTION DOCUMENT PROJECT MANUAL
MBE / WBE GOALS**

6C.3.6-04

MBE / WBE GOALS

The project's OPM, PMA Consultants, reached out to the Supplier Diversity Office (SDO) regarding establishing Minority and Women owned business workforce participation goals. The SDO informed them that they do not review projects until at least 75% CD cost estimates have been performed.

Ninety Percent Construction Document Cost Estimates have just been completed and reconciled for this project. PMA will now re-engage with the SDO and the established workforce goals will be incorporated into the Bid Set Project Manual.

6C.3.7

PROJECT COORDINATION

PROJECT COORDINATION

DESIGNER CONFIRMATION THAT SCIENCE LABS COMPLY WITH MSBA GUIDELINES

6C.3.7 - 01

6C.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.

