

**NORTHEAST METROPOLITAN
REGIONAL VOCATIONAL HIGH SCHOOL**
Wakefield, Massachusetts



**PRE-FEASIBILITY STUDY:
EXISTING CONDITIONS INVESTIGATION AND
EDUCATIONAL VISIONING REPORT**

Commissioned by the Office of the Superintendent

February 1, 2016



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TABLE OF CONTENTS

TABLE OF CONTENTS AND ACKNOWLEDGEMENTS	A
TABLE OF CONTENTS AND ACKNOWLEDGEMENTS	A-1
INTRODUCTION AND EXECUTIVE SUMMARY	B
EXECUTIVE SUMMARY	B-1
NORTHEAST METRO TECH SCHOOL - EXISTING CONDITIONS ASSESSMENT	C
EXISTING BUILDING DATA	C-1
AERIAL ORTHOPHOTO AND OBLIQUE VIEWS	
CIVIL – SITE	C-2
STRUCTURAL	C-3
ARCHITECTURAL	C-4
MECHANICAL	C-5
ELECTRICAL	C-6
PLUMBING	C-7
FIRE PROTECTION	C-8
HAZARDOUS MATERIALS	C-9
FOOD SERVICES	C-10
SECURITY	C-11
TECHNOLOGY SYSTEMS	C-12
EDUCATIONAL PROGRAMMING	D
EDUCATIONAL PROGRAM	D-1
ENROLLMENT PROJECTIONS	D-2
EDUCATIONAL VISIONING	D-3
SPACE NEEDS ASSESSMENT	E
SPACE USE - OVERVIEW AND ANALYSIS	E-1
SPACE USE – RED-YELLOW-GREEN PLANS	E-2
SPACE SUMMARY (ARCHITECTURAL PROGRAM)	E-3
CONCEPTUAL OPTIONS	F
CONCEPTUAL OPTIONS SUMMARY	F-1
CAPITAL IMPROVEMENT PLAN (CIP) OPTION	F-2
NEW CONSTRUCTION OPTION 2	F-3
NEW CONSTRUCTION OPTION 3	F-4

ADDITIONS AND RENOVATIONS OPTION 4.....	F-5
SITEWORK OPTIONS.....	F-6
REJECTED BUILDING OPTIONS.....	F-7
CAPITAL IMPROVEMENT PLAN AND BUILDING OPTIONS COST ESTIMATES.....	G
CAPITAL IMPROVEMENT PLAN COST ESTIMATE	G-1
COST ESTIMATES FOR OPTIONS 2 - 4.....	G-2
APPENDIX.....	H
ENROLLMENT DOCUMENTATION FROM NORTHEAST METRO TECH.....	H-1

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School Administration and Staff

Ted Nickole, Superintendent
David DiBarri, Principal
Paul Pisani, Co-Op Coordinator, Recruitment Coordinator
Robert Lilley, Vocational Coordinator
Joseph Capraro, Supervisor of Building Maintenance

Thanks to the Northeast Metro Tech School Committee, Community Advisory Committee members, faculty, staff, parents, and students who participated in the making of this study.

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EXECUTIVE SUMMARY

Need and Purpose

The Northeast Metropolitan Regional Vocational High School, located in Wakefield MA, and also known as “Northeast Metro Tech” (NEMT), is a grades 9-12 comprehensive vocational and technical high school of approximately 240,000 GSF which provides academic and vocational programs for approximately 1,250 students from twelve surrounding communities: Chelsea, Malden, Melrose, North Reading, Reading, Revere, Saugus, Stoneham, Wakefield, Winchester, Winthrop and Woburn (Map 1 – district in pink; school location is red dot).



Map 1

The school is located on a 30 acre plot at 100 Hemlock Road in Wakefield, MA. The school is a neighbor to the east of Wakefield Memorial High School. Breakheart Reservation, accessed via the Northeast parking area, is a 640-acre hardwood forest located west of the site, offering year-round recreation. Also on-site just west and north of the building are a football/track field with grandstand, basketball courts, baseball/softball fields and a practice field.

The facility was built in 1968, with a small storage outbuilding constructed in 1975. Apart from minor alterations and construction of other small storage outbuildings, it has not seen any significant renovations, additions, or improvements since that time.

This study was commissioned to generate a physical and programmatic assessment of the NEMT school facilities and to develop a conceptual master plan for critical maintenance, renovations and additions, or building replacement for the next ten years.



Northeast Metro Tech enjoys a solid reputation as a viable choice for high school students interested in a comprehensive technical education which can lead to a potentially remunerative and satisfying career. The school has a current grades 9-12 enrollment of 1267 students. There are currently 325-330 places—

or “seats”—at the school per grade level, and an average of 650 Freshman class applications are received annually, creating an annual waiting list or backlog of roughly 320 students, or almost double the number of places in the class. A surplus of applicants has existed consistently for the last twelve (12) years. There is a chronic shortage of classroom space for academic subjects and educational support services that has existed for at least eight years.

Northeast Metro Tech administration has been reaching out to its Community Advisory Committees and reflecting on the strength, interest, and relevance of its sixteen existing vocational programs, putting out feelers in the business community about trends and employment outlook in the region, and preparing to retool some of its programs in response to changing conditions in the regional job market and advances in technology. Over the last 18 months, the administrative team has taken a hard look at the current CTE program offerings, and—again with input from its advisory groups—has made the decision to implement fundamental changes in program offerings going forward. Such action of continuing successful programs, adding relevant new programs, and discontinuing programs in which interest and/or relevance is waning, only strengthens the school’s position in the school choice “market” going forward.

It is readily apparent to the lay person who spends some time at the facility that it is an aging building with physical deficiencies that can be mainly attributed to its time in service. Handicapped accessibility to all parts of the school is a significant issue, as well as lack of—or incomplete—accessible facilities within educational spaces, toilet rooms, and administrative spaces. There are also comments from staff of educational program deficiencies and challenges caused by the particular spatial arrangement and relationship of programs within the building, as well as the absence of some key educational or support spaces.

These factors have caused the administrative team to realize that the time is now to take advantage of a major renovation or new building project to simultaneously increase its capacity to reduce the backlog of student applications, address the physical plant deficiencies, and to tune its facilities to accommodate contemporary programming. Therefore, the administration is moving forward under this study with the goal of expanding its grades 9-12 enrollment to 1600 students, and contemplating comprehensive renovation/addition projects, or complete replacement of the facility with a new school building.

It is very clear that the time has come to make significant changes to the nature and quality of the built environment of this institution, and the Northeast Metropolitan Regional Vocational High School Committee and the Superintendent’s office have recognized this need and put a plan of action in place to address its deficiencies.

Process and Method

Dore & Whittier Architects was retained by the Northeast Metropolitan Regional Vocational High School District to conduct a feasibility study to:

- Evaluate its existing facilities and prepare a report documenting issues and deficiencies
- Conduct a set of Educational Planning and Visioning exercises that explore:
 - Current educational organization and function of the school
 - Level of satisfaction and success with the current models
 - Introduction and discussion of alternate organizational, pedagogical, and spatial models
 - Ideal internal organization of a re-envisioned school
 - Ideal site orientation of a re-envisioned school
- Incorporate the products of the educational visioning in the conceptual design of several options for a renovated or new vocational high school facility
- Cost-estimate the conceptual options
- Report upon the results of the study to the core administrative team, the School Committee, and the broader public of the twelve sending towns of the District

It should be noted that this study is titled, “Pre-Feasibility Study,” which means that it is a vehicle for the District to clarify its needs and purpose for facility improvements prior to entering the Massachusetts School Building Authority (MSBA) Statement of Interest (SOI) process. Once a district is invited into the MSBA funding program, it will be asked to complete a more fully developed Feasibility Study and Schematic Design.

Dore & Whittier Architects is the team leader for this study, and its method for conducting this process employs the specific skills and knowledge base of its staff and a team of consultants in the engineering disciplines of site/civil, structural, mechanical, electrical, plumbing, and fire protection, as well as consulting experts in the fields of information technology, security, food service, hazardous materials, and construction cost estimating. Dore & Whittier Architects has its own in-house team of educational planners to conduct the visioning portion of the study. Each consultant contributes its own body of observations and recommendations to the process, which are then synthesized and interpreted by the Architect and communicated to the Owner via this report.



Results and Findings

The school facility has numerous deficiencies: functional, shop safety, code violation, accessibility for the disabled, mechanical, electrical, fire protection, indoor environmental quality, building safety and security, technology, and deferred maintenance. Full descriptions of issues within each of these categories are found in the sections authored by the respective consultants within this report.

There are also educational program deficiencies and challenges caused by the particular spatial arrangement and relationship of programs in the building. In particular, we note that there is a departmental segregation between the vocational shop spaces and the academic teaching spaces which can create a bifurcated mindset in the process of learning. An alternate model that has shown promise, is a more integrated arrangement of technical and pure academic learning areas, which allows a more direct demonstration or practical application of seemingly abstract knowledge and learning—and vice-versa—and removes the perceived barrier between academic and applied learning. Along the same lines, we note that benefits may be realized by locating related educational disciplines in career clusters to capitalize on elements of overlapping curriculum.

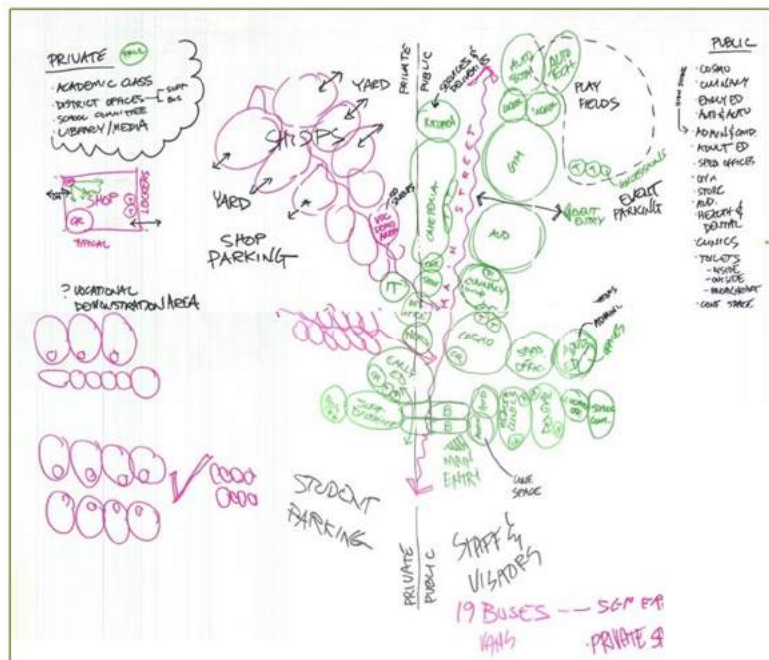
The team noted the absence of some key educational or support spaces. For example, there is no proper theater space. In addition to its function as the main assembly space where the student body can gather and share group experiences, a theater can support many academic programs. Theatrical Arts is a program that does exactly what is described above; nowhere else is there such a rich intersection between different modes and styles of learning, between the theoretical and the practical. It is a wonderful opportunity for students of all stripes to work together toward a common project and goal.

Additionally, there are very few educational support and meeting spaces distributed among the academic classrooms, making small group support, group project, and one-on-one support activities and learning nearly impossible. Special Education spaces are concentrated and somewhat segregated in a single corner of the building, creating a de facto stigmatizing situation.

In terms of the visioning work, the team and session participants derived main themes and “headlines” from their work:

- There are many good things happening at this school – people and programs – don’t lose sight of them

- Positive response to the need to adapt vocational and academic programs to changing student needs and employment trends
- The school is a huge community asset
- The overall organization of the building is important; some key desired features:
 - Recognized, secure main entrance
 - Public functions and public-facing programs up front
 - “Main street” arrangement to access large public/ assembly spaces
 - Shops in a more private wing
 - With staff and faculty, the jury is out on fully integrated academic classrooms
 - “Lock-off” ability during public functions and night school continuing education use
- Athletic facilities need improvement; pool is a great community asset, but expensive to operate
- A second entrance to the site is very important



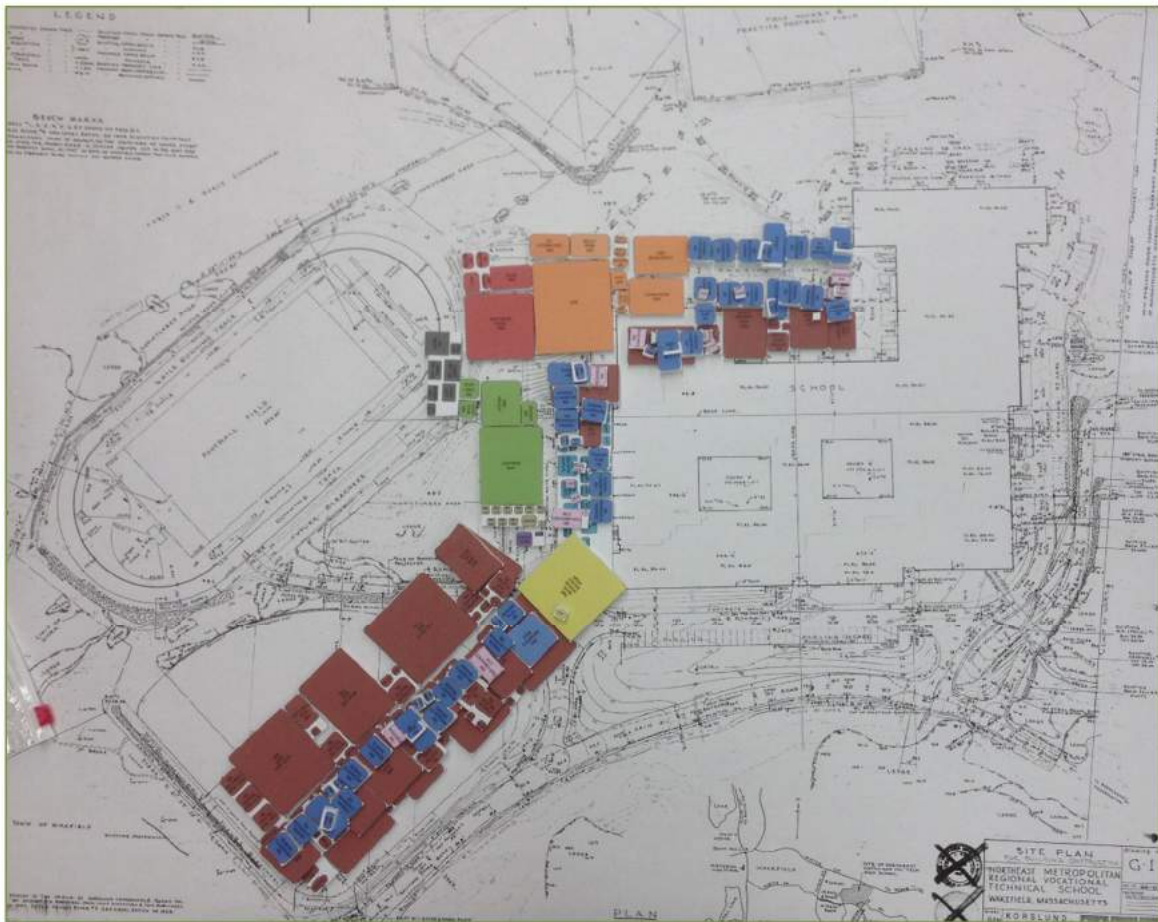
Visioning Session I exercise – Spatial and Program Relationships diagram

In terms of the process of designing options for a renovated or new facility, the visioning results indicated several key “take-away” concepts:

- Site topography is extremely challenging – true buildable space on this site is quite limited
- That said, viable construction options are possible which – for the most part – would not disrupt ongoing operation of the existing school
- Building the school on the southern, undeveloped hillside portion of the property will probably not be financially or functionally viable, mainly due to steep topography and difficult site/program fit
- A second vehicular entrance to the site using the southern portion of the parcel is apparently feasible, and warrants cost estimating and further study

- The renovation/addition option will be challenging due to the particular needs of vocational shops, and the difficulty with temporarily relocating them.
 - new space must be provided for shops to move into;
 - or a segmented, multi-phased approach will be necessary

A credible conceptual option for reno/add was designed, but it will need more detailed study at the next phase



Visioning Session II Exercise – Fitting the program on the site using scaled paper cutout program elements

Cost Summary

In total, six options out of the educational visioning process were studied and four were formalized for cost estimating as well as parallel design efforts by the Architects. In addition to the building options, two other sitework-related “line item add-ons” were discussed, formalized, and estimated. In summary, those options and their estimated Project Costs are:

OPTION	Construction Cost ^{1 4}	Project Cost ^{2 4}
Capital Improvement Plan (CIP) Option	\$46,851,293	\$56,221,552
Option 2 – “Hillside” Scheme	\$155,021,566	\$186,025,879
Option 3 – “Z” Scheme	\$156,864,995	\$188,237,994
Option 4 – Add/Reno Scheme	\$163,571,874	\$196,286,249
Site: New Entrance and Access Road ³	\$2,618,604	\$3,142,325
Site: Utility Upgrades ³	\$1,330,272	\$1,596,326

¹ Includes Cost of the Work with Contractor Markups: General Conditions & Requirements, Overhead & CM Fee, Bonds, Insurance, Construction/CM Contingency, Design & Estimating Contingency.

² Includes Construction Cost, Furniture, Fixtures & Equipment, Technology, Design Fees, Owner’s Project Management including Clerk of the Work, Testing, Administrative and Permitting Fees, Moving and Relocation Costs. [Construction Cost X 1.2 (20%)].

³ These costs would be added on to any of the options, and are applicable to all of them.

⁴ These costs are preliminary ESTIMATES and are subject to change based on changes in market conditions and modifications to the project scope. These estimates should be revisited periodically as the project becomes more defined through the planning and design process.

Recommendations

Due to the conceptual nature of this study and the general or strategic types of conversations had as part of our process, we feel it is not necessary, prudent, or productive to hone in on a preferred option at this point in the process. This study was the first step to clarify:

- Existing conditions and documentation
- Overall educational program goals
- Educational/building organizational methods and models
- Enrollment and program goals
- General site/building planning strategy and concepts

- Conceptual building planning – bubble and block diagram level
- Conceptual level cost estimates to establish a working project budget

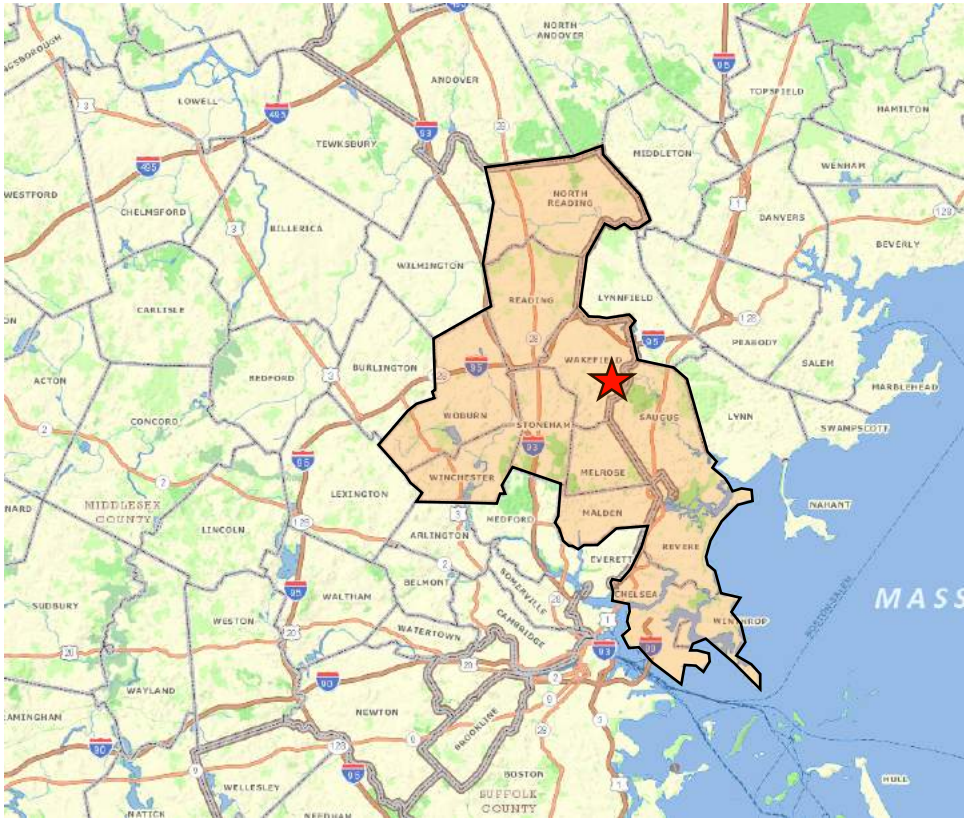
These factors are assembled to help the Owner compile a clear, concise, and effective Statement of Interest (SOI) to the MSBA, which is the next logical step in the process at the conclusion of this study.

If the District is fortunate enough to be invited into the MSBA construction funding program, much more detailed study will need to be done with each of the Options, taking into account more nuanced factors such as exact relationships between spaces, exact sizes and shapes of rooms, and a more rigorous tally of building area (to name a few factors). The next level of study will entail more fully-developed design materials than what were completed within the scope of this preliminary study, such as: more detailed plans, building elevations, building sections, and three-dimensional renderings.

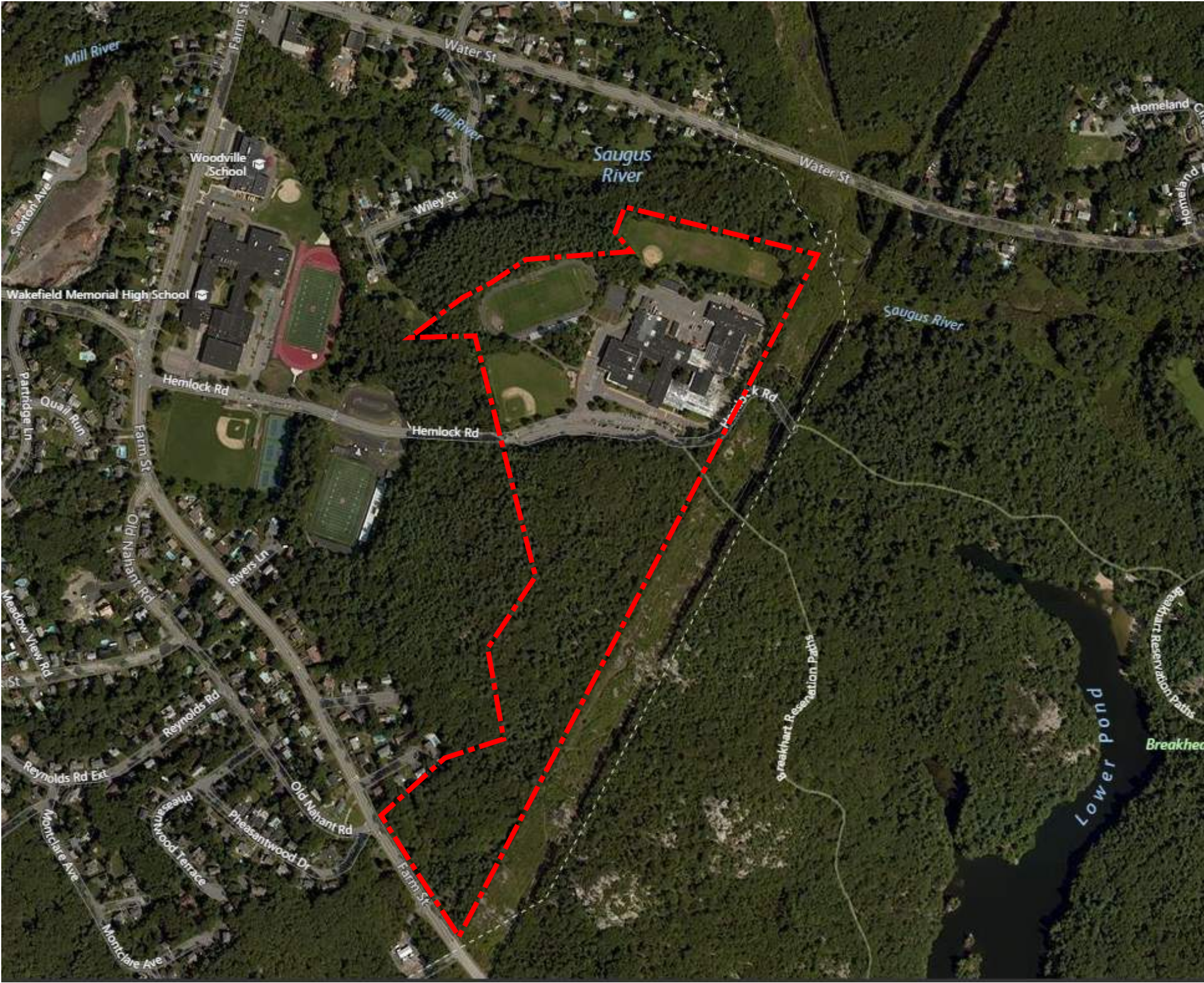
Next Steps

We will assist in conducting a series of four Public Information Meetings with the twelve sending towns: one meeting in a public location accessible and geographically central to three towns, for a total of four meetings. We will work with the NEMT administrative team to find the locations and schedule these meetings, and will present our findings of this report via PowerPoint similar to those we have presented to the administration and School Committee. The anticipated time frame for these meetings is Spring-Summer 2016.

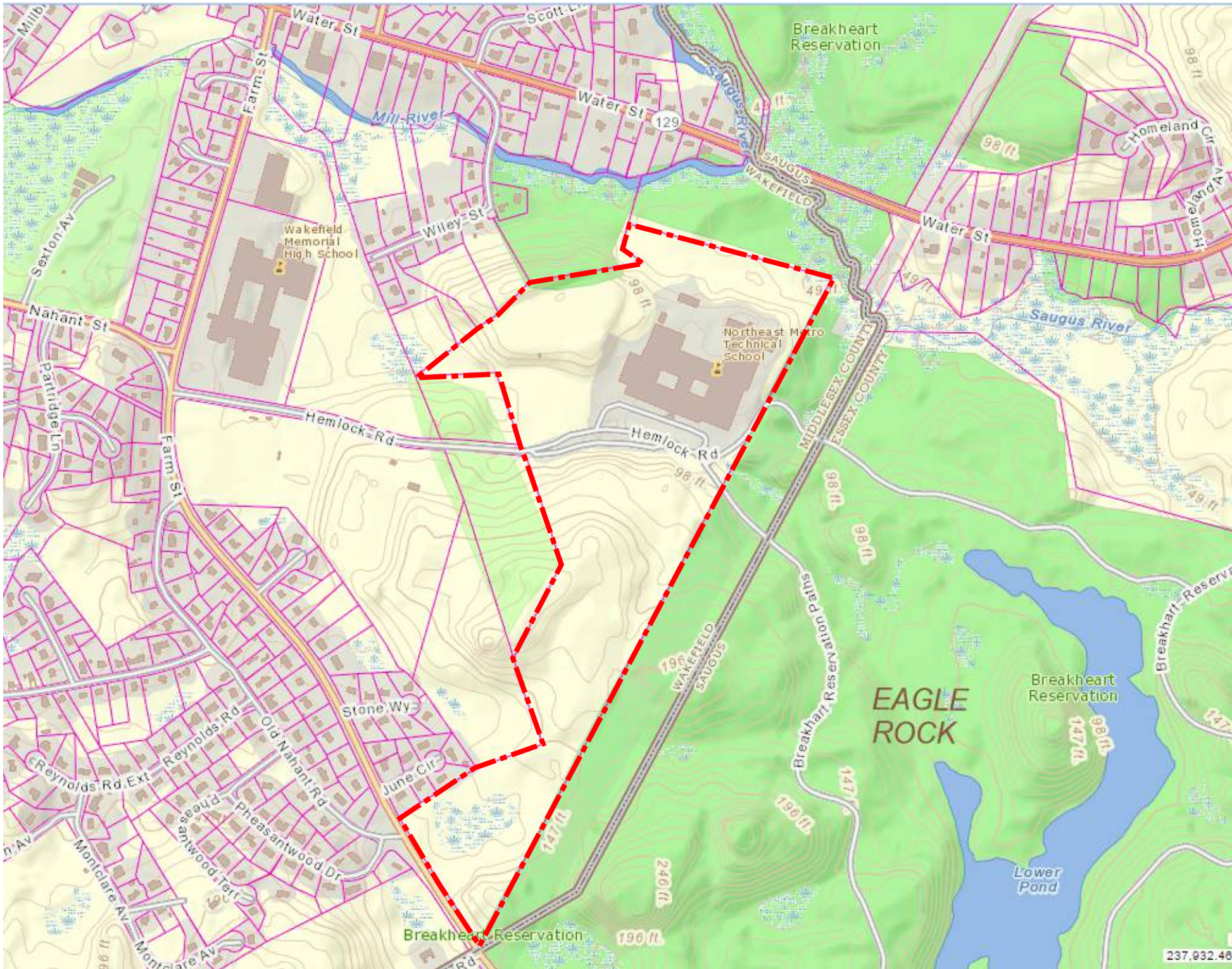
Additionally, Dore & Whittier Architects will engage with the designated writer(s) of the MSBA Statement of Interest (SOI). We will assist with the translation of relevant data and information from the body of this study into the SOI format, answer any questions, and generally guide the NEMT administrative team in filing the required forms with the MSBA in a timely fashion. The expected time frame for these activities is January – March of 2016.



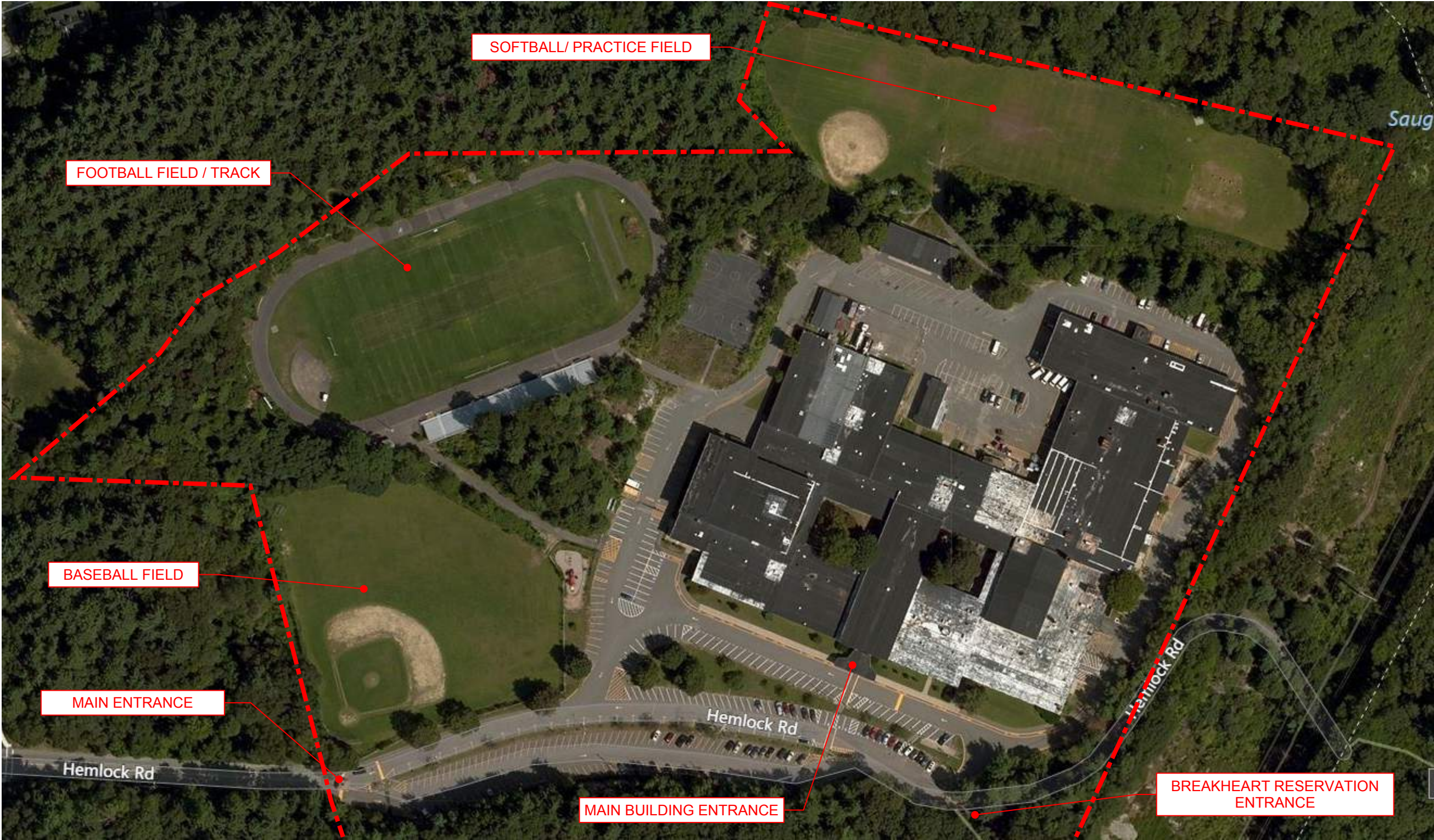
NORTHEAST METROPOLITAN VOCATIONAL SCHOOL DISTRICT
NOT TO SCALE



NORTHEAST METROPOLITAN VOCATIONAL SCHOOL PROPERTY BOUNDARIES OVER SATELLITE VIEW
NOT TO SCALE



NORTHEAST METROPOLITAN VOCATIONAL SCHOOL PROPERTY BOUNDARIES OVER MA GIS VIEW
NOT TO SCALE



NORTHEAST METROPOLITAN VOCATIONAL SCHOOL – DEVELOPED SITE AERIAL PLAN VIEW
NOT TO SCALE



NORTHEAST METROPOLITAN VOCATIONAL SCHOOL – DEVELOPED SITE: AERIAL BIRD’S EYE VIEW LOOKING NORTH



NORTHEAST METROPOLITAN VOCATIONAL SCHOOL – SITE AERIAL BIRD’S EYE VIEW LOOKING SOUTH

CIVIL / SITE - EXISTING CONDITIONS ASSESSMENT

Nitsch Engineering has performed an inventory of the existing site utility services and the overall site conditions at Northeast Metropolitan Regional Vocation School. The existing utility services were obtained from the following sources:

1. Site Plan for Building Construction Sheet C-1, prepared by Korslund, LeNormand & Quann, Inc. and dated November 24, 1967.
2. Plumbing Utilities Plan & Details, Sheet P-1, prepared by Korslund, LeNormand & Quann, Inc. and dated November 24, 1967.

In addition, Nitsch Engineering performed a site visit on April 16, 2015.

Athletic Fields

Varsity Football and Track

The football field and running track are located to the north west of the existing school building on a ridge above the school. There are two walkways to access the track, as seen in Images 1 and 2, with many accessibility issues. Both paths have deteriorating and settled pavement causing large cracks and an uneven walking surface. Neither path appears to meet accessibility guidelines with regard to pavement slope, and one includes a small stairway. The bleachers for spectators also do not have an accessible ramp.

The football field holds competitions for the school and would benefit from new sod and maintenance to maintain the sod. The running track is made of asphalt pavement and is not used for competition because of its poor quality. The pavement would require repaving or replacement of material to allow for track competitions to take place. The curb around the track is uneven and missing portions and should be reset if not replaced in full (Image 3).

Suggested Work

- New grass playing field
- New track surface-competition level
- Handicap parking on football field level, handicap accessible bleacher and pathway to field
- New press box (with accessible elevator)

Basketball Court

The basketball courts adjacent to the track also site on the ledge at a higher elevation than the existing building. The paved ramp to access the courts are in poor condition and have a slope that does not meet accessibility guidelines (Image 4). The basketball courts are in need of general maintenance; replace or reset the chain-link fence; cleanup of debris on the court; replace nets for



Image 1

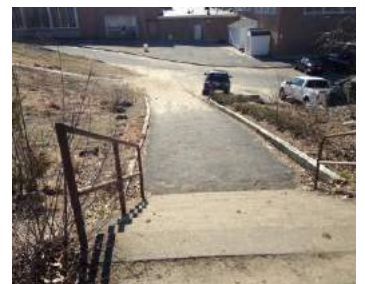


Image 2



Image 3

the basketball hoops. The pavement has multiple cracks and uneven surfaces that are potential tripping hazards. (Image 5).

Suggested Work

- New basketball hoops (4)
- New court surface- two side by side basketball courts
- New/reset chain-link fence around the courts

Softball and Practice Fields

At the rear (north) of the school property are practice fields and a competition softball field. The fields sit below the grade of the existing building. Access to the field is a concern with one access point on an uneven and deteriorating walkway (Image 6). This paved walkway is at a slope that would not meet accessibility standards. The fields themselves will require some maintenance and upkeep. This includes cleaning the fields of debris or unused equipment as well as general landscape practices. The softball field has no designated areas for the dugouts or spectators if competitions do take place (Image 7). There also appears to be equipment in the outfield that could conflict with game play.

Suggested Work

- New grass field
- Re orient softball field to provide adequate room
- Team dugouts and designated spectator areas

Varsity Baseball Field

The baseball field is located near the entrance of the site, adjacent to the entrance/access road (Image 8). Currently, there are no dugouts for the players and no specified area for spectators. According to maintenance staff, spectators provide their own seating and reside just outside the fence of the field. The field itself, similar to the other playing fields on the campus, would benefit from re-sodding provided it has enough time to “take” without use. Maintenance staff has difficulty maintaining the current field conditions with heavy and consistent wear and tear.

Suggested Work

- Players dugouts and spectator seating with accessible ramp
- New grass field
- Replace or reset chain-link fence



Image 4



Image 5



Image 6



Image 7

Roadway/Parking Conditions

Pavement

According to maintenance staff, the front lot and roadway were repaved within the past ten years which was the only major resurfacing project to occur on campus within the past 23 years. Curbing along the front of the building, specifically at the fire lane, is uneven and deteriorating (Image 9.) The access road to the rear and sides of the school, and associated parking, have deteriorating pavement in many locations and need significant repair or replacement. Large cracks and uneven pavement can be tripping hazards for visitor and users of the school.

Parking

Discussion with maintenance staff suggests that the number of parking spaces is not sufficient for the school's needs. Breakheart Reservation, is located adjacent to the school campus, and some parking at NE Metro Tech is reserved for public use of the Reservation.

Accessibility

Overall ADA accessibility at Northeast Metro Tech is an area of concern. The athletic fields currently do not meet accessibility standards for both access to the fields and spectator sections. There are two access points at the front and side of the building that include accessible parking spaces and ramp. One entrances leads to the pool which is no longer in use. The second entrance leads to an entrance with an interior ramp that does not seems to meet standards with regards to the steep slope (Image 10).

Areas of Improvement

- Provide accessible routes from the handicap parking to the building's entrance
- Resurface all pavement and reset/replace curbing
- Expand/restripe parking to provide adequate spaces including handicap parking

General Site Conditions

Aesthetics

In general, there are many clean up opportunities throughout site including debris of scrap metal and wood from school projects and site work. The debris is located most heavily towards the rear of the school building. It can give the impression of disorganization and clutter and can also become a hazard to users and visitors of the school (Image 11).



Image 8



Image 9



Image 10



Image 10

Day Care Playground

A child daycare playground existing at the extent of the baseball field to the front of the project site. The chain link fence around the playground is falling over in one location and is in need of repair and resetting. The playground surface is wood fibers which have currently been compacted and do not provide enough cover to the bottom of the playground structures. For example, the area around the slide and stairs are at least a foot drop before the wood fibers surface (Image 12). The playground surface can be leveled through raking the existing wood fibers, augment the existing surface with more wood fibers or replacing the surface with a more permanent surface.

Areas of Improvement

- Clean up of excess material on site
- Improvement to existing playground surface. Provide either new/additional hardwood chips or install a new resilient play surface



Image 11



Image 12

Utility Services

Water and Gas

The water service for Northeast Metro Tech is an 8-inch pipe from the 12-inch municipal main in Farm Street. The 8-inch cold water supply runs along the campus access drive and enters the building at two (2) locations, one at the eastern face and one at the rear (northern) of the school. Based on conversations with staff on campus, the current water services is below the capacity and needs of the school and require upgrades and a larger service. The school currently uses propane and oil for their building fuel needs. The school would also prefer gas service rather than their current propane and oil use. Improvement plans were developed in 1994 to provide a larger water service and gas line to the site, however, the project was not completed.

The plans detail a 16-inch water main and 3" high-pressure gas main to enter the site from Wiley Street to the west. The improvements would include routing of both gas and water to the service connections at the intersection of Montrose Avenue and Water Street. Please refer to sheets 2 and 3 of the Water and Gas Main Improvements Plans by Fay, Spofford & Thorndike, Inc. Engineers for reference. We would suggest revisiting the developed plans to provide water and gas needs to Northeast Metro Tech.

Sewer

There are two 6-inch and two 4-inch existing sanitary services at locations as specified on the attached plumbing utilities plan (P-1). The school also has two existing acid waste and vent lines for specific programs on campus. There are no known issues with any sewer services. Renovations to the building could require replacement or renovation to sewer services as well.

Storm Drainage

The existing storm drainage system on site collects into a system of catch basins and pipes to a headwall to the south east of the existing building. The drainage system is discharged at the headwall into a brook that continues east into Breakheart Reservation. After discussion with maintenance staff on campus, there are no apparent areas of concern or flooding on campus.

Access Road Options

After assessment of the existing parcel of land and land features of Northeast Metro Tech, we have established three options for an access road. Refer to Figure 1 for the three options.

Option 1 is to provide an additional access route to/from Farm Street. At this location the school property extends to the right of way and therefore no private property would be impeded. This route however requires an 86 foot elevation change and would require extensive grading and potentially blasting.

Option 2 explores the opportunity to use existing roadway in Breakheart reservation to provide an access road to the east of the existing school's property. Additional roadways will need to be constructed to connect the reservation routes to a public roadway. This would require allowing vehicular traffic onto the reservation, which was recently restricted, and obtaining easements for access through private properties, including extensive permitting requirements.

Option 3 would provide an access road from the residential street to the northwest of the schools building. This route would be similar to the location of the proposed water and gas main lines (as seen in the plans attached). This would also consolidate the location of the work to be completed for both an access road and any water and gas improvements. However, crossing private property would require obtaining easements and approval.

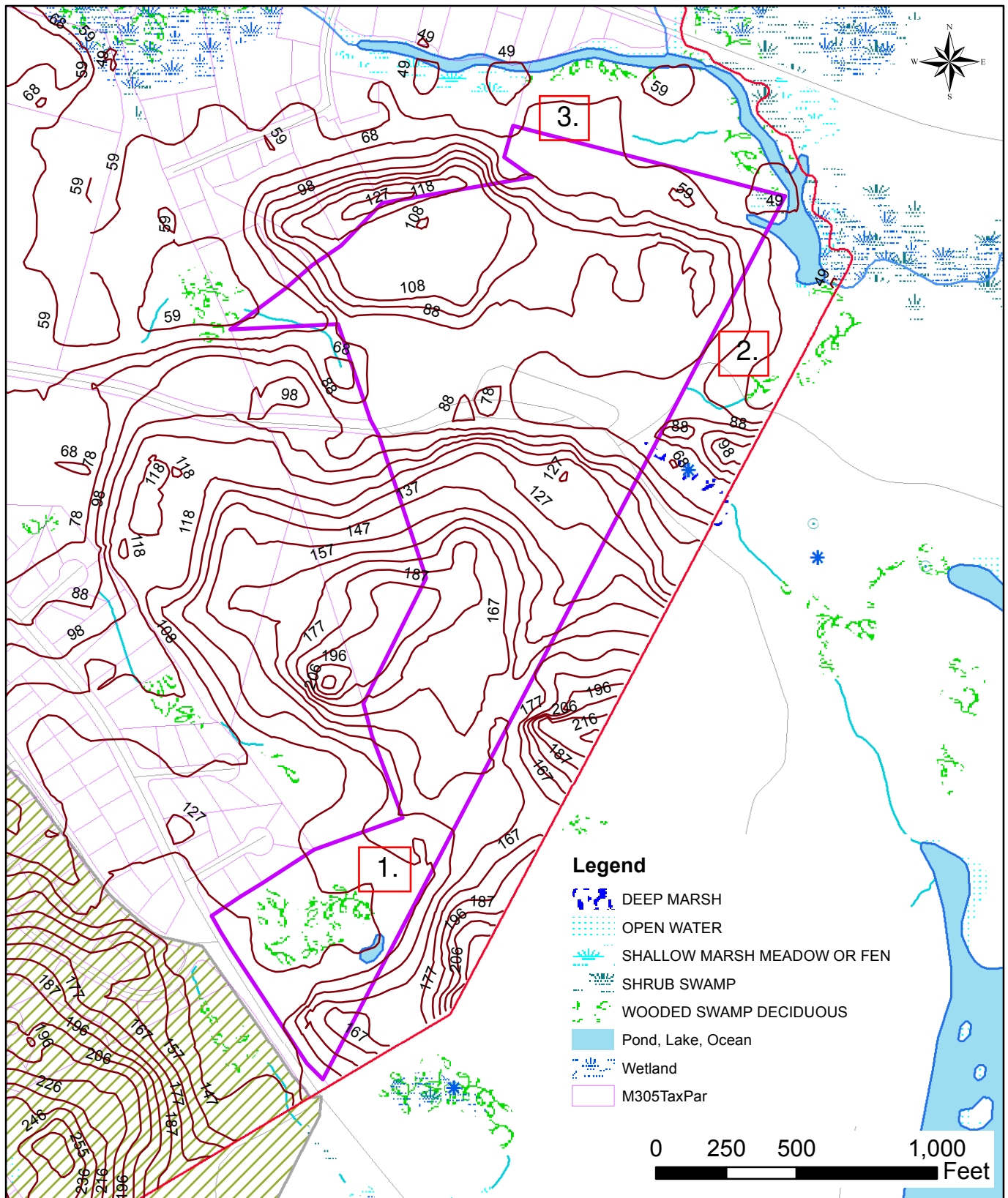


Figure 1: Locus Map
 Northeast Metro Tech
 Wakefield, MA

STRUCTURAL - EXISTING CONDITIONS ASSESSMENT

The purpose of this report is to describe, in broad terms, the structure of the existing building; to comment on the condition of the existing building; and on the feasibility of renovating and expanding the structure.

Scope

- Description of existing structure.
- Comments on the existing condition.
- Comments on the feasibility of renovation and expansion.

Basis of Report

This report is based on our visual observation during our site visit on February 17, 2015 and the review of the existing drawings of the existing building dated November 25, 1967 prepared by Korslund, LeNormand & Quann, Inc.

During our site visit, we did not remove any permanent finishes or take measurements. Where feasible the dropped ceiling tiles were removed to observe the structure above. Our understanding of the structure is limited to the available drawings and our observations of the structure.

Building Description

The building is located at 100 Hemlock Rd Wakefield, Massachusetts and was constructed in the late 1960s. The facility is essentially a single story rectangular structure with two interior courtyards and a partial basement. The portion of the structure between the two interior courtyards houses a two story classroom wing. The building is divided into seven parts separated by way of expansions joints. No major renovations or additions were constructed since the original construction. The pool structure was added as an alternate to the main building, but it is not clear if this structure was built at the along with the rest of the building or at a later date. The pool structure is located on the southwest of the school and is separated from the school structure by way of an expansion joint.



Figure 1



Figure 2

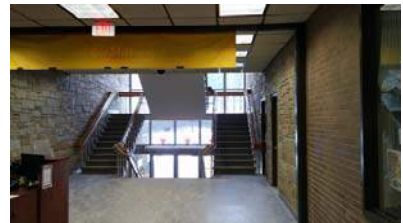


Figure 3

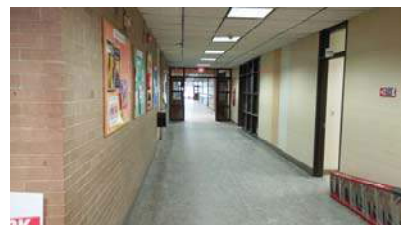


Figure 4

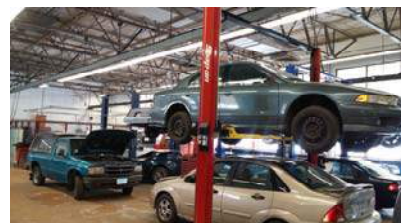


Figure 5



Figure 6



Figure 7



Figure 8



Figure 9

The lowest level floor is a concrete slab-on-grade. The portion of the first floor above the basement is a 12-inch thick reinforced concrete flat slab supported on wide flange steel columns.

The primary roof structure throughout the building consists of bulb-tees spanning between steel bar joists supported on masonry bearing walls on the interior as well as the perimeter. The typical roof construction is 2-inch poured gypsum deck supported on steel bulb tees spanning between steel bar joists. The bar joists are supported on interior and exterior masonry walls.

The Cafetorium roof consists of 2-inches of poured gypsum deck supported on steel bulb-tees spanning between steel trusses supported by reinforced concrete columns. The kitchen roof consists of 2-inches of poured gypsum deck supported on steel bulb-tees spanning between steel joists supported on wide flange structural steel beams and structural steel columns. The Gymnasium roof consists of pre-cast concrete tees supported on pre-cast concrete beams on masonry bearing walls. The typical second floor framing is a 2 ½-inch concrete slab on form deck supported on steel bar joists spanning between interior and exterior masonry walls. The lateral load of the structure is resisted by masonry shear walls.

The carpentry shop is used as a storage area and is currently not in use due to a fire that occurred in January 2013. The fire started in the dust collection system which was located inside the shop and destroyed the inner structural bay of the roof. The school replaced the old roof structure with new open web steel joists, corrugated metal deck and a membrane roofing system soon after the fire. Documents related to the design and construction of the roof replacement as well as inspection reports related to the remaining structure should be reviewed prior to any improvements being made in this space.

The pool structure is currently not in use. The pool deck is a concrete slab on metal deck supported on reinforced

concrete pool walls and exterior walls. The roof is framed with precast concrete tees supported on precast concrete beams and exterior masonry walls.

Existing Condition

Based on our observations the original (main) school structure is functioning adequately. We observed signs of minor water leaks in a few locations. The observable masonry appeared to be in good condition with the exception of some minor cracking in a few local areas. No observed cracks or leaks appeared to be a structural concern. We did not observe any excessive vibrations due to footfall on the framed floors. The roof and floor framing also appeared in good condition, steel angles were observed at the bearing location for the roof structure indicating that the framing is tied to the masonry walls. It is reasonable to assume that this structure was adequately designed for its original use. Local repairs to damaged framing members may be required.

From the basement/crawlspace below the deck around the pool we observed significant corrosion of the metal floor deck. It was not apparent from our review of the existing drawings whether or not this metal deck was an integral part of the floor system or was used as a form deck. We observed a significant amount of effervescence on the concrete in this space most likely due to chlorine infiltration when the pool was in use.

It was brought to our attention that the pool liner is cracked and that water had leaked through the liner into the soils below. The cause of the crack was not apparent. Due to the leaking, the pool structure was closed. Since the pool space is not currently in use, the temperature of this space has not been maintained. Cracking in the masonry walls was observed running vertically at regular intervals and propagating from the corners of windows and the heads of the doors. Most likely this cracking is due to the temperature fluctuations that this portion of the building has seen and may also be due to the lack of control joints in the wall.

We did not observe any major deterioration of the structure in the carpentry shop due to the fire. There appears to have been superficial damage to the floor and wall finishes. The structure appears to be functioning adequately.



Figure 10



Figure 11



Figure 12



Figure 13



Figure 14

A crack was observed in corridor D-116 near stairwell C at the joint between the flooring and wall finishes. Based on our observations, the cause of this crack was not apparent. After our review of the existing drawings, it is our opinion that the crack was caused by local settlement of the slab on grade.

Feasibility of Renovation and Expansion of the Structure

Depending on the scope of the renovations to the school, it may be feasible to make modifications to the existing structure without requiring full compliance with the code requirements for new construction. We would recommend that any additions, if planned, be separated from the existing structure by way of expansion joints.

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations, additions or change of occupancy or use are made to the existing structures, a check for compliance with 780 CMR, Chapter 34 “Existing Structures” (Massachusetts Amendments to The International Existing Building Code 2009) of the Massachusetts Amendments to the International Building Code 2009 (IBC 2009) and reference code “International Existing Building Code 2009” (IEBC 2009) is required. The intent of the IEBC and the related Massachusetts Amendments to IEBC is to provide alternative approaches to alterations, repairs, additions and/or a change of occupancy or use without requiring full compliance with the code requirements for new construction.

The IEBC provides three compliance methods for the repair, alteration, change of use or additions to an existing structure. Compliance is required with only one of the three compliance alternatives. Once the compliance alternative is selected, the project will have to comply with all requirements of that particular method. The requirements from the three compliance alternatives cannot be applied in combination with each other.

The three compliance methods are as follows:

- Prescription Compliance Method.
- Work Area Compliance Method.
- Performance Compliance Method.

Comment

The approach is to evaluate the compliance requirements for each of the three methods and select the method that would yield the most cost effective solution for the structural scope of the project. The selection of the compliance method may have to be re-evaluated after the impact of the selected method is understood and after analyzing the compliance requirements of the other disciplines, Architectural, Mechanical, Fire Protection, Electrical and Plumbing.

Since the existing buildings are un-reinforced masonry wall structures, the analysis and reinforcement of the existing structures would be governed by the requirements of Appendix A1 “Seismic Strengthening Provisions for Un-reinforced Masonry Bearing Wall Buildings” in the IEBC.

Prescriptive Compliance Method

In this method, compliance with Chapter 3 of the IEBC is required. As part of the scope of this report, the extent of the compliance requirements identified are limited to the structural requirements of this chapter.

Additions

Based on the project scope, the following structural issues have to be addressed:

- All additions should comply with the code requirements for new construction in the IBC.
- For additions that are not structurally independent of an existing structure, the existing structure and its addition, acting as a single structure, shall meet the requirements of the code for new construction for resisting lateral loads, except for the existing lateral load carrying structural elements whose demand-capacity ratio is not increased by more than 10 percent, these elements can remain unaltered.
- Any existing gravity, load-carrying structural element for which an addition or its related alterations causes an increase in the design gravity load of more than 5 percent shall be strengthened, supplemented or replaced.

Alterations

- Any existing gravity, load-carrying structural element for which an addition or its related alterations causes an increase in the design gravity load of more than 5 percent shall be strengthened, supplemented or replaced.
- For alterations that would increase the design lateral loads or cause a structural irregularity or decrease the capacity of any lateral load carrying structural element, the structure of the altered building shall meet the requirements of the code for new construction, except for the existing lateral load carrying structural elements whose demand-capacity ratio is not increased by more than 10 percent, these elements can remain unaltered.

Work Area Compliance Method

In this method, compliance with Chapter 4 through 12 of the IEBC is required. As part of the scope of this report, the extent of the compliance requirements identified are limited to the structural requirements of these chapters.

In this method, the extent of alterations has to be classified into LEVELS OF WORK based on the scope and extent of the alterations to the existing structure. The LEVEL OF WORK can be classified into LEVEL 1, LEVEL 2 or LEVEL 3 Alterations. In addition, there are requirements that have to be satisfied for additions to the existing structure.

The extent of the renovations (includes Architectural, FP and MEP renovations) for this project will exceed 50 percent of the aggregate area of each of the buildings, thus the LEVEL OF WORK for this project would be classified as LEVEL 3 Alterations. This would require compliance with provision of

Chapter 6, 7 and 8 of the IEBC. If the scope of the project includes new additions to the existing structure; this would trigger compliance with provisions in Chapter 10 of the IEBC.

Level 3 Alterations

- Any existing gravity, load-carrying structural element for which an alteration causes an increase in the design gravity load of more than 5 percent shall be strengthened, supplemented or replaced.
- For alterations where more than 30 percent of the total floor area and roof areas of a building or structure have been or proposed to be involved in structural alterations within a 12 month period, the evaluation and analysis shall demonstrate that the altered building complies with the full design wind loads as per the code requirements for new construction and with reduced IBC level seismic forces.
- For alterations where not more than 30 percent of the total floor and roof areas of a building are involved in structural alterations within a 12 month period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads at the time of the original construction or the most recent substantial alteration (more than 30 percent of total floor and roof area). If these alterations increase the seismic demand-capacity ratio on any structural element by more than 10 percent, that particular structural element shall comply with reduced IBC level seismic forces.
- For alterations that involve structural alterations to more than 30 percent of the total floor and roof area of a building within a 12 month period, the evaluation and analysis shall demonstrate that the altered building structure complies with IBC for wind loading and with reduced IBC level seismic forces.
- For alterations where more than 25 percent of the roof is replaced for buildings assigned to seismic design category B, C, D, E or F, all un-reinforced masonry walls shall be anchored to the roof structure and un-reinforced masonry parapets shall be braced to the roof structure.

Additions

- All additions shall comply with the requirements for the code for new construction in the IBC.
- Any existing gravity, load-carrying structural element for which an addition or its related alterations cause an increase in design gravity load of more than 5 percent shall be strengthened, supplemented or replaced.
- For additions that are not structurally independent of any existing structures, the existing structure and its additions, acting as a single structure, shall meet the requirements of the code for new construction in the IBC for resisting wind loads and IBC Level Seismic Forces (may be lower than loads from the Code for New Construction in the IBC), except for small additions that would not increase the lateral force story shear in any story by more than 10 percent cumulative. In this case, the existing lateral load resisting system can remain unaltered.

Performance Compliance Method

Following the requirements of this method for the alterations and additions may be onerous on the project because this method requires that the altered existing structure and the additions meet the requirements for the code for new construction in the IBC.

PARTICULAR REQUIREMENTS OF COMPLIANCE METHODS

For our project, in order to meet compliance with one of the two compliance methods “Prescriptive Compliance Method” or the “Work Area Compliance Method”, we have to address the following:

Prescriptive Compliance Method

Additions

Any proposed additions would be designed structurally independent of the existing structures, thus, would not impart any additional lateral loads on the existing structure.

If the proposed alterations are such that the alterations increase the design lateral loads on the existing building or cause any structural irregularity or decrease the lateral load carrying capacity of the building, the structure of the altered building shall meet the requirements of the Code for New Construction in the IBC.

If the proposed additions increase the design gravity load on portions of the existing roof members, these members would have to be reinforced and this incidental structural alteration of the existing structures would have to be accounted for in the scope of the alterations to the existing schools and would trigger requirements for alterations.

Alterations

Alterations that would increase the design gravity loads by more than 5 percent on any structural members would have to be reinforced.

If the proposed alterations of the structures increase the effective seismic weight on the existing structures due to the greater snow loads from the drifted snow against any proposed additions, or, by addition of equipment on the roof, the increase of the effective seismic weight from the drifted snow and the equipment would require that the existing lateral load resisting system comply with the requirements of the code for new construction in the IBC and it would increase the demand-capacity ratio on certain structural elements of the existing lateral load resisting system.

Work Area Compliance Method

Level 3 Alterations

If the proposed structural alterations of an existing structure are less than 30 percent of the total floor and roof areas of the existing structure, we have to demonstrate that the altered structure complies with the loads applicable at the time of the original construction and that the seismic

demand-capacity ratio is not increased by more than 10 percent on any existing structural element. Those structural elements whose seismic demand-capacity ratio is increased by more than 10 percent shall comply with reduced IBC level seismic forces. The percentage increase in seismic demand-capacity ratio on any particular structural element from the added snowdrift load against the proposed addition would be fairly low, thus, this would not have any major impact on the existing lateral load resisting system, though we would have to verify that the increase in seismic demand-capacity ratio on any of those particular structural elements is not greater than 10 percent.

If the proposed structural alterations of an existing structure exceed 30 percent of the total floor and roof areas of an existing structure, we have to demonstrate that the altered structure complies with the IBC for wind loading and with reduced IBC level seismic forces.

The seismic design category (SDC) of the existing structures is 'B'; thus, the replacement of the existing roofs would trigger anchorage of un-reinforced masonry walls to the roof structures and bracing of un-reinforced masonry parapets to the roof structures. All un-reinforced masonry walls in the existing schools will have to be identified. These un-reinforced masonry walls are required to be anchored to the roof structures. Since there are no existing un-reinforced masonry parapets, this requirement does not have any impact on the structural scope of the project.

Additions

Any proposed additions would be designed structurally independent of the existing structures, thus, they would not impart any additional lateral loads on the existing structures.

Comment

The compliance requirements of the two methods, in most respects, are very similar. The Work Area Compliance Method would trigger anchorage of un-reinforced masonry walls, if re-roofing of the existing structures is included as part of the scope for this project. The Prescriptive Compliance Method would require that the existing lateral load resisting systems meet the requirements of the code for new construction of the IBC, even for small increases of design lateral loads. We are required to comply with requirements of Appendix A1 of IEBC for either method, which requires anchorage of all existing masonry walls. Based on this, we would recommend the Work Area Compliance Method for the project.

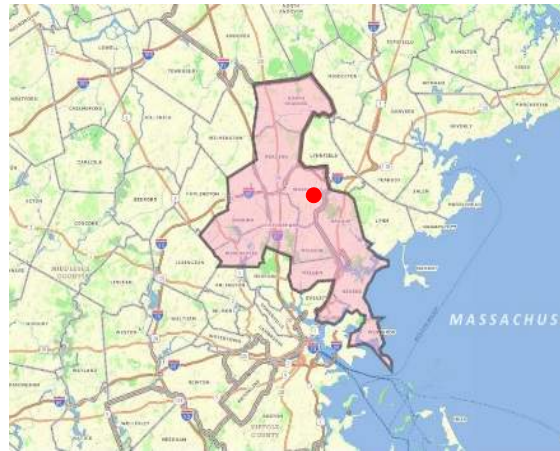
SUMMARY

The existing school structure appears to be performing adequately. The majority of the structural components that are visible appear to be in sound condition. We observed significant effervescence in the pool crawl space walls as well as severe corrosion of the metal deck which supports the slab around the pool. Further investigation will be required to verify the extents of the corrosion to the deck and to determine whether or not the deck is an integral component of the slab. An investigation will be required to determine whether the concrete slab and walls have been compromised by the chlorine from the pool water.

Any proposed major renovations or additions would likely require that the structure be updated to meet the code for new construction. This may require the addition of some shear walls, connecting the floor and roof diaphragms to the existing masonry walls, clipping of non-structural masonry walls to the structure. All of the existing masonry walls would have to be adequately connected to the roof and floor structure.

ARCHITECTURAL - EXISTING CONDITIONS ASSESSMENT

The Northeast Metropolitan Regional Technical High School, or Northeast Metro Tech (NEMT), provides academic and vocational programs for approximately 1,250 students from twelve surrounding communities: Chelsea, Malden, Melrose, North Reading, Reading, Revere, Saugus, Stoneham, Wakefield, Winchester, Winthrop and Woburn (Map 1). The school is located on a 30 acre plot at 100 Hemlock Road in Wakefield, MA. The parcel is divided into a developed northern portion, and an undeveloped southern portion, and the immediate school site is bounded by wooded areas to the south and west, and is sited east of Wakefield Memorial High School. The Saugus and Mill Rivers run north of the property bordering a residential stretch of Route 129/Water Street. Breakheart Reservation, accessed via the Northeast parking area, is a 640-acre hardwood forest located west of the site, and open year-round, with many recreation opportunities including hiking, biking, fishing, swimming, cross country skiing, to name a few. Also on site just west and north of the building are a football/track field with grandstand, basketball courts, baseball/softball fields and a practice field.



Map 1

The school (Image 1) was designed by Korslund, LeNormand & Quann, Inc. in 1967 and constructed in 1968. Some minor improvements and modifications within the building were designed and/or constructed through class projects. A fire in the woodshop approximately two years ago required some shuffling of programs and is unusable until repaired. Some structural work and a new roof has been completed for the space. Overall the school is relatively untouched. There is a 4,000 SF storage building, also designed by KLQ, Inc. in 1975 at the rear of the site, built into the slope between the parking lot and the athletic fields. Current enrollment is approximately 1,267 students in grades 9-12, and gross floor area is 240,138 ± SF. During the day peak staff numbers are approximately 190 people.



Image 1

The interior building survey for this report was conducted on February 17-18, 2015. Due to the record snow fall in Massachusetts this past winter, the exterior building survey was completed on April 16, 2015.



Image 2



Image 3



Image 4



Image 5



Image 6

Exterior

Foundation

The building has reinforced cement-parged concrete foundation walls and strip footings with concrete slab on grade floors. The foundation is visible along the perimeter of the building and in relatively good condition in most areas. Issues noted include the following.

1. Peeling of cement parging was noted at multiple locations around the building. Resurface with a quick-setting cement to avoid moisture causing further damage.

2. The pool building had the greatest distress with exposed and corroded rebar, and some noticeable cracks. Pieces of concrete were easily pulled away from the foundation wall as well. The pattern of corroding rebar is visible from the exterior in Image 3.

3. Exterior concrete pads and door slabs exhibit cracking, spalling, and deterioration as well (Image 4, 5). Determine level of deterioration and resurface or replace as warranted.

4. The loading dock walls have rust stains from metal bumpers and old handrails that have since been removed (Image 6).

Foundation – Recommendations

1. Cement parging at foundation around building should be resurfaced if minor cracks are evident. At areas that have severe breaks and chunks of detaching material, removed damaged sections before repairing.

2. Resurface cracked/spalling concrete. Replace concrete pads at doors that have deteriorated beyond repair.

3. Clean rust off concrete at Loading Dock with appropriate rust remover.

Walls

The basic exterior wall type is brick veneer over concrete masonry unit (CMU) back-up. The exterior wall is essentially a solid masonry wall with little R-value, or thermal resistance. Record drawings indicate the 1'-4" wall thickness does not include insulation within the wall cavity. The walls are relatively good condition. Some exception were noted during our site visit. Without a doubt, the Natatorium had the most apparent and significant problems, due to the great differences in temperature and humidity between interior and exterior that a pool structure in a Northern climate must undergo every winter.

1. West wall of the Pool Area: Significant efflorescence (white, chalky staining) was noted at the upper part of the exterior brick wall at the pool. Refer to Images 7 and 8. This condition is not uncommon to older natatoriums, and indicates the presence of moisture in the wall cavity and significant vapor drive pushing moisture-borne salts out through the mortar joints, which are then deposited on the brick surface. Based on the original 1967 drawings, we believe there is no vapor barrier in the wall. The interior finishes include a large area of unfinished masonry which would permit a significant amount of water vapor to pass through the wall causing the efflorescence. The pool is currently not in use, however if the pool was repaired and in use again, we recommend applying an interior vapor barrier to the unfinished CMU wall to limit water vapor from passing through the wall and sealing any gaps where the exterior wall meets the roof and around windows to avoid air moving into the brick cavity. Once the issue is mitigated, we would recommend cleaning the exterior brick.



Image 7



Image 8

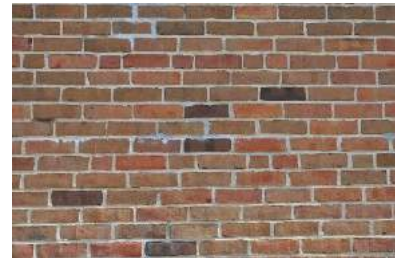


Image 9



Image 10



Image 11



Image 12



Image 13



Image 14



Image 15

2. Mortar deterioration was noted in isolated locations. At the pool wall, it was noted that some mortar repair was attempted (Image 9). A noticeable crack below the fascia was noted at the south elevation of the pool as well (Image 10).

3. A brick structure for flammable storage (Image 11) was added just outside of the Maintenance Area on the north side of the building. It is assumed this structure was added at a later time based on the darker shade of red brick. Smoke stains indicate there was a fire at one time.

4. A second brick flammable storage structure (Image below) attached to the building has multiple areas of discoloration, indicating sheet drainage and near-constant wetting on the face of the brick. It is likely the low points on the roof are not as designed or the amount of drainage on the roof is more than the scupper can handle.



Image 16

5. We observed significant expansion joint failure (Image 12) on the east side of the building, near door 23. This appears to be related to the settling floor issue just inside the corridor. Refer to structural assessment for more information. Flashing is visible where deteriorated concrete wall meets the brick at this same area (Image 13).



Image 20



Image 17

6. Damaged masonry under a vent on the east side of the building should be repaired (Image 14).
7. Precast concrete mullions in the building elevations define window wall areas. The wall type is precast concrete panels over CMU back-up below, and depending on the location, (Image 17) above window openings. A decorative precast panel was used below some windows and above some doors. Existing drawings refer to the panels as “3 inch Mosai panels”. The panels are in relatively good condition, except at a few isolated locations.
8. Holes were punched in the precast panels at a few locations on the north and east sides of the buildings, likely to allow for access for equipment connections at shop spaces. (Image 15)
9. Precast concrete sills are in good condition given their age. Little distress was noted other than a few isolated areas of cracking or spalling (Image 20).
10. Rust stains were noted due to vents or fans just above the sill (Image 17).
11. Cracking caulk at the concrete mullions (Image 18) was typical around the building.



Image 18



Image 19



Image 18



Image 19



Image 20



Image 21

12. Many of the storage buildings located on site are clad in vinyl siding. Some damage/cracks were noted (Image 19).

Doors

The majority of exterior hollow metal doors and frames are heavily worn with dents and scratches (Image 24), and exhibit rusting. Refer to Image 21 for one of the more damaged conditions noted during our site visit.

Many doors lack adequate air sealing properties as daylight is visible from within the building in multiple locations. Thresholds are damaged as snow was visible just inside some doors during the February walk-through (Image 22).

Overhead Doors

Although no issues were reported regarding the operation of the overhead doors, they are heavily worn with dents, rust and peeling paint (Image 25). The overhead doors are typically 14x14 or 10x14, some with vision panels, and account for much thermal loss as they typically have very low thermal values. For example, snow was noted inside the plumbing shop at the threshold of the overhead door (Image 22). Consideration should be given to replacing overhead doors that do not require vehicular access with a large set of double doors that would have better insulation and air sealing properties with far less maintenance.

Windows

Typical windows throughout the building are aluminum frames with a hopper-style, operable sash and non-insulated single pane glass. They are the original windows (Image 23) based on record drawings. Thermally inefficient but otherwise in fair condition, some operable sections were modified to fit an air conditioning unit. In some shop locations, lower venting sash have been replaced with fixed panes of plastic sheet or various other materials. Damaged screens were noted at a few locations.



Image 26

Fiberglass-faced, insulated, non-load bearing translucent panels (“Kalwall”-type) typically found at shop spaces are severely weathered, with fiber strands beginning to unravel from the panels’ exterior surface indicating the start of deterioration. One section at the auto mechanic shop was completely delaminated exposing the interior structure of the window (Image 26).

The degradation of the “Kalwall” system appears to have greatly reduce the amount of admitted daylight, and by their character the panels do not provide exterior views (Image 27). The hopper windows below are small and worn and provided limited views to the outdoors.

Grilles

The condition of the air intake grilles for unit ventilators vary in condition and are located at both upper and lower levels. The most common issues noted were that the lower level grilles are dented and rusted (Image 28). It appears some are in better condition and may have been replaced over time (Image 29). The cement parging is typically degraded at many grille openings as seen in both Images 28 and 29.



Image 22



Image 23



Image 24

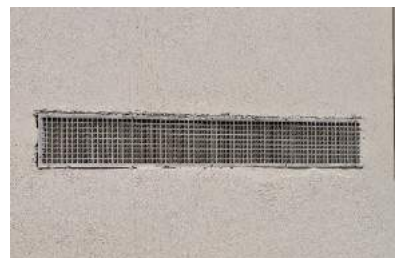


Image 25



Image 27



Image 28



Image 29



Image 30



Image 31

Roof

The flat EPDM roofs slope to internally plumbed drains, which are connected to the site storm water drainage system (see Civil Engineering portion of this report for more detail on this topic). According to staff, the entire EPDM roof was replaced in 1980, making it 35 years old, and well out of warranty. The roofing system is typically in fair condition in Areas A, B, D, and F, but poor condition in Area E. Area C was recently reroofed with a Goodyear “Versi-Gard” product after the fire in the carpentry shop, and is in nearly new condition.

The staff have noted that there are many active leaks in the membrane roof, and that as they are located and fixed, new ones spring up. Clearly, the roof is past the end of its service life. Winter is especially challenging as snow gets sucked into air intakes and melts, causing leaks to the interior.

We also note that the original roof deck is poured gypsum. This material typically does not hold up well when exposed to water via the leaking roof. Further invasive testing, such as a test cut, should be performed to assess its condition.

The following issues were noted:

1. Many white paint patches, likely a liquid roof repair product, were noted. Some were newer applications while others were worn/faded and discolored. Area E appears to be in the worst condition. It is unclear if the paint was used to repair leaks as they were discovered.

2. Cafeteria roof hatch bolt is broken. If the hatch is closed while people are still on the roof, there is no way to open the hatch, trapping those on the roof, which nearly happened to the team while on the walkthrough (Image 32).

3. A section of metal fascia on the high roof of the cafeteria is damaged and in poor condition (Image 33).

4. Most roof top equipment and supporting structures and ladders are rusted and staining the membrane in the surrounding areas (Images 35 and 36).



Image 36



Image 32



Image 33

5. Flashing at equipment varies in condition from fair to poor (Image 37).
6. Some roof drains are rusted or broken but appear to be draining as no visible ponding was noted except the center of section A (Image 38).
7. Gutters are broken and missing splash guards in many locations (Image 39).
8. Grout has deteriorated at the brick chimney and is in need of repointing (image 40).
9. Trees overhang the roof and should be trimmed to prevent damage to the membrane surface, and prevent accumulation of rotting leaves on the membrane and in drains.



Image 34



Image 35

10. Sections of newer roofing, fascia boards and roof drain covers were noted at the north sections of the roof.



Image 37



Image 38



Image 39



Image 40



Image 41

11. The membrane at the high roof of Area B above the gymnasium/pool areas has significant bubbling of the EPDM (Image 42). This may be due to evaporation of water trapped within the roof assembly.

12. Bulb-type expansion joints over building expansion joints appear to be in fair to good condition (Image 43).

13. Wood trim at higher roofs are rotting from water damage and weathering over time (Image 44).

14. Wood Soffits at the higher roofs are peeling and should be repainted (Image 45).

15. Kalwall translucent panels are somewhat worn with delaminating fibers (Image 45).



Image 42

Interior

Flooring

Numerous types of flooring in various conditions were found throughout the facility.

Terrazzo

Terrazzo flooring is a very durable product and is found at entries, corridors and cafeteria, all in very good condition. This finish is dingy and needs a thorough, deep cleaning, especially at the edges of corridors (Image 48).

- A section of the floor in corridor #116, from east of the expansion joint to the exit doors, has settlement issues (Image 49). The south side of the corridor has sunk approximately 1.5", and the north side has sunk approximately 0.5". Refer to the structural assessment for additional information.
- Terrazzo shower bases in Girls Locker Room exhibits cracking with rust stains around the floor drain from the metal partition system (Image 50).

Vinyl Tile

Vinyl tile flooring is the predominate flooring found in classrooms and administrative spaces. Much of the tile is Vinyl Composite Tile (VCT) however some Vinyl Asbestos Tile (VAT) still remains. Refer to hazardous materials section of this report for additional information. The condition of the vinyl tile and vinyl base varies throughout the building.

- Majority of classrooms have VCT in fair to good condition. Some classrooms have mismatched tile likely due to replacement of damaged sections over time, such as in the Dental Assistant Classroom (Image 55).



Image 43



Image 44



Image 45



Image 46



Image 47



Image 48



Image 49



Image 50

- Floor tile was missing randomly throughout the building but notably on the lower level of the building.
- Administration areas appear to have newer VCT in good condition.
- The vinyl tile is worn in the guidance suite along the path of travel from the main door to the offices. Rust stains were noted in some locations.
- In the Child Care computer lab, the VCT along the exterior wall appears to have had shifted with cracks in many of the tiles and discolored seams. This may be due to water/moisture issues and should be investigated further (Image 51).
- A row of tiles in Classroom 013 has warping along the seams. If the floor tiles did not properly adhere during installation, potentially due to moisture or water under the tile from cleaning, or vapor drive due to lack of vapor barrier under the slab. More investigation is warranted. (Image 52).
- There are areas where damage tile have not been repaired, or never installed under casework that has since been removed (Image 55). This condition was noted in a number of classrooms on the first floor as well as the professional development space off the library.

- VCT under chairs in the Office Technology Classroom are severely worn (Image 54); padding under chair legs is recommended at these location to prevent further damage to the flooring.

Wood Flooring

Wood is the flooring material in the gymnasium, performance platform and a few other various locations in the building.

- The maple wood strip gymnasium flooring was resurfaced a few years ago and appears to be in good condition (Image 56). A few isolated areas along the perimeter are showing some wear, likely from the movement of opening and closing the bleachers.
- The platform flooring is in poor condition (Image 57), with scratches from stage sets and dragging of the various mats on and off the platform. A few boards appear to have slightly started to lift. This may have resulted from leaks above (evident from the water stained ceiling above) which would warp the boards over time.
- The Superintendent's office has Pergo vinyl wood flooring in good condition (Image 58).
- The adult education classroom near current carpentry shop also has a floating laminate wood floating floor, however sections near the door have separated from each other (Image 59).
- The electrical shop space has tongue and groove wood flooring in poor condition. The floor should be refinished at minimum, if not replaced.
- The carpentry shop was damaged by fire, and half of the wood floor was removed. The other half remains but is in very poor condition and should be replaced.



Image 51



Image 52



Image 53

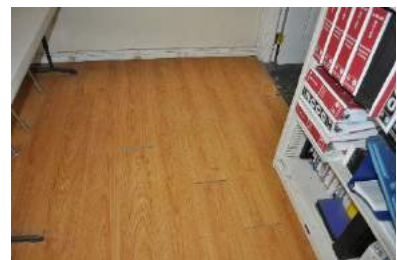


Image 54



Image 55



Image 56



Image 57



Image 58

Carpet

A few areas in the building have carpet in mostly good condition.

- The Library/Media Center carpet tile is worn with stains and rips in multiple locations (Image 64).
- Carpet in the conference room and some offices is in good condition.



Image 59

Ceramic Tile

The pool (Image 60), locker rooms and toilet rooms have mosaic floor tile in varying conditions. The gang toilet rooms and locker rooms throughout the building are typically in poor condition, mostly from wear and tear over the last 45 years.

The dark grout color throughout is deceiving in that floors may appear dirtier than they actually are, but nonetheless, most tile floors have a dingy appearance (Image 61) and could use a good deep cleaning.

The pool liner is cracked and was leaking water into the soil below at which time the pool was closed. The rusted drains and stains are apparent at the bottom of the pool (Image 62). Refer to the structural assessment for more information.

Quarry Tile

Quarry tile in Kitchen and Student Food Service Kitchen is worn, with sections of missing and cracked floor tiles (Image 63). No issues were noted with the quarry tile in the Café space.

Concrete Slab

The dry food storage areas have painted concrete slab in worn condition (Image 69). This condition may become a health code issue.



Image 64

Shop spaces vary in condition based on their use. Painted concrete floors are worn from typical wear and tear over the last 45 years. There is a layer of dirt on the floor between dust from the shop activity and outside weather elements tracking into the space (Image 65), especially near garage doors. No major cracking was noted in the floors, refer to structural assessment for more information.

Concrete slabs sloped to trench drains in the automotive areas may have settled as ponding near the trench drains is evident by the snow/salt stains visible on the floor from snow/dirt tracked in by vehicles (Image 66). Trench drains are rusting but appear to still be functioning adequately. Refer to structural/plumbing section for more information.

Slate

Slate flooring was noted on both sides of the stairs at the main entrance. It is in good condition and the only location in the school that this type of flooring was observed (Image 67).

Miscellaneous Flooring

The HVAC classroom was eclectic in its flooring selection: wood flooring is in the center area of the room with a decorative ceramic tile border and carpet along the



Image 60



Image 61

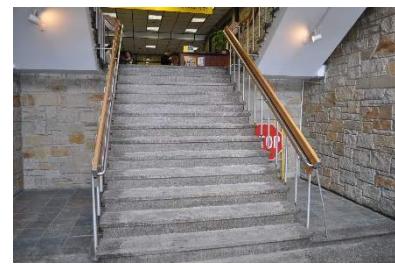


Image 62



Image 63



Image 65



Image 66



Image 67

perimeter of the walls. All three (3) flooring types appear to be in mostly good condition (Image 73). The carpet has a large water stain along the teaching wall (Image 68). Based on the missing ceiling tiles and stained substrate panels above, there was likely a roof leak.



Image 68

Walls

Brick

Select corridors, stair wells, the cafeteria and platform proscenium opening have brick walls with terrazzo base in fair to good condition (Image 70).

Concrete Masonry

Corridors are typically painted Concrete Masonry Units (CMU) in good condition. Many of the shop spaces have CMU walls, typically painted up to 6' and then left with natural finish above. A localized crack (Image 71) was noted above the door in the carpentry shop.

CMU is durable and appropriate to handle the wear and tear of heavy student traffic throughout the day. Most CMU is painted and in good condition. At the 2nd floor classroom wing, Zolatone or a similar abuse resistant paint product is used on the upper 4 courses of CMU in the corridor. Typically the Zolatone product is used on the lower half of the wall, and it appears it was painted over at some point (Image 72).

Glazed block is the primary wall material found in locker rooms and the weight room. The finish is in fair to poor condition in all locations (Image 78).



Image 73



Image 69



Image 70

Stone

Main entry has a 2-story stone wall finish with terrazzo base at main and second floor, all in good condition (Image 74).

Painted Plaster

Spaces typically consist of 6" metal stud with metal lath and painted plaster finish in varying conditions. There are multiple locations throughout the building with damaged areas including chipped /peeling paint (often near or behind mechanical units and windows), cracks and holes (Image 75).

Wall Tile

The pool, toilet rooms and kitchen/food service area have 4"x4" ceramic wall tile in fair condition, with many cracked tiles along the base (Image 76, 77). Water fountains found in hallways are marked by the mosaic wall tile behind it in fair condition.

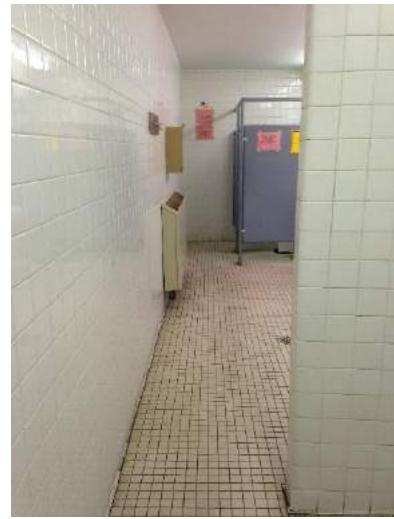


Image 71



Image 72

Moveable Partition Walls

Torjesen Wall-a-way folding partition walls were noted between four 2nd floor classrooms (Image 83). The tracks



Image 74



Image 75



Image 76



Image 77

look worn and were squeaky, but still operational. Operable partitions provides flexibility of space configuration and can promote collaboration between multiple subjects/classes. However if not utilized, their poor acoustical properties becomes a detriment and their removal should be considered.



Image 78

FRP Panels

Fiberglass reinforced panels (FRP) found in the weight room are in fair to poor condition.

Wood Panels

A few offices in the administrative suite have wood paneling in reasonably good condition (Image 79). It was also noted above some doors. This configuration was not part of the original design as the plans indicate this space was originally an open Teacher's Lounge.

Ceilings

Acoustical Ceiling Tile

The majority is 24"x24" acoustical dropped ceiling systems with either black or white grids (Image 80). The condition varies as some areas appear newer while other areas either have water damage from pipes/roof leaks or dirt from adjacent air distribution vents (Image 81). Many active leaks were noted during our February site visit, most likely from the large quantity of melting snow entering rooftop mechanical units, and damaging tiles.

Concealed Spline Ceiling Tile

The cafeteria and many classrooms have 12" x 12" ceiling tile with concealed suspension systems. The ceiling tiles of this type are mixed between poor and fair condition (Image 82). Some tiles exhibit water damage, have partially detached from the concealed grid or have a bright white appearance after being cleaned/painted. (Image 88). If painted, the tiles lose much of their acoustical value. Many classrooms have tiles removed to access technology wiring, that were not replaced.



Image 83

Exposed Structure/ - Gypsum Roof Deck System on Bulb Tees

Shop spaces have exposed structural trusses revealing the gypsum roof deck system above. This system consists of gypsum concrete over formboards supported by bulb tees and wire mesh system. Many of the formboards exhibit water damage and surface/finish damage (Image 83). The integrity of the gypsum deck is severely compromised when exposed to roof leaking over time, which has occurred on this building. Exploratory roof cuts should be made to ascertain the deck's condition.

Doors

Wood Doors in Metal Frames

Doors are in worn condition (Image 84) unless they were recently installed. Wired glass was noted at hallway doors lites and although it is no longer allowed by the building code for new door systems, the code does not require replacement of existing conditions. Interior hollow metal door frames are typically in fair condition. The paint is often scratched and worn but otherwise had no noteworthy issues. Door accessories such as push plates, kick plates, etc. are also worn and warrant replacement in most instances.



Image 79



Image 80



Image 81





Image 84



Image 85



Image 86



Image 87



Image 88

Windows

Sills

Sills appear to be made of a black epoxy resin material. A heavily damaged sill at the SPED CR was noted (Image 86). In general, most other sills were in fair to good condition.

Furnishings, Fixtures and Equipment

Based on our visual observation of the facilities we have compiled the following summary of the furnishings, fixtures and equipment conditions:

Furniture in the Administrative/Guidance Office suites are generally in fair to good condition and ranges widely in quality and age. The wood reception casework and mail boxes appear to be fair condition and the newer countertop is in good condition (Image 89). Desks and task seating are of reasonable quality, comfort, and adjustability. The office furniture in the guidance offices are cubicles intended for a shared office space. The cubicle setup barely fit into the small office areas creating a cramped space (Image 90).

The Cafétorium is in fair condition (Image 91). Tables and chairs in the Cafeteria dining area appear appropriate to the task with a mix of long rectangular tables and round tables and loose chairs (Image 92). All appear to be in fair condition. As a shared space, the performance component (Image 93) lacks a projection booth, sound and lighting equipment and a stage outfitted with full-fly rigging typically found at a school of this size. Curtains were not tested for function, but appeared to be in reasonable working order. There is a single row of stage lighting in the ceiling, as well as on-stage, whose age and functionality is unknown. It is unclear how often the space is used for performances/events. It should be noted that programmatically, the absence of a fully-functional, properly-equipped theater space is a missed opportunity in this high school, as a theater arts program would offer many access points for both academic and technical education.

The facility has a fully functioning commercial kitchen and a second student-run culinary kitchen and café. Most of the kitchen

equipment appears to have been well maintained (Image 99). Please refer to the Kitchen and Foodservice section of the report for assessment of the food service operation and equipment. The café furniture varies with 2-4 person wood tables in fair to good condition and wood booths in fair condition – some upholstered seats are worn with broken springs.



Image 94

Furniture and equipment in the shop spaces are specific to the needs of the trade taught. In general, the equipment is of varying age and condition. The equipment is replaced as needed and when supported by the budget.

Cosmetology space (Image 94) has an operating shop with dated furniture in fair condition, including many chips and other damage to the plastic laminate casework.

Health Assisting/Dental Assisting classrooms have older tables and chairs, but the training equipment, such as hospital beds (Image 95) and dental chair and associated components (Image 96) are in good to fair condition.

Furniture in the Child Care space appears newer in in good condition (Image 97).

The age of the equipment in computer based labs is not known, but appear somewhat dated. Seating varies from rolling task chairs to cushioned stationary chairs that are not adjustable. The stationary chairs are not suitable for the task as the correct ergonomics cannot easily be established for each student as they rotate through the day. Tables are dated with wood composite or plastic laminated tops which are delaminating in many locations, not just in lab spaces. (Images 98 and 103).



Image 89



Image 90



Image 91



Image 92



Image 93



Image 100



Image 101



Image 95



Image 96

Partitions in student gang toilet rooms and lockers/showers are typically painted metal, many of which are damaged with scratches, dents, or graffiti/discoloration and lack overhead bracing of any kind (Image 100, 101). Urinals lack privacy screens throughout.

Student desks vary greatly in styles from separate composite top desks and plastic chairs to one-piece tubular metal frames with high-density plastic writing desktops and seats, and range from good to very poor condition with considerable wear noted. Generally, student seating does not allow movement or flexibility, which, if present, would contribute to students' comfort and ability to concentrate as well as accommodating a wider variety of sizes and shapes of people. Teachers' desks similarly range in style and condition. . A few rooms, such as computer labs, have tables of metal and composite construction; most are in fair to poor condition.

Built-in Casework in classrooms consists primarily of wood bookshelves and a tall wood cabinet in fair condition. Classrooms with original wood casework are in poor condition with doors sagging, broken drawers and/or handles. Padlocks have been placed on some in lieu of hardware replacement (Image 107).

Lab casework in the Science Rooms is original with a few newer tables in some of the rooms. Chemical-resistant tops

are in fair to poor condition, as are the bases. The same is true for the glass-front display cabinets and built-in bookshelves in the labs. Vent Hoods appear to still be functional. A few of the eyewash stations are newer with floor drains, although there are a few that are original with either no floor drain or furniture blocking proper access to it (Image 102).



Image 100

There are numerous other areas of built-in wood millwork and casework at kitchenettes and storage rooms that vary in condition from fair to poor (Image 107).

Most blinds are in fair to poor condition (Image 104). Consideration should be given to replace items that are in poor condition.

The Gymnasium has retractable bleachers in fair condition. Plastic-molded seats are worn, very dingy, and badly need to be cleaned (Image 105). Safety rails are present. A fabric court dividing curtain is in fair condition and no functional issues were reported. There are also fixed and retractable basketball goals that are functional, however the fixed boards are out of date (Image 106). Limited wall padding behind the retractable backstops is in fair condition.

The Boys' and Girls' locker rooms have banks of single and double tiered lockers with sloped tops in fair condition. Most lockers that were open had rusting bottoms. The built-in benches have tile finish which is often damaged, and the wood seat cover is worn and coming apart in some instances (Image 112).



Image 97



Image 98

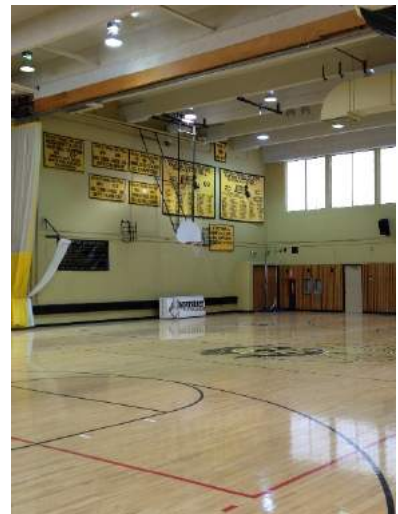


Image 99



Image 107



Image 108



Image 109



Image 110



Image 111



Image 112

Corridor lockers and some lockers within shop spaces are too thin to realistically fit a standard backpack. It is unclear how often the hallway lockers are utilized (Image 107). The lockers within shop spaces are relatively dirty and have some graffiti, and in poor condition overall (Image 108).

The Library (Image 109, 110) is primarily equipped with high wood shelving in good condition. Wood reading and computer tables and matching chairs are generally in good condition, but are dated. Soft seating looks fairly new, and is in very good condition. The circulation desk appears cramped in its design (not enough room for basic critical tasks and reasonable storage), but is in good condition.

Accessibility

The school has made some attempts at accommodation and accessibility in certain areas, but the facility as a whole lacks comprehensive compliance. Based on current Americans with Disabilities Act (ADA) and Massachusetts Architectural Access Board (MAAB) regulations, we have noted the following items concerning access to physically challenged users:

The main entrance is not accessible, as one must ascend stairs upon entering the main doors (Image 111). Most exterior

doors have an elevated concrete pad or single step/riser with no ramp (Image 113). The building does not have an elevator and a single stair-lift is inoperable. A new platform lift (appears to be a Limited Use/Limited Access—LULA—type) was in the process of being installed at the time of our visit. It is located in a storage room adjacent to the cafeteria, which will give access to the lower academic level (Image 114). Though a positive step, the addition of this lift does not create an accessible route that is equivalent to the route experienced by the general public.

There is a ramp at a south-east entrance of the building near the Breakheart Café and child care area; however, upon entering the building, one is forced to ascend or descend a set of stairs, negating the accessible route.

The ramp outside the entrance to the pool is the only apparent entrance a wheelchair-bound individual can use to access the facility (Image 115). This would give access to the main level corridor system, but access stops at a grade step at the rear third-point of the building of some eight risers. At that step point, there is one interior ramp at Corridor A, north of the science labs, but it is too steep and is non-compliant (Image 116).

In summary, there is no unbroken accessible route starting from accessible parking spaces, into the main building entrance, and from there linking all parts of the school, and this required accessible route is typically negated by level changes in the circulation system.

Many of the interior doors do not feature the required floor clearances for wheelchair approach to the latch side of the door, due to adjacent wall configurations, permanently built-in items, or heavy/ non-movable furniture. Eighteen inches of clearance is needed at the pull side of each door, and twelve inches at the push side, as well as other minimum areas for approach to, and operation of doors. Also many doors throughout the building feature hardware with knobs, instead of accessible lever handles. Furthermore, many doors are placed in deep-recessed masonry openings of more than six inches between face of door and face of surrounding wall (Image 122 shows many of these issues).



Image 113



Image 114



Image 115



Image 116



Image 117



Image 118



Image 119

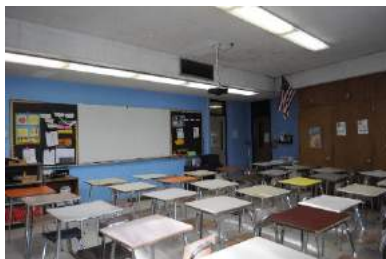


Image 120



Image 121



Image 122

The “cafetorium” platform is not accessible to people in wheelchairs from the audience. It is also three risers down from the upper corridor level running behind it. The steps to access the stage have been retrofitted with handrails that appear compliant (Image 117).

There may be maneuvering clearance or dimensional issues in the kitchen serving area; our visit did not coincide with a service period so we did not see the typical setup.

The locker rooms (Images 112, 127) have a long list of accessibility issues, including but not limited to: maneuvering clearances at doorways; no accessible toilets, sinks, showers, lockers, or drinking fountains; and PE offices are not accessible. Both male and female lockers are similar.

In the gym, the bleachers have accessible seating positions, as well as required guards for fall protection (Image 118).

A classroom on the main level with inaccessible tiered seating is too small and crowded to have a designated wheelchair position

on the floor at the front of the classroom. (Image 119)

Most classrooms, due to their small size and crowded furniture conditions, do not have an accessible route from the door to the teacher's desk, to accessible student desk(s), and to the front of the class and board area. Furthermore, many desks are the one-piece combination seat and desk which are not accessible (Image 120). Standing height tables were noted in most lab-type or workshop spaces – there are no accessible furniture accommodations in these spaces (Image 121).



Image 127

In general the toilet rooms throughout the building lack the necessary clearances and fixtures to provide full use by physically challenged users (Image 123). Some accommodations have been made, such as providing grab bars in a toilet stall or lowering of a sink, but we did not see any fully-compliant facilities (Image 124).

Shop spaces have their own toilet facilities, and most were not compliant. The doorways into and out of rooms must comply with maneuvering clearances, and most do not. At least one sink must be at the correct height, with the proper clearances under it; none of the sink water pipes we noted have the required knee-guards.

Mirrors, fixtures, and dispensers are not always mounted at the correct height. At least one toilet stall must be accessible, with



Image 123



Image 124



Image 125



Image 126



Image 128

many dimensional and equipment requirements. At least one urinal must be mounted at a lower height with appropriate urinal screens.

Wall-mounted equipment is not always mounted at the correct heights. It appears that many of these accommodations could be made within the confines of existing walls (in some cases), but would necessitate relocation of plumbing fixtures and stall dividers and the addition of screens at minimum.

Single toilet rooms off the cafeteria foyer have been modified for accessibility. However the urinal lacks a urinal screen and once added, may impact the maneuverable space for a clear turning radius (Image 125, 126).

Drinking fountains in public areas are not at accessible height, nor are they wheelchair-accessible from the front, and the code requires a dual-height installation where fountains are provided. (Reference Image 72)

The Main Office does not have an accessible-height countertop (Image 128) in the public area for the transaction of school business and its dedicated toilet room is not accessible.



Image 129

Kitchenettes and classroom sinks in the building typically do not have the correct countertop height, and may be required to have knee space for wheelchair users under the sink (Image 129).

Mezzanine areas, elevated instructor platforms (Images 130, 131) and offices within shop and maintenance spaces are not accessible as they have stairs, ladders or a step up to access. In some shops, mezzanines are used as instructional space, not storage, denying access to the mobility-impaired.



Image 130

Stairs in the classroom wing do not have compliant handrails (Images 131-134). See Health and Safety section below for other issues with stairs.



Image 131

Most wall-mounted devices, including fire alarms and fire extinguishers are not mounted at the correct height. Many wall-mounted objects protrude from the wall more than the required 4 inch maximum, which is an injury liability for the blind.

Health, Life Safety, and Welfare

Building codes have changed significantly since the original 1968 construction; there are a number of issues affecting the health, welfare, and safety of students, staff, and visitors that have emerged based on these changes to the codes and our general understanding and definition of building health and safety.

Because the building does not feature automatic sprinklers, storage rooms, boiler rooms, and other incidental use areas must be separated from the remainder of the building with fire resistant construction to contain fires that start in unattended spaces. Given the era in which the building was built, it is possible that no appropriate fire separations exist.

The building stairwells must be reviewed for width as related to egress capacity; they are somewhat narrow and suspected of being under-capacity. There is some damage to stair treads and nosings on some stairs, which is a trip hazard. Railings and guards do not comply with codes related to continuous railing requirements, railing locations, the 4" sphere rule for guard balusters, guard height minimums, and dimensions of treads and risers. This is true at building stairwells as well as mezzanines in shop spaces. (Refer to Images 131-134)

Because it is not sprinklered, it appears that the building has been separated into smaller fire areas using partitions, with doors to allow passage through the partition. Again, it is not clear that these partitions are built to the standards of true fire-rated walls, or if rules about penetrations and opening protectives have been observed. The corridor doors are on magnetic hold-open devices and presumably tied to the fire alarm. The building's fire area configuration must be carefully reviewed to ensure the areas are within code maximum, the partitions are the correct construction, and the doors are correctly designed, fitted out, and fully functional. It is important to determine whether the corridor doors are located due to programmatic or noise reasons, or for building code reasons.



Image 132



Image 133

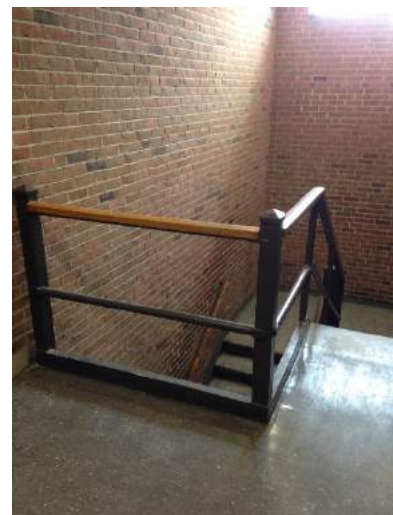


Image 134



Image 135



Image 136



Image 137

It was mentioned by the Superintendent that the size of water service line coming into the building has been the condition preventing the installation of sprinklers up to the present time.

Though not necessarily a code violation, the density of furniture in some classrooms is a safety issue, in that there is not a wide enough, clearly defined egress pathway to the door allowing safe orderly egress from the room (Image 138).



Image 138

Labs and shops with safety blankets, eye wash and shower stations, and other safety components should be checked regularly. Any damaged components should be fixed (Image 135).

Head clearance below and/or above mezzanine spaces are typically inadequate and do not meet the code minimum. Many mezzanines do not have the appropriate means of egress (number, type, and/or location) (Image 136, 137).

Some doors feature wired glass panels (Image 142). Wired glass has recently fallen out of favor since it has been proven to provide no better level of impact resistance than regular plate glass, and once broken the wire strands present a significant cutting hazard. Wired glass is no longer permitted in schools per federal codes and standards.



Image 142

Rooms with electrical panel equipment should be carefully checked for compliance as they are governed by strict dimensional rules. Open panels and improper storage were observed (Image 139).

The unit ventilators located throughout the building probably do not meet fresh air supply requirements required by current mechanical code for schools. The Print Shop has particularly bad, even hazardous, air quality issues with lack of mechanical exhaust and fresh air makeup (Image 140). Refer to mechanical assessment for more information.

Shop spaces in general are crowded with equipment. Required clearances and safe work areas around shop equipment should be carefully reviewed and corrected as needed to safely operate machinery (reference Images 131, 140).

Many exit signs are not illuminated and do not have directional arrows to direct persons towards the correct egress path during an emergency (Image 141). Refer to the electrical assessment for more information regarding emergency egress devices.

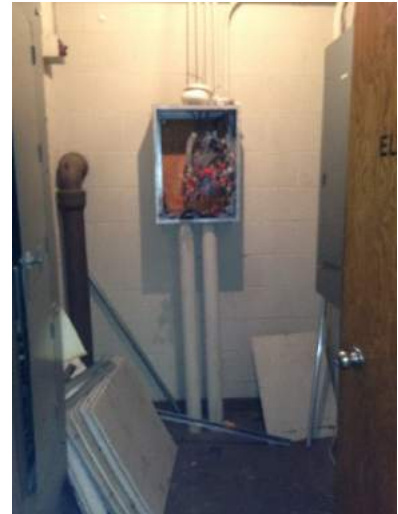


Image 139



Image 140



Image 141

MECHANICAL - EXISTING CONDITIONS ASSESSMENT

The building was constructed in 1969. The majority of the HVAC equipment and distribution system is 46 years old and has outlived its useable service life. There are close to 50 air handlers and rooftop units. There are over 90 exhaust fans.

Besides the age of the mechanical equipment, the biggest issue in the building is the lack of adequate HVAC system control due to the outdated pneumatic control system and the multiple failures of the control system.

Air Conditioning Systems

Generally, most of the building is air conditioned except for the gym and shop areas. The classrooms, administrative areas, cafeteria, drafting shop, cosmetology and child care are served by the chiller. The library, office technology, IT room, graphics shop and the health care area are served by stand-alone direct expansion air conditioning. A 255 ton electric chiller was installed around 1995, replacing a 290 ton existing chiller. The chiller communicates with an open cooling tower located on the roof. This cooling tower is original and has 2-speed fan control. The chiller is a Trane RTHA 255 screw chiller utilizing R-22 refrigerant. There is one chilled water pump, one condenser water pump and a standby pump located between the 2 pumps that can serve as a back-up for either pump by positioning manual isolation valves. The chilled water pump is a base mounted Taco model 862-162RP rated for 700 GPM at 70 ft. head at 20 HP. (Image 1) It is our understanding that the chilled water pump was rebuilt within the last couple of years. The condenser water pump is original and is rated for 870 GPM at 40 ft. head at 15 HP. The standby pump is rated for 870 GPM at 40 ft. head at 15 HP. All of the pumps are constant speed and are not served by variable speed drives.

Boiler Room

There are two (2) Cleaver Brooks CB 655-350 350 boiler horsepower fire-tube hot water boilers, each with an estimated capacity of 14,645 MBH input with the capability of burning 97.6 gallons per hour of No. 4 fuel oil. These boilers are original to the building. These boilers supply 180 deg. F hot water to the building. Each boiler is provided with dual low water cut-offs and all operating and safety controls. (Image 4)



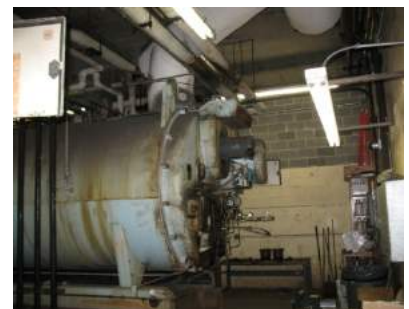
Chilled Water Pumps - Image 1



Duplex Controls Compressor - Image 2



Pneumatic Controls Station - Image 3



Fire tube Boiler - Image 4

It is our understanding that the boilers were re-tubed about 10-12 years ago and currently tubes are replaced as needed.



Fuel Oil Transfer Pumps - Image 5

Each boiler has an electric preheater to heat the oil before being burned in the boiler.

Each boiler is served by a Bell and Gossett in-line destratification pump. The breeching system is of the black steel welded type and is insulated with what appears to be calcium silicate with a canvas jacket. However, before an exact determination can be made, samples of the insulation should be tested for the presence of asbestos. The steel breeching terminates into a masonry chimney; the overall vertical height of the masonry chimney appears to be inadequate due to the fuel type being used. The chimney cleanout doors have been sealed with duct sealer which indicates a water infiltration problem.



Expansion Tank - New Welded Bottom – Image 6

It is our understanding that the underground fuel oil tank is original to the building. The tank has a Veeder Root TLS350 leak detection and monitoring system. The viscous number 4 fuel oil is heated in the tank via a hot water coil to allow the oil to be more easily pumped. It is our understanding that the fuel oil suction line that runs between the building and the tank was recently replaced. A portion of the tank was uncovered during this repair and the tank appeared to be sound. Some sludge was observed in the bottom of the tank during this repair. It is our understanding that the fuel oil transfer pumps were recently replaced and the internal parts of the duplex strainer were replaced last year. (Image 5)

Unheated outdoor air for combustion is blown into the boiler room via an in-line supply fan. Heat generated in the boiler room is exhausted via a wall mounted propeller fan. The hot water generated at each boiler is distributed to schedule 40 black steel insulated piping run throughout the school. There is a large pneumatically controlled 3-way valve located in the boiler room that supplies outdoor temperature compensated hot water to the building. The primary hot water pumps are base mounted rated for 900 GPM at 70 ft. head at 25 HP. These pumps are not original to the building. It is our understanding that the pumps have been rebuilt and the motors replaced. Due to corrosion and leaking in the expansion tanks, the bottoms of the tanks were replaced about three years ago. (Image 6)

Gurney Engineering is the corrosion control vendor that monitors the conductivity and chemical make-up of the heating hot water.

Major isolation valves have recently been replaced in the boiler room to allow the boiler to be isolated. The school has been adding strategically placed isolation valves, as there were few isolation valves in the original hot water heating system.

The automatic temperature control system is of the Barber Coleman pneumatic type and is provided with an air storage tank and two (2) 5 HP tank mounted compressors, an auxiliary air storage tank and a stand-alone main compressor. It appears that the compressors are operating and maintaining adequate compressed air to the control system. The system is provided with a refrigerated air dryer, as well as, an oil/water separator. (Image 2 & 3) The control system is manually switched between summer and winter operation. The control system is in rough condition. The control stations located throughout the building have experienced multiple failures. The controls system has outlived its useable life and is one of the biggest maintenance issues in the facility.

Classrooms

The classroom areas are provided with individual wall mounted classroom unit ventilators which are of the vertical discharge design located on the exterior wall of each space with adjacent fin tube radiation. All the unit ventilators, as well as fin tube, are served by the hot water heating system. The unit ventilators are provided with an outside air intake as well as filters, hot water heating coil, supply fans and return air. Each unit ventilator is original to the building and is generally antiquated. The exhaust for the classrooms is handled by a wall grille tied into a central ducted exhaust system with a rooftop exhaust fan. Considering the extreme antiquated nature and generalized condition of all equipment, consideration should be given to a complete upgrade at this time. (Image 7)

Ground Floor Classrooms

The partially below grade ground floor level has experienced poor air quality. The graphics area design and visual lab has no direct ducted ventilation. There are some wall openings that communicate with adjacent areas that have ventilation. (Images 8-9)



Typical Unit Ventilator & Finned Tube Radiation – Image 7



Ground Floor Unit Ventilator - Image 8



Graphics Area Dx Air Conditioner – Image 9

The desktop publishing area has an overhead direct expansion ducted cooling unit with no provisions for outside air.



Gymnasium Fresh Air Hood Leaking -
Image 10

There are extensive drain pans under the heating piping indicating a problem with leaks. The copier room has minimal exhaust given the nature of the copying activities.

Generally, there is no ventilation in the corridors.

Maintenance staff reports that any area with an intake vent on the roof is a source of leaks. Snow gets drawn in to the vent, builds up in the ductwork, then melts and causes a mess. The gymnasium is a good example of that condition. (Image 10)

Pool

The pool area has been abandoned in place. The pool heating system has been mothballed and anti-freeze added to the piping system. The pool was heated by a 2001 1342 MBH cast iron boiler firing propane. The pool was then heated by a water to water shell and tube heat exchanger. The pool space is served by two 3,750 CFM heating and ventilating units with roof mounted fresh air hoods. (Image 11)



Pool Heating Boiler - Image 11

Administration

Throughout the administrative area ductless cooling units have been added to provide additional cooling and individual temperature control. In some exterior rooms with unit ventilators, window air conditioners have been added.

The IT computer room has two 1-1/2 ton ductless cooling units to supplement the central cooling system and to provide redundancy.

In the school psychologist area there have been offices added to a former wide corridor. These offices have no direct ventilation.

Gymnasium

The gymnasium is served by two 7,500 CFM heating and ventilating units with roof mounted fresh air hood. Ventilation air is relieved by a roof mounted exhaust fan, as well as, by transfer into the locker rooms. There is finned tube radiation on the walls of the gym for supplemental heat.

Cafeteria

The cafeteria is served by a 14,600 CFM air handler with heating and cooling coils. The adjacent kitchen is served by a 12,650 CFM 100% outside air unit.

The canopy hood over the warming/oven area is 10,600 CFM of exhaust with no fire suppression system.

The two hoods in the cooking area are 6900 CFM and 6000 CFM of exhaust respectfully and have a hood fire suppression system. (Image 12)



Kitchen Hood - Image 12

Shops

The STEM area is served by a 2500 CFM 100% outside air unit with roof mounted fresh air hood.

The electrical shop is served by a 5000 CFM heating and ventilating unit with roof mounted fresh air hood.

The maintenance shop is served by a 4000 CFM heating and ventilating unit with roof mounted fresh air hood.

The HVAC shop is served by a 6000 CFM heating and ventilating unit with roof mounted fresh air hood.

The metal fabrication shop is served by a 6000 CFM heating and ventilating unit with roof mounted fresh air hood. The welding booths and benches have Fume Gator snorkels tied into utility set exhaust fans hung from the ceiling. The instructor's office has some ventilation off the central shop system and is cooled by a wall mounted air conditioner rejecting heat into the shop. (Image 13)



Welding Booth Exhaust - Image 13

The plumbing shop is served by a 6000 CFM heating and ventilating unit with roof mounted fresh air hood. The plumbing classroom is heated by electric baseboard and cooled by a window air conditioner.

The carpentry shop 151 is served by a 6000 CFM heating and ventilating unit with roof mounted fresh air hood. Each piece of woodworking equipment is connected to a dedicated dust collector/filtration unit that discharges air back into the shop. (Image 14)



Carpentry Shop Local Dust Collector - Image 14

The office tech area is served by a 4650 CFM heating and ventilating unit with roof mounted fresh air hood.

The auto body shop is served by a 12,000 CFM heating and ventilating unit with roof mounted fresh air hood. A make-up air unit was added that has no coil to temper the air. The space is heated with ceiling mounted horizontal unit heaters. There are ceiling paddle fans and smoke eater filtration units. The spray wash area hoods area exhausted to a Eurovac system. The instructor's elevated office has no ventilation and is cooled by a wall mounted air conditioner rejecting heat into the shop. The auto body computer lab has no air conditioning.

The auto technology shop is served by a 12,000 CFM heating and ventilating unit with roof mounted fresh air hood. There is an underfloor vehicle exhaust system ducted to a 5200 CFM fan. There are ceiling paddle fans. General ventilation for the shop is handled by a mix of high ceiling exhaust and exhaust pulled from lower areas of the shop. The instructor's elevated office has no ventilation and is cooled by a wall mounted air conditioner rejecting heat into the shop.

Recommendations

Extend natural gas to the site. Replace boilers with five (5) 4,000 MBH high efficiency condensing gas boilers. Two (2) of the boilers will be back-up to provide redundancy and a more reliable heating system.

Systematically replace pneumatic temperature controls with a direct digital control system. Add equipment to the DDC system as it is replaced and upgraded. Add DDC controls to areas that are controlled by local pneumatic control stations that have failed.

Modify the roof intake vents that are causing snow ingestion/leaking problems, such as in the gymnasium.

Replace one of the hot water heating pumps. The pump will be controlled by a variable speed drive with differential pressure controls to save energy.

Replace one of the chilled water pumps. The pump will be controlled by a variable speed drive with differential pressure controls to save energy.

Replace the expansion tanks in the boiler room. Due to corrosion, they have been repaired once.

Add isolation valves to major piping runs to improve ease of maintenance.

Systematically replace the unit ventilators and supplemental finned tube radiation serving the classrooms. Add the unit ventilators to the DDC control system. Improved classroom ventilation and temperature control will improve the learning environment.

Replace the exhaust fans associated with the unit ventilators. Add fans to DDC control system.

Add ventilation to areas not directly ventilated.

Replace heating and ventilating units in the shops, starting with the units in the worst condition or with the most lack of ventilation complaints. Start with auto technology shop first due to need for good ventilation with the presence of gasoline vapors.

Replace air handling unit serving the cafeteria to provide required make-up air quantity to kitchen hoods.

Replace the chiller when unit starts to incur excessive repair costs. The chiller is 20 years old.

Replace the cooling tower when it has deteriorated beyond repair or incurs excessive repair costs. Replacement tower fan to be controlled by a variable speed drive for improved energy efficiency.

ELECTRICAL - EXISTING CONDITIONS ASSESSMENT

Executive Summary:

The facility was constructed in the late 1960's. Most of the systems are original to the building and although functioning, have outlived its intended useful life. The facility's electrical power is provided by Wakefield Municipal Gas & Light Department and is secondary metered. Other incoming utilities include telephone, cable TV, fiber, and fire alarm.

The power distribution system has received a main power disconnect switch upgrade due to a failure, but most of the remainder is original and in poor condition. Approximately 60% of the lighting systems have been retrofitted recently with new lamps and ballasts, but the existing light fixtures and wiring were reused. The fire alarm system control panel has been upgraded however the system detection and signaling device have not and coverage is inadequate and not code compliant.

The emergency standby systems, due to code changes, are no longer code compliant and provide inadequate coverage.

We recommend replacement of all the electrical systems under a renovation program.

Power Distribution System

The primary service runs overhead along the entrance roadway where it transitions to underground at the last pole near the old Maintenance Building. (Image 1) The underground primary runs into a vault where the transformer is housed.

The secondary service between the vault and the adjacent Electric Room consists of a 4000 Ampere, 277/480V, 3Ø, 4W ventilated busduct manufactured by Federal Pacific, FPE.



Image 1

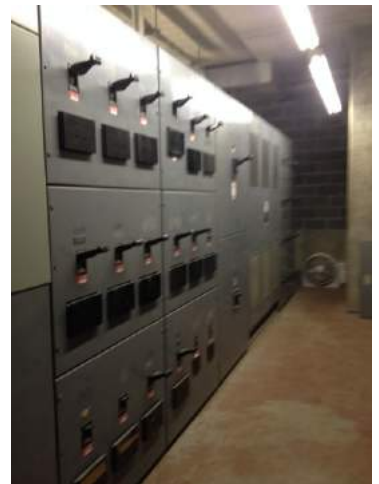


Image 2



Image 3

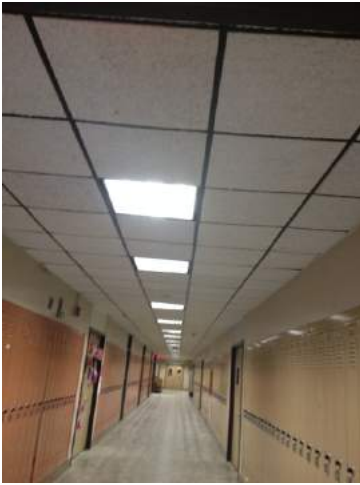


Image 4

The switchgear consists of a 4000A, 277/480V, 3Ø, 4W switchboard with a main/CT section and three distribution sections. The distribution sections are full. The integral 1000 KVA dry type transformer with 120/208V, 3Ø, 4W secondary feeds two distribution sections, also full. (Image 2)

The switchgear with the exception of the recently installed main bolted pressure switch, replaced due to failure, is original to the building and is obsolete and in poor condition. The switchgear was manufactured by Federal Pacific, FPE.

Most remote panelboards are of the breaker type but are full and are original to the building, manufactured by FPE and in poor condition. (Image 3)



Image 5

The building is secondary metered with the meter located in the main Electric Room.

The working clearances around the switchgear are not compliant with current codes. The Electric Room doors swing inward and do not have panic hardware.

The power distribution system, due to its age and condition, should be replaced.

Interior Lighting

Approximately 60% of lighting fixtures have been retrofitted. The work was done in house over the last 10 years with T8 lamps and electronic ballasts. The remainder of the fixtures still have T12 lamps and magnetic ballasts.

Corridor lighting consists of 2x2 recessed parabolic fixtures with 2T8U6 lamps. (Image 4) Corridor lights are locally controlled with key switches.

Typical Classroom has (4) surface rows of wraparound fixtures with acrylic lens and 2T8 lamps. (Image 5) Classrooms are controlled with one switch.



Image 6

The Gymnasium has metal halide high bays with 400 watt lamps. (Image 6) Fixtures do not have quartz restrike sockets for instant on lighting during hot or cold restrike.

Administration area has 2x2 recessed parabolic fixtures with T12 lamps and magnetic ballasts.

Media Center consists of surface 2x4 fixtures with acrylic lens and (4) T12 lamps, some with broken lens. (Image 7)

Kitchen has surface wraparound fixtures with (2) T12 lamps.

Culinary Kitchen has fluorescent vaportight fixtures, some with T8 lamps and others with T12 lamps.

Cosmetology Labs have surface wraparounds with 2T8 lamps, dual switched.

The Cafetorium has recessed down lights retrofitted with screw shell LED lamps, all breaker controlled. (Image 8) Cafetorium also has indirect cove mounted fluorescent fixtures on perimeter.

The stage has incandescent RLM fixtures. The dimming system is very old and does not appear to be functional. (Image 9) Theatrical lighting consists of two electrical pipes with border lights and minimal fresnels.

Shops generally are fitted with industrial strips with 2T8 lamps. (Image 10)

Locker Rooms generally have 6" square lensed fixtures with T12 lamps, most with broken lens.

Although Classroom fixtures and other selective areas have been retrofitted with T8 lamps, the fixtures and wiring were not replaced. Many areas still have T12 lamps and magnetic ballasts.

The lighting system should be replaced with an energy efficient LED lighting system.



Image 7



Image 8



Image 9



Image 10

Currently there are no occupancy sensors to turn off lights when space is unoccupied.

The facility does not have an automated lighting control system.

Exterior Lighting

The exterior lighting consists of HID cobra heads on tapered aluminum poles along roadways and parking areas. (Image 11) Shoe box type fixtures on square poles with HID source lamps also exist along walkways and parking areas. (Image 12)

Building mounted floods exist on building perimeter. The entrance canopy has surface mounted square HID lensed fixtures. (Image 13) The exterior lighting is controlled with photocell "ON" and timeclock "OFF".

Emergency Standby System

The facility has a propane fired 150KW, 120/208V, 3Ø, 4W interior generator located within a dedicated room. (Image 14) The generator was manufactured by Kohler, model 170R8276318A. The intake air louver was interlocked in the open position allowing freezing air into the room.

There is one (1) automatic transfer switch located in same generator room rated at 600 Amperes, 120/208V, 3Ø, 4W. (Image 15) The ATS is a Westinghouse CAT #ATS-MA3600 fed with (2) sets of 4#500 KCM aluminum conductors.

A system of normally-off emergency lights exist throughout the school, generally, recessed down lights with incandescent lamps. (Image 16) The Gym has normally-off high bays. Locker areas generally have a normally-off fixture in each room. Locker vestibules fixtures are missing lamps.



Image 11



Image 12

A system of split bus panelboards are used for normally-off lights and other generator loads.

Internally lit exit signs as well as non-lit paper exit signs exist throughout facility. Exit sign coverage is inadequate and does not meet code.

The emergency standby system is dated and in poor condition. The system does not meet current codes which require electrical and physical separation of standby loads from emergency life safety loads.

The emergency standby system should be replaced with a new code compliant system.

Fire Alarm System

The fire alarm system control panel has been recently replaced after the Carpentry Lab fire with a new silent knight IFP-1000 panel. The panel is located in the Administration area corridor. The panel is addressable and has a built-in digital communicator.

The audible devices consist of horns. (Image 17) Speakers with voice evacuation are now required by code. Visual devices exist and while some are ADA compliant, others are not. Coverage of audible/visual devices is inadequate.

Generator Room and Boiler Room have heat detectors. Occasional smoke detectors exist in Corridors but exceed NFPA spacing standards.

Typical Classroom do not have a smoke, heat or horn/strobe unit. Heat detectors in lieu of smoke detectors exist in stairways.

Corridor doors have magnetic door holders; stairwells do not. Manual pull stations generally exist at exterior doors, but are mounted at 5' above floor exceeding ADA standards.

Early Childhood Education suite has one horn/strobe and one heat detector and a non-system, plug-in carbon monoxide detector.

Toilets do not have visual strobes. Cafetorium/Stage do not have heat



Image 13

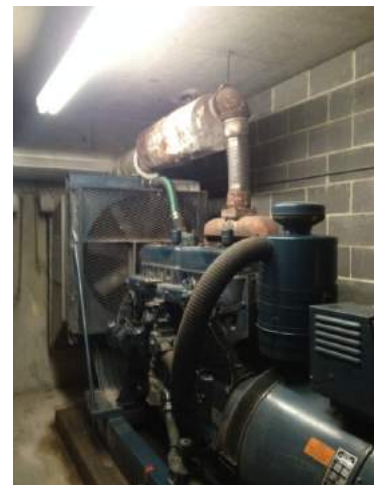


Image 14

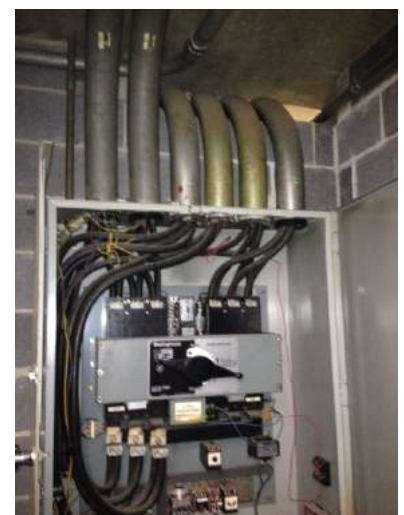


Image 15

or smoke detectors.

The Culinary Kitchen hood has a fire suppression system but the school kitchen does not. No carbon monoxide detectors exist in kitchens or Nurse's suite. No smoke or visual device exists in Nurse's suite.

Some of the shops do not have horn/strobe units.

The Gym does not have heats or smokes. Horns only without strobes exist within various spaces including Cosmetology Labs. The general alarm transmission is via an exterior local energy master box with IMSA cable that runs underground to pole #16. (Image 18)

The fire alarm system is not in compliance with current codes. The system offers inadequate coverage of detection and notification appliances. The system should be replaced with a code complaint system with voice evacuation and with full coverage of devices.

General/Miscellaneous

The facility does not have a lightning protection system.

The receptacle coverage is inadequate in most spaces. Typical classroom has one duplex receptacle per wall. Extension cords were used throughout Classrooms and Labs. The use of extension cords for permanent wiring is a code violation. Computer Lab has tele/power poles than a series of plug strips. (Image 19)

Freezer and cooler have local only temperature alarms.

Some kitchen receptacles are GFI type while others are not. (Image 21) Cable drops are used at Servery (Image 20).

There is no emergency power off device in the Kitchen to kill power to equipment under hoods.

Boiler Rooms do not have emergency power off, EPO stations at doors to kill power to boilers during an emergency.

The facility does not have a bi-directional antenna system used to



Image 16

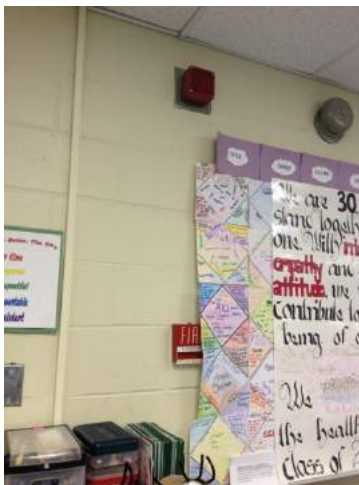


Image 17



Image 18

enhance communications with portable radios by First Responders.

The facility does not have a two-way communications call box system at the elevator lobbies above and below main level.

Emergency power off, EPO stations in Shops are scarce and mounting height exceeds ADA guidelines.

Recommendations

The power distribution system, due to its age and poor condition, needs to be replaced in their entirety. A new pad mounted transformer should be located on exterior with new underground primary and secondary services.

The interior lighting should be replaced with energy efficient, long life LED sources. Room occupancy sensors should be provided to conserve energy. Dimming photosensors should also be provided to automatically dim fixtures where natural daylight is available.

An automated lighting control system should be provided for interior and exterior lighting to conserve energy. The control system should interface with building management systems, security systems and fire alarm system.

The exterior lights should be replaced under a renovation program with LED cut-off luminaires with multi-level control capability.

A new exterior generator should be provided within a weatherproof sound attenuated enclosure. The generator should be sized for code required life safety systems as well as other optional loads including boilers, pumps, refrigeration, security systems, one elevator, communications systems, etc. LED exit signs should be provided to meet code.

The fire alarm system should be replaced with a code compliant, ADA compatible, addressable system. Voice evacuation is now required by code for K-12 occupancies.

A lightning protection system should be considered under a renovation program.

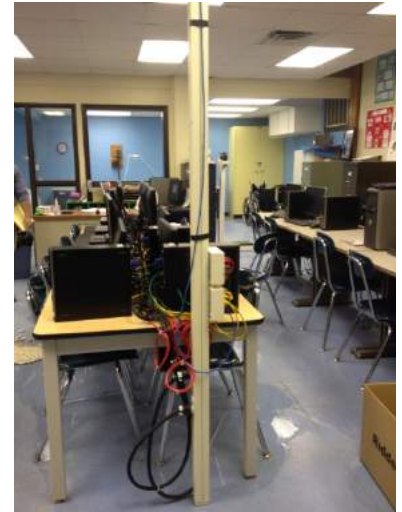


Image 19



Image 20



Image 21

Additional receptacles should be provided and fed from a system of computer grade panelboards.

Freezer and cooler alarm should be connected to the building management system.

All kitchen, boiler room, and receptacles within 6' of water sources need to be protected with GFI breakers or GFI receptacles.

Emergency power off devices should be provided in kitchen and in boiler room to kill power to equipment during an emergency.

A bi-directional antenna system to enhance communications of portable radios will likely be required by the local officials under a renovation program.

A two-way communications system for handicap use will be required at elevator lobbies to communicate with administration under a renovation program.

All controls that exceed 48" above floor need to be modified under a renovation program to make them accessible.

PLUMBING - EXISTING CONDITIONS ASSESSMENT

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary waste, vent system, storm drain piping and lp gas.

In general, the fixtures in the building are in fair condition. Fixtures do not meet current codes for accessibility. Current Access Code requires accessible fixtures wherever plumbing is provided. In terms of the water conservation fixtures, their use is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require the fixtures to be upgraded, but where new fixtures are installed, as may be required by other codes or concerns, the new fixtures need to be water-conserving type fixtures.

In general, the drainage piping can be reused where buried underground and where adequately sized for the intended new use.

Plumbing Fixtures

The water closets are predominately wall hung vitreous china with manual flush valves. Image 1.

Urinals are wall hung vitreous china, with exposed manual flush valves. Image 2.

Lavatories are either wall hung or countertop mounted vitreous china with hot and cold water handle faucets. Images 3 & 4.

Drinking fountains are either wall mounted with enameled steel cabinet and a push button control. Image 5.

The Mop sink basin is a floor mounted mop receptor with wall mount faucet. Faucet is not equipped with vacuum breaker. Image 6.

The utility sinks are a mix of wall mounted cast enamel trap standard with back mounted faucet and single & double bowl, freestanding thermoplastic units with deck mounted faucets and single bowl freestanding stainless steel units with back mounted faucets. Images 7, 8 & 9.

The hand washing basin is a floor-mounted stainless steel circular washing station with a foot pedal. Image 10.



Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Image 7

Science sinks are epoxy resin type with gooseneck faucet equipped with vacuum breakers. Image 11.

Science lab classrooms are equipped with emergency eyewash & showers. Images 12 & 13

Classroom sinks are single bowl stainless steel counter mounted sink with deck mounted faucets. Image 14.

Sinks in the Dentistry shops' denture making room is a stainless steel undermount sink with a back mounted faucet with vacuum breaker. Sediment trap located below sink. Sinks located at the dentist examining chair is equipped with a gooseneck rinse faucets. Images 15, 16 & 17.

Sinks in the Cosmetology shops are wall mounted fiberglass shampoo bowls with deck mounted pull out spray rinse nozzles and single hot/cold handle. Image 18.

Kitchen fixtures are in good condition. The three-bowl pot sink is connected to a grease interceptor. Dishwashers discharge are not connected to grease interceptors. Images 19, 20 & 21.

Locker room showers are partition type stalls with exposed piping. Images 22 & 23.

Domestic Water System

The 4" water service enters in the Mechanical Room Basement. There are multiple meters in the Mechanical Room. There is a building water meter and Fill/Make-up for cooling tower water meter. There is also a sub-meter for the boilers. Images 24, 25, 26, 27 & 28.

Water piping where exposed is copper tubing with sweat joints. Piping is in fair/good condition. Some of the Basement horizontal water distribution piping is insulated with fiberglass and the rest of the water piping is uninsulated.

Domestic Hot Water System

The building hot water is generated through (2) oil fired boilers with a separate 500 gallon storage tank. The hot water system is circulated through the building. Water piping is copper tubing sweat joints. Piping is developing pin holes and being replaced as needed. Image 29.

Sanitary Drainage System

Sanitary, waste, and vent piping is cast iron bell & spigot with areas of new work having no-hub cast iron pipe. Piping appears to be in good condition. The Basement Mechanical room has no floor drains, however, there is an open sump with a single sump discharging to the sewer. Images 30, 31 & 32.

In general, the cast iron drainage piping can be reused even in a major renovation where adequately sized for the intended new use. Video inspection of existing piping is recommended to confirm its integrity.

Roof Drainage System

Flat roof areas are collected by roof drains and interior rain leaders. There does not appear to be a secondary roof leader/overflow system; adjacent drain baskets are at a relatively similar elevation. There is no redundancy in this drainage system, which increases hazards due to pooling and standing water on the roof.

Gas System

LP gas is provided to the building. Gas supplies kitchen equipment, science classrooms and abandoned pool heating equipment. In general, piping is schedule 40 black steel with threaded fittings. Image 33.

Compressed Air System

(2) Air compressors in Mechanical room provide air to HVAC pneumatics. Compressors are in fair condition. Images 34 & 35

(2) Air compressors in the maintenance garage provide compressed air to multiple shops. Image 36.



Image 8



Image 9



Image 10



Image 11

Recommendations

Provide new high efficiency, low flow, water conserving plumbing fixtures.

Insulate all domestic water piping.

In general, existing cast iron drainage piping can be re-used if sized appropriately. We recommend video inspection of existing drains to confirm integrity.

Provide grease interceptor at dishwashers.

Provide a water heater for summer hot water usage in lieu of running the boilers to generate hot water.

Provide tepid water (70°F – 90°F) to emergency fixtures.



Image 12



Image 13



Image 14



Image 15



Image 20



Image 16



Image 21



Image 17



Image 22



Image 18



Image 23



Image 19



Image 28



Image 24



Image 29



Image 25



Image 30



Image 26



Image 31



Image 27



Image 33



Image 32



Image 34



Image 35



Image 36

FIRE PROTECTION - EXISTING CONDITIONS ASSESSMENT

The Building does not contain an automatic sprinkler system.

In general, Massachusetts General Law M.G.L. c.148, s.26G requires that any existing building over 7,500 square feet that undergoes major alterations or modifications or a building addition that results in a gross floor area over 7,500 square feet must be sprinklered.

A hydrant flow test will be required to determine adequate Municipal water supply. The understanding of the Superintendent is that the existing water service line is too small to adequately serve a full-building sprinkler system. This condition will need to be verified as a next step.

April 27, 2015

Mr. Thomas Hengelsberg
Dore & Whittier Architects
260 Merrimac Street
Newburyport, MA 01950

Reference: Hazardous Materials Determination Survey
Northeast Metropolitan Technical Vocational School, Wakefield, MA

Dear Mr. Hengelsberg:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for limited hazardous materials determination survey at the Northeast Metropolitan Technical Vocational School, Wakefield, MA.

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants



Ammar M. Dieb
President

UEC:\215 128\REPORT.DOC

Enclosure

**REPORT
FOR
HAZARDOUS MATERIALS DETERMINATION
SURVEY
AT THE
NORTHEAST METROPOLITAN TECHNICAL VOCATIONAL SCHOOL
WAKEFIELD, MASSACHUSETTS**

PROJECT NO: 215 128.00

Survey Dates:
April 16, 21-22, 2015

SURVEY CONDUCTED BY:
**UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 BREWSTER ROAD
FRAMINGHAM, MA 01702**

1.0 INTRODUCTION:

UEC has been providing comprehensive asbestos services since 2001 and has completed projects throughout New England. We have completed projects for a variety of clients including commercial, industrial, municipal, and public and private schools. We maintain appropriate asbestos licenses and staff with a minimum of twenty years of experience.

As part of the proposed renovation and demolition project, UEC was contracted by Dore & Whittier Architects to conduct the following services at the Northeast Metropolitan Technical Vocational School, Wakefield, MA:

- Inspection and Testing for Asbestos Containing Materials (ACM);
- Inspection for Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures;
- Inspection for Lead Based Paint (LBP).

It is required that once a detailed scope of work is identified, a comprehensive inspection per the Environmental Protection Agency (EPA) NESHAP regulations and testing for other hazardous materials including PCB's should be performed, which would provide a more accurate hazardous materials abatement scope.

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination of types of ACM found and cost estimates for remediation. Bulk samples analyses for asbestos were performed using the standard Polarized Light Microscopy (PLM) in accordance with EPA standard. Bulk samples were collected by Massachusetts licensed asbestos inspectors Mr. George Bezreh (AI-900609) and Mr. Jason Becotte (AI-034963) and analyzed by a Massachusetts licensed laboratory EMSL and Asbestos Identification Laboratory, Woburn, MA.

Refer to samples results.

2.0 FINDINGS:

The regulations for asbestos inspection are based on representative sampling. It would be impractical and costly to sample all materials in all areas. Therefore, representative samples of each homogenous area were collected and analyzed or assumed.

All suspect materials were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. A homogeneous area shall be determined to contain asbestos based on findings that the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent in accordance with EPA regulations. All suspect materials that contain any amount of asbestos must be considered asbestos if it is scheduled to be removed per the Department of Environmental Protection (DEP) regulations.

April 16, 2015:

Number of Samples Collected

Twenty five (25) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material

1. Exterior unit vent grille caulking

2. Exterior window framing caulking
3. Exterior window framing caulking
4. Exterior unit vent grille caulking
5. Exterior window framing caulking
6. Exterior window glazing caulking
7. Exterior door framing caulking
8. Exterior door framing caulking
9. Exterior window glazing caulking
10. Exterior window framing caulking
11. Exterior door framing caulking
12. Exterior window glazing caulking
13. Exterior caulking on window panel
14. Exterior glue daub on window panel
15. Exterior window framing caulking
16. Exterior unit vent grille caulking
17. Exterior window glazing caulking
18. Exterior window framing caulking
19. Exterior window glazing caulking
20. Exterior door framing caulking
21. Exterior window glazing caulking
22. Exterior window framing caulking
23. Exterior expansion joint caulking
24. Exterior concrete soffit fascia
25. Exterior caulking on window panel

Samples Results

Type and Location of Material

Sample Result

1. Exterior unit vent grille caulking	No Asbestos Detected
2. Exterior window framing caulking	No Asbestos Detected
3. Exterior window framing caulking	No Asbestos Detected
4. Exterior unit vent grille caulking	No Asbestos Detected
5. Exterior window framing caulking	No Asbestos Detected
6. Exterior window glazing caulking	No Asbestos Detected
7. Exterior door framing caulking	No Asbestos Detected
8. Exterior door framing caulking	No Asbestos Detected
9. Exterior window glazing caulking	8% Asbestos
10. Exterior window framing caulking	No Asbestos Detected
11. Exterior door framing caulking	No Asbestos Detected
12. Exterior window glazing caulking	8% Asbestos
13. Exterior caulking on window panel	No Asbestos Detected
14. Exterior glue daub on window panel	No Asbestos Detected
15. Exterior window framing caulking	No Asbestos Detected
16. Exterior unit vent grille caulking	5% Asbestos
17. Exterior window glazing caulking	No Asbestos Detected
18. Exterior window framing caulking	No Asbestos Detected
19. Exterior window glazing caulking	8% Asbestos
20. Exterior door framing caulking	No Asbestos Detected
21. Exterior window glazing caulking	No Asbestos Detected
22. Exterior window framing caulking	No Asbestos Detected
23. Exterior expansion joint caulking	No Asbestos Detected
24. Exterior concrete soffit fascia	No Asbestos Detected
25. Exterior caulking on window panel	No Asbestos Detected

April 22, 2015:

Number of Samples Collected

Ninety six (96) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material

1. Interior window glazing caulking at pool
2. Interior window glazing caulking at hallway by room 154
3. Interior window glazing caulking at room 158
4. Interior door glazing caulking at room 107
5. Interior door glazing caulking at room 104
6. Fire door insulation at cafeteria
7. Fire door insulation at cafeteria
8. 1'x 1' Acoustical ceiling tile at room 135
9. 1'x 1' Acoustical ceiling tile at room 157
10. 2'x 2' Acoustical ceiling tile at break room
11. 2'x 2' Acoustical ceiling tile at room 107
12. 2'x 4' Acoustical ceiling tile at room 011
13. 2'x 4' Acoustical ceiling tile at room 011
14. Plaster at room 120
15. Plaster at room 120
16. Plaster at room 126
17. Plaster at room 126
18. Plaster at room 128
19. Plaster at room 128
20. Plaster at room 128
21. Wall joint compound at room 152
22. Wall joint compound at room 152
23. Black sink coating at break room
24. Black sink coating at break room
25. Pink sink coating at room 153
26. Pink sink coating at room 153
27. White sink coating at room 019
28. White sink coating at room 019
29. Old lab countertop at room 123
30. Old lab countertop at room 123
31. Lab table at room 012
32. Lab table at room 012
33. Vertical caulking between block and column at room 162
34. Vertical caulking between block and column at room 162
35. Vertical caulking between block and block at gymnasium
36. Vertical caulking between block and block at gymnasium
37. Black mastic on fiberglass insulated pipe at mechanical room
38. Black mastic on fiberglass insulated pipe at mechanical room
39. Boiler gasket at boiler room
40. Boiler gasket at boiler room
41. Boiler exhaust insulation at boiler room
42. Boiler exhaust insulation at boiler room
43. Boiler exhaust insulation at boiler room
44. Generator exhaust insulation at generator room
45. Generator exhaust insulation at generator room
46. Generator exhaust insulation at generator room

47. Hard joint insulation off fiberglass insulated pipe at pool mechanical room
48. Hard joint insulation off fiberglass insulated pipe at room 153
49. Hard joint insulation off fiberglass insulated pipe at room 158
50. Hard joint insulation off fiberglass insulated pipe at room 158
51. Hard joint insulation off fiberglass insulated pipe at stage mechanical room
52. Hard joint insulation off fiberglass insulated pipe at stage
53. Hard joint insulation off fiberglass insulated pipe at mechanical room
54. Cement floor at library
55. Cement floor at library
56. Beige 12" x 12" vinyl floor tile at room 128
57. Beige 12" x 12" vinyl floor tile at room 128
58. Black mastic for beige 12" x 12" vinyl floor tile at room 128
59. Black mastic for beige 12" x 12" vinyl floor tile at room 128
60. Brown 12" x 12" vinyl floor tile at room 155
61. Brown 12" x 12" vinyl floor tile at room 158
62. Brown 12" x 12" vinyl floor tile at room 158
63. Black mastic for brown 12" x 12" vinyl floor tile at room 155
64. Black mastic for brown 12" x 12" vinyl floor tile at room 158
65. Dark grey 12" x 12" vinyl floor tile at room 103
66. Dark grey 12" x 12" vinyl floor tile at room 103
67. Pink 12" x 12" vinyl floor tile at office
68. Pink 12" x 12" vinyl floor tile at office
69. Light blue 12" x 12" vinyl floor tile at room 010
70. Light blue 12" x 12" vinyl floor tile at room 010
71. White/green 12" x 12" vinyl floor tile at room 018
72. White/green 12" x 12" vinyl floor tile at room 018
73. Black mastic for white/green 12" x 12" vinyl floor tile at room 018
74. Black mastic for white/green 12" x 12" vinyl floor tile at room 018
75. Yellow/blue 12" x 12" vinyl floor tile at room 019
76. Yellow/blue 12" x 12" vinyl floor tile at room 019
77. Black/white 12" x 12" vinyl floor tile at room 120
78. Black/white 12" x 12" vinyl floor tile at room 120
79. Blue 12" x 12" vinyl floor tile at room 161
80. Blue 12" x 12" vinyl floor tile at room 161
81. Tan 12" x 12" vinyl floor tile at room 120
82. Tan 12" x 12" vinyl floor tile at room 120
83. Black mastic for tan 12" x 12" vinyl floor tile at room 120
84. Black mastic for tan 12" x 12" vinyl floor tile at room 120
85. White/tan specks 12" x 12" vinyl floor tile at room 135
86. White/tan specks 12" x 12" vinyl floor tile at room 135
87. Black mastic for white/tan specks 12" x 12" vinyl floor tile at room 135
88. Black mastic for white/tan specks 12" x 12" vinyl floor tile at room 135
89. White/blue and red flecks 12" x 12" vinyl floor tile at room 151
90. White/blue and red flecks 12" x 12" vinyl floor tile at room 151
91. White/blue spots 12" x 12" vinyl floor tile at room 126
92. White/blue spots 12" x 12" vinyl floor tile at room 126
93. Slate window sill at room 126
94. Slate window sill at room 128
95. Interior caulking for exterior window
96. Interior caulking for exterior window

Samples Results**Type and Location of Material****Sample Result**

1. Interior window glazing caulking at pool	No Asbestos Detected
2. Interior window glazing caulking at hallway by room 154	2% Asbestos
3. Interior window glazing caulking at room 158	2% Asbestos
4. Interior door glazing caulking at room 107	2% Asbestos
5. Interior door glazing caulking at room 104	2% Asbestos
6. Fire door insulation at cafeteria	60% Asbestos
7. Fire door insulation at cafeteria	60% Asbestos
8. 1'x 1' Acoustical ceiling tile at room 135	No Asbestos Detected
9. 1'x 1' Acoustical ceiling tile at room 157	No Asbestos Detected
10. 2'x 2' Acoustical ceiling tile at break room	No Asbestos Detected
11. 2'x 2' Acoustical ceiling tile at room 107	No Asbestos Detected
12. 2'x 4' Acoustical ceiling tile at room 011	No Asbestos Detected
13. 2'x 4' Acoustical ceiling tile at room 011	No Asbestos Detected
14. Plaster at room 120	No Asbestos Detected
15. Plaster at room 120	No Asbestos Detected
16. Plaster at room 126	No Asbestos Detected
17. Plaster at room 126	No Asbestos Detected
18. Plaster at room 128	No Asbestos Detected
19. Plaster at room 128	No Asbestos Detected
20. Plaster at room 128	No Asbestos Detected
21. Wall joint compound at room 152	No Asbestos Detected
22. Wall joint compound at room 152	No Asbestos Detected
23. Black sink coating at break room	5% Asbestos
24. Black sink coating at break room	5% Asbestos
25. Pink sink coating at room 153	3% Asbestos
26. Pink sink coating at room 153	3% Asbestos
27. White sink coating at room 019	No Asbestos Detected
28. White sink coating at room 019	No Asbestos Detected
29. Old lab countertop at room 123	No Asbestos Detected
30. Old lab countertop at room 123	No Asbestos Detected
31. Lab table at room 012	No Asbestos Detected
32. Lab table at room 012	No Asbestos Detected
33. Vertical caulking between block and column at room 162	5% Asbestos
34. Vertical caulking between block and column at room 162	5% Asbestos
35. Vertical caulking between block and block at gymnasium	No Asbestos Detected
36. Vertical caulking between block and block at gymnasium	No Asbestos Detected
37. Black mastic on fiberglass insulated pipe at mechanical room	No Asbestos Detected
38. Black mastic on fiberglass insulated pipe at mechanical room	No Asbestos Detected
39. Boiler gasket at boiler room	No Asbestos Detected
40. Boiler gasket at boiler room	No Asbestos Detected
41. Boiler exhaust insulation at boiler room	20% Asbestos
42. Boiler exhaust insulation at boiler room	20% Asbestos
43. Boiler exhaust insulation at boiler room	30% Asbestos
44. Generator exhaust insulation at generator room	3% Asbestos
45. Generator exhaust insulation at generator room	40% Asbestos
46. Generator exhaust insulation at generator room	30% Asbestos
47. Hard joint insulation off fiberglass insulated pipe at pool mechanical room	No Asbestos Detected
48. Hard joint insulation off fiberglass insulated pipe at room 153	No Asbestos Detected
49. Hard joint insulation off fiberglass insulated pipe at room 158	No Asbestos Detected
50. Hard joint insulation off fiberglass insulated pipe at room 158	No Asbestos Detected

51. Hard joint insulation off fiberglass insulated pipe at stage mechanical room	No Asbestos Detected
52. Hard joint insulation off fiberglass insulated pipe at stage	No Asbestos Detected
53. Hard joint insulation off fiberglass insulated pipe at mechanical room	No Asbestos Detected
54. Cement floor at library	No Asbestos Detected
55. Cement floor at library	No Asbestos Detected
56. Beige 12" x 12" vinyl floor tile at room 128	3% Asbestos
57. Beige 12" x 12" vinyl floor tile at room 128	3% Asbestos
58. Black mastic for beige 12" x 12" vinyl floor tile at room 128	3% Asbestos
59. Black mastic for beige 12" x 12" vinyl floor tile at room 128	10% Asbestos
60. Brown 12" x 12" vinyl floor tile at room 155	3% Asbestos
61. Brown 12" x 12" vinyl floor tile at room 158	No Asbestos Detected
62. Brown 12" x 12" vinyl floor tile at room 158	2% Asbestos
63. Black mastic for brown 12" x 12" vinyl floor tile at room 155	10% Asbestos
64. Black mastic for brown 12" x 12" vinyl floor tile at room 158	10% Asbestos
65. Dark grey 12" x 12" vinyl floor tile at room 103	No Asbestos Detected
66. Dark grey 12" x 12" vinyl floor tile at room 103	No Asbestos Detected
67. Pink 12" x 12" vinyl floor tile at office	No Asbestos Detected
68. Pink 12" x 12" vinyl floor tile at office	No Asbestos Detected
69. Light blue 12" x 12" vinyl floor tile at room 010	No Asbestos Detected
70. Light blue 12" x 12" vinyl floor tile at room 010	No Asbestos Detected
71. White/green 12" x 12" vinyl floor tile at room 018	No Asbestos Detected
72. White/green 12" x 12" vinyl floor tile at room 018	No Asbestos Detected
73. Black mastic for white/green 12" x 12" vinyl floor tile at room 018	<1% Asbestos
74. Black mastic for white/green 12" x 12" vinyl floor tile at room 018	2% Asbestos
75. Yellow/blue 12" x 12" vinyl floor tile at room 019	No Asbestos Detected
76. Yellow/blue 12" x 12" vinyl floor tile at room 019	No Asbestos Detected
77. Black/white 12" x 12" vinyl floor tile at room 120	No Asbestos Detected
78. Black/white 12" x 12" vinyl floor tile at room 120	No Asbestos Detected
79. Blue 12" x 12" vinyl floor tile at room 161	No Asbestos Detected
80. Blue 12" x 12" vinyl floor tile at room 161	No Asbestos Detected
81. Tan 12" x 12" vinyl floor tile at room 120	2% Asbestos
82. Tan 12" x 12" vinyl floor tile at room 120	2% Asbestos
83. Black mastic for tan 12" x 12" vinyl floor tile at room 120	10% Asbestos
84. Black mastic for tan 12" x 12" vinyl floor tile at room 120	10% Asbestos
85. White/tan specks 12" x 12" vinyl floor tile at room 135	No Asbestos Detected
86. White/tan specks 12" x 12" vinyl floor tile at room 135	No Asbestos Detected
87. Black mastic for white/tan specks 12" x 12" vinyl floor tile at room 135	10% Asbestos
88. Black mastic for white/tan specks 12" x 12" vinyl floor tile at room 135	No Asbestos Detected
89. White/blue and red flecks 12" x 12" vinyl floor tile at room 151	No Asbestos Detected
90. White/blue and red flecks 12" x 12" vinyl floor tile at room 151	No Asbestos Detected
91. White/blue spots 12" x 12" vinyl floor tile at room 126	No Asbestos Detected
92. White/blue spots 12" x 12" vinyl floor tile at room 126	No Asbestos Detected
93. Slate window sill at room 126	5% Asbestos
94. Slate window sill at room 128	15% Asbestos
95. Interior caulking for exterior window	3% Asbestos
96. Interior caulking for exterior window	3% Asbestos

3.0 OBSERVATION AND COST ESTIMATES:

OBSERVATIONS:

All ACM must be removed by a Massachusetts licensed asbestos abatement contractor under the supervision of a Massachusetts licensed project monitor prior to any renovation or demolition activities that might disturb the ACM.

1. Exterior window glazing caulking was found to contain asbestos.
2. Exterior unit vent grille caulking was found to contain asbestos.
3. Interior window glazing caulking was found to contain asbestos.
4. Interior door glazing caulking was found to contain asbestos.
5. Fire door insulation was found to contain asbestos.
6. Black sink coating was found to contain asbestos.
7. Pink sink coating was found to contain asbestos.
8. Vertical caulking between block and column was found to contain asbestos.
9. Boiler exhaust insulation was found to contain asbestos.
10. Generator exhaust insulation was found to contain asbestos.
11. Various types of vinyl floor tiles and mastic were found to contain asbestos.
12. Slate window sill was found to contain asbestos.
13. Interior caulking for exterior window was found to contain asbestos.
14. Per the AHERA plan, ACM fireproofing was removed and replaced. ACM might be found behind walls and above fixed ceilings.
15. Transite inside fume hood was assumed to contain asbestos.
16. Paper and mastic under hardwood floors were assumed to contain asbestos.
17. Glue holding blackboard was assumed to contain asbestos.
18. Ceramic tiles grout and adhesive were assumed to contain asbestos.
19. All remaining suspect materials were found not to contain asbestos.
20. Roofing material was assumed to contain asbestos. Roofing material does not have to be removed by a licensed asbestos contractor. However, the General Contractor must comply with OSHA regulation during demolition and with state regulations for proper disposal.
21. Underground sewer pipe was assumed to contain asbestos.
22. Dampproofing on exterior and foundation walls was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal in an EPA approved landfill that does not recycle.
23. Painted surfaces were assumed to be LBP. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations.
24. Visual inspection of various equipments such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's. Tubes, thermostats, exit signs and switches were assumed to contain mercury. It would be very costly to test those equipments and dismantling would be required to access. Therefore, the above mentioned equipments should be disposed in an EPA approved landfill as part of the demolition project.
25. Caulking materials were assumed to contain PCB's.
26. One underground oil tank was observed. No records were found to determine size and condition.

COST ESTIMATES:

The cost includes removal and disposal of all accessible ACM and an allowance for removal of inaccessible or hidden ACM that may be found during the demolition or renovation project.

Location	Material	Approximate Quantity	Cost Estimate (\$)
Throughout	Vinyl Floor Tiles and Mastic	55,000 SF	220,000.00
	Light Fixtures	Unknown	25,000.00
	Interior Windows	300 Total	30,000.00
	Interior Doors	240 Total	24,000.00

Location	Material	Approximate Quantity	Cost Estimate (\$)
	Transite Window Sill	200 Total	25,000.00
	Hidden Fireproofing	Unknown	150,000.00
	Miscellaneous Hazardous Materials	Unknown	75,000.00
Various Locations	Ceramic Wall Tiles	10,000 SF	40,000.00
	Blackboards	40 Total	10,000.00
Room 162	Vertical Caulking	100 LF	500.00
Gymnasium	Hardwood Floor and Glue	7,500 SF	75,000.00
Shops	Hardwood Floor and Glue	5,000 SF	50,000.00
Boiler Room	Boiler Exhaust Insulation	300 SF	9,000.00
Generator Room	Generator Exhaust Insulation	10 SF	500.00
Lab	Fume Hood	1 Total	2,500.00
Exterior	Windows	200 Total	40,000.00
	Transite Sewer Pipes	Unknown ¹	50,000.00
	Damproofing on Exterior/Foundation Walls	Unknown ¹	400,000.00
	Oil Tank	1 Total ²	25,000.00
PCB's Remediation ³			95,000.00
Estimated costs for ACM Inspection and Testing Services			25,000.00
Estimated costs for PCB's Testing and Abatement Plans Services ³			35,000.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			93,500.00
Total:			1,500,000.00

¹: Part of total demolition.

²: Excluding any cost related to soil removal.

³: Should results exceed EPA limit.

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

Asbestos samples were collected using a method that prevents fiber release. Homogeneous sample areas were determined by criteria outlined in EPA document 560/5-85-030a.

Bulk material samples were analyzed using PLM and dispersion staining techniques with EPA method 600/M4-82-020.

5.0 LIMITATIONS AND CONDITIONS:

This report has been completed based on visual and physical observations made and information available at the time of the site visits, as well as an interview with the Owner's representatives. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.

131501952

CHAIN OF CUSTODY

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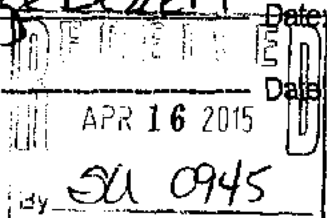
Town/City: Worcester, MA Building Name: Northeast Metro Tech

Sample	Result	Description of Material	Sample Location
1		caulking exterior	Univent cosmetology shop vent
2		Exterior window caulking	window cosmetology shop
3		caulking	Exterior window glazing @ brick
4		caulking exterior	univent Room 126 B
5		caulking	exterior window 126 B
6		window glass glazing caulking	exterior Room 126 B
7		door caulking framing	exterior door #2
8		door caulking framing	exterior door #3
9		window glass glazing caulking	exterior Room 164
10		Exterior window caulking	old carpenter's shop
11		door framing caulking	exterior door #7
12		window glass glazing caulking	exterior Room
13		Exterior panel above window	ISSN near door #8
14		Exterior panel glue daub	ISSN near door #8
15		Exterior window caulking	exterior window electrical shop
16		Exterior caulking	univent outside Maintenance Breakroom
17		window glass glazing caulking	exterior auto shop
18		Exterior caulking	exterior auto shop window frame
19		window glass glazing caulking	Exterior auto body shop
20		Door framing caulking	exterior door #18

Reported By: George Berceh Date: 4/16/15

Due Date: _____

Received By: _____ Date: _____



WIN

24 hrs

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

[illegible]

Due Date: 24 hrs

APR 16 2015
By SA 0945

**EMSL Analytical, Inc.**

7 Constitution Way, Suite 107, Woburn, MA 01801

Phone/Fax: (781) 933-8411 / (781) 933-8412

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EMSL Order: 131501952

CustomerID: UEC63

CustomerPO:

ProjectID:

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (508) 628-5486
Fax: (508) 628-5488
Received: 04/16/15 9:45 AM
Analysis Date: 4/17/2015
Collected: 4/16/2015

Project: **Northeast Metro Tech; Wakefield, MA**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
1 131501952-0001	Univent Cosmetology Shop Vent - Caulking Exterior	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
2 131501952-0002	Window Cosmetology Shop - Exterior Window Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
3 131501952-0003	Exterior Window Glazing @ Brick - Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
4 131501952-0004	Univent Room 126B - Caulking Exterior	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
5 131501952-0005	Exterior Window 126B - Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
6 131501952-0006	Exterior Room 126B - Window Glass Glazing Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
7 131501952-0007	Exterior Door #2 - Door Caulking Framing	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
8 131501952-0008	Exterior Door #3 - Door Caulking Framing	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)

Fievel Lam (25)

Steve Grise, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3 and VT AL357102

Initial report from 04/17/2015 16:41:41

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Analysis Date: 4/17/2015
Collected: 4/16/2015

Project: **Northeast Metro Tech; Wakefield, MA**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
9 131501952-0009	Exterior Room 164 - Window Glass Glazing Caulking	Gray Non-Fibrous Homogeneous		92% Non-fibrous (other)	8% Chrysotile
10 131501952-0010	Old Carpenter's Shop - Exterior Window Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
11 131501952-0011	Exterior Door #7 - Door Framing Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
12 131501952-0012	Exterior Room - Window Glass Glazing Caulking	Gray Fibrous Homogeneous		92% Non-fibrous (other)	8% Chrysotile
13 131501952-0013	ISSN Near Door #8 - Exterior Panel Above Window	Tan Fibrous Homogeneous	10% Glass	90% Non-fibrous (other)	None Detected
14 131501952-0014	ISSN Near Door #8 - Exterior Panel Glue Daub	Tan Fibrous Homogeneous	10% Glass	90% Non-fibrous (other)	None Detected
15 131501952-0015	Exterior Window Electrical Shop - Exterior Window Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
16 131501952-0016	Univent Outside Maintenance Break Room - Exterior Caulking	Gray Fibrous Homogeneous		95% Non-fibrous (other)	5% Chrysotile

Analyst(s)

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or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3 and VT AL357102

Initial report from 04/17/2015 16:41:41

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Analysis Date: 4/17/2015
Collected: 4/16/2015

Project: **Northeast Metro Tech; Wakefield, MA**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
17 131501952-0017	Exterior Auto Shop - Window Glass Glazing Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
18 131501952-0018	Exterior Auto Shop Window Frame - Exterior Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
19 131501952-0019	Exterior Auto Body Shop - Window Glass Glazing Caulking	Gray Non-Fibrous Homogeneous		92% Non-fibrous (other)	8% Chrysotile
20 131501952-0020	Exterior Door #18 - Door Framing Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
21 131501952-0021	@ Plumbing Shop Exterior Window - Window Glass Glazing Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
22 131501952-0022	@ Plumbing Shop Window - Exterior Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
23 131501952-0023	Exterior Expansion Joint at Door #23 - Caulking/Fill	Brown/White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (other)	None Detected
24 131501952-0024	Exterior Soffit Fascia - Concrete Fascia	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)

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Project: **Northeast Metro Tech; Wakefield, MA**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
25 131501952-0025	@ Carpenter's Shop - Exterior Panel Above Windows	Gray Fibrous Homogeneous	15% Glass	85% Non-fibrous (other)	None Detected

Analyst(s)

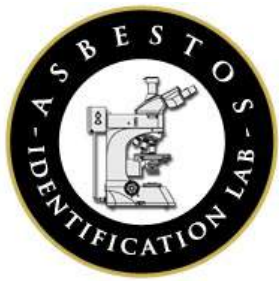
Fievel Lam (25)

Steve Grise, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3 and VT AL357102

Initial report from 04/17/2015 16:41:41



Asbestos Identification Laboratory

165 New Boston St., Ste 271

Woburn, MA 01801

781-932-9600

Web: www.asbestosidentificationlab.com

Email: mikemanning@asbestosidentificationlab.com

Batch:

5373



April 24, 2015

Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Project Number:

Project Name: NE Metro Tech, Wakefield, MA

Date Sampled: 2015-04-22

Work Received: 2015-04-22

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

Dear Ammar Dieb,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project.

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations Department of Health Certification: AAL-121

Thank you Ammar Dieb for your business.

Michael Manning
Owner/Director

April 24, 2015

Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Project Number:

Project Name: NE Metro Tech, Wakefield, MA

Date Sampled: 2015-04-22

Work Received: 2015-04-22

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
1	Interior Window Glaze	Pool	tan	Non-Fibrous	100 None Detected
57648					
2	Interior Window Glaze	Hall @ 154	gray	Non-Fibrous	98 Detected Chrysotile 2
57649					
3	Interior Window Glaze	Room 158 Autobody	gray	Non-Fibrous	98 Detected Chrysotile 2
57650					
4	Interior Door Glass Glaze	Room 107	white	Non-Fibrous	98 Detected Chrysotile 2
57651					
5	Interior Door Glass Glaze	Room 104	tan	Non-Fibrous	98 Detected Chrysotile 2
57652					
6	Fire Door Insulation	Cafeteria Door	white	Non-Fibrous	40 Detected Chrysotile 60
57653					
7	Fire Door Insulation	Cafeteria Door	white	Non-Fibrous	50 Detected Chrysotile 50
57654					
8	1x1 SAT	Room 135	tan	Fiberglass Non-Fibrous	90 None Detected 10
57655					
9	1x1 SAT	Room 157	gray	Fiberglass Non-Fibrous	85 None Detected 15
57656					
10	2x2 SAT	Break Room	gray	Mineral Wool Cellulose Non-Fibrous	30 None Detected 60 10
57657					
11	2x2 SAT	Room 107	gray	Fiberglass Non-Fibrous	90 None Detected 10
57658					
12	2x4 SAT	Room 011	gray	Mineral Wool Cellulose Non-Fibrous	30 None Detected 60 10
57659					
13	2x4 SAT	Room 011	gray	Mineral Wool Cellulose Non-Fibrous	40 None Detected 50 10
57660					
14	Plaster	Room 120	white	Non-Fibrous	100 None Detected
57661					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
15	Plaster	Room 120	white	Non-Fibrous	100 None Detected
57662					
16	Plaster	Room 126	white	Non-Fibrous	100 None Detected
57663					
17	Plaster	Room 126	white	Non-Fibrous	100 None Detected
57664					
18	Plaster	Room 128	white	Non-Fibrous	100 None Detected
57665					
19	Plaster	Room 128	multi	Non-Fibrous	100 None Detected
57666					
20	Plaster	Room 128	multi	Non-Fibrous	100 None Detected
57667					
21	Joint Compound	Room 152	white	Non-Fibrous	100 None Detected
57668					
22	Joint Compound	Room 152	white	Non-Fibrous	100 None Detected
57669					
23	Black Sink Coating	Break Room	black	Non-Fibrous	95 Detected Chrysotile 5
57670					
24	Black Sink Coating	Break Room	black	Non-Fibrous	95 Detected Chrysotile 5
57671					
25	Pink Sink Coating	Room 153	pink	Non-Fibrous	97 Detected Chrysotile 3
57672					
26	Pink Sink Coating	Room 153	pink	Non-Fibrous	97 Detected Chrysotile 3
57673					
27	White Sink Coating	Room 019	white	Cellulose Non-Fibrous	5 None Detected 95
57674					
28	White Sink Coating	Room 019	white	Cellulose Non-Fibrous	10 None Detected 90
57675					
29	Old Lab Counter Tops	Room 123	black	Non-Fibrous	100 None Detected
57676					
30	Old Lab Counter Tops	Room 123	black	Non-Fibrous	100 None Detected
57677					
31	Health Lab Tables	Room 012	black	Non-Fibrous	100 None Detected
57678					
32	Health Lab Tables	Room 012	black	Non-Fibrous	100 None Detected
57679					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
33	Vertical Caulk	Black-Column Room 162	tan	Non-Fibrous	95 Detected Chrysotile 5
57680					
34	Vertical Caulk	Black-Column Room 162	tan	Non-Fibrous	95 Detected Chrysotile 5
57681					
35	Vertical Caulk	Block-Block Gym	gray	Non-Fibrous	100 None Detected
57682					
36	Vertical Caulk	Block-Block Gym	gray	Non-Fibrous	100 None Detected
57683					
37	Black Mastic on FG Pipe	Mechanical Room	black	Non-Fibrous	100 None Detected
57684					
38	Black Mastic on FG Pipe	Mechanical Room	black	Non-Fibrous	100 None Detected
57685					
39	Boiler Gasket	Boiler Door	brown	Mineral Wool Hair Non-Fibrous	45 50 5 None Detected
57686					
40	Boiler Gasket	Boiler Door	brown	Mineral Wool Hair Non-Fibrous	50 45 5 None Detected
57687					
41	Boiler Exhaust Insulation	Boiler Room	multi	Non-Fibrous	80 Detected Chrysotile 20
57688					
42	Boiler Exhaust Insulation	Boiler Room	multi	Non-Fibrous	80 Detected Chrysotile 20
57689					
43	Boiler Exhaust Insulation	Boiler Room	multi	Non-Fibrous	70 Detected Chrysotile 30
57690					
44	Generator Exhaust Insulation	Generator Room	tan	Non-Fibrous	97 Detected Chrysotile 3
57691					
45	Generator Exhaust Insulation	Generator Room	gray	Non-Fibrous	60 Detected Chrysotile 40
57692					
46	Generator Exhaust Insulation	Generator Room	gray	Non-Fibrous	70 Detected Chrysotile 30
57693					
47	Hard Joint on FG Ins	Pool Mechanical Room	gray	Fiberglass Non-Fibrous	30 70 None Detected
57694					
48	Hard Joint on FG Ins	Room 153	gray	Fiberglass Non-Fibrous	30 70 None Detected
57695					
49	Hard Joint on FG Ins	Room 158 Autobody	gray	Fiberglass Non-Fibrous	35 65 None Detected
57696					
50	Hard Joint on FG Ins	Room 158 Autobody	gray	Fiberglass Non-Fibrous	20 80 None Detected
57697					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
51	Hard Joint on FG Ins	Stage Mechanical Room	gray	Fiberglass Non-Fibrous	20 None Detected 80
57698					
52	Hard Joint on FG Ins	Stage	gray	Fiberglass Non-Fibrous	25 None Detected 75
57699					
53	Hard Joint on FG Ins	Mechanical Room	gray	Fiberglass Non-Fibrous	30 None Detected 70
57700					
54	Cement Floor	Library	gray	Non-Fibrous	100 None Detected
57701					
55	Cement Floor	Library	gray	Non-Fibrous	100 None Detected
57702					
56	Beige 12x12 VFT	Room 128	tan	Non-Fibrous	97 Detected Chrysotile 3
57703					
57	Beige 12x12 VFT	Room 128	tan	Non-Fibrous	97 Detected Chrysotile 3
57704					
58	Black Mastic	Room 128	black	Non-Fibrous	97 Detected Chrysotile 3
57705					
59	Black Mastic	Room 128	black	Non-Fibrous	90 Detected Chrysotile 10
57706					
60	Brown 12x12 VFT	Room 155	multi	Non-Fibrous	97 Detected Chrysotile 3
57707					
61	Brown 12x12 VFT	Room 158 Autobody	multi	Non-Fibrous	100 None Detected
57708					
62	Brown 12x12 VFT	Room 158 Autobody	multi	Non-Fibrous	98 Detected Chrysotile 2
57709					
63	Black Mastic	Room 155	black	Non-Fibrous	90 Detected Chrysotile 10
57710					
64	Black Mastic	Room 158 Autobody	black	Non-Fibrous	90 Detected Chrysotile 10
57711					
65	Dark Grey 12x12 VFT	Room 103	gray	Non-Fibrous	100 None Detected
57712					
66	Dark Grey 12x12 VFT	Room 103	gray	Non-Fibrous	100 None Detected
57713					
67	Pink 12x12 VFT	Office	multi	Non-Fibrous	100 None Detected
57714					
68	Pink 12x12 VFT	Office	multi	Non-Fibrous	100 None Detected
57715					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
69	Light Blue 12x12 VFT	Room 010	blue	Non-Fibrous	100 None Detected
57716					
70	Light Blue 12x12 VFT	Room 010	blue	Non-Fibrous	100 None Detected
57717					
71	White and Green 12x12 VFT	Room 018	multi	Non-Fibrous	100 None Detected
57718					
72	White and Green 12x12 VFT	Room 018	multi	Non-Fibrous	100 None Detected
57719					
73	Black Mastic	Room 018	black	Non-Fibrous	100 Detected Chrysotile < 1
57720					
74	Black Mastic	Room 018	black	Non-Fibrous	98 Detected Chrysotile 2
57721					
75	Yellow + Blue 12x12 VFT	Room 019	yellow	Non-Fibrous	100 None Detected
57722					
76	Yellow + Blue 12x12 VFT	Room 019	blue	Non-Fibrous	100 None Detected
57723					
77	Black + White 12x12 VFT Checker Board	Room 120	white	Non-Fibrous	100 None Detected
57724					
78	Black + White 12x12 VFT Checker Board	Room 120	black	Non-Fibrous	100 None Detected
57725					
79	Blue 12x12 VFT	Room 161	blue	Non-Fibrous	100 None Detected
57726					
80	Blue 12x12 VFT	Room 161	blue	Non-Fibrous	100 None Detected
57727					
81	Tan Spotted 12x12 VFT	Room 120	tan	Non-Fibrous	98 Detected Chrysotile 2
57728					
82	Tan Spotted 12x12 VFT	Room 120	tan	Non-Fibrous	98 Detected Chrysotile 2
57729					
83	Black Mastic	Room 120	black	Non-Fibrous	90 Detected Chrysotile 10
57730					
84	Black Mastic	Room 120	black	Non-Fibrous	90 Detected Chrysotile 10
57731					
85	White w/ Tan Specks 12x12 VFT	Room 135	multi	Non-Fibrous	100 None Detected
57732					
86	White w/ Tan Specks 12x12 VFT	Room 135	multi	Non-Fibrous	100 None Detected
57733					

FieldID	Material	Location	Color	Non-Asbestos %	Asbestos %
LabID					
87	Black Mastic	Room 135	black	Non-Fibrous	90 Detected Chrysotile 10
57734					
88	Black Mastic	Room 135	black	Cellulose Non-Fibrous	20 None Detected 80
57735					
89	White w/ Blue + Red 12x12 VFT Flecks	Room 151	multi	Non-Fibrous	100 None Detected
57736					
90	White w/ Blue + Red 12x12 VFT Flecks	Room 151	multi	Non-Fibrous	100 None Detected
57737					
91	White w/ Blue Spots 12x12 VFT	Room 126	multi	Non-Fibrous	100 None Detected
57738					
92	White w/ Blue Spots 12x12 VFT	Room 126	multi	Non-Fibrous	100 None Detected
57739					
93	Slate Window Sill	Room 126	gray	Non-Fibrous	95 Detected Chrysotile 5
57740					
94	Slate Window Sill	Room 128	gray	Non-Fibrous	85 Detected Chrysotile 15
57741					
95	Black Window Caulk	Inside of Exterior Window Rm 126	black	Non-Fibrous	97 Detected Chrysotile 3
57742					
96	Black Window Caulk	Inside of Exterior Window Rm 128	black	Non-Fibrous	97 Detected Chrysotile 3
57743					
Friday 24 April 2015		End of Report		Page 6 of 6	
Analyzed by:		Batch: 5373			

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM
48-hour TAT

Town/City: Wakefield, MA Building Name: NE Metro Tech

Sample	Result	Description of Material	Sample Location
1		Interior window glaze	Pool
2			Hall @ 154
3			Room 158 Auto body
4		Interior door glass glaze	Room 107
5			Room 104
6		Fire door Insulation	Cafeteria door
7			
8		1x1 SAT	Room 135
9			Room 157
10		2x2 SAT	Break room
11			Room 107
12		2x4 SAT	Room 011
13			
14		Plaster	Room 120
15			
16			Room 126
17			
18			Room 128
19			
20			

Reported By: Tara Beattie Date: 4-22-15 Due Date: _____
 Received By: [Signature] Date: 4/22/15

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM
48-hour TAT

Town/City: Wake Field, MA Building Name NE Metro Tech

Sample	Result	Description of Material	Sample Location
21		Joint Compound	Room 152
22			
23		Black sink Coating	Break room
24			
25		Pink sink coating	Room 153
26			
27		white sink coating	Room 019
28			
29		old lab countertops	Room 123
30			
31		Health lab tables	Room 012
32			
33		vertical caulk	block - Column Room 162
34			
35		vertical caulk	Block-Block Gym
36			
37		Black mastic on FG pipe	mechanical room
38			
39		Boiler gasket	Boiler door
40			

Reported By: Jason Becette Date: 4-22-15 Due Date: _____
Received By: _____ Date: _____

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM
48-hour TAT

Town/City: Wakefield, MA Building Name: NE Metro Tech

Sample	Result	Description of Material	Sample Location
41		Boiler exhaust Insulation	Boiler room
42			
43			
44		Generator Exhaust Insulation	Generator room
45			
46			
47		Hard Joint on FG Insi	Pool mechanical room
48			Room 153
49			Room 158 Auto body
50			
51			stage mechanical room
52			stage
53			mechanical room
54		Cement Floor	Library
55			
56		Beige 12x12 vFT	Room 128
57			
58		Black mastic	
59			
60		Brown 12x12 vFT	Room 155

Reported By: Jason Bewette Date: 4-22-15 Due Date: _____

Received By: _____ Date: _____

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM
48-hour TAT

Town/City: Wake Field, MA Building Name NE Metro Tech

Sample	Result	Description of Material	Sample Location
61		Brown 12x12 VFT	Room 158 Auto body
62			
63		Black mastic	Room 155
64			Room 158 Auto body
65		Dark Grey 12x12 VFT	Room 103
66			
67		Pink 12x12 VFT	Office
68			
69		Light Blue 12x12 VFT	Room 010
70			
71		White and green 12x12 VFT	Room 018
72			
73		Black mastic	
74			
75		Yellow + Blue 12x12 VFT	Room 019
76			
77		Black + white checkerboard	Room 120
78		^ 12x12 VFT	
79		Blue 12x12 VFT	Room 161
80			

Reported By: Jason Bewette Date: 4-27-15 Due Date: _____

Received By: _____ Date: _____

CHAIN OF CUSTODY

Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Tel: (508) 628-5486 - Fax: (508) 628-5488
adieeb@uec-env.com

PLM
48-hour TAT

Town/City: Wake Field, MA Building Name: NE Metro Tech

Sample	Result	Description of Material	Sample Location
81		Tan spotted 12x12 VFT	Room 120
82			
83		Black mastic	
84			
85		white w/tan specks 12x12 VFT	Room 135
86			
87		Black mastic	
88			
89		white w/Blue/red flecks	Room 151
90		12x12 VFT	
91		white w/Blue spots 12x12 VFT	Room 126
92			
93		Slate window sill	Room 126
94			Room 128
95		Black window caulk	Inside of exterior window Rm 126
96			Inside of exterior window Rm 128

Reported By: Tyson Beebe Date: 4-22-15 Due Date: _____
 Received By: _____ Date: _____

FOOD SERVICES - EXISTING CONDITIONS ASSESSMENT

The Northeast Metropolitan Regional Vocational High School is a vocational school serving a total population of approximately 1,250 students in grades nine through twelve. The foodservices assessment in this report will address the school kitchen that serves the student population and the Culinary Arts program which is a teaching program.

The school's cafeteria kitchen serves the typical school lunch program offering a wide variety of food options at multiple service points. The Culinary Arts program focuses on three major courses of study. Those are ala carte cooking, baking, and general instruction. Practical real-world experience is taught in the James Wallace Breakheart Inn cafe. The cafe serves as a full service restaurant open daily to the public.

In addition to the traditional 9th through 12th academic instruction, there are community enrichment programs available for adult learners. Courses offered are Bartending, Culinary Arts, Foodservice Management, and general food services training.

Main School Kitchen

Image 1 is a view of the existing seating area and Image 2 is of the vending machines. If applicable in future planning, vending must be accounted for in the seating area so that it is not placed as shown in image 2 interfering with other function.

Various serving counters and portable salad bars, as seen in image 3 are in fair condition but in planning for the new serving area these items may not be appropriate for reuse depending on the method of serving as well as the atmosphere and décor of a new environment. New serving counters must be tailored to fit within the new design that pull these services out of the seating area and into the kitchen environment.



Image 1



Image 2



Image 3



Image 4

The cafeteria kitchen and servery has had the benefit of some equipment upgrades and replacements throughout the years. However, there is a mix of some equipment that is original to the buildings construction. Equipment that we observed as being newer and possibly reusable includes the following items.

- Ice maker, various work tables and shelves
- Reach-in refrigeration
- Sandwich slides and Sandwich make up tables
- Combination oven, conveyor ovens, and Panini grills

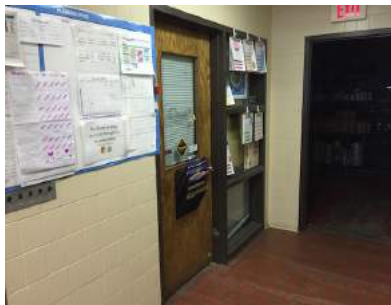


Image 5

Equipment that is identified for reuse may not be available by the time some future renovation is realized. Additionally some level of rehab and repair will be needed to be able to reuse equipment. Image 4 is an example of a sturdy table in need of caster replacement. Once the casters are replaced this table will serve its purpose for many more years to come. However, depending on the level of repair it may not be feasible to reuse some equipment. As equipment utility consumption and efficiency improves it may not be prudent to reuse certain types of equipment and it may make more sense to replace it with more efficient, modern pieces of equipment.

Back of House Kitchen Area

Back of House



Image 6

The back of house area is what is referred to when discussing the non-serving portion of the kitchen. The back of house consists of the food storage, preparation, cooking, pot washing, and offices. In image 5 there is an office for the foodservice director. Additional office space is needed for the kitchen manager as seen in image 6. For the kitchen manager there is an open desk area but that are should be enclosed in an office. An office would offer security of files and other important documents. In addition, offices should be segregated away from food preparation areas. Creating a distinct office area in needed for the separation of functions and eliminating the potential for cross contamination.

In any future planning sufficient office space must be identified and planned.

Over time any available work surface have been commandeered for use in the kitchen. Given the need staff are using any available work surface. Shown in in image 7, the table shown is not adequate for the harsh kitchen environment. The table is made of wood and water damage has begun to degrade the material.

As noted, some equipment is original to the construction of the school. As seen in image 8 the ware washer is rather old. As a testament to its quality it has withstood the test of time. However, this ware washer uses considerably more water than newer models. In addition, new models have a higher capacity of washing in a smaller footprint.

Back of House Finishes

The back of house space has held up well for its age. The original finishes are high quality ceramic wall tile and quarry tile floors. As can be expected, over the years finishes have degraded and some repairs and patching has been done.

Image 9 shows the original hood. Note the grease leaking down the front of the ductwork. In order for grease ducts to comply with current safety standards ducts must be watertight. A fully welded duct achieves this requirement and the existing condition is not watertight given the presence of grease. It is not clear where the grease is leaking from but it should be assumed that the grease is escaping from the interior of the duct onto the outside surface of the duct. This is a potential hazard, should there be a fire the grease would act as an accelerant. Luckily, the lack of open flame cooking diminishes that threat. With regard to finishes, an open gap in the ceiling is a health code violation. Ceiling must be comprised of smooth non-porous surfaces. Also, current standards require that the area above the hood be sealed to the finish ceiling above to prevent dust and grease from accumulating on any hard to clean horizontal surfaces.



Image 7



Image 8



Image 9



Image 10

With regard to wall finishes they too are appropriate but showing signs of wear. The walls are a very hardy glazed tile. With time normal wear and tear has overcome the finishes. In image 10 there are signs of corners being damaged. Dirt and grime will collect in these damaged areas and they will be difficult to clean.

In other instances wall plates have been removed creating a potential for an electrical shock hazard. Image 11 shows the missing wall plate. Wires can be seen and somewhat exposed.



Image 11

The floor over the years has been patched. The patches were not made in a professional manner and were made with standard concrete material. The concrete patch does not match the adjacent tiles. Image 12 is a good example of uneven floors caused by the patched conditions.

Recommendations

Overall the entire kitchen and serving area requires a finishes upgrade in order to comply with current food code standards. Equipment upgrades are needed as well. Walk-in coolers, work surfaces, hoods, and ware washing represents the greatest need but supplemental equipment needed for serving must also be considered.

In term of available space more is needed for offices and serving. Any renovation of the kitchen should focus on pulling the salad bars and cashier stations into the kitchen area so that it can be secured during off -hours.



Image 12

Culinary Arts Kitchen

The Culinary Arts Kitchen is well organized and has been equipped with a few new pieces of equipment. However, much of the original equipment is worn and in need of repair or replacement. Image 13 shows a wood top table that has one failed leg. In other cases all the legs have failed and a temporary repair similar to what is shown in the adjacent image was made. The wood tops on all of the tables are original. Wood is an acceptable surface but when it is of the vintage shown in image 13 the woods tends to have splits and gaps where food debris can accumulate. This condition results in an unsanitary condition.



Image 13

Image 14 is showing a walk-in cooler door that has already been replace once. The replacement door is showing significant rot in the lower right corner and duct tape is being used to keep the paneling in place. The door gaskets are leaking and overall the energy efficiency of the door is poor.

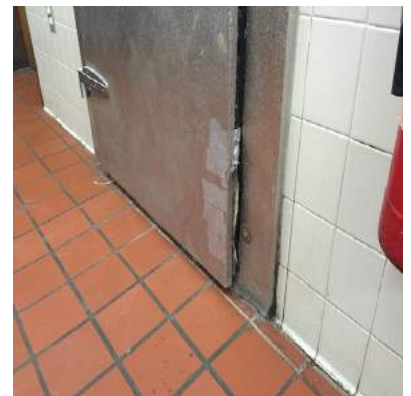


Image 14

The walk-in panels at the interior are also showing signs or wear. Minor mold growth is present. The lighting inside the walk-ins is poor and again the energy efficiency of the walk-in rooms is very poor. Modern standards for walk-in cooler construction makes for more efficient units that will consume much less energy and do a better job of holding food at the proper temperature.

Image 15 is a hood in the Culinary Arts kitchen. Similar to the main kitchen hood it is open to the finished ceiling above. Again, modern standards call for it to be sealed to the flat ceiling above. The ducts in this case appear to be in better condition. The construction of the hood is antiquated and lighting is poor. Modern hoods are more energy efficient and offer the adequate lighting levels needed for instruction.



Image 15

There have been recent equipment additions to the culinary kitchen. There are three new Hobart brand mixers that are in new condition. The mixers consist of a sixty, forty, and a twenty-quart mixer. These new mixers will serve the program well for many more years.

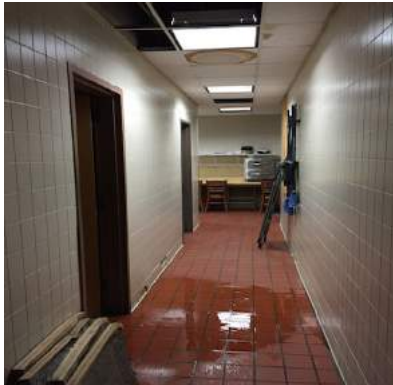


Image 16



Image 17



Image 18

Culinary Back of House Finishes

The finishes in the culinary area are similar to the finishes in the main kitchen. The original materials are of the same durable glazed tile and quarry tile flooring. However, roof leaks are affecting the finishes. As seen in Image 16 there is a recurring roof leak. Old stains can be seen and some tiles have been removed from prior leaks and damage.

In certain places the ceiling paint is peeling - see image 17. The presumed cause is another roof leak. Peeling paint is a major food code violation and a serious hazard. Paint chips of unknown composition can become loose and fall into food products, and could potentially be ingested.

There are many instances where exposed wood, piping, and electrical conduits have been installed as surface mounted applications on the wall. These exposed obstructions are difficult to clean and become collection points for grease and a place for dust to accumulate. Any renovation must eliminate and conceal piping within the wall cavities.

In the case where exposed unfinished plywood is present, that is a direct violation of the health code. Wood is considered a porous surface and is not easily cleaned. Image 18 shows one of the many exposed wood surfaces within the culinary kitchen.

As with the main kitchen there are instances where the floor was cut and opened to either install or repair underground plumbing drains. In cases where that occurred the floor was patched with a simple concrete patch. Exposed unsealed concrete is not an acceptable floor surface for a kitchen environment. Unsealed concrete will absorb grease and is difficult to clean.

Culinary Retail Space

The Culinary retail space is a practical learning environment that offers the students real life experiences related to operating in a busy kitchen and customer service. The retail operation offers customers the opportunity for a sit down table service meal.

The seating is a combination of booths and loose tables and chairs. The seating appears to be in good shape and may have been a recent upgrade to the program. The total seating count appears to be approximately 50 seats. Reuse of the existing seating is a possibility.

Image 20 - As a supplement to the sit down meal option there is a retail bakery area where baked goods and refrigerated items are displayed for sale. At the rear wall there is a tall bread display case and adjacent to that is a back counter offering beverages as well as supplementing the beverage service of the sit down restaurant. The equipment is reusable but the millwork components need to be replaced.

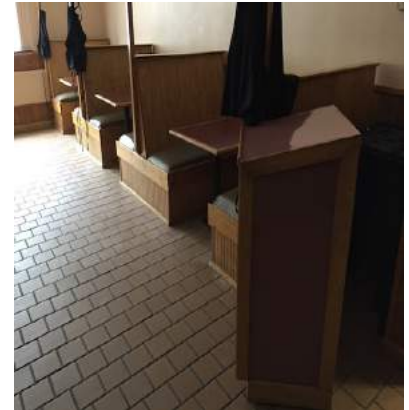


Image 19

Recommendations

As indicated in the opening paragraph the Culinary Arts program is robust. The a-la-carte program that serves the restaurant requires proper cooking line support. In the foodservice industry this is called the chef's table. There is a makeshift chef's table currently in place but it lacks the proper equipment to function to its fullest capacity. Secondary to the chef's table the program requires a Garden Manager station for the cold preparation of salads and desserts. Again, the instructors have recreated a version of this station with loose tables and refrigerated preparation tables but it is inadequate. For the program to effectively teach and prepare students for real world scenarios the program will need proper cooking line support in order to teach the function and importance of a properly equipped hot line.



Image 20

The baking area is well on its way. It is in need of a refresh but the recent addition of some very nice equipment is a start.

SECURITY - EXISTING CONDITIONS ASSESSMENT

As part of the overall pre-feasibility study, we visited campus to better understand the existing electronic security system(s) in use by the School. Our assessment was based solely on the equipment and state of technology and was not inclusive of opinion or facts regarding supporting policy, procedure, placement of devices, end user training, etc.

Our assessment, in general, revealed the School is largely using security technology that is consistent with contemporary standards in school security, is in working condition and is well maintained by the School's IT department.

While some challenges exist such as latency and image quality with current systems, such as cameras that have not been upgraded, the School has been migrating at a consistent pace to improve functionality.

Security Cameras

Northeast Metro Tech currently deploys more than 100 fixed and Pan, Tilt, Zoom (PTZ) security cameras throughout the interior and exterior of the School, as seen in Figure 1 & Figure 2.

The existing system includes a combination of newer HD cameras and older legacy cameras which are typically viewed by Security staff using the Ocularis software from OnSSI as seen in Figure 3. The OnSSI product is well known throughout the security industry and is considered amongst industry leaders.

In general, the cameras perform well and provide significant coverage based on discussion with security end users and they are generally in good working order, with few noted exceptions that the School is aware of and addressing. There were some exceptions or challenges that we will note below.

Video is recorded, stored and available to the IT department who maintain the system and system integrity. The recording capabilities and capacity are adequate for the environment and scalable to future needs.

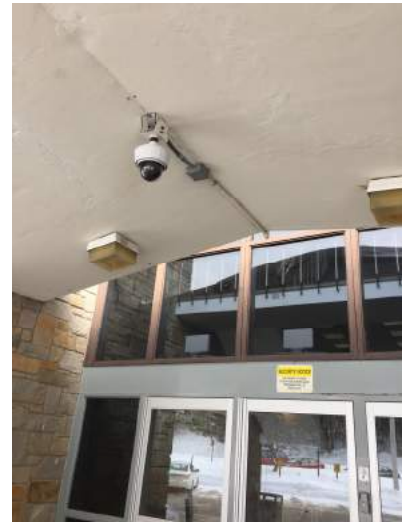


Figure 1

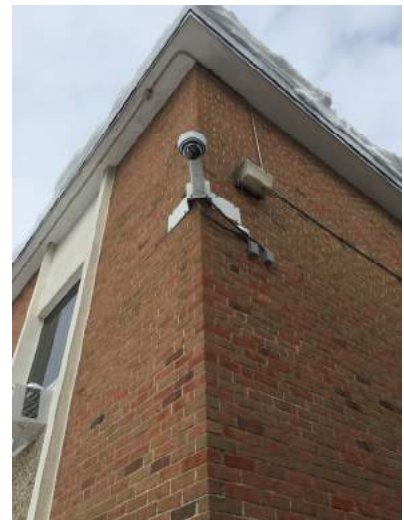


Figure 2



Figure 3

Findings

- Need to continue migration from legacy cameras
- Must address latency in calling cameras
- Image quality of legacy cameras is a concern, but can be eliminated through the migration
- Systems are well maintained by IT and can be scalable to new facilities

Electronic Access Control/Visitor Management

Northeast Metro Tech uses electronic access control integrated with visitor management software. Figures 3 & 4 show a typical credential reader and Fast Pass visitor management printer, while Figure 6 shows an exterior reader controlling a gate.

The School utilizes proximity card technology with HID readers. These readers appear to be in good working condition and generally have a substantial usable life expectancy assuming they do not suffer physical damage. It appears the access system is appropriate for the application and is scalable to future needs of the School should additional readers or patrons need to be added to the system.

The Fast-Pass system is a visitor management system that allows Security to print a visitor's pass and cross references sex offender, criminal and even School watch lists. While the system appears adequate and to meet the needs of the School, our observations and discussion noted some performance concerns from an end user perspective, but in general the system was effective and is in working order.

Findings

- Both access control and visitor management systems are in good working condition
 - Each system is scalable to meet future needs of the School
 - The Fast-Pass system bar code scanner seems only to work with MA drivers licenses which reduces its effectiveness
 - The background check feature of the Fast-Pass can sometime lead to false-positives causing operational delays



Figure 4



Figure 5



Figure 6

Voice & Video Intercom

The School currently utilizes both video and voice intercoms on perimeter entrances to control access, observe and communicate with visitors as seen in Figure 7 & 8.

At the time of our visit, all of the devices appeared to be in working order however, we heard complaints that the voice intercoms were not always clearly audible and this was confirmed by our evaluator when using the intercom to contact security

The use of the video intercoms was well received by security staff and provided clear voice and images to the operator and visitors. Should the School move forward with significant renovation or construction, it is our opinion that voice intercoms would not be transferable or reusable and we would recommend an upgrade to video intercoms.

Findings:

- Video intercoms are effective and in good working condition
- Video intercoms are adequate and scalable for the future
- Voice Intercoms are less reliable and aged
- Voice intercoms should be replaced upon substantial renovation or reconstruction
- Consider adding video intercoms that integrate video, camera and card technology

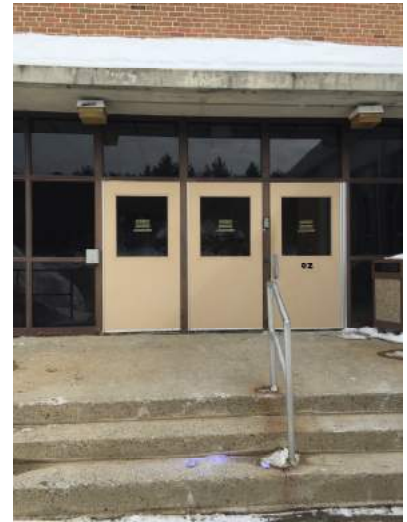


Figure 7



Figure 8

TECHNOLOGY SYSTEMS - EXISTING CONDITIONS ASSESSMENT

The technology systems are generally in fair condition. Northeast Metro Tech has made significant improvements to the network; however, clocks and paging systems remain original vintage for the most part. As in many schools built in this time frame, technology wiring has been retrofit and closets re-purposed to accommodate the growing need for technology.

Clock System

The master clock system is operational but beyond its useful life. The Simplex time controller (Image 1) is obsolete. Most classroom clocks are functional and some that have failed have been replaced with battery type stand-alone clocks.

Paging System

The paging system head end consists of general paging amplifiers, (2) 150 watt architectural acoustics amplifiers and an architectural acoustic MMA 800T 8-zone mixer (Image 4 & 5) with an adjacent Shure microphone for announcements. The system is located on top of filing cabinets and within a ventilated lockable enclosure.

Speakers are located throughout the building. The majority of room speakers are wall-mounted within a clock/speaker/telephone panel. (Image 2 & 3)



Image 1

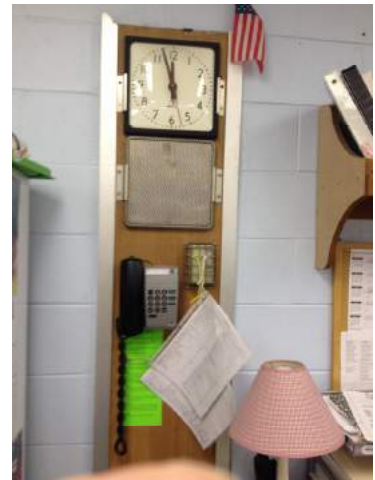


Image 2



Image 3



Image 4

Local Sound Reinforcement System

The cafetorium local sound system consists of wall-mounted loud speakers (Image 7) driven by a Bogen 8-channel mixer/amp. The sound system contains two TOA wireless microphone systems. (Image 6)

The gymnasium also contains a local sound reinforcement system. (Image 8)

Tel/Data Infrastructure

The main IT Room (Head End Room) consists of (2) server racks, a data cabling patch panel rack, and individual UPS units. (Image 9 & 10)



Image 5

The Head End Room is where the school's ISP fiber is terminated. The back bone consists of multi-mode fiber from the Head End Room to (11) intermediate distribution frames (IDF) throughout the school (Image 11 & 12), typically in wall-mounted lockable cubes (image 13). The CCTV system is a physically separate network with fiber run to each IDF for the security network. Cat 5e cable is then run to the desktop locations from the data patch panels.

Data cabling has been retro-fitted to accommodate the growing need for technology whether wireless access points or desktop computers. (Image 14 & 15)



Image 6

Approximately 35 wireless access points are currently installed in the school. Computer labs have been outfitted with power poles with dividers to accommodate tel/data cabling.

A typical classroom consists of one teacher station with connection to an overhead projector.

The three computer labs and library desktops are hard-wired. Four laptop carts with 30 laptops and 2 iPad carts are utilized throughout the school.

In general, the network infrastructure is in fair condition.

A typical classroom consists of one teacher station with connection to an overhead projector.

Recommendations

Clock System

The master clock system should be upgraded to a GPS/LAN based wireless clock system. The clock head end will be installed in the building MDF Room and either connected to a time server or a GPS antenna to receive and distribute the time to the remote wireless clocks. The clock system can be interfaced with the telephone system and paging so that the times of each system are in sync. Secondary wireless clocks can be battery operated or 120V hard wired. Each clock receives and transmits a signal.

Paging System

The existing paging system should be replaced with a new microprocessor based paging systems that will establish direct communication between any remote station and desktop instrument. The paging system should integrate with the master clock system for accurate time tone signaling for class changes as well as integrate with the telephone system so that telephone handsets can be used to communicate. The new paging system should be provided with a visual console that is web based where the staff can monitor/manage the following functions:

- Create or modify schedules
- Queue music or class change
- Holidays
- Paging
- Program
- Time zones

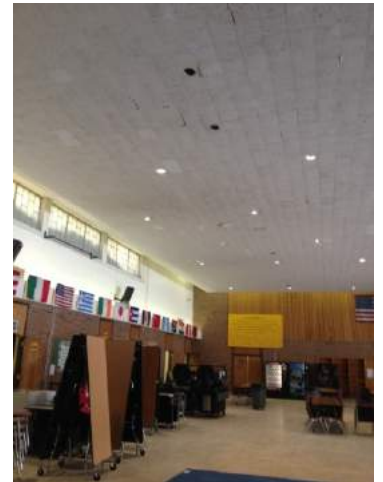


Image 7

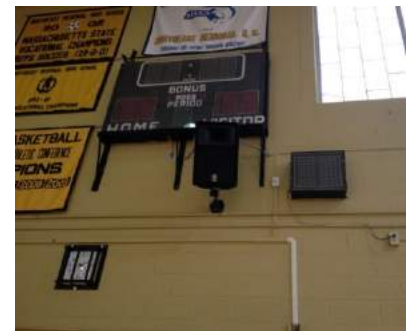


Image 8



Image 9



Image 10

Local Sound Reinforcement System

The local sound systems are in fair condition it should be confirmed that they are interfaced with the fire alarm system to mute during an alarm; this is a code requirement.

Tel/Data Infrastructure

Any vintage Cat3 cable should be upgraded to Cat6 cable and any renovation or reconfiguration of spaces shall be taken advantage of to replace any Cat5e with Cat6 cable. IDF closets should be constructed to serve areas of the buildings with proper ventilation power and cooling. This will phase out the individual cubicles currently mounted out in occupied spaces.



Image 11



Image 12



Image 13

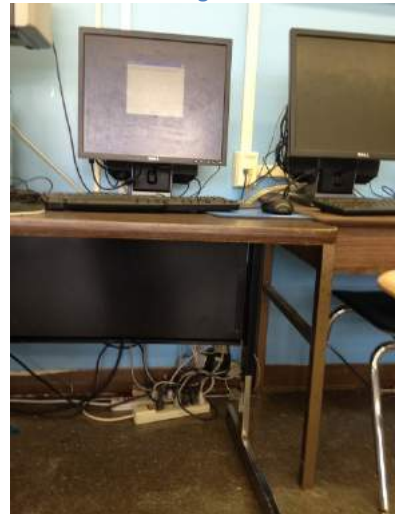


Image 14

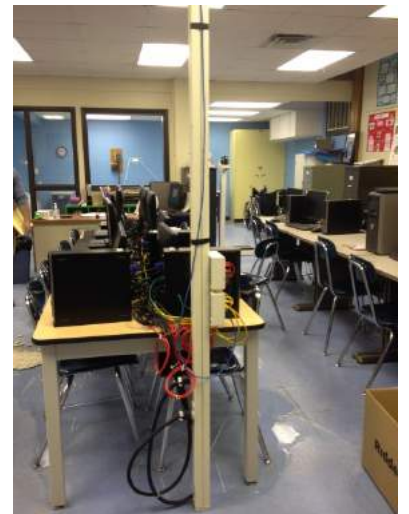


Image 15

EDUCATIONAL PROGRAM NARRATIVE

The following educational program communicates the current state of Northeast Metropolitan Technical High School's educational program and the vision for the future. During this study, the Project Team examined the program for a grade 9-12 regional Career Technical Education center. This section describes the District's position on key curriculum goals, objectives, policies, future course offerings, and expected educational activities for certain program areas.

Northeast Metro Tech administrators, educators, and stakeholders worked closely with Dore & Whittier Architects to define the educational program. The Project Team reviewed existing data including floor plans, enrollment information, past and current programmatic offerings, market trends, and emerging trends in career technical education. Key personnel offered insight into the culture of the school as well as the intended direction of the career technical curriculum, community use of the facility, and athletic opportunities. Additionally, key stakeholders attended two interactive workshops on June 4, 2015 and October 1, 2015 to discuss the future of Northeast Metro Tech. Participants included administrators, educators, business owners, public safety officials, building committee members, and former students. The first visioning session focused on the following major discussion topics:

- strengths, weaknesses, and opportunities of the existing facility
- future career technical program offerings under consideration
- key spatial adjacencies

The information gathered helped the Project Team generate a conceptual space summary, a document that lists each space and its corresponding square footage. It is then used as a tool to develop conceptual options for either a newly constructed or renovated facility that will uniquely serve the needs of the Northeast Metro Tech community.

The second visioning session incorporated the ideas heard in the first visioning session as well as information gathered to date. The second visioning session covered the following topics:

- Confirm educational program
- Confirm spatial adjacencies and functional relationships
- React to preliminary design options
- Explore spatial arrangements of a new or renovated facility in conjunction with building operation and site constraints

The Design team used the information from the second visioning session to further refine the conceptual options and pathways for building solutions moving forward. More information related to both visioning sessions is included in Section D-3 Educational Visioning.

Existing Educational Program

Northeast Metropolitan Regional Vocational High School serves 1,250 students across twelve (12) sending towns. Believing that all students are capable of learning, Northeast is committed to supplying a rigorous academic and career technical education to its students in an open, diverse, and supportive environment. The services provided by the integrated efforts of the sending communities, parents, administration, faculty, students and staff strive to meet all of the vocational, academic, physical, social, ethical, moral, and emotional needs of all students. When students graduate from Northeast, they earn both a Certificate of Vocational Proficiency and a High School Diploma.

Northeast Metro Tech School offers a comprehensive career, vocational, and technical education. Established in 1964, the regional school creates CTE opportunities for students that no single community would be able to fund independently. Although there have not been any major additions or renovations to the facility since opening, there have been several interior reconfigurations to accommodate educational program changes and needs.

At present, achieving the District's educational vision is impaired by facility and infrastructure constraints. Many academic and shop classrooms are undersized compared to MSBA and MGL Chapter 74 guidelines. See the plan diagrams in Section E-2 for a space needs analysis. Lack of handicap accessibility inhibits inclusion of students with disabilities and creates major obstacles for disabled students to participate in programmed activities on the basement level, rear part of the first level, and the second level of the building. Special education spaces are lacking in both number and position; they are for the most part concentrated in the southwest corner of the main level, rather than distributed per current best practice and MA DESE requirements. The gym is undersized for the school's population. The pool is in a state of disrepair and unusable, and outdoor space is limited, in poor condition, and/or unsafe for physical education.

The organization of the building also constrains the delivery of Northeast's educational vision. The geographic location of spaces within the building and relative to one another make collaborative teaching and learning activities difficult. As the programs offered at Northeast have changed over time, the current career technical shops are housed in rooms most appropriately sized for their function rather than location relative to other programs. Shops that have naturally synergistic curricula could benefit from being situated within career clusters to capitalize on elements of overlapping curriculum. Some academic classrooms are located in one wing of the building while science and any additional academic spaces are sprinkled throughout the building. The distance between classrooms hinders interdisciplinary coursework and collaboration among students and educators.

In contrast, the Northeast Metro Tech educators, administrators, faculty, and staff adapt to changes in education, employment trends and students' needs. This community successfully

adjusts their curriculum, delivery, and spaces to better serve the student population to the greatest extent possible within the existing facility.

Enrollment

Northeast Metro Tech currently enrolls 1,268 students from twelve sending towns.

CTE

Northeast Metro Tech offers seventeen career and technical education programs. Students progress from a basic understanding of their chosen concentration to apprentice level skills and beyond. These programs include:

- Automotive Repair
- Automotive Technology
- Business Technology
- Carpentry
- Computer Aided Drafting and Design
- Cosmetology
- Culinary Arts
- Dental Assisting
- Design and Visual Communications
- Early Childhood Education
- Electricity
- Graphic Communications
- Health Assisting
- HVAC/ Refrigeration
- Information Support Systems and Networking
- Metal Fabrication
- Plumbing & Pipefitting

As shown on the space needs diagram in Section E-2, many of the shop spaces and their related classrooms are undersized which leads to overcrowding situations. These programs include Cosmetology, Carpentry, Computer Technology, Dental Assisting, Drafting, Electrical, Auto Mechanics, and HVAC & Refrigeration. Some shops have adjacent related classrooms while others share classrooms where space is available. Storage spaces vary in size and many have been adapted and rebuilt by students and staff to better serve the program's needs.

The culinary program is located on the non-visible east side of the building, without an access point to an accessible entrance or the parking lot. Lacking any type of storefront presence, there is little visibility or awareness of the associated restaurant among the greater community. Additionally, accessibility issues and travel distance from the front door make it more difficult for senior citizens to dine at the restaurant.

Some programs are inhibited by their geographic location and accessibility within the building. Visual arts, graphic communications, and health assisting programs are housed on the lower level with very little access to natural daylight. There is also a severe indoor air quality problem in this program area, detailed in the facility assessment section of this report.

Exploratory

Prior to choosing a concentration, all grade nine students participate in an exploratory program. During the first fifteen shop weeks of the school year, students explore fourteen vocations as well as a STEM exploratory for one week. After the exploratory program, students choose their vocation of study. Grade nine students are placed in their permanent shop for the fourth quarter of the year.

Academic Core, Fine & Performing Arts, and Physical Education

The academic program runs parallel to the career technical offerings at Northeast Metro Tech. As established by the Massachusetts Department of Education, all students must meet the State requirement of the Massachusetts Comprehensive Assessment System (MCAS) testing to earn a diploma. Academic programs include English, Social Studies, Mathematics, Science, World Languages, and Physical Education. Honors classes are offered in all major academic program areas.

The building houses 29 instructional spaces, many of which are undersized in relation to MSBA guidelines. Undersized classrooms create an overcrowding situation. Eight spaces are dedicated to teaching science curriculum; however, the infrastructure is outdated. There is no auditorium or space available for dedicated art or music classrooms. Therefore, there are no programmatic offerings in the fine or performing arts. There are two teaching stations for physical education in the undersized gymnasium and a full-sized swimming pool that is no longer in use due to leaks and

structural damage. There are limited and undersized playfields that support the athletic program which includes the following teams:

Boys

- basketball
- baseball
- cross country
- football
- golf
- ice hockey
- lacrosse
- soccer
- swimming
- track and field

Girls

- basketball
- cheerleading
- cross country
- soccer
- softball
- swimming
- track and field
- volleyball

STEM Academy

Northeast Metro Tech introduced the STEM academy during the 2014-2015 school year. This program is available only to top-level seniors enrolled in any CTE program. STEM academy students incorporate this elective into their schedule during shop weeks. One day per shop week is dedicated to the STEM Academy where students participate in project-based learning to study science, technology, engineering, and math curricula.

Cooperative Education

Northeast sponsors cooperative education, which is a school-based and work-based program for qualified seniors and fourth-term juniors. Students continue to receive their academic training in the traditional classroom setting while spending their practical week employed by area businesses. Students perform work best suited to their qualifications while employers evaluate the students' progress according to their predetermined standards.

Cooperative education is a successful program in the minds of students, educators, and administrators alike. Included in the future of the educational vision for Northeast, the cooperative education program helps students make a smooth transition into the career path of their choice through practical experience and potential career opportunities.

Special Education

The special education department at Northeast provides educational support to students who cannot make effective progress in the regular academic program and are below grade level in academic subject areas as designated on an Individualized Education Program (IEP). Services are available to students on a referral basis in accordance with state and federal regulations. Students needing special education services are offered modified programs of instruction while being fully integrated within academic and CVTE programs.

Approximately 25% of the student population follows an IEP, but no substantially separate programs are offered. Dedicated special education spaces that provide support services are all located in one pair of suites in the south-west corner of the facility which presents two physical issues: all support spaces are in one location; and, that location is not central to the rest of the school. These conditions create significant obstacles for small group or individualized learning, and have a tendency to marginalize and possibly stigmatize this student population. Dispersed learning support spaces are needed throughout the school to effect a fully integrated special education model. There are no spaces for physical or occupational therapy, speech therapy, social/ emotional learning, conferencing, or intake meetings.

Schedule

Northeast uses a rotating week on/week off schedule where students alternate between taking academic classes and career technical classes. During week "A" grades 10 and 12 participate in CTE programming while grades 9 and 11 take academic classes. Students alternate CTE and academic programming during week "B". For the first three quarters of the year, students in grade 9 participate in exploratory during week B.

Students who are scheduled for the "shop" week are in shop class for the entire school day, occupying shop space and their related classrooms as dictated by the curriculum and the instructor. Students in academic classes experience a daily schedule with five blocks and one homeroom per day.

Adult Education/ Community Use

The Northeast Community Education and Training program provides opportunities for adults in the community to benefit from the use of the facility's specialized learning environments. As part of the school's mission statement, Northeast offers affordable lifelong learning opportunities in specialized career and technical programs to help position working adults for success in an evolving workplace. The school offers vocational, academic, summer programs, and extra-curricular activities that include coursework in the following:

- apprentice programs
- computer courses
- enrichment courses
- health & fitness courses
- language courses
- MA mandatory continuing education
- medical courses
- trade preparation

Northeast also provides licensing programs that prepare students to sit for state required testing in numerous certification and licensure fields as well as continuing education training for licensed professionals. Certification and license preparation areas include:

- Auto Damage Appraisal
- AWS D1.1 Welding Verification Preparation
- 10-OSHA General Industry Health and Safety Training
- 10-OSHA Construction Health and Safety Training
- Carpentry
- Construction Supervisor License
- Electrical
- Plumbing

Adult education programs and re-certifications are generally quite popular and well-attended. The school building is nearly as busy in the evening hours as it is during the school day.

Future Educational Program

A challenge exists when documenting the future educational program for any building expected to last fifty years and beyond. It is very difficult to predict the educational needs of a school beyond five to ten years. New research will emerge related to teaching and learning. Technology will continue to evolve and have an impact on means and methods. Similarly, the nature of the world economy is changing so rapidly that predicting the future of career and technical education is potentially more difficult than anticipating academic educational needs. With that understanding, the description of the future educational program provided in this sub-section is positioned as the vision of the near future for the life of any new or renovated building. For this reason, flexibility of space use should be considered and prioritized during the conceptual development of options.

Enrollment

Looking to the future, Northeast hopes to increase enrollment by nearly 100 students per grade level. Each year, Northeast receives approximately 150 additional applicants who are turned away

because the current facility cannot accommodate a larger population. This year alone there were 700 applicants for only 330 seats in the freshman class. For the purposes of this study, the District asked the Design Team to study an enrollment of 1600 students. More information is provided in Section D-2 Enrollment projections.

CTE

The future of CTE is constantly evolving. Through cooperative education and work study programs, Northeast Metro Tech has cultivated meaningful relationships between educators and local business and industry stakeholders. These relationships help inform career-related programs of study that will be relevant in the ever-changing workplace. Future program offerings are shaped by labor-market demand, student interest, and the capabilities of the facility.

During a visioning session, community members, industry stakeholders, administrators, and educators created a list of CTE programs that could be the future of Northeast Metro Tech. Stakeholders agreed that sixteen programs currently being offered are still valuable to the educational program and should continue to be offered at Northeast. Information Support Services and Networking is currently being phased out. Stakeholders also expressed interest in the following technical education categories which are currently not offered:

- Biotechnology
- Engineering Technology
- Robotics and Automation Technology
- Building and Property Maintenance
- Masonry and Tile Setting
- Environmental Science and Technology
- Horticulture
- Transportation
- Distribution
- Medical Assisting
- Medical Laboratory
- Operating Room Technology

Using this information, the leadership team at Northeast reviewed and refined the list of prospective additional programs to be offered. Should the facility expand, the team established that the school could support 20 CTE programs should enrollment increase to 1600 students. The increased enrollment number was based on current and historical enrollment data as well as the volume of applicants not able to be accepted to Northeast. Using local labor studies as well as CTE student enrollment, the leadership team established 20 CTE programs and the projected number of students per shop. Fifteen of the proposed shops are currently offered at Northeast and five programs would be in addition to the existing educational program. The following list and associated enrollment reflects the desires of the District:

Program Title	Number of Students
Plumbing	40
Metal Fabrication	40
HVAC	40
Health Assisting	50
Electrical	50
Drafting and Design	50
Design and Visual Communication	40
Dental Assisting	40
Culinary	40
Cosmetology	40
Child Care	36
Carpentry	40
Auto Tech	40
Auto Body	40
Business Technology	40
Medical Lab Technology	40
STEM Laboratory	40
Alternative Energy	30
Advanced Machining	30
Engineering Technology	30

In addition to shifting trends in CTE programming, alternate planning models could help shape the future of Northeast Metro Tech. Occupational clusters, a planning model whereby vocational shops or labs of allied subject matter are co-located, allow opportunities for interdisciplinary learning to occur within the same general subject area. Career Cluster models are used as an organizational tool for curriculum design and instruction and can also be applied to facility planning. Organizing vocational programs into integrated learning groups could support the logical adjacencies that enhance the learning experience for students in different but related career programs. For example, dental assisting, health assisting, biotechnology, and medical laboratory programs share common curriculum elements and if the respected shops could be located adjacent to one another with shared common space, students in could benefit from shared information, guest speakers and presenters, and integrated project delivery. It also provides opportunities to locate semi-related clusters adjacent to one another to take advantage of opportunities for cross-cluster integrated learning.

Academic Core

The academic program at Northeast Metro Tech largely relates to the State of Massachusetts standards as established by the MA Department of Education. Due to scheduling constraints for students, there are few opportunities or perceived need to change the general structure of the academic program at Northeast. The vision is to maintain major curricula in English, math, social studies, world language, and physical education.

STEM

The STEM program at Northeast is young and growing. Currently, enrollment in the STEM academy is only available to seniors, but if given the opportunity will expand to become a full immersion pre-engineering CTE program offered to all students. Although the vision is still evolving, educators, administrators, and community members alike envision the STEM program evolving into a vigorous career education program that integrates academic curriculum. This program would combine cutting edge technology with project-based learning to help students design, prototype, and manufacture products.

Community Use

The Northeast Metro Tech facility is considered a great asset to the community. The spaces and equipment used to provide a robust CTE experience also provide opportunities for community education, training, practical experience, and access to goods and services that would not otherwise exist.

One challenge that the existing facility faces is its lack of visibility to the greater community. The site only has one access point, and is located off the beaten path at the end of a cul-de-sac on Hemlock Road, behind the Wakefield Memorial High School. There is a building sign announcing Northeast's presence, next to the Wakefield High School baseball field at the end of Hemlock Road, but it gets visually lost in the clutter of that very busy intersection. Without a storefront that engages the surrounding neighborhoods, career technical programs offering goods and services have to overcome a general lack of awareness among potential patrons in the community. Additionally, the restaurant that is operated by the school's culinary program is located effectively in the rear of the building, putting it further 'out of sight, out of mind' of potential customers.

Physical Education

The physical education program could benefit from regulation-sized athletic fields and a track. The overall dilapidated condition of fields and equipment is demoralizing for students and PE instructors who want the best for their classes. The District has explored sharing fields with the neighboring Wakefield Memorial High School. However, this is not an option due to scheduling.

Performing Arts

The current facility does not have an auditorium which has limited potential performing arts electives and afterschool groups. Additionally, the cafeteria serves as the only assembly space and can be inaccessible due to scheduling constraints. The vision for the future of Northeast Metro Tech includes a theater space for performing arts, musical performance, and large assembly space. It would be an understatement to note that the theater arts would be a great opportunity to integrate multiple vocational and academic programs, such as language arts, drama production, accounting, visual art, music, carpentry, electrical, lighting design, audio engineering, videography, etc. It is a “made-to-order” cross-disciplinary project.

Space Summary

At present, Northeast Metro Tech is approximately 240,000 GSF. Based on the educational vision of the District, the facility is undersized with its current enrollment and even more so should enrollment increase to 1600 students. This study yields a projected estimated space need of 379,000 GSF. This study examines general space needs for the desired educational program and projects future needs based on state-established guidelines and regulations. Career technical shops and related classrooms compare to the Massachusetts Department of Elementary and Secondary Education Chapter 74 minimum square foot regulations while the Massachusetts School Building Authority's guidelines inform all other spaces.

For a traditional academic high school with equal enrollment, the MSBA recommends 55 academic classrooms sized between 825-950 NSF. Because only half of Northeast Metro Tech's student population participates in academics during an A or B week, any future facility would need 28 classrooms to align with state guidelines. For this study, the District chose to include 30 classrooms sized at 850 sf to support their educational program. The current facility has 23 classrooms, of which, many are undersized. Similarly, Northeast requires half of the recommended science labs. Many of the science labs at northeast are nearly 600 NSF below recommended guidelines and have outdated infrastructure. At present, the school does not have teacher planning spaces or small group seminar rooms which limit the extent of collaboration possible during the school day. Based on conversations with leadership and administration, five teacher planning rooms at 700 NSF and eight 125 NSF small group seminar rooms would support the educational program. The facility would need to grow nearly 20,000 NSF of academic space alone to support the academic program envisioned for Northeast Metro Tech.

Nearly a quarter of Northeast's student body receives special education services in deficient space. Any future facility should provide spaces for break-out services provided in small groups and spaces for one-on-one instruction, testing, conferencing, and IEP in-take meetings. A need exists for both occupational and physical therapy spaces. An additional 1,250 NSF is needed to satisfy the needs of students receiving special education services.

Supplemental program areas are also undersized or non-existent. There are no spaces for art or music. However, the District does not intend to incorporate these programs into a new or renovated facility because of the difficulty that students face in trying to incorporate electives into their schedule above and beyond the state required coursework. The facility's gym, locker rooms, and auxiliary PE spaces are all undersized. No auditorium or performing arts space exists. The media center is undersized relative to the population. To right-size these program areas in accordance with MSBA guidelines would require an additional 18,000 NSF.

The vocational program has the greatest space needs. Northeast currently offers 17 CTE programs within approximately 94,800 NSF. For this study, the existing shop spaces and future programs are compared against the Massachusetts DESE Ch. 74 minimum square footage recommendations. Based on projected shop enrollment, creating the space for additional programs and right-sizing each shop and related classroom would require an additional 35,500 NSF of space.

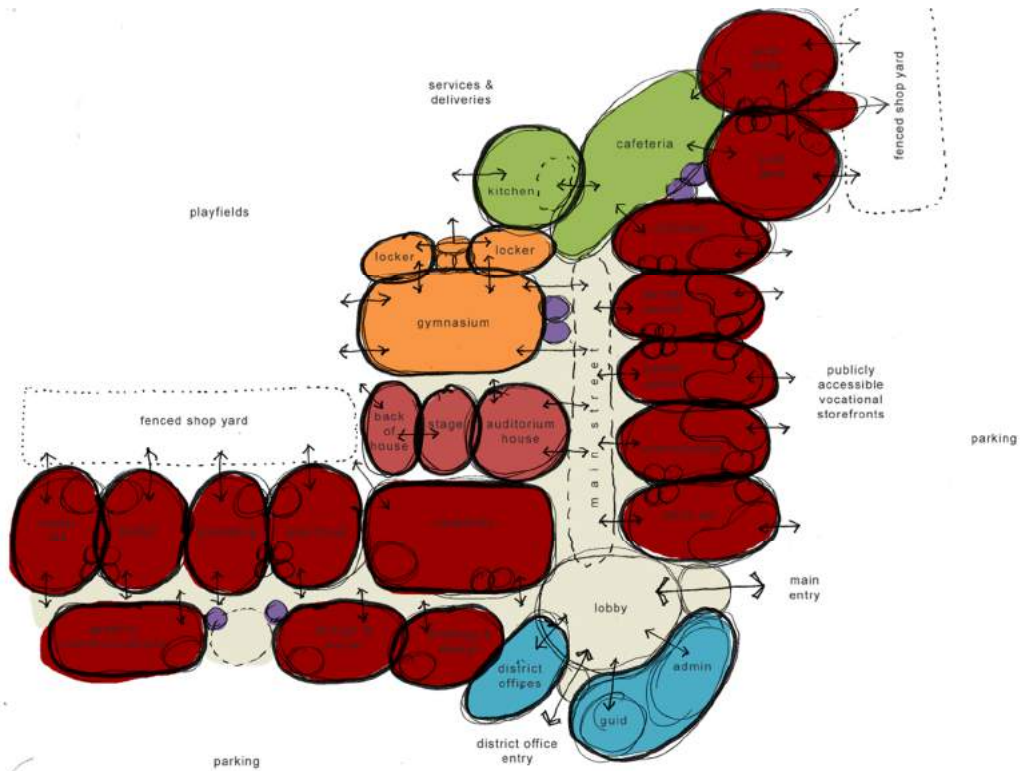
Each year, more students apply to Northeast Metro Tech than the facility is able to accommodate. School administration denied nearly 250 applicants for the 2014-2015 school year. This suggests that the District could potentially enroll more students and offer more career technical opportunities if the facility were larger. Many other factors affect enrollment and would need to be studied further. As a result of the visioning sessions and many conversations with school leadership, the future of Northeast Metro Tech would like to include 20 CTE programs. Please refer to the educational program section for a list of future programs. The study enrollment per program is based on current student enrollment less estimated enrollment for new programs.

At a minimum, the facility would need to be 140,500 NSF larger, totaling approximately 379,000 gross square feet, to support all of the academic and career technical programs under consideration as listed earlier in this report.

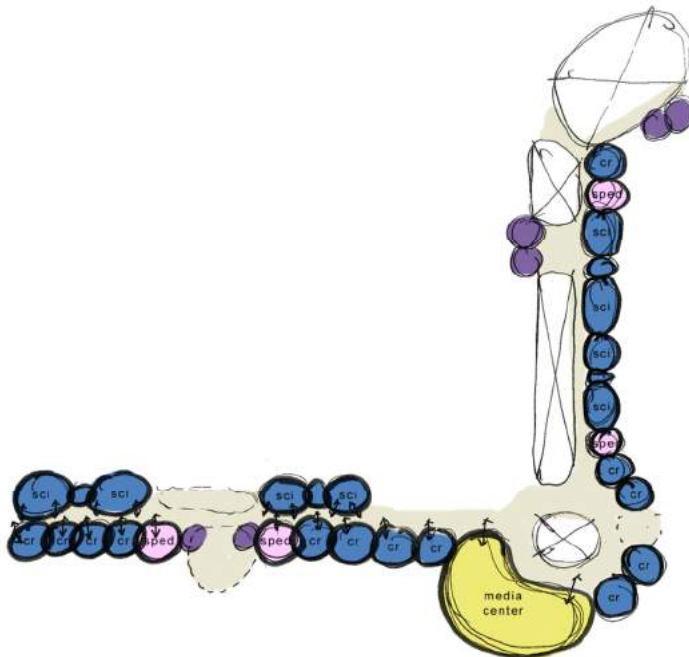
Key Spatial Adjacencies

The organization of a building greatly influences how the facility is able to function. Currently, the layout of Northeast Metro Tech adds some challenges to delivering the educational program desired by the District. Reorganization of certain spaces could help improve security, enable planning for career clusters, and augment the success of retail functions of shops.

From a safety and security standpoint, the District has expressed an interest in organizing the building into public and private zones. Because the building is a community asset as well as a school, there are spaces that should ideally be easily accessible to the public without jeopardizing the safety and security of students. The diagrams below show some of the spatial relationships suggested by the District to help support their educational mission.



Spatial Relationships Diagram - Level One



Spatial Relationships Diagram - Level Two

Within the public zone, design options should express the following:

- Administration suite
- Nurse's suite
- Special Education Office
- Vocational coordination office
- Career technical programs that offer retail functions
 - cosmetology
 - health clinic
 - dental clinic
 - Culinary
 - Early childhood education
 - Auto body
 - Auto tech
- Adult education administration and offices
- School Store
- Gymnasium
- Cafeteria
- Media Center

Within the private zone, design options should express the following:

- Superintendent and District offices
- School committee
- Academic classrooms
- Career technical programs not requiring retail space

Within the private zone, the District expressed the desire to keep academic classrooms in one zone and career technical classrooms in a separate and distinct zone. They also expressed the desire to organize shop classrooms in career clusters. Career clustering between technical programs that are related to each other could enhance the learning experience of students across occupational training programs. The physical orientation of teaching spaces emphasizes the collaborative approach to instruction in CTE and could enhance students' 21st century learning skills through a collaborative framework for instructional delivery.

ENROLLMENT PROJECTIONS

Northeast Metro Tech (NEMT), as a regional vocational education institution, does not make enrollment projections in the classic sense that other school districts do. NEMT is a selective institution with an application process and selection criteria, and not all applicants are accepted; thus there is a documented application backlog that is a reliable statistic that can indicate potential for future growth. Enrollment in most shop-based programs is capped by the number of students that can safely participate in the program. Other programs are capped by the practical limits of instruction: the student/instructor ratio, physical constraints of the instructional space, or other practical limits.

In general, NEMT relies upon the following empirical data to chart and plan its growth:

- Current and past enrollments: school total, and per program
- Trend line plot: school total, and per program
- Numbers of Applications
- Number of Acceptances (which is typically the number of “seats” - capped at 1250 per year)
- Application backlog: school total, and per program
- Program post-graduation outplacement rate

In addition to this empirical data, the school administration also relies upon the input and counsel of its Community Advisory Committees (there are Advisory Committees for each vocational program as well as an overall School Advisory Committee). These committees are made up of community members who are business and industry leaders from the twelve sending towns who advise the Superintendent and core administrative team on such items as career/employment trends, workforce needs, placement opportunities, skill set requirements, program content, technical advice, and other educational and operational factors. The Community Advisory Committees make enrollment recommendations on which programs should be grown, which remain steady but still relevant, which are waning in their economic importance, and perhaps most importantly, which emerging fields will require workforce development looking into the future.

In addition to the Community Advisory Committees, the NEMT Vocational District School Committee also provides oversight and guidance on matters that directly bear on enrollment maintenance and distribution over the 16 programs at NEMT.

Current Situation

Currently Northeast Metro Tech enjoys a solid reputation as a viable choice for high school students interested in a comprehensive technical education, which can lead to a potentially remunerative and satisfying career. The school has a current grade 9-12 enrollment of 1267 students. There are 325-330 places—or “seats”—at the school per grade level, and an average of 650 Freshman class applications are received annually, making an annual waiting list or backlog of roughly 320 students, or almost double the number of places in the class. This situation of a surplus of applicants has existed consistently for at

least eight years. There is a chronic shortage of classroom space for academic subjects and educational support services that has existed for at least five years in the school. Please refer to Appendix H-1 for a more detailed breakdown by sending town of enrollment trends at the school for Classes of 2012 - 2019.

Enrollment Looking Ahead

In the future, NEMT is optimistic and confident about its ability to maintain its strong market position in the realm of school choices in the North Shore region. Several factors contribute to this outlook:

- strong application rates year upon year
- strong demand for qualified graduates and high outplacement rates in most programs/fields the school offers
- continued information from community advisory committee members and the regional business community that demand remains high for certain programs
- NEMT's accreditation reports which, aside from facilities demerits, have very strong ratings for programs and instructors.

Additionally, over the last 18 months the administrative team has taken a hard look at the current CTE program offerings, and—again with input from its advisory groups—has made the decision to make some fundamental changes in program offerings going forward. These changes are detailed in Section D-1 – Educational Program. Such an action of continuing successful programs, adding some relevant new programs, and discontinuing programs where interest and/or relevance is on the wane, only strengthens the school's position in the school choice "market" going forward.

These factors have caused the administrative team to realize that the time is now to take advantage of a major renovation or new building project to simultaneously increase its capacity to handle its consistent backlog of student applications and to tune its facilities to handle the changes in programming. Therefore, the administration is moving forward under this study with the goal of expanding its enrollment to 1600 students.

It should be mentioned that there is a possibility in the near future that a thirteenth town, Everett, might join the Northeast Regional Vocational School District. While this possible increase in the student application pool would add even more credence to the notion that there is untapped potential in NEMT's enrollment, the administration feels that even if this change were not to come about, the enrollment target of 1600 is still a very responsible, reasonable number given current demand.

EDUCATIONAL VISIONING AND OUTCOMES

Dore & Whittier (D&W) and the Northeast Metro Technical High School (NEMT) community engaged in educational visioning to help gain an understanding of the educational future of NEMT. The purpose of this process was to arrive at and record a comprehensive, long-term planning tool for the school that considers and acknowledges the factors contributing to career technical education (CTE). The meetings established clear statements about the most appropriate educational practices, school organizational structure, and concepts that address how a school facility can support educational best practices at NEMT.

Career technical education is heavily dependent on educational research, trends in the economy, market conditions, changes in the workplace, innovations in educational delivery, and national trends. D&W facilitated interactive sessions that invited participants to discuss many of these topics from a variety of different angles to build a general consensus. Participants examined career and technical trends and determined which program elements and delivery models were applicable to NEMT. Topics discussed and conclusions drawn during visioning became the basis of a road map to bring NEMT into the future. Participants shared insights and ideas that helped guide the Design Team through developing options for a new or renovated facility that could effectively deliver the programs and style of education envisioned at NEMT for the next 40-50 years.

Through the course of this study, D&W held two, four-hour visioning sessions. The District invited school administrators, educators, school and building committee members, former students, local public safety officials, and business owners in the community. Each session included between 25-30 participants. Visioning sessions were held in the school library from 10AM-2PM on the following dates:

Visioning #1: June 4, 2015

Visioning #2: October 1, 2015

The visioning process helped define a common vision to bring about positive change at NEMT. Key takeaways realized during the visioning sessions belonged to the community of stakeholders rather than one individual. Furthermore, stakeholders were not bound by the current programmatic offerings or education delivery models and were encouraged to think in terms of “blue sky” future at NEMT. Participants were invited to think ideally in order to establish wants and needs and general priorities. The following educational vision reflects the work of the visioning team.

Visioning #1

The first visioning session began the dialog with stakeholders about the possibilities of CTE at NEMT and how elements of a facility could positively impact education. The group discussed shifts in CTE education that are occurring at a national, regional, and local level. Approximately 30 school administrators, educators, business leaders, and active community members worked together in a four-hour workshop to explore the opportunities and challenges at NEMT, the future of CTE education, and the key spatial relationships which help support educational delivery.

The Design Team began the session with an overview of the pre-feasibility study process. D&W briefly presented the study process and its expected outcomes. The study will generate an understanding of the deficiencies and opportunities within the current facility, will develop conceptual building options for moving forward, and will prepare the District to write a Statement of Interest to the MSBA. The visioning sessions helped inform each part of this process.

Next, stakeholders divided into small groups of seven to eight people to identify elements of the school that works well and what could be improved. Participants were given fifteen minutes and asked to discuss macro-level qualities of NEMT related to programs, curricula, facilities, adult education programs, parking, playfields, public/ private partnerships, funding mechanisms, staffing, etc. Groups reported the following:

Works	Could be Improved
<u>Group 1</u>	
- School's ability to adapt to ever changing student and employment trends - Pool was a community asset (no longer in operation) - School is a community asset - Adult education	- Flexibility and mobility of space - Geographic location of spaces within the building and relative to one another (for example: no opportunity for career clusters, an academic core, etc.) - No auditorium - STEM instruction - Community access to "public" programs, i.e. culinary arts & early childhood education - Shared parking for Breakheart and NEMT - Gym is small with no seating - Gym facilities – i.e. weight training - Track - Handicap accessibility - Need a variety of sizes for instructional space

Group 2

• Website and newspaper • Recruiting video • Vocational co-op and externships • Solid fundamentals of programs • Café • Academics – people and programs	• Community outreach/ communication, ie signage and showcasing • More technology and dedicated physical space would enhance and advance offerings • Public access and visibility to drive awareness • Café – better flow and greater capacity, more storage • Facilities – desire to go to more efficient gas system & separate facility for maintenance • Academics – flow /room sizes/ ergonomics • No Auditorium – auditorium that is multiuse and able to be partitioned; desire to accommodate graduation • Shops – space, outdated infrastructure, utilities, HVAC • Integration between classrooms and shops with technology • Vehicle circulation too constrained to accommodate bus, deliveries, and visitors • No track, baseball field. Desire for pool in separate facility
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Group 3

• Security – cameras, instant name tags/ IDs • Fire alarm system • School adaptable to new trends • Café/ Breakheart Inn • Student store/ marketing monitored by camera • Website	• Security – enter directly into building, door and gate access, shop entries • Technology – wifi, internet connections throughout school • Auditorium – ability to fit entire school • Phys. Ed./ sports – gym is too small, athletic fields are in poor condition & inaccessible • Handicap accessibility • Need for science labs and classrooms for forensic science • Advanced technology • Area/ size of shop for number of students • Restroom access within shops • Courtyards are oversized and underused • Shop/ academic adjacencies • Privacy in guidance and nurse’s offices • Insufficient parking • Access road – waterline, traffic, abutter, current road belongs to Breakheart Reservation • Inadequate office space – location and size
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For the next activity, D&W invited participants to share what programs and services might be desired in the future. In a large group, participants listed all of the CTE and academic programs that may want to be added to the list of programs offered as well as current programs to remain. The list included:

New CTE

- Bio-tech services
- Masonry
- Horticulture
- Facilities/ maintenance
- Transportation/ distribution
- Stationary engineering
- STEM
- Pre-engineering
- Robotics
- Medical Assisting
- Dental lab fabrication

Existing CTE to Remain

- Dental
- Auto body
- Auto tech
- Carpentry
- Cosmetology
- Culinary
- Drafting and design
- Early childhood education
- Electrical
- Health assisting
- HVAC
- Metal fabrication
- Business technology
- Plumbing

Academic

- Math
- English
- Foreign language
- Social studies
- Science
- Physical education

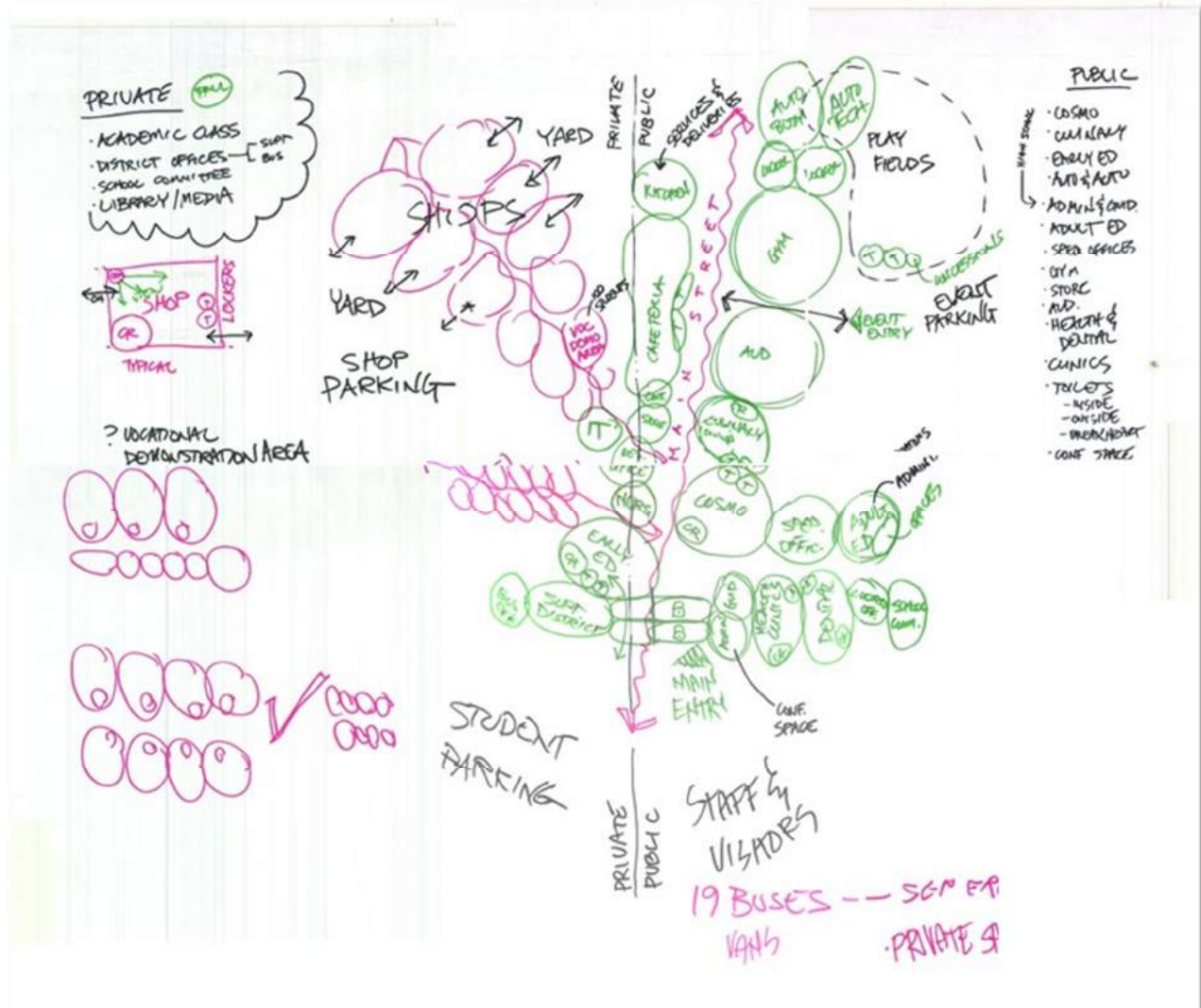
Special Education

- Speech & language
- Occupational therapy
- Social/ emotional
- Counseling

Athletics

- Full-sized play fields for soccer, lacrosse, & football
- Sanctioned competition-sized track
- Field lighting
- Practice field
- Seating for sporting events for entire school

Lastly, in a facilitated activity the group created an overall building diagram that expressed ideal functional relationships. The diagram described general building organization and key relationships between major educational functions, public and private zones, and key programmatic adjacencies. Refer to the diagram below.



While discussing building diagramming, key ideas related to building organization surfaced:

- The building should be divided into public and private zones so that a portion of the building can serve as a community asset while maintaining safety and privacy throughout the rest of the building meant to exclusively serve the NEMT community.
 - Public zone: cafeteria, auditorium, gymnasium, school store, conference space. Most shops would be in the public zone. Auto tech and auto body should be in the rear of the building, accessible to a drive and overhead door.
 - Private zone: academic classrooms, library/ media, district and school committee offices

- Academic classrooms should be clustered together and separate from vocational shops
- The main entrance should have at least two locked doors and a vestibule adjacent to administration and guidance where visitors can be let into the building only after being properly identified and checked-in.
- A typical shop should have lockers outside the entry, toilets just inside the entry, a classroom, and an office with view of the shop floor
- A demonstration area that could accommodate 100 students is desired in the shop-area of the building
- Cosmetology, health clinic, dental clinic, early childhood development, and Breakheart Inn should have separate entrances that are accessible to the public.
- Play fields and concessions should be next to gymnasium, dedicated toilet rooms, and separate, event entry and parking.
- Parking should be separate for events, students, staff, and visitors

Through the first visioning session key concepts began to emerge. Participants expressed a desire to expand CTE programmatic offerings and the ability to serve more students. Currently, the enrollment and the number of shops that the school is able to offer is bound by the size of the facility. A new or renovated facility could mean a different student enrollment target and a different amount of available CTE courses. Additionally, program organization is important to the functionality of NEMT. On a macro level, the visioning group expressed a desire to keep academics and CTE programs separate and to explore career clusters for compatible CTE programs.

Visioning #2

The second visioning session drilled deeper into concepts discussed in the first visioning session. Visioning #2 combined the ideas from the first session and the realities of the existing site. Participants explored and truth-tested the viability of conceptual options and construction of a new or renovated facility in conjunction with the constraints of the existing topography, utilities and infrastructure, and ongoing school operations.

The Design Team began the meeting with a review of the findings from Visioning #1 and study progress to date. Prior to the second visioning session D&W prepared an initial space summary. This document was generated from the discussions of the first visioning session, follow-up meetings with NEMT leadership group, Chapter 74 guidelines, and MSBA guidelines. D&W presented and reviewed the space summary with those in attendance.

From the space summary document D&W crafted conceptual design options. D&W presented conceptual options on the NEMT site. The building organization responded to the results of the previous visioning session and site constraints. The Design Team presented two options: a phased, three-story, new construction, “triangle” scheme that builds on the existing fields and the western third of the existing school building, and a second phased, new-construction option that builds into the hillside. The idea of creating a new vehicular entrance road over the wooded portion of the site was also discussed.

Next the Design Team invited participants to share their opinion of the pros and cons of presented options. The visioning group generated the following list:

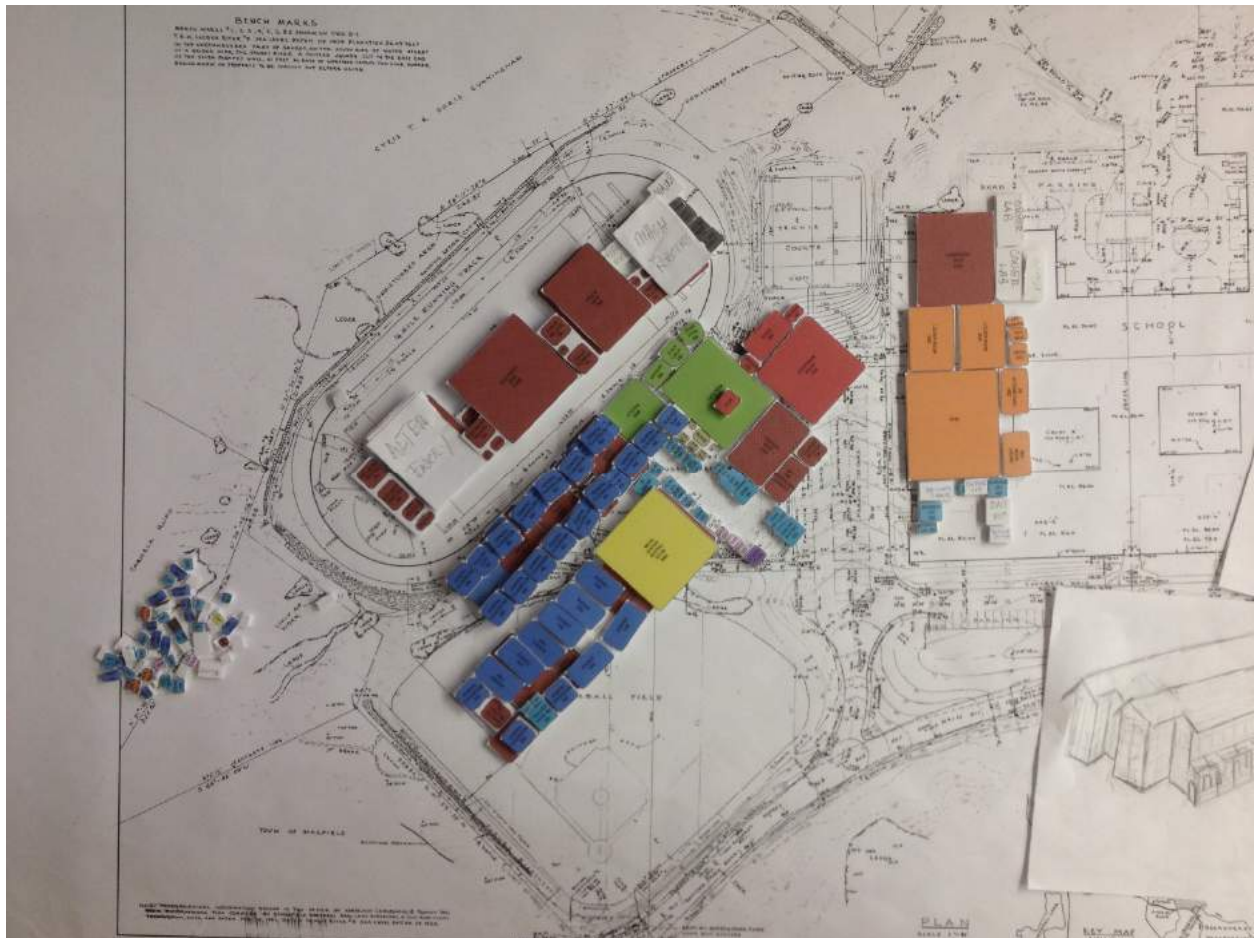
Pro	Con
• Compact Design • Security – differentiated public and private zones (triangle scheme) • Multi-purpose field • No pool • Phased construction that allows the current building to remain operable • Building on the hill could allow fields to be built on the previously developed land after the current building is demolished • Opportunities for green energy • Ability to use the building as a teaching tool	• Excessive travel distance for students • Inability to close portions of the school during events (stepped hillside scheme) • The placement of the adult-education classrooms in the public zone may not work over time. Adult-education offerings change overtime and may end up being in the private zone • No pool • Bringing traffic, water, and utilities off of Main St. is problematic

Following the group discussion, attendees were invited to create their own option diagrams. Participants broke up into small groups of four to five people. There were five groups in total. Each group was given a site plan and scaled puzzle pieces of each programmed space listed in the space summary. Groups were invited to arrange the program pieces on site to most fully comply with the vision for NEMT. Three groups explored new construction or renovation on the current site, one examined a renovation option, and the fifth group explored building on the hill, south of the existing site. Participants were asked to consider:

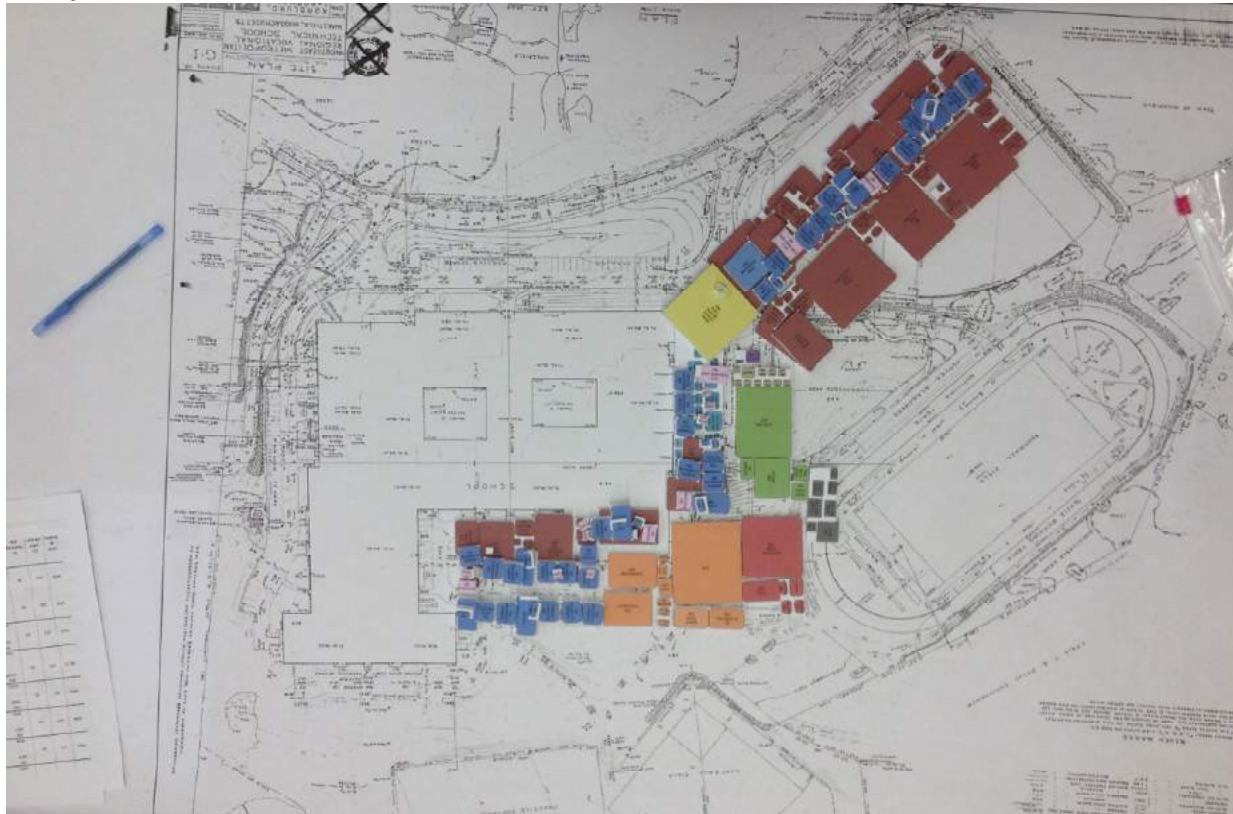
- How does the concept fit on the site?
- What functions go on the ground level?
- What functions can be on the upper levels?
- What functions need access to the public?
- How do major portions of the project relate to one another?

The groups generated the following diagrams:

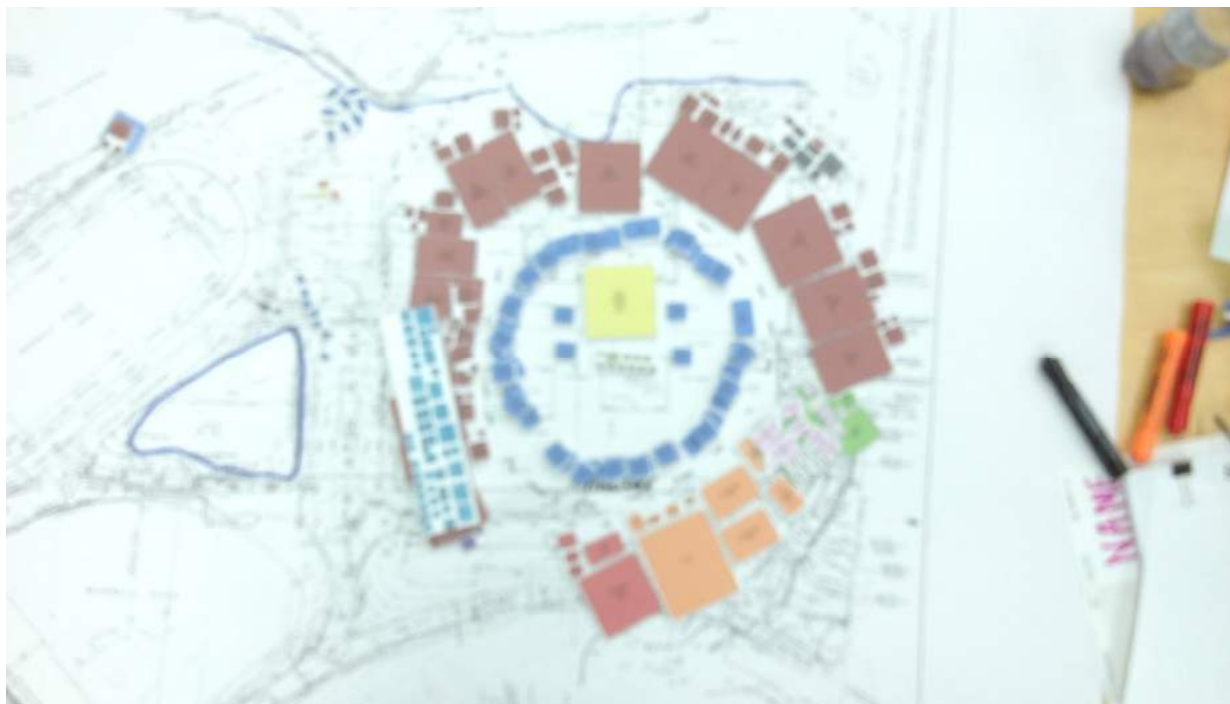
Group 1 – New Construction or Renovation



Group 2 – New Construction or Renovation



Group 3 – New Construction or Renovation



Group 4 – Renovation



Group 5 – Building on the Hill



The participants generally agreed that the exercise gave them a new-found appreciation for how the components of a new school might be assembled. There were many similarities among the different groups' design options and some key concepts are listed below:

- Each group made a multi-story option
- Each group gave dental assisting, health assisting, cosmetology, early childhood education, and culinary arts a storefront presence and access to the public
- Each group located auto body and auto tech at the rear of the building, reached by an access road
- Academic classrooms were largely grouped together on the second level. Related classrooms were paired with their shop.

Conclusions

The visioning exercises were successful in collecting together key concepts in an organized fashion that the building stakeholders wish to include in the design of a new facility. These concepts are enumerated and summarized above. The overarching conclusion is that some major decisions about school operations are made based on the capacity and constraints of the building, and how it occupies the site. Given a new or renovated facility, there is interest in expanding student enrollment and adding CTE programs to the current program offerings.

The development of ideas was consistent and harmonious. The creation, exploration, and documentation of ideas followed a thoughtful, orderly, and sensible process. Participants were able to effectively communicate their priorities and goals for a new facility and develop outcomes of their process that showed consistency and clarity throughout.

In terms of the process of designing options for a renovated or new facility, the visioning results indicated several key “take-away” concepts:

- Site topography is extremely challenging – true buildable space on this site is quite limited
- That said, viable construction options are possible which – for the most part – would not disrupt ongoing operation of the existing school
- Building the school on the southern, undeveloped hillside portion of the property will probably not be financially or functionally viable, mainly due to steep topography and difficult site/program fit
- A second vehicular entrance to the site using the southern portion of the parcel is apparently feasible, and warrants cost estimating and further study
- The renovation/addition option will be challenging due to the particular needs of vocational shops, and the difficulty with temporarily relocating them.
 - new space must be provided for shops to move into;
 - or a segmented, multi-phased approach will be necessary

SPACE USE AND RECOMMENDATIONS

Part of the scope of work at Northeast Metro Tech (NEMT) was to survey the size and number of program spaces in the existing building, and compare that data to MSBA and Chapter 74 space standards and guidelines. MSBA standards are used for academic and educational support spaces, and Chapter 74 standards are used for career vocational and technical education spaces. Using information provided by the school in the form of record drawings, as well as field-verifying certain conditions that deviated from those drawings, we generated a reasonably accurate set of floor plans of the school that reflect existing conditions.

We then used the MSBA Space Summary template (Excel spreadsheet) to enter the names, functions, and area in square feet of each program space in the building, and these spaces are totaled up to give the Net Floor Area in square feet. Consistent with MSBA space-counting methods, service-type and support spaces such as custodial, storage, and circulation spaces are not specifically counted, but are calculated as part of the Gross Floor Area of the building.

The next step was to compare the sizes of the existing program spaces to the space standards mentioned above. We employ a color-coded graphic indicator on the floor plans which gives the Owner an at-a-glance view of where the building stands, using a “traffic light” metaphor: spaces that are undersized by more than 10% are colored red on the plan; spaces that are within plus or minus 10% of the standard are colored yellow to indicate they are nearly correct; and spaces that are oversized by greater than 10% above the standard are colored green. This graphic mapping can indicate trends in what types of spaces are over, under, or OK; or locations or concentrations of over or under which can correspond with the age of that part of the building, type of space, or other indicators.

General Conclusions

Referring to the Space Needs Summary plans on the following pages of this report (Section E-2), one can see a predominance of red color-code on many educational spaces—shops and classrooms—that are clearly below the reference standards. On the main level of the school, the entire front row of Special Education, Cosmetology, Dental Assisting, Office Technology Computer Labs, as well as the Drafting, Design, Electrical, HVAC, Carpentry (temporary quarters), Auto Mechanics, and IS Support Services programs are all below standard. On the lower level, the Commercial Design shop and Nursing suite of rooms are below standard.

One place where this plan graphic information has to be combined with some practical information gleaned from our staff interviews is in the academic classrooms. The plan shows most academic classrooms as yellow (within +/- 10% of standards); however our observation and administration reports have indicated that there is a shortage of rooms in which to teach fully-enrolled academic class sections. Thus enrollment in many of these classrooms is too high for the size of the room, resulting in over-crowded conditions: too much furniture, too many people crammed into a room,

difficulties teaching, environmental problems, and the potential safety issue of no clear path for egress. Also not shown on our building plan is a block of four temporary modular classrooms at the rear of the facility (all of which would be coded red) that were intended to handle an enrollment “bubble” several years ago, that has not gone away. Administration leaders report these classrooms are nearly fully utilized the entire school day.

It is interesting to note that there are only three programs coded as oversized: the Graphics Shop, which includes a Desktop Publishing shop, Pre-Press work room, several support spaces, and a related classroom; the Child Care Center; and the newly fire-repaired Carpentry shop. By the same token, there are only four programs coded yellow: Auto Body, Plumbing, Metal Fabrication, and Culinary Arts. In summary, it is fair to say that such a small number of adequately-sized program spaces indicates an overall deficiency of the building to serve its intended purpose.

Other non-academic support functions do not follow any particular trend, but are somewhat typical in their space allocation for buildings of this type and era. Athletic facilities are coded undersized; the ‘Cafetorium’ is coded oversized but is fully utilized given the existing lunch schedule in the building (however, the adjacent Stage is undersized and there is no proper Auditorium); the administrative suite is a patchwork of all three colors; and as is typical of 1960’s buildings, custodial support spaces are coded oversized when compared to MSBA standards of today.

Programming and the Proposed Space Summary

Our next step in the methodology was to determine with the administrative team what the proposed enrollment and program changes would be in the school going forward, and assign proposed new space numbers and sizes for those programs, again based on MSBA and Chapter 74 recommendations and requirements (see discussion in Section D-2). As stated previously, the enrollment was proposed to increase from 1250 to 1600, and the number of CVTE programs was increased from sixteen (16) to twenty (20), with some less economically relevant programs projected to be discontinued, and more relevant programs to be initiated in their place. The proposed program offerings are listed in Section D-1 – Education Program.

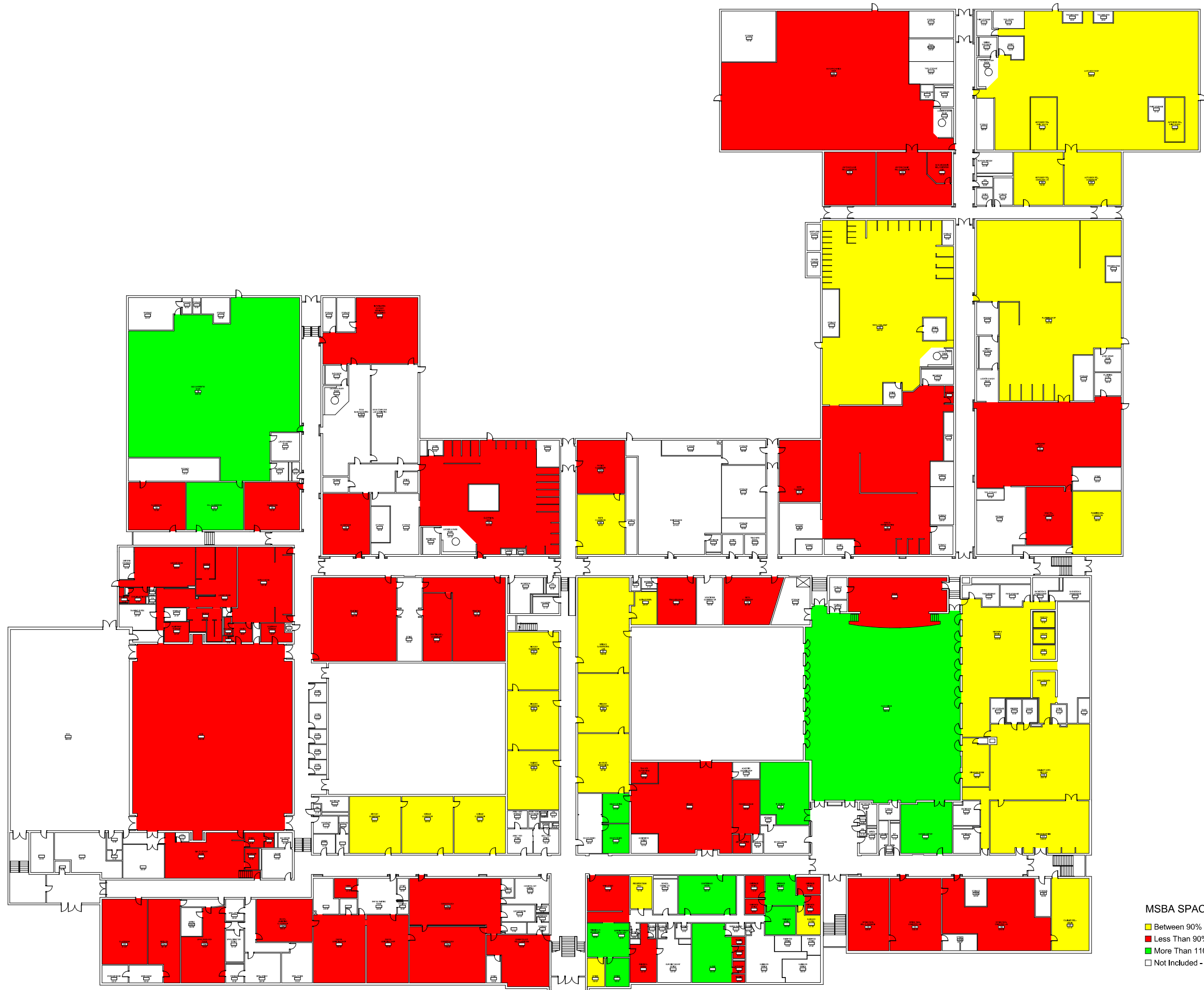
Generally, the program and enrollment changes indicated an increase in the gross floor area of the facility from 240,138 GSF existing to roughly 379,000 GSF proposed. The existing and proposed space programs are included in Section E-3 – Space Summary of this report.

Recommendations

Naturally, our overriding recommendation would be to right-size all spaces to meet the referenced standards as closely as possible. How this would be achieved will depend on the approach adopted for the reimagined facility:

- **Capital Improvement Plan (CIP) Renovation Option:** this model assumes there would be no changes to program spaces, and that only repairs and replacements to deficient systems would occur. Therefore there would be no improvements to the current space conditions under this scenario.
- **Renovation/Addition Option:** We have included an option which provides a combination of new space that is right-sized for the programs within it, and proposed renovations to existing spaces in which CVTE or academic programs are relocated to more closely match sizes of available structural “cells” of space in terms of both program size requirements as well as more ideal adjacency requirements. This option will allow great improvements in right-sizing of program spaces, but may not result in the greatest space efficiency or a perfect programmatic match in all cases.
- **New Construction Options:** We have included two new construction options which will address needs of space, program relationships and adjacencies, as well as maximizing the aesthetic and functional effect of the building to fully support the educational mission of Northeast Metro Tech.

Because of the particularly challenging site constraints, primarily due to topography and pervasive rock ledge on the site, each of these options has advantages and disadvantages, with implications to educational delivery, operations, logistics, security, and construction and operating costs, all of which will be further explored, studied and vetted as part of the next study phase of this project.



MSBA SPACE NEEDS SUMMARY

- Between 90% & 110% MSBA Guideline
- Less Than 90% MSBA Guideline
- More Than 110% MSBA Guideline
- Not Included - MSBA Guideline

FLOOR PLAN - FIRST FLOOR



FLOOR PLANS - BASEMENT & SECOND FLOOR

Draft

Revised - 9/23/2015

NORTHEAST METRO TECH	Existing Conditions		
	ROOM NFA ¹	# OF RMS	area totals
ROOM TYPE			
CORE ACADEMIC SPACES			23,272
(List classrooms of different sizes separately)			
Classroom - General			
MATH CLASSROOM - 109	788	1	788
PHYSICS CLASSROOM - 109-A	700	1	700
MATH CLASSROOM - 135	691	1	691
MATH CLASSROOM - 137	695	1	695
CLASSROOM - 145	795	1	795
CLASSROOM - 160	732	1	732
CLASSROOM - 164	752	1	752
ELA CLASSROOM - 200	808	1	808
MATH CLASSROOM - 201	813	1	813
CLRM - 202, 206, 207, 209,	837	4	3,348
MATH CLASSROOM - 203	832	1	832
S.S. CLASSROOM - 204	790	1	790
MATH CLASSROOM - 205	839	1	839
S.S. CLASSROOM - 208	884	1	884
WORLD HISTORY CLASSROOM - 016	620	1	620
S.S. CLASSROOM - 015	1,025	1	1,025
S.S. CLASSROOM - 013	819	1	819
HISTORY CLASSROOM	808	1	808
Teacher Planning			
Small Group Seminar (20-30 seats)			
Science Classroom / Lab			
SCIENCE CLASSROOM & LAB 107	1,368	1	1,368
SCIENCE CLASSROOM	808	2	1,616
SCIENCE CLASSROOM - 100	837	1	837
BIOLOGY CLASSROOM - 104	819	1	819
BIOLOGY CLASSROOM - 102, 105	837	2	1,674
Prep Room			
SCIENCE PREP.	219	1	219
Central Chemical Storage Rm			
SPECIAL EDUCATION			4,045
(List classrooms of different sizes separately)			
Self-Contained SPED			
CLASSROOM - 128	816	1	816
SPED. ED. - 128-A	661	1	661
Self-Contained SPED Toilet			
Resource Room			
ENGLISH/S.S. RESOURCE, MATH/SCIENCE RESOURCE	315	2	630
SPED. RESOURCE ROOM - 126-B	736	1	736
Small Group Room			
Work Room	163	1	163
Sped Director's Office	157	1	157
Special Education Office	316	1	316
Special Education Office	293	1	293
Special Education Office	108	1	108
Special Education Office 126-C	165	1	165
ART & MUSIC			0
Art Classroom - 25 seats			
Art Workroom w/ Storage & kiln			
Band - 50 - 100 seats			
Chorus - 50 - 100 seats			
Ensemble			
Music Practice			
Music Storage			
VOCATIONS & TECHNOLOGY			97,363
Tech Ctm. - (E.G. Drafting, Business)			
Tech Shop - (E.G. Consumer, Wood)			
Early Education and Care			
CHILD CARE - 019	921	1	921
CHILD CARE REL. - 018	799	1	799
CHILD CARE PLAY AREA	230	1	230
Child Care Storage	104	1	104
Child Care Storage	91	1	91
Child Care Storage	68	1	68
Office			
Health Assisting			
NURSING - 012	1,419	1	1,419
NURSING - 014	1,820	1	1,820
NURSING REL. CLASSROOM - 017	635	1	635
Storage	166	1	166
Office			
Graphic Communications and Design and Visual			
COMMERCIAL DESIGN SHOP/ graphic communications - 011	1,596	1	1,596
DESIGN SHOP	515	1	515
GRAPHICS SHOP - 010	2,670	1	2,670
GRAPHIC REL. CLASSROOM	705	1	705
PRE-PRESS WORKROOM	690	1	690
DARK ROOM	179	1	179
DARK ROOM PREP	60	1	60
Storage			
Office			
Design and Visual			
DESKTOP PUBLISHING	816	1	816
PRINT ROOM	190	1	190
Related Classroom			
PLOT & LAYOUT ROOM	181	1	181
Dept. Head Office	129	1	129
Storage			
Culinary Arts			
CULINARY ARTS KITCHEN - 118	2,257	1	2,257
BREAKHEART INN - 114	1,393	1	1,393
CULINARY REL. CLASSROOM - 117	747	1	747
Dry Storage	98	1	98
Food Storage	176	1	176
Food Storage	171	1	171
Cooler	95	1	95
Freezer	95	1	95
Storage	943	1	943
Office	77	1	77
Office Technology			
OFFICE TECH. COMPUTER LAB - 115	1,646	1	1,646
OFFICE TECH. COMPUTER LAB - 113	1,032	1	1,032
OFFICE TECH. REL. CLASSROOM - 111	820	1	820
Storage	165	1	165
Office			
Cosmetology			
COSMETOLOGY - 120-A	1,214	1	1,214
COSMETOLOGY - 120-B	1,180	1	1,180
COSMETOLOGY REL. CLASSROOM	760	1	760
Cosmetology Waiting	269	1	269
Storage	65	1	65
Storage	69	1	69
Locker Room	152	1	152
Office	109	1	109
Dental Assisting			
DENTAL ASSISTING SHOP	976	1	97

Proposed Space Summary - High Schools

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Revised - 9/23/2015

Proposed Space Summary - High Schools

NORTHEAST METRO TECH		Existing Conditions		
		ROOM NFA ¹	# OF RMS	area totals
ROOM TYPE				
Office				
Elecricity				
ELECTRICAL SHOP		3,374	1	3,374
ELECTRICAL SHOP REL. CLASSROOM				
Storage		168	1	168
Storage		31	1	31
Storage		38	1	38
Locker and Wash Room		235	1	235
Office		64	1	64
HVAC & Refrigeration				
HVAC & REFRIGERATION SHOP		4,663	1	4,663
HVAC SHOP BATHROOM		42	1	42
HVAC REL. CLASSROOM		721	1	721
Storage		479	1	479
Storage		246	1	246
Storage		161	1	161
Storage		112	1	112
Storage		170	1	170
Office		131	1	131
Plumbing				
PLUMBING SHOP		5,763	1	5,763
PLUMBING REL. CLASSROOM		846	1	846
Teacher Desk		107	1	107
Storage		196	1	196
Plumbing Office		168	1	168
Metal fabrication & joining technologies				
METAL FAB. SHOP		5,447	1	5,447
METAL FAB. SHOP REL. CLASSROOM				
Storage		78	1	78
Storage		217	1	217
Acetylene Storage		97	1	97
Oxygen Storage		86	1	86
Office		137	1	137
Office		109	1	109
Locker & Wash Room		156	1	156
Auto Body				
AUTO BODY SHOP		6,597	1	6,597
AUTO BODY REL. PAINT BOOTH		378	1	378
AUTO BODY REL. PAINT BOOTH		232	1	232
AUTO BODY REL. COMPUTER LAB		728	1	728
AUTO BODY REL. CLASSROOM		840	1	840
Teacher Desk		60	1	60
Teacher Desk		60	1	60
Tool Room		150	1	150
Office		142	1	142
Storage		245	1	245
Paint Storage		113	1	113
Locker & Wash Room		168	1	168
Automotive technology				
AUTO MECHANICS SHOP		6,864	1	6,864
AUTO MECHANIC REL. COMPUTER LAB		198	1	198
AUTO MECHANIC REL. CLASSROOM		756	1	756
AUTO MECHANIC REL. CLASSROOM		895	1	895
Tool Storage		276	1	276
Storage		328	1	328
Storage		278	1	278
Storage		761	1	761
Locker & Wash Room		161	1	161
Teacher Desk		51	1	51
Office				
Medical Laboratory Technology				
Medical Laboratory Technology Shop				
Medical Laboratory Technology Related Classroom				
Storage				
Office				
STEM Laboratory				
STEM Computer Lab 3D Printing		1,268	1	1,268
STEM Manufacturing		1,053	1	1,053
Storage		107	1	107
Locker & Wash Room		184	1	184
STEM Laboratory Shop				
STEM Laboratory Related Classroom				
Storage				
Office				
Alternative Energy				
Alternative Energy Shop				
Alternative Energy Related Classroom				
Storage				
Office				
Advanced Machining				
Advanced Machining Shop				
Advanced Machining Related Classroom				
Storage				
Office				
Engineering Technology				
Engineering Technology Shop				
Engineering Technology Related Classroom				
Storage				
Office				
HEALTH & PHYSICAL EDUCATION				19,784
Gymnasium				
GYM		8,160	1	8,160
POOL		6,655	1	6,655
WEIGHT ROOM		1,151	1	1,151
PE Alternatives				
Gym Storeroom				
Locker Rooms - Boys / Girls w/ Toilets				
GIRL'S LOCKER ROOM & BATHROOM		1,032	1	1,032
BUY'S LOCKER ROOM & BATHROOM		1,872	1	1,872
Phys. Ed. Storage				
EQUIPMENT STORAGE		144	1	144
EQUIPMENT STORAGE		137	1	137
Athletic Director's Office				
Health Instructor's Office w/ Shower & Toilet				
COACH'S OFFICE & BATHROOM		111	1	111
OFFICE & BATHROOM		120	1	120
OFFICE, BATHROOM & CLOSET		155	1	155
Training Office		247	1	247
MEDIA CENTER				2,686
Media Center / Reading Room				
Media Center Office				
Computer Lab				
LIBRARY		2,195	1	2,195
LIBRARY OFFICE		93	1	93
RESOURCE ROOM		398	1	398
AUDITORIUM / DRAMA				1,245
Auditorium				
Stage		1,245	1	1,245
Auditorium Storage				
Make-up / Dressing Rooms				
Controls / Lighting / Projection				
DINING & FOOD SERVICE				11,601
Cafeteria / Student Lounge / Break-out				
CAFETORIUM		7,665	1	7,665
Chair / Table Storage				
Scramble Serving Area				
Kitchen		2,175	1	2,175
DISHWASH ROOM		342	1	342
FOOD STORAGE		254	1	254
COOLER		85	1	85
FREEZER		91	1	91
OFFICE		91	1	91
Trash		78	1	78
Staff Lunch Room		351	1	351
Staff Break Room		168	1	168
Lounge		245	1	245
Kitchenette		56	1	56
MEDICAL				834
Medical Suite Toilet				
BATHROOM		41	2	82
Nurses' Office / Waiting Room				
NURSE/NURSE WAITING		692	1	692

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Proposed Space Summary - High Schools

NORTHEAST METRO TECH		Existing Conditions		
	ROOM NFA ¹	# OF RMS	area totals	
ROOM TYPE				
Interview Room				
Examination Room / Resting				
RESTING	30	2	60	
ADMINISTRATION & GUIDANCE			10,814	
General Office / Waiting Room / Toilet	533	1	533	
Teachers' Mail and Time Room				
Duplicating Room	157	1	157	
Records Room				
Principal's Office w/ Conference Area	332	1	332	
DEAN'S OFFICE	217	1	217	
DEAN'S OFFICE	398	1	398	
DEAN'S OFFICE	215	1	215	
Principal's Secretary / Waiting	96	1	96	
Assistant Principal's Office - AP1	185	1	185	
Assistant Principal's Office - AP2	138	1	138	
Supervisory / Spare Office				
In-house Suspension	837	1	837	
Conference Room	609	1	609	
Guidance Office				
GUIDANCE OFFICE	238	1	238	
GUIDANCE OFFICE	147	1	147	
GUIDANCE OFFICE	118	1	118	
GUIDANCE OFFICE	114	1	114	
GUIDANCE OFFICE	81	1	81	
GUIDANCE OFFICE	80	1	80	
Guidance Waiting Room	274	1	274	
Guidance Storeroom				
Career Center	719	1	719	
Records Room	191	1	191	
Teachers' Work Room	497	1	497	
Academic Coordinator	123	1	123	
SUPERINTENDENT OFFICE	437	1	437	
SUPERINTENDENT SECRETARY	96	1	96	
SCHOOL COMMITTEE	235	1	235	
Teachers Assoc.	121	1	121	
BUSINESS OFFICE	531	1	531	
BUSINESS OFFICE	255	1	255	
BUSINESS OFFICE	116	1	116	
BUSINESS OFFICE	97	1	97	
IT OFFICES	797	1	797	
Adult Education Office	170	2	340	
Adult Education Storage	95	1	95	
Admissions Office	143	1	143	
Vocational Coordinator	335	1	335	
Office	69	3	207	
Office	123	1	123	
Office	91	1	91	
Office	136	1	136	
Office	115	1	115	
Office	124	1	124	
Office	121	1	121	
Resource Officer Office				
CUSTODIAL & MAINTENANCE			6,690	
Custodian's Office				
Custodian's Workshop	364	1	364	
Maintenance	2,316	1	2,316	
Custodian's Storage	227	1	227	
Recycling Room / Trash	266	1	266	
Receiving and General Supply				
RECEIVING & STORAGE	1,713	1	1,713	
Storeroom				
Storage	185	1	185	
Storage	289	1	289	
Storage	244	1	244	
Storage	637	1	637	
RECORD STORAGE	449	1	449	
Network / Telecom Room				
OTHER			394	
Other (specify)				
School Store	354	1	354	
School Store Storage	40	1	40	
Total Building Net Floor Area (NFA)			178,728	
Proposed Student Capacity / Enrollment				
Total Building Gross Floor Area (GFA) ²			240,138	
Grossing factor (GFA/NFA)			1.34	

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
			100	3	300			
			100	6	600			
		0			10,379			0
			629	1	629			
			100	1	100			
			200	1	200			
			200	1	200			
			375	1	375			
			225	1	225			
			225	1	225			
			225	1	225			
			125	1	125			
			150	1	150			
			150	1	150			
					0			
			500	1	500			
			450	1	450			
			150	7	1,050			
			100	1	100			
			100	1	100			
			464	1	464			
			182	1	182			
			629	1	629			
			150	1	150			
			425	1	425			
			125	1	125			
			225	1	225			
			525	1	525			
			250	1	250			
			125	1	125			
			100	1	100			
			500	1	500			
			150	1	150			
			100	1	100			
			150	1	150			
			225	1	225			
			125	9	1,125			
			125	1	125			
		0			2,825			0
			150	1	150			
			250	1	250			
			375	1	375			
			400	1	400			
			550	1	550			
					0			
			900	1	900			
					0			
			200	1	200			
					0			
		0			400			0
			350	1	350			
			50	1	50			
		0			252,619			0
					378,929			

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⁷ **Individual Room Net Floor Area (NFA)** includes the net square footage measured from the inside face of the perimeter walls and includes all specific spaces assigned to a particular program area including such spaces as non-communal toilets and storage rooms.

² **Total Building Gross Floor Area (GFA)** Includes the entire building gross square footage measured from the outside face of exterior walls

Architect Certification	I hereby certify that all of the information provided in this "Proposed Space Summary" is true, complete and accurate and, except as agreed to in writing by the Massachusetts School Building Authority, in accordance with the guidelines, rules, regulations and policies of the Massachusetts School Building Authority to the best of my knowledge and belief. A true statement, made under the penalties of perjury.
	Name of Architect Firm: _____
	Name of Principal Architect: _____
	Signature of Principal Architect: _____
	Date: _____

CONCEPTUAL OPTIONS SUMMARY

Once the future space needs of the school were determined, and the administrative team and selected faculty and staff had engaged in a visioning process that clarified spatial needs, program adjacencies, aesthetic goals, and functional requirements, the next step was to commit some of these ideas to paper in the form of designing conceptual options for review and feedback.

The program elements were arranged on the site in organized block diagrams intended to show the accurate relative size and scale of elements on the site, program arrangement to serve adjacency requirements and relationships, general functional needs both within the building and on the site, and overall site circulation needs. It should be noted that because of the particularly challenging site constraints, primarily due to greatly varied topography and pervasive hard granite rock ledge near or at the surface, each of these options would have advantages and disadvantages, with distinct implications to be evaluated.

In total six options were studied and four were formalized for estimating out of the educational visioning process as well as parallel design efforts by the architects. In summary, those options were:

- **Capital Improvement Plan (CIP) Option:** Option includes:
 - health/safety/welfare improvements
 - code compliance
 - repair or replacement of deficient systems and assemblies
 - functional use of building (impacts on learning and/or below MSBA standards)
 - handicap accessibility
 - maintenance to extend the life of the facility

No program changes or site changes would be done under this scenario. This option is intended to establish a planning baseline cost to just fix what is there now and bring it up to code.

- **Option 1 – “Bridges” Scheme:** This option splits the program of the facility into three separate blocks, each located on a relatively level, open area of the existing site, and linked together by bridges to tie together the various levels of the school. The intent is to utilize open areas of the site to allow construction to commence while keeping the existing school running, and provide a smooth transition with no interruption to educational programs. This option was determined to be impractical due to too great a separation between elements that could have synergies, the practical isolation of the building blocks due to only some levels being connected by the bridges, site circulation difficulties mainly due to grade changes, as well as loss of the baseball field in the site plan. It was not formalized or estimated, but is included here for reference.
- **Option 2 – “Hillside” Scheme:** This option seeks to utilize the grade change of some 30 feet at the north end of the site to build the tall vocational shops into the side of the hill behind the present school. The “clean” or technical vocational shops would be located on top of the tall

“dirty” shops, with a bar of the administrative, shared, common and public spaces in front of those, a bar containing the public-facing shops at the very front of the facility, and bars of academic classrooms on a third level as required. This option has the advantages of compact building footprint with resulting gains to site facilities, good relationships of public and private spaces, and ability to be built while the existing school functions with only limited phased demolition. One disadvantage would be a lack of ability to fully integrate technical and academic learning spaces to move away from the departmentalized building organization that exists now. This option was formalized and estimated.

- **Option 3 – “Z Scheme”:** This option again tries to utilize relatively level, open areas directly adjacent to the existing school to allow construction while the present school operates. An initial block containing the large and small vocational and technical shops, as well as some academic classrooms, would be built on the existing baseball field area. A second phase would include demolition of the existing natatorium to make way for the construction of the middle bar containing the administrative, shared, common, and public spaces, with more classrooms and the Library on its second level. The third phase would include demolition of the present Carpentry shop to make way for the top wing of the reversed “Z” containing the public-facing shops, athletic facilities, and more classrooms on its second level. While this option does have the advantages of continuous facility operation, flexibility to be either integrated or departmentally organized, and major site circulation and parking improvements, it is shoehorned into the margin of the site and will entail some rock removal as well as potential structural fill on its back side where grade falls away. This option was formalized and estimated.
- **Option 4 – Add/Reno Scheme:** This option is a multi-phase exercise in utilizing new space, leased swing space, and carefully-orchestrated program moves to achieve a like-new facility. It consists of a new shop addition for Auto Body and Automotive Mechanics, renovated shops for the balance of the vocational trade programs, and new space in the front of the building for public-facing shops, administrative, shared, common, and public spaces, and a second level with technical shops, Library, and academic classrooms located strategically over top of other spaces. Though this option suffers from lack of space efficiency, and great disadvantages to the ongoing programs due to multiple phasing maneuvers, it must be entertained as a responsible approach to the facility’s improvement, and was formalized and estimated.
- **“Hilltop” Option (not formalized or estimated):** as part of the visioning work, the undeveloped southern portion of the NEMT land parcel was identified as a possible location for an all-new facility. The discussion began with the point that the present site has only one vehicular entrance/egress (shared with Wakefield High School), and this is of great concern for reasons of day-to-day circulation and traffic congestion as well as emergency access and scenario planning. An old agricultural road exists that goes up over the hilly southern portion of the site, and the team studied the grades of this trail, the ability to “bench in” pads large enough to build upon the hillside, and ways to provide well-functioning circulation around it all. After some study it

was concluded that the 50 to 60 foot grade difference between the high and low ends of the necessary building footprint would create a financially untenable building solution and/or functionally compromised building plans. This option was not formalized or estimated, but is included for reference.

In addition to the building options, two other sitework-related “line item add-ons” were discussed, formalized, and estimated:

- **New Entrance and Access Road:** Not wanting to ‘throw the baby out with the bathwater,’ work from the Hilltop Option (mentioned above) was applied to this site option. Even if a building could not reasonably be built on the southern portion of the site, with some minor adjustments the proposed alignment for the new road was advanced as a viable option to provide a second means of vehicular access and egress to and from the site. The road would provide construction access to the site during the building project, which would take a lot of heavy traffic away from Hemlock Road and a very low-functioning intersection in front of Wakefield High School, neighboring the NEMT site. This factor has great value in the overall equation of the project. Conceivably this new entrance could become the main entrance to Northeast, giving it a distinct road-front presence it now lacks, and would take away a lot of traffic from the Wakefield HS campus.
- **Utility Upgrades:** NEMT does not currently have access to natural gas, and the School Committee and core administrative team consider this to be a high priority to include with the proposed project. The school will also need a larger (nominally 10”) water main in order to serve a sprinkler system that would be required under any scenario. And as long the trench is being excavated, it would be appropriate to pull new primary electric power feed, as existing power is not adequate. Currently these utilities enter the site under Hemlock Road. There might be some complementary needs that occur in a potential future utility relocation project in Hemlock Road currently being discussed at Wakefield Memorial High School. Realizing that the timing of these two projects might not synchronize, the design team has structured the work packages such that the utility installation/relocation might be split and phased between the two projects. The NEMT share would include new utility installation in Hemlock road from the WMHS project limit line, east to the NEMT project location: approximately 1,120 feet length of utility excavation, installation, backfill, and re-paving of the street under existing Hemlock Road (to NEMT property line), plus 590 feet of new installation under new pavement as part of the NEMT project (inside of NEMT property line). Incidentally, the sanitary sewer line currently leaves the NEMT building to the north and downhill, and appears to be adequate to serve the proposed project in any of the options with some modifications.

Each of these options is discussed in more detail in the following sections of this report.

General Conclusions

Due to the conceptual nature of this study and the very high-level or strategic types of conversations had as part of our process, we do not feel it is necessary, prudent, or productive to hone in on a preferred option at this point in the process. Much more detailed study will need to be done with each of these alternatives, taking into account more nuanced factors and more fully-developed design materials than what were completed within the scope of this study. This study is the first step which seeks to clarify:

- Existing conditions analysis and documentation
- Overall educational program goals
- Educational/ building organizational methods and models
- Enrollment and program goals
- General site/building planning strategy and concepts
- General building planning – bubble and block diagram level
- Conceptual level cost estimates to establish a working project budget

These factors are all assembled to help the Owner clarify its needs and compile a clear, concise, and effective Statement of Interest (SOI) to the MSBA, which would be the next logical step in the process at the conclusion of this study.

CAPITAL IMPROVEMENTS PLAN (CIP) REPAIR OPTION

This option was generated directly out of the existing conditions survey of the present Northeast Metro Tech building (see Section C of this report). Observations and recommendations were provided by the consultant team, and organized into the following categories:

- health/safety/welfare improvements
- code compliance
- repair or replacement of deficient systems and assemblies
- functional use of building (impacts on learning and/or below MSBA standards)
- handicap accessibility
- maintenance to extend the life of the facility

Quantities were assigned to each measure and its approximate cost was estimated. No program changes or site changes would be done under this scenario; therefore there were no drawings produced. A spreadsheet is provided in Section G-1 which details the improvements, measures, and maintenance items and their costs.

General Conclusions

This conceptual option is intended to establish a planning baseline cost to “just fix up” what presently exists and bring it up to code. The cost of the CIP is compared to the costs of the other alternatives, and it is often a sobering bit of information that just “fixing up” the present facility, with no improvements whatsoever to programs, educational delivery, or basic functionality can cost so much. It is also instructive to look at the CIP cost and compare it to the incremental percentage required to achieve any of the design options.

OPTION 2 – “HILLSIDE” SCHEME

This option seeks to utilize the steep grade change of some 26 feet at the north end of the site to build a “sectional” scheme into the hillside behind the present school.

Phase 1:

The relatively tall “dirty” vocational and trade shops will be on level 1, and are 20 feet to the bottom of the long-span floor structure above, making them roughly 24 feet in total floor-to-floor height. The remaining two feet of the height difference can be made up by bringing up the grade of the practice fields to floor slab level with structural fill. This will also help keep the slab elevation above any wet conditions, as this part of the site is directly adjacent to low-lying wetlands. This option will require a 24 foot tall, 28 inch thick reinforced concrete retaining wall for its entire length, some of which would be backfilled with structural fill to support the slab above it. This level will also include the main mechanical and electrical rooms, so this phase can be self-supporting while the rest of the building is built onto it.

The “clean” or technical vocational shops would be located on level 2, on top of the vocational shops, with the possibility of a roof terrace for outdoor activities or as a green roof element to aid with storm water retention.

A third level would house academic classrooms, science labs, special education rooms, and teacher planning spaces.

Phase 2:

The existing carpentry wing as well as the automotive and auto body sections of the existing building will be demolished to make way for Phase 2.

A rectangular building element on level 2 will house the administrative, athletic, auditorium, and cafeteria/kitchen and public spaces. This block houses the main entrance to the facility, which leads to a public lobby serving the administration, the auditorium, and the gym as well as leading to the cafeteria.

In front of this block, a rectangular building element containing the public-facing shops will be at the very front of the facility, facing and proximate to guest parking for customers of the cosmetology, dental assisting, health assisting, and culinary programs, as well as the early education lab.

Additional pods of academic classrooms and educational support spaces will be constructed on the third level in a “donut” circulation pattern. The Library will be on this level, at the head of the middle section of the building.

General Conclusions

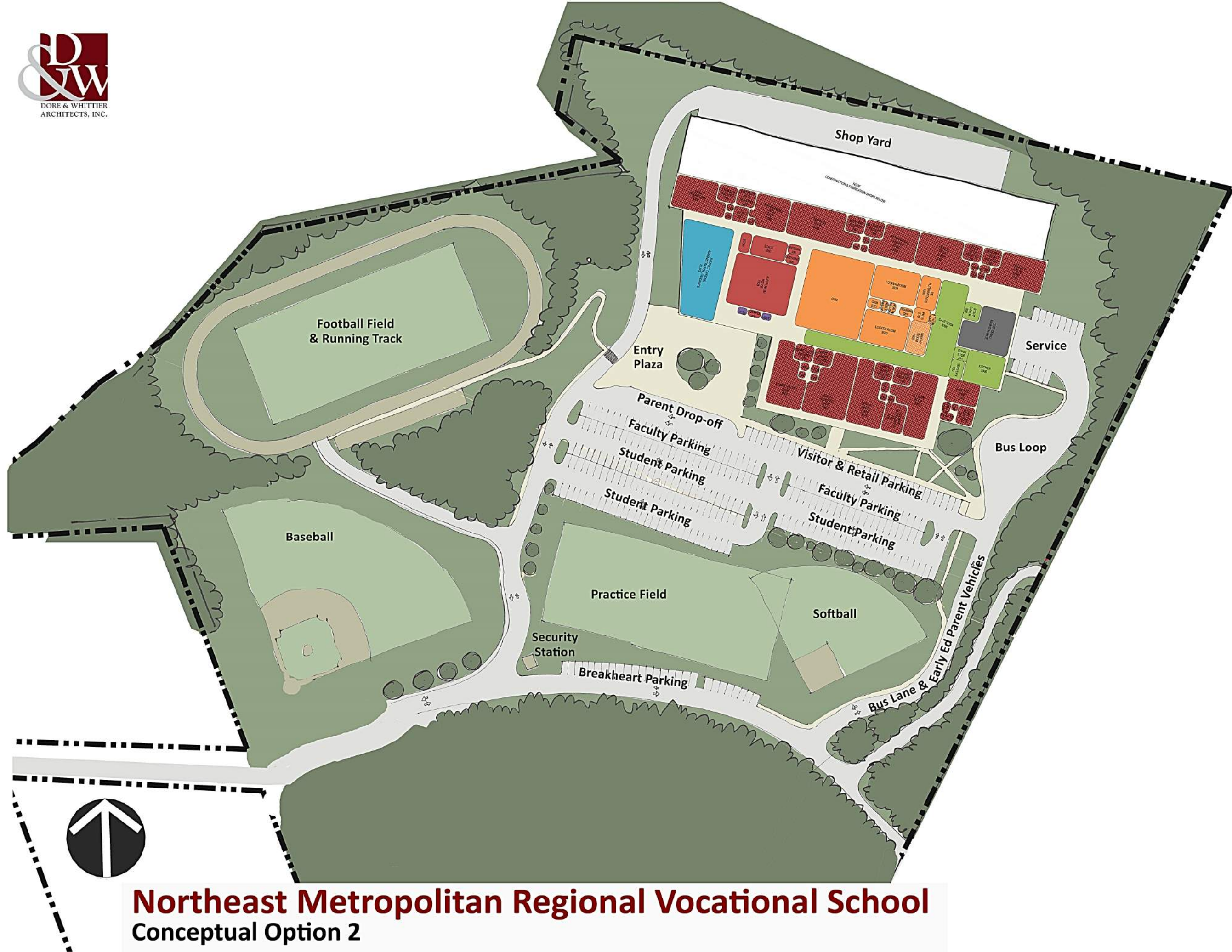
This option has several advantages and a few disadvantages to be considered.

Advantages:

- compact building footprint with resulting gains to site facilities as well as potentially shorter travel times within building
- good relationships of public-facing spaces to front of building, parking, and entry plaza
- public spaces can be locked off from academics and shops for night and special event access without security compromise
- separates Breakheart Reservation parking from school parking, and moves security station to control school parking
- ability to be built while the existing school functions with only limited phased demolition

Disadvantages:

- Less ability to fully integrate technical and academic learning spaces to potentially move away from the departmentalized building organization that exists now (if that is desired).
- Site access to level 1 is steep, narrow and limited at the bottom.
- Shop yard is narrow and does not offer good turning facilities or drive-through for delivery trucks.



Northeast Metropolitan Regional Vocational School
Conceptual Option 2

OPTION 3 – “Z SCHEME”

Like some others, this option tries to utilize relatively level, open areas directly adjacent to the existing school to allow construction while the present school operates, minimizing phasing costs and logistical issues.

Phase 1:

The first phase would entail demolition of the existing natatorium to make way for the construction of the middle segment of the new building. The bottom and middle of the reversed “Z” figure would be built in this phase. Some rock ledge removal is also expected to allow the middle section of this phase to be built, as well as to improve access to the football field and track.

The bottom wing would be built on the existing baseball field area, and on the first level would contain the large vocational and technical shops, as well as the “clean” technical classrooms and an academic classroom pod on the second level. Drives and aprons would be provided for delivery of materials, and adjacent parking for automotive programs.

The middle segment of the building on the ground level will include the main entrance to the facility, which is a covered “portico” created by an overhung form containing the library. Directly inside there is a public lobby serving the administration and the cafeteria, that leads to the auditorium and gym. This segment will also contain the kitchen, custodial, mechanical, and service spaces. The second level will include more general education classrooms, academic support spaces, teacher planning areas, and the Library.

Phase 2:

This building phase will also require some advance demolition: the present carpentry shop, the wood materials crib, and the storage/locker room building will all have to come down prior to phase 2 construction commencement. Depending on how this building location can be finessed, there might need to be some retaining wall and structural fill construction on the north (back) side of this phase to accommodate the sharp slope off the rear of the building pad.

The Phase 2 wing—the top of the reversed “Z” figure—will house the gymnasium and athletics complex, and the auditorium, stage, and support spaces. There is a second event entrance formed by the void between the middle and top segments of the Z. Public-facing shops and spaces will be at the front of the facility, facing and proximate to guest parking for customers of the cosmetology, dental assisting, health assisting, and culinary programs, as well as the early education lab. The second level of this wing will house more classrooms, educational support spaces, and teacher planning spaces.

Phase 3:

This phase consists primarily of existing building demolition and site work. The old high school will be demolished, foundations removed, any required rock removal performed to level playing field areas, and parking, drives, stormwater retention, and athletic fields constructed.

General Conclusions

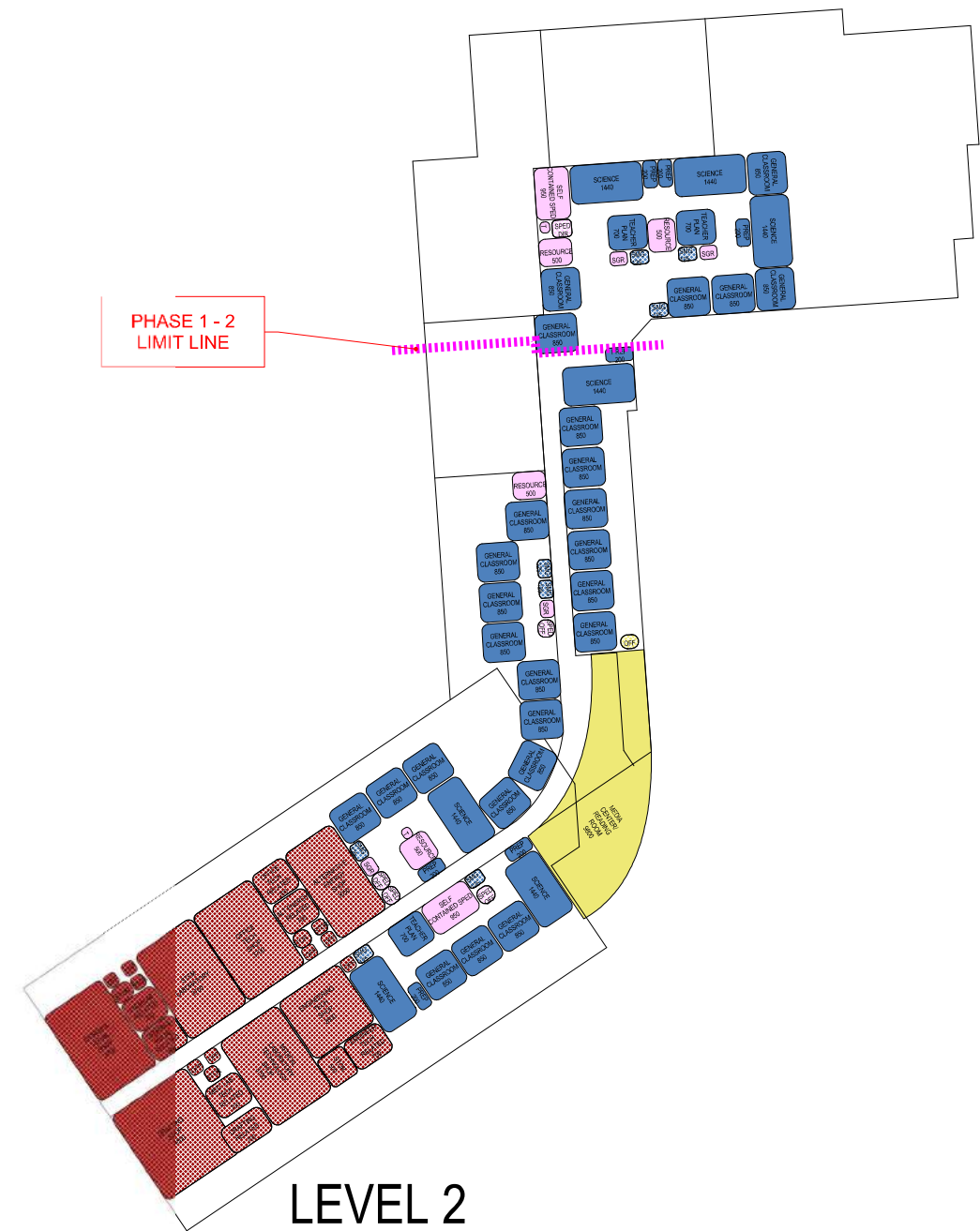
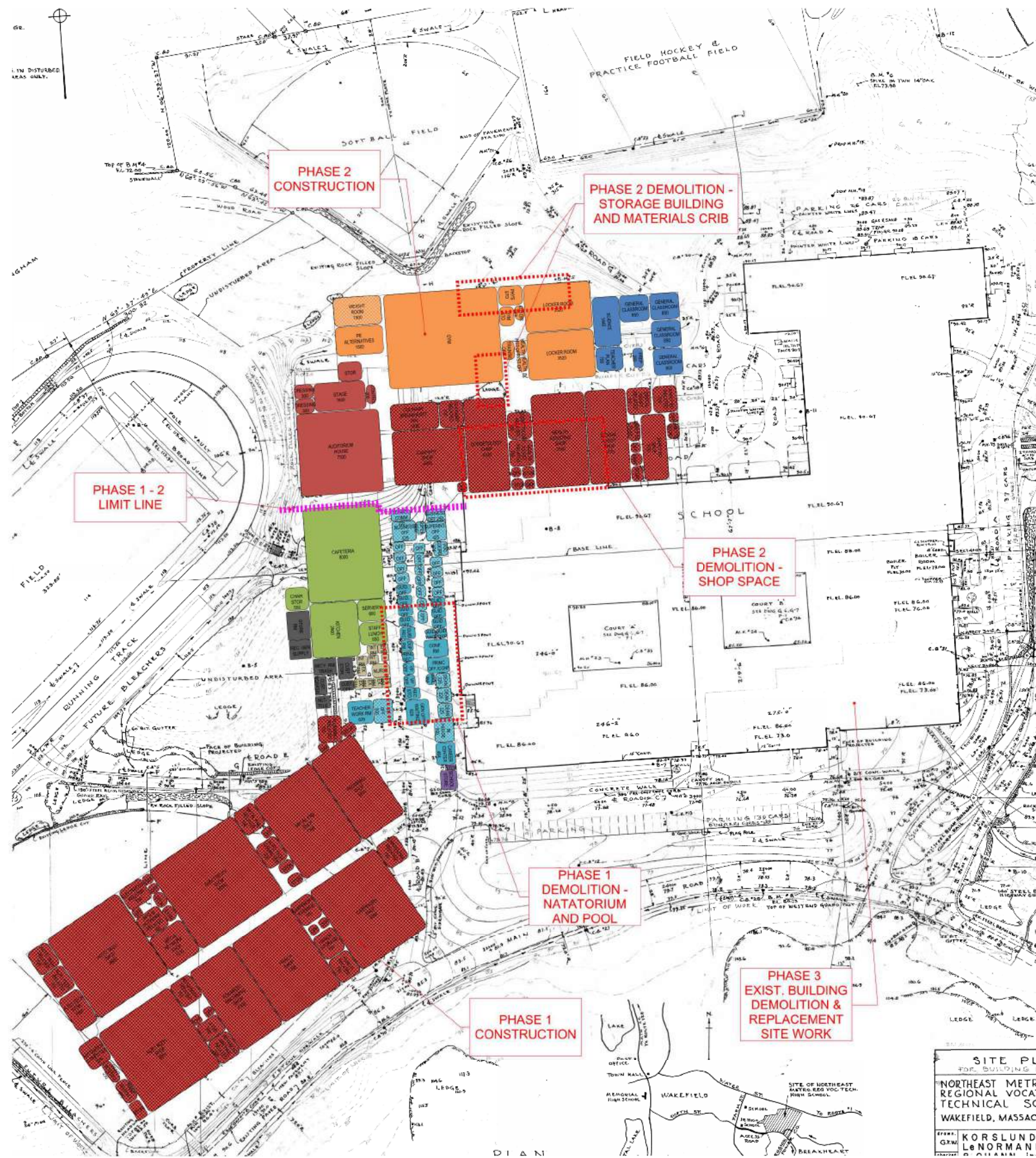
This option has several advantages and a few disadvantages to be considered.

Advantages:

- major site circulation and parking improvements
- compact building footprint with greatly improved parking and site circulation
- good relationships of public-facing spaces to front of building, parking, and entry plaza
- public spaces can be locked off from academics and shops for night and special event access without security compromise – has separate event entrance for assembly functions.
- separates Breakheart Reservation parking from school parking, and moves security station to control school parking
- ability to be built while the existing school functions with only limited phased demolition

Disadvantages:

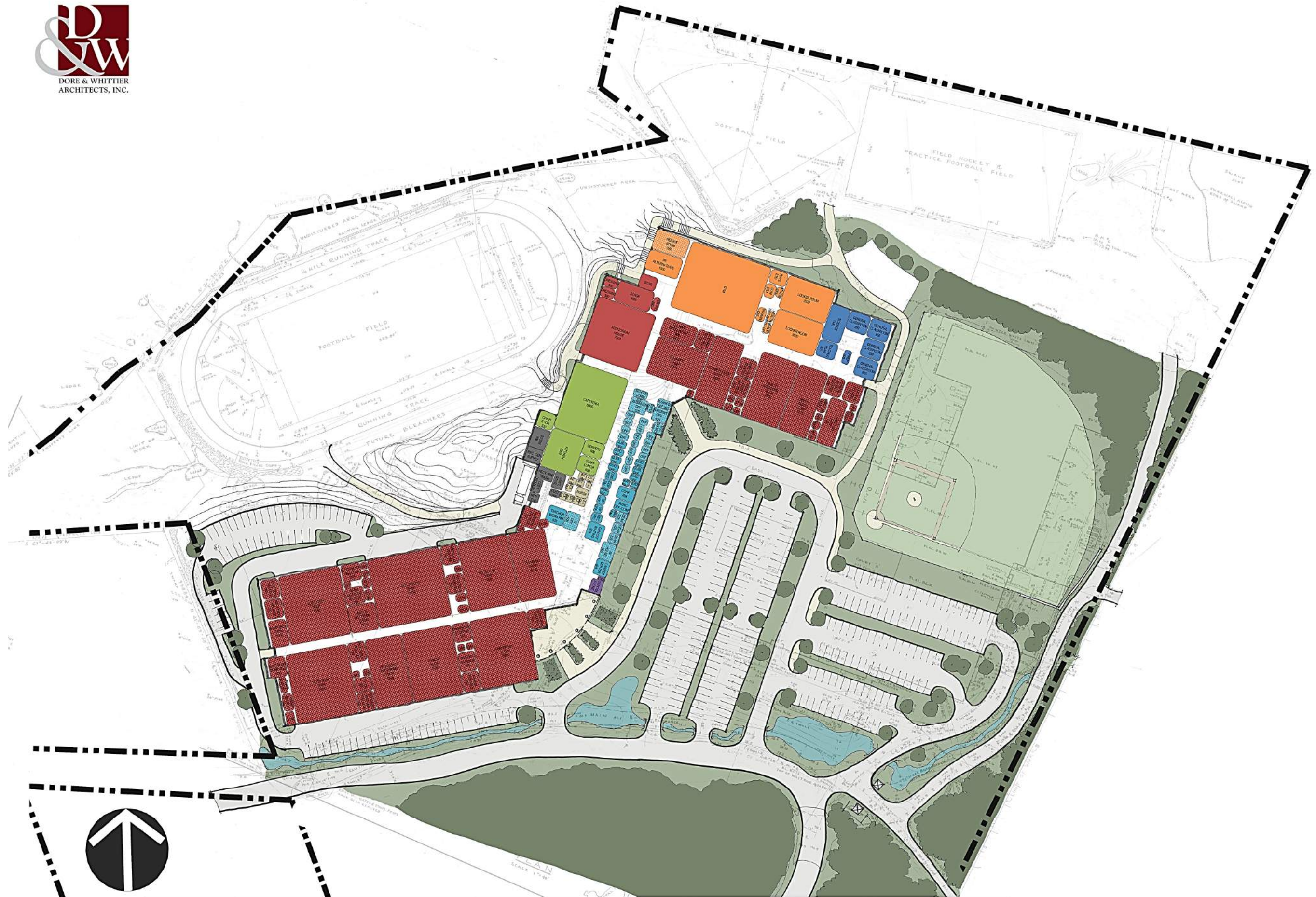
- Less ability to fully integrate technical and academic learning spaces to potentially move away from the departmentalized building organization that exists now (if that is desired).
- Site work requires some blasting and potentially some retainage and under slab fill or structural slab in phase 2.
- Shop yard is narrow and does not offer good turning facilities or drive-through for delivery trucks.



NORTHEAST METRO TECH - Z SCHEME

0 20 40
SCALE: 1"=40' GRAPHIC SCALE





Northeast Metropolitan Regional Vocational School
Conceptual Option 3

OPTION 4 – “ADD-RENO” SCHEME

This option is a multi-phase exercise in utilizing new space, leased swing space, and carefully-orchestrated program moves to achieve a like-new facility. It consists of a new shop addition for Auto Body and Automotive Mechanics, renovated shops for the balance of the vocational trade programs, and new space in the front of the building for public-facing shops, administrative, shared, common, and public spaces, and a second level with technical shops, Library, and academic classrooms located strategically over top of other spaces.

Phasing:

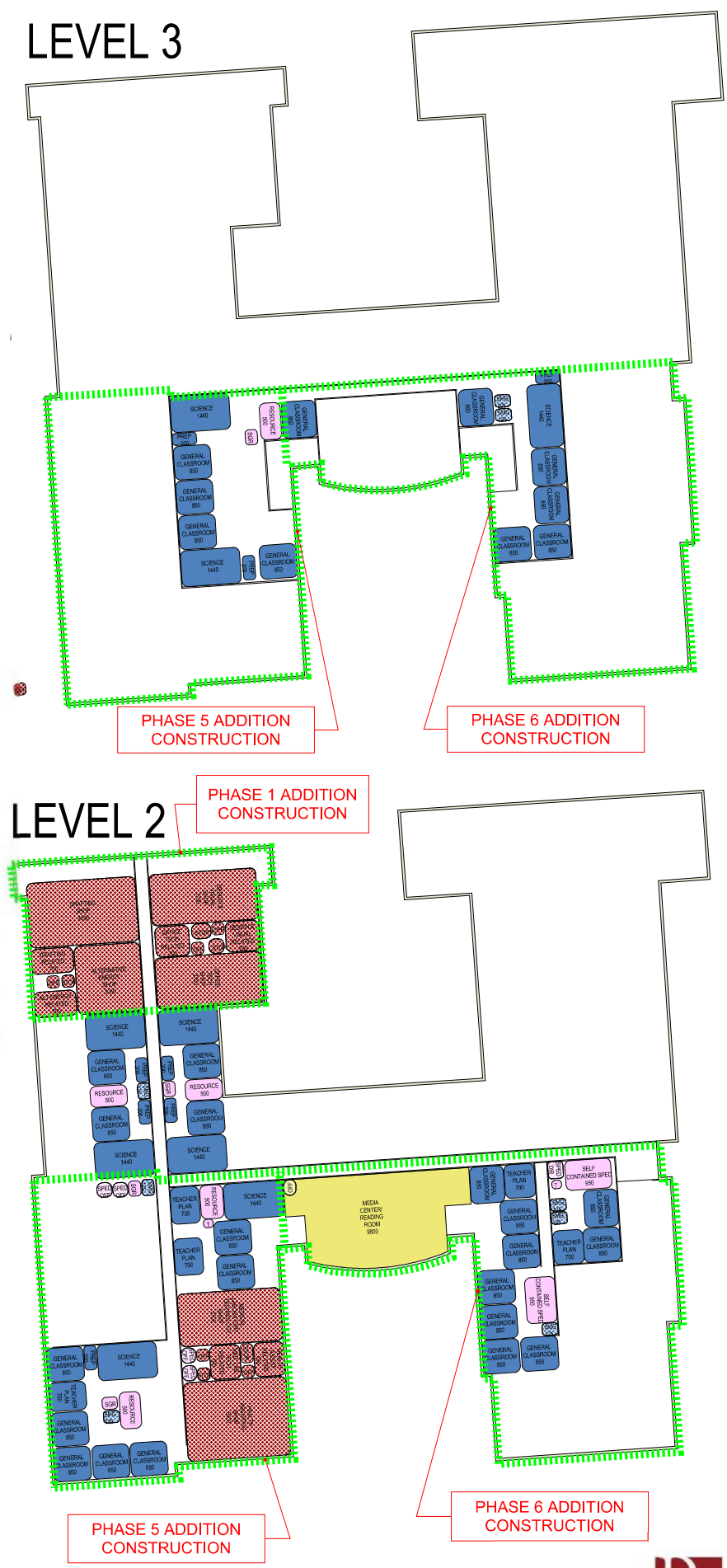
Refer to attached diagrams for phasing logistics. Generally speaking, the renovation portion of this project will be a messy, disruptive process using the phasing concept of building one new block of space, move the programs into it, renovate the vacated space, move programs into it, and so on. The new construction portion will require a large amount of leased modular space for smaller, more “cellular” functions, a temporary kitchen/dining module, and the school will have to do without athletic facilities while new facilities are being constructed. Clearly this option will have the greatest impact on the student experience for its longer duration when compared to the other options.

General Conclusions

Though this option may suffer from potential lack of space efficiency (typically encountered when renovating existing space), and great disadvantages and/or disruptions to the ongoing programs due to multiple phasing maneuvers, it must be entertained as a responsible approach to the facility’s improvement. Another disadvantage is the new building further encroaches on the site area in front of the building, making the tight parking and circulation system even tighter. Some additional parking is realized on the west side of the building, but the layout is not ideal.

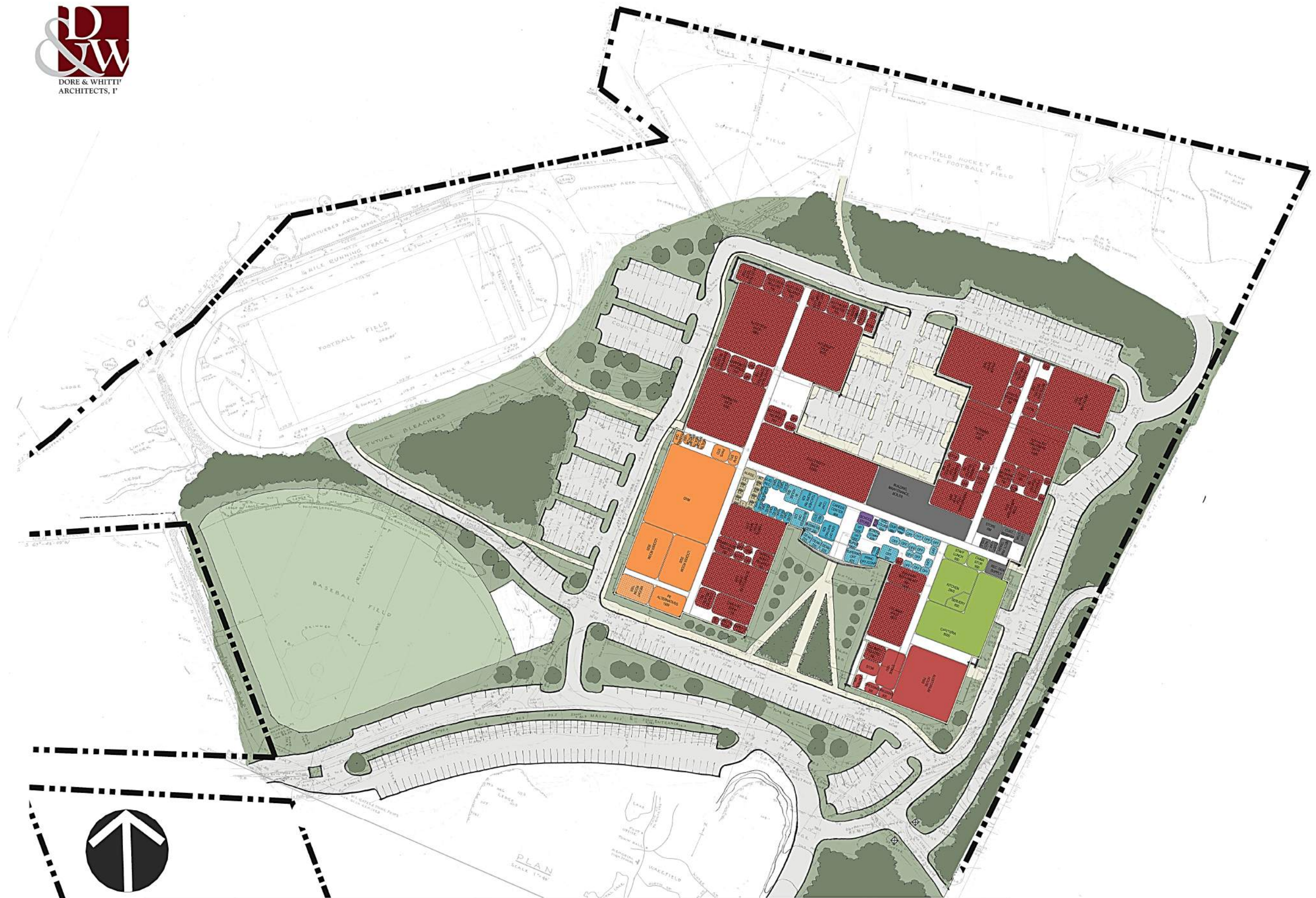
Some advantages to this design include:

- the creation of a new entry forecourt which gives a more aesthetic sense of entry as well as increased building security
- clear separation between public and private functions of the school, especially the athletic area
- separate event entry on east side related to the auditorium and Breakheart Café/ culinary lab
- Athletics block position maintained close to fields.
- Separate parking lot for Breakheart Reservation users



NORTHEAST METRO TECH - ADDITION/RENOVATION SCHEME





Northeast Metropolitan Regional Vocational School

Conceptual Option 4

SITEWORK OPTIONS

In addition to the building options, two other sitework-related “line item add-ons” were discussed, formalized, and estimated as part of this study:

New Entrance and Access Road:

Currently there is only one vehicular entrance/egress to the NEMT property, and concerns about emergency access, traffic congestion, pedestrian access, and emergency scenario planning have caused the School Committee and Core Administrative Team to make the creating of a second access to the site a high priority to include with the proposed project. Study work from the Hilltop Building Option (mentioned previously) was applied to this site option – refer to attached site drawing. After consideration of several options, a route over the southern portion of the site was pursued as the best way forward.

The Northeast Metro Tech land parcel is divided between the developed northern portion where the present school and fields now sit, and a hilly, wooded, and rocky southern portion that is honeycombed with unmarked hiking trails. An existing disused agricultural/logging road was noted on the site roughly bisecting the southern portion of the parcel, originating near the main entrance guard house and cutting diagonally across and up the steep slope of the hill. Where the grade eases at the top of this slope, the road heads south through a “saddle” in the topography and back down to join the trail network that runs under the electrical lines in the neighboring utility easement. From that point, the road alignment could be cut through some immature woods on the NEMT property—steering clear of a delineated wetland—and linked up with Farm Street, close to the Saugus town line.

Upon reflection, the design team realized there would be an easier path for the road on its north end: a more moderate grade was noted if the new road originated at the present Breakheart Reservation gate, which would be moved back 100 feet to give the road the space it needs to blend and resolve with existing road grades. From that point, the road would wind up and around a more gradual path to the “saddle” at the top of the first slope, and continue as described above, resulting in a much less curvy and higher functioning road alignment overall. For those entering the facility using this new roadway from the south, this alternate alignment would create maximum impact, pointing users directly at the new or renovated building as they come down the hill.

The new road was advanced as a viable option to provide a second means of vehicular access and egress to and from the site. The road construction would ideally be the first phase of any project, and would provide construction access to the site during the building project. This important step would take a lot of heavy traffic away from Hemlock Road and the very low-functioning intersection in front of Wakefield High School, neighboring the NEMT site.

Conceivably this new access could become the main entrance to Northeast Metro Tech, giving it a distinct road-front presence it now lacks (as well as the ability to advertise its public-facing career programs), and would take a lot of traffic away from the Wakefield HS campus.

The option included the following improvements and estimated roadway quantities (from the proposed new entrance, south, to the existing site, north):

- New vehicular entrance with 100' turning lane
- New traffic signal on Farm Street
- New sign for NEMT complex: assume rubble stone piers and lighted sign with LED remote-programmable display
- Traffic signage and pavement markings on road
- New 60' wide road:
 - 18' ditch/swale
 - 24' wide pavement with (2) 10' lanes and 2' wide paved shoulder each side
 - 18' ditch/swale
 - Swale width to be adjusted subject to presence of ledge
- Road lengths as follows (south to north):
 - 745' easier grade less than 2%
 - 400' moderate grade 8% with some blasting
 - 725' easier grade between 2% - 5%
 - 200' moderate grade 10% with some blasting
 - 315' moderate grade between 5% and 8%
 - 145' steeper grade 10-11% with significant blasting
 - 50' blend grade to existing parking – less than 2%
 - 100' move entrance gate to Breakheart Reservation – two masonry piers, iron gate, and entry railing
- Assume balanced cut and fill for the road design.

It should be noted that other scenarios for an additional vehicular entrance to the NEMT campus were considered and rejected. The design team looked at a possible easement connection to Wiley Street or Water Street, but both of these options were rejected mainly due to their potential for political and possible legal opposition by neighbors, as well as the need in either scenario to traverse wetlands to connect to the NEMT property. The Mill River wetland complex forms part of the northern boundary of the NEMT property.

Utility Upgrades:

Northeast Metro Tech does not currently have access to natural gas, and the School Committee and Core Administrative Team consider this to be a high priority to include with the proposed project. The school will also need a larger 10" water main in order to serve the sprinkler system that would be required under any of the design options. And as long the trench is being dug, it would be appropriate to pull a new primary electric power feed, as existing power is not adequate for future needs and spare capacity. Currently the utilities that exist enter the site under Hemlock Road from the west.

There is currently under discussion a major renovation or new building project at the neighboring Wakefield Memorial High School (with the feasibility study being conducted by Dore & Whittier Architects). A potential future utility relocation project in Hemlock Road is under discussion as part of the WMHS project, which might result in some complementary benefits to the NEMT project. If the road is excavated to move utilities, this would be the time to capitalize on that condition for the mutual benefit of both projects.

Realizing that the timing of these two projects might not synchronize, the design team has structured the work packages such that the utility installation/relocation might be split and phased between the two schools. The NEMT share would include new utility installation in Hemlock Road from the WMHS project limit line, east to the NEMT project location:

- 1,120 feet length of utility excavation, installation, backfill, and re-paving of the street under existing Hemlock Road (to NEMT property line)
- 590 feet of new installation under new pavement as part of the NEMT project (inside of NEMT property line).

If it turns out that the Wakefield project is significantly delayed, the NEMT project would have to find another way to get natural gas onto the site: either paying the full cost of running the line from Farm Street, up Hemlock Road to the school; or by way of an easement from the north in the vicinity of Wiley Street or Water Street (please note that this second option is the cost that has been carried in the Capital Improvement Plan Option cost estimate). This alternate easement plan was first discussed by NEMT officials in the early 2000's and concept drawings were provided to the design team as part of the study.

Incidentally, the sanitary sewer line currently leaves the NEMT building to the north and downhill to Water Street, and appears to be adequate to serve the proposed project under any of the Options with some modifications and new connections.



NORTHEAST METROPOLITAN VOCATIONAL SCHOOL – SITework OPTIONS - AERIAL BIRD'S EYE VIEW LOOKING SOUTH

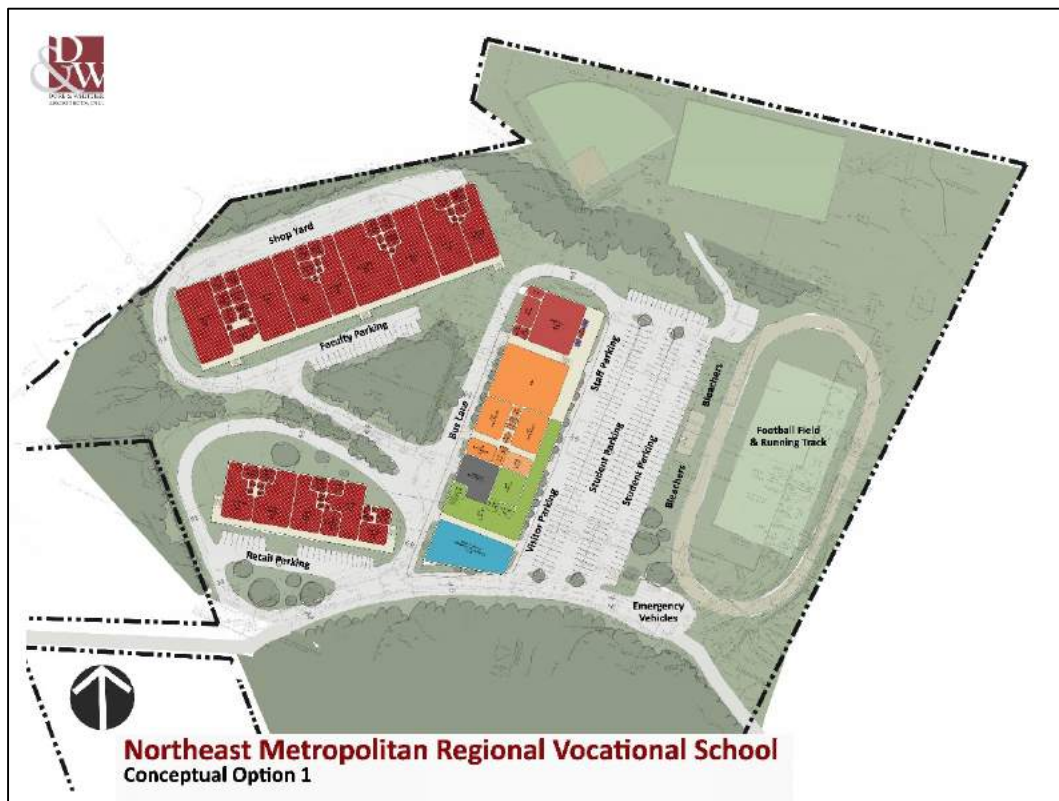
REJECTED BUILDING OPTIONS

In total six options were studied and four were formalized for estimating out of the educational visioning process as well as parallel design efforts by the architects. The rejected options are included here for reference.

Option 1 – “Bridges” Scheme:

This option split the program of the facility into three separate blocks, each located on a relatively level, open area of the existing site, and linked together by bridges to tie together the various levels of the school. The intent was to utilize open areas of the site to allow construction to commence while keeping the existing school running, and provide a smooth transition with no interruption to educational programs. This option was determined to be impractical due to:

- too great a separation between program elements that could have beneficial synergies
- the practical and programmatic/educational isolation of the building blocks due to only some levels being connected by the bridges
- increased travel times within the building
- site circulation difficulties mainly due to grade changes
- loss of the baseball field in the site plan
- significant earthwork and fill required to build a new football field/track facility



“Hilltop” Option:

As part of the visioning work, the undeveloped southern portion of the NEMT land parcel was identified as a possible location for an all-new facility. Please refer to the attached site plan/ site section drawings directly after this section.

The discussion began with the observation that the present site has only one vehicular entrance/egress through Hemlock Road (shared with Wakefield High School), and this is of great concern for reasons of day-to-day circulation and traffic congestion as well as emergency access and scenario planning. An old agricultural road/trail exists that goes up over the hilly southern portion of the site. The team studied the grades of this trail, the ability to “bench in” pads large enough to build upon the hillside, and ways to provide functional vehicular and pedestrian circulation around it. After a walk along this trail, the option appeared somewhat promising.

It should be noted that this portion of the site has moderate to steep slopes, very little topsoil, and pervasive granite ledge outcrops. It has been stated by committee members familiar with the conditions that the ledge is very hard, would not be able to be ripped with heavy equipment, and would need to be blasted.

The least-sloped portion of the site was identified, and once required lot setbacks were applied, a building envelope took shape. This envelope was also informed by the alignment of the existing road/trail, which was imagined to be developed into a full-width two-lane access road. The resulting envelope broke down into three main segments: a long, narrow segment on top, and two nested L-shaped segments below it, all trying to conform to existing topography as much as possible.

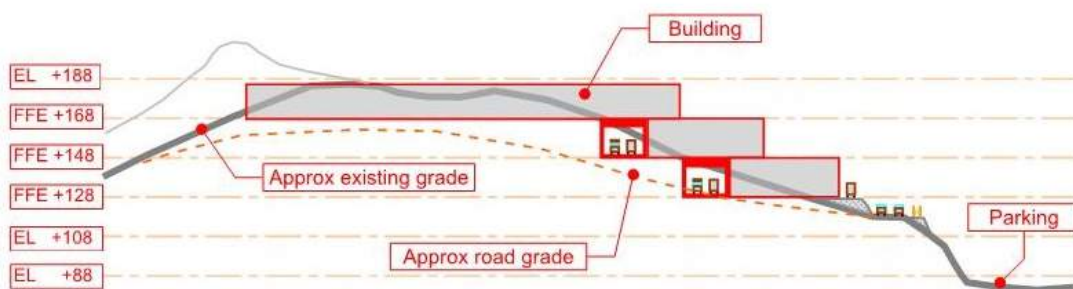
After some study of potential building solutions in both plan and section using this envelope, it was concluded that the 50 to 60 foot grade difference between the high and low ends of the building envelope, resulting in 20 foot excavated steps between the three bench levels, would create a financially untenable building solution and/or functionally compromised building plans.

Additionally, though some parking lots could be created near the building alongside the access road, much of the necessary parking would still be down in the present parking lot area, creating a 40 foot elevation change between that lot and the lowest building level. This would introduce challenges for accessibility as well as operational and logistical challenges for all building users.

For all these reasons, the option was abandoned.



SCHEMATIC SITE PLAN
not to scale



SCHEMATIC SITE SECTION
not to scale

**NORTHEAST METRO TECH
HILLTOP OPTION
DORE & WHITTIER ARCHITECTS
11.13.2015**

Capital Improvement Plan
Northeast Metropolitan Regional Vocational High School
Wakefield, Massachusetts
21 July 2015

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1	Health, Safety & Welfare										
	1.01	Civil - Replace existing track and field with new sod/grass playing field and replace track surface	1	ea	\$900,000	\$135,000	\$1,035,000	\$155,250	\$103,500	\$258,750	\$1,552,500
	1.02	Civil - Replace the day care playground play surface with a new resilient surface	1	ea	\$160,000	\$24,000	\$184,000	\$27,600	\$18,400	\$46,000	\$276,000
	1.03	Civil - Provide 16" water main to WILLEY STREET (per 1994 improvment plans)	1,100	LF	\$275,000	\$41,250	\$316,250	\$47,438	\$31,625	\$79,063	\$474,375
	1.04	Structural - Natatorium: investigative work to determine extend of corrossion of metal deck, and if concrete slab and walls have been compromised by chlorine. Make appropriate repairs.	6,500	SF	\$50,000	\$7,500	\$57,500	\$8,625	\$5,750	\$14,375	\$86,250
	1.05	Fire protection - Conduct Hydrant flow test to determine adequate municipal water supply	1	ea	\$3,000	\$450	\$3,450	\$518	\$345	\$863	\$5,175
	1.06	Fire Protection - Provide addressable automatic sprinkler system throughout building.	240,138	All Bldg SF	\$1,200,690	\$180,104	\$1,380,794	\$207,119	\$138,079	\$345,198	\$2,071,190
	1.07	Mech - Add ventilation to areas not directly ventilated, including corridors .	240,138	All Bldg SF	\$500,000	\$75,000	\$575,000	\$86,250	\$57,500	\$143,750	\$862,500
	1.08	Mech - Replace all heating and ventilating units in the shops, studios, etc. , starting with the units in the worst condition or with the most ventilation complaints. Start with auto technology shop first due to need for good ventilation with the presence of gasoline vapors. Print shop is also high on the list.	10	ea	\$480,000	\$72,000	\$552,000	\$82,800	\$55,200	\$138,000	\$828,000
	1.09	Mech - Replace air handling unit serving the cafeteria to provide required make-up air quantity to kitchen hoods.	2	ea	\$225,000	\$33,750	\$258,750	\$38,813	\$25,875	\$64,688	\$388,125
	1.10	Electrical - The exterior lights should be replaced under a renovation program with LED cut-off luminaires with multi-level control capability.	240,138	All Bldg SF	\$240,000	\$36,000	\$276,000	\$41,400	\$27,600	\$69,000	\$414,000
	1.11	Electrical - Freezer and cooler alarm should be connected to the building management system.	2	ea	\$2,000	\$300	\$2,300	\$345	\$230	\$575	\$3,450
	1.12	Electrical - All kitchen, boiler room, and receptacles within 6' of water sources need to be protected with GFI breakers or GFI receptacles.	240,138	All Bldg SF	\$5,000	\$750	\$5,750	\$863	\$575	\$1,438	\$8,625
	1.13	Electrical - Emergency power off devices should be provided in kitchen and in boiler room to kill power to equipment during an emergency.	2	ea	\$2,500	\$375	\$2,875	\$431	\$288	\$719	\$4,313
	1.14	Electrical - A bi-directional antenna system to enhance communications of portable radios will likely be required by the local officials under a renovation program.	1	ea	\$120,000	\$18,000	\$138,000	\$20,700	\$13,800	\$34,500	\$207,000
	1.15	Plumbing - Provide Tepid water to emergency eyewash fixtures.	10	ea	\$40,000	\$6,000	\$46,000	\$6,900	\$4,600	\$11,500	\$69,000
	1.16	Security - Conitnue migration from legacy cameras to HD cameras; address latency in calling cameras	240,138	All Bldg SF	\$150,000	\$22,500	\$172,500	\$25,875	\$17,250	\$43,125	\$258,750
	1.17	Security - Replace voice intercoms with video intercoms that integrate video, camera and card technology	240,138	All Bldg SF	\$75,000	\$11,250	\$86,250	\$12,938	\$8,625	\$21,563	\$129,375
	1.18	Civil - Provide 2nd means of egress from site. Option 1: Develop Road along right-of-wy (power lines) connecting Hemlock Road to Farm Street.	2,300	LF	\$435,978	\$65,397	\$501,374	\$75,206	\$50,137	\$125,344	\$752,062
	1.19	Civil - Provide 2nd means of egress from site. Option 3: Provide access road from north west area of site to Water Street, along path of any water/gas improvements.	1,100	LF	\$208,511	\$31,277	\$239,788	\$35,968	\$23,979	\$59,947	\$359,682

Capital Improvement Plan
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Wakefield, Massachusetts
21 July 2015

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2	Code Compliance (items not noted above)										
	2.01	Electrical - A new exterior generator should be provided within a weatherproof, sound-attenuated enclosure. The generator should be sized for code required life safety systems as well as other optional loads including boilers, pumps, refrigeration, security systems, one elevator, communications systems, etc. LED exit signs should be provided to meet code.	1	ea	\$720,000	\$108,000	\$828,000	\$124,200	\$82,800	\$207,000	\$1,242,000
	2.02	Electrical - The fire alarm system should be replaced with a code compliant, ADA compatible, addressable system. Voice evacuation is now required by code for K-12 occupancies.	240,138	All Bldg SF	\$480,000	\$72,000	\$552,000	\$82,800	\$55,200	\$138,000	\$828,000
	2.03	Plumbing- Provide grease interceptor at dishwashers.	1	ea	\$7,500	\$1,125	\$8,625	\$1,294	\$863	\$2,156	\$12,938
	2.04	Food Service - Overall the entire kitchen and serving area requires a finishes upgrade in order to comply with current food code standards.	8,033	All kitch SF	\$321,320	\$48,198	\$369,518				
	2.05	Technology - Confirm local sound systems are interfaced with the fire alarm system to mute during an alarm.	240,138	All Bldg SF	\$25,000	\$3,750	\$28,750	\$4,313	\$2,875	\$7,188	\$43,125
3	Functional Use of Building (Impact on Learning - below MSBA standards)										
	3.01	Electrical - Additional power receptacles should be provided and fed from a system of computer grade panelboards.	240,138	All Bldg SF	\$240,000	\$36,000	\$276,000	\$41,400	\$27,600	\$69,000	\$414,000
	3.02	Food Service - Provide proper equipment for Chef's table (cooking line support)		Assume quan	\$145,000	\$21,750	\$166,750	\$25,013	\$16,675	\$41,688	\$250,125
	3.03	Food Service - Provide proper equipment for Garden Manager Station (cold prep of salads and desserts)		Assume quan	\$80,000	\$12,000	\$92,000	\$13,800	\$9,200	\$23,000	\$138,000
	3.04	Replace flooring throughout - classrooms LIN	194,735	All CR SF	\$2,142,085	\$321,313	\$2,463,398	\$369,510	\$246,340	\$615,849	\$3,695,097
	3.05	Replace flooring throughout - shops: resurface concrete floors	44,688	All Shop SF	\$223,440	\$33,516	\$256,956	\$38,543	\$25,696	\$64,239	\$385,434
	3.06	Replace concealed spline ceiling tile with suspended acoustical ceiling system	240,138	All Bldg SF	\$1,097,431	\$164,615	\$1,262,045	\$189,307	\$126,205	\$315,511	\$1,893,068
4	Handicap Accessibility (includes only items not noted above)										
	4.01	Civil - New football field press box with accessible elevator	1	ea	\$225,000	\$33,750	\$258,750	\$38,813	\$25,875	\$64,688	\$388,125
	4.02	Civil - Provide handicap parking (4 spaces) at football field. Account for 1600 SF (parking spaces and turnaround) and 600 foot (30' rise) pathway to field. Budget to clear/blast 30,000 SF.	1600	SF	\$10,000	\$1,500	\$11,500	\$1,725	\$1,150	\$2,875	\$17,250
	4.02b	Pathway/ramp	600	LF	\$108,000	\$16,200	\$124,200	\$18,630	\$12,420	\$31,050	\$186,300
	4.02c	Clearing/Blasting	30000	SF	\$180,000	\$27,000	\$207,000	\$31,050	\$20,700	\$51,750	\$310,500
	4.03	Civil- Provide handicap accessible bleacher	1,960	seats	\$490,000	\$73,500	\$563,500	\$84,525	\$56,350	\$140,875	\$845,250
	4.04	Civil - Provide handicap accessible pathway to practice field. Include allowance for blasting to create wider path for emergency vehicular access, handicapp parking or to allow for ramps.	1600	SF	\$30,000	\$4,500	\$34,500	\$5,175	\$3,450	\$8,625	\$51,750
	4.04b	Pathway/ramp	600	LF	\$108,000	\$16,200	\$124,200				
	4.05	Civil - Provide accessible route from handicap parking spaces to building entrance	85	LF	\$15,300	\$2,295	\$17,595	\$2,639	\$1,760	\$4,399	\$26,393

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	4.06	Electrical -A two-way communications system for handicap use will be required at elevator lobbies to communicate with administration under a renovation program.	1	ea	\$75,000	\$11,250	\$86,250	\$12,938	\$8,625	\$21,563	\$129,375
	4.07	Electrical - All controls that exceed 48" above floor need to be modified under a renovation program to make them accessible.	240,138	All Bldg SF	\$100,000	\$15,000	\$115,000	\$17,250	\$11,500	\$28,750	\$172,500
	4.08	Civil - provide 200 LF ramp to access Basketball court (10 foot rise from parking lot)	200	LF	\$130,000	\$19,500	\$149,500	\$22,425	\$14,950	\$37,375	\$224,250
	4.09	Civil - provide 600 foot ramp to access lower practice fields from parking lot.	600	LF	\$390,000	\$58,500	\$448,500	\$67,275	\$44,850	\$112,125	\$672,750
5	Maintenance - Extending the Life of the Building (includes only items not noted above)										
	5.01	Civil - Convert from oil and propane to 3" high-pressure gas main - - connection to WILLEY STREET parallel to new water main (per 1994 improvement plans)	1,100	LF	\$66,000	\$9,900	\$75,900	\$11,385	\$7,590	\$18,975	\$113,850
	5.02	Civil - Provide 4 new basketball hoops at basketball court.	4	ea	\$5,000	\$750	\$5,750	\$863	\$575	\$1,438	\$8,625
	5.03	Civil- Resurface basketball courts (2 side-by-side courts)	2	ea	\$49,600	\$7,440	\$57,040	\$8,556	\$5,704	\$14,260	\$85,560
	5.04	Civil - Provide new chain-link fence around basketball courts	460	LF	\$27,600	\$4,140	\$31,740	\$4,761	\$3,174	\$7,935	\$47,610
	5.05	Civil - Softball field - provide new grass field	1	ea	\$300,000	\$45,000	\$345,000	\$51,750	\$34,500	\$86,250	\$517,500
	5.06	Civil - Softball field - provide team dugouts	2	ea	\$20,000	\$3,000	\$23,000	\$3,450	\$2,300	\$5,750	\$34,500
	5.07	Civil - Softball field - provide spectator seating - (2) new aluminum bleachers for 100 seats each	2	100 seats	\$30,000	\$4,500	\$34,500	\$5,175	\$3,450	\$8,625	\$51,750
	5.08	Civil - Baseball field - provide new grass field	1	ea	\$380,000	\$57,000	\$437,000	\$65,550	\$43,700	\$109,250	\$655,500
	5.09	Civil - Baseball field - provide team dugouts	2	ea	\$20,000	\$3,000	\$23,000	\$3,450	\$2,300	\$5,750	\$34,500
	5.10	Civil - Baseball field - provide spectator seating - (2) new aluminum bleachers for 100 seats each	2	100 seats	\$30,000	\$4,500	\$34,500	\$5,175	\$3,450	\$8,625	\$51,750
	5.11	Civil - Baseball field - Replace chain-link fence	1,363	LF	\$81,780	\$12,267	\$94,047	\$14,107	\$9,405	\$23,512	\$141,071
	5.12	Civil - Resurface all pavement and reset/replace curbing	287,140	SF	\$1,148,560	\$172,284	\$1,320,844	\$198,127	\$132,084	\$330,211	\$1,981,266
	5.13	Civil - Restripe parking areas to provide more parking spaces including handicap spaces	287,140	SF	\$25,000	\$3,750	\$28,750	\$4,313	\$2,875	\$7,188	\$43,125
	5.14	Civil - Reset day care playground fence	450	LF	\$9,000	\$1,350	\$10,350	\$1,553	\$1,035	\$2,588	\$15,525
	5.15	Mech - Replace 2 existing hot water boilers with five (5) 4,000 MBH high efficiency condensing gas boilers. (Two of the boilers will be back-up to provide redundancy and a more reliable heating system.)	5	ea	\$700,000	\$105,000	\$805,000	\$120,750	\$80,500	\$201,250	\$1,207,500
	5.16	Mech - Replace pneumatic system with a DDC System	240,138	All Bldg SF	\$1,300,000	\$195,000	\$1,495,000	\$224,250	\$149,500	\$373,750	\$2,242,500
	5.17	Mech - Modify the roof intake vents that are causing snow ingestion/leaking problems, such as in the gymnasium.	240,138	All Bldg SF	\$30,000	\$4,500	\$34,500	\$5,175	\$3,450	\$8,625	\$51,750
	5.18	Mech - Replace the expansion tanks in the boiler room.	2	ea	\$10,000	\$1,500	\$11,500	\$1,725	\$1,150	\$2,875	\$17,250

Capital Improvement Plan
Northeast Metropolitan Regional Vocational High School
Wakefield, Massachusetts
21 July 2015

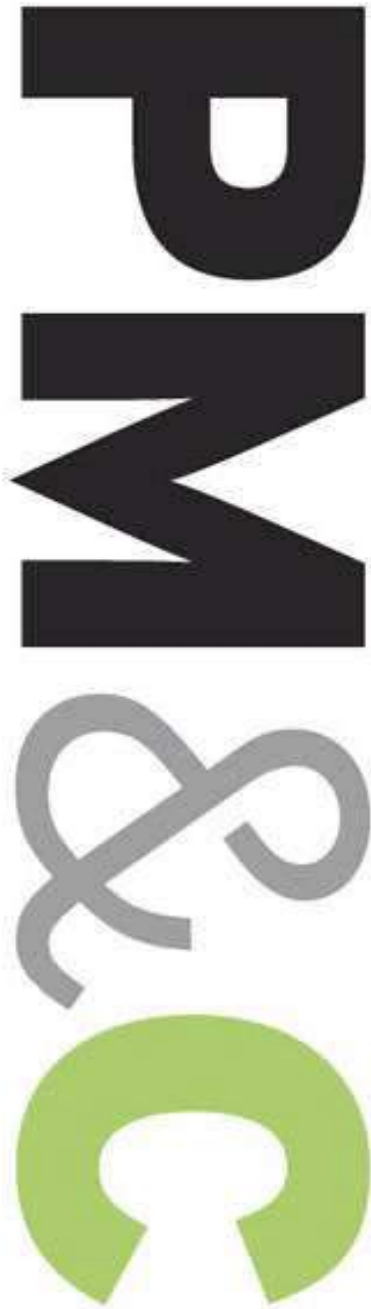
		Northeast Metropolitan Regional Vocational High School (240,138 SF existing)	Quantities	Units	Trade Costs	GC Markups ¹	Costs incl GC Markups ¹	Design and Estimating Contingency 15%	Owners Contingency 10%	Soft Cost Allowance 20%	Estimated Cost
	5.19	Mech - Add isolation valves to major piping runs to improve ease of maintenance. Replace suspect runs of piping and existing valves & fittings in their entirety if leaking or suspected/deteriorated.	240,138	All Bldg SF	\$500,000	\$75,000	\$575,000	\$86,250	\$57,500	\$143,750	\$862,500
	5.20	Mech - Systematically replace the unit ventilators and supplemental finned tube radiation serving the classrooms. Add the unit ventilators to the DDC control system. Improved classroom ventilation and temperature control will improve the learning environment.	240,138	All Bldg SF	\$480,000	\$72,000	\$552,000	\$82,800	\$55,200	\$138,000	\$828,000
	5.21	Mech - Replace the exhaust fans associated with the unit ventilators. Add fans to DDC control system.	240,138	All Bldg SF	\$120,000	\$18,000	\$138,000	\$20,700	\$13,800	\$34,500	\$207,000
	5.22	Mech - Replace the chiller when unit starts to incur excessive repair costs. The chiller is 20 years old.	1	ea	\$225,000	\$33,750	\$258,750	\$38,813	\$25,875	\$64,688	\$388,125
	5.23	Mech - Replace the cooling tower when it has deteriorated beyond repair or incurs excessive repair costs. Replacement tower fan to be controlled by a variable speed drive for improved energy efficiency.	1	ea	\$60,000	\$9,000	\$69,000	\$10,350	\$6,900	\$17,250	\$103,500
	5.24	Electrical - The power distribution system, due to its age and poor condition, needs to be replaced in its entirety. A new pad mounted transformer should be located on the exterior with new underground primary and secondary services.	240,138	All Bldg SF	\$1,000,000	\$150,000	\$1,150,000	\$172,500	\$115,000	\$287,500	\$1,725,000
	5.25	Electrical - A lightning protection system should be considered under a renovation program.	1	ea	\$120,000	\$18,000	\$138,000	\$20,700	\$13,800	\$34,500	\$207,000
	5.26	Plumbing- Insulate all domestic water piping	240,138	All Bldg SF	\$150,000	\$22,500	\$172,500	\$25,875	\$17,250	\$43,125	\$258,750
	5.27	Plumbing - video inspection of existing cast iron drainage piping to confirm integrity	240,138	All Bldg SF	\$50,000	\$7,500	\$57,500	\$8,625	\$5,750	\$14,375	\$86,250
	5.28	Food Service - Kitchen equipment upgrades are needed. Walk-in coolers, work surfaces, hoods, and ware washing represents the greatest need but supplemental equipment needed for serving must also be considered. Plan for full kitchen equipment replacement allowance.	8033	Kitchen SF	\$780,000	\$117,000	\$897,000	\$134,550	\$89,700	\$224,250	\$1,345,500
	5.29	Technology - Upgrade master clock system to a GPS/LAN based wireless clock system. The clock head end will be installed in the building MDF Room and either connected to a time server or a GPS antenna to receive and distribute the time to the remote wireless clocks. Interface with the telephone system and paging. Secondary wireless clocks can be battery operated or 120V hard wired. Each clock receives and transmits a signal.	240,138	All Bldg SF	\$120,000	\$18,000	\$138,000	\$20,700	\$13,800	\$34,500	\$207,000
	5.30	Technology -Replace paging system with a new microprocessor based paging systems to establish direct communication between any remote station and desktop instrument. Integrate with the master clock system and telephone system. Provide with a visual console that is web based.	240,138	All Bldg SF	\$120,000	\$18,000	\$138,000	\$20,700	\$13,800	\$34,500	\$207,000
	5.31	Technology -Upgrade Cat3 cable to Cat6 cable (and any renovation or reconfiguration of spaces shall be taken advantage of to replace any Cat5e with Cat6 cable). IDF closets should be constructed to serve areas of the buildings with proper ventilation power and cooling. (This will phase out the individual cubicles currently mounted out in occupied spaces.)	240,138	All Bldg SF	\$840,000	\$126,000	\$966,000	\$144,900	\$96,600	\$241,500	\$1,449,000
	5.32	Arch - Cement parging at foundation around building should be resurfaced if minor cracks are evident. At areas that have severe breaks and chunks of detaching material, removed damaged sections before repairing.	5000	SF	\$75,000	\$11,250	\$86,250	\$12,938	\$8,625	\$21,563	\$129,375
	5.33	Arch- Resurface cracked/spalling concrete. Replace concrete pads at doors that have deteriorated beyond repair.	20	CY	\$6,000	\$900	\$6,900	\$1,035	\$690	\$1,725	\$10,350
	5.34	Arch- Clean rust off concrete at Loading Dock with a rust remover or lightly sandblast.	200	SF	\$2,000	\$300	\$2,300	\$345	\$230	\$575	\$3,450

Capital Improvement Plan
Northeast Metropolitan Regional Vocational High School
Wakefield, Massachusetts
21 July 2015

		Northeast Metropolitan Regional Vocational High School (240,138 SF existing)	Quantities	Units	Trade Costs	GC Markups ¹	Costs incl GC Markups ¹	Design and Estimating Contingency 15%	Owners Contingency 10%	Soft Cost Allowance 20%	Estimated Cost
	5.35	Arch - Efflorescence at exterior brick of Natatorium should be addressed with a vapor barrier applied to the interior of unfinished CMU. Sealants should be used at any gaps found where exterior wall meets the roof and at windows to prevent water vapor and air from entering the brick cavity. Once this work is complete, clean efflorescence from brick masonry with appropriate cleaning product.	9,100	SF of Wall	\$182,000	\$27,300	\$209,300	\$31,395	\$20,930	\$52,325	\$313,950
	5.36	Arch - Repoint any mortar deterioration to prevent further damage. Isolated locations around the building, as well as at chimney.	300	SF of Wall	\$9,000	\$1,350	\$10,350	\$1,553	\$1,035	\$2,588	\$15,525
	5.37	Arch - Clean soot from brick of flammable storage structures.	750	SF of Wall	\$7,500	\$1,125	\$8,625	\$1,294	\$863	\$2,156	\$12,938
	5.38	Arch - Clean rust off brick/concrete where stained.	2000	SF of Wall	\$20,000	\$3,000	\$23,000	\$3,450	\$2,300	\$5,750	\$34,500
	5.39	Arch- Repair/fill damaged brick and holes in precast panels.	100	ea	\$12,000	\$1,800	\$13,800	\$2,070	\$1,380	\$3,450	\$20,700
	5.40	Arch - Replace any failed expansion joints.	600	LF	\$24,000	\$3,600	\$27,600	\$4,140	\$2,760	\$6,900	\$41,400
	5.41	Arch - Replace rusted air intake grills	80	ea	\$16,000	\$2,400	\$18,400	\$2,760	\$1,840	\$4,600	\$27,600
	5.42	Arch - Budget to replace EPDM Roofing at all roof areas except Area C. Replace/repair rusted roof hatches, rusted ladders, metal fascia, wood soffits and trim, drain covers, support structures for rooftop equipment, gutters and splashguards where needed.	240,138	All Bldg SF	\$3,770,250	\$565,538	\$4,335,788	\$650,368	\$433,579	\$1,083,947	\$6,503,681
	5.43	Arch -Gut renovation of toilet rooms	3950	All TR SF	\$592,500	\$88,875	\$681,375	\$102,206	\$68,138	\$170,344	\$1,022,063
	5.44	Arch - Replace interior partition doors with accordian fire doors (opens up corridors)	14	opgs	\$70,000	\$10,500	\$80,500	\$12,075	\$8,050	\$20,125	\$120,750
	5.45	Arch - Gut renovation of locker rooms - gym	6325	SF	\$628,800	\$94,320	\$723,120	\$108,468	\$72,312	\$180,780	\$1,084,680
	5.46	Arch - Gut renovation of locker rooms - pool	2,200	SF	\$216,000	\$32,400	\$248,400	\$37,260	\$24,840	\$62,100	\$372,600
	5.47	Arch - add 5/8" GWB w/ edge trim, PTD, over all exposed shop ceilings at each structural bay - assume 80% ceiling coverage	35,750	Shop SF @ 80%	\$343,200	\$51,480	\$394,680	\$59,202	\$39,468	\$98,670	\$592,020
	5.48	Arch - Replace corridor lockers	1250	openings	\$300,000	\$45,000	\$345,000	\$51,750	\$34,500	\$86,250	\$517,500
6	Energy Efficiency / Energy, Water Saving (includes only items not noted above)										
	6.01	Mech - Replace one of the hot water heating pumps. The pump will be controlled by a variable speed drive with differential pressure controls to save energy.	1	ea	\$20,000	\$3,000	\$23,000	\$3,450	\$2,300	\$5,750	\$34,500
	6.02	Mech - Replace one of the chilled water pumps. The pump will be controlled by a variable speed drive with differential pressure controls to save energy.	1	ea	\$20,000	\$3,000	\$23,000	\$3,450	\$2,300	\$5,750	\$34,500
	6.03	The interior lighting should be replaced with energy efficient, long life LED sources. Room occupancy sensors should be provided to conserve energy. Dimming photosensors should also be provided to automatically dim fixtures where natural daylight is available.	240,138	All Bldg SF	\$2,173,000	\$325,950	\$2,498,950	\$374,843	\$249,895	\$624,738	\$3,748,425
	6.04	An automated lighting control system should be provided for interior and exterior lighting to conserve energy. The control system should interface with building management systems, security systems and fire alarm system.	240,138	All Bldg SF	Inc above						
	6.05	Plumbing - Provide new high efficiency, low flow, water conserving plumbing fixtures.	122	fixtures	\$150,000	\$22,500	\$172,500	\$25,875	\$17,250	\$43,125	\$258,750
	6.06	Plumbing - Provide a water heater for summer hot water usage in lieu of running the boilers to generate hot water.	1	ea	\$30,000	\$4,500	\$34,500	\$5,175	\$3,450	\$8,625	\$51,750
	6.07	Arch - Replace exterior doors and door frame systems throughout.	50	leafs	\$175,000	\$26,250	\$201,250	\$30,188	\$20,125	\$50,313	\$301,875
	6.08	Arch - Replace overhead doors at non-automotive shop spaces with insulated, oversized swinging doors for better themal value. Assume each opg 6'-0" x 8'-0" (2 @ 3')	5	opgs	\$20,000	\$3,000	\$23,000	\$3,450	\$2,300	\$5,750	\$34,500
	6.09	Arch - replace overhead doors at automotive shops. Assume 10' W x 14' H	4	opgs	\$39,200	\$5,880	\$45,080	\$6,762	\$4,508	\$11,270	\$67,620
	6.10	Arch - replace single pane windows throughout with high efficiency thermally broken aluminum windows with dual pane glazing.	21,444	SF	\$2,037,214	\$305,582	\$2,342,796	\$351,419	\$234,280	\$585,699	\$3,514,194

Capital Improvement Plan
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21 July 2015

		Northeast Metropolitan Regional Vocational High School (240,138 SF existing)	Quantities	Units	Trade Costs	GC Markups ¹	Costs incl GC Markups ¹	Design and Estimating Contingency 15%	Owners Contingency 10%	Soft Cost Allowance 20%	Estimated Cost
7	Hazardous Materials Abatement										
	7.01	Abatement as recommended in Universal Environmental Cons. report	1	ea	\$1,500,000	\$1,500,000	\$1,500,000				\$1,500,000
											\$0
		TOTALS			\$33,651,959	\$6,322,794	\$38,474,753	\$5,472,155	\$3,648,103	\$9,120,259	\$56,221,552
GENERAL NOTES											
1. Cost Estimates have been prepared by PM&C. Costs are conceptual in nature, are for comparison purposes only and are not intended for use in construction. They are based on current market conditions in September 2015 and must be adjusted for inflation and construction market conditions for each year beyond this date. No cost for phasing or portable classrooms has been included.											
2. An Allowance has been provided for Hazardous Materials abatement (asbestos, lead, pcb). The actual cost depends on the scope and extent of the work performed as well as any additional testing that may be necessary as part of the scope of the work.											
3. GC Overhead & Profit and estimated Soft Costs and Owner's Contingency have been included in these figures.											
4. Refer to each section of the Report for more detailed information. Before moving forward with a specific project, a detailed review of the scope of work and a re-assessment of the cost estimate for that scope should be performed.											
5. Some items should be completed in combination with other items. Some of these suggestions may be noted above. We recommend that once a scope of work is desired to be pursued, a mini-study should be done to confirm which work should be done together. See the next general note below for additional information.											
6. Due to the conceptual nature of these recommendations and estimates and the complexity of existing conditions, several solutions may be provided to achieve the end result. Existing conditions in some areas may limit the ability to fully implement the proposed scope of work. Part or all of this work may trigger other renovation requirements related to code, seismic, sprinklers or handicap accessibility. Once a determination is made to move forward with a specific improvement line item, a mini study specific to the scope of work should be done to confirm the scope of work, prepare sketches as necessary and prepare a refined cost estimate.											



Feasibility Design Submission

Northeast Metro Tech High School Design Options

Wakefield, MA

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Prepared for:

Dore and Whittier

December 17, 2015



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

MAIN CONSTRUCTION COST SUMMARY

	Construction Start	Gross Floor Area	\$/sf	Estimated Construction Cost
OPTION 2 - NEW CONSTRUCTION HILLSIDE				
DEMOLISH EXISTING BUILDING - including outbuildings (PHASED)		245,988	\$9.00	\$2,213,892
NEW BUILDING		378,929	\$247.84	\$93,911,997
REMOVE HAZARDOUS MATERIALS - Allowance				\$1,475,928
SITework				\$9,718,165
SUB-TOTAL	Sep-17	378,929	\$283.22	\$107,319,982
ESCALATION TO START - (assumed 4% PA)	7%			\$7,512,399
DESIGN AND PRICING CONTINGENCY	15%			\$16,097,997
SUB-TOTAL	Sep-17	378,929	\$345.53	\$130,930,378
GENERAL CONDITIONS	7.00%			\$9,165,126
GENERAL REQUIREMENTS	3.00%			\$3,927,911
BONDS	1.25%			\$1,636,630
INSURANCE	1.15%			\$1,505,699
PERMIT				NIC
OVERHEAD AND FEE	3.0%			\$3,927,911
GMP CONTINGENCY	3%			\$3,927,911
TOTAL OF ALL CONSTRUCTION OPTION 2	Sep-17	378,929	\$409.10	\$155,021,566



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

OPTION 3 - NEW CONSTRUCTION Z SCHEME

DEMOLISH EXISTING BUILDING - including outbuildings (PHASED)		245,988	\$10.00	\$2,459,880
NEW BUILDING		378,929	\$250.97	\$95,098,132
REMOVE HAZARDOUS MATERIALS - Allowance				\$1,475,928
SITework				\$9,562,229
SUB-TOTAL	Sep-17	378,929	\$286.59	\$108,596,169
ESCALATION TO START - (assumed 4% PA)	7%			\$7,601,732
DESIGN AND PRICING CONTINGENCY	15%			\$16,289,425
SUB-TOTAL	Sep-17	378,929	\$349.64	\$132,487,326
GENERAL CONDITIONS	7.00%			\$9,274,113
GENERAL REQUIREMENTS	3.00%			\$3,974,620
BONDS	1.25%			\$1,656,092
INSURANCE	1.15%			\$1,523,604
PERMIT				NIC
OVERHEAD AND FEE	3.0%			\$3,974,620
GMP CONTINGENCY	3%			\$3,974,620
TOTAL OF ALL CONSTRUCTION OPTION 3	Sep-17	378,929	\$413.97	\$156,864,995



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

OPTION 4 - ADDITION and RENOVATION SCHEME

DEMOLISH EXISTING PORTION OF BUILDING (PHASED)		132,968	\$10.00	\$1,329,680
NEW ADDITION		278,551	\$256.15	\$71,349,826
RENOVATION		100,378	\$210.53	\$21,132,204
TEMPORARY KITCHEN AND DINING AT PH 6		12,000	\$100.00	\$1,200,000
REMOVE HAZARDOUS MATERIALS - Allowance				\$797,808
SITework				\$9,560,455
SUB-TOTAL	Sep-17	378,929	\$278.07	\$105,369,973
ESCALATION TO START - (assumed 4% PA)	7%			\$7,375,898
DESIGN AND PRICING CONTINGENCY	15%			\$15,805,496
SUB-TOTAL	Sep-17	378,929	\$339.25	\$128,551,367
GENERAL CONDITIONS	7.00%			\$8,998,596
GENERAL REQUIREMENTS	3.00%			\$3,856,541
BONDS	1.25%			\$1,606,892
INSURANCE	1.15%			\$1,478,341
PERMIT				NIC
OVERHEAD AND FEE	3.0%			\$3,856,541
PHASING ALLOWANCE	4%			\$5,142,055
GMP CONTINGENCY	3%			\$3,856,541
TEMPORARY MODULAR CONSTRUCTION		41,500	\$150.00	\$6,225,000
TOTAL OF ALL CONSTRUCTION OPTION 4	Sep-17	378,929	\$431.67	\$163,571,874



Northeast Metro Tech High School

Design Options

Wakefield, MA

17-Dec-15

Feasibility Design Submission

Costs below are applicable to all schemes

ADD FOR SECONDARY ENTRANCE (Includes all Markups)	ADD	\$2,618,604
ADD FOR UTILITY ELOCATION AT HEMLOCK - NEMT SHARE (Includes all Markups)	ADD	\$1,330,272

Assumed CMr procurement

This Feasibility cost estimate was produced from drawings, outline specifications and other documentation prepared by Dore and Whittier Architects and their design team dated November 23, 2015. Design and engineering changes occurring subsequent to the issue of these documents have not been incorporated in this estimate.

This estimate includes all direct construction costs, construction manager's overhead, fee and design contingency. Cost escalation assumes start dates indicated.

Bidding conditions are expected to be public bidding under Chapter 149a of the Massachusetts General Laws to pre-qualified construction managers, and pre-qualified sub-contractors, open specifications for materials and manufactures.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

ITEMS NOT CONSIDERED IN THIS ESTIMATE

Items not included in this estimate are:

- Land acquisition, feasibility, and financing costs
- All professional fees and insurance
- Site or existing conditions surveys investigations costs, including to determine subsoil conditions
- All Furnishings, Fixtures and Equipment
- Items identified in the design as Not In Contract (NIC)
- Items identified in the design as by others
- Owner supplied and/or installed items as indicated in the estimate
- Utility company back charges, including work required off-site
- Work to City streets and sidewalks, (except as noted in this estimate)
- Construction contingency



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA 378,929

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 2 - NEW SCHOOL HILLSIDE OPTION					
A10 FOUNDATIONS					
A1010	Standard Foundations	\$1,347,808			
A1020	Special Foundations	\$0			
A1030	Lowest Floor Construction	\$2,953,279	\$4,301,087	\$11.35	4.6%
A20 BASEMENT CONSTRUCTION					
A2010	Basement Excavation	\$467,596			
A2020	Basement Walls	\$1,359,303	\$1,826,899	\$4.82	1.9%
B10 SUPERSTRUCTURE					
B1010	Upper Floor Construction	\$7,570,366			
B1020	Roof Construction	\$4,662,694	\$12,233,060	\$32.28	13.0%
B20 EXTERIOR CLOSURE					
B2010	Exterior Walls	\$9,795,583			
B2020	Windows	\$3,502,456			
B2030	Exterior Doors	\$118,541	\$13,416,580	\$35.41	14.3%
B30 ROOFING					
B3010	Roof Coverings	\$3,341,388			
B3020	Roof Openings	\$32,500	\$3,373,888	\$8.90	3.6%
C10 INTERIOR CONSTRUCTION					
C1010	Partitions	\$9,852,154			
C1020	Interior Doors	\$1,515,716			
C1030	Specialties/Millwork	\$2,599,093	\$13,966,963	\$36.86	14.9%
C20 STAIRCASES					
C2010	Stair Construction	\$392,000			
C2020	Stair Finishes	\$80,630	\$472,630	\$1.25	0.5%
C30 INTERIOR FINISHES					
C3010	Wall Finishes	\$1,894,645			
C3020	Floor Finishes	\$2,652,503			
C3030	Ceiling Finishes	\$2,273,574	\$6,820,722	\$18.00	7.3%
D10 CONVEYING SYSTEMS					
D1010	Elevator	\$260,000	\$260,000	\$0.69	0.3%
D20 PLUMBING					
D20	Plumbing	\$4,781,112	\$4,781,112	\$12.62	5.1%



Northeast Metro Tech High School
Design Options
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17-Dec-15

Feasibility Design Submission

GFA 378,929

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 2 - NEW SCHOOL HILLSIDE OPTION					
D30 HVAC					
D30 HVAC		\$13,319,235	\$13,319,235	\$35.15	14.2%
D40 FIRE PROTECTION					
D40 Fire Protection		\$1,545,550	\$1,545,550	\$4.08	1.6%
D50 ELECTRICAL					
D5010 Complete System		\$12,840,336	\$12,840,336	\$33.89	13.7%
E10 EQUIPMENT					
E10 Equipment		\$2,412,200	\$2,412,200	\$6.37	2.6%
E20 FURNISHINGS					
E2010 Fixed Furnishings		\$2,041,735			
E2020 Movable Furnishings	NIC		\$2,041,735	\$5.39	2.2%
F10 SPECIAL CONSTRUCTION					
F10 Special Construction		\$300,000	\$300,000	\$0.79	0.3%
F20 HAZMAT REMOVALS					
F2010 Building Elements Demolition		\$0			
F2020 Hazardous Components Abatement		\$0	\$0	\$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)			\$93,911,997	\$247.84	100.0%



Feasibility Design Submission

GFA 378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

GROSS FLOOR AREA CALCULATION

LL	98,635
First Floor	162,864
UL	117,430

TOTAL GROSS FLOOR AREA (GFA)

378,929 sf

A10 FOUNDATIONS

A1010 STANDARD FOUNDATIONS

Strip footings - 3'-0" x 2'-0"

Excavation	2,994	cy	12.00	35,928
Store on site for reuse	2,994	cy	14.00	41,916
Backfill with new fill	2,455	cy	16.00	39,280
Formwork	9,240	sf	11.00	101,640
Re-bar, 10#/lf	23,100	lbs	1.20	27,720
Concrete material; 3,000 psi	539	cy	125.00	67,375
Placing concrete	539	cy	55.00	29,645

Foundation walls at exterior - 16" thick

Formwork	18,480	sf	12.50	231,000
Re-bar, 4#/sf	36,960	lbs	1.20	44,352
Concrete material; 4,000 psi	419	cy	135.00	56,565
Placing concrete	419	cy	65.00	27,235
Dampproofing foundation wall and footing	13,860	sf	1.90	NIC
Insulation to foundation walls; 2" thick	9,240	sf	2.50	23,100
Form shelf	2,310	lf	8.00	18,480

Thickened slab at interior load bearing walls

Excavation	1,345	cy	12.00	16,140
Store on site for reuse	1,345	cy	14.00	18,830
Backfill with new fill	1,224	cy	16.00	19,584
Formwork	2,075	sf	11.00	22,825
Re-bar, 10#/lf	10,373	lbs	1.20	12,448
Concrete material; 3,000 psi	121	cy	125.00	15,125
Placing concrete	121	cy	55.00	6,655

Exterior column footings, typical, 8' x 8' x 2'-0"

Excavation	710	cy	15.00	10,650
Store on site for reuse	710	cy	14.00	9,940
Backfill with new fill	501	cy	16.00	8,016
Formwork	2,688	sf	11.00	29,568
Re-bar, 150/cy	31,350	lbs	1.20	37,620
Concrete material; 3,000 psi	209	cy	125.00	26,125
Placing concrete	209	cy	55.00	11,495
Set anchor bolts grout plates	42	ea	150.00	6,300

Interior column footings, typical, 9' x 9' x 2'-0"

Excavation	1,587	cy	15.00	23,805
Store on site for reuse	1,587	cy	14.00	22,218
Backfill with new fill	1,083	cy	16.00	17,328
Formwork	5,760	sf	11.00	63,360
Re-bar, 150/cy	60,000	lbs	1.20	72,000
Concrete material; 3,000 psi	504	cy	125.00	63,000
Placing concrete	504	cy	55.00	27,720
Set anchor bolts grout plates	80	ea	150.00	12,000



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 - NEW SCHOOL HILLSIDE OPTION							
56	Perimeter drainage system	2,310	lf	22.00	50,820		
57	SUBTOTAL					1,347,808	
58							
59	A1020 SPECIAL FOUNDATIONS						
60	No Work in this section						
61	SUBTOTAL						
62							
63	A1030 LOWEST FLOOR CONSTRUCTION						
64	<u>New Slab on grade, 5" thick</u>						
65	Structural gravel fill; assume 10 feet at gym wing	30,293	cy	30.00	908,790		
66	Base course, 12" gravel	6,032	cy	35.00	211,120		
67	Rigid insulation	162,864	sf	2.25	366,444		
68	Vapor barrier	162,864	sf	0.75	122,148		
69	Under slab drainage -allow	162,864	sf	2.50	407,160		
70	Mesh reinforcing 15% lap	187,294	sf	0.80	149,835		
71	Concrete - 5" thick	2,660	cy	125.00	332,500		
72	Placing concrete	2,660	cy	45.00	119,700		
73	Finishing and curing concrete	162,864	sf	1.50	244,296		
74	Control joints - saw cut	162,864	sf	0.10	16,286		
75	<u>Miscellaneous</u>						
76	New Elevator pits	2	ea	25,000.00	50,000		
77	New loading dock - allow	1	ls	20,000.00	20,000		
78	Equipment pads - allow	1	ls	5,000.00	5,000		
79	SUBTOTAL					2,953,279	
80							
81	TOTAL - FOUNDATIONS						\$4,301,087
82							
83							
84	A20 BASEMENT CONSTRUCTION						
85							
86	A2010 BASEMENT EXCAVATION						
87	Raise existing levels 2ft AV; structural fill	7,306	cy	28.00	204,568		
88	Excavation and disposal for LL at slopes	21,919	cy	12.00	263,028		
89	SUBTOTAL					467,596	
90							
91	A2020 BASEMENT WALLS						
92	<u>Strip footings at retaining wall - 6'-0" x 2'-0"</u>						
93	Excavation	1,287	cy	12.00	15,444		
94	Store on site for reuse	1,287	cy	14.00	18,018		
95	Backfill with new fill	963	cy	16.00	15,408		
96	Formwork	2,779	sf	11.00	30,569		
97	Re-bar, 10#/lf	6,948	lbs	1.20	8,338		
98	Concrete material; 3,000 psi	324	cy	125.00	40,500		
99	Placing concrete	324	cy	55.00	17,820		
100	<u>Retaining walls at LL - 28" thick</u>						
101	Formwork	33,360	sf	18.00	600,480		
102	Re-bar, 6#/sf	100,080	lbs	1.20	120,096		
103	Concrete material; 4,000 psi	1,511	cy	135.00	203,985		
104	Placing concrete	1,511	cy	65.00	98,215		
105	Waterproofing foundation wall and footing	16,680	sf	8.00	133,440		
106	Insulation to foundation walls; 2" thick	16,680	sf	2.50	41,700		
107	Perimeter drainage system	695	lf	22.00	15,290		
108	SUBTOTAL					1,359,303	
109							
110	TOTAL - BASEMENT CONSTRUCTION						\$1,826,899



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

B10 SUPERSTRUCTURE

B1010 FLOOR CONSTRUCTION

Floor Structure - Steel:

Steel beams and columns; 13/SF

Shear studs

Floor Structure

3" Metal floor Deck

WWF reinforcement

Concrete Fill to metal deck; 5 1/4" Light weight

Place and finish concrete

Misc. perimeter angles

Miscellaneous

Fire proofing to columns and beams

Fire stopping floors

SUBTOTAL

B1020 ROOF CONSTRUCTION

Roof Structure - Steel:

Steel beams/Joists; 12#/SF

Roof Structure

3" Metal floor Deck @ roof

Acoustic deck at gym, 3", type NA

Roof Structure @ Mech Equipment/Low roof

WWF reinforcement

Concrete Fill to metal deck; 5 1/4" Light weight

Place and finish concrete

Miscellaneous

Canopy framing - allow

Roof screen framing - allow

Fire proofing to columns, beams and deck

SUBTOTAL

TOTAL - SUPERSTRUCTURE

\$12,233,060

B20 EXTERIOR CLOSURE

B2010 EXTERIOR WALLS

Interior skin

8" metal stud backup

Batt insulation in stud

2 1/2" Rigid Insulation

Air barrier

Air barrier/flashing at windows

Gypsum Sheathing

Drywall lining to interior face of stud backup

Interior skin @ LL

8" CMU backup

2 1/2" Rigid Insulation

Air barrier

Premium for GF block



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

165	Exterior skin						
166	Brick veneer	70,987	sf	45.00	3,194,415		
167	Metal panels	36,569	sf	70.00	2,559,830		
168	Miscellaneous						
169	Temporary WP exterior closure between PH 1 and PH 2; includes removal	16,463	sf	40.00	658,520		
170	Aluminum sign at main entrance	1	ls	10,000.00	10,000		
171	Staging to exterior wall	139,018	sf	3.00	417,054		
172	SUBTOTAL					9,795,583	
173							
174	B2020 WINDOWS	31,462	sf				
175	Curtainwall	10,697	sf	120.00	1,283,640		
176	Premium for sunscreen and light shelf elements	1	ls	200,000.00	200,000		
177	Windows/storefront	20,765	sf	90.00	1,868,850		
178	Louvers (allowance)	250	sf	60.00	15,000		
179	Backer rod & double sealant	10,382	lf	9.00	93,438		
180	Wood blocking at openings	10,382	lf	4.00	41,528		
181	SUBTOTAL					3,502,456	
182							
183	B2030 EXTERIOR DOORS						
184	Glazed entrance doors including frame and hardware; double door	5	pr	8,000.00	40,000		
185	HM doors, frames and hardware- Double	2	pr	3,600.00	7,200		
186	HM doors, frames and hardware- Single	1	ea	1,800.00	1,800		
187	Coiling doors	9	ea	7,500.00	67,500		
188	Backer rod & double sealant	157	lf	9.00	1,413		
189	Wood blocking at openings	157	lf	4.00	628		
190	SUBTOTAL					118,541	
191							
192	TOTAL - EXTERIOR CLOSURE						\$13,416,580
193							
194							
195	B30 ROOFING						
196							
197	B3010 ROOF COVERINGS						
198	Flat roofing						
199	PVC roof membrane fully adhered	162,864	sf	7.50	1,221,480		
200	Insulation	162,864	sf	6.50	1,058,616		
201	1/2" dens-deck protection board	162,864	sf	2.00	325,728		
202	Reinforced vapor barrier	162,864	sf	1.00	162,864		
203	Rough blocking	2,505	lf	20.00	50,100		
204	Miscellaneous Roofing						
205	Canopies - allow	1,000	sf	120.00	120,000		
206	Roof screens - allow	1,500	sf	60.00	90,000		
207	Roof fascia/cornice	1,964	lf	150.00	294,600		
208	Roof ladders	1	ls	3,000.00	3,000		
209	Walk pads	1	ls	15,000.00	15,000		
210	SUBTOTAL					3,341,388	
211							
212	B3020 ROOF OPENINGS						
213	Skylights, allow	1	ls	30,000.00	30,000		
214	Roof hatch	1	loc	2,500.00	2,500		
215	SUBTOTAL					32,500	
216							
217	TOTAL - ROOFING						\$3,373,888
218							
219							
220	C10 INTERIOR CONSTRUCTION						



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

C1010 PARTITIONS

Allowance for interior partitions	378,929	gsf	26.00	9,852,154	
SUBTOTAL					9,852,154

C1020 INTERIOR DOORS

Allowance for specialty doors, doors and hardware	378,929	gsf	4.00	1,515,716	
SUBTOTAL					1,515,716

C1030 SPECIALTIES / MILLWORK

Toilet Partitions and accessories	378,929	gsf	0.80	303,143	
Backer panels in electrical closets	1	ls	1,000.00	1,000	
Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms; 20' tackboard w/ 8' markerboard in each Educational space	378,929	sf	1.00	378,929	
Catwalk platform at auditorium	1	ls	120,000.00	120,000	
Pipe grid at art classroom	1,407	sf	15.00	21,105	
Pipe grid at auditorium	3,694	sf	15.00	55,410	
Pipe grid at multimedia engineering lab	2,090	sf	15.00	31,350	
Building directory	1	loc	3,000.00	3,000	
Bronze dedication plaque	1	loc	2,500.00	2,500	
Room Signs	378,929	gsf	0.40	151,572	
Fire extinguisher cabinets	126	ea	350.00	44,100	
Corridor Lockers	378,929	gsf	1.00	378,929	
Janitors Closet Accessories	1	ls	1,000.00	1,000	
Shelving in storage rooms	1	ls	10,000.00	10,000	
Staff mailboxes/casework	1	ls	5,000.00	5,000	
Reception desk in Media - allowance	1	ls	20,000	20,000	
Library shelving				F,F & E	
Display cases	1	ls	30,000.00	30,000	
Miscellaneous metals throughout building	378,929	sf	1.50	568,394	
Miscellaneous sealants throughout building	378,929	sf	1.25	473,661	
SUBTOTAL					2,599,093

TOTAL - INTERIOR CONSTRUCTION

\$13,966,963

C20 STAIRCASES

C2010 STAIR CONSTRUCTION

Feature stair including rails and finishes	1	flt	60,000.00	60,000	
Stage stairs, wood	2	flts	5,000.00	10,000	
Metal pan stair; egress stair	10	flt	30,000.00	300,000	
Concrete fill to stairs	11	flt	2,000.00	22,000	
SUBTOTAL					392,000

C2020 STAIR FINISHES

High performance coating to stairs including all railings etc.	11	flt	3,000.00	33,000	
Rubber tile at stairs - landings	1,650	sf	12.00	19,800	
Rubber tile at stairs - treads & risers	1,265	lft	22.00	27,830	
SUBTOTAL					80,630

TOTAL - STAIRCASES

\$472,630

C30 INTERIOR FINISHES



Feasibility Design Submission

GFA 378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

C3010 WALL FINISHES

Allowance for wall finishes	378,929	gsf	5.00	1,894,645		
SUBTOTAL						1,894,645

C3020 FLOOR FINISHES

Allowance for floor finishes	378,929	gsf	7.00	2,652,503		
SUBTOTAL						2,652,503

C3030 CEILING FINISHES

Allowance for ceiling finishes	378,929	sf	6.00	2,273,574		
SUBTOTAL						2,273,574

TOTAL - INTERIOR FINISHES

\$6,820,722

D10 CONVEYING SYSTEMS

D1010 ELEVATOR

New elevator; 3 stop	2	ea	130,000.00	260,000		
SUBTOTAL						260,000

TOTAL - CONVEYING SYSTEMS

\$260,000

D20 PLUMBING

D20 PLUMBING, GENERALLY

<u>Equipment</u>						
Plumbing equipment	378,929	sf	0.90	341,036		
<u>Plumbing Fixtures</u>						
Plumbing fixtures	378,929	sf	2.00	757,858		
<u>Domestic Water Piping</u>						
Copper pipe type L with fittings & hangers	378,929	sf	3.00	1,136,787		
Valves & accessories	1	ls	285,000.00	285,000		
<u>Pipe insulation</u>						
Pipe insulation	378,929	sf	1.55	587,340		
<u>Sanitary Waste And Vent Pipe w/ Hangers</u>						
Cast iron pipe with fittings & hangers	378,929	sf	2.50	947,323		
<u>Storm Drainage, Hubless Cast Iron Pipe</u>						
Cast iron pipe with fittings & hangers	378,929	sf	0.60	227,357		
<u>Acid Waste And Vent Pipe w/ Hangers</u>						
Acid resistant pipe with fittings & hangers	378,929	sf	0.15	56,839		
<u>Natural Gas Piping</u>						
Natural gas pipe with fittings & hangers	378,929	sf	0.40	151,572		
Valves & accessories	1	ls	38,000.00	38,000		
<u>Compressed Air Piping</u>						
Black steel pipe with fittings & hangers	1	ls	16,000.00	16,000		
Valves & accessories	1	ls	4,000.00	4,000		
<u>Miscellaneous</u>						
Coordination & management	1	ls	110,000.00	110,000		
Commissioning support	1	ls	52,000.00	52,000		
Coring, sleeves & fire stopping	1	ls	10,000.00	10,000		
Testing and sterilization	1	ls	12,000.00	12,000		
Fees & permits	1	ls	48,000.00	48,000		
SUBTOTAL						4,781,112

TOTAL - PLUMBING

\$4,781,112

D30 HVAC

D30 HVAC, GENERALLY

<u>Heating equipment</u>						
Heating equipment	378,929	sf	1.25	473,661		



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

340	<u>Pumps</u>						
341	Pumps	378,929	sf	0.15	56,839		
342	<u>Cooling Equipment</u>						
343	Cooling equipment	378,929	sf	0.50	189,465		
344	<u>Air distribution</u>						
345	<u>Air Handling Unit</u>						
346	Air distribution equipment	378,929	sf	6.00	2,273,574		
347	<u>Exhaust fan</u>						
348	Exhaust fans	378,929	sf	0.75	284,197		
349	<u>Sheet metal & Accessories</u>						
350	Galvanized ductwork with fittings & hangers	303,000	lbs	10.00	3,030,000		
351	Black steel welded ductwork with hangers	6,000	lbs	14.00	84,000		
352	Boiler combustion air system	1	ls	50,000.00	50,000		
353	Registers, grilles & diffusers	2,526	ea	125.00	315,750		
354	Duct insulation	182,000	sf	4.00	728,000		
355	Miscellaneous sheet metal accessories	378,929	sf	0.50	189,465		
356	<u>Piping</u>						
357	<u>Hot Water & Chilled Water Pipe</u>						
358	Hot water piping with fittings & hangers	378,929	sf	3.50	1,326,252		
359	Chilled water piping with fittings & hangers	378,929	sf	0.60	227,357		
360	Valves & accessories	1	ls	390,000.00	390,000		
361	<u>Refrigerant Piping</u>						
362	Refrigerant piping with fittings & hangers	378,929	sf	0.12	45,471		
363	Valves & accessories	1	ls	10,200.00	10,200		
364	<u>Condensate Drain Piping</u>						
365	Condensate drain piping with fittings & hangers	378,929	sf	0.25	94,732		
366	<u>Piping Insulation</u>						
367	Piping insulation	378,929	sf	2.00	757,858		
368	<u>Controls (DDC)</u>						
369	Automatic temperature controls	378,929	sf	5.50	2,084,110		
370	<u>Balancing</u>						
371	System testing & balancing	378,929	sf	0.65	246,304		
372	<u>Miscellaneous</u>						
373	Coordination & management	1	ls	260,000.00	260,000		
374	Commissioning support	1	ls	85,000.00	85,000		
375	Coring, sleeves & fire stopping	1	ls	10,000.00	10,000		
376	Equipment start-up and inspection	1	ls	2,000.00	2,000		
377	Rigging & equipment rental	1	ls	75,000.00	75,000		
378	Vibration & seismic restraints	1	ls	30,000.00	30,000		
379	SUBTOTAL					13,319,235	

TOTAL - HVAC

\$13,319,235

D40 FIRE PROTECTION

D40 FIRE PROTECTION, GENERALLY

387	Double check valve assembly	1	ea	12,000.00	12,000		
388	Wet alarm check valve assembly	1	ea	4,000.00	4,000		
389	Siamese connection	1	ea	1,500.00	1,500		
390	Zone control valve stations	3	ea	2,500.00	7,500		
391	Sprinkler head	2,914	ea	75.00	218,550		
392	Branch pipe with fittings & hangers	35,500	lf	20.00	710,000		
393	Main pipe with fittings & hangers	12,500	lf	26.00	325,000		
394	Standpipe with fittings & hangers	4,000	lf	32.00	128,000		
395	Miscellaneous valves & accessories	1	ls	50,000.00	50,000		
396	<u>Miscellaneous</u>						
397	Coordination & management	1	ls	50,000.00	50,000		
398	Hydraulic calculations	1	ls	6,000.00	6,000		



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

399	Shop drawings	1	ls	8,000.00	8,000		
400	Coring, sleeves & fire stopping	1	ls	10,000.00	10,000		
401	Fees & permits	1	ls	15,000.00	15,000		
402	SUBTOTAL					1,545,550	
403							
404	TOTAL - FIRE PROTECTION						\$1,545,550

D50 ELECTRICAL

D5010 COMPLETE ELECTRICAL SYSTEM

Gear & Distribution

Normal Power

Gear and distribution

Associated panelboards, transformers and feeders

378,929 sf 5.00 1,894,645

Emergency power

Emergency generator, annunciator, ATS's and associated panelboards, transformers and feeders

378,929 sf 1.50 568,394

Equipment Wiring

Elevator feed and connection

1 ls 3,500.00 3,500

Elevator cab power feed and connection

1 ls 1,500.00 1,500

Electrical feed and connections to misc. equipment

378,929 sf 1.00 378,929

Kitchen equipment wiring and connections

1 ls 40,000.00 40,000

SUBTOTAL

2,886,968

D5020 LIGHTING & POWER

Lighting & Branch Power

General, classroom, common area and bathroom lighting LED

378,929 sf 4.25 1,610,448

Gymnasium lighting (allow)

30 ea 550.00 16,500

Exterior building lighting

1 ls 10,000.00 10,000

Lighting controls

Automated Lighting control system with occupancy sensors and photo sensing

378,929 sf 1.50 568,394

Branch devices

Duplex and GFI receptacles

378,929 sf 0.50 189,465

Lighting and branch circuitry

Lighting and branch circuitry. Conduit and MC cable wiring methods.

378,929 sf 5.00 1,894,645

SUBTOTAL

4,289,452

D5030 COMMUNICATION & SECURITY SYSTEMS

Fire Alarm

Control panel

1 ea 15,000.00 15,000

Annunciator

1 ea 4,500.00 4,500

Beacon

1 ea 225.00 225

Knox box

1 ea 650.00 650

Master box

1 ea 3,500.00 3,500

Initiating devices, reporting devices, circuitry, programming and testing

378,929 sf 2.00 757,858

Bi-Directional Amplification System

BDA system

1 ls 125,000.00 125,000

Telephone/Data/CATV

MDF/IDF Fit-out

1 ls 25,000.00 25,000

Voice over IP, Centrex system and switching (PBX)

378,929 sf 1.00 378,929

Devices & cabling

378,929 sf 2.25 852,590

Rough-in, conduit stubs and backboxes

378,929 sf 1.00 378,929

Grounding

1 ls 2,500.00 2,500

PA/Master Clock System

Head end

1 ls 30,000.00 30,000

Clocks, speakers, backboxes and circuitry

378,929 sf 0.80 303,143



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 - NEW SCHOOL HILLSIDE OPTION							
455	Speech reinforcement system (allow)	378,929	sf	0.40	151,572		
456	<u>Security System</u>						
457	Head end	1	ls	30,000.00	30,000		
458	CCTV system monitoring corridors, stairwells, large assembly locations	378,929	sf	2.00	757,858		
459	Intrusion detection system comprising keypads, motion detectors and door contacts	378,929	sf	0.50	189,465		
460	Card access and proximity reader system	378,929	sf	0.50	189,465		
461	<u>Audio Visual</u>						
462	AV system equipment (Provided by others)						
463	AV rough-in	378,929	sf	0.25	94,732		
464	<u>Multi-Purpose / Gymnasium</u>						
465	Scoreboard, controller and wiring	1	ls	12,500.00	12,500		
466	Gymnasium equipment feed and connections	1	ls	12,000.00	12,000		
467	Sound system	1	ls	15,000.00	15,000		
468	<u>Cafeteria</u>						
469	Sound system	1	ls	10,000.00	10,000		
470	<u>Auditorium</u>						
471	Rigging and drapery					DIV. 11	
472	ER	2	ea			By Others	
473	Rigging point power & control (allow)	1	ls	10,000.00	10,000		
474	<u>Theatrical lighting system</u>	1	ls			DIV. 11	
475	Dimmer rack and stage lighting (allow)	1	ea	200,000.00	200,000		
476	Dimmer rack installation	2	ea	1,500.00	3,000		
477	Dimmer rack feed, ELTS and company switches (allow)	1	ls	30,000.00	30,000		
478	House lighting and circuitry (allow)	1	ls	25,000.00	25,000		
479	Control:						
480	Control rack	1	ea			DIV. 11	
481	Rack power	1	ls	1,000.00	1,000		
482	Backboxes, conduit and wiring (allow)	1	ls	30,000.00	30,000		
483	Stage Circuitry:						
484	Circuit boxes (allow)	35	ea			DIV. 11	
485	Backboxes, conduit and wiring (allow)	1	ls	150,000.00	150,000		
486	Terminations (allow)	350	ea	10.00	3,500		
487	Theatrical fixture & accessory package	1	ls			DIV. 11	
488	System turn-on & training	1	ls			DIV. 11	
489	<u>Media Center/ Video Production Studio</u>						
490	Rough-in with unistrut conduit and backboxes	1	ls	5,000.00	5,000		
491	Power feed and connections	1	ls	25,000.00	25,000		
492	Sound system	1	ls	7,500.00	7,500		
493	Video equipment is provided by others					By Others	
494	<u>Lightning Protection System</u>						
495	Lighting protection and grounding	1	ls	140,000.00	140,000		
496	<u>Photovoltaic system</u>						
497	Rough-in provisions for future photovoltaic system	1	ls	3,500.00	3,500		
498	SUBTOTAL					4,973,916	
499							
500	D5040 OTHER ELECTRICAL SYSTEMS						
501	<u>Miscellaneous</u>						
502	Demolition and make safe	1	ls	25,000.00	25,000		
503	Seismic restraints	1	ls	15,000.00	15,000		
504	Coordination / BIM	1	ls	200,000.00	200,000		
505	Temp power and lights	1	ls	200,000.00	200,000		
506	Fees & Permits	1	ls	250,000.00	250,000		
507	SUBTOTAL					690,000	
508							
509							
510	TOTAL - ELECTRICAL						\$12,840,336
511							



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION

E10 EQUIPMENT

E10 EQUIPMENT, GENERALLY

Gym wall pads	1	ls	10,000.00	10,000	
Basketball backstops; swing up; electric operated	4	ea	9,800.00	39,200	
Gymnasium dividing net; electrically operated	1	loc	45,000.00	45,000	
Volleyball net and standards	1	ea	2,000.00	2,000	
Telescoping bleachers	1	ls	25,000.00	25,000	
Theatrical Equipment Stage curtains, rigging and controls	1	ls	750,000.00	750,000	
Theatrical AV equipment	1	ls	500,000.00	500,000	
Shop equipment	1	ls	150,000.00	150,000	
Stage lighting and dimming	1	ls	75,000.00	75,000	
Food Service equipment	1	ls	750,000.00	750,000	
Electrically operated projection screens	1	loc	10,000.00	10,000	
Loading dock leveler and bumpers	2	loc	8,000.00	16,000	
Fume Hoods	4	ea	10,000.00	40,000	
AV Equipment (including Smartboards, Projectors, LED monitors, Digital information displays etc.)				FF+E	
SUBTOTAL					2,412,200

TOTAL - EQUIPMENT

\$2,412,200

E20 FURNISHINGS

E2010 FIXED FURNISHINGS

Entry mats & frames - recessed with carpet/rubber strips	500	sf	45.00	22,500	
Manual operated roller shades	20,765	sf	6.00	124,590	
Counters, base cabinets, tall storage in classrooms and other rooms	378,929	gsf	5.00	1,894,645	
SUBTOTAL					2,041,735

E2020 MOVABLE FURNISHINGS

All movable furnishings to be provided and installed by owner

SUBTOTAL NIC

TOTAL - FURNISHINGS

\$2,041,735

F10 SPECIAL CONSTRUCTION

F10 SPECIAL CONSTRUCTION

Allowance for greenhouse	1	ls	300,000.00	300,000	
SUBTOTAL					\$300,000

TOTAL - SPECIAL CONSTRUCTION

\$300,000

F20 SELECTIVE BUILDING DEMOLITION

F2010 BUILDING ELEMENTS DEMOLITION

See main summary for demolition of existing buildings

SUBTOTAL

F2020 HAZARDOUS COMPONENTS ABATEMENT

See main summary for HazMat allowance

See Summary

SUBTOTAL

TOTAL - SELECTIVE BUILDING DEMOLITION



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

378,929

<i>CSI CODE</i>	<i>DESCRIPTION</i>	<i>QTY</i>	<i>UNIT</i>	<i>UNIT COST</i>	<i>EST'D COST</i>	<i>SUB TOTAL</i>	<i>TOTAL COST</i>
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OPTION 2 - NEW SCHOOL HILLSIDE OPTION



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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SITework OPTION 2

G SITEWORK

G10 SITE PREPARATION & DEMOLITION

311000	Site construction fence/barricades	5,335	lf	14.00	74,690		
311000	Site construction fence gates	2	ea	2,500.00	5,000		
311000	Stabilized construction entrance	2,500	sf	6.00	15,000		
311000	Pavement/curbing removal, crush and re-use for sub-base	130,000	sf	1.50	195,000		
311000	Walkways	1	ls	50,000.00	50,000		
311000	Track	1	ls	30,000.00	30,000		
311000	Demolition of existing utility; cutting and capping	1	ls	25,000.00	25,000		
311000	Miscellaneous demolition	1	ls	100,000.00	100,000		
	<u>Site Earthwork</u>						
312000	Cuts/Fills allowance	1	ls	200,000.00	200,000		
312500	Strip and store topsoil	1	ls	100,000.00	100,000		
312500	Blasting allowance	1,000	cy	60.00	60,000		
312500	Silt fence/erosion control, wash bays, stock piles	5,335	lf	11.00	58,685		
312500	Silt fence maintenance and monitoring	1	ls	30,000.00	30,000		
	<u>Hazardous Waste Remediation</u>						
	Remove existing underground fuel storage tank					w/ haz mat	
	Dispose/treat contaminated soils/water					NIC	
	SUBTOTAL						943,375

G20 SITE IMPROVEMENTS

320000	<u>Asphalt Paving</u>	263,549					
320000	gravel base; 12" thick	9,761	cy	35.00	341,635		
320000	asphalt; 4" thick	29,283	sy	24.00	702,792		
320000	Granite curb	10,218	lf	38.00	388,284		
320000	Road markings	1	ls	15,000.00	15,000		
320000	HC curb cuts	10	loc	350.00	3,500		
101400	Signage	1	ls	25,000.00	25,000		
	<u>Pedestrian Paving</u>						
	Concrete paving						
312000	gravel base; 12" thick	556	cy	35.00	19,460		
033000	4" concrete paving	15,000	sf	7.00	105,000		
	<u>Concrete Pavers</u>						
	<u>Concrete pavers</u>						
323000	Precast concrete pavers	30,000	sf	18.00	540,000		
312000	gravel base; 8" thick	744	cy	35.00	26,040		
312000	dry pack; 2" thick	178	cy	28.00	4,984		
033000	concrete base; 4" thick	30,000	sf	5.55	166,500		
	<u>Site Improvements</u>						
323000	Rubber play surface	2,658	sf	18.00	47,844		
323000	Flagpole	1	ls	6,500.00	6,500		
323000	Play equipment	1	ls	40,000.00	40,000		
323000	Bike racks	5	ea	1,000.00	5,000		
323000	Fencing	1	ls	100,000.00	100,000		
323000	Bollards	1	ls	20,000.00	20,000		
101400	Entrance sign	1	ls	15,000.00	15,000		
101400	Miscellaneous site improvements	1	ls	100,000.00	100,000		
	<u>Football Field</u>	117,838			-		
312000	Crushed stone - 12" thick	4,364	cy	35.00	152,740		
312000	Gravel base - assumed 8" thick	2,924	cy	30.00	87,720		
323000	Synthetic turf	117,838	sf	8.00	942,704		
323000	Scoreboard	1	ea	25,000.00	25,000		
323000	Line markings - Allowance	1	ls	2,000.00	2,000		
323000	Football goals	1	ls	5,000.00	5,000		
323000	Vinyl CL Fencing; 6'	4,000	lf	45.00	180,000		
323000	Gate, single	4	ea	1,200.00	4,800		
323000	Gate, double	2	ea	2,400.00	4,800		
323000	Portable Bleachers	1	ls	150,000.00	150,000		
323000	High Jump / Discuss / Long/Triple Jump	1	ls	60,000.00	60,000		



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITework OPTION 2							
63	<u>Running Track</u>	40,423					
64	312000 Gravel base - 12" thick	1,497	cy	35.00	52,395		
65	323000 Running track surface - 1/2" urethane surfacing	4,491	sy	65.00	291,915		
66	<u>Softball Field / Baseball Field /Soccer Field</u>						
67	312000 Gravel base - assumed 12" thick	5,926	cy	35.00	207,410		
68	312000 Sand base	5,926	cy	40.00	237,040		
69	329000 Sodded athletic field	160,000	sf	1.00	160,000		
70	329000 Infield mix	23,129	sf	0.30	6,939		
71	329000 Stone dust warning track	5,727	sf	6.00	34,362		
72	329000 Pitching mound; home plate	2	loc	2,750.00	5,500		
73	329000 3 bases	2	loc	700.00	1,400		
74	329000 Line markings w/ marking pins below grade	2	ls	4,000.00	8,000		
75	329000 Players benches	8	ea	2,500.00	20,000		
76	329000 Soccer goals (movable)	4	loc	3,500.00	14,000		
77	329000 24' chain-link backstop	190	lf	90.00	17,100		
78	329000 Batting cage	2	ea	10,000.00	20,000		
79	329000 Portable break away outfield fencing	367	lf	30.00	11,010		
80	329000 New scoreboard	2	ea	7,500.00	15,000		
81	<u>Landscaping</u>						
82	329000 Topsoil - amended	5,556	cy	24.00	133,344		
83	329000 Lawn - seed	300,000	sf	0.25	75,000		
84	329000 Raingarden	1	ls	150,000.00	150,000		
85	329000 Misc. plantings	1	ls	250,000.00	250,000		
86	329000 Irrigation well	1	ls	25,000.00	25,000		
87	329000 Irrigation to playfields	160,000	sf	1.00	160,000		
88	SUBTOTAL					6,182,718	
89							
90	G30 CIVIL MECHANICAL UTILITIES						
91	<u>Water supply</u>						
92	330000 New DI piping; 8"	900	lf	110.00	99,000		
93	330000 New DI piping; 6"	900	lf	100.00	90,000		
94	330000 FD connection	1	loc	2,000.00	2,000		
95	330000 Gate valves	5	loc	750.00	3,750		
96	330000 PIV	1	loc	1,000.00	1,000		
97	330000 Connect to existing piping	2	loc	3,000.00	6,000		
98	330000 Fire hydrant	2	ea	5,000.00	10,000		
99	330000 <u>Sanitary</u>						
100	330000 6" PVC	1,000	lf	60.00	60,000		
101	330000 SMH	2	ea	3,500.00	7,000		
102	330000 Connect to existing	1	loc	3,000.00	3,000		
103	330000 Grease trap	1	ea	10,000.00	10,000		
104	330000 <u>Storm water allowances</u>						
105	330000 Storm water allowances	1	ls	1,200,000.00	1,200,000		
106	<u>Gas service</u>						
107	312000 E&B trench for new gas pipe - install by plumbing	900	lf	22.00	19,800		
108	SUBTOTAL					1,511,550	
109							
110	G40 ELECTRICAL UTILITIES						
111	<u>Power - Main Building</u>						
112	260000 Pole riser	1	ls	1,200.00	1,200		
113	260000 Primary ductbank; main building						
114	260000 2" PVC conduit; allow	1,000	lf	80.00	80,000		
115	260000 Trench w/ concrete encasement	1,000	lf	120.00	120,000		
116	260000 Pad mount xfmr	1	ea	By Utility			
117	260000 8' x 8' pre-cast pad assembly for xfmr	1	ea	8,000.00	8,000		
118	260000 Transformer pad grounding	1	ea	2,000.00	2,000		
119	260000 Meter box/socket	1	ea	2,500.00	2,500		
120	260000 5,000A secondary feeder	50	lf	3,000.00	150,000		
121	260000 800A feeder to emergency switchboard; assumed to be life safety; concrete encased RGS	100	lf	358.29	35,829		
122	260000 Premium for concrete encasement to main feeder	100	lf	120.00	12,000		
123	260000 Generator Pad	1	ea	2,000.00	2,000		
124	260000 <u>Power - Sports Complex</u>						



Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITEWORK OPTION 2							
125 260000	Primary ductbank; sports complex; extension of existing						
126 260000	2# 4" PVC conduit; allow	150	lf	31.42	4,713		
127 260000	Trench w/ concrete encasement	150	lf	120.00	18,000		
128 260000	Handhole	1	ea	4,000.00	4,000		
129 260000	Wall mounted pull box	1	ea	1,500.00	1,500		
130 260000	<u>Communications</u>						
131 260000	Communication riser	1	ea	1,600.00	1,600		
132 260000	4-4" communications ductbank; allow	1,000	lf	60.68	60,680		
133 260000	Trenching	1,000	lf	25.00	25,000		
134 260000	Communication handhole	1	ea	1,500.00	1,500		
135 260000	<u>Site Lighting</u>						
136 260000	Allowance for general site lighting	1	ls	550,000.00	550,000		
137	SUBTOTAL					1,080,522	
138							
139	TOTAL - SITE DEVELOPMENT						\$9,718,165



Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SECONDARY VEHICULAR ENTRANCE							
G	SITEWORK						
G10	SITE PREPARATION & DEMOLITION						
311000	Site construction fence/barricades	5,160	lf	12.00	61,920		
311000	Site construction fence gates	1	ea	2,500.00	2,500		
311000	Stabilized construction entrance	2,500	sf	6.00	15,000		
311000	Form new entrance with 100 ft turning lane	1	ls	10,000.00	10,000		
311000	Site clearing	4.00	acre	15,000.00	60,000		
311000	Miscellaneous demolition	1	ls	25,000.00	25,000		
	<u>Site Earthwork</u>						
312000	Blasting allowance	4,478	cy	60.00	268,680		
312000	Cut and fills	21,300	cy	12.00	255,600		
312500	Strip and store topsoil	1	ls	30,000.00	30,000		
312500	Silt fence/erosion control, wash bays, stock piles	5,160	lf	11.00	56,760		
312500	Silt fence maintenance and monitoring	1	ls	15,000.00	15,000		
	<u>Hazardous Waste Remediation</u>						
	Remove existing underground fuel storage tank					w/ haz mat	
	Dispose/treat contaminated soils/water					NIC	
	SUBTOTAL						800,460
G20	SITE IMPROVEMENTS						
320000	<u>Asphalt Paving</u>	61,920	sf				
320000	gravel base; 12" thick	2,293	cy	35.00	80,255		
320000	asphalt; 4" thick	6,880	sy	26.00	178,880		
320000	Granite curb	5,160	lf	32.00	165,120		
320000	Road markings	1	ls	5,000.00	5,000		
101400	Signage	1	ls	10,000.00	10,000		
320000	Construct and shape swales	92,880	sf	2.00	185,760		
320000	New turning lane	1	ls	25,000.00	25,000		
	<u>Site Improvements</u>						
323000	New rubble stone entrance sign	1	ls	20,000.00	20,000		
323000	New entrance gate piers	2	ea	5,000.00	10,000		
323000	Entrance gate	1	ea	6,000.00	6,000		
	<u>Landscaping</u>						
329000	Seeding and reinstatement of landscaping	1	ls	25,000.00	25,000		
	SUBTOTAL						711,015
G30	CIVIL MECHANICAL UTILITIES						
	Assumed none required						
	SUBTOTAL						-
G40	ELECTRICAL UTILITIES						
260000	New traffic signal	1	ls	200,000.00	200,000		
260000	Lighting at entrance sign	1	ls	5,000.00	5,000		
260000	Lighting at roadway; assumed every 150 feet	17	loc	6,000.00	102,000		
	SUBTOTAL						307,000
TOTAL NEW SECONDARY ENTRANCE							\$1,818,475



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
NEMT SHARE OF HEMOCK ROAD UTILITY RELOCATION							
G	SITEWORK						
G10	SITE PREPARATION & DEMOLITION						
312500	Demolish existing pavement for new utilities at Hemlock street	28,000	sf	1.50	42,000		
312500	Police details	1	ls	15,000.00	15,000		
	SUBTOTAL					57,000	
G20	SITE IMPROVEMENTS						
320000	Replace existing roadway after installation of utilities	28,000	sf	5.00	140,000		
	SUBTOTAL					140,000	
G30	CIVIL MECHANICAL UTILITIES						
	<u>Water supply</u>						
330000	New DI piping; 10"	1,840	lf	160.00	294,400		
	<u>Gas service</u>						
312000	E&B trench for new gas pipe - install by utility	1,840	lf	35.00	64,400		
	SUBTOTAL					358,800	
G40	ELECTRICAL UTILITIES						
260000	Primary ductbank; main building						
260000	2" PVC conduit; allow	1,840	lf	80.00	147,200		
260000	Trench w/ concrete encasement	1,840	lf	120.00	220,800		
	SUBTOTAL					368,000	
TOTAL - UTILITY RELOCATION							\$923,800



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA 378,929

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 3 - NEW SCHOOL OPTION Z					
A10 FOUNDATIONS					
A1010	Standard Foundations	\$1,871,304			
A1020	Special Foundations	\$0			
A1030	Lowest Floor Construction	\$3,931,537	\$5,802,841	\$15.31	6.1%
A20 BASEMENT CONSTRUCTION					
A2010	Basement Excavation	\$0			
A2020	Basement Walls	\$0	\$0	\$0.00	0.0%
B10 SUPERSTRUCTURE					
B1010	Upper Floor Construction	\$4,793,478			
B1020	Roof Construction	\$6,901,626	\$11,695,104	\$30.86	12.3%
B20 EXTERIOR CLOSURE					
B2010	Exterior Walls	\$9,964,262			
B2020	Windows	\$4,194,817			
B2030	Exterior Doors	\$118,541	\$14,277,620	\$37.68	15.0%
B30 ROOFING					
B3010	Roof Coverings	\$4,740,666			
B3020	Roof Openings	\$32,500	\$4,773,166	\$12.60	5.0%
C10 INTERIOR CONSTRUCTION					
C1010	Partitions	\$9,852,154			
C1020	Interior Doors	\$1,515,716			
C1030	Specialties/Millwork	\$2,599,093	\$13,966,963	\$36.86	14.7%
C20 STAIRCASES					
C2010	Stair Construction	\$264,000			
C2020	Stair Finishes	\$51,310	\$315,310	\$0.83	0.3%
C30 INTERIOR FINISHES					
C3010	Wall Finishes	\$1,894,645			
C3020	Floor Finishes	\$2,652,503			
C3030	Ceiling Finishes	\$2,273,574	\$6,820,722	\$18.00	7.2%
D10 CONVEYING SYSTEMS					
D1010	Elevator	\$180,000	\$180,000	\$0.48	0.2%
D20 PLUMBING					
D20	Plumbing	\$4,781,112	\$4,781,112	\$12.62	5.0%



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA 378,929

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 3 - NEW SCHOOL OPTION Z					
D30 HVAC					
D30 HVAC		\$13,319,235	\$13,319,235	\$35.15	14.0%
D40 FIRE PROTECTION					
D40 Fire Protection		\$1,545,550	\$1,545,550	\$4.08	1.6%
D50 ELECTRICAL					
D5010 Complete System		\$12,840,336	\$12,840,336	\$33.89	13.5%
E10 EQUIPMENT					
E10 Equipment		\$2,412,200	\$2,412,200	\$6.37	2.5%
E20 FURNISHINGS					
E2010 Fixed Furnishings		\$2,067,973			
E2020 Movable Furnishings	NIC		\$2,067,973	\$5.46	2.2%
F10 SPECIAL CONSTRUCTION					
F10 Special Construction		\$300,000	\$300,000	\$0.79	0.3%
F20 HAZMAT REMOVALS					
F2010 Building Elements Demolition		\$0			
F2020 Hazardous Components Abatement		\$0	\$0	\$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)			\$95,098,132	\$250.97	100.0%



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

GROSS FLOOR AREA CALCULATION

First Floor

243,765

Second Floor

135,164

TOTAL GROSS FLOOR AREA (GFA)

378,929 sf

A10 FOUNDATIONS

A1010 STANDARD FOUNDATIONS

Strip footings - 3'-0" x 2'-0"

Excavation	4,547	cy	12.00	54,564
Store on site for reuse	4,547	cy	14.00	63,658
Backfill with new fill	3,729	cy	16.00	59,664
Formwork	14,030	sf	11.00	154,330
Re-bar, 10#/lf	35,076	lbs	1.20	42,091
Concrete material; 3,000 psi	818	cy	125.00	102,250
Placing concrete	818	cy	55.00	44,990

Foundation walls at exterior - 16" thick

Formwork	28,064	sf	12.50	350,800
Re-bar, 4#/sf	56,128	lbs	1.20	67,354
Concrete material; 4,000 psi	637	cy	135.00	85,995
Placing concrete	637	cy	65.00	41,405
Dampproofing foundation wall and footing	21,048	sf	1.90	NIC
Insulation to foundation walls; 2" thick	14,032	sf	2.50	35,080
Form shelf	3,508	lf	8.00	28,064

Thickened slab at interior load bearing walls

Excavation	1,345	cy	12.00	16,140
Store on site for reuse	1,345	cy	14.00	18,830
Backfill with new fill	1,224	cy	16.00	19,584
Formwork	2,075	sf	11.00	22,825
Re-bar, 10#/lf	10,373	lbs	1.20	12,448
Concrete material; 3,000 psi	121	cy	125.00	15,125
Placing concrete	121	cy	55.00	6,655

Exterior column footings, typical, 8' x 8' x 2'-0"

Excavation	1,505	cy	15.00	22,575
Store on site for reuse	1,505	cy	14.00	21,070
Backfill with new fill	1,062	cy	16.00	16,992
Formwork	5,696	sf	11.00	62,656
Re-bar, 150/cy	66,450	lbs	1.20	79,740
Concrete material; 3,000 psi	443	cy	125.00	55,375
Placing concrete	443	cy	55.00	24,365
Set anchor bolts grout plates	89	ea	150.00	13,350

Interior column footings, typical, 9' x 9' x 2'-0"

Excavation	1,349	cy	15.00	20,235
Store on site for reuse	1,349	cy	14.00	18,886
Backfill with new fill	921	cy	16.00	14,736
Formwork	4,896	sf	11.00	53,856
Re-bar, 150/cy	51,000	lbs	1.20	61,200
Concrete material; 3,000 psi	428	cy	125.00	53,500
Placing concrete	428	cy	55.00	23,540
Set anchor bolts grout plates	68	ea	150.00	10,200
Perimeter drainage system	3,508	lf	22.00	77,176



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

SUBTOTAL 1,871,304

A1020 SPECIAL FOUNDATIONS

No Work in this section

SUBTOTAL

A1030 LOWEST FLOOR CONSTRUCTION

New Slab on grade, 5" thick

Structural gravel fill; assume 10 feet at gym wing 30,293 cy 30.00 908,790

Base course, 12" gravel 9,028 cy 35.00 315,980

Rigid insulation 243,765 sf 2.25 548,471

Vapor barrier 243,765 sf 0.75 182,824

Under slab drainage -allow 243,765 sf 2.50 609,413

Mesh reinforcing 15% lap 280,330 sf 0.80 224,264

Concrete - 5" thick 3,981 cy 125.00 497,625

Placing concrete 3,981 cy 45.00 179,145

Finishing and curing concrete 243,765 sf 1.50 365,648

Control joints - saw cut 243,765 sf 0.10 24,377

Miscellaneous

New Elevator pits 2 ea 25,000.00 50,000

New loading dock - allow 1 ls 20,000.00 20,000

Equipment pads - allow 1 ls 5,000.00 5,000

SUBTOTAL 3,931,537

TOTAL - FOUNDATIONS

\$5,802,841

A20 BASEMENT CONSTRUCTION

A2010 BASEMENT EXCAVATION

No Work in this section

SUBTOTAL

-

A2020 BASEMENT WALLS

No Work in this section

SUBTOTAL

-

TOTAL - BASEMENT CONSTRUCTION

B10 SUPERSTRUCTURE

B1010 FLOOR CONSTRUCTION

Floor Structure - Steel:

Steel beams and columns; 13/SF 879 tns 3,400.00 2,988,600

Shear studs 27,033 ea 2.50 67,583

Floor Structure

3" Metal floor Deck 135,164 sf 4.00 540,656

WWF reinforcement 155,439 sf 0.80 124,351

Concrete Fill to metal deck; 5 1/4" Light weight 2,155 cy 170.00 366,350

Place and finish concrete 135,164 sf 2.00 270,328

Misc. perimeter angles 3,508 lf 25.00 87,700

Miscellaneous

Fire proofing to columns and beams 135,164 sf 2.50 337,910

Fire stopping floors 2 flrs 5,000.00 10,000

SUBTOTAL 4,793,478



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

B1020 ROOF CONSTRUCTION

Roof Structure - Steel:

Steel beams/Joists; 12#/SF 1,463 tns 3,400.00 4,974,200

Roof Structure

3" Metal floor Deck @ roof 232,465 sf 4.00 929,860

Acoustic deck at gym, 3", type NA 11,300 sf 7.00 79,100

Roof Structure @ Mech Equipment/Low roof

WWF reinforcement 11,500 sf 0.80 9,200

Concrete Fill to metal deck; 5 1/4" Light weight 159 cy 170.00 27,030

Place and finish concrete 10,000 sf 3.00 30,000

Miscellaneous

Canopy framing - allow 1 ls 30,000.00 30,000

Roof screen framing - allow 1,500 sf 20.00 30,000

Fire proofing to columns, beams and deck 243,765 sf 3.25 792,236

SUBTOTAL 6,901,626

TOTAL - SUPERSTRUCTURE

\$11,695,104

B20 EXTERIOR CLOSURE

B2010 EXTERIOR WALLS

Interior skin 114,264 sf

8" metal stud backup 94,500 sf 8.00 756,000

Batt insulation in stud 94,500 sf 2.25 212,625

2 1/2" Rigid Insulation 94,500 sf 3.00 283,500

Air barrier 94,500 sf 6.00 567,000

Air barrier/flashing at windows 8,296 lf 7.00 58,072

Gypsum Sheathing 94,500 sf 2.75 259,875

Drywall lining to interior face of stud backup 94,500 sf 3.00 283,500

Interior skin @ gym/auditorium

8" CMU backup 19,764 sf 22.00 434,808

2 1/2" Rigid Insulation 19,764 sf 3.00 59,292

Air barrier 19,764 sf 6.00 118,584

Premium for GF block 19,764 sf 5.00 98,820

Exterior skin

Brick veneer 75,414 sf 45.00 3,393,630

Metal panels 38,850 sf 70.00 2,719,500

Miscellaneous

Temporary WP exterior closure between PH 1 and PH 2; includes removal 6,300 sf 40.00 252,000

Aluminum sign at main entrance 1 ls 10,000.00 10,000

Staging to exterior wall 152,352 sf 3.00 457,056

SUBTOTAL 9,964,262

B2020 WINDOWS

38,088 sf

Curtainwall 12,950 sf 120.00 1,554,000

Premium for sunscreen and light shelf elements 1 ls 200,000.00 200,000

Windows/storefront 25,138 sf 90.00 2,262,420

Louvers (allowance) 250 sf 60.00 15,000

Backer rod & double sealant 12,569 lf 9.00 113,121

Wood blocking at openings 12,569 lf 4.00 50,276

SUBTOTAL 4,194,817



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

B2030 EXTERIOR DOORS

Glazed entrance doors including frame and hardware;
double door
HM doors, frames and hardware- Double
HM doors, frames and hardware- Single
Coiling doors
Backer rod & double sealant
Wood blocking at openings
SUBTOTAL

5 pr 8,000.00 40,000
2 pr 3,600.00 7,200
1 ea 1,800.00 1,800
9 ea 7,500.00 67,500
157 lf 9.00 1,413
157 lf 4.00 628

118,541

TOTAL - EXTERIOR CLOSURE

\$14,277,620

B30 ROOFING

B3010 ROOF COVERINGS

Flat roofing

PVC roof membrane fully adhered
Insulation
1/2" dens-deck protection board
Reinforced vapor barrier
Rough blocking

243,765 sf 7.50 1,828,238
243,765 sf 6.50 1,584,473
243,765 sf 2.00 487,530
243,765 sf 1.00 243,765
3,703 lf 20.00 74,060

Miscellaneous Roofing

Canopies - allow
Roof screens - allow
Roof fascia/cornice
Roof ladders
Walk pads
SUBTOTAL

1,000 sf 120.00 120,000
1,500 sf 60.00 90,000
1,964 lf 150.00 294,600
1 ls 3,000.00 3,000
1 ls 15,000.00 15,000

4,740,666

B3020 ROOF OPENINGS

Skylights, allow
Roof hatch
SUBTOTAL

1 ls 30,000.00 30,000
1 loc 2,500.00 2,500

32,500

TOTAL - ROOFING

\$4,773,166

C10 INTERIOR CONSTRUCTION

C1010 PARTITIONS

Allowance for interior partitions
SUBTOTAL

378,929 gsf 26.00 9,852,154

9,852,154

C1020 INTERIOR DOORS

Allowance for specialty doors, doors and hardware
SUBTOTAL

378,929 gsf 4.00 1,515,716

1,515,716

C1030 SPECIALTIES / MILLWORK

Toilet Partitions and accessories
Backer panels in electrical closets
Marker boards/tackboards in classrooms, offices,
conference rooms, library and MP rooms; 20'
tackboard w/ 8' markerboard in each Educational
space
Catwalk platform at auditorium
Pipe grid at art classroom
Pipe grid at auditorium

378,929 gsf 0.80 303,143
1 ls 1,000.00 1,000
378,929 sf 1.00 378,929
1 ls 120,000.00 120,000
1,407 sf 15.00 21,105
3,694 sf 15.00 55,410



Feasibility Design Submission

GFA 378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 - NEW SCHOOL OPTION Z							
220	Pipe grid at multimedia engineering lab	2,090	sf	15.00	31,350		
221	Building directory	1	loc	3,000.00	3,000		
222	Bronze dedication plaque	1	loc	2,500.00	2,500		
223	Room Signs	378,929	gsf	0.40	151,572		
224	Fire extinguisher cabinets	126	ea	350.00	44,100		
225	Corridor Lockers	378,929	gsf	1.00	378,929		
226	Janitors Closet Accessories	1	ls	1,000.00	1,000		
227	Shelving in storage rooms	1	ls	10,000.00	10,000		
228	Staff mailboxes/casework	1	ls	5,000.00	5,000		
229	Reception desk in Media - allowance	1	ls	20,000	20,000		
230	Library shelving				F,F & E		
231	Display cases	1	ls	30,000.00	30,000		
232	Miscellaneous metals throughout building	378,929	sf	1.50	568,394		
233	Miscellaneous sealants throughout building	378,929	sf	1.25	473,661		
234	SUBTOTAL					2,599,093	
235							
236	TOTAL - INTERIOR CONSTRUCTION						\$13,966,963
237							
238							
239	C20 STAIRCASES						
240							
241	C2010 STAIR CONSTRUCTION						
242	Feature stair including rails and finishes	1	flt	60,000.00	60,000		
243	Stage stairs, wood	2	flts	5,000.00	10,000		
244	Metal pan stair; egress stair	6	flt	30,000.00	180,000		
245	Concrete fill to stairs	7	flt	2,000.00	14,000		
246	SUBTOTAL					264,000	
247							
248	C2020 STAIR FINISHES						
249	High performance coating to stairs including all railings etc.	7	flt	3,000.00	21,000		
250	Rubber tile at stairs - landings	1,050	sf	12.00	12,600		
251	Rubber tile at stairs - treads & risers	805	lft	22.00	17,710		
252	SUBTOTAL					51,310	
253							
254	TOTAL - STAIRCASES						\$315,310
255							
256							
257	C30 INTERIOR FINISHES						
258							
259	C3010 WALL FINISHES						
260	Allowance for wall finishes	378,929	gsf	5.00	1,894,645		
261	SUBTOTAL					1,894,645	
262							
263	C3020 FLOOR FINISHES						
264	Allowance for floor finishes	378,929	gsf	7.00	2,652,503		
265	SUBTOTAL					2,652,503	
266							
267	C3030 CEILING FINISHES						
268	Allowance for ceiling finishes	378,929	sf	6.00	2,273,574		
269	SUBTOTAL					2,273,574	
270							
271	TOTAL - INTERIOR FINISHES						\$6,820,722
272							
273							
274	D10 CONVEYING SYSTEMS						
275							
276	D1010 ELEVATOR						
277	New elevator; 2 stop	2	ea	90,000.00	180,000		
278	SUBTOTAL					180,000	
279							



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

TOTAL - CONVEYING SYSTEMS

\$180,000

D20 PLUMBING

D20 PLUMBING, GENERALLY

Equipment

Plumbing equipment

378,929

sf

0.90

341,036

Plumbing Fixtures

Plumbing fixtures

378,929

sf

2.00

757,858

Domestic Water Piping

Copper pipe type L with fittings & hangers

378,929

sf

3.00

1,136,787

Valves & accessories

1

ls

285,000.00

285,000

Pipe insulation

Pipe insulation

378,929

sf

1.55

587,340

Sanitary Waste And Vent Pipe w/ Hangers

Cast iron pipe with fittings & hangers

378,929

sf

2.50

947,323

Storm Drainage, Hubless Cast Iron Pipe

Cast iron pipe with fittings & hangers

378,929

sf

0.60

227,357

Acid Waste And Vent Pipe w/ Hangers

Acid resistant pipe with fittings & hangers

378,929

sf

0.15

56,839

Natural Gas Piping

Natural gas pipe with fittings & hangers

378,929

sf

0.40

151,572

Valves & accessories

1

ls

38,000.00

38,000

Compressed Air Piping

Black steel pipe with fittings & hangers

1

ls

16,000.00

16,000

Valves & accessories

1

ls

4,000.00

4,000

Miscellaneous

Coordination & management

1

ls

110,000.00

110,000

Commissioning support

1

ls

52,000.00

52,000

Coring, sleeves & fire stopping

1

ls

10,000.00

10,000

Testing and sterilization

1

ls

12,000.00

12,000

Fees & permits

1

ls

48,000.00

48,000

SUBTOTAL

4,781,112

TOTAL - PLUMBING

\$4,781,112

D30 HVAC

D30 HVAC, GENERALLY

Heating equipment

Heating equipment

378,929

sf

1.25

473,661

Pumps

Pumps

378,929

sf

0.15

56,839

Cooling Equipment

Cooling equipment

378,929

sf

0.50

189,465

Air distribution

Air Handling Unit

Air distribution equipment

378,929

sf

6.00

2,273,574

Exhaust fan

Exhaust fans

378,929

sf

0.75

284,197

Sheet metal & Accessories

Galvanized ductwork with fittings & hangers

303,000

lbs

10.00

3,030,000

Black steel welded ductwork with hangers

6,000

lbs

14.00

84,000

Boiler combustion air system

1

ls

50,000.00

50,000

Registers, grilles & diffusers

2,526

ea

125.00

315,750

Duct insulation

182,000

sf

4.00

728,000

Miscellaneous sheet metal accessories

378,929

sf

0.50

189,465

Piping

Hot Water & Chilled Water Pipe

Hot water piping with fittings & hangers

378,929

sf

3.50

1,326,252



Feasibility Design Submission

GFA 378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

342	Chilled water piping with fittings & hangers	378,929	sf	0.60	227,357		
343	Valves & accessories	1	ls	390,000.00	390,000		
344	<u>Refrigerant Piping</u>						
345	Refrigerant piping with fittings & hangers	378,929	sf	0.12	45,471		
346	Valves & accessories	1	ls	10,200.00	10,200		
347	<u>Condensate Drain Piping</u>						
348	Condensate drain piping with fittings & hangers	378,929	sf	0.25	94,732		
349	<u>Piping Insulation</u>						
350	Piping insulation	378,929	sf	2.00	757,858		
351	<u>Controls (DDC)</u>						
352	Automatic temperature controls	378,929	sf	5.50	2,084,110		
353	<u>Balancing</u>						
354	System testing & balancing	378,929	sf	0.65	246,304		
355	<u>Miscellaneous</u>						
356	Coordination & management	1	ls	260,000.00	260,000		
357	Commissioning support	1	ls	85,000.00	85,000		
358	Coring, sleeves & fire stopping	1	ls	10,000.00	10,000		
359	Equipment start-up and inspection	1	ls	2,000.00	2,000		
360	Rigging & equipment rental	1	ls	75,000.00	75,000		
361	Vibration & seismic restraints	1	ls	30,000.00	30,000		
362	SUBTOTAL					13,319,235	

TOTAL - HVAC

\$13,319,235

D40 FIRE PROTECTION

D40 FIRE PROTECTION, GENERALLY

370	Double check valve assembly	1	ea	12,000.00	12,000		
371	Wet alarm check valve assembly	1	ea	4,000.00	4,000		
372	Siamese connection	1	ea	1,500.00	1,500		
373	Zone control valve stations	3	ea	2,500.00	7,500		
374	Sprinkler head	2,914	ea	75.00	218,550		
375	Branch pipe with fittings & hangers	35,500	lf	20.00	710,000		
376	Main pipe with fittings & hangers	12,500	lf	26.00	325,000		
377	Standpipe with fittings & hangers	4,000	lf	32.00	128,000		
378	Miscellaneous valves & accessories	1	ls	50,000.00	50,000		
379	<u>Miscellaneous</u>						
380	Coordination & management	1	ls	50,000.00	50,000		
381	Hydraulic calculations	1	ls	6,000.00	6,000		
382	Shop drawings	1	ls	8,000.00	8,000		
383	Coring, sleeves & fire stopping	1	ls	10,000.00	10,000		
384	Fees & permits	1	ls	15,000.00	15,000		
385	SUBTOTAL					1,545,550	

TOTAL - FIRE PROTECTION

\$1,545,550

D50 ELECTRICAL

D5010 COMPLETE ELECTRICAL SYSTEM

Gear & Distribution

Normal Power

Gear and distribution

396	Associated panelboards, transformers and feeders	378,929	sf	5.00	1,894,645		
397	<u>Emergency power</u>						
398	Emergency generator, annunciator, ATS's and associated panelboards, transformers and feeders	378,929	sf	1.50	568,394		
399	<u>Equipment Wiring</u>						
400	Elevator feed and connection	1	ls	3,500.00	3,500		



Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3 - NEW SCHOOL OPTION Z							
401	Elevator cab power feed and connection	1	ls	1,500.00	1,500		
402	Electrical feed and connections to misc. equipment	378,929	sf	1.00	378,929		
403	Kitchen equipment wiring and connections	1	ls	40,000.00	40,000		
404	SUBTOTAL					2,886,968	
405	D5020 LIGHTING & POWER						
406	<u>Lighting & Branch Power</u>						
408	General, classroom, common area and bathroom lighting LED	378,929	sf	4.25	1,610,448		
409	Gymnasium lighting (allow)	30	ea	550.00	16,500		
410	Exterior building lighting	1	ls	10,000.00	10,000		
411	<u>Lighting controls</u>						
412	Automated Lighting control system with occupancy sensors and photo sensing	378,929	sf	1.50	568,394		
413	<u>Branch devices</u>						
414	Duplex and GFI receptacles	378,929	sf	0.50	189,465		
415	<u>Lighting and branch circuitry</u>						
416	Lighting and branch circuitry. Conduit and MC cable wiring methods.	378,929	sf	5.00	1,894,645		
417	SUBTOTAL					4,289,452	
418	D5030 COMMUNICATION & SECURITY SYSTEMS						
419	<u>Fire Alarm</u>						
421	Control panel	1	ea	15,000.00	15,000		
422	Annunciator	1	ea	4,500.00	4,500		
423	Beacon	1	ea	225.00	225		
424	Knox box	1	ea	650.00	650		
425	Master box	1	ea	3,500.00	3,500		
426	Initiating devices, reporting devices, circuitry, programming and testing	378,929	sf	2.00	757,858		
427	<u>Bi-Directional Amplification System</u>						
428	BDA system	1	ls	125,000.00	125,000		
429	<u>Telephone/Data/CATV</u>						
430	MDF/IDF Fit-out	1	ls	25,000.00	25,000		
431	Voice over IP, Centrex system and switching (PBX)	378,929	sf	1.00	378,929		
432	Devices & cabling	378,929	sf	2.25	852,590		
433	Rough-in, conduit stubs and backboxes	378,929	sf	1.00	378,929		
434	Grounding	1	ls	2,500.00	2,500		
435	<u>PA/Master Clock System</u>						
436	Head end	1	ls	30,000.00	30,000		
437	Clocks, speakers, backboxes and circuitry	378,929	sf	0.80	303,143		
438	Speech reinforcement system (allow)	378,929	sf	0.40	151,572		
439	<u>Security System</u>						
440	Head end	1	ls	30,000.00	30,000		
441	CCTV system monitoring corridors, stairwells, large assembly locations	378,929	sf	2.00	757,858		
442	Intrusion detection system comprising keypads, motion detectors and door contacts	378,929	sf	0.50	189,465		
443	Card access and proximity reader system	378,929	sf	0.50	189,465		
444	<u>Audio Visual</u>						
445	AV system equipment (Provided by others)						
446	AV rough-in	378,929	sf	0.25	94,732		
447	<u>Multi-Purpose / Gymnasium</u>						
448	Scoreboard, controller and wiring	1	ls	12,500.00	12,500		
449	Gymnasium equipment feed and connections	1	ls	12,000.00	12,000		
450	Sound system	1	ls	15,000.00	15,000		
451	<u>Cafeteria</u>						
452	Sound system	1	ls	10,000.00	10,000		
453	<u>Auditorium</u>						
454	Rigging and drapery					DIV. 11	



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

455	ER	2	ea			By Others	
456	Rigging point power & control (allow)	1	ls	10,000.00	10,000		
457	<u>Theatrical lighting system</u>	1	ls			DIV. 11	
458	Dimmer rack and stage lighting (allow)	1	ea	200,000.00	200,000		
459	Dimmer rack installation	2	ea	1,500.00	3,000		
460	Dimmer rack feed, ELTS and company switches (allow)	1	ls	30,000.00	30,000		
461	House lighting and circuitry (allow)	1	ls	25,000.00	25,000		
462	Control:						
463	Control rack	1	ea			DIV. 11	
464	Rack power	1	ls	1,000.00	1,000		
465	Backboxes, conduit and wiring (allow)	1	ls	30,000.00	30,000		
466	Stage Circuitry:						
467	Circuit boxes (allow)	35	ea			DIV. 11	
468	Backboxes, conduit and wiring (allow)	1	ls	150,000.00	150,000		
469	Terminations (allow)	350	ea	10.00	3,500		
470	Theatrical fixture & accessory package	1	ls			DIV. 11	
471	System turn-on & training	1	ls			DIV. 11	
472	<u>Media Center/ Video Production Studio</u>						
473	Rough-in with unistrut conduit and backboxes	1	ls	5,000.00	5,000		
474	Power feed and connections	1	ls	25,000.00	25,000		
475	Sound system	1	ls	7,500.00	7,500		
476	Video equipment is provided by others					By Others	
477	<u>Lightning Protection System</u>						
478	Lighting protection and grounding	1	ls	140,000.00	140,000		
479	<u>Photovoltaic system</u>						
480	Rough-in provisions for future photovoltaic system	1	ls	3,500.00	3,500		
481	SUBTOTAL						4,973,916

D5040 OTHER ELECTRICAL SYSTEMS

484	<u>Miscellaneous</u>						
485	Demolition and make safe	1	ls	25,000.00	25,000		
486	Seismic restraints	1	ls	15,000.00	15,000		
487	Coordination / BIM	1	ls	200,000.00	200,000		
488	Temp power and lights	1	ls	200,000.00	200,000		
489	Fees & Permits	1	ls	250,000.00	250,000		
490	SUBTOTAL						690,000

TOTAL - ELECTRICAL

\$12,840,336

E10 EQUIPMENT

E10 EQUIPMENT, GENERALLY

499	Gym wall pads	1	ls	10,000.00	10,000		
500	Basketball backstops; swing up; electric operated	4	ea	9,800.00	39,200		
501	Gymnasium dividing net; electrically operated	1	loc	45,000.00	45,000		
502	Volleyball net and standards	1	ea	2,000.00	2,000		
503	Telescoping bleachers	1	ls	25,000.00	25,000		
504	Theatrical Equipment Stage curtains, rigging and controls	1	ls	750,000.00	750,000		
505	Theatrical AV equipment	1	ls	500,000.00	500,000		
506	Shop equipment	1	ls	150,000.00	150,000		
507	Stage lighting and dimming	1	ls	75,000.00	75,000		
508	Food Service equipment	1	ls	750,000.00	750,000		
509	Electrically operated projection screens	1	loc	10,000.00	10,000		
510	Loading dock leveler and bumpers	2	loc	8,000.00	16,000		



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

378,929

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 3 - NEW SCHOOL OPTION Z

511	Fume Hoods	4	ea	10,000.00	40,000		
512	AV Equipment (including Smartboards, Projectors, LED monitors, Digital information displays etc.)				FF+E		
513	SUBTOTAL					2,412,200	
514							
515	TOTAL - EQUIPMENT						\$2,412,200

E20 FURNISHINGS

E2010 FIXED FURNISHINGS

521	Entry mats & frames - recessed with carpet/rubber strips	500	sf	45.00	22,500		
522	Manual operated roller shades	25,138	sf	6.00	150,828		
523	Counters, base cabinets, tall storage in classrooms and other rooms	378,929	gsf	5.00	1,894,645		
524	SUBTOTAL					2,067,973	
525							
526	E2020 MOVABLE FURNISHINGS						
527	All movable furnishings to be provided and installed by owner						
528	SUBTOTAL					NIC	
529							
530	TOTAL - FURNISHINGS						\$2,067,973

F10 SPECIAL CONSTRUCTION

F10 SPECIAL CONSTRUCTION

536	Allowance for greenhouse	1	ls	300,000.00	300,000		
537	SUBTOTAL					\$300,000	
538							
539	TOTAL - SPECIAL CONSTRUCTION						\$300,000

F20 SELECTIVE BUILDING DEMOLITION

F2010 BUILDING ELEMENTS DEMOLITION

545	See main summary for demolition of existing buildings						
546	SUBTOTAL						
547							
548	F2020 HAZARDOUS COMPONENTS ABATEMENT						
549	See main summary for HazMat allowance				See Summary		
550	SUBTOTAL						
551							
552	TOTAL - SELECTIVE BUILDING DEMOLITION						



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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SITework OPTION 3

G SITEWORK

G10 SITE PREPARATION & DEMOLITION

311000	Site construction fence/barricades	5,335	lf	14.00	74,690		
311000	Site construction fence gates	2	ea	2,500.00	5,000		
311000	Stabilized construction entrance	2,500	sf	6.00	15,000		
311000	Pavement/curbing removal, crush and re-use for sub-base	130,000	sf	1.50	195,000		
311000	Walkways	1	ls	50,000.00	50,000		
311000	Track	1	ls	30,000.00	30,000		
311000	Demolition of existing utility; cutting and capping	1	ls	25,000.00	25,000		
311000	Miscellaneous demolition	1	ls	100,000.00	100,000		
	<u>Site Earthwork</u>						
312000	Cuts/Fills allowance	1	ls	200,000.00	200,000		
312500	Strip and store topsoil	1	ls	100,000.00	100,000		
312500	Blasting allowance	1,500	cy	60.00	90,000		
312500	Silt fence/erosion control, wash bays, stock piles	5,335	lf	11.00	58,685		
312500	Silt fence maintenance and monitoring	1	ls	30,000.00	30,000		
	<u>Hazardous Waste Remediation</u>						
	Remove existing underground fuel storage tank					w/ haz mat	
	Dispose/treat contaminated soils/water					NIC	
	SUBTOTAL						973,375

G20 SITE IMPROVEMENTS

320000	<u>Asphalt Paving</u>	243,730					
320000	gravel base; 12" thick	9,027	cy	35.00	315,945		
320000	asphalt; 4" thick	27,081	sy	24.00	649,944		
320000	Granite curb	14,047	lf	38.00	533,786		
320000	Road markings	1	ls	15,000.00	15,000		
320000	HC curb cuts	10	loc	350.00	3,500		
101400	Signage	1	ls	25,000.00	25,000		
	<u>Pedestrian Paving</u>						
	Concrete paving						
312000	gravel base; 12" thick	556	cy	35.00	19,460		
033000	4" concrete paving	15,000	sf	7.00	105,000		
	<u>Concrete Pavers</u>						
	<u>Concrete pavers</u>						
323000	Precast concrete pavers	30,000	sf	18.00	540,000		
312000	gravel base; 8" thick	744	cy	35.00	26,040		
312000	dry pack; 2" thick	178	cy	28.00	4,984		
033000	concrete base; 4" thick	30,000	sf	5.55	166,500		
	<u>Site Improvements</u>						
323000	Rubber play surface	2,658	sf	18.00	47,844		
323000	Flagpole	1	ls	6,500.00	6,500		
323000	Play equipment	1	ls	40,000.00	40,000		
323000	Bike racks	5	ea	1,000.00	5,000		
323000	Fencing	1	ls	100,000.00	100,000		
323000	Bollards	1	ls	20,000.00	20,000		
101400	Entrance sign	1	ls	15,000.00	15,000		
101400	Miscellaneous site improvements	1	ls	100,000.00	100,000		
	<u>Football Field</u>	117,838			-		
312000	Crushed stone - 12" thick	4,364	cy	35.00	152,740		
312000	Gravel base - assumed 8" thick	2,924	cy	30.00	87,720		
323000	Synthetic turf	117,838	sf	8.00	942,704		
323000	Scoreboard	1	ea	25,000.00	25,000		
323000	Line markings - Allowance	1	ls	2,000.00	2,000		
323000	Football goals	1	ls	5,000.00	5,000		
323000	Vinyl CL Fencing; 6'	4,000	lf	45.00	180,000		
323000	Gate, single	4	ea	1,200.00	4,800		
323000	Gate, double	2	ea	2,400.00	4,800		
323000	Portable Bleachers	1	ls	150,000.00	150,000		
323000	High Jump / Discuss / Long/Triple Jump	1	ls	60,000.00	60,000		



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITEWORK OPTION 3							
63	<u>Running Track</u>	40,423					
64	312000 Gravel base - 12" thick	1,497	cy	35.00	52,395		
65	323000 Running track surface - 1/2" urethane surfacing	4,491	sy	65.00	291,915		
66	<u>Softball Field / Baseball Field</u>						
67	312000 Gravel base - assumed 12" thick	4,074	cy	35.00	142,590		
68	312000 Sand base	4,074	cy	40.00	162,960		
69	329000 Sodded athletic field	110,000	sf	1.00	110,000		
70	329000 Infield mix	23,129	sf	0.30	6,939		
71	329000 Stone dust warning track	5,727	sf	6.00	34,362		
72	329000 Pitching mound; home plate	2	loc	2,750.00	5,500		
73	329000 3 bases	2	loc	700.00	1,400		
74	329000 Line markings w/ marking pins below grade	2	ls	4,000.00	8,000		
75	329000 Players benches	8	ea	2,500.00	20,000		
76	329000 24' chain-link backstop	190	lf	90.00	17,100		
77	329000 Batting cage	2	ea	10,000.00	20,000		
78	329000 Portable break away outfield fencing	367	lf	30.00	11,010		
79	329000 New scoreboard	2	ea	7,500.00	15,000		
80	<u>Landscaping</u>						
81	329000 Topsoil - amended	5,556	cy	24.00	133,344		
82	329000 Lawn - seed	300,000	sf	0.25	75,000		
83	329000 Raingarden	1	ls	150,000.00	150,000		
84	329000 Misc. plantings	1	ls	250,000.00	250,000		
85	329000 Irrigation well	1	ls	25,000.00	25,000		
86	329000 Irrigation to playfields	110,000	sf	1.00	110,000		
87	SUBTOTAL					5,996,782	
88							
89	G30 CIVIL MECHANICAL UTILITIES						
90	<u>Water supply</u>						
91	330000 New DI piping; 8"	900	lf	110.00	99,000		
92	330000 New DI piping; 6"	900	lf	100.00	90,000		
93	330000 FD connection	1	loc	2,000.00	2,000		
94	330000 Gate valves	5	loc	750.00	3,750		
95	330000 PIV	1	loc	1,000.00	1,000		
96	330000 Connect to existing piping	2	loc	3,000.00	6,000		
97	330000 Fire hydrant	2	ea	5,000.00	10,000		
98	<u>Sanitary</u>						
99	330000 6" PVC	1,000	lf	60.00	60,000		
100	330000 SMH	2	ea	3,500.00	7,000		
101	330000 Connect to existing	1	loc	3,000.00	3,000		
102	330000 Grease trap	1	ea	10,000.00	10,000		
103	<u>Storm water allowances</u>						
104	330000 Storm water allowances	1	ls	1,200,000.00	1,200,000		
105	<u>Gas service</u>						
106	312000 E&B trench for new gas pipe - install by plumbing	900	lf	22.00	19,800		
107	SUBTOTAL					1,511,550	
108							
109	G40 ELECTRICAL UTILITIES						
110	<u>Power - Main Building</u>						
111	260000 Pole riser	1	ls	1,200.00	1,200		
112	260000 Primary ductbank; main building						
113	260000 2" PVC conduit; allow	1,000	lf	80.00	80,000		
114	260000 Trench w/ concrete encasement	1,000	lf	120.00	120,000		
115	260000 Pad mount xfmr	1	ea	By Utility			
116	260000 8' x 8' pre-cast pad assembly for xfmr	1	ea	8,000.00	8,000		
117	260000 Transformer pad grounding	1	ea	2,000.00	2,000		
118	260000 Meter box/socket	1	ea	2,500.00	2,500		
119	260000 5,000A secondary feeder	50	lf	3,000.00	150,000		
120	260000 800A feeder to emergency switchboard; assumed to be life safety; concrete encased RGS	100	lf	358.29	35,829		
121	260000 Premium for concrete encasement to main feeder	100	lf	120.00	12,000		
122	260000 Generator Pad	1	ea	2,000.00	2,000		
123	<u>Power - Sports Complex</u>						



Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITEWORK OPTION 3							
124 260000	Primary ductbank; sports complex; extension of existing						
125 260000	2# 4" PVC conduit; allow	150	lf	31.42	4,713		
126 260000	Trench w/ concrete encasement	150	lf	120.00	18,000		
127 260000	Handhole	1	ea	4,000.00	4,000		
128 260000	Wall mounted pull box	1	ea	1,500.00	1,500		
129 260000	<u>Communications</u>						
130 260000	Communication riser	1	ea	1,600.00	1,600		
131 260000	4-4" communications ductbank; allow	1,000	lf	60.68	60,680		
132 260000	Trenching	1,000	lf	25.00	25,000		
133 260000	Communication handhole	1	ea	1,500.00	1,500		
134 260000	<u>Site Lighting</u>						
135 260000	Allowance for general site lighting	1	ls	550,000.00	550,000		
136	SUBTOTAL					1,080,522	
137	TOTAL - SITE DEVELOPMENT						\$9,562,229
138							



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA 278,551

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 4 - NEW SCHOOL ADDITION					
A10 FOUNDATIONS					
A1010	Standard Foundations	\$1,769,937			
A1020	Special Foundations	\$0			
A1030	Lowest Floor Construction	\$2,092,630	\$3,862,567	\$13.87	5.4%
A20 BASEMENT CONSTRUCTION					
A2010	Basement Excavation	\$0			
A2020	Basement Walls	\$0	\$0	\$0.00	0.0%
B10 SUPERSTRUCTURE					
B1010	Upper Floor Construction	\$4,950,306			
B1020	Roof Construction	\$3,993,874	\$8,944,180	\$32.11	12.5%
B20 EXTERIOR CLOSURE					
B2010	Exterior Walls	\$7,793,769			
B2020	Windows	\$3,744,035			
B2030	Exterior Doors	\$118,541	\$11,656,345	\$41.85	16.3%
B30 ROOFING					
B3010	Roof Coverings	\$2,942,002			
B3020	Roof Openings	\$32,500	\$2,974,502	\$10.68	4.2%
C10 INTERIOR CONSTRUCTION					
C1010	Partitions	\$7,242,326			
C1020	Interior Doors	\$1,114,204			
C1030	Specialties/Millwork	\$1,990,294	\$10,346,824	\$37.15	14.5%
C20 STAIRCASES					
C2010	Stair Construction	\$328,000			
C2020	Stair Finishes	\$65,970	\$393,970	\$1.41	0.6%
C30 INTERIOR FINISHES					
C3010	Wall Finishes	\$1,392,755			
C3020	Floor Finishes	\$1,949,857			
C3030	Ceiling Finishes	\$1,671,306	\$5,013,918	\$18.00	7.0%
D10 CONVEYING SYSTEMS					
D1010	Elevator	\$260,000	\$260,000	\$0.93	0.4%
D20 PLUMBING					
D20	Plumbing	\$3,485,697	\$3,485,697	\$12.51	4.9%



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA 278,551

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 4 - NEW SCHOOL ADDITION					
D30 HVAC					
D30 HVAC		\$9,463,313	\$9,463,313	\$33.97	13.3%
D40 FIRE PROTECTION					
D40 Fire Protection		\$1,114,204	\$1,114,204	\$4.00	1.6%
D50 ELECTRICAL					
D5010 Complete System		\$9,573,105	\$9,573,105	\$34.37	13.4%
E10 EQUIPMENT					
E10 Equipment		\$2,412,200	\$2,412,200	\$8.66	3.4%
E20 FURNISHINGS					
E2010 Fixed Furnishings		\$1,549,001			
E2020 Movable Furnishings	NIC		\$1,549,001	\$5.56	2.2%
F10 SPECIAL CONSTRUCTION					
F10 Special Construction		\$300,000	\$300,000	\$1.08	0.4%
F20 HAZMAT REMOVALS					
F2010 Building Elements Demolition		\$0			
F2020 Hazardous Components Abatement		\$0	\$0	\$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)			\$71,349,826	\$256.15	100.0%



Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - NEW SCHOOL ADDITION

GROSS FLOOR AREA CALCULATION

First Floor	138,613
Second Floor	110,306
Third Floor	29,632

TOTAL GROSS FLOOR AREA (GFA)

278,551 sf

A10 FOUNDATIONS

A1010 STANDARD FOUNDATIONS

Strip footings - 3'-0" x 2'-0"

Excavation	3,829	cy	12.00	45,948
Store on site for reuse	3,829	cy	14.00	53,606
Backfill with new fill	3,140	cy	16.00	50,240
Formwork	11,814	sf	11.00	129,954
Re-bar, 10#/lf	29,535	lbs	1.20	35,442
Concrete material; 3,000 psi	689	cy	125.00	86,125
Placing concrete	689	cy	55.00	37,895

Foundation walls at exterior - 16" thick

Formwork	23,632	sf	12.50	295,400
Re-bar, 4#/sf	47,264	lbs	1.20	56,717
Concrete material; 4,000 psi	536	cy	135.00	72,360
Placing concrete	536	cy	65.00	34,840
Dampproofing foundation wall and footing	17,724	sf	1.90	NIC
Insulation to foundation walls; 2" thick	11,816	sf	2.50	29,540
Form shelf	2,954	lf	8.00	23,632

Thickened slab at interior load bearing walls

Excavation	1,345	cy	12.00	16,140
Store on site for reuse	1,345	cy	14.00	18,830
Backfill with new fill	1,224	cy	16.00	19,584
Formwork	2,075	sf	11.00	22,825
Re-bar, 10#/lf	10,373	lbs	1.20	12,448
Concrete material; 3,000 psi	121	cy	125.00	15,125
Placing concrete	121	cy	55.00	6,655

Exterior column footings, typical, 8' x 8' x 2'-0"

Excavation	1,505	cy	15.00	22,575
Store on site for reuse	1,505	cy	14.00	21,070
Backfill with new fill	1,062	cy	16.00	16,992
Formwork	5,696	sf	11.00	62,656
Re-bar, 150/cy	66,450	lbs	1.20	79,740
Concrete material; 3,000 psi	443	cy	125.00	55,375
Placing concrete	443	cy	55.00	24,365
Set anchor bolts grout plates	89	ea	150.00	13,350

Interior column footings, typical, 9' x 9' x 2'-0"

Excavation	1,290	cy	15.00	19,350
Store on site for reuse	1,290	cy	14.00	18,060
Backfill with new fill	880	cy	16.00	14,080
Formwork	4,680	sf	11.00	51,480
Re-bar, 150/cy	48,750	lbs	1.20	58,500
Concrete material; 3,000 psi	410	cy	125.00	51,250
Placing concrete	410	cy	55.00	22,550
Set anchor bolts grout plates	65	ea	150.00	9,750



Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 4 - NEW SCHOOL ADDITION							
56	Premium for foundations against existing building	670	lf	150.00	100,500		
57	Perimeter drainage system	2,954	lf	22.00	64,988		
58	SUBTOTAL					1,769,937	
59							
60	A1020 SPECIAL FOUNDATIONS						
61	No Work in this section						
62	SUBTOTAL						
63							
64	A1030 LOWEST FLOOR CONSTRUCTION						
65	<u>New Slab on grade, 5" thick</u>						
66	Raise existing levels 3ft AV; structural fill	15,401	cy	28.00	431,228		
67	Base course, 6" gravel	2,567	cy	35.00	89,845		
68	Rigid insulation	138,613	sf	2.25	311,879		
69	Vapor barrier	138,613	sf	0.75	103,960		
70	Under slab drainage -allow	138,613	sf	2.50	346,533		
71	Mesh reinforcing 15% lap	159,405	sf	0.80	127,524		
72	Concrete - 5" thick	2,264	cy	125.00	283,000		
73	Placing concrete	2,264	cy	45.00	101,880		
74	Finishing and curing concrete	138,613	sf	1.50	207,920		
75	Control joints - saw cut	138,613	sf	0.10	13,861		
76	<u>Miscellaneous</u>						
77	New Elevator pits	2	ea	25,000.00	50,000		
78	New loading dock - allow	1	ls	20,000.00	20,000		
79	Equipment pads - allow	1	ls	5,000.00	5,000		
80	SUBTOTAL					2,092,630	
81							
82	TOTAL - FOUNDATIONS						\$3,862,567
83							
84							
85	A20 BASEMENT CONSTRUCTION						
86							
87	A2010 BASEMENT EXCAVATION						
88	No Work in this section						
89	SUBTOTAL					-	
90							
91	A2020 BASEMENT WALLS						
92	No Work in this section						
93	SUBTOTAL					-	
94							
95	TOTAL - BASEMENT CONSTRUCTION						
96							
97							
98	B10 SUPERSTRUCTURE						
99							
100	B1010 FLOOR CONSTRUCTION	13	lbs/sf				
101	<u>Floor Structure - Steel:</u>	1,742	tns				
102	Steel beams and columns; 13/SF	910	tns	3,400.00	3,094,000		
103	Shear studs	27,988	ea	2.50	69,970		
104	<u>Floor Structure</u>						
105	3" Metal floor Deck	139,938	sf	4.00	559,752		
106	WWF reinforcement	160,929	sf	0.80	128,743		
107	Concrete Fill to metal deck; 5 1/4" Light weight	2,231	cy	170.00	379,270		
108	Place and finish concrete	139,938	sf	2.00	279,876		
109	Misc. perimeter angles	2,954	lf	25.00	73,850		
110	<u>Miscellaneous</u>						



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - NEW SCHOOL ADDITION

111	Fire proofing to columns and beams	139,938	sf	2.50	349,845		
112	Fire stopping floors	3	flrs	5,000.00	15,000		
113	SUBTOTAL					4,950,306	

B1020 ROOF CONSTRUCTION

Roof Structure - Steel:

117	Steel beams/Joists; 12#/SF	832	tns	3,400.00	2,828,800		
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Roof Structure

119	3" Metal floor Deck @ roof	127,313	sf	4.00	509,252		
120	Acoustic deck at gym, 3", type NA	11,300	sf	7.00	79,100		

Roof Structure @ Mech Equipment/Low roof

122	WWF reinforcement	11,500	sf	0.80	9,200		
123	Concrete Fill to metal deck; 5 1/4" Light weight	159	cy	170.00	27,030		
124	Place and finish concrete	10,000	sf	3.00	30,000		

Miscellaneous

126	Canopy framing - allow	1	ls	30,000.00	30,000		
127	Roof screen framing - allow	1,500	sf	20.00	30,000		
128	Fire proofing to columns, beams and deck	138,613	sf	3.25	450,492		
129	SUBTOTAL					3,993,874	

TOTAL - SUPERSTRUCTURE

\$8,944,180

B20 EXTERIOR CLOSURE

B2010 EXTERIOR WALLS

Interior skin

136	8" metal stud backup	69,218	sf	8.00	553,744		
137	Batt insulation in stud	69,218	sf	2.25	155,741		
138	2 1/2" Rigid Insulation	69,218	sf	3.00	207,654		
139	Air barrier	69,218	sf	6.00	415,308		
140	Air barrier/flashing at windows	7,356	lf	7.00	51,492		
141	Gypsum Sheathing	69,218	sf	2.75	190,350		
142	Drywall lining to interior face of stud backup	69,218	sf	3.00	207,654		

Interior skin @ LL

143	8" CMU backup	21,510	sf	22.00	473,220		
144	2 1/2" Rigid Insulation	21,510	sf	3.00	64,530		
145	Air barrier	21,510	sf	6.00	129,060		
146	Premium for GF block	21,510	sf	5.00	107,550		

Exterior skin

147	Brick veneer	59,880	sf	45.00	2,694,600		
148	Metal panels	30,848	sf	70.00	2,159,360		

Miscellaneous

149	Aluminum sign at main entrance	1	ls	10,000.00	10,000		
150	Staging to exterior wall	124,502	sf	3.00	373,506		
151	SUBTOTAL					7,793,769	

B2020 WINDOWS

152	Curtainwall	11,483	sf	120.00	1,377,960		
153	Premium for sunscreen and light shelf elements	1	ls	200,000.00	200,000		
154	Windows/storefront	22,291	sf	90.00	2,006,190		
155	Louvers (allowance)	250	sf	60.00	15,000		
156	Backer rod & double sealant	11,145	lf	9.00	100,305		
157	Wood blocking at openings	11,145	lf	4.00	44,580		



Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - NEW SCHOOL ADDITION

SUBTOTAL 3,744,035

B2030 EXTERIOR DOORS

Glazed entrance doors including frame and hardware; double door	5	pr	8,000.00	40,000
HM doors, frames and hardware- Double	2	pr	3,600.00	7,200
HM doors, frames and hardware- Single	1	ea	1,800.00	1,800
Coiling doors	9	ea	7,500.00	67,500
Backer rod & double sealant	157	lf	9.00	1,413
Wood blocking at openings	157	lf	4.00	628

SUBTOTAL 118,541

TOTAL - EXTERIOR CLOSURE

\$11,656,345

B30 ROOFING

B3010 ROOF COVERINGS

Flat roofing				
PVC roof membrane fully adhered	138,613	sf	7.50	1,039,598
Insulation	138,613	sf	6.50	900,985
1/2" dens-deck protection board	138,613	sf	2.00	277,226
Reinforced vapor barrier	138,613	sf	1.00	138,613
Rough blocking	3,149	lf	20.00	62,980
Miscellaneous Roofing				
Canopies - allow	1,000	sf	120.00	120,000
Roof screens - allow	1,500	sf	60.00	90,000
Roof fascia/cornice	1,964	lf	150.00	294,600
Roof ladders	1	ls	3,000.00	3,000
Walk pads	1	ls	15,000.00	15,000

SUBTOTAL 2,942,002

B3020 ROOF OPENINGS

Skylights, allow	1	ls	30,000.00	30,000
Roof hatch	1	loc	2,500.00	2,500

SUBTOTAL 32,500

TOTAL - ROOFING

\$2,974,502

C10 INTERIOR CONSTRUCTION

C1010 PARTITIONS

Allowance for interior partitions	278,551	gsf	26.00	7,242,326
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SUBTOTAL 7,242,326

C1020 INTERIOR DOORS

Allowance for specialty doors, doors and hardware	278,551	gsf	4.00	1,114,204
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SUBTOTAL 1,114,204

C1030 SPECIALTIES / MILLWORK

Toilet Partitions and accessories	278,551	gsf	0.80	222,841
Backer panels in electrical closets	1	ls	1,000.00	1,000
Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms; 20' tackboard w/ 8' markerboard in each Educational space	278,551	sf	1.00	278,551
Catwalk platform at auditorium	1	ls	120,000.00	120,000
Pipe grid at art classroom	1,407	sf	15.00	21,105



Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 4 - NEW SCHOOL ADDITION							
220	Pipe grid at auditorium	3,694	sf	15.00	55,410		
221	Pipe grid at multimedia engineering lab	2,090	sf	15.00	31,350		
222	Building directory	1	loc	3,000.00	3,000		
223	Bronze dedication plaque	1	loc	2,500.00	2,500		
224	Room Signs	278,551	gsf	0.40	111,420		
225	Fire extinguisher cabinets	93	ea	350.00	32,550		
226	Corridor Lockers	278,551	gsf	1.00	278,551		
227	Janitors Closet Accessories	1	ls	1,000.00	1,000		
228	Shelving in storage rooms	1	ls	10,000.00	10,000		
229	Staff mailboxes/casework	1	ls	5,000.00	5,000		
230	Reception desk in Media - allowance	1	ls	20,000	20,000		
231	Library shelving				F,F & E		
232	Display cases	1	ls	30,000.00	30,000		
233	Miscellaneous metals throughout building	278,551	sf	1.50	417,827		
234	Miscellaneous sealants throughout building	278,551	sf	1.25	348,189		
235	SUBTOTAL					1,990,294	
236							
237	TOTAL - INTERIOR CONSTRUCTION						\$10,346,824
238							
239							
240	C20 STAIRCASES						
241							
242	C2010 STAIR CONSTRUCTION						
243	Feature stair including rails and finishes	1	flt	60,000.00	60,000		
244	Stage stairs, wood	2	flts	5,000.00	10,000		
245	Metal pan stair; egress stair	8	flt	30,000.00	240,000		
246	Concrete fill to stairs	9	flt	2,000.00	18,000		
247	SUBTOTAL					328,000	
248							
249	C2020 STAIR FINISHES						
250	High performance coating to stairs including all railings etc.	9	flt	3,000.00	27,000		
251	Rubber tile at stairs - landings	1,350	sf	12.00	16,200		
252	Rubber tile at stairs - treads & risers	1,035	lft	22.00	22,770		
253	SUBTOTAL					65,970	
254							
255	TOTAL - STAIRCASES						\$393,970
256							
257							
258	C30 INTERIOR FINISHES						
259							
260	C3010 WALL FINISHES						
261	Allowance for wall finishes	278,551	gsf	5.00	1,392,755		
262	SUBTOTAL					1,392,755	
263							
264	C3020 FLOOR FINISHES						
265	Allowance for floor finishes	278,551	gsf	7.00	1,949,857		
266	SUBTOTAL					1,949,857	
267							
268	C3030 CEILING FINISHES						
269	Allowance for ceiling finishes	278,551	sf	6.00	1,671,306		
270	SUBTOTAL					1,671,306	
271							
272	TOTAL - INTERIOR FINISHES						\$5,013,918
273							
274							
275	D10 CONVEYING SYSTEMS						
276							
277	D1010 ELEVATOR						
278	New elevator; 3 stop	2	ea	130,000.00	260,000		
279	SUBTOTAL					260,000	



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - NEW SCHOOL ADDITION

TOTAL - CONVEYING SYSTEMS

\$260,000

D20 PLUMBING

D20 PLUMBING, GENERALLY

Equipment

Plumbing equipment

278,551

sf

0.90

250,696

Plumbing Fixtures

Plumbing fixtures

278,551

sf

2.00

557,102

Domestic Water Piping

Copper pipe type L with fittings & hangers

278,551

sf

3.00

835,653

Valves & accessories

1

ls

188,100.00

188,100

Pipe insulation

Pipe insulation

278,551

sf

1.55

431,754

Sanitary Waste And Vent Pipe w/ Hangers

Cast iron pipe with fittings & hangers

278,551

sf

2.50

696,378

Storm Drainage, Hubless Cast Iron Pipe

Cast iron pipe with fittings & hangers

278,551

sf

0.60

167,131

Acid Waste And Vent Pipe w/ Hangers

Acid resistant pipe with fittings & hangers

278,551

sf

0.15

41,783

Natural Gas Piping

Natural gas pipe with fittings & hangers

278,551

sf

0.40

111,420

Valves & accessories

1

ls

25,080.00

25,080

Compressed Air Piping

Black steel pipe with fittings & hangers

1

ls

16,000.00

16,000

Valves & accessories

1

ls

4,000.00

4,000

Miscellaneous

Coordination & management

1

ls

72,600.00

72,600

Commissioning support

1

ls

34,320.00

34,320

Coring, sleeves & fire stopping

1

ls

10,000.00

10,000

Testing and sterilization

1

ls

12,000.00

12,000

Fees & permits

1

ls

31,680.00

31,680

SUBTOTAL

3,485,697

TOTAL - PLUMBING

\$3,485,697

D30 HVAC

D30 HVAC, GENERALLY

Heating equipment

Heating equipment

278,551

sf

1.25

348,189

Pumps

Pumps

278,551

sf

0.15

41,783

Cooling Equipment

Cooling equipment

278,551

sf

0.50

139,276

Air distribution

Air Handling Unit

Air distribution equipment

278,551

sf

6.00

1,671,306

Exhaust fan

Exhaust fans

278,551

sf

0.75

208,913

Sheet metal & Accessories

Galvanized ductwork with fittings & hangers

199,980

lbs

10.00

1,999,800

Black steel welded ductwork with hangers

6,000

lbs

14.00

84,000

Boiler combustion air system

1

ls

50,000.00

50,000

Registers, grilles & diffusers

1,667

ea

125.00

208,375

Duct insulation

120,120

sf

4.00

480,480

Miscellaneous sheet metal accessories

278,551

sf

0.50

139,276

Piping

Hot Water & Chilled Water Pipe



Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 4 - NEW SCHOOL ADDITION							
342	Hot water piping with fittings & hangers	278,551	sf	3.50	974,929		
343	Chilled water piping with fittings & hangers	278,551	sf	0.60	167,131		
344	Valves & accessories	1	ls	257,400.00	257,400		
345	<u>Refrigerant Piping</u>						
346	Refrigerant piping with fittings & hangers	278,551	sf	0.12	33,426		
347	Valves & accessories	1	ls	10,200.00	10,200		
348	<u>Condensate Drain Piping</u>						
349	Condensate drain piping with fittings & hangers	278,551	sf	0.25	69,638		
350	<u>Piping Insulation</u>						
351	Piping insulation	278,551	sf	2.00	557,102		
352	<u>Controls (DDC)</u>						
353	Automatic temperature controls	278,551	sf	5.50	1,532,031		
354	<u>Balancing</u>						
355	System testing & balancing	278,551	sf	0.65	181,058		
356	<u>Miscellaneous</u>						
357	Coordination & management	1	ls	171,600.00	171,600		
358	Commissioning support	1	ls	56,100.00	56,100		
359	Coring, sleeves & fire stopping	1	ls	10,000.00	10,000		
360	Equipment start-up and inspection	1	ls	2,000.00	2,000		
361	Rigging & equipment rental	1	ls	49,500.00	49,500		
362	Vibration & seismic restraints	1	ls	19,800.00	19,800		
363	SUBTOTAL					9,463,313	
364	TOTAL - HVAC						\$9,463,313
365							
366							
367							
368	D40 FIRE PROTECTION						
369							
370	D40 FIRE PROTECTION, GENERALLY						
371	Fire protection allowance	278,551	sf	4.00	1,114,204		
372	SUBTOTAL					1,114,204	
373							
374	TOTAL - FIRE PROTECTION						\$1,114,204
375							
376							
377	D50 ELECTRICAL						
378							
379	D5010 COMPLETE ELECTRICAL SYSTEM						
380	Gear & Distribution						
381	<u>Normal Power</u>						
382	Gear and distribution						
383	Associated panelboards, transformers and feeders	278,551	sf	5.00	1,392,755		
384	<u>Emergency power</u>						
385	Emergency generator, annunciator, ATS's and associated panelboards, transformers and feeders	278,551	sf	1.50	417,827		
386	<u>Equipment Wiring</u>						
387	Elevator feed and connection	1	ls	3,500.00	3,500		
388	Elevator cab power feed and connection	1	ls	1,500.00	1,500		
389	Electrical feed and connections to misc. equipment	278,551	sf	1.00	278,551		
390	Kitchen equipment wiring and connections	1	ls	40,000.00	40,000		
391	SUBTOTAL					2,134,133	
392							
393	D5020 LIGHTING & POWER						
394	<u>Lighting & Branch Power</u>						
395	General, classroom, common area and bathroom lighting LED	278,551	sf	4.25	1,183,842		
396	Gymnasium lighting (allow)	30	ea	550.00	16,500		
397	Exterior building lighting	1	ls	10,000.00	10,000		
398	<u>Lighting controls</u>						
399	Automated Lighting control system with occupancy sensors and photo sensing	278,551	sf	1.50	417,827		



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 4 - NEW SCHOOL ADDITION							
400	<u>Branch devices</u>						
401	Duplex and GFI receptacles	278,551	sf	0.50	139,276		
402	<u>Lighting and branch circuitry</u>						
403	Lighting and branch circuitry. Conduit and MC cable wiring methods.	278,551	sf	5.00	1,392,755		
404	SUBTOTAL					3,160,200	
405							
406	D5030 COMMUNICATION & SECURITY SYSTEMS						
407	<u>Fire Alarm</u>						
408	Control panel	1	ea	15,000.00	15,000		
409	Annunciator	1	ea	4,500.00	4,500		
410	Beacon	1	ea	225.00	225		
411	Knox box	1	ea	650.00	650		
412	Master box	1	ea	3,500.00	3,500		
413	Initiating devices, reporting devices, circuitry, programming and testing	278,551	sf	2.00	557,102		
414	<u>Bi-Directional Amplification System</u>						
415	BDA system	1	ls	82,500.00	82,500		
416	<u>Telephone/Data/CATV</u>						
417	MDF/IDF Fit-out	1	ls	25,000.00	25,000		
418	Voice over IP, Centrex system and switching (PBX)	278,551	sf	1.00	278,551		
419	Devices & cabling	278,551	sf	2.25	626,740		
420	Rough-in, conduit stubs and backboxes	278,551	sf	1.00	278,551		
421	Grounding	1	ls	2,500.00	2,500		
422	<u>PA/Master Clock System</u>						
423	Head end	1	ls	30,000.00	30,000		
424	Clocks, speakers, backboxes and circuitry	278,551	sf	0.80	222,841		
425	Speech reinforcement system (allow)	278,551	sf	0.40	111,420		
426	<u>Security System</u>						
427	Head end	1	ls	30,000.00	30,000		
428	CCTV system monitoring corridors, stairwells, large assembly locations	278,551	sf	2.00	557,102		
429	Intrusion detection system comprising keypads, motion detectors and door contacts	278,551	sf	0.50	139,276		
430	Card access and proximity reader system	278,551	sf	0.50	139,276		
431	<u>Audio Visual</u>						
432	AV system equipment (Provided by others)						
433	AV rough-in	278,551	sf	0.25	69,638		
434	<u>Multi-Purpose / Gymnasium</u>						
435	Scoreboard, controller and wiring	1	ls	12,500.00	12,500		
436	Gymnasium equipment feed and connections	1	ls	12,000.00	12,000		
437	Sound system	1	ls	15,000.00	15,000		
438	<u>Cafeteria</u>						
439	Sound system	1	ls	10,000.00	10,000		
440	<u>Auditorium</u>						
441	Rigging and drapery					DIV. 11	
442	ER	2	ea			By Others	
443	Rigging point power & control (allow)	1	ls	10,000.00	10,000		
444	<u>Theatrical lighting system</u>	1	ls			DIV. 11	
445	Dimmer rack and stage lighting (allow)	1	ea	200,000.00	200,000		
446	Dimmer rack installation	2	ea	1,500.00	3,000		
447	Dimmer rack feed, ELTS and company switches (allow)	1	ls	30,000.00	30,000		
448	House lighting and circuitry (allow)	1	ls	25,000.00	25,000		
449	Control:						
450	Control rack	1	ea			DIV. 11	
451	Rack power	1	ls	1,000.00	1,000		
452	Backboxes, conduit and wiring (allow)	1	ls	30,000.00	30,000		
453	Stage Circuitry:						



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - NEW SCHOOL ADDITION

454	Circuit boxes (allow)	35	ea			DIV. 11	
455	Backboxes, conduit and wiring (allow)	1	ls	150,000.00	150,000		
456	Terminations (allow)	350	ea	10.00	3,500		
457	Theatrical fixture & accessory package	1	ls			DIV. 11	
458	System turn-on & training	1	ls			DIV. 11	
459	<u>Media Center/ Video Production Studio</u>						
460	Rough-in with unistrut conduit and backboxes	1	ls	5,000.00	5,000		
461	Power feed and connections	1	ls	25,000.00	25,000		
462	Sound system	1	ls	7,500.00	7,500		
463	Video equipment is provided by others					By Others	
464	<u>Lightning Protection System</u>						
465	Lighting protection and grounding	1	ls	92,400.00	92,400		
466	<u>Photovoltaic system</u>						
467	Rough-in provisions for future photovoltaic system	1	ls	3,500.00	3,500		
468	SUBTOTAL						3,809,772

D5040 OTHER ELECTRICAL SYSTEMS

471	<u>Miscellaneous</u>						
472	Demolition and make safe	1	ls	25,000.00	25,000		
473	Seismic restraints	1	ls	15,000.00	15,000		
474	Coordination / BIM	1	ls	132,000.00	132,000		
475	Temp power and lights	1	ls	132,000.00	132,000		
476	Fees & Permits	1	ls	165,000.00	165,000		
477	SUBTOTAL						469,000

TOTAL - ELECTRICAL

\$9,573,105

E10 EQUIPMENT

E10 EQUIPMENT, GENERALLY

486	Gym wall pads	1	ls	10,000.00	10,000		
487	Basketball backstops; swing up; electric operated	4	ea	9,800.00	39,200		
488	Gymnasium dividing net; electrically operated	1	loc	45,000.00	45,000		
489	Volleyball net and standards	1	ea	2,000.00	2,000		
490	Telescoping bleachers	1	ls	25,000.00	25,000		
491	Theatrical Equipment Stage curtains, rigging and controls	1	ls	750,000.00	750,000		
492	Theatrical AV equipment	1	ls	500,000.00	500,000		
493	Shop equipment	1	ls	150,000.00	150,000		
494	Stage lighting and dimming	1	ls	75,000.00	75,000		
495	Food Service equipment	1	ls	750,000.00	750,000		
496	Electrically operated projection screens	1	loc	10,000.00	10,000		
497	Loading dock leveler and bumpers	2	loc	8,000.00	16,000		
498	Fume Hoods	4	ea	10,000.00	40,000		
499	AV Equipment (including Smartboards, Projectors, LED monitors, Digital information displays etc.)					FF+E	
500	SUBTOTAL						2,412,200

TOTAL - EQUIPMENT

\$2,412,200

E20 FURNISHINGS

E2010 FIXED FURNISHINGS

508	Entry mats & frames - recessed with carpet/rubber strips	500	sf	45.00	22,500		
509	Manual operated roller shades	22,291	sf	6.00	133,746		



Feasibility Design Submission

GFA

278,551

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 4 - NEW SCHOOL ADDITION							
510	Counters, base cabinets, tall storage in classrooms and other rooms	278,551	gsf	5.00	1,392,755		
511	SUBTOTAL					1,549,001	
512							
513	E2020 MOVABLE FURNISHINGS						
514	All movable furnishings to be provided and installed by owner						
515	SUBTOTAL					NIC	
516							
517	TOTAL - FURNISHINGS						\$1,549,001
518							
519							
520	F10 SPECIAL CONSTRUCTION						
521							
522	F10 SPECIAL CONSTRUCTION						
523	Allowance for greenhouse	1	ls	300,000.00	300,000		
524	SUBTOTAL					\$300,000	
525							
526	TOTAL - SPECIAL CONSTRUCTION						\$300,000
527							
528							
529	F20 SELECTIVE BUILDING DEMOLITION						
530							
531	F2010 BUILDING ELEMENTS DEMOLITION						
532	See main summary for demolition of existing buildings						
533	SUBTOTAL						
534							
535	F2020 HAZARDOUS COMPONENTS ABATEMENT						
536	See main summary for HazMat allowance				See Summary		
537	SUBTOTAL						
538							
539	TOTAL - SELECTIVE BUILDING DEMOLITION						



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA 100,378

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 4 - RENOVATION TO EXISTING SCHOOL					
A10 FOUNDATIONS					
A1010	Standard Foundations	\$501,890			
A1020	Special Foundations	\$0			
A1030	Lowest Floor Construction	\$200,756	\$702,646	\$7.00	3.3%
A20 BASEMENT CONSTRUCTION					
A2010	Basement Excavation	\$0			
A2020	Basement Walls	\$0	\$0	\$0.00	0.0%
B10 SUPERSTRUCTURE					
B1010	Upper Floor Construction	\$0			
B1020	Roof Construction	\$903,024	\$903,024	\$9.00	4.3%
B20 EXTERIOR CLOSURE					
B2010	Exterior Walls	\$936,750			
B2020	Windows	\$1,306,862			
B2030	Exterior Doors	\$0	\$2,243,612	\$22.35	10.6%
B30 ROOFING					
B3010	Roof Coverings	\$1,993,871			
B3020	Roof Openings	\$0	\$1,993,871	\$19.86	9.4%
C10 INTERIOR CONSTRUCTION					
C1010	Partitions	\$2,409,072			
C1020	Interior Doors	\$401,512			
C1030	Specialties/Millwork	\$635,799	\$3,446,383	\$34.33	16.3%
C20 STAIRCASES					
C2010	Stair Construction	\$0			
C2020	Stair Finishes	\$0	\$0	\$0.00	0.0%
C30 INTERIOR FINISHES					
C3010	Wall Finishes	\$501,890			
C3020	Floor Finishes	\$702,646			
C3030	Ceiling Finishes	\$602,268	\$1,806,804	\$18.00	8.6%
D10 CONVEYING SYSTEMS					
D1010	Elevator	\$0	\$0	\$0.00	0.0%
D20 PLUMBING					
D20	Plumbing	\$1,304,914	\$1,304,914	\$13.00	6.2%



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA 100,378

CONSTRUCTION COST SUMMARY					
<i>BUILDING SYSTEM</i>		<i>SUB-TOTAL</i>	<i>TOTAL</i>	<i>\$/SF</i>	<i>%</i>
OPTION 4 - RENOVATION TO EXISTING SCHOOL					
D30 HVAC					
D30 HVAC		\$3,513,230	\$3,513,230	\$35.00	16.6%
D40 FIRE PROTECTION					
D40 Fire Protection		\$401,512	\$401,512	\$4.00	1.9%
D50 ELECTRICAL					
D5010 Complete System		\$3,312,474	\$3,312,474	\$33.00	15.7%
E10 EQUIPMENT					
E10 Equipment		\$10,000	\$10,000	\$0.10	0.0%
E20 FURNISHINGS					
E2010 Fixed Furnishings		\$607,550			
E2020 Movable Furnishings	NIC		\$607,550	\$6.05	2.9%
F10 SPECIAL CONSTRUCTION					
F10 Special Construction		\$0	\$0	\$0.00	0.0%
F20 HAZMAT REMOVALS					
F2010 Building Elements Demolition		\$886,184			
F2020 Hazardous Components Abatement		\$0	\$886,184	\$8.83	4.2%
TOTAL DIRECT COST (Trade Costs)			\$21,132,204	\$210.53	100.0%



Feasibility Design Submission

GFA 100,378

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - RENOVATION TO EXISTING SCHOOL

GROSS FLOOR AREA CALCULATION

First Floor 100,378

TOTAL GROSS FLOOR AREA (GFA) 100,378 sf

A10 FOUNDATIONS

A1010 STANDARD FOUNDATIONS

Allowance for miscellaneous foundation work for seismic upgrades **100,378** sf 5.00 501,890

SUBTOTAL 501,890

A1020 SPECIAL FOUNDATIONS

No Work in this section

SUBTOTAL

A1030 LOWEST FLOOR CONSTRUCTION

Allowance for patching of existing slabs disturbed by new work **100,378** sf 2.00 200,756

Miscellaneous

New Elevator pits 1 ea 25,000.00 In Addition

New loading dock - allow 1 ls 20,000.00 In Addition

Equipment pads - allow 1 ls 5,000.00 In Addition

SUBTOTAL 200,756

TOTAL - FOUNDATIONS \$702,646

A20 BASEMENT CONSTRUCTION

A2010 BASEMENT EXCAVATION

No items in this section

SUBTOTAL -

A2020 BASEMENT WALLS

No items in this section

SUBTOTAL -

TOTAL - BASEMENT CONSTRUCTION

B10 SUPERSTRUCTURE

B1010 FLOOR CONSTRUCTION

No Work in this section

SUBTOTAL -

B1020 ROOF CONSTRUCTION

Upgrades for snow loading 1 ls 100,000.00 100,000

Allowance for seismic upgrades **100,378** sf 8.00 803,024

SUBTOTAL 903,024

TOTAL - SUPERSTRUCTURE \$903,024

B20 EXTERIOR CLOSURE



Feasibility Design Submission

GFA

100,378

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - RENOVATION TO EXISTING SCHOOL

B2010 EXTERIOR WALLS

Miscellaneous

Repairs/ repointing to existing exterior wall 19,800 sf 35.00 693,000

Demolition/ create opes/ tie in at existing exterior closure @ connection to new additions 9,750 sf 25.00 243,750

SUBTOTAL 936,750

B2020 WINDOWS

Windows/storefront replace existing 13,860 sf 90.00 1,247,400

Backer rod & double sealant 4,574 lf 9.00 41,166

Wood blocking at openings 4,574 lf 4.00 18,296

SUBTOTAL 1,306,862

B2030 EXTERIOR DOORS

No Work in this section

SUBTOTAL -

TOTAL - EXTERIOR CLOSURE \$2,243,612

B30 ROOFING

B3010 ROOF COVERINGS

Flat roofing

Remove existing roof membrane down to insulation 100,378 sf 3.00 301,134

PVC roof membrane fully adhered 100,378 sf 7.50 752,835

Insulation 100,378 sf 6.00 602,268

1/2" dens-deck protection board 100,378 sf 2.00 200,756

Reinforced vapor barrier 100,378 sf 1.00 100,378

Rough blocking 1,300 lf 20.00 26,000

Miscellaneous Roofing

Roof ladders 1 ls 3,000.00 3,000

Walk pads 1 ls 7,500.00 7,500

SUBTOTAL 1,993,871

B3020 ROOF OPENINGS

Roof hatch 1 loc 2,500.00 ETR

SUBTOTAL -

TOTAL - ROOFING \$1,993,871

C10 INTERIOR CONSTRUCTION

C1010 PARTITIONS

Allowance to modify/replace existing partitions at extensive renovation 100,378 sf 24.00 2,409,072

SUBTOTAL 2,409,072

C1020 INTERIOR DOORS

Allowance for specialty doors, doors and hardware 100,378 gsf 4.00 401,512

SUBTOTAL 401,512

C1030 SPECIALTIES / MILLWORK

Toilet Partitions and accessories 100,378 gsf 0.80 80,302

Backer panels in electrical closets 1 ls 1,000.00 1,000



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

GFA

100,378

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - RENOVATION TO EXISTING SCHOOL

112	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms; 20' tackboard w/ 8' markerboard in each Educational space	100,378	sf	1.00	100,378		
113	Building directory	1	loc	3,000.00	In Addition		
114	Bronze dedication plaque	1	loc	2,500.00	In Addition		
115	Room Signs	100,378	gsf	0.40	40,151		
116	Fire extinguisher cabinets	33	ea	350.00	11,550		
117	Corridor Lockers	100,378	gsf	1.00	100,378		
118	Janitors Closet Accessories	1	ls	1,000.00	1,000		
119	Shelving in storage rooms	1	ls	10,000.00	10,000		
120	Staff mailboxes/casework	1	ls	5,000.00	In Addition		
121	Reception desk in Media - allowance	1	ls	20,000	In Addition		
122	Library shelving				F,F & E		
123	Display cases	1	ls	15,000.00	15,000		
124	Miscellaneous metals throughout building	100,378	sf	1.50	150,567		
125	Miscellaneous sealants throughout building	100,378	sf	1.25	125,473		
126	SUBTOTAL					635,799	

TOTAL - INTERIOR CONSTRUCTION

\$3,446,383

C20 STAIRCASES

C2010 STAIR CONSTRUCTION

No Work in this section

SUBTOTAL

-

C2020 STAIR FINISHES

No Work in this section

SUBTOTAL

-

TOTAL - STAIRCASES

C30 INTERIOR FINISHES

C3010 WALL FINISHES

Allowance for wall finishes at extensive renovation

100,378

gsf

5.00

501,890

SUBTOTAL

501,890

C3020 FLOOR FINISHES

Allowance for floor finishes at extensive renovation

100,378

gsf

7.00

702,646

SUBTOTAL

702,646

C3030 CEILING FINISHES

Allowance for ceiling finishes at extensive renovation

100,378

sf

6.00

602,268

SUBTOTAL

602,268

TOTAL - INTERIOR FINISHES

\$1,806,804

D10 CONVEYING SYSTEMS

D1010 ELEVATOR

SUBTOTAL

-

TOTAL - CONVEYING SYSTEMS

D20 PLUMBING



Feasibility Design Submission

GFA 100,378

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 4 - RENOVATION TO EXISTING SCHOOL							
D20	PLUMBING, GENERALLY						
	Plumbing; complete system at extensive renovation	100,378	gsf	13.00	1,304,914		
	SUBTOTAL					1,304,914	
TOTAL - PLUMBING							\$1,304,914
D30 HVAC							
D30	HVAC, GENERALLY						
	HVAC complete system at extensive renovation	100,378	gsf	35.00	3,513,230		
	SUBTOTAL					3,513,230	
TOTAL - HVAC							\$3,513,230
D40 FIRE PROTECTION							
D40	FIRE PROTECTION, GENERALLY						
	New Sprinkler system	100,378	gsf	4.00	401,512		
	SUBTOTAL					401,512	
TOTAL - FIRE PROTECTION							\$401,512
D50 ELECTRICAL							
D5010	COMPLETE ELECTRICAL SYSTEM						
	Electrical system; complete at extensive renovation	100,378	gsf	33.00	3,312,474		
	SUBTOTAL					3,312,474	
TOTAL - ELECTRICAL							\$3,312,474
E10 EQUIPMENT							
E10	EQUIPMENT, GENERALLY						
	Gym wall pads	1	ls		In Addition		
	Basketball backstops; swing up; electric operated	4	ea		In Addition		
	Gymnasium dividing net; electrically operated	1	loc		In Addition		
	Volleyball net and standards	1	ea		In Addition		
	Telescoping bleachers	1	ls		In Addition		
	Theatrical Equipment Stage curtains, rigging and controls	1	ls		In Addition		
	Stage lighting and dimming	1	ls		In Addition		
	Food Service equipment	1	ls		In Addition		
	Electrically operated projection screens	1	loc	10,000.00	10,000		
	AV Equipment (including Smartboards, Projectors, LED monitors, Digital information displays etc.)				FF+E		
	SUBTOTAL					10,000	
TOTAL - EQUIPMENT							\$10,000
E20 FURNISHINGS							
E2010	FIXED FURNISHINGS						
	Entry mats & frames - recessed with carpet/rubber strips	500	sf	45.00	22,500		
	Manual operated roller shades	13,860	sf	6.00	83,160		
	Counters, base cabinets, tall storage in classrooms and other rooms at extensive renovations	100,378	gsf	5.00	501,890		
	SUBTOTAL					607,550	



Feasibility Design Submission

GFA 100,378

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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OPTION 4 - RENOVATION TO EXISTING SCHOOL

E2020 MOVABLE FURNISHINGS

All movable furnishings to be provided and installed
by owner

SUBTOTAL

NIC

TOTAL - FURNISHINGS

\$607,550

F10 SPECIAL CONSTRUCTION

F10 SPECIAL CONSTRUCTION

No Work in this section

SUBTOTAL

TOTAL - SPECIAL CONSTRUCTION

F20 SELECTIVE BUILDING DEMOLITION

F2010 BUILDING ELEMENTS DEMOLITION

Extensive demolition of renovation areas; finishes,
doors, MEP systems, casework and specialties at
extensive renovations

100,378

sf

8.00

803,024

Demo of exterior windows

13,860

sf

6.00

83,160

Demo of roof included in Divisions above

SUBTOTAL

886,184

F2020 HAZARDOUS COMPONENTS ABATEMENT

See main summary for HazMat allowance

See Summary

SUBTOTAL

TOTAL - SELECTIVE BUILDING DEMOLITION

\$886,184



Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
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SITEWORK OPTION 4

G SITEWORK

G10 SITE PREPARATION & DEMOLITION

311000	Site construction fence/barricades	5,335	lf	14.00	74,690		
311000	Site construction fence gates	2	ea	2,500.00	5,000		
311000	Stabilized construction entrance	2,500	sf	6.00	15,000		
311000	Pavement/curbing removal, crush and re-use for sub-base	130,000	sf	1.50	195,000		
311000	Walkways	1	ls	50,000.00	50,000		
311000	Track	1	ls	30,000.00	30,000		
311000	Demolition of existing utility; cutting and capping	1	ls	25,000.00	25,000		
311000	Miscellaneous demolition	1	ls	100,000.00	100,000		
	<u>Site Earthwork</u>						
312000	Cuts/Fills allowance	1	ls	200,000.00	200,000		
312500	Strip and store topsoil	1	ls	100,000.00	100,000		
312500	Silt fence/erosion control, wash bays, stock piles	5,335	lf	11.00	58,685		
312500	Silt fence maintenance and monitoring	1	ls	30,000.00	30,000		
	<u>Hazardous Waste Remediation</u>						
	Remove existing underground fuel storage tank					w/ haz mat	
	Dispose/treat contaminated soils/water					NIC	
	SUBTOTAL						883,375

G20 SITE IMPROVEMENTS

320000	<u>Asphalt Paving</u>	265,167					
320000	gravel base; 12" thick	9,821	cy	35.00	343,735		
320000	asphalt; 4" thick	29,463	sy	24.00	707,112		
320000	Granite curb	14,133	lf	38.00	537,054		
320000	Road markings	1	ls	15,000.00	15,000		
320000	HC curb cuts	10	loc	350.00	3,500		
101400	Signage	1	ls	25,000.00	25,000		
	<u>Pedestrian Paving</u>						
	Concrete paving						
312000	gravel base; 12" thick	556	cy	35.00	19,460		
033000	4" concrete paving	15,000	sf	7.00	105,000		
	<u>Concrete Pavers</u>						
	<u>Concrete pavers</u>						
323000	Precast concrete pavers	30,000	sf	18.00	540,000		
312000	gravel base; 8" thick	744	cy	35.00	26,040		
312000	dry pack; 2" thick	178	cy	28.00	4,984		
033000	concrete base; 4" thick	30,000	sf	5.55	166,500		
	<u>Site Improvements</u>						
323000	Rubber play surface	2,658	sf	18.00	47,844		
323000	Flagpole	1	ls	6,500.00	6,500		
323000	Play equipment	1	ls	40,000.00	40,000		
323000	Bike racks	5	ea	1,000.00	5,000		
323000	Fencing	1	ls	100,000.00	100,000		
323000	Bollards	1	ls	20,000.00	20,000		
101400	Entrance sign	1	ls	15,000.00	15,000		
101400	Miscellaneous site improvements	1	ls	100,000.00	100,000		
	<u>Football Field</u>	117,838			-		
312000	Crushed stone - 12" thick	4,364	cy	35.00	152,740		
312000	Gravel base - assumed 8" thick	2,924	cy	30.00	87,720		
323000	Synthetic turf	117,838	sf	8.00	942,704		
323000	Scoreboard	1	ea	25,000.00	25,000		
323000	Line markings - Allowance	1	ls	2,000.00	2,000		
323000	Football goals	1	ls	5,000.00	5,000		
323000	Vinyl CL Fencing; 6'	4,000	lf	45.00	180,000		
323000	Gate, single	4	ea	1,200.00	4,800		
323000	Gate, double	2	ea	2,400.00	4,800		
323000	Portable Bleachers	1	ls	150,000.00	150,000		
323000	High Jump / Discuss / Long/Triple Jump	1	ls	60,000.00	60,000		
	<u>Running Track</u>	40,423					
312000	Gravel base - 12" thick	1,497	cy	35.00	52,395		



Northeast Metro Tech High School
Design Options
Wakefield, MA

17-Dec-15

Feasibility Design Submission

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
SITework OPTION 4							
64	323000 Running track surface - 1/2" urethane surfacing	4,491	sy	65.00	291,915		
65	<u>Softball Field / Baseball Field</u>						
66	312000 Gravel base - assumed 12" thick	4,074	cy	35.00	142,590		
67	312000 Sand base	4,074	cy	40.00	162,960		
68	329000 Sodded athletic field	110,000	sf	1.00	110,000		
69	329000 Infield mix	23,129	sf	0.30	6,939		
70	329000 Stone dust warning track	5,727	sf	6.00	34,362		
71	329000 Pitching mound; home plate	2	loc	2,750.00	5,500		
72	329000 3 bases	2	loc	700.00	1,400		
73	329000 Line markings w/ marking pins below grade	2	ls	4,000.00	8,000		
74	329000 Players benches	8	ea	2,500.00	20,000		
75	329000 24' chain-link backstop	190	lf	90.00	17,100		
76	329000 Batting cage	2	ea	10,000.00	20,000		
77	329000 Portable break away outfield fencing	367	lf	30.00	11,010		
78	329000 New scoreboard	2	ea	7,500.00	15,000		
79	<u>Landscaping</u>						
80	329000 Topsoil - amended	5,556	cy	24.00	133,344		
81	329000 Lawn - seed	300,000	sf	0.25	75,000		
82	329000 Raingarden	1	ls	150,000.00	150,000		
83	329000 Misc. plantings	1	ls	250,000.00	250,000		
84	329000 Irrigation well	1	ls	25,000.00	25,000		
85	329000 Irrigation to playfields	110,000	sf	1.00	110,000		
86	SUBTOTAL					6,085,008	
87							
88	G3o CIVIL MECHANICAL UTILITIES						
89	<u>Water supply</u>						
90	330000 New DI piping; 8"	900	lf	110.00	99,000		
91	330000 New DI piping; 6"	900	lf	100.00	90,000		
92	330000 FD connection	1	loc	2,000.00	2,000		
93	330000 Gate valves	5	loc	750.00	3,750		
94	330000 PIV	1	loc	1,000.00	1,000		
95	330000 Connect to existing piping	2	loc	3,000.00	6,000		
96	330000 Fire hydrant	2	ea	5,000.00	10,000		
97	330000 <u>Sanitary</u>						
98	330000 6" PVC	1,000	lf	60.00	60,000		
99	330000 SMH	2	ea	3,500.00	7,000		
100	330000 Connect to existing	1	loc	3,000.00	3,000		
101	330000 Grease trap	1	ea	10,000.00	10,000		
102	330000 <u>Storm water allowances</u>						
103	330000 Storm water allowances	1	ls	1,200,000.00	1,200,000		
104	330000 <u>Gas service</u>						
105	312000 E&B trench for new gas pipe - install by plumbing	900	lf	22.00	19,800		
106	SUBTOTAL					1,511,550	
107							
108	G4o ELECTRICAL UTILITIES						
109	<u>Power - Main Building</u>						
110	260000 Pole riser	1	ls	1,200.00	1,200		
111	260000 Primary ductbank; main building						
112	260000 2" PVC conduit; allow	1,000	lf	80.00	80,000		
113	260000 Trench w/ concrete encasement	1,000	lf	120.00	120,000		
114	260000 Pad mount xfmr	1	ea	By Utility			
115	260000 8' x 8' pre-cast pad assembly for xfmr	1	ea	8,000.00	8,000		
116	260000 Transformer pad grounding	1	ea	2,000.00	2,000		
117	260000 Meter box/socket	1	ea	2,500.00	2,500		
118	260000 5,000A secondary feeder	50	lf	3,000.00	150,000		
119	260000 800A feeder to emergency switchboard; assumed to be life safety; concrete encased RGS	100	lf	358.29	35,829		
120	260000 Premium for concrete encasement to main feeder	100	lf	120.00	12,000		
121	260000 Generator Pad	1	ea	2,000.00	2,000		
122	260000 <u>Power - Sports Complex</u>						
123	260000 Primary ductbank; sports complex; extension of existing						
124	260000 2# 4" PVC conduit; allow	150	lf	31.42	4,713		



Feasibility Design Submission

<i>CSI CODE</i>	<i>DESCRIPTION</i>	<i>QTY</i>	<i>UNIT</i>	<i>UNIT COST</i>	<i>EST'D COST</i>	<i>SUB TOTAL</i>	<i>TOTAL COST</i>
SITEWORK OPTION 4							
125 260000	Trench w/ concrete encasement	150	lf	120.00	18,000		
126 260000	Handhole	1	ea	4,000.00	4,000		
127 260000	Wall mounted pull box	1	ea	1,500.00	1,500		
128 260000	<u>Communications</u>						
129 260000	Communication riser	1	ea	1,600.00	1,600		
130 260000	4-4" communications ductbank; allow	1,000	lf	60.68	60,680		
131 260000	Trenching	1,000	lf	25.00	25,000		
132 260000	Communication handhole	1	ea	1,500.00	1,500		
133 260000	<u>Site Lighting</u>						
134 260000	Allowance for general site lighting	1	ls	550,000.00	550,000		
135	SUBTOTAL					1,080,522	
136	TOTAL - SITE DEVELOPMENT						\$9,560,455
137							

Enrollment by Race/Ethnicity (2014-15)			
Race	% of District		% of State
African American	3.0		8.7
Asian	1.3		6.3
Hispanic	29.0		17.9
Native American	0.0		0.2
White	65.0		63.7
Native Hawaiian, Pacific Islander	0.1		0.1
Multi-Race, Non-Hispanic	1.7		3.1

Enrollment by Gender (2014-15)		
	District	State
Male	692	489,731
Female	575	466,113
Total	1,267	955,844

Enrollment by Grade (2014-15)																
	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	SP	Total
Northeast Metro Regional Vocational	0	0	0	0	0	0	0	0	0	0	330	334	297	306	0	1,267
District	0	0	0	0	0	0	0	0	0	0	330	334	297	306	0	1,267

Northeast Metro Tech High School

Student Application Summary

Class of 2012

Town	Accepted	Applied	Declined	Incoming	Incomplete	Interview	Not Qual	On Hold	Wait List	Wd App	Enrolled	Total
Chelsea	61	0	0	9	52	1	0	20	0	56	0	138
Malden	24	1	0	20	54	1	0	13	0	24	0	114
Melrose		0	0	4	9	1	0	5	0	0	0	19
North Reading		0	0	1	10	0	0	3	0	0	0	14
Reading		0	0	0	8	0	0	0	0	0	0	8
Revere	72	1	0	11	61	0	0	10	0	54	0	137
Saugus	56	0	0	6	50	2	0	13	0	27	0	98
Stoneham		0	0	0	15	0	0	3	(1)	0	1	20
Wakefield		0	0	3	27	0	0	2	0	(1)	1	34
Winchester		0	0	0	4	0	0	0	0	0	0	4
Winthrop		0	0	2	15	1	0	3	0	0	0	21
Woburn		0	0	7	21	0	0	8	0	0	0	36
Total		2	0	63	326	6	0	80	1	162	2	643

Class of 2012 School Choice

Town	Accepted	Applied	Declined	Incoming	Incomplete	Interview	Not Qual	On Hold	Wait List	Wd App	Enrolled	Total
Boston	0	0	0	0	0	0	1	0	7	0	0	8
Everett	0	0	0	3	1	0	2	0	5	0	0	11
Lynn	0	0	0	0	0	0	0	0	1	0	0	1
Middleton	0	0	0	0	0	0	0	0	1	0	0	1
Peabody	0	0	0	2	0	0	0	0	4	0	0	6
Somerville	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	5	1	0	3	0	19	0	0	28

Class of 2012

Town	Accepted	Applied	Declined	Incoming	Incomplete	Interview	Not Qual	On Hold	Wait List	Wd App	Enrolled	Total
Chelsea	0	0	0	0	1	0	0	0	0	0	0	1
Malden	0	0	0	0	0	0	0	0	1	0	0	1
North Reading	0	0	0	0	0	0	0	0	1	0	0	1
Saugus	0	0	0	0	0	0	0	0	1	0	0	1
Stoneham	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	1	0	0	0	4	0	0	5

Northeast Metro Tech High School Student Application Summary

09/17/2009

Class of 2013

	Town	Applied	Declined	Enrolled	Incomplete	Interview	Late	No Response	Not Qual	WD App	WD-Public	Wait List	Total
Local	Chelsea	0	26	39	5	0	0	1	23	0	0	37	131
	Malden	0	24	54	0	1	0	0	19	1	0	27	126
	Melrose	0	1	18	0	0	0	1	3	0	0	0	23
	N. Reading	0	4	13	0	0	0	0	4	0	0	0	21
	Reading	0	1	6	0	0	0	1	1	0	1	0	10
	Revere	1	9	59	2	0	1	1	13	0	0	37	123
	Saugus	0	10	44	1	0	0	0	17	1	1	14	88
	Stoneham	0	2	15	1	0	0	0	8	0	0	0	26
	Wakefield	0	4	30	1	0	0	0	6	0	0	0	41
	Winchester	0	1	6	0	0	0	0	0	0	0	0	7
	Winthrop	0	0	23	0	0	0	0	1	0	1	0	25
	Woburn	0	4	20	1	0	0	0	8	0	0	0	33
	Total	1	86	327	11	1	1	4	103	2	3	115	654
School Choice	Beverly	0	0	0	0	0	0	0	1	0	0	0	1
	Brockton	0	0	0	0	0	0	0	1	0	0	0	1
	Charlestown	0	0	0	0	0	0	0	1	0	0	1	2
	E. Boston	0	0	2	0	0	0	0	1	0	0	4	7
	Everett	0	0	3	2	0	0	0	1	0	0	6	12
	Haverhill	0	0	0	0	0	0	0	0	1	0	0	1
	Leominster	0	0	0	0	0	0	0	0	0	0	1	1
	Lynn	0	0	0	0	0	0	0	0	0	0	2	2
	Lynnfield	0	1	0	0	0	0	0	0	0	0	0	1
	Medford	0	0	0	0	0	0	0	0	0	0	1	1
	Methuen	0	0	1	0	0	0	0	0	0	0	0	1
	N. Andover	0	0	0	0	0	0	0	0	0	0	1	1
	Peabody	0	0	0	1	0	0	0	0	0	0	2	3
	Somerville	0	0	0	0	0	0	0	0	0	0	1	1
	Tewksbury	0	0	0	1	0	0	0	0	0	0	0	1
	Total	0	1	6	4	0	0	0	5	1	0	19	36
		0	0	0	0	0	0	0	0	0	0	1	1
	Total	0	0	0	0	0	0	0	0	0	0	1	1
Grand Totals		1	87	333	15	1	1	4	108	3	3	135	691

Northeast Metro Tech High School Student Application Summary

09/22/2010

Class of 2014

	Town	Accepted	Declined	Enrolled	Incoming	Incomplete	Not Qual	Old App	WD App	WD-Public	Wait List	Total
Local	Chelsea	3	25	43	1	4	22	0	0	0	30	128
	Malden	0	19	62	0	2	15	0	0	1	0	99
	Melrose	0	5	24	0	0	1	0	0	0	0	30
	N. Reading	0	3	9	0	0	4	0	0	0	0	16
	Reading	0	2	4	0	0	0	0	0	0	0	6
	Revere	0	9	58	0	3	21	0	1	0	8	100
	Saugus	0	12	49	0	0	10	0	0	0	14	85
	Stoneham	0	2	19	0	0	3	0	0	0	0	24
	Wakefield	0	8	21	0	1	6	1	0	0	0	37
	Winchester	0	1	4	0	0	1	0	0	0	0	6
	Winthrop	0	4	15	0	0	9	0	0	0	0	28
	Woburn	0	6	16	0	0	8	0	0	0	0	30
	Total	3	96	324	1	10	100	1	1	1	52	589
School Choice	Danvers	0	0	0	0	0	0	0	0	0	1	1
	E. Boston	0	0	2	0	0	1	0	0	0	1	4
	Everett	0	0	0	0	0	2	0	1	0	8	11
	Lynn	0	0	0	0	0	0	0	0	0	1	1
	Medford	0	0	0	0	0	1	0	0	0	0	1
	Peabody	0	0	3	0	0	0	0	0	0	1	4
	Tewksbury	0	0	0	0	0	0	0	0	0	1	1
	Total	0	0	5	0	0	4	0	1	0	13	23
		0	0	0	0	0	0	0	0	0	1	1
	Total	0	0	0	0	0	0	0	0	0	1	1
Grand Totals		3	96	329	1	10	104	1	2	1	66	613

Northeast Metro Tech High School Student Application Summary

09/14/2011

Class of 2015

Town		Declined	Enrolled	Incoming	Incomplete	Late	No Response	Not Qual	WD App	Wait List	Total
Local	Chelsea	11	66	0	4	0	2	21	0	34	138
	Malden	13	50	0	0	0	4	21	0	0	88
	Melrose	12	18	0	1	0	0	5	1	0	37
	N. Reading	4	8	0	0	0	0	2	0	0	14
	Reading	3	3	0	0	0	0	0	1	0	7
	Revere	12	56	0	1	1	0	33	0	0	103
	Saugus	6	54	0	0	0	0	6	0	6	72
	Stoneham	2	18	0	0	0	0	9	0	0	29
	Wakefield	8	13	0	0	0	1	5	0	0	27
	Winchester	3	3	0	0	0	0	0	0	0	6
	Winthrop	4	15	0	1	1	0	3	0	0	24
	Woburn	6	22	0	0	0	0	8	0	0	36
	Total	84	326	0	7	2	7	113	2	40	581
School Choice	E. Boston	0	0	0	0	0	0	1	0	0	1
	Everett	0	3	1	2	0	0	1	0	2	9
	Lynn	2	0	0	0	0	0	0	0	0	2
	Marblehead	0	1	0	0	0	0	0	0	0	1
	Medford	0	0	0	0	0	0	0	0	1	1
	Peabody	1	1	0	0	0	0	1	0	2	5
	Total	3	5	1	2	0	0	3	0	5	19
Grand Totals		87	331	1	9	2	7	116	2	45	600

Northeast Metro Tech High School Student Application Summary

09/27/2012

Class of 2016

	Town	Declined	Enrolled	Incoming	Incomplete	Late	No Response	No Space	Not Qual	WD App	WD-Public	Wait List	Total
Local	Chelsea	10	56	0	1	4	1	0	18	0	0	22	112
	Malden	25	43	0	2	0	1	0	14	0	2	5	92
	Melrose	2	16	0	0	0	0	0	4	0	0	0	22
	N. Reading	2	9	0	0	0	0	0	1	0	0	0	12
	Reading	8	8	0	0	0	0	0	0	1	0	0	17
	Revere	16	55	0	2	4	0	1	10	0	0	3	91
	Saugus	22	46	4	0	0	0	0	13	0	1	7	93
	Stoneham	10	20	0	0	0	0	0	3	0	0	0	33
	Wakefield	6	20	0	1	0	0	0	2	0	0	0	29
	Winchester	1	3	0	0	0	0	0	0	0	0	0	4
	Winthrop	5	18	0	0	0	0	0	1	0	0	0	24
	Woburn	15	29	0	0	2	0	0	9	0	0	0	55
	Total	122	323	4	6	10	2	1	75	1	3	37	584
School Choice	E. Boston	1	0	0	0	0	0	0	1	0	0	0	2
	Everett	2	3	0	0	1	0	0	2	0	0	2	10
	Lynn	1	0	0	0	0	0	0	1	0	0	1	3
	Medford	0	0	0	1	0	0	0	0	0	0	0	1
	Peabody	0	1	0	0	0	0	0	0	0	0	1	2
	Total	4	4	0	1	1	0	0	4	0	0	4	18
Grand Totals		126	327	4	7	11	2	1	79	1	3	41	602

Northeast Metro Tech High School Student Application Summary

09/26/2013

Class of 2017

Town		Accepted	Declined	Enrolled	Incomplete	Late	No Response	Not Qual	WD App	WD-Public	Wait List	Total
Local	Chelsea	1	18	45	4	0	3	9	0	0	47	127
	Malden	0	13	51	1	0	3	22	0	0	3	93
	Melrose	0	9	22	1	0	1	1	0	0	0	34
	N. Reading	0	2	7	0	1	0	1	0	0	0	11
	Reading	0	3	4	0	0	0	1	0	0	0	8
	Revere	0	6	59	4	0	0	27	3	0	21	120
	Saugus	0	8	36	0	0	1	11	0	2	16	74
	Stoneham	0	5	22	0	0	0	7	0	1	0	35
	Wakefield	0	5	22	0	0	0	1	0	0	0	28
	Winchester	0	3	3	0	0	0	0	0	0	0	6
	Winthrop	0	4	18	3	0	0	4	0	0	1	30
	Woburn	0	10	33	0	0	2	7	0	0	1	53
	Total	1	86	322	13	1	10	91	3	3	89	619
School Choice	Andover	0	0	0	0	0	0	0	0	0	1	1
	Brighton	0	0	1	0	0	0	0	0	0	0	1
	Burlington	0	0	0	0	0	0	1	0	0	0	1
	E. Boston	0	0	0	0	0	0	0	0	0	5	5
	Everett	0	0	2	1	0	1	1	1	0	11	17
	Lynn	0	0	0	1	0	0	0	0	0	2	3
	Medford	0	0	0	0	0	0	1	0	0	2	3
	Peabody	0	0	3	0	0	0	1	0	0	5	9
	Total	0	0	6	2	0	1	4	1	0	26	40
Grand Totals		1	86	328	15	1	11	95	4	3	115	659

Northeast Metro Tech High School Student Application Summary

09/18/2014

Class of 2018

	Town	Declined	Enrolled	Incomplete	No Response	No Space	Not Qual	WD App	WD-Public	Wait List	Total
Local	Chelsea	10	48	10	0	0	20	1	0	12	101
	Malden	25	42	2	3	0	19	0	0	0	91
	Melrose	5	13	0	0	0	1	0	0	0	19
	N. Reading	3	12	0	1	0	2	0	0	0	18
	Reading	2	4	1	0	0	1	0	0	0	8
	Revere	19	56	1	2	0	18	1	0	35	132
	Saugus	10	53	4	1	0	8	2	0	19	97
	Stoneham	9	21	0	0	0	4	1	0	0	35
	Wakefield	7	17	0	1	0	3	0	0	0	28
	Winchester	4	2	0	0	0	3	0	0	0	9
	Winthrop	11	22	3	1	2	6	0	0	3	48
	Woburn	12	34	0	1	0	6	1	1	0	55
	Total	117	324	21	10	2	91	6	1	69	641
School Choice	E. Boston	1	1	0	0	0	1	0	1	4	8
	Everett	2	5	0	0	0	2	0	0	12	21
	Lowell	0	0	1	0	0	0	0	0	0	1
	Lynn	1	1	0	0	0	1	0	0	3	6
	Medford	1	0	0	0	0	1	0	0	1	3
	Peabody	0	0	0	0	0	1	0	0	0	1
	Swampscott	0	0	0	0	0	0	0	0	1	1
	Tewksbury	0	0	0	0	0	0	1	0	0	1
	Total	5	7	1	0	0	6	1	1	21	42
Grand Totals		122	331	22	10	2	97	7	2	90	683

Northeast Metro Tech High School Student Application Summary

09/28/2015

Class of 2019

	Town	Applied	Declined	Enrolled	Incomplete	Late	No Response	Not Qual	WD App	WD-Public	Wait List	Total
Local	Chelsea	0	11	72	1	1	6	28	0	0	2	121
	Malden	0	17	44	7	1	4	14	1	0	0	88
	Melrose	0	6	15	1	0	1	6	0	0	0	29
	N. Reading	0	4	9	0	0	1	0	0	0	0	14
	Reading	0	2	6	1	0	1	0	1	0	0	11
	Revere	1	16	73	3	3	8	20	3	0	0	127
	Saugus	0	21	48	3	0	4	11	2	2	9	100
	Stoneham	0	3	10	0	0	1	2	0	0	0	16
	Wakefield	0	1	12	0	0	1	4	0	1	0	19
	Winchester	0	1	3	0	0	0	0	0	0	0	4
	Winthrop	0	1	11	0	0	2	8	0	2	0	24
	Woburn	0	18	27	3	0	8	6	0	0	0	62
	Total	1	101	330	19	5	37	99	7	5	11	615
School Choice	Andover	0	0	0	0	0	0	1	0	0	0	1
	Brighton	0	0	0	0	0	0	2	0	0	0	2
	Burlington	0	0	0	1	0	0	0	0	0	0	1
	Charlestown	0	0	0	0	0	0	1	0	0	0	1
	Danvers	0	0	0	0	0	0	1	0	0	0	1
	E. Boston	0	0	0	0	0	0	5	0	0	0	5
	Everett	0	0	0	0	0	0	19	0	0	0	19
	Lynn	0	0	0	0	0	0	3	0	0	0	3
	Lynnfield	0	0	0	0	0	0	1	0	0	0	1
	Medford	0	0	0	0	0	0	1	0	0	0	1
	Norton	0	0	0	0	0	0	1	0	0	0	1
	Peabody	0	0	0	0	0	0	1	0	0	0	1
	Total	0	0	0	1	0	0	36	0	0	0	37
	E. Hartford	0	0	0	0	0	0	0	1	0	0	1
	Phoenix	0	0	0	0	0	0	1	0	0	0	1
	Total	0	0	0	0	0	0	1	1	0	0	2
Grand Totals		1	101	330	20	5	37	136	8	5	11	654