Evaluation of Existing Conditions 3.1.4

EVALUATION OF EXISTING CONDITIONS

SUMMARY OF EXISTING CONDITIONS

The Albert B. Consentino Middle School is located at 685 Washington St. in Haverhill, Massachusetts and is one of five middle schools in the district. The project site is situated in a residential neighborhood of single and multi-family homes. Access to the site is by Washington St., a winding thoroughfare that connects Lowell Ave. to River St. (Image 1) The site was developed over time through the taking and consolidation of individual residential properties.

Image 1

The site itself is comprised of approximately 28 acres and includes the Consentino Middle School, the adjacent Silver Hill Elementary School as well as paved parking, drives, and playfields associated with both schools (Images 2 & 3). The Consentino School is clearly visible on the approach from Washington St. as it occupies the northwestern portion of the site with dedicated parking to the north and a smaller

visitor parking area to the west of the school. To the south of the school is a larger parking lot used by the Silver Hill School and a shared bus loop that servers both schools. The Silver Hill school is set back from Washington St., occupying the eastern central portion of the site. Playfields used by both schools are located in the northeast corner of the site and additional fields and open space are located down a slope to the south. Dense wooded areas along the north and east sides of the site as well as a significant slope to the northeast creates a natural and functional buffer to the residential properties in the area. Additional details regarding existing site conditions can be found in Section 3.1.4-B of this report.

The school building itself is a one and two-story brick and precast concrete building constructed in 1969. The building includes 114,069 gross square feet of space and has been effectively unmodified since its original construction. Three primary entrances serve the facility – a southern entry associated with the bus loop, a western entry (the main entry into the building) associated with the visitor parking and van/taxi loop, and a northern entry associated with the parent loop and staff parking lot. The school building has certain durable features – particularly the masonry exterior and terrazzo floors throughout the school – continue to perform exceptionally well. However, the vast majority of building systems, components, fixtures, and finishes have far exceeded their useful life and/or do not comply with current building and energy codes, accessibility regulations, or educational principals. Section 3.1.4-B of this report provides detailed assessment and evaluation of the existing building systems and features.

Aspects of the existing building and site make alterations, additions, or major repair options viable options for school project. The structural system and building enclosure are sound and intact and offer opportunities for alteration and improvement. However, nearly every other major building system would require complete replacement, significant alterations and improvements, and in some cases new installation in order to comply with current building regulations. Additionally, spatial arrangements within the building do not support the districts educational vision or current best practices and substantial reconfiguration would need to be considered part of any major alteration option. A complete renovation of the existing building still would not fulfill the requirements for the education program of this project.

New construction options, including an all-new facility or addition/renovation options will need to utilize space to the north of the existing building (in the area of the current parking lot) or to the east (the current play field area) as they are the most viable areas for development on the site. Limited additions to the west are possible, but constrained by the slope down to Washington St. Expansion or new construction to the south is not technically feasible as it would require a reconfiguration of Silver Hill School parking and traffic.

This Section 3.1.4 Evaluation of Existing Conditions is organized into two major subdivisions. Section 3.1.4-A contains the explicit Module 3 requirements outlined by the MSBA. Section 3.1.4-B provides the detailed existing conditions site and building assessments necessary to inform an evaluation of all options for the project.


Dr. Albert B. Consentino Middle School
Silver Hill Elementary School
Stripes And Solids
Billiards supply store
Therapeutic Education Assessment...
Dr Eddy rose affordable Music entertainment
Westford St
Washington St
Day St
Pleasant View Ave
Greenlawn Ave
Belgrade St
Overlook Ave
Studley St
Ashworth Terrace
Observatory Ave
Silver St
Maple St
Merton St
Davis St
Beach St
Garfield St
Hendrick St

Image 2

Image 3

LEGAL TITLE OF PROPERTY AND AVAILABILITY OF THE PROPERTY FOR DEVELOPMENT

As part of this feasibility study, the School Department has requested and received from the City Solicitor's office a Title Analysis of the property. Appendix X.08 of this report details the title analysis for the property and documents the history of the eminent domain takings of 45 parcels to form the current 28 + acre site. The conclusions of this title analysis are that the City of Haverhill is the Owner of the premises at 685 Washington St. (the project site) and that there are no mortgages, attachments, executions, notices of bankruptcy, or other liens on the property. An easement to the Haverhill gas Company serves the current school building.

The current school site, and in particular the area north and east of the existing Consentino School building which are the focus of this study, is available for development subject to the restrictions noted below in Developmental Restrictions.

HISTORIC REGISTRATIONS

In accordance with M.G.L. c.9, Sections 26 – 27C as amended, a Project Notification Form was submitted to the Massachusetts Historical Commission (MHC) for the Consentino Middle School Project. A response has not yet been received, but it is anticipated that the site is not included in the Inventory of Historic and Archeological Assets of the Commonwealth, nor is it listed in the National and State Registers of Historic Places. A preliminary search on the MACRIS database indicates that the subject property at 685 Washington St. is not included on any historic registration listing. The response from the MHC is anticipated prior to the conclusion of the Preferred Schematic Report and will be incorporated into that submission.

DEVELOPMENTAL RESTRICTIONS

Restrictions to development include the City of Haverhill Zoning Code, as updated on March 2020. Additionally, should the selected option disturb greater than one acre (likely for any of the addition or new construction alternatives), it is anticipated that a Notice of Intent will need to be filed with the EPA.

The Consentino Middle School site does not contain a wetland resource area within the property lines, and it does not appear that there is a jurisdictional wetland resource area within 200 feet of the site; therefore, it is anticipated that Conservation Commission permitting will not be needed for a proposed project. Based on the FEMA Flood Insurance Rate Maps for Haverhill (Community Panel No. 25009C0088F), the Site does not fall in a regulated Flood Zone. According to MassGIS, the majority of the site is located within Prime Farmland Soils. Because the site is not currently being used for agricultural purposes, it is not anticipated that any related permitting will be required.

ZONING ANALYSIS

The lot is located within Medium Density Residential (RM) area. According to the City of Haverhill Table of Dimensional and Density Regulations, the requirements for RM are as follows:

Minimum Lot Area: 20,000 square feet
Minimum Lot Frontage: 150 feet
Minimum Lot Depth: 100 feet
Minimum Front setback: 25 feet
Minimum Side Setback: 15 feet
Minimum Rear Setback: 30 feet
Maximum Height (feet): 35 feet
Maximum Height (stories): 2.5
Minimum Building Coverage: 25%

Minimum Open Space: 45%

The parking requirements of the Zoning Code require 3 parking spaces per classroom for middle schools. The actual number of parking spaces required for any new-build option will need to be calculated once the preferred option is selected and the proposed number of classrooms has been established.

The athletic fields located behind the existing building are designated as Municipal Open Space. Should a new construction option be developed, adjustment of or variance from zoning regulations would be required for any option over 35 feet or 2.5 stories in height.

The table below illustrates the site related permits that would be required for the proposed project.

Permit	Permitting Authority
Planning Board & Site Plan Review	City of Haverhill
National Pollutant Discharge Elimination System (NPDES) with EPA Notice of Intent	Environmental Protection Agency (EPA)
Utility (Water, Sewer, and Drainage) Connection Permits	City of Haverhill
Stormwater Management Permit	City of Haverhill Department of Public Works

DETERMINATION OF NEED FOR GEOTECHNICAL EVALUATION

Existing geotechnical and soils information, in the form of the original borings and test pits conducted as part of the 1969 construction of the school are included on Sheet C-1, attached to this report as Appendix X.07. The existing soils information is adequate for this preliminary phase of the Feasibility Study. It is anticipated that when a preferred alternative is selected in in the next phase, should that alternative be a new construction or addition alternative, initial geotechnical investigation will be conducted prior to the completion of Schematic Design in order to verify that the soils conditions in any new construction portions of the project are the same as what is reflected in the 1969 documents and that the proposed foundation design is reflective of the geotechnical data. Following the completion of Module 5, additional geotechnical investigation may be incorporated as part of the Detailed Design phase of the project.

EVALUATION OF EXISTING CONDITIONS ON ALTERNATIVES

EXISTING SITE CONSTRAINTS ON ALTERNATIVES

The existing site imposes constraints on the alternatives under consideration. In general, the primary constraints center around the segregation of on-site construction or repair activities from ongoing school operations. No off-site swing space is available for the school. So any alternatives will need to be evaluated in light of a site occupied by both Consentino and Silver Hill schools. In particular, site considerations include:

- Segregation of vehicular, pedestrian, and bicycle traffic associated with school operations – both at Consentino and Silver Hill schools – from construction activities and traffic.
- Consideration of how utilities and services will be maintained to the existing school while being upgraded (for repair or renovation-only alternatives) or extended (for all-new or add-reno alternatives).
- Temporary reduction in available parking during construction operations.
- Temporary suspension of use of all or portions of the playfields, particularly for all-new or add-reno alternatives.
- Incorporation of new stormwater infiltration or other management options, particularly for all-new or add-reno alternatives.
- For all-new or add-reno alternatives, consideration of how new construction will impact residential properties to the north and east, particularly if the wooded buffers are altered.
- Consideration of how emergency vehicle access will be maintained to the occupied building, particularly on the north and east sides.
- Consideration of emergency vehicle access as part of the completed project.
- Consideration of the adequacy of existing utilities to serve a completed project, including
    - Adequacy of the water services to provide appropriate volume and flow for a new sprinkler system
    - Adequacy of the electrical service to support new electrical loads.
    - Capacity and condition of existing telecommunications infrastructure.
- Complication of site traffic for facility users vs. deliveries. The current loading dock is located directly adjected to the northern building entry. Any alternative that proposes re-use of the existing building will need to consider how to better segregate the traffic associated with these two entry types.

EXISTING BUILDING CONSTRAINTS ON ALTERNATIVES

In addition to the site considerations which are applicable to all projects, the repair-only, renovation-only, and all addition-renovation options will need to consider additional constraints imposed by working within and adapting the existing school building itself. The constraints to consider include:

- Low floor-to-floor height (11'-4") in the existing two-story classroom wing. This low floor to floor height will make the incorporation of modern HVAC systems particularly challenging.
- Limited access to daylight through existing window openings. The current fenestration patterns do not provide the types and amounts of daylight access that would be considered current best practices for educational environments.
- Structural systems in the one-story portion of the building rely primarily on load-bearing masonry walls. Alterations that seek to reconfigure spaces in this portion of the building will be hampered by the costs and complexity of alterations to load-bearing walls.
- Structural systems in general will need to be evaluated based on the instruction of additional piping and equipment associated with modern HVAC, plumbing, and fire protection systems.
- Several interior spaces do not have any windows, contradictory to current best practices for educational spaces. Alternatives that re-use the existing building will need to consider how to introduce daylight and views into these interior spaces.
- The existing exterior envelope does not meet the thermal performance required by current energy codes. While alterations could improve the thermal envelope, any intervention will not result in an envelope that performs as well as a modern exterior envelope.
- Several features of the existing building do not comply with current accessibility codes. Even for portions of the building where no spatial re-configuration is anticipated, exceeding the 30% threshold for full compliance will compel significant alterations throughout the facility.
- There is no off-site swing space available and on-site temporary classrooms may not be supported by the site configuration.
    - For repair-only or renovation-only alternatives, temporary swing-space may need to be constructed inside the existing building – likely in the current gymnasium – making such space un-available for typical use during the project.
    - For addition-renovation alternatives, new additions could be constructed first and serve as swing space while alterations occur within the existing building.

Any proposed alternative will need to be considered in light of the Existing Site Constraints noted above. However, the all-new construction alternatives are able to completely segregate construction operations from on-going use of the two school buildings, which would allow construction to proceed at the contractor's discretion. Any alternative that considered re-use of the existing building will need to contend with physical limitations of the building noted above as well as the logistical limitations of trying to phase and sequence construction operations within a facility used and occupied by students and staff. This occupied renovation type of work is invariably more complicated and disruptive to

school operations and Districts can benefit from utilizing a Construction Manager at Risk (CMR) procurement methodology. For all-new construction alternatives where construction operations can be more effectively separated from school operations, a conventional Design-Bid-Build procurement may be feasible.

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EXISTING CONDITIONS: REGULATORY OVERVIEW

Applicable Regulations

Buildings undergoing repairs, alterations, additions, changes in use, or relocation will be permitted under the 9th edition of the Massachusetts State Building Code (780 CMR).The base code for the 9th Edition is comprised of the following 2015 International Code Council family of codes with Massachusetts amendments:

- International Building Code (IBC)
- International Energy Conservation Code (IECC)
- International Existing Building Code(IEBC)
- International Mechanical Code (IMC)

Additional building regulations, included by reference in the base code or enforceable under Massachusetts General Law include:

- Massachusetts Fire Code (527CMR)
- Massachusetts Elevator Code (524 CMR)
- Massachusetts Plumbing Code (248 CMR)
- Massachusetts Electrical Code (NFPA 70 – NEC)

Accessibility regulations applicable to the project are the Massachusetts Architectural Access Board Rules (MAAB) (521 CMR), and the 2010 Americans with Disabilities Act Architectural Guidelines. Where these two regulations are in conflict, the regulation that provides the greater accessibility should be provided.

Finally, in addition to the sprinkler protection requirement found in the building codes, certain Massachusetts General Laws (M.G.L.s) require sprinkler protection in certain types of new and existing non-residential buildings over 7,500 gross square feet.

Scoping Requirements and Thresholds for Compliance

Of the regulations described above, three of them require special consideration since they contain specific thresholds for full compliance with the regulation. These threshold-defining regulations are:

- The International Existing Building Code (IEBC)
- 521 CMR , or the Architectural Access Board (MAAB)
- M.G.L. c.148 s.26G, or the Automatic Sprinkler System Requirements

Compliance thresholds are based on either the area or cost of proposed work in comparison the existing building area or building value and are defined in greater detail under each specific regulation description below. Generally, when the proposed scope of work does not exceed a defined threshold, only the work being performed is required to comply with the current edition of the codes. The Americans with Disabilities Act (ADA) also contains requirements for incorporating improvements to an accessible path to Primary Function areas where alterations to that area are undertaken.

INTERNATIONAL EXISTING BUILDING CODE (IEBC)

When considering changes to an existing building, the principal guiding regulation is the International Existing Building Code (IEBC), which is enforced by the local building official. The IEBC requires that any proposed work on an existing building or portion thereof first undergo an evaluation to determine the effect of the proposed work on at least the following systems: structural, means of egress, fire protection, energy conservation, lighting, hazardous materials, accessibility, and ventilation for the space under consideration. Because no specific scope of work is being proposed as part of an existing conditions survey, this report includes a Regulatory Assessment for each building under consideration in order to determine to what degree the existing building[s] and systems comply with current regulations. It should be understood that non-compliance with current regulations does not compel corrective action. Only when a scope of work is defined can the Existing Building Code be applied to determine the applicable requirements.

Following completion of an evaluation for a proposed scope of work, a *compliance path* needs to be selected for the application of building code requirements. Owners must choose either the Prescriptive, Work Area, or Performance Compliance path and apply only the provisions of the chosen compliance path to the project. *The Prescriptive Compliance Path* provides a broad-brush approach to existing buildings and could result in requiring additional work that may not be necessary under the other compliance paths and will not be employed for this assessment.

The *Performance Compliance Path* uses a calculation based methodology to determine the general level of life safety of a building. This path assigns numeric values to various life safety features of a building to arrive at an overall building "score". Different building types require different scores to determine compliance or non-compliance with this path. This numeric value approach can be useful to evaluate the general life safety performance of an existing building as compared to current building regulations; because of this the Performance Compliance Path will be used to evaluate the general life safety condition of the existing facilities. Again, it should be noted that a non-compliant score does not compel corrective action – this methodology will be used to convey only how the existing building compares to current regulations.

The *Work Area Compliance* path typically offers the most advantageous approach to defining the code requirements for each portion of a building undergoing a scope of work because it most closely correlates the required upgrades to building systems and components to that specific defined scope of work; for this reason, the Work Area compliance path will be the assumed compliance path for sake

of any proposed work on the facilities, should they be pursued.

Work Area Compliance relies on identifying the type of work that is occurring throughout the building, and then applying the requirements for that type of work to the *Work Area*. The *Work Area*, as defined by the IEBC is:

> *That portion or portions of a building consisting of all reconfigured spaces as indicated in the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed...*

Using the definitions provided in the Code, the scope of work identified for existing buildings or portions thereof is categorized as follows:

Repairs:"...include the patching or restoration or replacement of damaged materials, elements, equipment, or fixtures for the purpose of maintaining such components in good or sound conditions with respect to loads or performance requirements..."(IEBC s. 502.1) Examples of repair would be repair or replacement of damaged plaster finishes, tiled or wood floors, replacement of wood trim, replacement of door hardware, replacement of any plumbing, heating, electrical ventilating, air conditioning, refrigerating, and fire protection equipment as well as the repair of any exterior masonry or roofing system, and repair of damaged structural elements with "in kind" elements or equipment. Chapter 6 of the IEBC is applicable to all Repairs.

Level 1 Alterations: "...include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose." This classification could be described as replacement with different systems, materials, or equipment, but providing the same function. Replacing wood flooring with a tile floor system, or proving all new kitchen equipment to replace outdated equipment would be considered Level 1 Alterations. (IEBC s. 503.1). Chapter 7 of the IEBC is applicable to all Level 1 alterations.

Level 2 Alterations: "...include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment." (IEBC s. 503.1). Chapter 7 and Chapter 8 of the IEBC is applicable to all Level 2alterations.

Level 3 Alterations: "...apply where the work area exceeds 50 percent of the *building area*."

Change of Occupancy: "A change in the use of the building or a portion of the building. A change of occupancy shall include any change of occupancy classification, any change from one group to another group within an occupancy classification or any change in use within a group for a specific occupancy classification."

Additions: "An extension or increase in floor area, number of stories, or height of a building structure."

Under the work area compliance path, each of the classifications of work described above require increasing levels of compliance with the building code. Repairs have the least restrictive requirements, essentially permitting replacement-in-kind for any repaired elements. Additions require the highest level of compliance and require that the addition comply with the building code as for new construction. The other classifications require increasing compliance and, for each classification,

define prescriptive requirements for specific systems and elements such as means of egress, mechanical, electrical and fire protection systems, building materials, fire resistance ratings, and structural systems.

Work Areas, including Level 2 Alterations and Additions would be required to be identified on the construction documents. Repairs and Level 1 alterations, because they do not include reconfigured spaces, are not considered part of the "Work Area" defined by the code. Although there may be substantial repairs and Level 1 alterations throughout the building, this distinction is important; when the Work Area exceeds 50% of the floor area, the provisions for Level 3 alterations become applicable.

In addition to alterations that affect the building spaces and areas, it is necessary to understand how alterations affect the building structural system and elements. Where alterations change individual gravity or lateral load resisting elements, each element requires evaluation to determine if the alteration will result in additional loads and, if so, the element must be altered or replaced. For buildings with concrete or unreinforced masonry walls, when the work area exceeds 50 percent of the floor area, than all of the structural concrete or masonry walls (both gravity and lateral load resisting walls) are required to be secured to the floor or roof deck above.

Sprinkler Protection Requirements

There are two separate regulations that govern the requirements for sprinkler protection: the IEBC and M.G.L. c.148 s.26G.

IEBC requirements, enforced by the building official, would require sprinklers where the *work area* (defined previously) exceeds 50 percent of the floor area and the work area is required to be provided with sprinklers in accordance with the International Building Code, Chapter 9.

M.G.L. c.148 s.26G, which is enforced by the fire official, requires enhanced sprinkler protection in certain buildings which total more than 7,500 gross square feet in aggregate (adding all stories) floor area. This requirement is applicable when "major" alterations or modifications are occurring to a building. Because the statue is not specific about the definition of a "major" alteration, a memo issued on October 14, 2009 by the Fire Safety Commission's Automatic Sprinkler Appeals Board provides additional guidance on this subject.

This memo indicates two factors that are used to determine whether "major" alterations are taking place: a Nature of Work factor and a Scope of Work factor.

If the **Nature of the Work** is such that the effort to install sprinklers is substantially less than if the building was intact, or is the nature of work merely minor repairs and cosmetic work, or is the Nature of the Work "major" in its scope. There is no specific definition of "major", but the memo offers examples including: the demolition of existing ceiling or installation of suspended ceilings; the removal and installation of subflooring, exposing the building framing (not merely the replacement of finished flooring); the reconstruction or repositioning of walls; and the removal or relocation of a significant portion of the buildings HVAC, plumbing, or electrical systems involving penetrations of

walls, floors, or ceilings.

If the **Scope of Work** affects a substantial portion of the building, or the cost of work is moderate in comparison to the total cost of work, than the Scope of Work criteria would be applicable to a project. The Scope of Work Thresholds defined in the memo are as follows:

1. Alterations or modifications are reasonably considered major when the work affects ***33 percent or more of the total gross square footage of the building*** (all floor levels combined). Again, no specific definition of alterations or modifications is provided, but we can infer from other codes and definitions that alterations relate specifically to the reconfiguration of spaces, or the "major" Nature of Work examples above.
2. Alterations or modifications are reasonably considered major when the total cost of the work (excluding costs related to sprinkler expenditure) is equal to or greater than ***33 percent of the assessed value of the subject building.***

The memo then indicates that if the Nature and Scope of work criteria and the Scope of Work (either 1 or 2) is satisfied, than the Board would consider the alterations "major" and thus require the installation of a sprinkler system.

ACCESSIBILITY

STATE REQUIREMENTS

In Massachusetts, the state developed Architectural Access Board Regulations (521 CMR) replace the accessibility provisions of the building code. Like the other sections of the building code, the accessibility regulations are enforced by the building official. However, waivers or variances to 521 CMR cannot be granted by the building official. Rather, any such appeal or variance request needs to be reviewed and accepted by the Architectural Access Board.

Chapter 3 of the Architectural Access Board Regulations outlines the scoping thresholds for the applicability of accessibility guidelines for a project. Specifically, section 3.3 describes three different dollar value thresholds for any proposed *additions to, reconstruction, remodeling*, and *alterations* or *repairs* to existing buildings as compared to the buildings “full and fair cash value”. The full and fair cash value is generally the assessed value of the building as recorded with the town assessor’s office. This section then lists the applicability requirements for each dollar value threshold:

- For work costing less than $100,000, only the work being performed is required to comply with Accessibility regulations.
- A scope of work that is more than $100,000, but less than 30% of the full and fair cash value requires the incorporation of an accessible public entrance, toilet, telephone, and drinking fountain.
- When a scope of work costing more than 30% of the full and fair cash value is proposed, the entire facility is required to be brought into compliance with the accessibility guidelines. This threshold also clarifies that additions costing more than 30% of the current building value

would require the entire existing facility to be brought into compliance.

Three additional sections in Chapter 3 require special consideration. Section 3.4 requires that when a building undergoes a change from a private use to a public use, an accessible entrance must be provided, even if no work is being performed. This is significant because it is the *only compulsory requirement* found in the building or accessibility codes when no other work is proposed or anticipated.

Section 3.5 titled *Work Performed Over Time* requires that when work has been divided into separate phases or projects under separate building permits, the total of all work performed in a 36-month period be added together when considering the dollar value scoping thresholds of Section 3.3.

Finally, 521 CMR section 3.9 allows for variances to the accessibility guidelines for Historic Structures listed on the State or National Register of historic places. The process of documenting and being granted variances for a broad range of accessibility requirements based on historic status is a complicated and nuanced process that requires careful coordination with the Access Board. The Board reviews the proposed variances to ensure that people with disabilities are granted dignified access to the primary function spaces of the building with as little influence on the historic fabric of the building as is feasible.

Federal Regulations

The Americans with Disabilities Act Architectural Guidelines (ADAAG 2010) is part of a federal civil rights regulation that is also applicable to work on existing buildings depending on their intended users. ADA applicability would be under Title II for any state or local government entity, program, service, or facility whereas Title III is applicable for any places of public accommodation or commercial facilities that fall into specifically defined categories. The requirements for buildings under the ADA are enforced by the US Department of Justice, and enforcement is typically through investigations or civil lawsuits resulting from complaints filed by individuals or organizations for perceived violations of the Act. These actions can be brought against a building Owner at any time, as opposed to building codes which are typically enforced when an building permit is granted for a proposed scope of work.

Title II (State and Local Governments) of the ADA requires that all services, programs, and activities provided by state and local government entities be accessible to people with disabilities. This does not require that all existing facilities be brought into compliance, but that barriers be removed in existing buildings such that all public services or programs, when viewed in their entirety, are accessible. Any proposed work on an existing building under Title II would be required to comply with ADA guidelines to the maximum extent feasible and new facilities would be required to comply completely with the guidelines. Additionally, when work is proposed that affects a primary function of an existing facility, the path of travel to that area, including the bathrooms, drinking fountain, and telephones on that path would need be made accessible as well. There are exceptions in Title II for structural impracticability, historic buildings, certain types of spaces, and disproportionality of cost for alterations to an accessible path serving a primary function area which all require close consideration for each scope of work in each building under consideration.

Title III facilities are privately owned buildings that are either defined as places of public accommodation (business open to the public and fall into one of 12 categories listed in the ADA) or as

commercial facilities (non-residential facilities that are not defined as places of public accommodation). The requirements for alterations to these facilities are similar to those as for Title II facilities, including the provisions for an accessible path serving a space that is considered a primary function. The most significant difference is that Title III existing facilities are not held to the same "removal of existing barriers" standard or program and service access standards as Title II facilities. Still, any proposed work in a Title III building would be required to comply to the maximum extent feasible, taking all of the applicable exceptions into consideration.

Energy Conservation

The 2018 International Energy Conservation Code (IECC) replaces the Chapter 13 requirements of the building code. This specialized code, also enforced by the building official, is intended to regulate the design and construction of facilities with respect to the use and conservation of energy over the life of the building. Chapter 5 of the IECC controls the alteration, repair, addition, and change of occupancy of existing buildings and has no authority to require the removal, alteration, or prevent the continued use of any existing buildings. For communities that have adopted the Massachusetts STRETCH Code, increased reductions in energy consumption beyond the baseline thresholds established in the base Code would be required for new buildings and additions to existing buildings meeting certain project type and size criteria described in 780 CMR Appendix AA. Alterations to existing buildings in these communities would be subject to the requirements of Chapter 5 of the 2015 IECC, described below.

Section C501.6, states that no provisions of the code relating to the repair, alteration, restoration or change of occupancy shall be mandatory for historic structures provided a report is submitted to the building official demonstrating that compliance with the provision would threaten, degrade, or destroy the historic fabric function of the building. While this is not a categorical exemption to the energy conservation code, it does place a high degree of value on the historic fabric of the building.

Proposed additions to existing structures would be required to comply with the IECC as for new construction. Alterations to existing buildings also need to comply with the IECC as for new construction and cannot make the existing building less conforming to the code than it was prior to the alteration. In general, this means that when a building envelope or mechanical system or piece of equipment is modified as part of a scope of work, the replacement elements or systems are required to comply with the IECC for new construction. There is no provision, based on the work area or dollar value of alterations, which would require an existing facility to be brought into full compliance with the energy code.

Certain specific scopes of work that may be limited to one portion of the building, whether considered as additions or alterations to existing facilities, are required to consider the effect on the entire facility. The addition of windows or other fenestration, including skylights, needs to incorporate all of the building fenestration areas in the total allowable fenestration area. Alternatively, a project could pursue the Total Building Performance method, requiring energy modeling, but would then need to

demonstrate full compliance with the IECC as for new construction. Otherwise, alteration and addition compliance requirements are limited to the work performed.

Although not part of the energy conservation code, it is important to note that in Massachusetts, M.G.L. chapter 7C, section 29 requires that for any new construction or renovation of a public facility where the cost exceeds $25,000 and includes systems or elements that affect energy or water consumption, a life-cycle cost analysis (LCCA) would be required to be performed. This analysis is required to determine the short and long term costs and feasibility of different technologies or systems considered as part of the scope of work. These systems and components would include both energy consuming equipment as well as building envelope elements or systems, since all of these elements affect energy consumption.

Fire Safety Code

In addition to the building code (780 CMR), there is also a Massachusetts Comprehensive Fire Safety Code (527) which is enforced by the local Fire Official. The Fire Code is generally enforced as a safety maintenance code, intended to prevent or remedy any conditions that may be fire hazards and to provide safety requirements to protect the public in the event of a fire. This code also regulates the installation and maintenance of fire safety equipment such as sprinkler systems and fire detection systems.

The Fire Code does apply to both new and existing conditions, but this code states that all installations of equipment completed prior to the adoption of the code are deemed to be in compliance. However, the fire official still has the authority to require compliance with the code for any condition which constitutes an imminent danger.

For the purposes of this report, it is important to note that the Fire Code also states that any provision related to the construction, alteration, movement, enlargement, replacement, repair, equipment, use, occupancy, removal, or demolition of buildings shall effectively be regulated by the building code and is subject to the jurisdiction of the Building Official. As such, this report contains minimal references to the Fire Code and will rely on the IEBC requirements outlines above for evaluation and consideration of existing conditions and any proposed scope of work.

Historic Structures

Massachusetts General Laws require that any project that requires funding, licensing, or permitting from a state agency to be reviewed by the Massachusetts Historical Commission (MHC). This review and the regulations that guide the review are designed to identify historic properties, evaluate the impact of a proposed project, and consult with the invested parties to avoid, minimize, or mitigate any adverse effects of the project. Once a general scope of work is defined, a Project Notification Form

should be filed with the MHC to determine if any historical or archeological considerations will need to be addressed as part of the project.

Beyond the State of Massachusetts regulations, the US Department of the Interior has developed a set of standards and guidelines related to the maintenance, repair, replacement of historic materials, and the design of alterations or additions to historic structures. The *Standards* are a set of concepts related to these different treatments, whereas the Guidelines offer design and technical recommendations in applying the Standards.

In order to determine which Standards and Guidelines are applicable, it is necessary to determine which treatment of a historic structure would be pursued for a given facility. A proposed scope of work outlined in a Capital Improvements Plan generally falls into work that could be classified as one of the following Treatments:

- **Preservation**: the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time.
- **Rehabilitation**: recognizing the need to alter or add to a historic property to meet continuing or changing uses while retaining the properties historic character.

In working to develop a defined scope of work as well as a sustainable capital improvement plan for the future, the Standards for Preservation and Rehabilitation as well as the Guidelines for the Treatment of Historic Properties will serve as guiding documents in the development of such plans. Compliance with the Guidelines is not obligatory, but will provide the best practice approach to both maintaining the building and allowing for alterations to serve the intended end use. It also serves to demonstrate that the Owner values and wishes to maintain the historic integrity of a building, reinforcing the appropriate application of any historic structure exceptions to accessibility and building code regulations.

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EXISTING CONDITIONS: REGULATORY ASSESSMENT

INTRODUCTION

This Regulatory Assessment will convey to what degree the Consentino Middle School, in its current condition, complies with current building codes and regulations. The Assessment does not attempt to define a scope of work, but rather highlight specific non-complying conditions and identify which conditions would require correction if a repair, alteration, addition, or change of use were to be proposed for the facility.

It is important to note that a building or a portion of a building does not require correction simply because it does not comply with current codes; any building that is legally occupied and adequately maintained can remain so without bringing the building into full compliance with codes and regulations. This *principal of non-conforming rights* (that a newly adopted regulation cannot impose the undue burden of compliance on legally existing occupancies) is reflected in how the codes identify to what degree existing buildings must be brought into compliance when a scope of work is proposed. The greater the scope of work, the greater the burden of compliance with a given code or regulation will be required.

For some regulations, such as 521 CMR Accessibility Rules or the Massachusetts special sprinkler provisions of MGL c.148 s.26G, these compliance thresholds are “hard lines” comprised of specific dollar value thresholds. When determining the dollar value thresholds for compliance, the cash value of the building is used as the basis for the determining the requirements for compliance. The full and fair cash value of the *building*, as determined from the Town Assessor's online database is calculated as follows:

Property Value	**$ 7,463,500**
Land Value	**($ 2,515,700)**
Other Improvements or outbuildings	**($ 23,000)**
Full and Fair Cash Value	**$ 4,924,800**

This value will be used later in this Assessment to calculate the applicable compliance thresholds. The Existing Building Code uses the type of work and the affected area to determine when increasing levels of compliance are required. When considering a proposed scope of work for the building, a careful consideration of the various degrees of compliance will need to be considered. Refer to the

Regulatory Overview section of this report for a more detailed description of the various compliance paths outlined in the Existing Building Code.

THE INTERNATIONAL EXISTING BUILDING CODE (IEBC)

The Performance Compliance path provides a simple yet comprehensive overview of the general life safety aspects of a building. Although designed as a building code compliance path, it can also be used as an assessment tool. This assessment will utilize the value and scoring based method of the Performance Compliance path to assign a score to the building as it is currently configured and maintained. Similar to previous comments, a failing score in any category as part of an assessment does not compel any corrective action - it simply indicates how the building would be viewed under current codes. It is intended to illustrate the relative general and life safety performance of the existing building.

The building is constructed of non-combustible materials, specifically masonry bearing walls or structural steel frame and concrete floor and roof decks over steel framing. While some portions of the steel frame are protected with sprayed fire-resistant material (SFRM), the fire protection of the steel is incomplete, and most floor and roof secondary members are not protected. As such, the building would best be classified as Type II-B construction.

The building does incorporate some life safety assets; specifically, the non-combustible construction type and the number and arrangement of exits. However, most life-safety features are antiquated, non-functioning, or simply missing, resulting in deficits in nearly every category. Many of these missing or incomplete features are further compounded by the lack of a sprinkler system, which affords relief to buildings that do include them. While this list is not exhaustive, noted code deficiencies include

- No sprinkler system
- Fire area more than that permitted for the Construction Type. The lack of firewalls and sprinkler system result in a floor area more than double the Code maximum.
- Inadequate egress capacity (width in inches) from second story classrooms.
- Excessive travel from second story due to unprotected stair enclosures.
- Non-compliant handrails and guardrails at stairwells.
- Lack of 1-hour fire resistive rated corridors (without sprinkler system).
- Non-compliant door hardware throughout the facility.
- Inadequate exit signage and exterior egress lighting.
- Elevator cannot accommodate standard gurney per Elevator Code.
- While not specifically addressed by the code, the wood trellis in the interior courtyard and the precast entry canopy on the south of the building are in disrepair to the point that they may be hazardous.

The table and evaluation scores on the following page summarize the facility under the Performance Compliance path of the IEBC.

Table 1401.7 Summary Sheet - IEBC PERFORMANCE GRADE - CONSENTINO MIDDLE SCHOOL

Existing Occupancy	**Educational**	Proposed Occupancy	**Educational**		
Year building was constructed	**1969**	Number of Stories	**2**	Height in feet	**24**
Type of construction	**II-B**	Area per floor	**84,614 / 26,318**		
Percentage of open perimeter increase	**75%**				
Completely Supressed	**No**	Corridor wall rating	**0 hr.**		
		Type	**N/A**		
Compartmentation	**No**	Required door closers	**No**		
Fire resistance rating of vertical opening enclosures	**No**				
Type of HVAC system	**Unit Vent / duct exh.**	, serving number of floors	**1 and 2**		
Automatic fire detection	**Yes**	Type and location	**Smoke/heat in classrooms & corr.**		
Fire alarm system	**Yes**	Type	**Non-addressable, non-compliant**		
Smoke control	**No**	Type	**N/A**		
Adequate exit routes	**Yes**	Dead ends	**Yes**	Length in feet	**53**
Maximum exit access travel distance	**205 feet**	Elevatory controls	**Yes**		
Means of egress lighting	**Yes**	Mixed Occupancies	**Yes**		
Standpipes	**No**	Patient abilty for self preservation	**N/A**		
Incidental use	**Yes**	patient concentration	**N/A**		
Smoke compartment less than 22,500 sq. ft.	**No**	Attendant-to-patient ratio	**N/A**		

Safety Parameters	Fire Safety (FS)	Means of Egress (ME)	General Safety (GS)
1401.6.1 Building Height	0	0	0
1401.6.2 Building Area	-59	-59	-59
1401.6.3 Compartmentation	0	0	0
1401.6.4 Tenant and Dwelling Unit Separations	0	0	0
1401.6.5 Corridor Walls	-5	-5	-5
1401.6.6 Vertical Openings	-5	-5	-5
1401.6.7 HVAC Systems	-5	-5	-5
1401.6.8 Automatic Fire Detection	8	8	8
1401.6.9 Fire Alarm System	-5	-5	-5
1401.6.10 Smoke Control	****	0	0
1401.6.11 Means of Egress	****	0	0
1401.6.12 Dead Ends	****	-2	-2
1401.6.13 Maximum Exit Access Travel Distance	****	0	0
1401.6.14 Elevator Control	0	0	0
1401.6.15 Means of Egress Emergency Lighting	****	****	0
1401.6.16 Mixed Occupancies	0	0	0
1401.6.17 Automatic Sprinklers	-12	-6	-12
1401.6.18 Standpipes	0	0	0
1401.6.19 Incidental Use	-1	-1	-1
1401.6.20 Smoke Compartmentation	0	0	0
1401.6.21.1 Patient Ability for Self-preservation	****	0	0
1401.6.21.2 Patient Concentration	****	0	0
1401.6.21.3 Attendant-to-patient Ratio	****	0	0
Building Score - total value	-84	-80	-86

Table 1401.9 Evaluation Formula

Consentino Middle School Evaluation:

				Score	Pass	Fail
-84	(FS) -	*29*	(MFS)=	-113		X
-80	(MS) -	*40*	(MMS)=	-120		X
-86	(GS) -	*40*	(MGS)=	-126		X

Sprinkler Protection Requirements

The building does not include a sprinkler system and therefore is not in compliance with M.G.L. c.148 s.26G. Because the building is larger than 7500 Gross Square Feet (GSF), any scope of work meeting the criteria of a "major alteration" would require a sprinkler system to be installed throughout the facility. In Massachusetts, a building's *fire area* includes all portions of the building enclosed by the exterior walls regardless of interior sub-division with fire walls or fire barriers. This is important to understand because the sub-division of a building into separate fire areas (with fire walls and fire barriers, for example) would not be considered a compliance strategy in Massachusetts.

To be considered a "major alteration" the scope of work would have to meet both the "nature of work" and "scope of work" criteria. For the scope of work criterion, the Division of Fire Services provides two separate thresholds - if the project exceeds one of these thresholds, then the project is considered "major" in scope. For the Consentino Middle School, if the work area exceeds **36,608** square feet (33% of the total building area of **110,932** square feet) ***OR*** if the cost of work exceeds **$1,625,184** (33% of the value of the building, calculated above), the project *scope* would be considered "major". (The square footages used here are the *Building Area* as defined in the Code, not the more conventional Gross Square Footage area.)

The "nature of work" criterion is less specific, but essentially if any work is being done that would not make the installation of sprinklers substantially more difficult, it would be considered “major” in nature. Examples include the demolition of ceilings, walls, or floor decking exposing the structural framing.

Accessibility

Any proposed work will be required to comply with the accessibility requirements of 521 CMR (The Massachusetts Architectural Access Board, or MAAB Rules).

If the cost of the proposed work exceeds $100,000, an accessible entrance, toilet room, drinking fountain, and telephone (if drinking fountains and telephones are provided) will be required in addition to the compliance requirements of the proposed work.

When the cost of work exceeds 30% of the full and fair cash value (calculated above), than the entire facility will be required to comply with the MAAB Rules. For the Consentino Middle School, this 30% threshold dollar value would be **$1,477,440.**

Because the building is a public school, owned and operated by the local municipality, it is considered a Title II facility under the Americans with Disabilities Act (ADA). As such, any proposed work to the facility would be required to comply to the maximum extent feasible with the ADA Architectural Guidelines (the ADAAG) except where it would be structurally impractical. The ADA does not have a threshold for requiring full facility compliance, but does require that when there are alterations to an area of "primary function" (including classrooms, gymnasium, cafeteria, and administration areas),

than the path of travel as well as the restrooms, telephones, and drinking fountains serving the areas of primary function are also accessible.

Specific deficiencies or non-compliant conditions were noted at the Consentino Middle School. If a major alteration exceeding the 30% threshold were undertaken, all of these items would require correction.

Site Features

- Accessible parking spaces do not provide the required 5-foot wide access aisles adjacent to the parking area (Image 1). There are only two accessible parking spaces provided. With a total parking capacity of 77 cars (at west and north lots), at least 4 spaces should be provided, at least one of which should be van accessible.
- A curb cut is provided across from the parking spaces marked accessible (Image 2). No tactile warning strip provided, and one is not required by Code. However, the incorporation of such tactile warnings is considered best practice and recommended for all school facility curb cuts.
- Besides the curb cut at the sidewalk approach to the main entry, no other marked crosswalk included a curb cut. In many locations, striped crosswalks did not connect to a sidewalk or accessible way (Images 3 & 4). (10 locations)

Entrances

- Some entrances were provided with flush transitions at doorways, such as at the main entry (west) near admin, the north entry to the parking area, and the south entry. However, all secondary doors include a step from a landing to grade (Image 5), resulting in less than the required number of accessible means of egress from most spaces in the building.
- There is no accessible toilet room or drinking fountain near the main entry of the building. One such accessible toilet and drinking fountain (and telephone if telephones are provided) would have been required to be added during the 2012 window and boiler project since the value of that contract was greater than $500,000 threshold for exempted work.

Doors

- In general, interior doors are not provided with accessible hardware. There were a few exceptions noted at some interior door replacement locations – such as the library – but the majority of doors still include knob-style hardware (image 6).
- Many doors in the building, and the majority of the doors in the classroom wing, do not provide the required push or pull clearances. (Image 6).
- Several doors, such as those to the toilet rooms, provide less than the required 32-inch clear width.

Accessible Route

- No accessible route connects the building to public streets or sidewalks. See Site Features above.
- There is no accessible route from the main level to the two mezzanine spaces above the locker rooms.

- There is no accessible route to the performance platform in the Cafetorium.
- There is no accessible route though Boys and Girls locker rooms.

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

- The elevator cab does not provide the required 68-inch by 51-inch clear floor area and does not include hall lanterns. Because the elevator is not accessible, all second-floor classrooms are not served by an accessible route.

Toilet Rooms & Plumbing Fixtures

- No accessible toilet rooms were observed throughout the entire school building for visitors, staff, or studens. Nearly all toilet rooms include the original fixture layouts and no accessible toilet compartments or urinals were observed.
    - Grab bars were added to some toilets (Image 7), presumably in an attempt to be more accessible, but these cannot be used by people in wheelchairs.
    - In some toilet rooms, lavatories have been changed out with accessible-type fixtures (image 8). While the lavatory itself may be considered accessible, these fixtures are generally not on an accessible route and are often not provided with mirrors, soap dispensers and/or paper towel dispensers within the required reach ranges.
    - Two toilet rooms were added into one of the mezzanines above the Girls Locker room. These rooms closely approximate accessible toilet rooms, but mirrors, grab bars, and the shower do not comply. And since they are located on a second level with no accessible route to them, the rooms are effectively non-accessible. (Image 9).
    - In Boys and Girls (Image 10) locker rooms, no accessible showers or changing areas are provided.
    - Staff showers are non-compliant. (Image 11).
- No compliant drinking fountains were observed in the building. Newly installed bottle filling stations are within the required reach range, but no drinking fountain with required high and low spouts was observed. (During the visit, nearly all drinking fountains were covered, most likely due to COVID precautions.)

Controls & Miscellaneous

- Accessible signage is not provided to any observed space. (One men's room included a sign with the symbol for accessibility. However, the sign was mounted on the door and the room did not contain any accessible fixtures or features.)
- Typical classroom (Image 12), specialty classroom (Images 13, 14, and 15), and staff workroom (Image 16) casework is generally inaccessible with counter heights that are non-compliant and sink bases that do not provide knees space.
- In many spaces, room controls and equipment such as thermostats or wall-mounted telephones were mounted outside the reach ranges.

Image 7

Image 8

Image 9

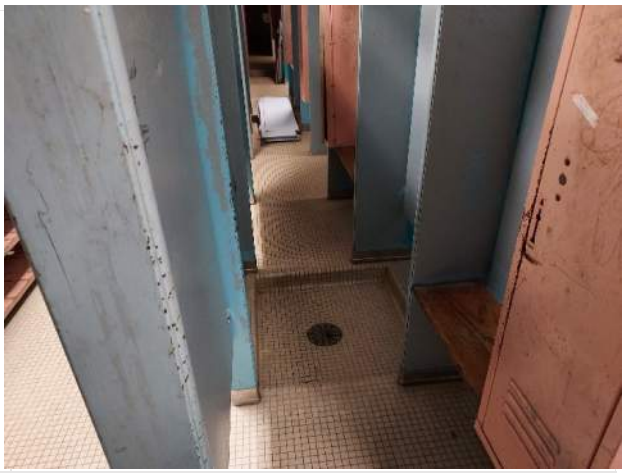

Image 10

Image 11

Image 12

Image 13

Image 14

Image 15

Image 16

STANDARDS FOR THE TREATMENT OF HISTORIC STRUCTURES

The building and property is not listed on, nor is it eligible for listing on the National Register of Historic Buildings. Refer to the Regulatory Overview portion of this report for Historical Regulations.

ENVIRONMENTAL SITE ASSESSMENT

A Phase 1 Environmental Site Assessment draft dated December 14, 2021 has been developed by Sanborn Head & Associates. The Assessment and associated attachments is included here in its entirety.

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APPENDICES

EXECUTIVE SUMMARY

On behalf of Dore & Whittier (Client), Sanborn, Head & Associates, Inc. (Sanborn Head) has prepared this Phase I Environmental Site Assessment (ESA) for a portion of the property located at 685 Washington Street in Haverhill, Massachusetts (Site).

This Phase I ESA report was performed in substantial conformance with the scope and limitations of the *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13) and the U.S. Environmental Protection Agency's (USEPA) "All Appropriate Inquiry" Final Rule, 40 C.F.R. Part 312 (AAI). Sanborn Head's services and this report are subject to the limitations provided in Appendix A.

Based on the services summarized herein, this Phase I ESA has revealed no evidence of Recognized Environmental Conditions (RECs) in connection with the Site.

This Phase I ESA has revealed evidence of one Historical Recognized Environmental Condition (HREC) at the Site:

- On August 17, 2012, a 10,000-gallon No. 2 fuel oil underground storage tank (UST) was removed from the Consentino Middle School property (Site). Prior to the removal of the tank, approximately 7,000 gallons of fuel oil was removed for the tank. According to the Haverhill Fire Department, the tank was observed to be in good condition but the feed line from the tank to the school building was observed to be in poor condition and evidence of a fuel oil release was observed. Soil and groundwater data was collected at the Site in November 2012 and July 2017.

  Using the soil and groundwater data gathered during the investigations, a Method 3 risk characterization was completed to assess site-specific risks of harm to human health, safety, public welfare and the environment. The risk characterization confirmed that a condition of No Significant Risk had been achieved for the release and additional response actions were not warranted. Because regulatory closure has been achieved for the on-Site RTN, it is Sanborn Head's opinion that the fuel oil release constitutes a HREC in connection with the subject Site.

1.0 INTRODUCTION

This report documents the results of a Phase I Environmental Site Assessment (ESA) performed by Sanborn, Head & Associates, Inc. (Sanborn Head) on behalf of Dore & Whittier (Client) for a portion of the property located at 685 Washington Street in Haverhill, Massachusetts (Site) and shown on the Locus Plan provided as Figure 1. The objective of this ESA was to identify "Recognized Environmental Conditions" (RECs) associated with the Site. As defined by ASTM E1527-13[1] a REC is the presence or likely presence of hazardous substances or petroleum products in, on, or at a site: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

The Site, shown on Figure 2, consists of a portion of an approximately 28-acre parcel (Parcel ID: 556-1-1) of land owned by the City of Haverhill, which is mainly classified as municipal. The Site, which is the northern portion of the larger 685 Washington Street property, contains one school building, Consentino Middle School, which was built in about 1969. In addition to the school building and supporting structures (parking lots, transformers, light fixtures, etc.), a weather station is located at the Site. Consentino Middle School is a one- and two-story building with an area of approximately 110,000 square feet.

1.1 Scope of Services

This Phase I ESA report was performed in substantial conformance with the scope and limitations of ASTM E 1527-13 and the U.S. Environmental Protection Agency's (USEPA) "All Appropriate Inquiry" Final Rule, 40 C.F.R. Part 312 (AAI). The term "Phase I" as used in this report is defined in ASTM E 1527-13 and should not be considered equivalent to the use of the same term in various state regulatory programs. The Scope of Services to complete this Phase I ESA was outlined in Sanborn Head's Proposal for Services dated June 2, 2021, which was accepted by the Client. The scope of services consisted of four main components:

- A review of physical setting, historical use records, and reasonably ascertainable records relative to environmental conditions at the Site;
- A reconnaissance visit of readily-accessible interior and exterior portions of the Site;
- Interviews with Site personnel and select local government representatives regarding environmental conditions at the Site; and
- Preparation of this report to document Sanborn Head's findings, opinions, and conclusions regarding potential RECs in connection with the Site.

Sanborn Head's services did not include non-scope considerations listed in ASTM 1527-13, such as the presence of asbestos-containing building materials, lead based paint, polychlorinated biphenyls (PCBs) in building materials, biological agents, cultural and historic resources, ecological resources, endangered species, health and safety, indoor air quality unrelated to releases of hazardous substances or petroleum products into the

[1] ASTM International. "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process"

environment, industrial hygiene, lead in drinking water, mold, radon, regulatory compliance, or wetlands.

1.2 Limitations, Deviations, and Limiting Conditions

As stated in ASTM E 1527-13, Section 4.5.1, uncertainty regarding the potential for RECs at the Site cannot be wholly eliminated through completion of Phase I ESA services. Conducting this Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs in connection with the Site, recognizing reasonable limits of time and cost. It is assumed that this Phase I ESA may not identify latent environmental conditions potentially related to or arising out of undocumented past uses of the Site or neighboring properties. Sanborn Head's services and this report are subject to the limitations provided in Appendix A.

In our opinion, no deviations or exceptions to the scope of work outlined in ASTM E 1527-13 have been made.

Limiting conditions of this ESA included the following:

- Not every classroom/room was entered during the Site reconnaissance due to similarities between multiple classrooms and/or no suspicion of environmental concerns.
- Accompanying facility individual during the Site reconnaissance had limited knowledge of key Site features.

Based on the information reviewing during our file review, it is Sanborn Head's opinion that these limiting conditions do not impact our ability to identify RECs associated with the Site.

1.3 Terms, Conditions and User Reliance

This Phase I ESA was conducted pursuant to the accepted Proposal for Services and the Terms and Conditions established therein between the Client and Sanborn Head. This report was prepared for the exclusive use of the Client in connection with potential finance of the Site. No other party is entitled to rely on this document without the prior express written consent of Sanborn Head and the Client. Upon request, terms and conditions under which reliance can be extended to other parties will be reviewed with the Client.

2.0 RECORDS REVIEW

Sanborn Head reviewed reasonably ascertainable (as defined in ASTM 1527-13) records to:

- Identify characteristics of the Site's physical setting;
- Establish whether the Site or nearby properties are identified on lists (databases) maintained by government agencies for the presence or potential presence of RECs;

- Identify whether documents provided by the User, Owner, or Key Site Manager provide information relative to the physical setting of the Site and/or indicate the presence of RECs;

- Establish whether information maintained by the State and local regulatory agencies and supplemental to what is included in the environmental database search report provides evidence related to potential RECs; and

- Establish a historical record of prior Site use.

In our opinion, the information obtained from the files/records review is sufficient to meet the evaluation criteria specified in ASTM E 1527-13.

2.1 Physical Setting

Records related to the physical setting of the Site reviewed for this ESA included topographic maps, aerial photographs, a Massachusetts Department of Environmental Protection (MassDEP) Phase I Site Assessment Map, the Massachusetts Bureau of Geographic Information (MassGIS) interactive map viewer OLIVER, locally provided files from the City of Haverhill, and the Physical Setting Addendum provided by EDR, copies of which are provided in Appendix B. Based on the review of these records, a physical setting description of the Site and vicinity is provided in the table below.

Site Topography and Drainage	The Site topography in the area of the school building and athletic fields is essentially flat at an approximate elevation (El.) of 180 feet above Mean Sea Level (MSL) with a slight downward slope towards the west. The Consentino Middle School has a finished floor elevation (FFE) of 177.25 feet above MSL. The Site generally drains from the northeast to the west and south.
Site Vicinity Topography	The Site vicinity topography is characterized primarily by the Site proximity to Silver Hill, with a maximum elevation of El. 274 feet above MSL. The topography slopes downward in all directions with increased distance from the hill. To the west, south, and east of the Site there is a uniform downward slope towards the Merrimack River, which has an approximate elevation of El. 10 feet above MSL.
Nearest Water Body, Direction and Distance	The Merrimack River is the nearest body of water, located approximately 0.3 miles west, south, and east of the Site.
Site Stormwater	Stormwater that is not infiltrated to the subsurface is collected by on-Site catch basins; the catch basins located around the Consentino Middle School drain to the municipal combined drainage/sewer system located on Washington Street. Catch basins along Washington Street also receive stormwater runoff by overland flow, which are connected to the municipal combined drainage/sewer system.
Site Geology	In November 2012, five soil borings were advanced northeast of the Consentino School building, and in July 2017 four soil borings were advanced in the same area. The soil stratigraphy generally consists of fill material extending to a depth of between 5 and 6 feet bgs, underlain by natural fine to medium sand, which generally extends to the bottom of each boring. Drilling refusal was encountered at depths of between 12 to 16 feet bgs.

	According to the USGS Geology of the Conterminous United States, bedrock in the area is identified as the Berwick formation.
Inferred Depth to Groundwater	Based on the EDR Physical Setting Addendum, the depth to groundwater at the Site is anticipated to be between 2 to 5.7 feet bgs. Groundwater was encountered at a depth of 9.4 feet bgs northeast of the Consentino Middle School in November 2012, and at a depth of 6.68 feet bgs in July 2017.
Inferred Direction of Groundwater Flow	Based on topographic gradients, groundwater generally flows towards Washington Street to the west[2].
Flood Zone Designation	The Site is not located within a FEMA Flood Zone.
Sensitive Human Receptors	Residential neighborhoods border the Site in all directions. The Site is improved with one school building (Consentino Middle School), and six additional schools are located within a one-mile radius of the Site , located to the north, east, and south. The Merrimack River, located 0.3 miles west, south, and east of the Site, is used for recreational purposes. The EDR Physical Setting Addendum identifies 34 monitoring wells within a one-mile radius of the Site. Twenty-five of the wells are maintained by the USGS Massachusetts Water Science Center. There are no Potential Drinking Water Source Areas, Aquifers, or Public Water Supply protection areas shown within a half mile of the Site. According to the MassGIS and MassDEP Phase I Site Assessment Map, Protected and Recreational Open Space areas are located at the athletic fields and wooded area on-Site and at the field south of the Moody School 0.3 miles south of the Site.
Sensitive Environmental Receptors	Wetlands are located 0.2 miles to the west, and the Merrimack River is located 0.3 miles to the west, south, and east of the Site. Based on the MassDEP Phase I Site Assessment map, Estimated Rare Wetland Wildlife Habitats are located 0.5 miles to the west, south, and east of the Site (at the Merrimack River).

2.2 Environmental Database Search

2.2.1 Methodology

Sanborn Head contracted EDR to perform a database search on July 28, 2021. The database search reviews federal and state standard environmental record sources in accordance with ASTM E 1527-13 search distances. EDR also provided copies of building permits for the Site and surrounding properties.

Information related to properties identified in standard environmental sources and located within the approximate minimum search distances was reviewed to assess the likelihood of an impact to Site soil, groundwater, or vapor from migrating hazardous substances or petroleum products. The information used in this assessment included:

[2] We note that subsurface conditions, the presence of subsurface utilities, faults and fractures in the underlying rocks, groundwater extraction, and other factors may influence the direction of groundwater flow. Additionally, groundwater flow direction can fluctuate seasonally.

- Distance from the Site boundary[3];
- Anticipated direction of groundwater flow;
- Regional and local geologic conditions;
- Anticipated stormwater and surface water flow directions;
- The presence of utilities or other subsurface structures;
- The presence/absence of documented contaminant releases at the identified sites; and
- The regulatory status of the documented releases.

A summary of our search findings is included herein, and a copy the EDR Report is provided in Appendix C.

2.2.2 Results

Several listings were identified for the Site, as described in the table below.

Summary of On-Site Database Listings	
Key Database[4]	**Summary**
FTTS/HIST FTTS	In January 2001, the building was inspected following a private citizen/press complaint. No violations were reported from the inspection.
SHWS/LUST/RELEASE/RGA LUST/MA ENF	The address is associated with a release from an underground storage tank (UST) and release tracking number (RTN) 3-31069, which is discussed in Section 2.4.1.
ASBESTOS/FINDS	An asbestos removal occurred in the fall of 2012.

EDR identified several listings for surrounding properties in various databases within the minimum search distances from the Site. Listings for adjoining properties and/or properties that represent a potential migration risk to the Site are summarized in the table below. The remaining listings are not considered likely to have releases of hazardous substances and/or petroleum products with the potential to migrate to the Site property.

[3] For potential to impact Site soil vapor, listings that indicated releases of petroleum products and non-petroleum chemicals of concern located within 0.1 and 0.3 mile of the Site, respectively, were considered.

[4] A list of databases and acronyms can be found in the EDR Radius Map™ Report with GeoCheck® in Appendix C.

Summary of Key Off-Site Database Listings			
Facility Name	**Distance/ Direction from Site and Anticipated Hydrogeologic Location Relative to Site[5]**	**Potential Migration Pathway**	**Summary**
11 Villa St	Approximately 670 feet southeast Down-gradient	Vapor	This property is listed in the SHWS and RELEASE databases. It is associated with RTN 3- 23696, which is discussed further in Table 1.
Four Season Car Wash 427 River St	Approximately 700 feet southeast Down-gradient	Vapor	This property is listed in the SHWS and RELEASE databases. It is associated with RTN 3-18923, which is discussed further in Table 1.

Based on the information available from EDR, additional files were reviewed for several listings, including the on-Site release, as summarized in Section 2.4.

2.3 Owner Provided Documents

The owner has not provided documents associated with the Site at the time of this report.

2.4 State/Federal Regulatory Agency Documents

Sanborn Head reviewed selected documents available from MassDEP for the Site and surrounding properties identified in the EDR Radius Map Report, or through other on-line search methods. Off-Site files were reviewed if the property was adjoining the subject Site, or if we identified the potential for hazardous substance or petroleum migration from these properties to the Site based on our understanding of hydrogeologic or geologic conditions and/or the potential for vapor migration.

A summary of the MassDEP file review sites and their locations relative to the Site is provided in Table 1, and a figure showing the reviewed sites' locations relative to the Site is provided as Figure 3.

Based on the data and reports reviewed, the release sites identified by EDR and reviewed on the MassDEP website have been remediated, have achieved regulatory closure, are located in apparently down-gradient locations from the Site, and/or are small spills located at a significant distance from the Site. Therefore, in our opinion, the release sites reviewed do not appear to represent a significant risk to Site soil, groundwater, or soil vapor quality. The on-Site release is described further in Section 2.4.1.

[5] The identification of a surrounding Site as potentially up-gradient, cross-gradient and down-gradient assumes the direction of groundwater provided in Section 2.1 of this report.

2.4.1 On-Site Release, RTN 3-31069

On August 17, 2012, a 10,000-gallon No. 2 fuel oil underground storage tank (UST) was removed from the Consentino Middle School property (Site). The UST was located at the northeastern corner of the school building, at the approximate location shown on Figure 2. Information regarding the removal of the tank and post-removal response actions is provided in a report titled "Immediate Response Action Completion Report and Permanent Solution Statement with No Conditions," dated December 2017 and prepared by SAK Environmental, LLC (SAK), a copy of which is included in Appendix D.

According to SAK, the UST had reportedly been abandoned for several years following a change in fuel for the heating system to natural gas. Prior to the removal of the tank, approximately 7,000 gallons of fuel oil was removed for the tank. According to the Haverhill Fire Department, the tank was observed to be in good condition but the feed line from the tank to the school building was observed to be in poor condition and evidence of a fuel oil release was observed. The excavation was approximately 10 feet deep and groundwater was not encountered.

During the UST removal, soil samples were collected and screened for the presence of organic vapors using a photo-ionization detector (PID)-equipped instrument. Organic vapors were detected at a maximum concentration of 178 parts per million by volume (ppmv). Because the detected concentration of organic vapors exceeded the 72-hour Massachusetts Department of Environmental Protection (MassDEP) reporting threshold of 100 ppm, the MassDEP was notified of the release and assigned Release Tracking Number (RTN) 3-31069. The MassDEP verbally approved the removal of petroleum-impacted soils and an evaluation of potential migration pathways as an Immediate Response Action (IRA).

In November 2012, SAK observed the advancement of soil borings in the vicinity of the former UST to assess soil conditions. One of the borings was completed as a groundwater monitoring well. Soil and groundwater samples were collected for confirmatory chemical analysis. In July 2017, SAK observed the advancement of soil borings and installation of groundwater monitoring wells to assess the potential for a complete vapor intrusion pathway. Soil and groundwater samples were collected for confirmatory chemical analysis.

Using the soil and groundwater data gathered during the investigations, SAK completed a Method 3 risk characterization to assess site-specific risks of harm to human health, safety, public welfare and the environment. The risk characterization confirmed that a condition of No Significant Risk had been achieved for the release and additional response actions were not warranted.

Because regulatory closure has been achieved for the on-Site RTN, it is Sanborn Head's opinion that the fuel oil release constitutes a HREC in connection with the subject Site.

2.5 Local File Review

The findings of our local file review are summarized below. Select information obtained during the local file review is included in Appendix D.

Office	Types of Information Available	Summary of Available Information

Assessor's Office	Assessor's Card and Map	• Current (2021) and historic property cards for the Site property.
		  • Consentino Middle School and Silver Hill Elementary School are both located on Parcel ID#556-1-1. The parcel consists of 28.16 acres of land mainly classified as municipal with two school buildings, built in about 1969 and 1991, respectively. The parcel is owned by the City of Haverhill. The Site is the portion of the parcel containing the Consentino Middle School.
		  • Consentino Middle School consists of a two-story approximately 110,000 square foot structure with a brickstone foundation, wood frame, brick veneer walls, a gable asphalt roof, plaster interior walls, and linoleum/vinyl flooring.
		  • Consentino Middle School is heated with a forced hot water system that is serviced by natural gas.

Health & Inspectional Services Department	Supply Well, Septic/Sewer Information	• In November 2018, a citizen complaint of visible black mold causing breathing issues was filed.
		• Notice of Responsibility/Notice of Permanent Solution Statement (RTN 3-31069).
		• Permits, construction applications, and inspectional receipts relating to historical work on the building and food/milk storage.
		  • Consentino Middle School is heated with a forced hot water system that is serviced by natural gas.
		  • In 2012, the boiler was replaced, and the boiler room was repaired.

Fire Department	UST Information, Fires, Releases	• Application for Permit (7/6/1992) to install a double wall, 20,000-gallon fuel oil UST and associated piping and controls. • Licensed Tankage document (7/10/1992) for Consentino School for a 20,000-gallon capacity tank. • Application and Permit for the removal and disposal of the 10,000-gallon #2 Oil UST.
City Clerk	UST Information, Permits, Deeds	No information available.
Economic Development & Planning Department	Permits, Zoning Map, Applications	No information available.
Department of Public Works	Engineering and Utility Plans	No information available.
Conservation Department	Site Plans, Environmental Information/Citations	No information available.

None of the information reviewed is considered to indicate a REC in connection with the Site. The historical presence of a fuel oil UST at the Site and subsequent release is considered an HREC, as discussed in Section 2.4.1.

2.6 Historical Use Information

Sanborn Head reviewed historical mapping (e.g., fire insurance and USGS topographic maps) and aerial photographs. Historical topographic maps and aerial photographs were available for the Site and vicinity spanning from 1888 through 2016. Other historical sources reviewed as part of this assessment included an EDR City Directory report.

The following key information was available in our review of the historical sources:

- **Site:** From as early as 1906, the Site has consisted of a cleared area consisting of multiple historic parcels along Washington and Silver Streets. The northeastern portion of the Site was used for farming. Since at least 1888, unpaved roadways have existed at the western portion of the Site. Sanborn Fire Insurance Maps identify these Streets as Lenox Street, Penfield Street, Randolph Street, and Virginia Avenue with residential parcel distinctions indicative of proposed residential developments; at least three houses were constructed on these on-Site parcels. By 1969, the parcels along Washington Street and Silver Street were divided, and the farmlands and cleared areas were combined into the current Parcel area (the houses remained with smaller yards surrounding the Parcel). Additionally, the roadways and residences at the western portion of the Site had been removed/demolished.

  Consentino Middle School and its athletic fields and parking areas were constructed in approximately 1969 at the western portion of the Site. Building access was available via two paved entrance points along Washington Street, and a paved path from Silver Street. By 2006, a weather station had been constructed northeast of Consentino Middle School.

- **Adjoining Properties:** Since at least 1888, the Site has been surrounded by Washington Street to the west, an unpaved roadway to the north, cleared areas to the south (partially used for farming), and residences in all directions except to the north. By 1938, the Bartlett School had been constructed to the southwest of the Parcel. By 1960, additional houses were constructed to the west (immediately beyond Washington Street), and by 1992 and 1998, additional houses were constructed to the north. By 1969, the farmlands to the south had become overgrown. In 1991, the Silver Hill Elementary School was built to the south of the Site; it is listed with the address 675 Washington Street, despite being identified by the Assessor's Office as part of the Parcel.

- **Surrounding Area:** Since at least 1888, the Site vicinity has been primarily composed of residences, particularly to the west, south, and east. There were large increases in the residential building density by 1971 and again by 2006, particularly to the west, north, and east of the Site.

  Commercial/industrial buildings have existed south of the Site in the areas along River Street since at least 1938. There were significant increases in such developments in

this area by 1953 and again by 2006 with the construction of two car dealerships at the western portion of River Street.

The area to the northeast of the Site, in the vicinity of Silver Hill, has been relatively forested and undeveloped until at least 1888; however, multiple developments have occurred at the peak of the hill. A ten-story monument titled Tilton's Tower stood atop the hill from 1887 through 1945. By 1953, a radio tower and an associated building were constructed on the hill, by 1992 a larger radio tower was constructed adjacent to the previous tower. A cell phone tower and an associated building were constructed on the hill by 1995.

The area to the northwest of the Site has consisted of farmlands since at least 1938. By 1971, some of these parcels had been developed for residences. Some of the remaining farmlands still exist, though they appear to be abandoned to some degree.

Copies of documentation obtained during the Site history review are provided in Appendix B.

2.7 User Provided Information

As required to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001, Sanborn Head requested that the User of this Phase I ESA (Client) complete a User Questionnaire. The User's responses regarding their knowledge of the information related to the Site have been incorporated into this report where relevant. A copy of the User Questionnaire is included in Appendix E.

Sanborn Head was not informed by the User or Site personnel of environmental liens or activity/use limitations in place for the Site. During Sanborn Head's review of local/state files, we did not identify environmental liens or use restrictions in place for the Site.

3.0 SITE RECONNAISSANCE

A Sanborn Head representative performed a Site reconnaissance to obtain evidence of RECs potentially present in connection with the Site, as summarized in the table below.

Date of Site Visit	July 30, 2021
Sanborn Head Representative(s)	J. McCarthy
Accompanying Facility Individual(s)	Eric Russell
Title(s)	Head Custodian
Tenure at Facility	10 years (attended school as a student in years prior)
Limiting Conditions	Not every classroom/room was entered during the Site reconnaissance due to similarities between multiple classrooms and/or no suspicion of environmental concerns. Accompanying facility individual had limited knowledge of key Site features.

A photograph log from the Site reconnaissance is included in Appendix F. A summary of the site reconnaissance findings is presented below.

Information about the key structures and improvements at the property are described in the table below.

Number of On-Site Structures	One building and supporting structures (parking lots, transformers, light fixtures, etc.), and a weather station.
Number of Stories, Mezzanine Levels	One to two.
Basements/Crawl Spaces	None.
Structure Size (square feet)	Approximately 110,000 square feet
General Construction	Brickstone foundation, wood frame, brick veneer walls, a gable asphalt roof, plaster interior walls, and linoleum/vinyl flooring.
Date of Construction	Approximately 1969.
Roads, Streets, Parking Facilities on the Site	Paved parking lots are located to the north and south of the Site building, as shown on Figure 2.
Roads Adjoining the Site	Washington Street adjoins the Site to the west, as shown on Figure 2.
Railroad Lines /Spurs On or Adjacent to the Site	None.

Land uses in the area of the Site include residences and a school. The abutting properties include:

North	Residential
South	Residential and Silver Hill Elementary School
East	Residential
West	Residential

Key observations from the Site are included in the table below.

Observation	**Observed or Suspected**
Areas of OHM product storage and use / Drums / Hazardous Substance and Petroleum Products Containers	Typical janitorial and maintenance supplies (commercial cleaning chemicals and solutions) were observed in maintenance/storage rooms in the Site building. The boiler room was observed to be in generally good condition, with *de minimis* surficial staining and pooling compressor oil discharge was observed.
Above Ground Storage Tanks (ASTs)	None observed.
Underground Storage Tanks (USTs)	None observed. A 10,000-gallon UST containing No. 2 fuel oil was historically located northeast of the Site building. It was removed on August 17, 2012.
Odors	None observed.
Pools of liquid	*De minimis* oil from elevator machinery (with multiple cloths to absorb the liquid) and from compressor discharge line. The floors in these areas were observed to be intact with no evidence of deterioration or cracks.
Unidentified Substance Containers	None observed.
Transformers and any identified PCB-containing equipment	A transformer is located to the northeast of building; however, it was not observed. Information of the condition or potential staining is unknown.

Observation	Observed or Suspected
Heating/Cooling system	Natural gas powered forced hot water system with individual heaters in each classroom/room. Historically powered by heating oil from a 10,000-gallon UST until switching to natural gas in circa 2012.
Interior stains or corrosion	*De minimis* staining was observed on the floor of the maintenance rooms, the elevator machinery room, the boiler room, the heater/compressor room, and the kitchen (around a grease trap). The floors in these areas were observed to be intact with no evidence of deterioration or cracks.
Interior drains, sumps, and below grade conveyances	Multiple drains were observed on the floor of the kitchen, the heater/compressor room, and science classrooms.
Exterior pits/ponds/lagoons	None observed.
Pesticide use	None observed.
Stained soil or pavement	*De minimis* staining was observed on the concrete surface near dumpsters and in the loading dock areas and on the asphalt surface at parking areas.
Stressed vegetation	None observed.
Evidence of solid waste disposal on the Site	None observed.
Evidence of fill materials	None observed during the Site reconnaissance; however, the downward slope of the surrounding area towards the west (below the FFE), suggests fill was placed at the western portion of the building footprint. In November 2012 and July 2017, boring logs indicate fill material extending to a depth of between 5 and 6 feet bgs. No debris was observed in the fill.
Wastewater discharges	Catch basins located around the Site building drain to the municipal combined drainage/sewer system located on Washington Street. Catch basins along Washington Street also receive stormwater runoff by overland flow, and are connected to the municipal combined drainage/sewer system.
Wells	One monitoring well was installed northeast of the building in November 2012 and two in July 2017, relating to the response to the historic UST release. These monitoring wells were not observed during the site reconnaissance.
Septic systems	None observed.
Evidence of spills/releases	None observed.
Hazardous waste	None observed.
Non-Hazardous waste	Non-hazardous wastes are placed in on-Site dumpsters and roll-off containers. *De minimis* surficial staining was observed near the roll-off containers.
Air Emissions	None observed.
Other	A small interior grease trap in the kitchen was surrounded by *de minimis* surficial oil/grease staining. A weather station is located northeast of the school building. A greenhouse and garden are located in the inner courtyard.

Current utilities that service the Site include the following:

Electricity	Unknown
Natural Gas	Unknown
Water	City of Haverhill
Sewer	City of Haverhill
Wastewater	City of Haverhill

4.0 INTERVIEWS

4.1 Interview with Site Owner/Key Site Manager

The following individuals were interviewed for this ESA:

Individual(s)	Eric Russell
Title(s)	Head Custodian
Tenure at Facility	10 years (attended school as a student prior)

Relevant information provided during the interviews is presented throughout this report, where appropriate.

4.2 Interviews with Local Government Officials

The following individuals were interviewed for this ESA:

Name	Title	Agency
Robert Moore	Environmental Health Technician	Conservation Department
Christine Webb	Tax Assessor	Assessor's Office
Janice Allinson	Department Power Reviewer	Health & Inspectional Services Department (coordinated with: Fire Department, Department of Public Works, City Clerk's Office, Economic Development & Planning Department)

Relevant information obtained from local officials is presented throughout this report, where applicable.

5.0 EVALUATION

5.1 Findings, Opinion, and Conclusions

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 of a portion of the 685 Washington Street property in Haverhill, Massachusetts. Any exceptions to, or deletions from, this practice are described in Section 1.3 of this report.

This assessment has revealed no evidence of RECs in connection with the Site.

Sanborn Head identified the following HREC for the Site:

- On August 17, 2012, a 10,000-gallon No. 2 fuel oil UST was removed from the Site. Prior to the removal of the tank, approximately 7,000 gallons of fuel oil was removed for the tank. According to the Haverhill Fire Department, the tank was observed to be in good condition but the feed line from the tank to the school building was

observed to be in poor condition and evidence of a fuel oil release was observed. Soil and groundwater data was collected at the Site in November 2012 and July 2017.

Using the soil and groundwater data gathered during the investigations, a Method 3 risk characterization was completed to assess site-specific risks of harm to human health, safety, public welfare and the environment. The risk characterization confirmed that a condition of No Significant Risk had been achieved for the release and additional response actions were not warranted. Because regulatory closure has been achieved for the on-Site RTN, it is Sanborn Head's opinion that the fuel oil release constitutes a HREC in connection with the subject Site.

De minimis conditions were observed with pooling oil at the elevator machinery and the compressor discharge line, and with surficial staining within maintenance rooms, the elevator machinery room, the boiler room, the heater/compressor room, the kitchen (around the grease trap), the loading dock, the dumpster area, and parking areas. The floors and pavement in these areas were observed to be intact with no evidence of deterioration or cracks.

5.2 Data Gaps

ASTM E 1527-13 requires that data gaps in the research performed be identified. In our opinion, no potential data gaps were encountered while conducting this Phase I ESA except for the following:

Data Gap	Assessment
Not every classroom/room was entered during the site reconnaissance due to similarities between multiple classrooms and/or no suspicion of environmental concerns.	It is Sanborn Head's opinion that not observing the interior floor condition and the interior of these spaces represents a potential data gap. However, given the other site conditions, this is not considered a significant data gap that affects our ability to render an opinion regarding RECs at the Site.
The accompanying facility individual during the Site reconnaissance had limited knowledge of key Site features.	Based on the other information obtained during this Phase I ESA, it is in Sanborn Head's opinion that this limiting condition does not represent a significant data gap.
As of the time of this report, Sanborn Head has not received completed questionnaires.	Based on the other information obtained during this Phase I ESA, it is Sanborn Head's opinion that the lack of completed questionnaires does not materially impact our ability to identify RECs at the Site.

5.3 References

Key documents that were used in preparing this report have been referenced within the text of the report.

5.4 Signatures of Environmental Professionals

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in Section 312.10 of 40 C.F.R. 312. We have the

specific qualifications based on education, training, and experience to assess a Site of the nature, history, and setting of the subject Site. We have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 C.F.R. Part 312.

****DRAFT***	***DRAFT***
Laura J. Garvey, P.E., LSP	Timothy Snay, LSP
Senior Project Manager	*Vice President*

6.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

Timothy J. Snay, LSP, LEP
Vice President

Tim Snay has 35 years of professional experience in environmental due diligence, site investigation, risk characterization, site remediation and environmental compliance. Tim has completed hundreds of environmental assessments to evaluate the nature, extent and distribution of contamination, subsurface conditions and redevelopment options. Tim has been a Licensed Site Professional (LSP) in Massachusetts and a Licensed Environmental Professional (LEP) in Connecticut for over 23 years. As a Massachusetts LSP, Tim has been the LSP-of-Record for more than 400 disposal sites from Great Barrington to Rockport. Of these 400 disposal sites, approximately 300 of them have achieved a Permanent Solution under Tim's direction. Tim holds a degree from the University of New Hampshire.

Laura Garvey, P.E., LSP, LEP
Senior Project Manager

Ms. Garvey has over 15 years of experience in performing Phase I Environmental Site Assessments, risk assessments, site investigations and site characterization work. Ms. Garvey also has experience with data management and quality assurance, and has created and maintained databases and geographic information systems for several large environmental projects. She has extensive experience preparing regulatory documents required under the Massachusetts Contingency Plan and the Connecticut Remediation Standard Regulations. Additionally, Ms. Garvey has performed a wide variety of drilling and environmental sampling programs, which have included groundwater, soil, surface water and soil vapor and indoor air sampling. She is a registered professional environmental engineer and is licensed as a Licensed Site Professional (LSP) in Massachusetts. She is also a Licensed Environmental Professional (LEP) in Connecticut. Laura holds a degree in environmental engineering from Tufts University.

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Table 1
Summary of MassDEP File Review Information
685 Washington Street
Haverhill, Massachusetts

Figure 3 ID	RTN	Site Name	Address	Distance and Direction from Site	OHM Released and Suspected Source	Media Impacted	Response Actions	Regulatory Status and Date
A	3-31069	Consentino Middle School	685 Washington Street	on-Site	10,000-gallon No. 2 fuel oil. UST removal.	Soil	On August 17, 2012 the UST was removed from the Site, PID screenings of soil samples were collected, and the excavation was backfilled with clean soil. In November 2012 five soil borings were advanced at the borders of the excavation and soil samples detected EPH and VPH above the RC. In July 2017, four soil borings were advanced further from the excavation and and soil samples detected EPH and VPH below the RC.	PSNC/NSR December 7, 2017
B	3-23696	No Location Aid	11 Villa Street	Approximately 670 feet to the southeast	10 gallons of non-PCB mineral oil dielectric fluid. Pad mounted electrical transformer.	Concrete Pad, Soil	Granular oil-absorbent material was applied to the concrete pad, which was then washed and removed following the removal of the transformer for evaluation. A Vactor truck was used to remove 8 cubic yards of impacted soil (above the water table), which were transported off the property.	Class A-2 RAO May 24, 2004
C	3-18923	Four Seasons Car Wash	427 River Street	Approximately 810 feet to the southeast	Petroleum hyrdocarbons. Historic disposal site activities.	Soil, Groundwater	Test borings and a monitoring well were advanced to evaluate conditions.	Class B-1 RAO December 16. 1999

Notes:

RAO = Response Action Outcome
RTN = Release Tracking Number
OHM = Oil and/or hazardous materials
UST = underground storage tank
EPH = Extractable Petroleum Hydrocarbon
VPH = Volatile Petroleum Hydrocarbon
RC = Reportable Concentration
PCB = polychlorinated biphenyl

PSNC = Permanent Solution with No Conditions
NSR = No Significant Risk to human health (Method 3 Risk Characterization)
Class A-2 RAO = a permanent solution has been achieved and contamination has not been reduced to background
Class B-1 RAO = remedial actions have not been conducted because a level of No Significant Risk exists.

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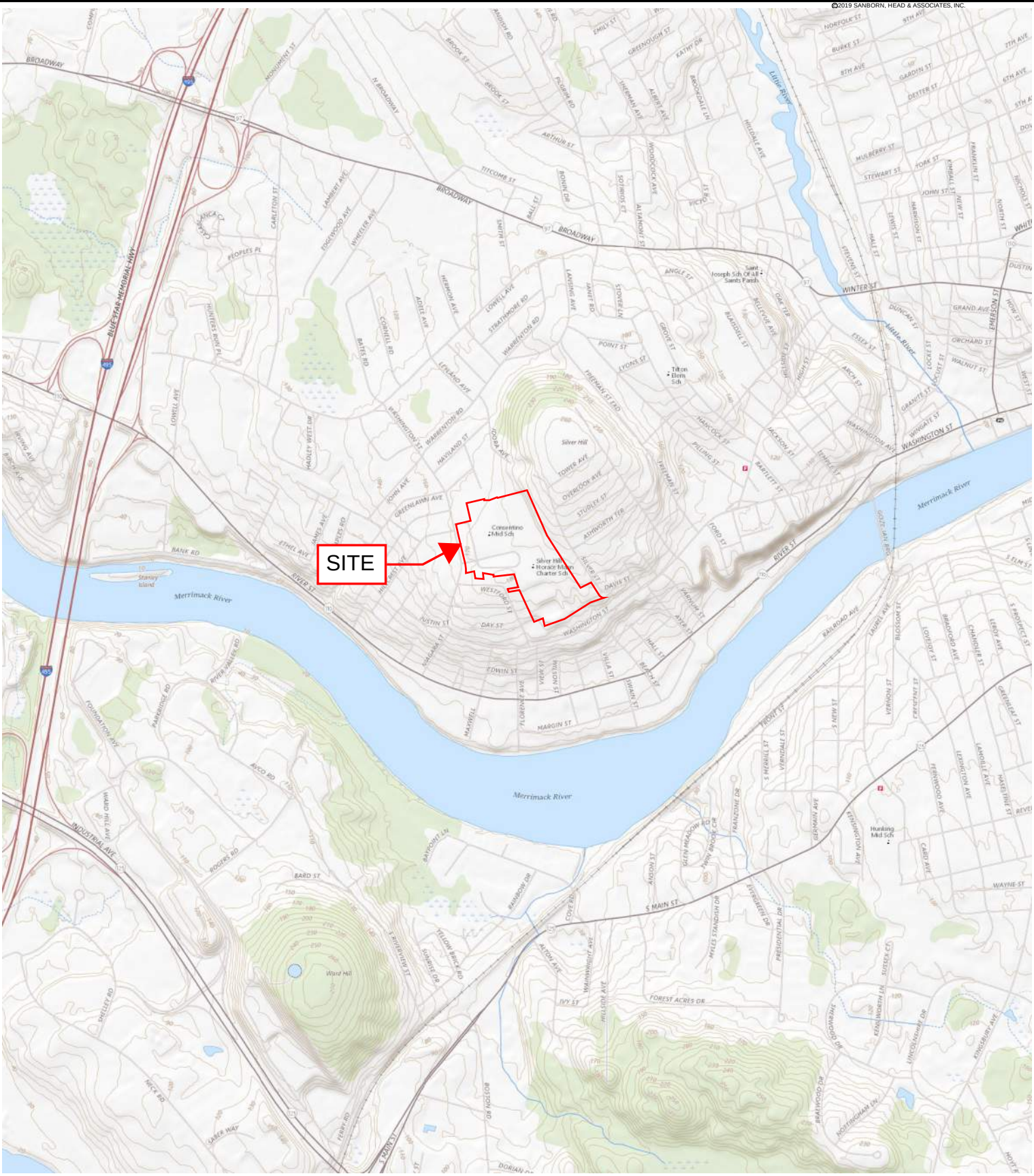

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NOTES:
The base map was taken from the United States Geological Survey, National Map Viewer using the 7.5 minute USGS Topo Basemap

Drawn By: J. McCarthy
Designed By: J. McCarthy
Reviewed By: L. Norton
Project No: 5034.00
Date: December 2021

SCALE: 1:25,000

SANBORN HEAD

Figure 1

Locus Plan

Phase I Environmental Site Assessment

685 Washington Street
Haverhill, Massachusetts

Figure cereated in Bluebeam

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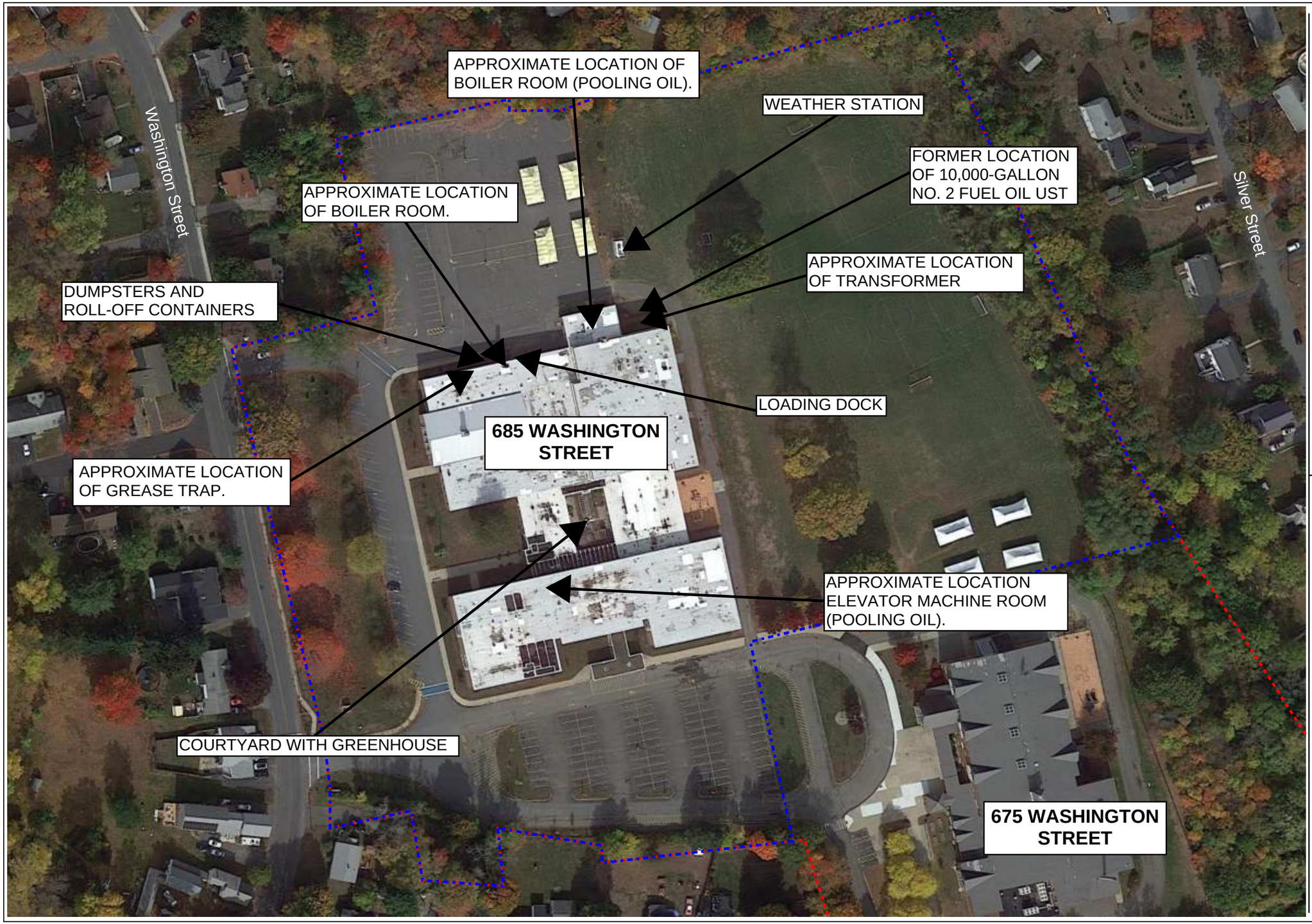

Figure Narrative

This base map was taken from Google Earth. Imagery Date: (2021)

Site features should be considered approximate and are based on observations made during a Site reconnaissance performed by Sanborn Head on July 30, 2021

Consentino Middle School (685 Washington Street) and Silver Hill Elementary School (675 Washington Street) are part of the Site identified as Parcel ID 556-1-1.

Legend

- Approximate Parcel Boundary
- Approximate Site Boundary

SANBORN HEAD

GRAPHICAL SCALE
0' 25 50 100 150

N

NO.	DATE	DESCRIPTION	BY

DRAWN BY: J. McCarthy
DESIGNED BY: J. McCarthy
REVIEWED BY: L. Norton
PROJECT MGR: L. Norton
PIC: K. Stetson
DATE: December 2021

Phase I Environmental Site Assessment
685 Washington Street
Haverhill, Massachusetts

Site Plan

PROJECT NUMBER: 5034.00

SHEET NUMBER: 2 OF 3

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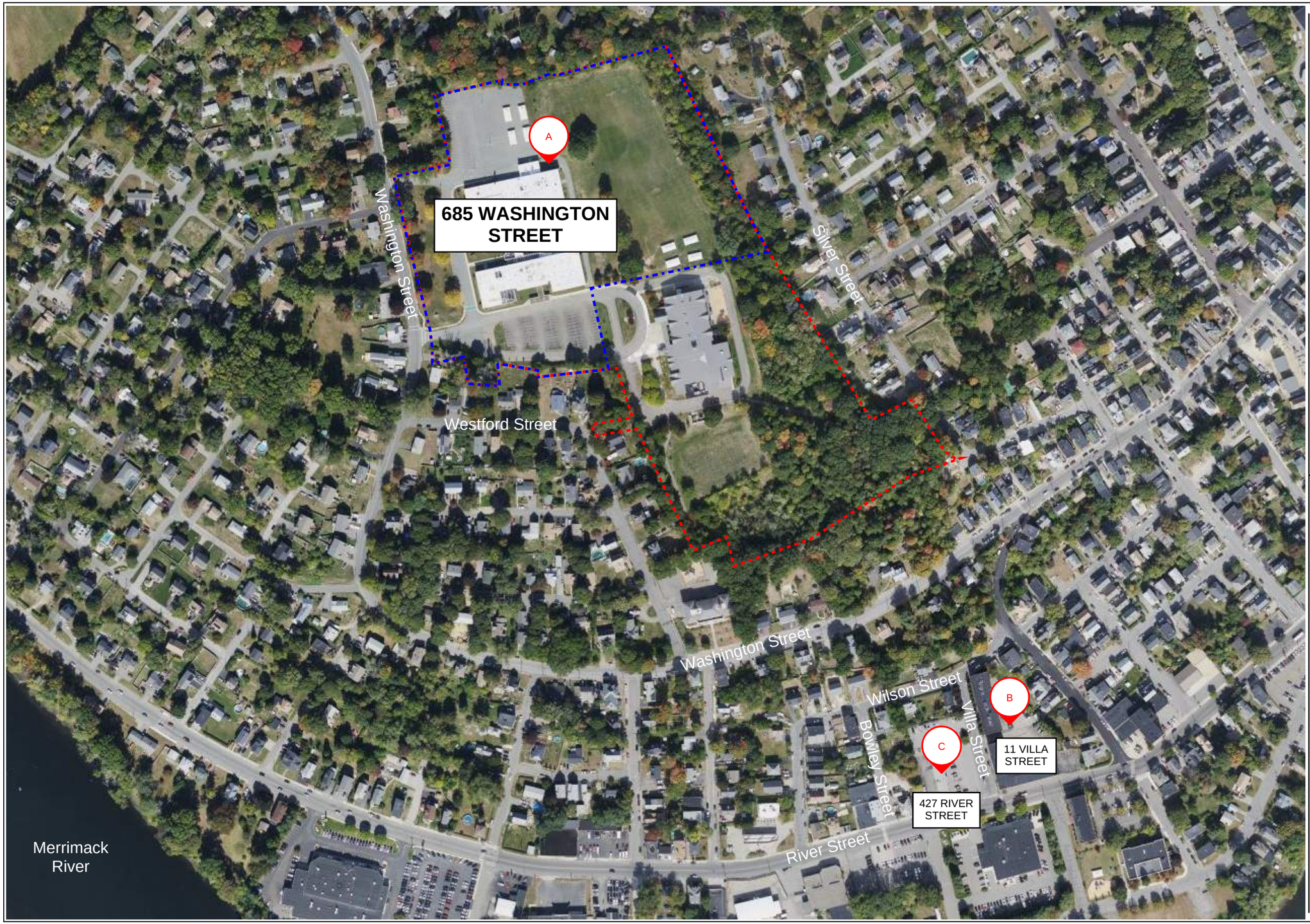

Figure Narrative

This base map was taken from Google Earth. Imagery Date: (2021)

This figure shows the approximate locations of Massachusetts Department of Environmental Protection (MA DEP) files viewed online from the Energy and Environmental Affairs Data Portal from August 18 through August 19, 2021.

Legend

- Approximate Parcel Boundary
- Approximate Site Boundary
- A — Approximate location of MassDEP Site referred to in Table 1

SANBORN HEAD

GRAPHICAL SCALE
0' 55 110 220 330

N

NO.	DATE	DESCRIPTION	BY

DRAWN BY: J. McCarthy
DESIGNED BY: J. McCarthy
REVIEWED BY: L. Norton
PROJECT MGR: L. Norton
PIC: K. Stetson
DATE: December 2021

Phase I Environmental Site Assessment
685 Washington Street
Haverhill, Massachusetts

MassDEP File Review Locations

PROJECT NUMBER: 5034.00

SHEET NUMBER: 3 OF 3

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HAZARDOUS MATERIALS SURVEY

A Hazardous Materials Determination Survey, dated July 6, 2021 has been developed by Universal Environmental Consultants. The survey and associated attachments is included here in its entirety.

UEC universal environmental consultants

July 6, 2021

Mr. Dave Mentzer
Dore & Whittier Architects
260 Merrimac Street
Newburyport, MA 01950

Reference: Hazardous Materials Determination Survey
Consentino Middle School, Haverhill, MA

Dear Mr. Mentzer:

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

Enclosed please find the report for hazardous materials determination survey at Consentino Middle School, Haverhill, MA.

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

Very truly yours,

Universal Environmental Consultants

_____
Ammar M. Dieb
President

UEC\ 221 339.00\Report-Consentino Middle School.DOC

Enclosure

REPORT
FOR
HAZARDOUS MATERIALS DETERMINATION
SURVEY
AT THE
CONSENTINO MIDDLE SCHOOL
HAVERHILL, MASSACHUSETTS

PROJECT NO: 221 339.00

Survey Dates:
June 28-30, 2021

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 thirty-two years of experience.

UEC was contracted by Dore & Whittier Architects to conduct the following services at the Consentino Middle School, Haverhill, MA:

- Inspection and Testing for Asbestos Containing Materials (ACM);
- Inspection for Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures;
- Inspection for PCB's-Caulking;
- Inspection for Lead Based Paint (LBP);
- Mercury in Rubber Flooring inspection and sampling;
- Airborne Mold inspection and sampling;
- Radon sampling;

A comprehensive survey per the Environmental Protection Agency (EPA) NESHAP regulation would be required prior to any renovation or demolition activities.

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 a Massachusetts licensed asbestos inspector Mr. Jason Becotte (AI-034963) and analyzed by a Massachusetts licensed laboratory EMSL, Woburn, MA.

Airborne mold samples were analyzed by an EPA trained laboratory EMSL, Woburn, MA.

Radon samples were analyzed by an EPA licensed laboratory AccuStar, Ward Hill, MA.

Refer to samples results.

2.0 FINDINGS:

Asbestos Containing Materials (ACM):
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.

Number of Samples Collected
June 30, 2021:
Sixty-eight (68) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material

1. Textured soft ceiling plaster at cafeteria
2. Textured soft ceiling plaster at cafeteria
3. Textured soft ceiling plaster at cafeteria
4. Textured soft ceiling plaster at cafeteria
5. Textured soft ceiling plaster at cafeteria
6. Rough ceiling plaster at boiler room
7. Rough ceiling plaster at boiler room
8. Rough ceiling plaster at boiler room
9. Rough ceiling plaster at boiler room
10. Rough ceiling plaster at boiler room
11. Generator exhaust insulation at generator room
12. Generator exhaust insulation at generator room
13. Generator exhaust insulation at generator room
14. Hard joint insulation off fiberglass insulated pipe
15. Hard joint insulation off fiberglass insulated pipe
16. Hard joint insulation off fiberglass insulated pipe
17. Pipe insulation at room 68
18. Pipe insulation at room 68
19. Pipe insulation at room 67
20. Wood fire door insulation at kitchen
21. Wood fire door insulation at boiler hallway
22. Plaster at room 3
23. Plaster at large storage
24. Plaster at room 54
25. Plaster at teacher's room 57
26. Plaster at second floor hallway
27. Plaster at room 32
28. Plaster at room 42
29. 2' x 4' Acoustical ceiling tile type I at girl's locker room
30. 2' x 4' Acoustical ceiling tile type I at boy's locker room
31. 2' x 4' Acoustical ceiling tile type II at gymnasium/cafeteria hallway
32. 2' x 4' Acoustical ceiling tile type II at gymnasium/cafeteria hallway
33. 2' x 4' Acoustical ceiling tile type III at hallway 1-16
34. 2' x 4' Acoustical ceiling tile type III at library
35. 2' x 4' Acoustical ceiling tile type IV at room 21
36. 2' x 4' Acoustical ceiling tile type IV at room 42
37. 1' x 1' Acoustical wall tile at band room
38. 1' x 1' Acoustical wall tile at band room
39. Glue daub for 1' x 1' acoustical wall tile at band room
40. Glue daub for 1' x 1' acoustical wall tile at band room
41. 1' x 1' Acoustical ceiling tile at room 3
42. 1' x 1' Acoustical ceiling tile at room 32
43. Black sink coating at room 3
44. Black sink coating at room 32
45. Grey sink coating at library office
46. Grey sink coating at room 67
47. Joint compound at room 8

48. Joint compound at library
49. Lab countertop at art room 1
50. Lab countertop at art room 1
51. Interior window glazing caulking at central hallway
52. Interior window glazing caulking at second floor hallway
53. Beige/tan 12” x 12” vinyl floor tile at room 45
54. Beige/tan 12” x 12” vinyl floor tile at teacher’s room 57
55. Mastic for beige/tan 12” x 12” vinyl floor tile at room 45
56. Mastic for beige/tan 12” x 12” vinyl floor tile at teacher’s room 57
57. White/colors 12” x 12” vinyl floor tile at room 8
58. White/colors 12” x 12” vinyl floor tile at room 39
59. Yellow glue for white/colors 12” x 12” vinyl floor tile at room 8
60. Yellow glue for white/colors 12” x 12” vinyl floor tile at room 39
61. Grey 12” x 12” vinyl floor tile at large storage room 1-6
62. Grey 12” x 12” vinyl floor tile at office 31-36
63. Mastic for grey 12” x 12” vinyl floor tile at large storage room 1-6
64. Mastic for grey 12” x 12” vinyl floor tile at office 31-36
65. Brown 12” x 12” vinyl floor tile at room 3
66. Brown 12” x 12” vinyl floor tile at room 3
67. Mastic for brown 12” x 12” vinyl floor tile at room 3
68. Mastic for brown 12” x 12” vinyl floor tile at room 3

Samples Results

Type and Location of Material	**Sample Result**
1. Textured soft ceiling plaster at cafeteria	2% Asbestos
2. Textured soft ceiling plaster at cafeteria	2% Asbestos
3. Textured soft ceiling plaster at cafeteria	2% Asbestos
4. Textured soft ceiling plaster at cafeteria	2% Asbestos
5. Textured soft ceiling plaster at cafeteria	2% Asbestos
6. Rough ceiling plaster at boiler room	No Asbestos Detected
7. Rough ceiling plaster at boiler room	No Asbestos Detected
8. Rough ceiling plaster at boiler room	No Asbestos Detected
9. Rough ceiling plaster at boiler room	No Asbestos Detected
10. Rough ceiling plaster at boiler room	No Asbestos Detected
11. Generator exhaust insulation at generator room	No Asbestos Detected
12. Generator exhaust insulation at generator room	No Asbestos Detected
13. Generator exhaust insulation at generator room	No Asbestos Detected
14. Hard joint insulation off fiberglass insulated pipe	No Asbestos Detected
15. Hard joint insulation off fiberglass insulated pipe	No Asbestos Detected
16. Hard joint insulation off fiberglass insulated pipe	No Asbestos Detected
17. Pipe insulation at room 68	20% Asbestos
18. Pipe insulation at room 68	No Asbestos Detected
19. Pipe insulation at room 67	20% Asbestos
20. Wood fire door insulation at kitchen	15% Asbestos
21. Wood fire door insulation at boiler hallway	15% Asbestos
22. Plaster at room 3	No Asbestos Detected
23. Plaster at large storage	No Asbestos Detected
24. Plaster at room 54	No Asbestos Detected
25. Plaster at teacher’s room 57	No Asbestos Detected
26. Plaster at second floor hallway	No Asbestos Detected
27. Plaster at room 32	No Asbestos Detected
28. Plaster at room 42	No Asbestos Detected
29. 2’ x 4’ Acoustical ceiling tile type I at girl’s locker room	No Asbestos Detected

30. 2’ x 4’ Acoustical ceiling tile type I at boy’s locker room	No Asbestos Detected
31. 2’ x 4’ Acoustical ceiling tile type II at gymnasium/cafeteria hallway	No Asbestos Detected
32. 2’ x 4’ Acoustical ceiling tile type II at gymnasium/cafeteria hallway	No Asbestos Detected
33. 2’ x 4’ Acoustical ceiling tile type III at hallway 1-16	No Asbestos Detected
34. 2’ x 4’ Acoustical ceiling tile type III at library	No Asbestos Detected
35. 2’ x 4’ Acoustical ceiling tile type IV at room 21	No Asbestos Detected
36. 2’ x 4’ Acoustical ceiling tile type IV at room 42	No Asbestos Detected
37. 1’ x 1’ Acoustical wall tile at band room	No Asbestos Detected
38. 1’ x 1’ Acoustical wall tile at band room	No Asbestos Detected
39. Glue daub for 1’ x 1’ acoustical wall tile at band room	No Asbestos Detected
40. Glue daub for 1’ x 1’ acoustical wall tile at band room	No Asbestos Detected
41. 1’ x 1’ Acoustical ceiling tile at room 3	No Asbestos Detected
42. 1’ x 1’ Acoustical ceiling tile at room 32	No Asbestos Detected
43. Black sink coating at room 3	2% Asbestos
44. Black sink coating at room 32	2% Asbestos
45. Grey sink coating at library office	5% Asbestos
46. Grey sink coating at room 67	5% Asbestos
47. Joint compound at room 8	No Asbestos Detected
48. Joint compound at library	No Asbestos Detected
49. Lab countertop at art room 1	No Asbestos Detected
50. Lab countertop at art room 1	No Asbestos Detected
51. Interior window glazing caulking at central hallway	2% Asbestos
52. Interior window glazing caulking at second floor hallway	2% Asbestos
53. Beige/tan 12” x 12” vinyl floor tile at room 45	2% Asbestos
54. Beige/tan 12” x 12” vinyl floor tile at teacher’s room 57	2% Asbestos
55. Mastic for beige/tan 12” x 12” vinyl floor tile at room 45	10% Asbestos
56. Mastic for beige/tan 12” x 12” vinyl floor tile at teacher’s room 57	10% Asbestos
57. White/colors 12” x 12” vinyl floor tile at room 8	No Asbestos Detected
58. White/colors 12” x 12” vinyl floor tile at room 39	No Asbestos Detected
59. Yellow glue for white/colors 12” x 12” vinyl floor tile at room 8	No Asbestos Detected
60. Yellow glue for white/colors 12” x 12” vinyl floor tile at room 39	No Asbestos Detected
61. Grey 12” x 12” vinyl floor tile at large storage room 1-6	5% Asbestos
62. Grey 12” x 12” vinyl floor tile at office 31-36	5% Asbestos
63. Mastic for grey 12” x 12” vinyl floor tile at large storage room 1-6	10% Asbestos
64. Mastic for grey 12” x 12” vinyl floor tile at office 31-36	10% Asbestos
65. Brown 12” x 12” vinyl floor tile at room 3	5% Asbestos
66. Brown 12” x 12” vinyl floor tile at room 3	5% Asbestos
67. Mastic for brown 12” x 12” vinyl floor tile at room 3	10% Asbestos
68. Mastic for brown 12” x 12” vinyl floor tile at room 3	10% Asbestos

Number of Samples Collected

July 1, 2022:

Eighteen (18) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material

1. Chalkboard glue daub at room 33
2. Chalkboard glue daub at room 33
3. Tackboard glue daub at room 11 divider
4. Tackboard glue daub at room 11 divider
5. Interior door glazing caulking at room 34
6. Interior door glazing caulking at room 34
7. Interior window sill at room 35

8. Interior window sill at room 53
9. Fiber pad under hardwood floor at gymnasium
10. Fiber pad under hardwood floor at gymnasium
11. Black coating under hardwood floor at gymnasium
12. Black coating under hardwood floor at gymnasium
13. Exterior door framing caulking
14. Exterior door framing caulking
15. Exterior window framing caulking
16. Exterior window framing caulking
17. Exterior unit vent grille caulking
18. Exterior unit vent grille caulking

Samples Results

Type and Location of Material	**Sample Result**
1. Chalkboard glue daub at room 33	2% Asbestos
2. Chalkboard glue daub at room 33	2% Asbestos
3. Tackboard glue daub at room 11 divider	No Asbestos Detected
4. Tackboard glue daub at room 11 divider	No Asbestos Detected
5. Interior door glazing caulking at room 34	No Asbestos Detected
6. Interior door glazing caulking at room 34	No Asbestos Detected
7. Interior window sill at room 35	No Asbestos Detected
8. Interior window sill at room 53	No Asbestos Detected
9. Fiber pad under hardwood floor at gymnasium	No Asbestos Detected
10. Fiber pad under hardwood floor at gymnasium	No Asbestos Detected
11. Black coating under hardwood floor at gymnasium	No Asbestos Detected
12. Black coating under hardwood floor at gymnasium	No Asbestos Detected
13. Exterior door framing caulking	No Asbestos Detected
14. Exterior door framing caulking	No Asbestos Detected
15. Exterior window framing caulking	No Asbestos Detected
16. Exterior window framing caulking	No Asbestos Detected
17. Exterior unit vent grille caulking	No Asbestos Detected
18. Exterior unit vent grille caulking	No Asbestos Detected

Observations and Conclusions:

The condition of ACM is very important. ACM in good condition does not present a health issue unless it is disturbed. Therefore, it is not necessary to remediate ACM in good condition unless it will be disturbed through renovation, demolition or other activity.

1. Fireproofing spray-on was previously found to contain asbestos. The ACM was found to exist above the ceiling tiles on the first floor and assumed to exist on the second floor.
2. Troweled-on plaster was previously found to contain asbestos. The ACM was found to exist above the ceiling tiles on the first floor and assumed to exist on the second floor.
3. Vibration dampeners were previously found to contain asbestos.
4. Brown/white 12” x 12” vinyl floor tile was previously found to contain asbestos.
5. Mastic for brown/white 12” x 12” vinyl floor tile was previously found to contain asbestos.
6. Leveling compound was previously found to contain asbestos.
7. Textured soft ceiling plaster at cafeteria was found to contain asbestos.
8. Pipe insulation was found to contain asbestos.
9. Wood fire door insulation was found to contain asbestos.
10. Black sink coating was found to contain asbestos.
11. Grey sink coating was found to contain asbestos.
12. Interior window glazing caulking was found to contain asbestos.
13. Beige/tan 12” x 12” vinyl floor tile was found to contain asbestos.

14. Mastic for beige/tan 12” x 12” vinyl floor tile was found to contain asbestos.
15. Grey 12” x 12” vinyl floor tile was found to contain asbestos.
16. Mastic for grey 12” x 12” vinyl floor tile was found to contain asbestos.
17. Brown 12” x 12” vinyl floor tile was found to contain asbestos.
18. Mastic for brown 12” x 12” vinyl floor tile was found to contain asbestos.
19. Paper/mastic under hardwood flooring were assumed to exist and assumed to contain asbestos.
20. Glue holding chalk/tack boards was found to contain asbestos.
21. Ceramic tile grout and adhesive were assumed to contain asbestos.
22. Roofing material was assumed to contain asbestos. Roofing material does not have to be removed by a licensed asbestos contractor. However, the Demolition/Roofing Contractor must comply with OSHA regulation during demolition and with state regulations for proper disposal. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval
23. Damproofing 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. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval.
24. Underground sewer pipes were assumed to contain asbestos.
25. Thru-wall flashing was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval.
26. All other suspect materials were found not to contain asbestos. Hidden ACM may be found during demolition activities.

Polychlorinated Biphenyls (PCB’s)-Electrical Equipment and Light Fixtures:
Observations and Conclusions
Visual inspection of various equipment 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 since there were labels indicating that “No PCB’s” was found. Tubes in light fixtures, thermostats, signs and switches were assumed to contain mercury. It would be very costly to test those equipment and dismantling would be required to access. Therefore, the above-mentioned equipment should be disposed in an EPA approved landfill as part of the demolition project.

PCB’s in Caulking:
Observations and Conclusions
Caulking was assumed to contain PCB’s.

Lead Based Paint (LBP):
Observations and Conclusions
LBP was assumed to exit on painted surfaces. A school is not considered a regulated facility. 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. According to OSHA, any amount of LBP triggers compliance.

Mercury in Rubber Flooring:
Observations and Conclusions:
No rubber flooring exists in the school.

Airborne Mold:
Airborne mold testing was performed utilizing Zefon International Incorporated’s Air-O-Cell® sampling device following all manufacturer supplied recommended sampling procedures.

The Air-O-Cell® is a direct read total particulate air sampling device. It works using the inertial impaction principle similar to other spore trap devices. It is designed for the rapid collection and analysis of airborne particulate including bioaerosols. The particulate includes fibers (e.g. asbestos, fiberglass, cellulose, clothing fibers) opaque particles (e.g. fly ash, combustion particles, copy toner, oil droplets, paint), and bioaerosols (e.g. mold spores, pollen, insect parts, skin cell fragments).[1]

The method involves drawing a known quantity of air through a sterile sampling cassette. Subsequent to sampling, the cassette is sealed and transferred to a microbiology laboratory under chain of custody protocol for microscopic analysis. This method counts both viable and nonviable mold spores.

AIRBORNE MOLD and PARTICULATE

Lab ID #	Location	Total Mold Counts/M^3	Pollen	Insect Fragment	Hyphal Fragments
132104489-0001	Room 34	20	ND	ND	ND
132104489-0002	Room 38	240	ND	ND	ND
132104489-0003	Room 42	40	ND	ND	ND
132104489-0004	Library	590	ND	ND	ND
132104489-0005	Room 2	850	20	ND	ND
132104489-0006	Room 11	360	ND	ND	ND
132104489-0007	Gymnasium	40	ND	ND	ND
132104489-0008	Band Room	40	ND	ND	ND
132104489-0009	Cafetorium	100	ND	ND	ND
132104489-0010	Outside	9,160	ND	ND	20

AIRBORNE MOLD and PARTICULATE
(Subjective Scales)

Lab ID #	Location	Skin Fragment Density (SFD)	Fibrous Particulates (FP)	Total Background Particulate (TBP)
132104489-0001	Room 34	1	1	1
132104489-0002	Room 38	1	1	1
132104489-0003	Room 42	1	1	1
132104489-0004	Library	1	1	1
132104489-0005	Room 2	1	1	1
132104489-0006	Room 11	1	1	1
132104489-0007	Gymnasium	-	-	1
132104489-0008	Band Room	-	-	1
132104489-0009	Cafetorium	1	1	1
132104489-0010	Outside	1	1	1

Legend:
ND - Not Detected

[1] Zefon International Inc. <www.zefon.com>

Observations:
There are currently no guidelines or standards promulgated by a government agency or widely recognized organization for the interpretation of airborne mold spore levels. The most commonly employed tool used to assess if mold growth is occurring in a structure is to compare quantities and species of mold outdoors to indoor. If there were more mold indoor, and/or if species were present which were not present outdoors, then growth is occurring, and remediation is recommended.

Indoor airborne mold spore concentrations were found to be much lower than the outside sample. Based on comparisons with historical data from projects of similar type, building utilization, geographic location and season, the indoor airborne levels are considered average. Indoor mold spore counts in the early summer are typically in the 1,500-3,500-spores/cubic meter range.

Pollen, insect fragments and Hyphal fragments were either not present or low in the samples. Hyphal fragment is a non-reproductive part of the mold.

Total background particulate on all samples was assessed as "1" on a scale of 1-5 where 1 is low and 5 is high. Skin fragment density on all samples was assessed as "1" on a scale of 1-4 where 1 is low and 4 is high. The total background levels are measured to determine airborne dust not related to airborne mold. Skin fragments are measured to determine proper housing cleaning.

Radon:
Number of Samples Collected
Ten (10) air samples were collected at the following locations:

Location of Sample

1. Gymnasium
2. Chorus
3. Cafetorium
4. Room 68
5. Room 65
6. Main Office
7. Library
8. Room 2
9. Room 8
10. Room 15

Location of Sample	**Sample Result**
1. Gymnasium	0.4 pCi\L
2. Chorus	<0.4 pCi\L
3. Cafetorium	<0.4 pCi\L
4. Room 68	0.5 pCi\L
5. Room 65	0.4 pCi\L
6. Main Office	0.5 pCi\L
7. Library	<0.4 pCi\L
8. Room 2	<0.4 pCi\L
9. Room 8	0.4 pCi\L
10. Room 15	<0.4 pCi\L

Observations and Conclusions:
The measured radon concentrations of the samples were found to be much lower than the EPA guideline of 4 picoCuris of radon per liter of air (pCi/L). No further action is required based on the results.

3.0 COST ESTIMATES:

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

Location	Material	Approximate Quantity	Cost Estimate ($)
Throughout	Flooring Materials and Mastic	60,000 SF	300,000.00
	Interior Windows/Doors	290 Total	58,000.00
	Sink Damproofing	55 Total	11,000.00
	Pipe and Hard Joint Insulation	Unknown	250,000.00
	Chalkboards/Tackboards	240 Total	72,000.00
	Hidden Pipe and Hard Joint Insulation	Unknown	75,000.00
	Miscellaneous Hazardous Materials	Unknown	50,000.00
	Light Fixtures	1,800 Total	72,000.00
Various Locations	Spray-On Fireproofing	Unknown	250,000.00
	Plaster above Steel Support Beams	Unknown	150,000.00
	Ceramic Tiles Grout/Adhesive	5,500 SF	22,000.00
	Wood Fire Doors	32 Total	9,600.00
Cafeteria	Soft Textured Ceiling Plaster	1,200 SF	12,000.00
Shop	Hardwood Floor and Paper	1,900 SF	19,000.00
Exterior	Transite Sewer Pipes	Unknown[1]	50,000.00
	Damproofing on Walls	3,500 Tons[1]	700,000.00
	Roofing Materials	74,000 SF	148,000.00
PCB's Remediation[2]			50,000.00
Estimated costs for PCB's Testing and Abatement Plans Services[2]			10,000.00
Estimated costs for NESHAP Inspection and Testing Services			18,400.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			210,000.00
		Total:	**2,518,000.00**
		Total:	**2,700,000.00**[3]

[1]: Part of total demolition.
[2]: Should results exceed EPA limit.
[3]: Work to be Performed by a C.M at Risk Contractor.

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

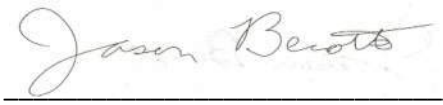
Asbestos:

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.

Airborne Mold:
The samples were analyzed by an EPA approved laboratory EMSL, Woburn, MA.

Radon:
Radon samples were analyzed by an EPA licensed laboratory AccuStar, Ward Hill, MA.

Inspected By:



Jason Becotte
Asbestos Inspector (AI-034963)

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.

OrderID: 132104490

132104490

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

24-hour TAT

Town/City: Haverhill, MA Building Name: Consentino school

Sample	Result	Description of Material	Sample Location
1		Textured Softplaster	Cafeteria
2		"	"
3		"	"
4		"	"
5		"	"
6		Rough ceiling Plaster	Boiler room
7		"	"
8		"	"
9		"	"
10		"	"
11		Generator exhaust Ins	Generator room
12		"	"
13		"	"
14		Hard Joint on FG Ins	Hidden above ceiling
15		"	"
16		"	Gym
17		Pipe Insulation	Room 68
18		"	"
19		"	Room 67
20		Wood fire door Ins	Kitchen

Reported By: Jason Beaulieu Date: 6-30-21 Due Date:

Received By: Date:

REC'D JUN 30 2021 EMSL-BOSTON

UNIVERSAL ENVIRONMENTAL CONSULTANTS

132104490

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

Town/City: Haverhill, MA Building Name Consentino School

Sample	Result	Description of Material	Sample Location
21		wood fire door Ins	Boiler Hallway
22		Plaster	Room 3
23		" "	Large Storage 1-6
24		" "	Room 54
25		" "	Teachers 57
26		" "	2nd fl. Hallway
27		" "	Room 32
28		" "	Room 42
29		2x4 SAT Horizontal Pattern	Girls Locker
30		" "	Boys Locker
31		2x4 SAT Craggy	Gym/Cafe Hallway
32		" "	" "
33		2x4 SAT Decorative	Hallway 1-16
34		" "	Library
35		2x4 SAT modern	Room 21
36		" "	Room 42
37		1x1 wall AT	Band room
38		" "	" "
39		Brown Glue dots	" "
40		" "	" "

Reported By: Jason Beaute Date: 6-30-21 Due Date: ----------

Received By: ---------- Date: ----------

REC'D EMSL-BOSTON JUN 30 2021

UNIVERSAL ENVIRONMENTAL CONSULTANTS

132104490

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

Town/City: Haverhill, MA Building Name Consentino School

Sample	Result	Description of Material	Sample Location
41		1x1 Splined AT	Room 3
42		1 1	Room 32
43		Black sink coating	Room 3
44		1 1	Room 32
45		Gray sink coating	Library Office
46		1 1	Room 67
47		Joint Compound	Room 8
48		1 1	Library
49		Lab countertop	Art 1
50		1 1	1 1
51		Interior window Gloze	Central Hallway
52		1 1	2nd fl. Hallway
53		Beige w/tan fleck 12x12VFT	Room 45
54		1 1	Teachers 57
55		Black mastic	Room 45
56		1 1	Teachers 57
57		white w/color fleck 12x12VFT	Room 8
58		1 1	Room 39
59		Yellow Glue	Room 8
60		1 1	Room 39

Reported By: Jason Bewtte Date: 6-30-21 Due Date: ----------

Received By: ---------- Date: ----------

REC'D EMSL-BOSTON JUN 30 2021

UNIVERSAL ENVIRONMENTAL CONSULTANTS

132104490

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

Town/City: Haverhill, MA Building Name Consentino School

Sample	Result	Description of Material	Sample Location
61		Gray 12x12 VFT	Large storage 1-6
62		1 1	office 31-36
63		Black mastic	Large storage 1-6
64		1 1	office 31-36
65		Brown 12x12 VFT	Room 3
66		1 1	Room 32
67		Black mastic	Room 3
68		1 1	Room 32

Reported By: Jason Beaute Date: 6-30-21 Due Date: ----------

Received By: ---------- Date: ----------

REC'D EMSL-BOSTON JUN 30 2021

UNIVERSAL ENVIRONMENTAL CONSULTANTS

EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

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

http://www.EMSL.com / bostonlab@emsl.com

EMSL Order:	132104490
Customer ID:	UEC63
Customer PO:	
Project ID:	

Attention:	Ammar Dieb	**Phone:**	(617) 984-9772
	Universal Environmental Consultants	**Fax:**	(508) 628-5488
	12 Brewster Road	**Received Date:**	06/30/2021 5:30 PM
	Framingham, MA 01702	**Analysis Date:**	07/01/2021
		Collected Date:	
Project:	Consentino School; Haverhill, MA		

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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
01 *132104490-0001*	Cafeteria - Textured Soft Plaster	White Fibrous Homogeneous	5% Cellulose	93% Non-fibrous (Other)	2% Chrysotile
02 *132104490-0002*	Cafeteria - Textured Soft Plaster	White Fibrous Homogeneous	5% Cellulose	93% Non-fibrous (Other)	2% Chrysotile
03 *132104490-0003*	Cafeteria - Textured Soft Plaster	White Fibrous Homogeneous	5% Cellulose	93% Non-fibrous (Other)	2% Chrysotile
04 *132104490-0004*	Cafeteria - Textured Soft Plaster	White Fibrous Homogeneous	5% Cellulose	93% Non-fibrous (Other)	2% Chrysotile
05 *132104490-0005*	Cafeteria - Textured Soft Plaster	White Fibrous Homogeneous	5% Cellulose	93% Non-fibrous (Other)	2% Chrysotile
06 *132104490-0006*	Boiler Room - Rough Ceiling Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07 *132104490-0007*	Boiler Room - Rough Ceiling Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08 *132104490-0008*	Boiler Room - Rough Ceiling Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09 *132104490-0009*	Boiler Room - Rough Ceiling Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10 *132104490-0010*	Boiler Room - Rough Ceiling Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11 *132104490-0011*	Generator Room - Generator Exhaust Insulation	White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
12 *132104490-0012*	Generator Room - Generator Exhaust Insulation	White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
13 *132104490-0013*	Generator Room - Generator Exhaust Insulation	White Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
14 *132104490-0014*	Hidden Above Ceiling - Hard Joint on FG Insulation	Gray Fibrous Homogeneous	30% Min. Wool	70% Non-fibrous (Other)	None Detected
15 *132104490-0015*	Hidden Above Ceiling - Hard Joint on FG Insulation	Gray Fibrous Homogeneous	30% Min. Wool	70% Non-fibrous (Other)	None Detected
16 *132104490-0016*	Gym - Hard Joint on FG Insulation	Gray Non-Fibrous Homogeneous	30% Min. Wool	70% Non-fibrous (Other)	None Detected

Initial report from: 07/01/2021 16:56:57

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5 Constitution Way, Unit A Woburn, MA 01801
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http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 132104490
Customer ID: UEC63
Customer PO:
Project ID:

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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17 *132104490-0017*	Room 68 - Pipe Insulation	Gray Fibrous Homogeneous		80% Non-fibrous (Other)	15% Amosite 5% Chrysotile
18 *132104490-0018*	Room 68 - Pipe Insulation	Gray Fibrous Homogeneous	30% Min. Wool	70% Non-fibrous (Other)	None Detected
19 *132104490-0019*	Room 67 - Pipe Insulation	Gray Fibrous Homogeneous		80% Non-fibrous (Other)	15% Amosite 5% Chrysotile
20 *132104490-0020*	Kitchen - Wood Fire Door Insulation	White Fibrous Homogeneous		85% Non-fibrous (Other)	15% Amosite
21 *132104490-0021*	Boiler Hallway - Wood Fire Door Insulation	White Fibrous Homogeneous		85% Non-fibrous (Other)	15% Amosite
22 *132104490-0022*	Room 3 - Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
23 *132104490-0023*	Large Storage 1-6 - Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
24 *132104490-0024*	Room 54 - Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
25 *132104490-0025*	Teachers 57 - Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
26 *132104490-0026*	2nd Floor Hallway - Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
27 *132104490-0027*	Room 32 - Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
28 *132104490-0028*	Room 42 - Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
29 *132104490-0029*	Girls Locker - 2x4 SAT Horizontal Pattern	Gray/White Fibrous Homogeneous	70% Min. Wool	30% Non-fibrous (Other)	None Detected
30 *132104490-0030*	Boys Locker - 2x4 SAT Horizontal Pattern	Gray/White Fibrous Homogeneous	70% Min. Wool	30% Non-fibrous (Other)	None Detected
31 *132104490-0031*	Gym/Café Hallway - 2x4 SAT Craggy	Gray/White Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
32 *132104490-0032*	Gym/Café Hallway - 2x4 SAT Craggy	Gray/White Fibrous Homogeneous	50% Cellulose 30% Min. Wool	20% Non-fibrous (Other)	None Detected
33 *132104490-0033*	Hallway 1-16 - 2x4 SAT Decorative	Gray/White Fibrous Homogeneous	40% Cellulose 40% Min. Wool	20% Non-fibrous (Other)	None Detected
34 *132104490-0034*	Library - 2x4 SAT Decorative	Gray/White Fibrous Homogeneous	40% Cellulose 40% Min. Wool	20% Non-fibrous (Other)	None Detected
35 *132104490-0035*	Room 21 - 2x4 SAT Modern	Gray/White Fibrous Homogeneous	60% Cellulose 20% Min. Wool	20% Non-fibrous (Other)	None Detected

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EMSL Order: 132104490
Customer ID: UEC63
Customer PO:
Project ID:

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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
36 *132104490-0036*	Room 42 - 2x4 SAT Modern	Gray/White Fibrous Homogeneous	60% Cellulose 20% Min. Wool	20% Non-fibrous (Other)	None Detected
37 *132104490-0037*	Band Room - 1x1 Wall AT	Gray/White Fibrous Homogeneous	30% Cellulose 50% Min. Wool	20% Non-fibrous (Other)	None Detected
38 *132104490-0038*	Band Room - 1x1 Wall AT	Gray/White Fibrous Homogeneous	30% Cellulose 50% Min. Wool	20% Non-fibrous (Other)	None Detected
39 *132104490-0039*	Band Room - Brown Glue Daub	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
40 *132104490-0040*	Band Room - Brown Glue Daub	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
41 *132104490-0041*	Room 3 - 1x1 Splined AT	Gray/White Fibrous Homogeneous	30% Cellulose 50% Min. Wool	20% Non-fibrous (Other)	None Detected
42 *132104490-0042*	Room 32 - 1x1 Splined AT	Gray/White Fibrous Homogeneous	40% Cellulose 40% Min. Wool	20% Non-fibrous (Other)	None Detected
43 *132104490-0043*	Room 3 - Black Sink Coating	Black Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
44 *132104490-0044*	Room 32 - Black Sink Coating	Black Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
45 *132104490-0045*	Library Office - Gray Sink Coating	Gray Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
46 *132104490-0046*	Room 67 - Gray Sink Coating	Gray Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
47 *132104490-0047*	Room 8 - Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
48 *132104490-0048*	Library - Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
49 *132104490-0049*	Art 1 - Lab Countertop	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
50 *132104490-0050*	Art 1 - Lab Countertop	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
51 *132104490-0051*	Central Hallway - Interior Window Glaze	Tan/Black Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
52 *132104490-0052*	2nd Floor Hallway - Interior Window Glaze	Tan Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
53 *132104490-0053*	Room 45 - Beige w/ Tan Fleck 12x12 VFT	Tan/Beige Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
54 *132104490-0054*	Teachers 57 - Beige w/ Tan Fleck 12x12 VFT	Tan/Beige Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile

Initial report from: 07/01/2021 16:56:57

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EMSL Order: 132104490
Customer ID: UEC63
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Project ID:

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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
55 *132104490-0055*	Room 45 - Black Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
56 *132104490-0056*	Teachers 57 - Black Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
57 *132104490-0057*	Room 8 - White w/ Color Fleck 12x12 VFT	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
58 *132104490-0058*	Room 39 - White w/ Color Fleck 12x12 VFT	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
59 *132104490-0059*	Room 8 - Yellow Glue	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
60 *132104490-0060*	Room 39 - Yellow Glue	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
61 *132104490-0061*	Large Storage 1-6 - Gray 12x12 VFT	Gray Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
62 *132104490-0062*	Office 31-36 - Gray 12x12 VFT	Gray Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
63 *132104490-0063*	Large Storage 1-6 - Black Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
64 *132104490-0064*	Office 31-36 - Black Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
65 *132104490-0065*	Room 3 - Brown 12x12 VFT	Brown Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
66 *132104490-0066*	Room 32 - Brown 12x12 VFT	Brown Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
67 *132104490-0067*	Room 3 - Black Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
68 *132104490-0068*	Room 32 - Black Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile

Initial report from: 07/01/2021 16:56:57

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EMSL Order:	132104490
Customer ID:	UEC63
Customer PO:	
Project ID:	

Analyst(s)
Kevin Pine (68)

Steve Grise, Laboratory Manager
or Other Approved Signatory

Initial report from: 07/01/2021 16:56:57

OrderID: 132104555

132104555

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
24-hour TAT

Town/City: Haverhill, MA Building Name: Consentino School

Sample	Result	Description of Material	Sample Location
1		Chalkboard Glue	Room 33
2		" "	" "
3		Tackboard Glue	Room 11 divider
4		" "	" "
5		Interior door glass glaze	Room 34
6		" "	Room 4
7		windowsill on Interior	Room 35
8		" "	Room 93
9		Fiberpad under hardwood	Gym floor
10		" "	"
11		Black coating on Pad	"
12		" "	"
13		Door caulk	exterior door
14		" "	" "
15		window caulk	exterior window
16		" "	" "
17		vent caulk	exterior vent
18		" "	" "

Reported By: Jason Beaute Date: 7-1-21 Due Date:

Received By: Date: RECD JH EMSL-BOSTON JUL 02 2021

Walk-in 2pm

UNIVERSAL ENVIRONMENTAL CONSULTANTS

EMSL Analytical, Inc.

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EMSL Order:	132104555
Customer ID:	UEC63
Customer PO:	
Project ID:	

Attention:	Ammar Dieb	**Phone:**	(617) 984-9772
	Universal Environmental Consultants	**Fax:**	(508) 628-5488
	12 Brewster Road	**Received Date:**	07/02/2021 2:00 PM
	Framingham, MA 01702	**Analysis Date:**	07/06/2021
		Collected Date:	07/01/2021
Project:	Consentino School; Haverhill, MA		

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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
01 *132104555-0001*	Room 33 - Chalkboard Glue	Brown Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
02 *132104555-0002*	Room 33 - Chalkboard Glue	Brown Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
03 *132104555-0003*	Room 11 Divider - Tackboard Glue	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04 *132104555-0004*	Room 11 Divider - Tackboard Glue	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
05 *132104555-0005*	Room 34 - Interior Door Glass Glaze	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
06 *132104555-0006*	Room 4 - Interior Door Glass Glaze	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07 *132104555-0007*	Room 35 - Window Sill on Interior	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08 *132104555-0008*	Room 53 - Window Sill on Interior	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09 *132104555-0009*	Gym Floor - Fiberpad Under Hardwood	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
10 *132104555-0010*	Gym Floor - Fiberpad Under Hardwood	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
11 *132104555-0011*	Gym Floor - Black Coating on Pad	Black Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
12 *132104555-0012*	Gym Floor - Black Coating on Pad	Black Fibrous Homogeneous	85% Cellulose	15% Non-fibrous (Other)	None Detected
13 *132104555-0013*	Exterior Door - Door Caulk	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14 *132104555-0014*	Exterior Door - Door Caulk	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15 *132104555-0015*	Exterior Window - Window Caulk	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
16 *132104555-0016*	Exterior Window - Window Caulk	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 07/06/2021 06:33:37

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EMSL Order: 132104555
Customer ID: UEC63
Customer PO:
Project ID:

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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17 *132104555-0017*	Exterior Vent - Vent Caulk	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
18 *132104555-0018*	Exterior Vent - Vent Caulk	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)
Ramon Buenaventura (18)

Steve Grise, Laboratory Manager
or Other Approved Signatory

Initial report from: 07/06/2021 06:33:37

OrderID: 132104489

universal environmental consultants
12 Brewster Road
Framingham, MA 01702
Phone: 508.628.5486
Fax: 508.628.5488

132104489

CHAIN OF CUSTODY

BUILDING / SITE NAME: Consentino School
TOWN / CITY: Haverhill
WORK AREA:
STATE: MA

Analysis Type	Turnaround Time (x)				
	6-8 Hr	12 Hr	24 Hr	48 Hr	72 hr
TEM / AHERA					
TEM / Level II					
TEM / Dust					
TEM / Bulk					
TEM / Water					
PLM					
Mold			X		
Other:					

Specific Project Notes

SAMPLE ID	MATERIAL DESCRIPTION	SAMPLE LOCATION	START	STOP	TIME	L/MIN	VOLUME
1	3231 8324	Room 34	0759	0809	10	15	150
2	3231 8328	Room 38	0802	0812	10	15	150
3	3231 6371	Room 42	0810	0820	10	15	150
4	3231 8320	Library	0814	0824	10	15	150
5	3231 8318	Room 2	0821	0831	10	15	150
6	3231 8349	Room 11	0825	0835	10	15	150
7	3231 8330	Gym	0833	0843	10	15	150
8	3231 8327	Band Room	0837	0847	10	15	150
9	3231 6349	Cafetorium	0844	0854	10	15	150
10	3231 8323	outside	0848	0858	10	15	150

SAMPLED BY: Jason Becotte DATE/TIME: 6-29-21
RECEIVED BY: DATE/TIME:
RELINQUISHED BY: DATE/TIME:
RECEIVED IN LAB BY: DATE/TIME:

REC'D JUN 30 2021 EMSL-BOSTON

EMSL Analytical, Inc.

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EMSL Order: 132104489
Customer ID: UEC63
Customer PO:
Project ID:

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

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected Date:
Received Date: 06/30/2021 05:30 PM
Analyzed Date: 07/01/2021

Project: Consentino School; Haverhill, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	132104489-0001			132104489-0002			132104489-0003		
Client Sample ID:	01			02			03		
Volume (L):	150			150			150		
Sample Location:	Room 34			Room 38			Room 42		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	1	20	100	8	200	83.3	2	40	100
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	2	40	16.7	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-
Helicosporium	-	-	-	-	-	-	-	-	-
Oidium	-	-	-	-	-	-	-	-	-
Total Fungi	**1**	**20**	**100**	**10**	**240**	**100**	**2**	**40**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other Approved Signatory

Initial report from: 07/01/2021 12:31 PM

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

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EMSL Order: 132104489
Customer ID: UEC63
Customer PO:
Project ID:

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

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected Date:
Received Date: 06/30/2021 05:30 PM
Analyzed Date: 07/01/2021

Project: Consentino School; Haverhill, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	132104489-0004			132104489-0005			132104489-0006		
Client Sample ID:	04			05			06		
Volume (L):	150			150			150		
Sample Location:	Library			Room 2			Room 11		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	4	80	9.4	2	40	11.1
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	26	550	93.2	35	730	85.9	8	200	55.6
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	20	2.4	4	80	22.2
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	1	20	2.4	-	-	-
Myxomycetes++	2	40	6.8	-	-	-	2	40	11.1
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-
Helicosporium	-	-	-	-	-	-	-	-	-
Oidium	-	-	-	-	-	-	-	-	-
Total Fungi	**28**	**590**	**100**	**41**	**850**	**100**	**16**	**360**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	1	20	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Steve Grise, Laboratory Manager
or other Approved Signatory

No discernable field blank was submitted with this group of samples.

Initial report from: 07/01/2021 12:31 PM

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

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

http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 132104489
Customer ID: UEC63
Customer PO:
Project ID:

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

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected Date:
Received Date: 06/30/2021 05:30 PM
Analyzed Date: 07/01/2021

Project: Consentino School; Haverhill, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	132104489-0007			132104489-0008			132104489-0009		
Client Sample ID:	07			08			09		
Volume (L):	150			150			150		
Sample Location:	Gym			Band Room			Cafeteria		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	2	40	100	2	40	100	6	100	100
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-
Helicosporium	-	-	-	-	-	-	-	-	-
Oidium	-	-	-	-	-	-	-	-	-
Total Fungi	**2**	**40**	**100**	**2**	**40**	**100**	**6**	**100**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	-	-	-	-	-	-	1	-
Fibrous Particulate (1-4)	-	-	-	-	-	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other Approved Signatory

Initial report from: 07/01/2021 12:31 PM

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

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Fax: (508) 628-5488
Collected Date:
Received Date: 06/30/2021 05:30 PM
Analyzed Date: 07/01/2021

Project: Consentino School; Haverhill, MA

Test Report:Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	**132104489-0010**		
Client Sample ID:	**10**		
Volume (L):	**150**		
Sample Location:	**Outside**		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-
Ascospores	27	570	6.2
Aspergillus/Penicillium	23	480	5.2
Basidiospores	330	6920	75.5
Bipolaris++	-	-	-
Chaetomium	-	-	-
Cladosporium	29	610	6.7
Curvularia	-	-	-
Epicoccum	-	-	-
Fusarium	-	-	-
Ganoderma	2	40	0.4
Myxomycetes++	4	80	0.9
Pithomyces++	1	20	0.2
Rust	-	-	-
Scopulariopsis/Microascus	-	-	-
Stachybotrys/Memnoniella	-	-	-
Unidentifiable Spores	1	20	0.2
Zygomycetes	-	-	-
Botrytis	18	380	4.1
Helicosporium	1	20	0.2
Oidium	1	20	0.2
Total Fungi	**437**	**9160**	**100**
Hyphal Fragment	1	20	-
Insect Fragment	-	-	-
Pollen	-	-	-
Analyt. Sensitivity 600x	-	21	-
Analyt. Sensitivity 300x	-	7*	-
Skin Fragments (1-4)	-	1	-
Fibrous Particulate (1-4)	-	1	-
Background (1-5)	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or other Approved Signatory

Initial report from: 07/01/2021 12:31 PM

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EPA Method #402-R-92-004
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NRPP Device Code 8088
NRSB Device Code 12193

Laboratory Report for:

Universal Environmental Consultant
12 Brewster Road
Framingham MA 01702

Property Tested:

Consentino School
685 Washington Street
Haverhill MA 01832

Log Number	Device Number	Test Exposure Duration:				Area Tested	Result pCi/L
2953635	4596855	06/28/2021	8:31 am	06/30/2021	10:41 am	First Floor Room Gym	0.4
2953636	4596854	06/28/2021	8:33 am	06/30/2021	10:42 am	First Floor Room Chorus	< 0.4
2953637	4596885	06/28/2021	8:37 am	06/30/2021	10:43 am	First Floor Room Cafeteria	< 0.4
2953638	4596852	06/28/2021	8:42 am	06/30/2021	10:43 am	First Floor Room 68 Music	0.5
2953639	4596860	06/28/2021	8:44 am	06/30/2021	10:45 am	First Floor Room 65 Clothing	0.4
2953640	4596875	06/28/2021	8:45 am	06/30/2021	10:45 am	First Floor Room Main Office	0.5
2953641	4596867	06/28/2021	8:46 am	06/30/2021	10:46 am	First Floor Room Library	< 0.4
2953642	4596863	06/28/2021	8:49 am	06/30/2021	10:47 am	First Floor Room 2	< 0.4
2953643	4596851	06/28/2021	8:52 am	06/30/2021	10:48 am	First Floor Room 8	0.4
2953644	4596869	06/28/2021	8:54 am	06/30/2021	10:49 am	First Floor Room 15	< 0.4

Comment: Universal Environmental Consultant was emailed a copy of this report.

Test Performed By: Placed: Jason Becotte Retrieved: Jason Becotte

Distributed by: Universal Environmental Consultant

Date Received: 07/01/2021 Date Logged: 07/01/2021 Date Analyzed: 07/02/2021 Date Reported: 07/02/2021

Report Reviewed By: Elizabeth Degree Report Approved By:

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is ~+/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

EXISTING CONDITIONS:
CIVIL UTILITY & ENVIRONMENTAL PERMITTING
NITSCH ENGINEERING, INC.

EXECUTIVE SUMMARY

Nitsch Engineering has performed research of the existing site conditions and anticipated site permitting requirements for the Consentino Middle School site located at 685 Washington Street, Haverhill, Massachusetts. Nitsch Engineering's research included an initial site visit and walk, as well as a review of GIS information. Nitsch Engineering also reviewed record plans, including the Drainage Plan and Site Plan, dated May 15, 1968. Nitsch Engineering also contacted the Site Facilities Director, Stephen Dorrance. Mr. Dorrance indicated that he is not aware of any drainage or site utility related issues, although the City of Haverhill has had some line challenges which have impacted the school.

As the Project moves forward, an existing conditions site survey with utility research should be completed to verify assumptions made from the review of record plans and above ground assumptions. In addition, a video inspection of the existing closed drainage system may be required if the field survey cannot determine the location of existing drainage structures from the surface.

GENERAL SITE DESCRIPTION

Consentino Middle School is located near Silver Hill within a mainly residential area. According to Haverhill GIS, the lot is approximately 28 acres and contains the existing school building, athletic fields, driveways, parking lots, and pedestrian walks, as well as the adjacent Silver Hill Elementary School and associated site amenities. There is a wooded buffer to the north and east of the site, residential properties to the south, and Washington Street to the west. The slope generally slopes from east to west toward Washington Street.

Access to the site is provided by two vehicular entrances off Washington Street. There is a large parking lot to the north of the school as well as a large parking lot to the south of the school. There is also a small parking area to the west of the school near the main entrance. A sloped grass area separates that parking area from Washington Street. Athletic fields are located uphill of the school to the east.

EXISTING SITE UTILITIES

STORM DRAINAGE

There is an 18-inch vitrified clay storm drain main in Washington Street. Record Drawings indicate a

closed drainage system; however, many of the existing structures could not be located on-site. The Record Drawings show multiple catch basins in the parking lot to the north of the school, but none were observed. Several catch basins were observed in the parking lot to the south of the school. Record drawings indicate that the roof drainage from the existing building connects into the closed drainage system.

Because it was constructed prior to 2008, it is assumed that the existing closed drainage system is not in compliance with the current Massachusetts Department of Environmental Protection (MassDEP) Stormwater regulations. The proposed stormwater system will need to be designed in compliance with the MassDEP Stormwater Standards.

According to the Natural Resources Conservation Service's Web Soil Survey, the majority of the site is classified as Woodbridge fine sandy loam, which has a Hydrologic Soil Group (HSG) rating of C/D. Group C/D soils have slow infiltration rates. Test pits will be required as part of the design process to confirm the HSG and soil infiltrations rates.

SEWER

There is an 8-inch vitrified clay sewer main in Washington Street which eventually increases to a 15-inch sewer main south of the school. Record Drawings indicate several sewer manholes in front of the school but do not show the location of sewer service to the building. Based on the sewer manholes observed in the field, the sewer service may exit the southern wing of the building and connect to a sewer manhole in Washington Street, but this should be confirmed.

WATER

There is a 12-inch transite water main in Washington Street. Record Drawings do not indicate where the water service enters the building, but the Plumbing Assessment portion of this report notes that the water entry was observed on the west wall of the boiler room. There is not a separate fire protection service as the building is not sprinklered.

There are several hydrants located throughout the site around the building: one in front of the school building, one to the north of the building, and one to the south of the building.

The proposed school will most likely need to provide separate domestic water and fire protection services for the building. Hydrant locations will need to be reviewed by the Fire Chief.

NATURAL GAS

There is a 6-inch gas main in Washington Street. Gas meter and regulator assemblies were observed within a fenced enclosure on the north side of the boiler room, indicating the gas service entry location, and Dig Safe markings observed on-site indicate the general route to the gas main.

Record drawings indicate there was originally a fuel tank located near the northern side of the

building. The 2012 boiler replacement project indicated removal of this tank as Alternate #1, but there is no record that it was removed. Additional investigation should determine whether or not this fuel tank is still located on-site.

ELECTRIC/TELECOMMUNICATIONS

There are existing electrical lines located along Washington Street. Record Drawings do not indicate where the electrical or telecommunications lines enter the building. However, Dig Safe markings observed on-site indicate a ductbank coming from Utility Pole 14 on Washington Street through the site and back to the transformer area. Electric and telecommunication manholes were also observed in the parking area north of the building. There are additional electrical and telecommunication manholes near the south entry into the site; these are assumed to serve the Silver Hill school from Utility Pole 17.

According to Mr. Dorrance, Facilities Director, Haverhill is plagued by winter power losses. If a feeder gets hit, whole sections of the City lose power. Consentino Middle School was affected twice by a lost trunk line off-site.

PRELIMINARY PERMITTING CONSIDERATIONS

WETLANDS PROTECTION ACT (310 CMR 10.00)

The Wetlands Protection Act ensures the protection of Massachusetts' inland and coastal wetlands, tidelands, great ponds, rivers, and floodplains. It regulates activities in coastal and wetlands areas, and contributes to the protection of ground and surface water quality, the prevention of flooding and storm damage, and the protection of wildlife and aquatic habitat.

The Consentino Middle School site does not contain a wetland resource area within the property lines, and it does not appear that there is a jurisdictional wetland resource area within 200 feet of the site; therefore, it is anticipated that Conservation Commission permitting will not be needed for the proposed project.

STORMWATER MANAGEMENT PERMIT

The City of Haverhill has a Stormwater Management Permit which is required for land disturbances greater than one acre within the City. The Stormwater Management Permit requires the Applicant to address stormwater runoff control to minimize and avoid the adverse effects of soil erosion and sedimentation, construction site runoff, increased post-development stormwater runoff, decreased groundwater recharge, and non-point source pollution.

Because the land disturbance for the Project is anticipated to be greater than one acre, it is anticipated that a Stormwater Management Permit will need to be obtained. The Permit is granted by the City's Department of Public Works.

New work proposed on-site would be required to meet the MassDEP Stormwater Standards by providing stormwater detention and recharge to groundwater where possible and providing stormwater quality treatment using bioretention systems, hydrodynamic separators and/or other structural and non-structural BMPs.

FLOODPLAIN

Based on the FEMA Flood Insurance Rate Maps for Haverhill (Community Panel No. 25009C0088F), the Site does not fall in a regulated Flood Zone.

PRIME FARMLAND SOIL

According to MassGIS, the majority of the site is located within Prime Farmland Soils. Because the site is not currently being used for agricultural purposes, it is not anticipated that any related permitting will be required, but this will need to be confirmed.

USEPA NPDES

Construction activities that disturb one acre or more are regulated under the United States Environmental Protection Agency's (USEPA) National Pollution Discharge Elimination System (NPDES) Program. In Massachusetts, the USEPA issues NPDES permits to operators of regulated construction sites. Regulated projects are required to develop and implement stormwater pollution prevention plans in order to obtain permit coverage.

Because the land disturbance for the Project is anticipated to be greater than one acre, it is anticipated that a Notice of Intent will need to be filed with the EPA.

ZONING ANALYSIS

The lot is located within Medium Density Residential (RM) area. According to the City of Haverhill Table of Dimensional and Density Regulations, the requirements for RM are as follows:

Minimum Lot Area: 20,000 square feet
Minimum Lot Frontage: 150 feet
Minimum Lot Depth: 100 feet
Minimum Front setback: 25 feet
Minimum Side Setback: 15 feet
Minimum Rear Setback: 30 feet
Minimum Building Coverage: 25%
Minimum Space: 45%

The athletic fields located behind the existing building are designated as Municipal Open Space.

PERMITTING TABLE TIMELINE

Permit	Permitting Authority	Anticipated Filing Date	Anticipated Approval Date
Planning Board & Site Plan Review	City of Haverhill		
National Pollutant Discharge Elimination System (NPDES) with EPA Notice of Intent	Environmental Protection Agency (EPA)		
Utility (Water, Sewer, and Drainage) Connection Permits	City of Haverhill		
Stormwater Management Permit	City of Haverhill Department of Public Works		

Fire Hydrant in Front of School

Catch Basin in Rear of School

Fire Hydrant and Catch Basin in Southern Parking Lot

Possible Sewer Manhole in Front of School

Northern Parking Lot (No catch basins observed)

Manhole in Front of School Entrance

Electric Manholes on Northern Side of School

Dig Safe Electrical Ductbank Markings

Electric and Telecommunication Manholes North of School

Utility Pole 14 on Washington Street

Outside Boiler Room

Dig Safe Gas Markings

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SITE TRAFFIC

Dore + Whittier performed two separate site visits to document and observe site traffic existing conditions. First, a site visit was performed on July 1st , 2021 to document the condition of site traffic features such as drives, walks, striping, signage, and crosswalks. Second, site observations of traffic patterns during morning drop-off and afternoon pick-up at the Consentino Middle School and Silver Hill Elementary School Site were conducted on September 8th, 2021 (after the start of the school year). The purpose of these observation periods was to document existing conditions, gather input from school administrators, and document the use of site circulation patterns by buses, cars, pedestrians, and bicycles in an effort to understand the unique opportunities and challenges of site traffic management. A formal traffic study was not conducted at this phase of the project but is anticipated to be completed during the Design Development phase. Site observations focused primarily on the Consentino school as the subject of this report. However, because the Silver Hill and Consentino share use of the parking / bus loop on the south side of the Consentino, some observation and consideration of Silver Hill traffic features is warranted and included.

EXISTING TRAFFIC FEATURES & CONDITIONS

Site vehicular drives and parking areas are paved with bituminous concrete. The paved surfaces are aged and cracked in several areas and re-paving of different areas at various times is evident with the visitor loop / parking are appearing to be the most recently paved portion. The western visitor parking & drive is the most recently paved area and is generally in good condition (Image 1); the northern parking & Consentino parent drop area is older and shows more signs of cracking and wear, but is still in good to fair condition (Image 2). The southern parking / bus / Silver Hill loop area is older and shows more significant wear with some severe cracking & delamination of paved areas and is in fair to poor condition. (Image 3).

Pedestrian paved areas are predominantly cast-in-place concrete and, like the vehicular areas, of various ages and conditions. Sidewalks along Washington St., the approach from Washington to the school, and along the northern portion of the school appear to be older and possibly original to the 1969 construction. These walks are narrower, cracked in several locations with vegetation growing in crack and control joints, but still relatively usable and in fair to good condition (Image 4). Walks along the eastern and southern side of the school have patches of more recent repairs and some older sections visible. The recently repaired portions are in good condition while the older sections are in fair to good condition. (Image 5)

Image 1

Image 2

Image 3

Pedestrian walks are protected with a combination of concrete curbing and granite curbing. The original construction documents indicate granite curbing where site drives intersect Washington St. and along the street itself; these original curbs are still in place and are in fair condition with some sections significantly displaced and in poor condition (Image 4). The documents also indicate concrete curbing at the walks immediately adjacent to the school. Many of these curbs have crumbled and failed over time and in some sections been replaced with new granite curbing. The new granite curbing is in good condition while the original concrete curbing is in fair to poor condition. (Image 5)

Image 4

Image 5

Crosswalk locations where pedestrian walks intersect roadways, drives, or parking areas were in various conditions. Many did not include curb cuts and / or curb ramps (Image 4). The visitor entry route connecting the accessible parking spaces to the main building entry did include a curb cut with flared sides, but no detectable warning tiles (Image 6). Detectable warning tiles are not a specific requirement of accessibility regulations but are considered a best practice and generally included in all new curb ramp designs. Some locations associated with the Silver Hill school did include such detectable tiles (Image 7), but none of the six crosswalks associated with Consentino included them.

Image 6

Image 7

The north parking lot includes 48 striped parking spaces, the east parking lot includes 29 striped spaces (including two marked as accessible). The total parking spaces provided (77 spaces) is less

than would be required under current zoning regulations (150 spaces). Additionally, current accessibility regulations (521 CMR) would require 4 accessible parking spaces, at least one of which would need to be a van accessible space. While two spaces are marked as "accessible" they do not include the required loading zones and therefore do not comply with the current code (Image 8). As such, the facility does not currently have any compliant accessible parking spaces.

Image 8

Image 9

There is minimal on-site directional traffic striping or making; while the parent drop-off direction is indicated with yellow arrows, there are no turn direction indications at the entry from or on Washington St. There are no directional striping or markings besides two crosswalks on Washington St. No lighted School Zone or rapid repeating pedestrian beacons (RRPB) were observed at the school entry drives or at crosswalks in Washington St. 20 MPH signage was posted on Washington St., however, the signage is significantly obscured by tree overgrowth (Image 9). The lack of safety signage as well as the low-visibility approach – particularly from the south – provides very little warning to drivers that they are approaching a school.

TRAFFIC OBSERVATIONS

Observations made on September 8th were made from 8 observation positions indicated on the Traffic Operations Diagram included at the end of this section. The observations from each position are summarized below.

Northern Position (Consentino Parent Route)

- Parent vehicles entered the school property at the north entry point into the north parking

lot where they were directed to park in a tight grid at northeast area of the parking lot to wait for their child. Students approached the parked cars to load. Parents would have to wait for the vehicle in front to get their student and exit in order to exit after them, hence getting "stuck".

- Once the grid parking area was full, cars queued up at the exit route, which moved around the parked faculty cars.
- Students approach the parent pick up area from different directions and loaded the parent cars at all locations, parked grid and moving car line, hence student safety is compromised.
- Pedestrian and biking students crossed the moving parent vehicle line at several locations.
- Faculty vehicles are not able to exit until all parent vehicles have exited.

Eastern Position (Consentino Van / Taxi Route)

- Students exited the front of the building from numerous exit points. The students dispersed in various directions.
- Approximately three school vans queued in front of the building waiting for student dismissal. The vans exited once all students boarded. These vehicles crossed one area of pedestrian traffic as well as having to merge with the exiting pick-up line
- Later additional school vans pulled up in front and students boarded.
- Approximately two taxis pulled up in front of the school to pick up students.

Consentino South Position (Consentino Bus Route – only afternoon drop-off was observed)

- Buses did not arrive all at once but a few at a time over the course of about 20 minutes.
- Not all buses were on site at the time of dismissal. The principal reported that this is typical for buses to not arrive precisely at the same time, but not typical for them to be this far apart. Bus driver shortages and other factors related to the COVID pandemic may be responsible for this anomaly.
- Students waited in the corridors inside the building near the bus entry until their specific bus arrived.
- The principal was the administrator managing the bus loading procedure. As buses arrived, the principal would radio the main office, where an announcement was made over the PA system that a specific bus had arrived and students on that bus were allowed to exit the building to board.
- D+W observed that students mostly followed this procedure but not entirely. Some students who had mis-heard the announcements or who didn't want to wait in the corridors were observed milling about under and around the bus entry canopy. But no mis-behaviors of students were observed.
- D+W observed at least one student who missed her bus as a result of not hearing the announcements about her specific bus. The principal was helped the student contact

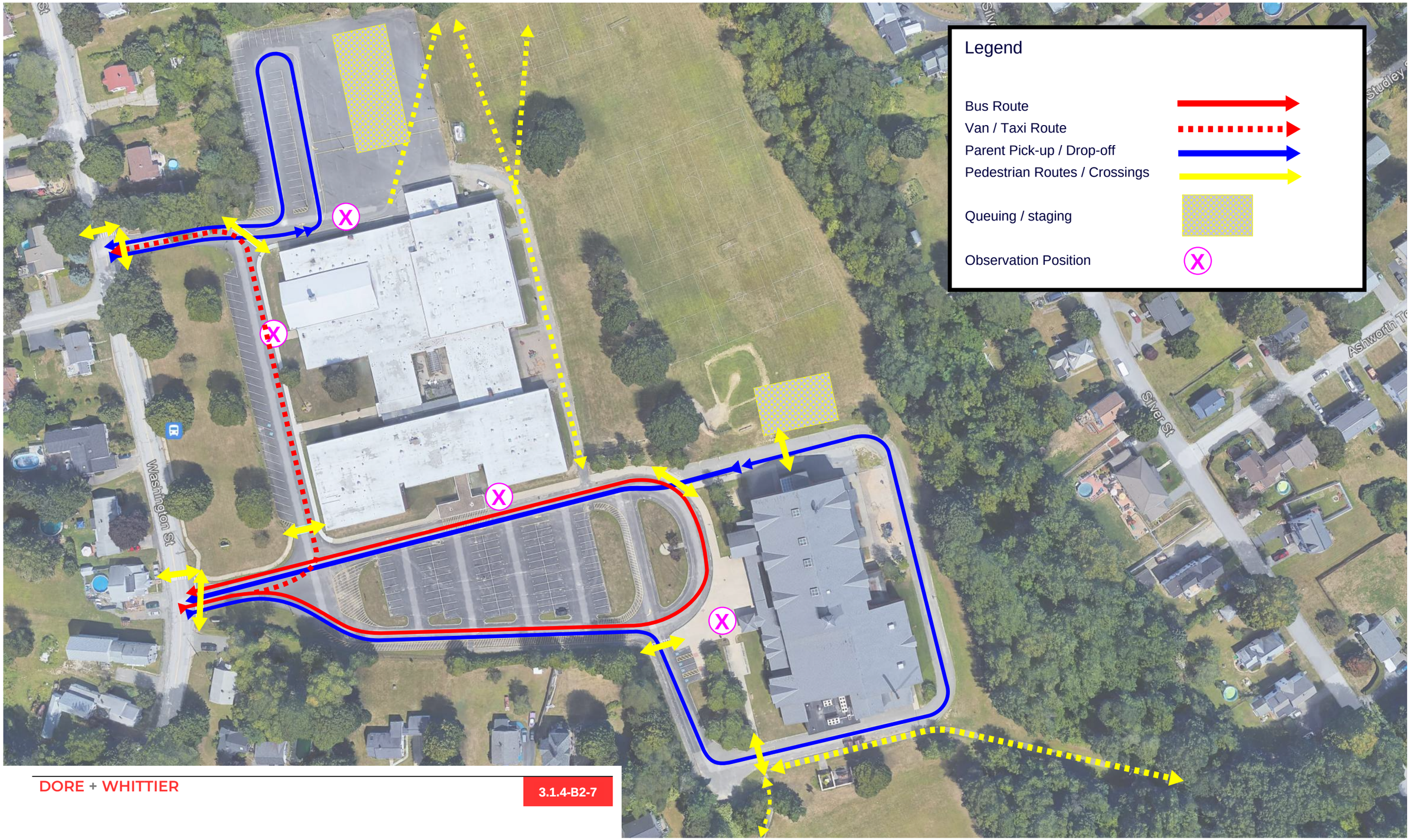
someone to ensure she had a safe transportation.

Southwest Position (Silver Hill Parents / Pedestrian Route)

- Parents picking up Silver Hill students began to queue at approximately 2:15. The queue quickly backed-up around Silver Hill school to the west, south, and along the southern edge of the south parking lot. Eventually, the queue backed up onto Washington St.
- The parent pick-up queue crossed two primary pedestrian routes to the south and east of Silver Hill School.
- As parents picked up children from the queuing / staging area of Silver Hill, parents left the site, crossing two pedestrian paths, the bus circulation route, and the van / taxi route. Vans & taxis had already left the site by the time Silver Hill students were released to parents.
- As walkers left the south exit of Consentino, approximately 75 students walked to the Silver Hill school – some to pick up siblings – and continued on pedestrian paths to the south and southeast of Silver Hill school.
- Some walkers (approximately 10) leaving the south exit of Consentino were observed to walk north across the playfields.

TRAFFIC OPERATONS DIAGRAM

NOT TO SCALE



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EXISTING CONDITIONS: LANDSCAPE ARCHITECTURE

TERRAINK

EXECUTIVE SUMMARY

The Consentino Middle School exists within a large expanse of open space, that is set within a primarily northern deciduous woodland. The topography is moderately flat, with the most notable change in grade occurring between roughly 1:3 and 1:5 slopes. Access into and out of the site (by vehicles, pedestrians, and/or bicycles) offers wonderful opportunity for connectivity to the neighboring residential abutters, nearby local schools, and play fields; however, ADA accessibility will need to be evaluated during the project's development. Large, specimen-type, deciduous trees were noted throughout the property. The site furnishings throughout the school site have weathered and aged over time, in addition to the concrete sidewalks and the existing play and sports equipment, including play structures, basketball hoops, and the baseball diamond/chain link backstop. On the interior of the building, we observed a central courtyard (accessible from multiple points within the building only) that, while worn and unsafe in its current condition, maintains the potential for the development of an exciting space to encourage sustainable gardening lessons and outdoor learning opportunities.

SITE CONDITIONS – LANDSCAPE

When traveling from the south along Washington Street, upon approach of the Consentino Middle School site, the front yard Right-Of-Way (ROW) maintains upright utility poles, a cast-in-place concrete pedestrian sidewalk, and vehicular signage. The visitor is then greeted by an expansive, moderately sloped, front open (mown) lawn space that hosts several deciduous and coniferous tree species that vary in age, size, and variety. The lawn panel is dappled with a mixture of beautiful, mature deciduous trees including *Gleditsia triacanthos 'Honey Locust', Tilia 'Linden',* and *Acer rubrum 'Red Maple'*. The lawn panel also maintains various newly planted species such as *Metasequoia glyptostroboides 'Dawn Redwood',* a row of *Betula nigra 'River Birch, Prunus kanzan 'Flowering Cherry',* and several *Picea abies 'Norway Spruce'*, which flank the edge of the northern exit drive aisle. While the

trees appear to be in good condition, a licensed arborist should be consulted to evaluate the health and safety of the trees to confirm their anticipated life span and to confirm that they will not be a hazard to users (i.e.: damaged limbs, evidence of disease, etc.).

Upon entering the School's property from Washington Street (via the southern vehicular entrance), the visitor is met by two School signs (please refer to the image below) on either side of the entrance drive; one sign outlines the "School Happenings" and is a message style board that is interchangeable to announce community events, while the other sign outlines the "School Events," is a bit larger in size, offers similar messaging opportunities, and is embedded in a moderately sized plant bed with a scattering of shrubs and perennials. The signs are outdated, and the plant beds are thin; a new sign(s) with updated plant beds will enhance the School's frontage, while also providing a visual, and physical, material connection to the future School improvements (i.e.: through the use of like materials, such as stone, brick, metal, color variations, etc.).

Further along the entrance drive, the visitor is met with a large, open, surface parking lot to the right and the two-story classroom wing of the Middle School building to the left. The vehicular entrance curbs and sidewalk are in disrepair with cracks and weed growth evident in several locations. The curbs terminate at the approximate midpoint of the first leg of the entrance drive, which has resulted in lawn damage, likely due to snow removal and/or vehicles. The sidewalk should be replaced with a new cast-in-place concrete sidewalk and the curbs should be replaced with new granite curbs that extend, at a minimum, to the end of this first leg of the entrance drive.

In front of the building, there exists a granite-curbed, cast-in-place concrete sidewalk that appears to have been recently installed. While the curb and sidewalk are in generally fine condition, the existing granite curb should be salvaged and reused to the greatest extent possible. The existing cast-in-place concrete sidewalk should be removed and replaced with a new cast-in-place concrete sidewalk due to the likelihood that the majority of the pedestrian sidewalks throughout the site will need to be replaced with new cast-in-place concrete (given their condition and the anticipated impact that construction will have on their existing condition). The main entrance walkway should match the color, material, and age of all new pedestrian sidewalks throughout the site.

As the visitor arrives on the west side of the building, they park their vehicle in a bituminous concrete, visitor, surface parking lot (which provides the only designated accessible parking spaces onsite) and are then led to the main entrance of the building via a cast-in-place concrete sidewalk that

is aged, maintaining a series of bituminous concrete patches, cracks, weed growth, and tripping hazards. The sidewalks within the west entry courtyard will need to be replaced with cast-in-place concrete sidewalks. The addition of a small, west entry courtyard (constructed of concrete unit pavers) will also provide pavement variability within the courtyard, possibly at locations for seating and gathering.

Within this west entrance courtyard, the wood rails need to be removed and discarded as they are weathered and splintering. The existing, surface-set curbs need to be removed and discarded. The galvanized pipe bicycle rack will need to be removed and replaced with bicycle racks that meet the Town's bicycle/alternate transportation code requirements. The topography is relatively flat; therefore, careful attention to maintaining positive drainage throughout this semi-enclosed courtyard will be critical. There does not appear to be any walkway lighting within this entrance zone; pedestrian walkway lighting should be considered. The existing flagpole and its associated plantings should be removed and relocated to accommodate the likely pedestrian circulation/gathering improvements. The existing mown lawn extends to the base of the building and has clover and crabgrass throughout, while the plantings at the main entrance are sparse, with the exception of a fantastic, mature *Tilia 'Linden'* tree to the left of the front doors that should be preserved to the greatest extent possible.

As the guest enters the main entry of the building and continues down the interior school corridor(s), they are greeted with a light-filled outdoor room that clearly serves as a central courtyard for a variety of activities. The courtyard maintains a large, overhead wooden trellis (to the south), a greenhouse at the opposite side of the courtyard (to the north), and a series of raised brick planters (approximately 3'-0" in height) on top of the concrete unit paver patio surface. The edges of the courtyard feature planting beds that are filled with a variety of vegetable and cut-flower plants. One movable, plastic table and chair set provides a small area for gathering, while a cultivar of *Hedera 'Ivy'* has found a home on several of the inner courtyard building facades.

While this space appears to be successfully activated, the physical condition of the space is unsafe, aged, likely inaccessible (per ADA standards), and in need of update. The trellis has been weathered overtime and is rapidly deteriorating, creating an unsafe overhead condition. The greenhouse does not appear to be code compliant and contains uneven pavement, in addition to metal, desk-height edges that obtrude into the walkway. The raised brick planters are in disrepair as many of the bricks have shifted and the mortar is eroding, creating a potentially unsafe condition where users may try to sit, or stand, on a compromised condition. The concrete pavement contains evident weed growth and is beginning to shift and heave due to the natural freeze and thaw impact of an outdoor environment; thereby creating dangerous tripping hazards. Many of the plantings are invasive and overgrown, while the suckering vine is slowly overtaking the building façade, compromising the integrity of the brick. The site furnishings are worn, unsightly, and are not code compliant. Given these observations, the majority (if not all) of the elements throughout courtyard will need to be removed, and the courtyard redesigned, to create an ADA accessible and physically safe environment for all users.

As the visitor leaves the interior courtyard, returning to the main building entrance to exit the building, the concrete walkway then guides the visitor to the north, along the main entrance drive aisle, which serves as an additional drop-off/pickup zone. Walking north along the concrete sidewalk, the visitor is then channeled into a secondary, large, worn, bituminous surface parking lot, which hosts vehicular cobra-head pole lights and three, bright yellow basketball hoops. This northern surface parking area also maintains the current service zone for the building.

The service zone exists on the north-facing façade of the building and maintains a loading dock-type entry and two large dumpsters within a fenced off utility zone (which contains the gas meter adjacent to the boiler room) that exists beside a small garage access door with a ramp. On the east side of the parking lot, there is a large air-quality testing mechanical unit (operated by the Massachusetts DEP) that is encased within a galvanized chain-link fence and set adjacent to several,

broken wood rails and one, steel vehicular guardrail (that appears to be unused). There also exists a large, metal Conex storage box serving as a makeshift shed at the northeast corner of the building.

Throughout this parking and service zone, it would be useful to introduce various types of built and/or vegetative screens to serve as visual buffers to the unsightly mechanicals; perhaps a louver fence or black, vinyl coated chain link fence with scrim inserts, to effectively screen the utilities from visual and physical (safety and access) perspectives. In addition, it would be necessary to create a thoughtful pedestrian and vehicular circulation plan that deters users (specifically the students) away from these utility and service zones for safety purposes.

Continuing toward the east, around to the back side of the School property, the visitor is greeted by a massive open (mown) lawn space, which appears to be in relatively good health with a spattering of clover and crabgrass throughout the open area. While the drainage appeared to be sufficient at the time of the site visit, a careful analysis of the existing soils, topography, and drainage patterns will need to be completed to ensure proper drainage, post-construction.

The majority of the open lawn appears to be used for athletics given the presence of several soccer goals at the perimeter of the space, in addition to an old baseball diamond that is set within the southeast corner of the open area (in proximity to the Silver Hill Elementary School), which is complete with a chain link backstop and two wooden player's benches. The chain link backstop and wooden benches are outdated and look to have not been used in several years, at this point presenting safety concerns for the user group due to splintering wood, jagged metal edges, and invasive plant material (as the diamond and chain link backstop have been overtaken by vegetation). This area should be completely removed and replaced in-kind, assuming this is, indeed, a desired program use.

This sizable open space is set within a dense, mature woodland along the eastern and northern property boundaries and, in keeping with the open lawn frontage on the west side of the school, this open area boasts a large row of beautiful mature tree species, including: *Aesculus hippocastanum 'Horse Chestnut'*, *Carya 'Hickory'*, *Acer rubrum 'Red Maple'*, and *Quercus bicolor 'Swamp White Oak'*. The lawn is lush and green in most areas; however, with a refresh of new soils with additives, an irrigation system, proper mowing and fertilization practices, it could be significantly enhanced, both for longevity and aesthetics.

On the east side of the building, immediately adjacent to the existing facade, exists a playground that provides four (4) primary pieces of traditional play equipment for the children, with engineered wood fiber mulch as the safety surface medium. Although the engineered wood fiber mulch appears to be recently refreshed, the playground equipment is outdated and in need of replacement, both for aesthetics, but primarily for safety and use. Due to the latest ADA accessibility regulations (American Disabilities Act), engineered wood fiber mulch is no longer classified as an accessible play surface medium; therefore, it will need to be replaced with either a stabilized turf or poured-in-place resilient rubber play surface to maintain code requirements for Universal use.

Adjacent to the playground is a bituminous concrete path that provides maintenance and

emergency vehicular access around the School, connecting the northern and southern parking lots. Varied pavement-based games have been painted onto the surface of this access drive, including hopscotch and four-square.

Continuing south along the eastern building facade, the southern edge of the site is dominated by a weathered, bituminous concrete surface parking lot that has a series of lawn-planted islands (along the eastern, southern, and western edges of the lot) that are planted with small, upright, deciduous trees, some of which appear to be newly planted at only 8'-0" to 10'-0" in height. The surface parking lot also maintains large vehicular pole lights (color: black) set atop worn, cast-in-place concrete sonotube foundations. The parking lot is encompassed by a one-way drive lane that delineates the outer circulation of the parking lot, thereby accommodating vehicular drop-off to the southern entrance of the school, which is identified by a looming concrete overhang that is set on concrete columns as it extends south toward the parking lot from the building façade.

At the furthest outskirts of the school property (to the south of the Silver Hill Elementary School), there exists a perimeter vehicular drive, an evident brick and chain link fence utility enclosure, an open play field, and bituminous concrete pedestrian walkways. The walkways slope down the existing topography via dense, deciduous woodland corridors to the neighboring residential properties and to the lower-lying Therapeutic Education Assessment Center of Haverhill via stairs; thereby rendering this walkway ADA inaccessible. The open-air brick structure, shown below, appears to house some utilities and has been overcome by vegetation.

Specific Issues	Recommendations
We would consider several species of mature deciduous trees throughout the campus to be specimens that should be preserved as part of a future scope of work (upon verification by a licensed arborist); i.e.: *Gleditsia triacanthos 'Honey Locust', Tilia 'Linden', Carya 'Hickory', Acer rubrum 'Red Maple', Aesculus hippocastanum 'Horse Chestnut'*, *Acer rubrum 'Red Maple'*, and *Quercus bicolor 'Swamp White Oak'*. This may cause a challenge when it comes to site grading and the location of a potential building addition. PLEASE REFER TO IMAGE 1 BELOW	Utilize best management practices relative to the site grading and the placement of proposed elements (walkways, courtyards, outdoor classrooms, etc.) to strategically alter the site in a manner that will allow us to preserve as many specimen trees as possible.
Due to a moderately steep slope from Washington Street up to the existing building, which ends at a crosswalk with no curb-cut, there does not exist an ADA accessible route at this location.	Establish an easily identifiable ADA accessible route from Washington Street to the main entrance of the building; please refer to the "Accessibility" portion of this report.

PLEASE REFER TO IMAGE 2 BELOW	
The existing School signage along Washington Street is outdated.	Replace with new School signage.
Lack of irrigation onsite will likely result in compromised plant establish and longevity.	If the longevity of the plant material is a priority, then we recommend the use of native plants that require minimal waiter, in addition to an irrigation system that can be used during extended periods of drought.
Concrete walkways and curbs throughout the property are damaged and/or in disrepair. PLEASE REFER TO IMAGES 3 AND 4 BELOW	Replace the walkways, curbs, and access routes to provide for even, ADA accessible, and well drained surfaces; please refer to the "Accessibility" portion of this report.
The interior building courtyard is unsafe and outdated.	The trellis, greenhouse, brick planters, pavement, and plantings need to be removed and discarded, with new elements introduced to encourage user safety and accessibility.
Several areas throughout the property have damaged wooden vehicular guardrails and steel vehicular gates. PLEASE REFER TO IMAGES 5 AND 6 BELOW	Remove and replace the damaged rail and vehicular gate elements relative to the security and access requirements as directed by the Owner and/or the Facilities Department.
Site furnishings and amenities are outdated and potentially hazardous for use. PLEASE REFER TO IMAGES 7 – 12 BELOW	Remove and replace with new site features and amenities (outlined below are anticipated quantities that will be further refined upon design development): (40) Bicycle Racks (12 sets) Movable Table and Chairs (6) Wooden Courtyard Benches (1) Baseball Field Chain-Link Backstop (2) Metal Player's Benches (10) Metal Benches (with backs for field viewing) (6) Basketball Hoops (6) Vehicular Gates New Playground Equipment Site Lighting (Pedestrian and Vehicular) Irrigation System

Image 1

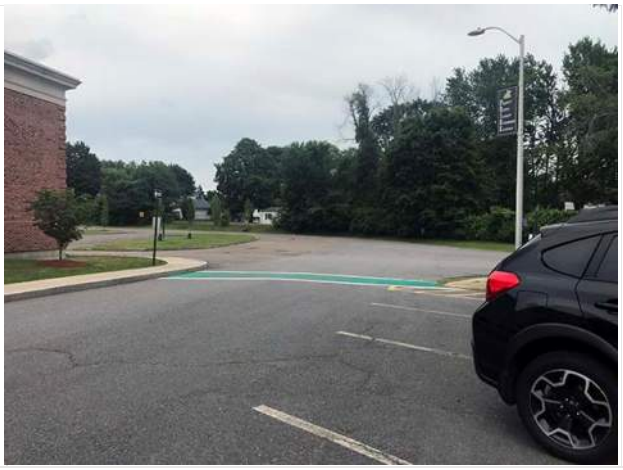

Image 2

Image 3

Image 4

Image 5

Image 6

Image 7

Image 8

Image 9

Image 10

Image 11

Image 12

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EXISTING CONDITIONS: ARCHITECTURAL

ARCHITECTURAL SUMMARY

The Consentino Middle School is a well-preserved school building with some features that have performed exceptionally well over time and other features that are damaged, outdated, or otherwise well beyond their useful life. Building elements, systems, and configurations have remained unmodified (but well maintained) since the school opened in 1969 with most spaces reflecting original room and fixture layouts and finishes that have endured for over 50 years. In many cases, this durability is a testament to the quality of the original construction, especially with respect to exterior wall construction, the structural system, and the original terrazzo floors. Other systems and components have not fared as well; in particular, ceiling finishes, roofing systems, and plumbing fixtures/toilet room configurations. These elements are failing in nearly every observable location and do not meet current codes or standards.

The plan arrangement and massing of the building is geometrically concise and efficient, reflective of a late modern pragmatism. However, entablatures, pilasters, and even a pedimented elevation at the cafeteria adds a classical language that attempts to overlay some institutional gravitas onto an otherwise modest, if not utilitarian composition. The result is effective: classical elements are not overwrought, and the composition reflects a community that upholds the timeless values of durability and functionality with a confident pride, framing those values with a touch of well-deserved ornamentation.

While the lack of significant alterations is notable for a school building of this vintage, there have been some modifications worth noting. In 2012, all of the exterior windows and passage doors were replaced, and new boilers were installed as part of the MSBA's Green Repair program. Two toilet rooms, a small storage/kitchenette area, and a partition that subdivides the space were built into the mezzanine above the girl's locker room in 1992. While the toilet rooms attempted to be accessible, they are on an upper lever that can only be reached via stairs and are therefore not on an accessible route. Finally, five small offices and a conference area have been built into one of the ground level classrooms; this work also appears to have been completed in the past ten to fifteen years.

EXTERIOR

FOUNDATION

The foundations for the school are cast in place concrete frost walls on shallow spread footings as indicated in the original 1968 construction documents and the Structural Assessment portion of this report. The foundations are in very good condition with very few indications of wear or damage. In

almost all locations, the brick shelf transitions to grade are two courses below the Level 1 finish floor elevation (Image 1) with two exceptions where the brick shelf steps to accommodate grade around the northern portion of the building. There are a few locations where small cracks were noted, but these cracks appear to be shrinkage cracks and not an indication of settlement as they had not telegraphed into the brick veneer above (Image 2). At the northwest corner of the kitchen office, there is one crack that has telegraphed slightly into the quoin corbels of the brick veneer above; this was the only noted location of this condition (Image 3).

Specific Issues	Recommendations
Shrinkage cracks noted at several locations around the building, most notably at steps in the brick shelf.	Repair cracks with cementitious crack injection adhesive.
Shrinkage or settlement crack telegraphing into brick veneer above.	Repair cracks with cementitious crack injection adhesive. Remove cracked / loose brick or repair in situ with crack injection adhesive.

Exterior Walls

Exterior walls are treated with two primary materials – facing brick and precast concrete – both installed over concrete masonry units to form solid masonry exterior bearing walls with no air cavity. The brick makes up the majority of the exterior wall treatment while precast concrete is reserved for ornamental conditions (Image 4). The term “facing brick” is used here instead of the more contemporary “brick veneer” because the brick and CMU back-up have been laid simultaneously to form a bonded double wythe structural wall. With conventional brick veneer systems, the brick is laid separately from and then tied to a back-up wall for stability, forming an air space that allows water to weep out and the brick is not part of the structural system. At Consentino, the brick is laid in a common bond, specifically with five courses of running bond and every sixth course alternating header and stretcher bricks. This alternating course allows the brick veneer to tie back to the concrete masonry back-up wall forming a solid bearing wall. At public fronting elevations like the cafeteria and two-story classroom wing, the outside corners are treated with corbeled brick quoins (Image 3). Steel lintels are provided at openings (Image 5); in some locations the brick running bond continues directly over the opening while in others a header course is used to accent the door or window openings.

For the most part, the brick veneer is in excellent condition with some areas in need of repointing. The concrete cap at the boiler breeching chimney is severely cracked (Image 6), leading to significant

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

water infiltration as shown by the efflorescence on the chimney. Steel lintels at openings show some signs of surface rust or scaling but are in sound condition and could be readily cleaned and re-painted (Image 5). At most window sills there are signs of a whiteish outwash, presumed to be from perimeter sealant used during the 2012 window replacement breaking down (Image 7). The existing drawings show no indication of an air or vapor barrier material and one portion of the wall that was observed to have some brick removed revealed that no such barrier is present (Image 8).

Precast concrete elements include window sills, pilasters (Image 4), spandrel panels at the two-story classroom wing (Image 1), and an entablature on nearly all portions of the building made up of separate frieze and cornice profiles (Image 9). All of the precast elements are dirty and/or stained and the condition of precast elements varies widely, ranging from good condition at window sills, spandrel panels, and frieze panels to fair condition at the pediment pilasters and cornice (Image 10), to poor at the south entry colonnade (Images 11-13) and numerous cornice elements. The cornice profiles where originally installed with skyward facing exposed surfaces and joints (Image 14), which would have accelerated their deterioration. Nearly all of these been covered with metal flashing caps as part of reroofing projects except at the mid-height profiles at the gym which have not been covered. These joints appear to have been coated with a waterproofing membrane and/or had skyward facing joints covered with membrane flashing. However, nearly all of these treatments have failed.

The east and west gables at the cafeteria are clad with painted plywood at the pediment and wood trim at cornices (Image 15). The paint is in poor condition and in many areas the wood trim is rotting (Image 16).

Soffits associated with exterior walls – such as at exterior doors and some recessed window conditions – are plaster over metal lath. Most appear to be in fair condition with some areas of cracking, but are generally intact with no large portions broken away from the lath. In some locations, the soffits are bowing, suggesting some of the tie wires supporting the framing may have rusted and broken (Image 5).

Exterior walls with plaster interior finish, primarily in the classroom wing and one story classroom/administration areas, include one inch of foam insulation behind the plaster finish.

Specific Issues	Recommendations
Some areas of facing brick require repointing.	Repoint as needed (approximately 20% of brick area).
Boiler chimney cap is cracked, resulting in water infiltration and efflorescence.	Replace chimney cap. Clean brick at chimney. Repoint brick at chimney following replacement.

Image 7

Image 8

Image 9

Image 10

Image 11

Image 12

Brick corbelled quoin cracked at northwest corner of kitchen office	Replace brick or repair in situ.
Steel lintels are lightly rusted or scaling	Clean all lintels of rust and scaling. Prepare surface for paint and re-paint all lintels.
At windows with preacast sills, signs of outwash from sealant is staining brick below sills.	Following replacement of perimeter sealant (see Exterior Windows portion of this assessment) clean brick below sills.
A portion of the north gymnasium wall facing brick has been removed and could result in bulk water intrusion into the wall cavity.	Infill wall opening.
Precast concrete elements are dirty and/or stained. Many pieces are cracked or crumbling. Surface joints require resealing or repointing.	Clean all precast concrete elements. Repoint all precast concrete joints. Replace precast concrete cornice elements that have broken or failed (Approximately 20% of cornice). Repair miscellaneous precast shapes as needed.
Precast concrete colonnade is in poor condition; reinforcing steel is exposed on the underside; concrete columns are heavily eroded and/or cracked clear through; portions of the corning are crumbling and loose.	Demolish precast concrete colonnade and replace with a new entry canopy.
Skyward facing precast cornice pieces at the gymnasium with prior surface and/or membrane joint treatments are largely washed away or failed.	Provide prefinished metal flashing cap at all precast cornice locations to protect all skyward facing joints from water intrusion.
Wood pediment at cornice trim at the cafeteria (east and west elevations) has paint faded or missing; wood trim is rotted, particularly at the rake to eave transition.	Replace rotted wood trim elements. Repaint all wood trim, pediment at both elevations.
Exterior soffits in some locations are sagging, suggesting back-up framing may be failing. Some soffits have minor plaster cracks that could be repaired.	Replace sagging soffits (approximately 50% of soffits). Patch or repair balance of plaster soffits. Paint / repaint all soffits.

Image 13

Image 14

Image 15

Image 16

Image 17

Image 18

Exterior Windows

The 2012 window project entailed the replacement of all the original single glazed metal exterior windows with dual glazed double-hung fiberglass windows (Image 17). The only windows that were observed to be original are the windows of the cupola and the round window in the pediment of the cafeteria (Image 15); these remaining windows are painted wood and are in poor condition. The project also included the addition of window air-conditioning units supported by aluminum angles anchored to the brick veneer. The windows appear to be functioning well for the most part; only one condition of a misaligned sash was noted. The window exterior perimeters are finished with metal panning and sealed to the jamb brick or precast concrete sills. In most locations, the sealant is dried, hardened, and no longer adhered to the panning (Image 18). The air conditioning units have the effect of blocking natural daylight and views while adding considerable background mechanical noise into the classrooms and offices. These air conditioners also drip condensate on adjacent wall surfaces (Image 19), keeping them constantly saturated during warmer months. This perpetual saturation can accelerate deterioration of wall materials – particularly mortar and precast concrete – contribute to moss or other growth, and even saturate back-up wall or interior finishes since the walls are monolithic construction.

Specific Issues	Recommendations
Perimeter sealants between window panning and adjacent brick or precast concrete have hardened and are at the end of their service life.	Remove and replace all perimeter sealant with new sealant.
Air conditioning units block natural daylight, views. Condensate is saturating adjacent wall materials, which may contribute to accelerated deterioration or interior water infiltration.	Remove air conditioning units (Note: must be coupled with another means of providing cooling to spaces). Patch holes in brick from removed aluminum brackets.

Exterior Doors

The 2012 project also replaced nearly all the exterior doors on the project. The remaining original doors are the hollow metal doors at the loading dock (Image 20) and boiler room. While perimeter gasketing has been added, the frames are rusted at the bottom, the doors are dented and scratched, and the thresholds are damaged and/or not sealed. The paneled overhead door at the maintenance storage bay was also not addressed in 2012 (Image 21). This door frame is still in sound condition, but the door itself is not insulated or gasketed and in poor condition with the plywood panels – which appear to be replacements themselves – delaminating and paint flaking off.

All of the replacement doors utilize aluminum storefront systems. These aluminum systems

Image 19

Image 20

Image 21

Image 22

Image 23

Image 24

incorporate insulated glass sidelights and transoms, aluminum door systems at more public entries (Image 22), and fiberglass reinforced plastic (FRP) doors at more utilitarian locations (such as the gymnasium egress doors) (Image 23). The new entry systems are all in good to very good condition. Perimeter sealants at jambs and soffits have hardened and, in some locations, pulled away from the framing system.

Specific Issues	Recommendations
Two hollow metal doors and associated frames remaining prior to 2012 window & door project are in poor condition.	Replace doors, frames, and associated perimeter gaskets and thresholds with new insulated and thermally broken assemblies.
Overhead door is not insulated or gasketed and plywood panels are in poor condition.	Replace overhead door with insulated and gasketed overhead door.
Perimeter sealants at many aluminum storefront systems have hardened and are at the end of their service life.	Remove and replace all perimeter sealant with new sealant.

Louvers and Other Openings

Classrooms and most other spaces are provided with through-wall unit ventilators, resulting in numerous louvers on most elevations of the building (Image 24). Proper maintenance and sealing of louvers is critical for a facility of this age since there are so many locations where potential failure could result in water and air leakage and/or improper ventilator function. Most unit ventilator louvers are in fair to good shape, which is notable given their age. Still, some louvers were noted to have damaged protective grilles and/or louver blades and should be replaced (Image 25). In most locations, perimeter sealants had dried and hardened and pulled away from adjacent surfaces, leaving perimeter conditions vulnerable to water intrusion, particularly at near-grade locations. Louvers at the generator room are in poor condition and should be replaced (Image 26). A new louver at the boiler room was installed as part the 2012 boiler replacement project (Image 27); the louver is in good condition and the adjacent brick infill appears to be performing well.

Image 25

Image 26

Image 27

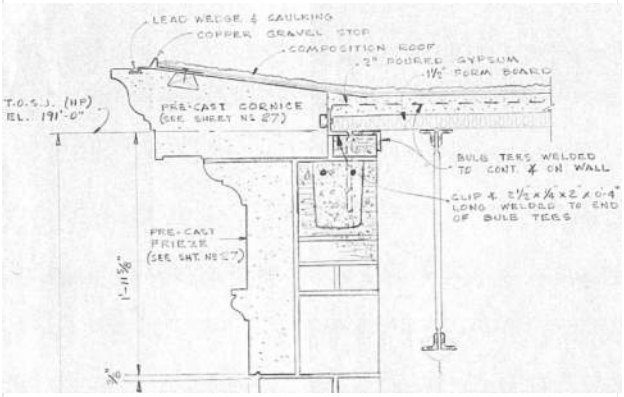

Image 28

Image 29

Image 30

Specific Issues	Recommendations
Several unit ventilator louver protective grilles have been damaged.	Replace damaged grilles and louvers (10% of unit vent louvers).
Perimeter sealants at louvers have dried and hardened and are no longer adhered to adjacent surfaces.	Replace all perimeter sealants at louvers.
Two louvers at generator room are in poor condition.	Replace louvers.

ROOF

An extensive Roof Repair Investigation Report, prepared by Russo Barr Associates and dated January 24, 2019 was reviewed as part of this existing conditions assessment. The report is thorough and clearly documents the dire condition of the current roofing. In summary, the current roof system is a mechanically fastened PVC membrane with two inches of rigid (polyisocyanurate) insulation installed over the original built-up roofing assembly. The structural deck is two inches of gypsum concrete over either fiberglass form board or metal deck on steel joists. The PVC membrane was installed in 1987 (34 years old), and is well beyond its service life. The result of the RBA report was a roof repair project conducted during the summer of 2019. However, even RBA was skeptical as to how well these repairs could resolve the pervasive leaks, stating “It should be noted that these repairs are temporary at best and it is unlikely that a roofing contractor will provide a warranty for any repairs that they perform due to the fact that the roofing systems are in such poor condition.” The report goes on to cite conditions such as saturated insulation, dirt and debris accumulation, broken drain strainers, failed sealants and mastics, aged and brittle roof membrane, previous repairs with EPDM membrane which have also failed.

In addition to the RBA report, field observations reveal additional issues with the roofing system and components. Although the original 1968 roof plan suggests that the roof was pitched toward drains, this is not feasible given that the original joists and gypsum deck would have been installed level. The 1987 roofing project that added insulation would not have sufficient thickness to develop adequate slope, and so it is assumed that the current roof does not pitch to drains. This is reinforced by the numerous large puddles and areas of ponding seen on nearly every roof surface. Installing roofing membrane on a flat or near-flat surface will generally void most roofing warranties and is not permitted under current building codes. Long periods of standing water increase the potential for water to leak through seams, corroborated by the 2019 report and infrared imaging which revealed large areas of saturated insulation. The addition of two inches of insulation is also much less than

Image 31

Image 32

Image 33

Image 34

Image 35

Image 36

what would be required under the current energy conservation code.

Evidence of extensive leaking was clear in many portions of the building with the underside of roof form board stained, stained ceiling tiles, and numerous areas of replaced ceiling tile. The large areas of leaking roof have most likely saturated much of the added insulation, which drastically reduces the thermal performance of the material. Several dome skylights have been replaced with Velux CWC2 dual glazed unit skylights during the 2019 repairs. Th replacement skylights appear to be in good condition, but have a listed U-value of 0.61 and do not meet current energy code requirements.

There are two fixed metal roof ladders that provide access to upper roofs at the gymnasium and the two-story classroom wing. The gymnasium ladder is in fair condition. The ladder to the classroom wing roof has one bolt that had broken off and only one bolt is holding the ladder in place. Neither ladder is over 24 feet, which would require a cage enclosure.

Specific Issues	Recommendations
The roof is well beyond its service life, is not sloped toward drains, is not provided with overflow drains, and insulation R-value is less than required by code.	Replace roofing system: Remove existing roof and insulation down to structural gypsum deck. Repair water damaged deck if discovered. Provide new roof system with minimum R-30 insulation, sloped to drains. Assume the addition of 10 new drains tied to existing drainage system. Provide new framed parapet to conceal built up insulation. Provide new prefinished metal and parapet and cornice cap.
Existing skylight domes do not meet energy code requirements.	When skylights are removed as part of a reroofing project, replace with triple glazed skylight domes meeting energy code requirements.
No overflow drainage is provided as required by code.	As part of a reroofing project, provide overflow drains to daylight and/or scuppers for all roof areas.
Roof access ladder to classroom roof is broken.	Provide new fixed ladder to classroom roof.

Other Exterior Features

Exterior doors are provided with either isolated frost pads (Image 23) or site paving that extends to

Image 37

Image 38

Image 39

Image 40

Image 41

Image 42

the door (Image 22). Most of these are in fair to good condition with little signs of cracking or settling. The concrete apron at the maintenance door is the one exception where the apron has broken away from the door opening. Frost pads that have a step down to the adjacent pathway do not meet accessibility code requirements. Refer to the Code & Accessibility portion of this report.

The loading area at the north end of the building, near the kitchen entry, incorporates a concrete loading dock, concrete stairs to grade, and rubber loading dock bumpers (Images 37 & 38). Like many things in the school, these features appear to have fared well over the years, but components are starting to show their age and are nearing the end of their useful life. The stair serves as a means of egress from the kitchen corridor and these stairs do not meet means of egress dimensional requirements. Refer to the Code & Accessibility portion of this report. Fasteners on the rail and dock bumpers are rusting and the bumpers themselves are worn.

A cupola perched above the cafeteria is, along with the classical precast elements, one of the more notable ornamental features of the building (Images 39 - 42). The octagonal base of the lantern, the square plinth, and the sills of the windows have been wrapped with white roofing membrane (Image 42). The membrane itself appears to be in good condition and there were no obvious signs of water infiltration between the membrane portions and the copper flashing, which is also in good shape. The wood lantern framing and window sashes are in very poor condition (Images 40 & 41). Beyond peeling paint, there are signs of wood rot, missing or broken windowpanes, and all glazing compound has long since been replaced with sealant. Still, there appears to be enough integrity to the cupola framing that would allow for in-situ repairs rather than complete reconstruction.

Specific Issues	Recommendations
Concrete apron at the maintenance overhead door is severely damaged.	Provide new apron at maintenance door.
Loading dock accessories such as railing, and dock bumpers have reached the end of their service life.	Replace loading dock stair rail and dock bumpers.
Cupola is in general disrepair.	Repair cupola: Remove existing roofing membrane and copper flashings. Investigate and replace rotted or damaged wood trim and framing members. Reconstruct portions of plinth and lantern base with pressure treated wood and prefinished metal flashings. Provide new custom window sashed. Repair damage wood trim at lantern. Repaint.

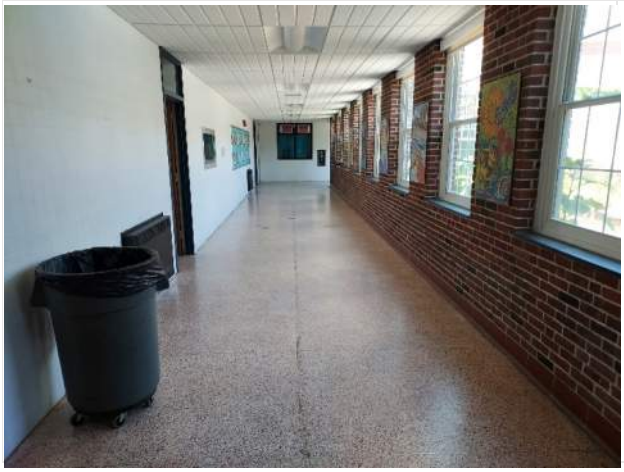

Image 43

Image 44

Image 45

Image 46

Image 47

Image 48

INTERIOR

FLOORS

Original terrazzo floors feature prominently in vestibules, corridors spaces such as the cafetorium and the kitchen (Images 43 & 44). All of the terrazzo that was observed is in excellent condition, even in high traffic areas like the kitchen, and the only recommendation would be to continue to preserve and maintain them. Stair treads are also terrazzo with a slip-resistant strip. All of the observed treads appear to be in excellent condition except for a few locations where a resilient tread had been installed over the original terrazzo (Image 45).

Most educational spaces and offices areas still have the original vinyl tile floors. The majority of these floors are in good condition and appear to be well maintained with some localized areas in fair to poor condition (Image 46). The most consistent issue observed was shrinkage of the tile resulting in large gaps between tiles. There was also noticeable difference in wear between room perimeters and the center of the room, typical of older floors that have experienced decades of use and maintenance and the difficulty of cleaning near walls. In custodial closets, vinyl tile was in poor condition (Image 47), and in some locations the tile and resilient base were missing, and bare mastic was visible. In a few rooms, complete replacement of the floor tile was observed. In many areas wall base was worn or missing (Image 48). Although the floor tile has been well maintained, it has far exceeded its anticipated service life and the years of wear are starting to show in most places.

Ceramic mosaic tile floors in toilet rooms, although dated, were generally in good condition (Image 49). The tile floors in the large shower rooms and staff toilet rooms were also observed to be in good condition (Image 50). In many locations, particularly the large shower rooms and some staff shower areas, the grout shows areas of staining; the tile could benefit from a thorough cleaning, but otherwise tile and grout are generally sound. There are also patches of mosaic tile in wet areas of the art classrooms, which are also in good condition.

The wood floors in the gymnasiums are in good to fair condition. The floors in the play areas are sound and well maintained. The two auxiliary gymnasiums appear to have the

Image 49

Image 50

Image 51

Image 52

Image 53

Image 54

original floor finish based on the degree of discoloration (Image 52) and are flaking off in some areas, but the main gym floor appears to have been re-finished more recently (Image 51). There were some areas of water staining observed, likely from the various roof leaks in the area and around drinking fountains (Image 53), and some perimeter wall base and flooring pieces were loose and in disrepair. The track location for the divider between the west aux. gym and the main gym was buckled, creating a potential tripping hazard. The other divider track location could not be observed due to storage of materials around the divider. The wood floor in the shop is also in fair condition. The majority of the finish in the space has been worn through and bare wood is exposed (Image 54), making it more susceptible to wear and staining. There were numerous floor patches and equipment mounting locations noted, but the floor was not buckled or loose and could be put into service with some patching and refinishing.

There are relatively few areas that indicate carpet in the 1968 documents: the office area (Image 55) and the media center (Image 56). The carpets in these spaces have since been recently replaced with modular carpet tile and the carpet tile is in excellent condition.

Specific Issues	Recommendations
Terrazzo tile is in excellent condition.	As part of any major alterations, preserve as much original terrazzo as possible.
Vinyl Tile is in good condition with some areas of wear.	Continue to maintain vinyl tile under current practice. Repair localized areas of broken or loose tile. As part of any major alteration, abate tile and mastic.
Ceramic mosaic floor tile is dirty with some grout staining observed.	Thoroughly clean all floor tile surfaces. Treat all floor tile grout with grout stain remover and seal all grout after treatment.
Wood floors show areas of localized water damage, buckling at coiling partition floor track, loose flooring, and missing vented based.	Repair damaged, loose, or stained wood flooring. Replace missing vented wall base.
Auxiliary gyms have original flooring which is flaking in several locations.	Refinish auxiliary gym floors.

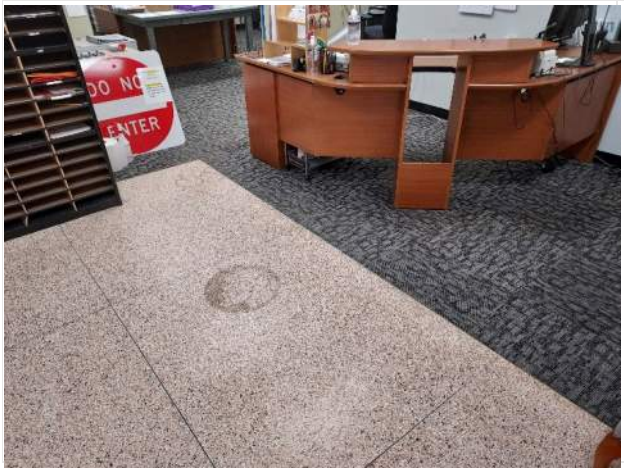

Image 55

Image 56

Image 57

Image 58

Image 59

Image 60

Shop wood floor finish is worn away in most areas. Floor has localized areas of damage and staining.	Repair or replace damaged and stained areas (approximately 20% of floor area). Refinish wood floor.

Walls, Partitions, and Wall Finishes

Interior partitions are generally of two types: concrete block masonry and metal stud framed with plaster over lath board. Most walls and partitions are in good condition (Image 57) with only a few minor areas of cracked plaster finish observed. Janitor closets showed the worst wear of plaster finished due to the constant use of water. At one janitor closet (Image 47), water had infiltrated into one wall and plaster was failing in the adjacent room (Image 58); it is assumed that the studs are rusted in this location.

Most of the exposed concrete block is painted except for the gymnasium, where bare pumice block was used (Image 59), presumably for superior acoustic properties. Similarly, most of the exposed plaster finishes are painted except for a teacher's work room where wall covering was installed over the plaster (Image 60). In that room, the wall covering has peeled away from the plaster. In locations with simple painted block or plaster, the finishes have held up quite well. Some areas, like janitor closets (Image 61), need cleaning/repainting of block walls or patching and repainting of plaster finishes.

Ceramic tile features prominently in many spaces such as toilet rooms, primary corridors, the cafetorium, entry vestibules, and various other high traffic, high visibility areas. Again, much of this tile is dated, but in good condition. There were some limited areas of observed tile damage, particularly in toilet rooms with some damaged areas observed in corridors and the locker rooms. Grout in many areas is stained, particularly in toilet rooms, shower rooms, and staff toilet rooms with showers (Image 63). Tile in some areas such as the main entry and corridors near the administrative offices have been recently treated with a spray applied elastomeric coating (which may simply be acrylic latex paint); these areas are in very good condition (Image 64).

In the main and auxiliary gymnasiums there is a wood wainscotting (Image 59) up to 7'-4" which is in fair to poor condition. It is heavily damaged and in some places the face veneer is delaminating.

The cafetorium also includes some molded solid redwood paneling and redwood veneer paneling. The solid wood molding is in good condition, and the veneer plywood paneling is in fair condition generally, but poor condition around windows where condensation appears to have stained the plywood (Image 65). This space also incorporates acoustic plaster at high soffits and walls (Image 66). Because the plaster is more porous and located near unit ventilators, it has accumulated more dirt than other plaster surfaces. Other than a dingy appearance, the acoustic plaster is in good condition.

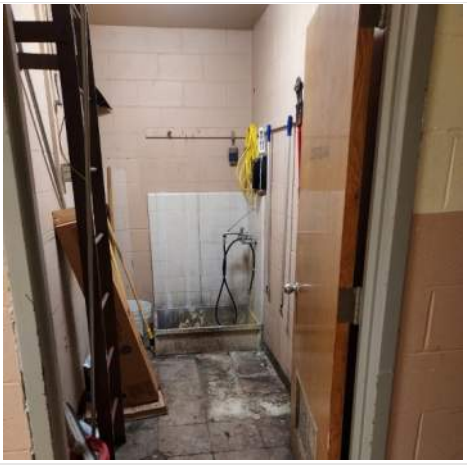

Image 61

Image 62

Image 63

Image 64

Image 65

Image 66

Some secondary corridors and stairways include facing brick as the interior finish; all areas with brick wall finish were observed to be in good to excellent condition.

Specific Issues	Recommendations
Some areas of plaster finish are cracked or otherwise damaged, particularly in custodial closets.	Repair damaged plaster finish and repaint.
Painted concrete block in custodial closets is extremely dirty.	Prepare and repaint concrete block.
Ceramic tile in shower and toilet are dirty and have stained grout.	Thoroughly clean all wall tile surfaces. Treat all tile grout with grout stain remover and seal all grout after treatment.
Portions of ceramic tile are broken.	Repair broken ceramic tile.
Gymnasium wood wainscotting is in poor condition and beyond its service life.	Replace gymnasium wood wainscotting.
Solid and veneered wood paneling in cafetorium is worn and in some areas exhibiting signs of moisture damage, particularly around windows.	Refinish all wood paneling. Replace moisture damaged portions at cafetorium window jambs.
Acoustic plaster at cafetorium is dirty.	Prepare surface for refinishing. Refinish with spray applied cotton based acoustical plaster.

Interior Windows

There are very few interior windows in the building. Large hollow metal windows are featured in the library and main office (Images 67 and 68). Smaller hollow metal frames are located between offices areas and the spaces they serve such as at the art classroom office, girls shower room office, and kitchen office. All of the frames are in very good condition. All frames feature clear vision glass with the exception of the frames around the administration offices, which includes wired glass.

Image 67

Image 68

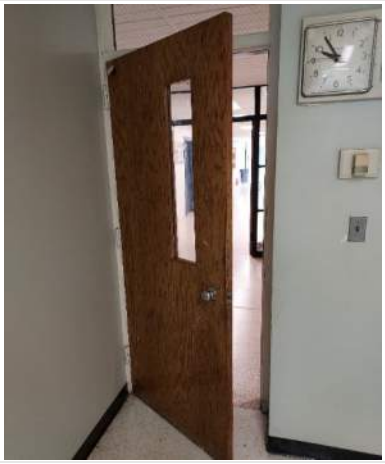

Image 69

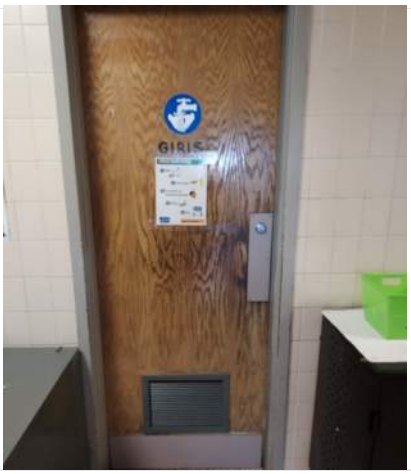

Image 70

Image 71

Image 72

Specific Issues	Recommendations
Interior windows at offices include wired glass, which is safety concern.	Replace wired glass with clear vision glass or tempered safety glass in areas required by the building code.

Interior Doors

Most interior doors to classrooms, offices, toilet rooms, storage rooms, and other occupied spaces are red oak wood doors in hollow metal frames (Images 69 and 70) with some hollow metal doors at back-of-house and custodial spaces. Exit doors at stairwells incorporate hollow metal doors with vison panels; these doors are provided in hollow metal frames with glazed sidelights and transoms (Images 71 and 72). All glazing in wood and hollow metal doors and transom or sidelight panels was observed to be wired glass.

Many of the wood doors are very dirty with staining and/or delaminated veneer observed around door hardware and near the floor, particularly at toilet rooms (Images 70 and 73). Typical doors do not feature modern classroom, storage, or office security function hardware, nor do they include hardware that is accessible. Some door leaves appear newer and are likely replacements, but many of the replacements still do not provide accessible hardware (Image 74). Egress hardware at stairs and in corridors varies in terms of function, but nearly all of it is non-compliant with some doors on manual hold-opens and several that do not latch (Image 72).

Specific Issues	Recommendations
Wood door leaves are worn, dirty, delaminating, and do not incorporate door hardware that accommodates current security best practices.	Replace wood doors. (While some wood doors could be re-finished, the fact that many of them should be fitted with new hardware would add to the labor cost of simply refinishing.)
Hollow metal doors, including stair egress doors are antiquated, not rated where required (egress stairs), and do not incorporate door hardware required by current codes.	Replace hollow metal doors. (While some hollow metal doors could be modified and repainted, in many locations they are not part of fire rated assemblies as required by code.)

Image 73

Image 74

Image 75

Image 76

Image 77

Image 78

Door glass lights and metal frame side lights and transoms are wired glass. Wire glass is not a suitable material for safety glazing or fire rated glazing.	Replace all transom and sidelight glazing with glass appropriate to the use (safety and/or fire rated). If doors leaves are not replaced, replace all window glass lights with glass appropriate to the use (safety and/or fire rated).

CEILINGS

The predominant ceiling finish throughout the facility is acoustic tile. These original ceilings were 1' x 1' flush tiles on concealed suspended framing and can be observed in most educational and office spaces. These ceilings are in poor condition. In nearly every space, tiles are missing or severely stained – mostly due to pervasive roof leaks over the years. The result is a patchwork of damaged tiles, replacement infill tiles, or replacement with more conventional 2' x 2' or 2' x 4' suspended acoustic tiles on exposed suspended metal grids (Images 75 & 76). In some areas, most notably some of the primary corridors and the library, entire ceilings have been removed and replaced with modern 2' x 4' suspended acoustical ceiling systems (Image 77), presumably as part of lighting upgrades or Library renovations. These are in fair to good condition. In the library, many of the ceiling tiles were observed to be sagging considerably (Image 78) even though they are relatively new.

In many wet service areas, such as the boy's and girl's lockers and many of the gang toilet rooms, the ceilings are plaster finish (Image 79). Locker areas and the kitchen include moisture resistant ceiling tiles (Image 80). Many of these are in good to fair condition with some minor areas of localized moisture damage. Evidence of repairs was seen in several toilet rooms (Image 81).

Some high bay spaces such as the gymnasiums and the mezzanines above the locker rooms have exposed structure and roof form boards. In all spaces, the underside of roof is stained from years of water leakage and paint on exposed joists is flaking off (Image 82). These exposed ceiling spaces are showing signs of wear in all spaces and in need of refurbishment.

Specific Issues	Recommendations
Original acoustic tiles are failing in nearly every space observed.	As part of any major alteration, replace concealed grid acoustic tile ceilings with conventional 2' x 2' suspended grid acoustical ceilings.

Image 79

Image 80

Image 81

Image 82

Image 83

Image 84

Plaster ceilings in some wet service areas have been damaged and/or paint is peeling.	Repair plaster ceilings. Repaint plaster ceilings with gloss paint to inhibit moisture damage.
Fiberglass roof form deck is stained from years of roof leaks. Paint on exposed roof joists if peeling and in many locations, bare steel joists are showing signs of surface rust.	Following replacement of the roof, prepare and repaint all exposed ceiling roof deck and exposed structure.

Accessories, Fixtures, and Equipment

The elevator is original to the building and still functions adequately. It has been updated with modern controls, including fire department controls (Image 84). The elevator cab finishes and lighting are dated (image 83), but otherwise in good condition. The elevator does not meet elevator and accessibility code dimensional criteria in terms of cab size or door opening.

Stair handrails/guardrails are also original to the building, and all appear to be in good condition (Image 85). However, none of the observed guardrail assemblies met the dimensional criteria in the building or accessibility codes.

Four types of operable partitions were observed. Manual folding partitions are used to subdivide classroom blocks in the two-story portion of the building, allowing groups of three classrooms to be opened to each other (Image 86). All these classroom partitions were closed during the visit. The finishes and tracks appear to be in fair condition, but it is unknown if the partitions still function. Based on the construction type and condition of ceiling tracks, floor seals, and passage doors, it is assumed that the partitions create poor acoustic separation between classrooms. An accordion style room divider remains in what was once teacher breakroom and workspace. The divider and track appear to be in good condition but use of the divider was not observed. Motor operated paneled dividers in the cafetorium can sub-divide the space into three smaller instruction spaces (Image 87). The condition of the tracks and panels appear to be good, and the panels may even be replacements given the relatively new look of the hardware. Operation of the partitions was not observed during the visit. Finally, large coiling wood slat dividers can subdivide the auxiliary gyms from the main gym and also subdivide the main gym in half (Image 88). One divider was observed to be in the closed position and the others were in the open position. Operation of the partitions was not observed during the visit. The condition of the wood slats was good with some observed damage on the lower portion of the closed partition. Operable passage leaf doors within the coiling dividers appeared to be in fair to poor condition.

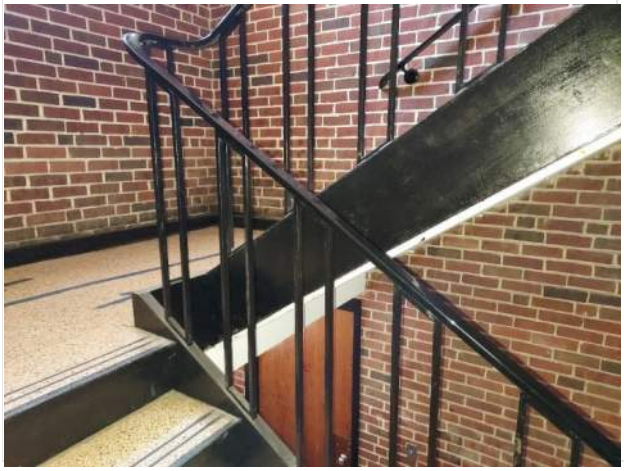

Image 85

Image 86

Image 87

Image 88

Image 89

Image 90

Lockers in corridors appeared to be recently replaced and were in excellent condition. Lockers in other portions of the building, including boy's and girl's locker rooms and staff lockers appear to be original to the school and are in poor condition (Image 89).

Recessed fire extinguisher cabinets in corridors ranged from good to fair condition and several some were missing cabinet door glass. Wall signage indicating fire extinguisher locations was observed in corridors.

Stainless steel corner guards were observed at outside corners in several high traffic areas such as corridors that feature ceramic wall tile. The corner guards are in good to excellent condition and some of the guards were painted along with adjacent wall tile (refer to Wall Finishes section above).

There was a range of different display cabinet types throughout the school. Wood display cabinets and trophy cabinets that are original to the school are in good to fair condition with some failure of finishes or delamination observed. A newer aluminum framed replacement display cabinet was observed to be in good condition.

There are various types and configurations of casework depending on the room type. Typical classrooms include bookshelves with laminate tops flanking unit ventilators along exterior walls and a corner sink base cabinet (Image 90) as well as a metal storage cabinet in the corner of each classroom (Image 92). Typical classroom casework ranges from fair to poor condition with mild to extensive wear and delaminating countertops observed in many spaces. Science classrooms contain perimeter base cabinets with solid resin countertops and a teaching station with a casework display island and tall storage cabinets (Image 91). The teachers station includes a sink and gas turrets and two of the three science teacher stations are provided on a low platform. Science casework is generally in good to fair condition with some casework in poor condition. Several cabinets were observed with delaminating veneers. Science countertops are generally in good condition. The food classroom incorporates various configurations of wood casework with laminate countertops; this casework is in poor condition with numerous missing or broken components, delaminating veneers and countertops, and outdated cooking appliances (Image 93). Art classrooms include wood veneer work tables with resin countertops and stainless steel sinks and the Clothes casework includes a series of tall wood storage cabinets. The casework in these spaces is in fair to poor condition, again with missing or broken components and delaminating veneer being typical. Teacher work spaces incorporated banks of casework with laminate tops, generally in fair to poor condition. No accessible classroom sinks were observed.

Classrooms are equipped with chalkboards that appear to be original to the building. In some classrooms, the chalkboards are still being used and appear to be in good condition. However, in most classroom, a marker surface has been directly fastened to the face of the chalkboards. Not only does this permanently damage the chalkboard, but the marker surface is not rigid and in many

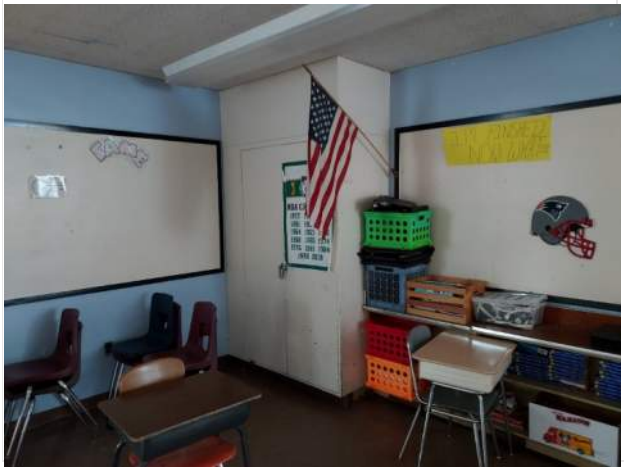

Image 92

Image 91

Image 93

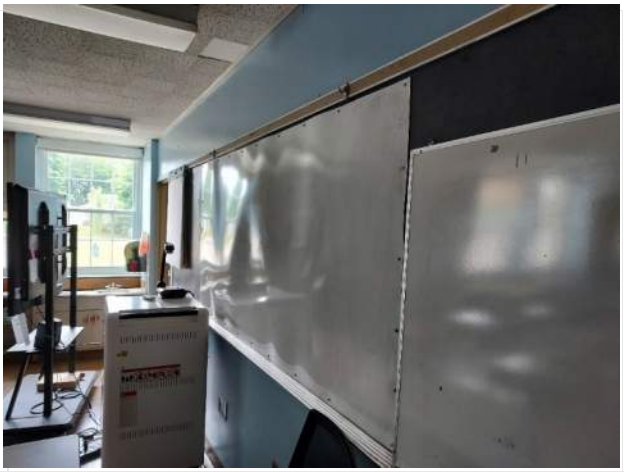

Image 94

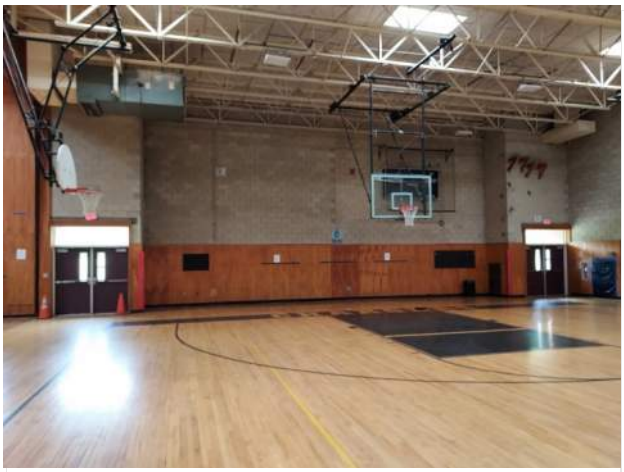

Image 95

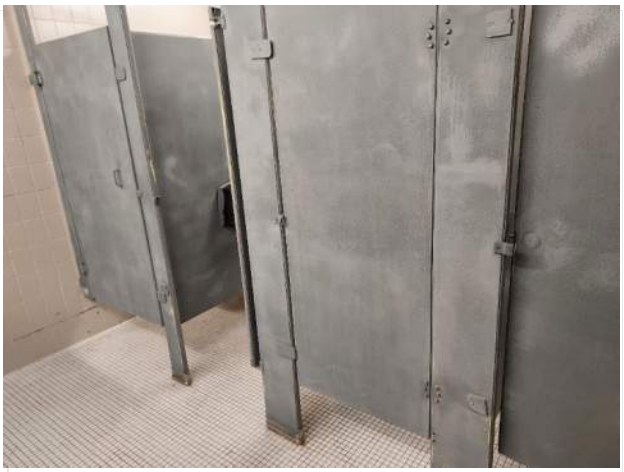

Image 96

rooms was observed to be buckled and wavy (Image 94). Electronic instructional devices vary widely from room to room; refer to the Technology Assessment portion of this report for additional detail.

In the main gymnasium there are six motor operated retractable basketball backstops. These were in various states of retraction and appear to be operational. The main court backstops appear to be in good condition while the cross-court backstops are older, but still in fair to good condition. One scoreboard was mounted on the exterior wall at the east end of the main gym (Image 95). No shot clocks were observed. No wall pads were observed except at outside corners. The main gym also contained loose folding bleachers stored along the south wall. These bleachers appear to be in good condition. The north auxiliary gym included gymnastic apparatus mounting grommets in the floor which appear original to the building. There was also climbing equipment mounted to exterior walls in the auxiliary and main gymnasium. These appear to be in good condition but unfortunately were though-bolted to the exterior wall, resulting in penetrations that could permit bulk water, condensate water, and air infiltration into the building.

In the Laundry room between Food and Clothing classrooms, there is a clothes washer and dryer that appear to be in fair condition, but the dryer is not ducted to the exterior.

Toilet partitions in most gang toilet rooms and boy's and girl's shower rooms are original to the building (Image 96); most are in poor condition with many damaged partitions noted. In some locations they are still in fair condition. In one gang toilet room, the partitions have been replaced and the replacement partitions are in fair condition. Toilet room mirrors are missing or the silvering has failed (Image 99). Toilet room accessories are of various types and few are original to the building. On the whole, their condition can be summarized as fair, but in nearly every space observed, accessories were not mounted in accessible locations. Similarly, plumbing fixture conditions vary widely: some are antiquated, in poor condition, and in many toilet rooms, plumbing fixtures have been removed (Image 97). Urinals are not screened from each other as required. Refer to the Plumbing Assessment portion of this report for additional detail.

Showers in the boy's and girl's locker rooms differ in layout; the boy's showers gang style with stainless steel enclosure (Image 99). The fixtures appear to be in good condition, but function was not observed. The girl's showers include private locker and changing areas on each side of a single shower stall (Image 100). These changing & shower areas are in fair condition with most finishes rusted or stained and many lockers not functioning. In various staff toilet rooms, stand-alone shower enclosures are provided. Nearly all of these are in poor condition with some showing many years of failed attempts at repair (Image 101).

Science classrooms include emergency showers which appear to have been added as supply piping is exposed in the corridors (Image 102). Function of the showers was not observed.

The Cafetorium platform includes stage curtains, rigging, and lighting; refer to the Theatrical Assessment portion of this report for additional information.

Image 98

Image 97

Image 99

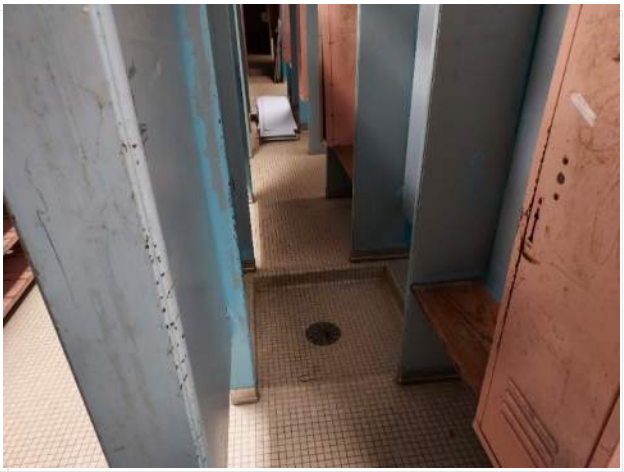

Image 100

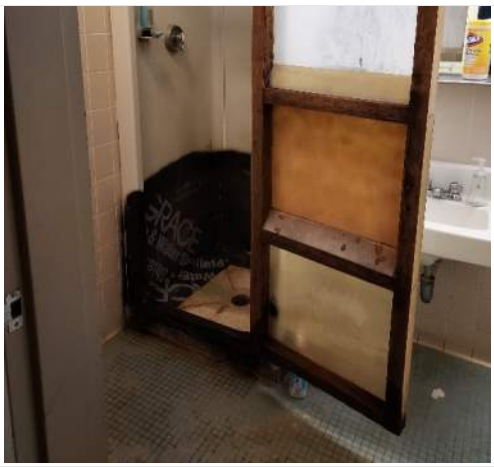

Image 101

Image 102

Refer to the Food Service Assessment portion of this report for detail on kitchen equipment.

Specific Issues	Recommendations
Elevator has exceeded its service life and does not comply with elevator or accessibility codes.	Provide a new compliant 3500 lb. capacity hydraulic elevator.
Guardrails do not comply with building code requirements for height, handrail grasp ability, and likely would not satisfy structural requirements.	Replace all stair guardrails with compliant assemblies.
Classroom folding partitions are in disrepair and provide poor acoustic separation between spaces.	Replace all folding partitions with manual room dividers with 50 STC minimum.
Gymnasium coiling partitions are in fair condition with passage doors in poor condition.	Service and refinish wood slat coiling partitions. Replace passage doors with new doors incorporating accessible hardware.
Some fire extinguisher cabinets are in disrepair.	Replace or repair damaged fire extinguisher cabinets.
Casework in nearly every educational or administrative space was in fair to poor condition with failing veneers, laminates, hardware, missing components, and is generally not accessible.	Replace all casework with new wood or laminated casework, laminate tops, and heavy-duty hardware. In science classrooms and art classrooms, provide resin epoxy countertops.
Chalkboards are largely out of use or have been damaged by the installation of flexible marker surface.	Replace all chalkboards with markerboards.
Toilet room partitions and accessories have outlived their service life and are in various states of repair.	Replace all toilet room accessories, including toilet paper dispensers, soap dispensers, mirrors, sanitary napkin disposal units, and toilet partitions. Provide urinal screening.

Toilet room layouts are not accessible, and fixtures are in disrepair.	As part of a major alteration, provide all new plumbing fixtures incorporating accessible fixture layouts.
Shower room configurations are outdated and do not meet modern functional requirements. Locker room equipment and fixtures are antiquated, in poor condition, and do not meet accessibility requirements.	As part of a major alteration, provide all new locker and shower room layouts, including slab demolition and new shower room, locker room, and toilet room configurations and equipment complying with current accessibility codes.

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EXISTING CONDITIONS: STRUCTURAL

ENGINEERS DESIGN GROUP, INC.

Executive Summary

The purpose of this report is to describe, in broad terms, the structure of the existing building, comment on the existing structure, comment on the structural integrity of the building and comment on the structural code issues related to the future renovation and expansion of the existing building. In general, the existing structure is performing very well and should continue to do so in the context of a major alteration or renovation. Depending on the proposed scope of alterations, some modifications and improvements to the structural systems will be required to comply with current codes.

Scope

- Description of existing structure.
- Evaluation of the structural integrity of the building.
- Comments on the existing condition.
- Discussion of primary structural code issues that would influence the renovations and design of new additions.

Basis of Report

This report is also based on the our visual observations during our site visit on July 1, 2021 and the review of the original design drawings prepared by Korslund, LeNormand & Quann, Inc. dated May 15, 1968.

During our visit, we did not remove any finishes; so, our understanding of the structure is limited and may have to be further evaluated as the design evolves.

Building Description

The school is located on 685 Washington Street in Haverhill, Massachusetts. The school is essentially a one and two story steel masonry and concrete structure. The school structure was constructed in 1968 and no major renovations or additions have been constructed since the original construction. In 2012 minor renovations were conducted and windows were replaced in the entire school. The typical roof construction is minimum 2" of poured gypsum concrete on 1½" of insulated foamboards supported on open web steel joists supported on interior and exterior masonry bearing walls in the Part A of the school that houses the Gymnasium, Music spaces, cafetorium and other ancillary spaces. The typical roof construction is the same in Part B, the academic portion of the school, here the open web steel joists span between interior steel beam and columns and exterior masonry walls. The second floor and the two mezzanine spaces in the gymnasium are 2½" concrete slab on ½" metal form deck supported on open web steel joists

spanning between steel beams, columns and masonry bearing walls. The typical lowest level floor is a concrete slab on grade. The entire structure is supported on reinforced concrete shallow foundations. The interior and exterior masonry bearing walls help in resisting the lateral loads of the structure. The existing Part A and B portions of the school are separated by way of an expansion joint.

Image 1

EXISTING CONDITIONS

Based on our observations, the school structure is functioning well based on the age of the school.

- We observed that the non-structural masonry walls are not adequately connected to the structure.
- We observed several cracks in the interior masonry walls and exterior masonry façade.
- We observed signs of past water leaks and ponding of water on the low roof at several locations. The gypsum and foamboard roof deck assembly can deteriorate over time if they are exposed to moisture over a long period of time. The extent of this damage can be evaluated when the deck is exposed by removing the roofing membrane or by conducting an infrared survey of the roof for moisture in the roof system. If it is determined that there is substantial damage to the roof deck we may have to consider replacing the damaged portions with metal roof deck.
- We did not observe any signs of foundation settlement, or any undue vibrations from footfall and traffic on the supported floor slab.

- We observed some cracks in the supported deck and the flooring, they do not appear to be a structural concern.

Proposed Schemes

Based on the requirements of the code, no structural upgrades are triggered for any proposed renovations of limited scope that do not invoke any required structural modifications. The extent of the code required structural upgrades is dependent on the extents of the proposed renovations. The following is a description of the compliance methods that may be triggered depending on the extents of the proposed schemes as dictated by other disciplines.

General Code Considerations

If any repairs, renovations, additions or change of occupancy or use are made to the existing structure, an evaluation of the structure is required to demonstrate compliance with 780 CMR, Chapter 34 "Existing Building Code" (Massachusetts Amendments to The International Existing Building Code 2015). 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. The three compliance methods are as follows:

1. Prescription Compliance Method.
2. Work Area Compliance Method.
3. Performance Compliance Method.

For more information on these compliance methods, refer to the Regulatory Overview section of this report. A summary of the structural implications of the various compliance methods follows.

Prescriptive Compliance Method

In this method, compliance with Chapter 4 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.

Alterations

- If the proposed alterations of the structures increase the demand-capacity ratio of any lateral load resisting element by more than 10 percent, the structure of the altered building or structure shall meet the requirements for the code for new construction.
- Where alterations increase the design gravity loads by more than 5 percent on any structural members, those members would have to be strengthened, supplemented, or replaced.

Additions

Additions can be designed to be structurally separate or structurally connected to the existing building. Based on the project scope, the following structural issues must be

addressed: The requirements applicable to the existing structure for connected additions are similar to those for altered structures.

- All construction of all addition areas must comply with the code requirements for new construction in the IBC.
- For additions that are not structurally independent of an existing structure, the following rules apply to the existing building:
  - The existing structure and its addition - acting as a single structure - must meet the requirements of the code for new construction for resisting lateral loads. Exceptions allow that structural elements that only resist lateral forces whose demand-capacity ratio is not increased by more than 10 percent may remain unaltered.
  - Any load-bearing structural element for which the addition or its related alterations causes an increase in the design gravity load of more than 5 percent shall be strengthened, supplemented or replaced. This may invoke or cause additional renovation work to access the structure.

In order to avoid invoking required structural modifications to the existing building, any planned additions should be designed as structurally separate buildings.

Work Area Compliance Method

In this method, compliance with Chapter 5 through 13 of the IEBC is required. The extent of alterations has to be classified into LEVELS OF WORK based on the scope and extent of the alterations to the existing building. Refer to the Regulatory Overview section of this report for an explanation of the Levels of Work.

This report assumes that planned renovation schemes would affect more than 50 percent of the floor area and invoke Level 3 Alteration requirements, and the following analysis is based on that assumption. In addition, there are requirements that have to be satisfied for additions to the existing structure.

Level 3 Alterations

- Any existing load-bearing 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.
- 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.
- Existing anchorage of all unreinforced masonry walls to the structure have to be evaluated. If the existing anchorage of the walls to the structure is deficient, the tops of the masonry walls will require new connections to the structure.
- 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, the project must demonstrate that the altered structure complies with the loads applicable at the time of the original construction (or the most recent major renovation) 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 must be strengthened, supplemented, or replaced in order to comply with reduced IBC level seismic forces.

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.

SUMMARY

The existing school structure appears to be performing well. All of the structural components that are visible appear to be in sound condition. The cracks in the exterior masonry façade and interior masonry walls are not a structural part concern and they should be repaired or masonry repointed as part of an on-going maintenance program. The cracks in the supported floors and slabs on grade are not a structural concern. The signs of past leaks and ponding of water on the roofs may be signs of damage to the roof assembly. It is possible that the gypsum and foamboard roof deck system may have been damaged or compromised from exposure to moisture form the past leaks. The extents of the damage can be determined by either exposing the gypsum deck by removing the roofing during a reroofing project or by conducting an infrared survey of the roof for moisture in the roof assembly. The damaged portions of the roof system will have to be rplaced with roof metal deck.

The compliance requirements of the two Prescriptive and Work Area Compliance methods are very similar in most respects for a major renovation. The Prescriptive Compliance Method

would be more restrictive, as it would likely require that the existing lateral load resisting systems of the existing building meet the requirements of the code for new construction of the IBC, even for small increases of design lateral loads. Based on this, we would recommend the Work Area Compliance Method for the project.

Any major proposed renovations and additions would likely require that the structure be updated to meet the requirements for the Code for New Construction. This may require addition of reinforced masonry shear walls with new reinforced concrete foundations, connecting the floor and roof diaphragms to the existing masonry walls. All of the existing masonry walls would have to be adequately connected to the roof and floor structure.

EXISTING CONDITIONS: MECHANICAL

GARCIA, GALUSKA DESOUSA CONSULTING ENGINEERS, INC.

EXECUTIVE SUMMARY

The HVAC systems serving the Dr. Albert B. Consentino Middle School are a gas-fired heating hot water plant, unit ventilators with hot water heating coils, both general and dedicated exhaust systems communicating to roof and inline exhaust fans, terminal hot water heating units, and a pneumatic control system. The school's HVAC systems appear to have received below average maintenance over its occupied years. Even with proper maintenance, through normal operation, systems gradually deteriorate due to scale, poor water conditions, and lack of preventive maintenance. Systems will gradually deteriorate to a point of exceeding their maximum serviceable life. While the heating hot water system is relatively new, most of the building HVAC systems are in poor operating condition, missing components, show signs of leakage, and need replacement. The limited pneumatic temperature control system appears compromised due to failed pneumatic components. The overall HVAC system has become inefficient and costly to operate and maintain. Ventilation rates and acceptable air-quality are likely compromised due to the surface contamination on many systems as well as inoperable or poorly operating outside ventilation controls.

HEATING HOT WATER PLANT:

The Consentino Middle School building is heated by a boiler plant consisting of three (3) natural gas fired heating hot water boilers. The boilers are forced draft utilizing room air for combustion and directly venting flue gases to the outdoors. The heating hot water plant is piped in a primary/secondary configuration with six (6) pumped zones. Two of the boilers are manufactured by HB Smith, they are constructed of cast iron, Model 28HE-17 (Image 1), with maximum input capacity of 5,238 MBH. Both boilers are provided with matching Power Flame burners, Model C4-G-25HBS-17. The third boiler is an Aerco, Benchmark 2.0 model (Image 2), high-efficiency condensing boiler, with an input capacity of 2,000 MBH.

The flue gases for the Smith boilers are combined into a single galvanized venting system. The mechanical room has a high/low make-up combustion air system to allow for the forced draft Smith boilers to operate. The Aerco boiler has its own direct vented intake and exhaust duct systems that terminates through the mechanical room roof.

The heating hot water distribution system serves several terminal and air handling type units such as, fin tube radiation, cabinet unit heaters, heating and ventilation units, and unit ventilators. Several sections of the hot water piping and insulation located within the boiler room appear to be in poor condition, showing signs of water damage, rips, tears, and punctures. The majority of pipe throughout the building was otherwise concealed but expected to be in satisfactory condition. (Images 3, 4)

Specific Issues	Recommendations
Main heating hot water boilers are not high efficiency and provide a max of approximately 82% efficiency.	Replace entire heating system with a new high efficiency condensing boiler plant with electronically commutated motors (ECM) pump arrays for increased energy savings. Save existing high efficiency condensing boiler and reuse for renovation or at other Town location.
Signs of corrosion on pumps/piping and flanges. Pipe integrity unknown. Water damaged insulation.	Replace entire piping system with a combination of schedule 40 black steel and copper piping and utilize dielectric fitting for dissimilar materials. Replace insulation.

Image 1: HB Smith Cast Iron Boilers, Model 28HE-17

Image 2: Aerco gas-fired Condensing Boiler, Model Benchmark 2.0

Image 3: Existing Boiler Pump With Signs of Leaking

Image 4: Heating Hot Water Pipe Insulation with Water Damage

ATC Controls

The building heating and ventilation systems are controlled by a combination of pneumatic and direct digital control systems. There is a Pneumatic control air compressor manufactured by Quincy with a 2 HP motor that is located in the boiler room (*Image 5*). The pneumatic system controls a majority of the buildings control components with the direct digital control system as an overlay (*Image 6*). This overlay allows some control of building components via a building management system. The direct digital control system is manufactured by Siemens. There are a limited amount of spaces that are provided with an actual Siemens thermostat for control and monitoring. The spaces are limited to the Gym, Café and Library. Overall, the building management system is used for monitoring and on/off operation of boilers and pumps. The system is antiquated and in need of replacement due to its limited capability with equipment control and overall decreased thermal comfort.

Specific Issues	Recommendations
Pneumatic control systems are generally considered inefficient, and unreliable. Many of the existing pneumatic thermostats are damaged and non-operational.	Replace the entire Pneumatic control system with current direct digital control (DDC) technologies for improved reliability, controllability, and the ability for a web-based building management system (BMS)

CLASSROOMS:

The classrooms are heated and ventilated by hot water unit ventilators (*Image 7*). The hot water coil valve and dampers are pneumatically actuated. Ventilation air brought in thru the unit ventilators is relieved via a low-wall grille typically located near the entryway of the classroom, connected to a central exhaust system with fans located on the roof. The unit ventilators appear to be originally installed equipment, are in poor condition and are reaching, or beyond, their expected service life. Older unit ventilators are inherently noisy, and as a result some faculty turn fans off, which effectively stops the flow of ventilation air. Additionally, books and other classroom materials are occasionally placed in front of or on top of unit ventilator grilles which creates noise and reduces ventilation effectiveness. The classrooms are generally provided with window air conditioners for cooling needs (*Image 8*).

Specific Issues	Recommendations
Currently, installed Unit Ventilators have far-exceeded their expected service lives and are therefore noisy & approaching failure.	Provide new HVAC equipment & associated control systems to provide the classroom spaces with greater indoor environmental conditions.

There are not any sources of supplemental heating currently installed for maintenance of unoccupied space temperatures; this requires the unit ventilators to run at a greater energy cost to the building.	Provide supplemental hot water heating terminal units within all spaces as the primary occupied and unoccupied heating source.
Window air conditioners typically produce noise above newer noise criteria standards, are generally considered inefficient versus other types of terminal cooling, or central plants, and do not distribute cool air evenly throughout a space.	Provide new supplemental cooling terminal units such as min-split, or variable refrigerant flow (VRF), systems.

Image 5: Newer Quincy Pneumatic Controls Compressor

Image 6: Direct Digital Controls Cabinet in Mechanical Room

Image 1: Typical Classroom Unit Ventilator

Image 2: Typical Window Air Conditioner

ADMINISTRATION AREAS:

The administration area is heated and ventilated via ceiling mounted unit ventilators. It was unclear if these units are provided with ventilation air through a ducted roof hood or if the operable windows within the area are utilized. There is one unit which is located above the ceiling in the general area, this unit serves all general area and individual office spaces. The unit is generally loud which can create a nuisance for occupants. The grilles in this area are dirty and dusty, a filter replacement should be verified. Some of the perimeter spaces were provided with hot water unit heaters which had individual speed control.

Control for all of the administration spaces is provided by one wall mounted thermostat which is located in the general area. Overall, there is no individual control of space temperatures which decreases thermal comfort.

Specific Issues	Recommendations
Natural Ventilation is code compliant; however, ventilation is only available when the windows are opened.	Provide Mechanical Ventilation Systems to serve all spaces that currently include natural ventilation via operable windows.
Currently, installed Unit Ventilator has far-exceeded its expected service life and is therefore noisy & approaching failure.	Provide new HVAC equipment & associated control systems to provide the classroom spaces with greater indoor environmental conditions.
There is no individual temperature control for each office/space.	Provide a new direct digital control system

GYMNASIUMS:

The large and small gymnasiums are heated and ventilated by several pneumatically controlled H&V units suspended from the ceiling. There are four units in the gym proper, and an additional unit in each small gym extension, for a total of 6 units. All units supply directly to the space. Return air is also brought directly back to the H&V through a unit mounted return air damper. Relief air is through several low wall mounted relief grilles. The H&V units are provided with a hot water heating coil, supply fan, filters and a mixing box. The outside air intakes are routed from the ceiling suspended unit, directly up through the roof. The exhaust/relief grilles are in generally poor condition and in some cases are blocked entirely. Likely indicating operational issues with dampers and/or exhaust fans. (*Image 9, 10*).

Specific Issues	Recommendations
Currently, installed heating & ventilating unit has exceeded its expected service life and is in poor condition.	Provide new HVAC equipment & associated control systems to provide the gym with acceptable indoor air quality.

Image 9: Ceiling Suspended Heating and Ventilation Unit

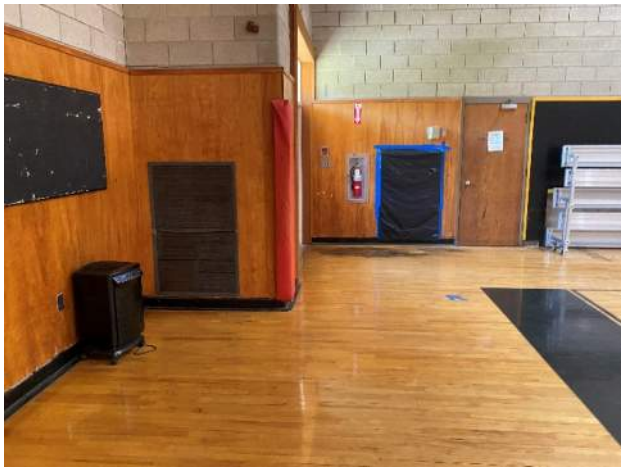

Image 10: Low Wall Exhaust/Relief Grilles (Note: Left Grille Damaged, Right Grille Covered/Blocked)

KITCHEN AND CAFETERIA/STAGE:

There is a larger stainless steel island-type range exhaust hood (Image 11) that is ducted to dedicated roof-mounted up-blast exhaust fans. There are grease filters and a fire suppression system installed for the hood. Make-up air for the kitchen appears to be provided by several space mounted unit ventilators. It appears an original commercial dishwasher has since been removed and its associated ductwork has been abandoned in place. There did not appear to be a means of general ventilation provided for the kitchen space, although it is open to the cafeteria and may be adequately ventilated indirectly from that space's mechanical ventilation systems.

The cafeteria/stage area is served by six soffit mounted unit ventilators (Image 13). It is assumed outside air is provided from roof mounted intake hoods while exhaust/relief air is provided from low wall grilles (Image 14) connected to duct and fans that terminate at the roof level, similar to the classrooms and gymnasium. There is also a low wall transfer grille (Image 12, 15) between the cafeteria and kitchen which is utilized to maintain proper pressurization during hood operations. Unit ventilators appear to be controlled with upgraded direct digital controls, with older, pneumatic controls (Image16) being abandoned in place.

Specific Issues	Recommendations
Currently, installed unit ventilator units have exceeded their expected service life and is in poor condition.	Provide new HVAC equipment & associated control systems to provide the kitchen with acceptable indoor air quality.

Image 11: Kitchen Unit Ventilator and Hood

Image 13: Transfer Gille Between Kitchen and Cafeteria

Image 134: Cafeteria Unit Ventilators

Image 14: Typical Low Wall Relief/Exhaust Grille

Image 15: Additional Cafeteria to Kitchen Transfer Grilles

Image16: Old Pneumatic, and New DDC Thermostats

GENERATOR ROOM:

The generator room is located adjacent to both the boiler room and the main electric room. The generator is ducted directly to a large exterior wall louver for cooling exhaust (Image 17). A separate pneumatically actuated damper connected to a louver is provided on an adjacent wall for make-up air (Image 18). The generator combustion fumes are directly vented to the outdoors by a black steel vent that turns up to terminate above the roof level. An Electric unit heater is also present in the space, suspended from the ceiling.

Specific Issues	Recommendations
None witnessed	

Image 17: Generator and Generator Exhaust Louver

Image 18: Generator Room Make-up Air Louver

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EXISTING CONDITIONS: ELECTRICAL

GARCIA, GALUSKA, DESOUSA CONSULTING ENGINEERS, INC.

Executive Summary

The existing systems of this facility range from original vintage to upgrades/add-ons installed including lighting upgrades. The facility has systems that do not reflect nor do they meet the needs of a modern-day facility. Code changes over the years have resulted in some existing systems that do not meet today's electrical codes. Most of the existing systems are not suited for expansion due to the incompatibility of new technologies and age of the equipment. We recommend replacement of the older electrical systems for this facility.

Electrical Distribution System

Secondary service runs underground to a utility company pad mounted transformer (Image 1) with 4" conduits to a 1600 ampere, 120/208v, 3-phase, 4-wire main switchboard with a main breaker located in electric room (Image 3) and distributes power to local and remote panelboards. Other remote panels of the circuit breaker type exist in rooms throughout the building (Image 5 & 6). The switchboard and panels were manufactured by Frank Adam (Image 4) and are original to the building. Meter socket located in the room (Image 2). Existing electrical service is sufficient to serve the existing building if no new large equipment is added. The building has an existing generator to provide emergency power which is sufficient for the heating and lighting now being served.

Specific Issues	Recommendations
Existing electrical service is sufficient if no large equipment is added.	Replace electrical service if equipment load is added.
The switchboard and panels were manufactured by Frank Adam and are original to the building.	Replace switchboard and panels during any major renovation.

Image 1

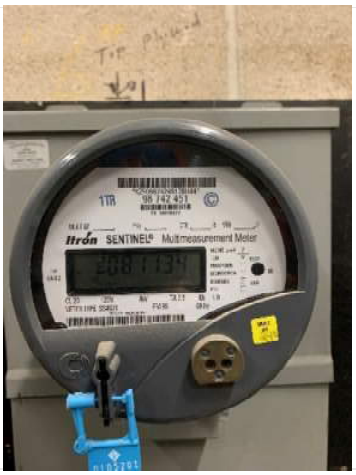

Image 2

Image 3

Image 4

Image 5

Image 6

INTERIOR LIGHTING

Corridor lighting consists of a combination of 2X2 recessed lens fixtures with (2) T8 lamps (Image 14), some are breaker controlled, which is not energy code compliant. There are some newer 2x4 LED fixtures in the renovated area of the building (Image 10). Classrooms lights consist of 1x4 surface wraparound fixtures with T8 lamps switched by one switch (Image 8). No occupancy sensors exist in the classrooms.

Some classroom have 2x4 recessed troffers with (2) T8 lamps on (2) switches (Image 7 & 12).

The open space in the Gym consists of chain mounted LED high bay fixtures, switched locally (Image 9).

Office lighting consists of surface 1'x4' wraparound fixtures (Image 11).

Media center has been renovated and has newer LED lighting fixtures (Image 13).

Fluorescent lighting should be changed to LED type.

Specific Issues	Recommendations
No occupancy sensors exist in the classrooms.	Add occupancy sensors in classrooms to conserve energy.
No daylight harvesting.	Add daylight harvesting in all areas with outside exposure to conserve energy.
Lighting is not efficient.	Upgrade to LED type light fixtures with automated lighting control.

Image 7

Image 8

Image 9

Image 10

Image 11

Image 12

Image 13

Image 14

Exterior Lighting

There is newer pole lighting in parking lot areas (Image 15). Wall packs and flood light with some ceiling mounted exist at entrances (Image 16 & 17). Most fixtures are LED type but some are still fluorescent or incandescent. Time clocks were observed in the building that provide control to the existing site lighting. All exterior lighting should be LED type.

Specific Issues	Recommendations
Some lighting is fluorescent and incandescent type.	Replace fluorescent type lighting with LED.

Image 15

Image 16

Image 17

Emergency Standby System

The building has a 65KW Onan generator (Image 18 & 19). It has an Automatic Transfer Switch (ATS) to transfer power from the utility company source to the generator during an outage (Image 20). There is a distribution panel that serves remote panels throughout the building to provide emergency power (Image 21). The generator is sized for the current building load and will not handle added load.

The exterior doors have no exterior emergency lighting in the form of remote heads (Image 22).

Most exit signs have battery back-up (Image 23). Exit sign coverage appears adequate. Exit signs seem to be in proper operating condition.

Specific Issues	Recommendations
Exterior doors have no exterior emergency lighting in the form of remote heads.	Add remote heads at exterior doors.
Emergency generator does not have the capacity for any new required loads.	Increase emergency generator to a larger size to accommodate life safety and optional standby electrical loads.
No separate life safety equipment (ATS) needed for code complaint.	Add required automatic transfer switches for life safety and provide rollup generator docking station with manual transfer switch to meet code.

Image 18

Image 19

Image 20

Image 21

Image 22

Image 23

Fire Alarm System

The fire alarm system consists of a non-addressable Fire-Lite Sensiscan 1000 control panel located in the Main Electric Room (Image 24). The graphic annunciator is located in the Vestibule. The horn/strobes are not ADA compliant (Image 29 & Item 30). Pull stations are located at the exit doors (Image 28 & 31). Smoke and heat detectors exist in corridors and classrooms (Image 26 & 27).

The toilet rooms do not have strobes and smoke detectors. There are smoke alarms in classrooms (Image 27), corridors, stairways and offices.

There are no horn/strobes in the classrooms and toilets.

A existing master Box is installed at the front entrance of the building (Image 25).

No duct smoke detectors were observed at the time of visit. Duct smoke detectors will need to be added as required for all mechanical equipment over 2000 CFM. Exterior beacons and knox box are provided at the main entrance (Image 25).

The fire alarm system is antiquated and does not meet the current code and does not provide adequate detection and notification to occupants.

Specific Issues	Recommendations
The fire alarm system is antiquated and does not meet the current code and does not provide adequate detection and notification to occupants.	Replace fire alarm system with new code compliant system including notification.

Image 24

Image 25

Image 26

Image 27

Image 28

Image 29

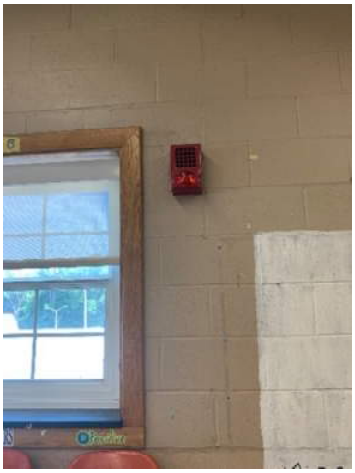

Image 30

Image 31

MISCELLANEOUS

The facility does not have lightning protection system. The receptacle coverage is inadequate in most spaces (Image 32 & 33). Typical classrooms have as few as two duplex receptacles per room. Some rooms have had surface mounted raceways with receptacles added (Image 34).

Specific Issues	Recommendations
The facility does not have lightning protection system.	Add lightning protection system.
The receptacle coverage is inadequate in most spaces. Typical classrooms have as few as two duplex receptacles per room. Some rooms have had surface mounted raceways with receptacles added.	Add appropriate quantity of receptacles for space use.

Image 32

Image 33

Image 34

EXISTING CONDITIONS: TECHNOLOGY AND COMMUNICATIONS

EDVANCE TECHNOLOGY DESIGN

EXECUTIVE SUMMARY

Technology and communication systems for this facility range from those that are original to more current systems such as the wireless network and the instructional flat panel technology. However, the newer systems, although fully functional, have been added to a building that does not adequately support these systems. There is a lack of controlled and dedicated space, power, and environmental conditioning for network switches. Furthermore, many of the core communication systems, including but not limited to the telephone, public address, and master clock systems cannot be upgraded or expanded due to the age of the equipment. We recommend that the older equipment be replaced and that the network infrastructure, audio visual systems of large assembly spaces, and the building security systems be upgraded to current standards.

STRUCTURED CABLING

The Haverhill Consentino Middle School appears to have newer network cabling installed throughout the school that is run from wall mount enclosures (Image 5) that are located in 4 or 5 shared spaces. These shared spaces include classrooms, storage closets, and offices. The new cabling is in very good condition. Older preexisting network cabling is exposed in many locations (Image 1 and 2) and in some areas abandon wire mold has been left in place. Some newer cabling has also been left exposed (Image 3 and 4).

Specific Issues	Recommendations
Newer network cabling exists. However, cabling has been run to wall mount protective enclosures in shared spaces, which is common when implementing new cabling work in the context of an older existing facilities.	Dedicated network closets should be established as part of any building renovation project, with new Cat 6A cabling installed from outlets to closets. The wall mount enclosures will not support any new cabling.
Exposed older surface mount raceways and cabling exists throughout.	Remove older existing surface mount raceways and cabling as part of any renovation project.

Image 1

Image 2

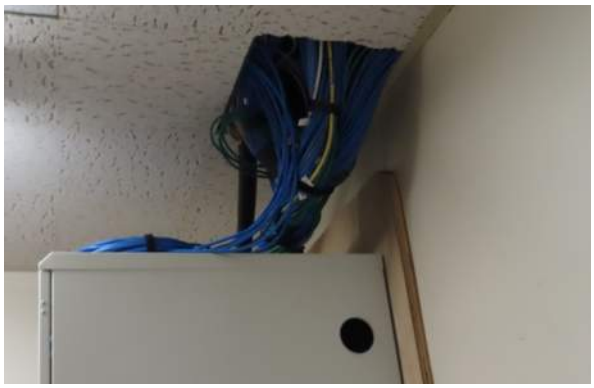

Image 3

Image 4

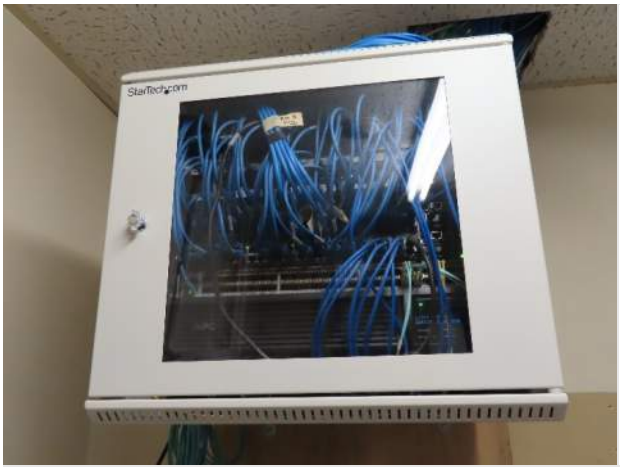

Image 5

Image 6

NETWORK SWITCHES

Brocade Network switches are installed in wall mount enclosures along with patch panels, patch cords and UPS equipment (Image 5 and 6). In some situations, it was noted that the UPS equipment did not fit in the enclosure, and it was resting unsecured on the top of the enclosure instead.

Specific Issues	Recommendations
Newer network switches are installed in wall mounted enclosures located in the shared storage and classroom spaces.	Dedicated network closets should be established as part of a building renovation project, where network switches can be secured and installed.
UPS equipment does not fit into wall mount enclosures in all cases	Dedicated network closets with free standing open relay racks will provide space for securing UPS equipment.

WIRELESS NETWORK

Wireless Access points were observer throughout the facility and located in all classroom spaces (Image 7), in large assemble areas like the cafetorium (Image 8) and in other general spaces.

Specific Issues	Recommendations
The school is relying on newer wireless network equipment for achieving network connectivity. This is the best strategy in older buildings. However, there are applications, especially streaming applications where hardwired connections are preferable.	New hard-wired data outlets in addition to cabling for wireless should be installed in all educational spaces as part of any building renovation project so that teachers and staff can make a hardwired connection to the Network when required.

Image 7

Image 8

Image 9

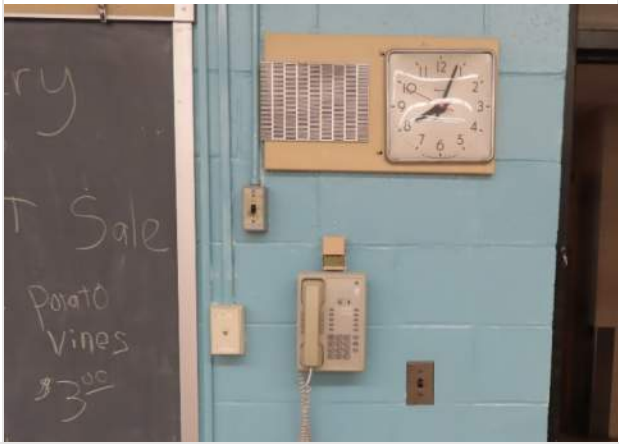

Image 10

Image 11

Image 12

PUBLIC ADDRESS AND CLOCK SYSTEM

The main public address system cabinet is located in the main office (Image 9), which is an antiquated Rauland Borg Telecenter System. Most classrooms have an intercom handset installed below the clock/speaker assembly (Image 10). A public address system console was observed in the main office (Image 11). Older Speaker-Clock assemblies original to the 1968 construction were in all classrooms but were observed to be in varying degrees of disrepair. Battery clocks of various types and sizes were observed throughout (Image 12).

Specific Issues	Recommendations
Antiquated public address System. It was noted that many speakers in the speaker/clock assemblies were missing and/or no longer function.	Install new public address main equipment including new speakers as part of any facility renovation or upgrade project.
Every variation of battery-operated clock was observed indicating that the existing master and secondary clock system is not functional.	Install new master clocks system with low voltage secondary clocks as part of any facility renovation or upgrade project.

TELEPHONE SYSTEM

The Telephone System serves primarily the main office administration area and is an antiquated AT&T Merlin System (Image 13 and 14). The handsets in the classrooms are strictly tied to the public address system for making calls between classrooms and between classrooms and the main office. There may be a connection between the public address system and telephone system at the main system side to allow for outside calls from the classroom handsets, but, it was not verifiable from the site visit.

Specific Issues	Recommendations
Telephone system is antiquated making it more difficult to service and maintain equipment in the future.	Install new Telephone System as part of any facility renovation and upgrade.
Telephone system capability may not currently extend to all classrooms and other spaces other than the main office.	Install a new Telephone system capable of incorporating telephone handsets in all classrooms and spaces.

Image 13

Image 14

Image 15

Image 16

Image 17

AUDIO-VISUAL SYSTEMS FOR LARGE ASSEMBLY SPACES

The large assembly spaces include the Cafetorium and Gymnasium, which can each be further subdivided into smaller areas. Both spaces are equipped with older audio visual technology. The speakers in the Gymnasium appear to be the original speakers form when the school was constructed (Image 15). A podium with built-in hard-wired microphone was locate on the stage of the Cafetorium. (Image 16). A relatively new large mobile flat panel display was located on the stage of the Cafetorium (Image 17). Appropriate levels of large assembly audio-video equipment were not observed.

Specific Issues	Recommendations
Older built-in Audio-Visual Systems	Upgrade all built in Audio-Visual systems in large assembly spaces as part of any facilities renovation and upgrade project
Flat panel technology is not suitable for large venue presentations.	Include a new large format projection screen with a permanently installed high lumen projector and sound system in the Cafetorium.

INSTRUCTIONAL AUDIO-VISUAL SYSTEMS

Classroom instructional technology includes a variety of systems and devices. Most classrooms are equipped with newer mobile flat panel technology with Elmo style TT12 document cameras (Image 18). However, older CRT TV's mounted form the ceiling was also observed in many locations (Image 19). Pull down projection screens (Image 21), along with older wall mount and ceiling mount projectors (Image 20) were also observed in various rooms. Some rooms may lack the functionality and educational opportunities that more current audio-visual display technology provides. Modern voice reinforcement equipment was not observed.

Specific Issues	Recommendations
Older Instructional Audio-Visual Systems were observed throughout.	Remove older systems and cabling add to the existing newer flat display technology including newer interactive flat panel technology and/or newer interactive ultrashort projectors.

Voice Reinforcement systems were not observed in classrooms	Include state of the art Voice Reinforcement systems to increase voice intelligibility for students and reduce teacher vocal fatigue during renovations or facility upgrades

Image 18

Image 19

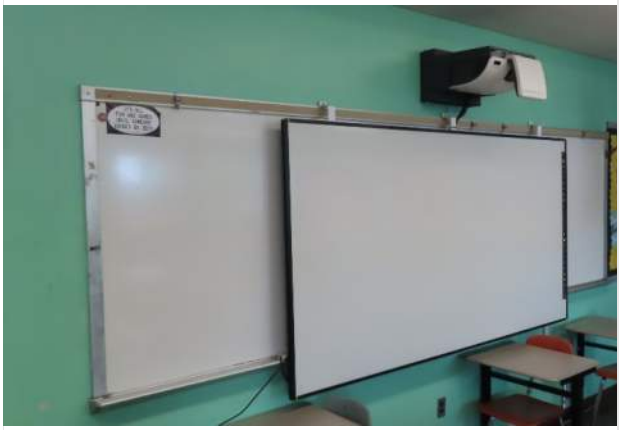

Image 20

Image 21

Image 22

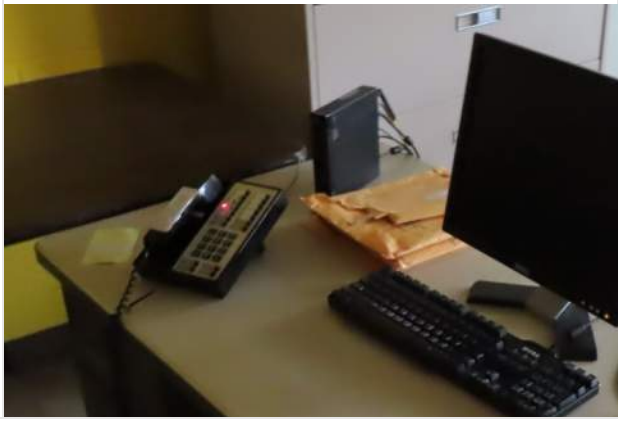

Image 23

NETWORK COMPUTERS AND PRINTERS

Mobile student technology carts for Chromebook or iPad were observed through the school (Image 22). It was assumed without confirmation that the school is either 1-to-1 or close to being 1-to-1 by the number of carts that were observed. The carts appeared to be empty, and it was assumed that either the devices were with students for the summer or being centrally managed and updated at another location. Dell micro desktop computers were observed in some teacher locations and in offices (Image 23).

Specific Issues	Recommendations
Mobile charging cars are still relevant if the school is managing the student devices.	Depending on the plan for mobile devices, design into the classroom a place where charging carts can be stored.
Mobile charging carts take up considerable real estate and are less functional if students are managing their own devices including charging.	Remove charging carts and provide more versatile charging locations for students to charge devices they are managing themselves.

DIGITAL SIGNAGE

One flat panel display was observed that may be associated with digital signage (Image 24)

Specific Issues	Recommendations
Limited or no signage displays	Add Digital Signage technology, which is an excellent medium for disseminating general information to students and staff.

SECURITY

Video surveillance and intrusion detection systems were observed with limited cameras and motion sensors respectively. A video intercom device was located at the main visitor entrance (Image 25), which had a corresponding monitor device located on the wall in the main office. It is assumed that this device also provides remote control of the main entrance door. An intrusion alarm panel was observed at the main entrance (Image 26). A surveillance camera was observed at the exterior to the main entrance (image 27). Surveillance cameras were also observed throughout the interior of the school (Image 28), and at the exterior to a secondary entrance. Generally, cameras were not observed at all entrances or on the perimeter of the building. The one exception was what appeared to be a multi-sensor camera installed on one of the light poles at the front of the school ((mage 29). Access control was not observed.

Specific Issues	Recommendations
Limited exterior video surveillance and relatively few interior cameras compared to modern schools were observed.	Add additional surveillance cameras and necessary Network Video Recorder storage as part of any facilities upgrade project.
Limited intrusion system motion sensors were observed.	Add infrared motions sensors to all windowed spaces on the first floor. Ensure all exterior doors have contacts to sense a forced entry.
There is no Access Control System.	Add an Access Control system to provide greater management and control of personnel to the facility as part of any facilities upgrade project.

Image 24

Image 25

Image 26

Image 27

Image 28

Image 29

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EXISTING CONDITIONS: PLUMBING

AKAL ENGINEERING, INC.

EXECUTIVE SUMMARY

The Haverhill Consentino Middle School has received minimum maintenance on the plumbing systems and equipment over its occupied years apart from minor upgrades in a few bathrooms. Even with adequate maintenance, systems will gradually deteriorate due to scale and poor water conditions. Some of the plumbing fixtures were not operational at the time of site visit. Majority of the plumbing equipment and systems are near the end of their useful life. Along with aging systems, many of the systems are not up to current codes. If it is anticipated that major modifications are planned for this building, then the project scope should anticipate an overall upgrade of plumbing systems.

PLUMBING FIXTURES

Most of the fixtures are original to the school and are not of the water saving type. Due to the fixture age, maintenance is routinely required on faucets and toilet fill valves to keep fixture operational. Existing water closets are wall mount flush valve type and most of which are not equipped with water conserving 1.6 gallon per flush type valve. The lavatory sinks are of the wall hung type and have manual faucets. The faucets are not metered and not comply with latest water conservation requirement. Majority of toilets are not equipped with ADA / MA accessibility compliance toilet fixtures. Urinals have non water conserving flush valves and are not provided with side shielding as required by the plumbing code. The majority of the water closets and urinals were observed to not be in working order. Some were covered with plastic cover (image 1,2&3) The existing buildings plumbing systems will need to be verified for adequacy in quantity based on planned occupancy use. Art room sinks lack solid interceptors. Science room gas turrets are not operational and are not provided with an accessible master shut off valve.

The Boys' locker rooms have showers of a gang configuration and girls' locker rooms have individual stalls. In each locker room, the shower water supply is controlled via a central water tempering control valve (image 8) Drinking fountains observed are original vitreous china fountains and are not ADA compliant (image 4). In the kitchen area, there are one three-bowl pot/scullery sink and a 2-bowl prep. sink. Two fully underground recessed indoor grease traps are provided under those sinks. Most of the kitchen appliances have gas connections for heating. Janitor closets in the facility have floor or wall mounted utility sinks. Faucets in some sinks have no vacuum breakers and lack proper backflow prevention system from mop soap detergent connection.

Specific Issues	Recommendations
Some plumbing fixtures are not functional and temporary covered with plastic cover. (image 1,2 &3)	Plumbing fixtures are to be replaced with new plumbing fixtures.
Code would require plumbing fixtures to be modified to water conservation type fixtures.	Replace flush valve and faucets to be low flow fixtures.
Fixtures are not ADA accessible.	Replace or modify plumbing fixtures to ADA accessible fixtures and in compliance with current code.
Drinking water cooler	Replace water cooler with electric refrigerated water cooler with bottle filler. The water cooler to be bi level for ADA accessible requirement.
Mop Sinks	Replace all mop receptors and janitor sinks with new fixtures and provide backflow protection for soap dispensers to comply with code.
Showers	Replace showers with new low flow fixtures, handicap accessible fixtures. Replace floor drains and mixing valves.
Emergency Showers has only cold-water supply	Replace emergency shower with new mixing valve with a feed of hot and cold water.
Urinals are not side shielded.	As part of any replacement or reconfiguration of plumbing fixtures, provide the required urinal shielding.

DOMESTIC COLD-WATER SUPPLY

The building is supplied with 3” domestic water service and enters in the Mechanical Room. The domestic service has a backflow preventer and water meter at the main line (image 5). Water piping is copper, with soldered joints. valves are gate, butterfly, and ball valves. Cold water is provided to the boiler as make-up complete with backflow preventers as to avoid cross contamination. Most of the piping is insulated. Insulation all over the school appears to be mostly fiberglass and may have asbestos in some areas. Water piping appears to be in fair condition in all the areas of the building except in the excavated space and near storage tank.

Specific Issues	Recommendations
Due to the pipe age, there is a probability that the water service could have lead containing solder in the fittings.	Water quality should be tested and monitored for any possible lead contamination and corrected if found to be a problem. If the project involves substantial renovation, we recommend complete replacement of all domestic water piping, valves and accessories because they are at end of life and does not meet the latest NSF 61 and NSF 372 standards for lead free safe drinking water Act.

DOMESTIC HOT-WATER SUPPLY

The domestic hot water needs of the building are primarily supported by gas fired water heater and direct storage tank (image 11) to generate domestic hot water. The storage tank is Lochinvar Model TVC1250 with storage capacity is 1,250 gallons and water heater is Lochinvar Model AWN1500 with 1,745 GPH of recovery rate. The current configuration requires that the large water heater to remain active in summer whenever the building is occupied to generate hot water for the building fixtures is low. There is a mixing valve located on the discharge of the water storage tank which tempers the water for general building use (image 6). A separate tempering valve is provided at the locker rooms to support code required shower discharge temperatures. The science room has emergency shower (image 14) and lack mixing valve to supply tepid water. Kitchen has its own supply 140F of water to the dishwasher and pre rinse sink.

Specific Issues	Recommendations
Due to the pipe age, there is a probability that the water service could have lead containing solder in the fittings.	Water quality should be tested and monitored for any possible lead contamination and corrected if found to be a problem. If the project involves substantial renovation, we recommend complete replacement of all domestic water piping, valves and accessories because they are at end of life.
The present hot water heater configuration has oversize storage tank and high "standby" losses during low load.	The school would benefit greatly from small water heater tank that would be more appropriately sized for the domestic water load.

There does not appear to be a two-temperature system which would be required to satisfy code requirements for occupant fixtures (bathroom sinks) to discharge hot water at a temperature no greater than 110-112°F for safety reasons, whereas the service fixtures (janitor's sinks, kitchenette sinks, etc) are required to have hot water temperatures in excess of 120°F for sanitation reasons.	The two- temperature tempering system can be addressed via a separate pipe system or locally at fixtures with point of use thermostatic mixing valve We recommend point of thermostatic mixing valve to be installed under each fixture.
There are reports that it is difficult to obtain hot water in some areas of the building indicating possible problems with the 120 degree recirculation system. The mixing valve missing a temperature gauge.	Provide new master mixing valve with temperature gauge and recirculation pumps.

SOIL WASTE AND VENT

The soil piping observed was a combination of extra heavy cast iron, with bell and spigot joints. Visible vents are galvanized steel with threaded fittings. The sanitary sewer flow is by gravity and the all the piping run below the slab and exit the building to a municipal sewer system. The kitchen 3-compartment sink and dishwasher drainage are connected to a local indoor grease interceptor. (image 13). It appears outdoor grease interceptor is not installed for the kitchen waste. The science waste is drained with glass drum traps and glass piping directly into the sanitary system. There is no separate science waste piping system or neutralization for the science waste.

Specific Issues	Recommendations
The interior surface condition of existing underground sanitary waste piping is not known.	All underground piping should be video inspected for any interior corrosion and blockage. Consider replacement in its entirety if found excessive corrosion due to its age.
Kitchen grease waste system	Replace existing grease interceptor. Coordinate with DPH for the requirement of outdoor grease interceptor. Replace all kitchen floor drains with a new sediment buckets and trap primer. Rod and clean under-ground drainage piping.

Science and Art room	Upgrade existing acid waste and interceptor

ROOF DRAINAGE

The roof drains all seem to be relatively in fair condition. The drains consisted of cast metal dome tops, flashing clamps/ gravel stops and cast-iron bodies. Piping observed was No-Hub cast iron soil pipe and fittings. No problems with the roof drain system were observed. However, in some areas we noticed significant water ponding due to HVAC condensate drain and inadequate roof slope (image 12). No overflow drainage system was observed.

Specific Issues	Recommendations
The interior surface condition of existing underground storm piping is not known.	All underground piping should be video inspected for any interior corrosion and blockage. Consider replacement in its entirety if found excessive corrosion due to its age.
Roof drain, Overflow drain and scuppers	Replace all roof drains that appear rusted and clogged. Provide secondary roof drainage scuppers to comply with code.

FUEL

The facility has a 5” natural gas enters the building near Boiler room (image 13). The outdoor gas utility split into two pipes one which serves the building utilities and the other serves the emergency generator. The gas line in the building (image 13) is low pressure and feeds the boilers, water heaters and kitchen appliances (image 14). Overall gas piping appears to be in good condition.

Specific Issues	Recommendations
Gas leak detection	In kitchen and science area, install automatic shutdown with manual reset gas valve and interlocked with CO detectors to comply with current code.
Gas shut off valve	Provide accessible master gas shut off valve in each science classroom.

Image 1

Image 2

Image 3

Image 4

Image 5

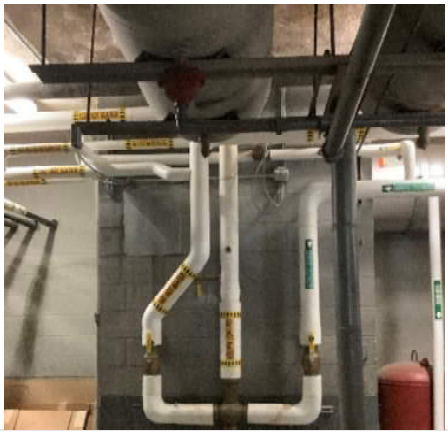

Image 6

Image 7

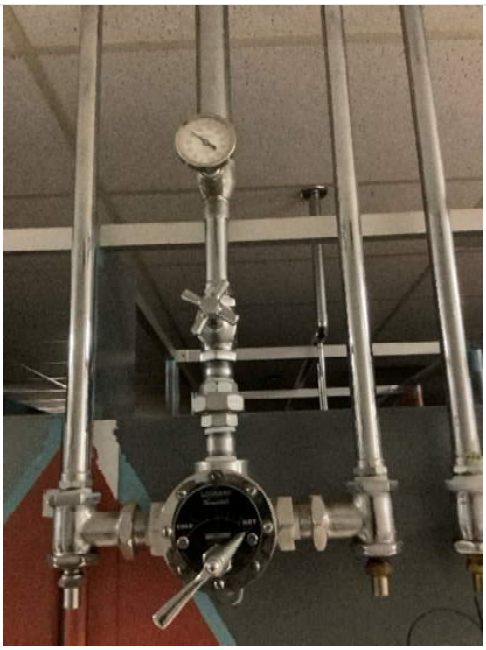

Image 8

Image 9

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Image 10

Image 11

Image 12

Image 13

Image 14

Image 11

Image 12

Image 13

Image 14

EXISTING CONDITIONS: FIRE PROTECTION

AKAL ENGINEERING, INC.

EXECUTIVE SUMMARY

There is no active fire suppression system in the building. Building has no automatic sprinklers, or fire department standpipes present.

Specific Issues	Recommendations
No Fire Protection System	If the existing building is renovated to any substantial degree, the entire building needs to be upgraded with fire suppression system per latest Massachusetts Building Code 780 CMR Chapter 9. The existing site water service and capacity needs to be evaluated for new requirement and to comply with the latest Commonwealth of Massachusetts building code and the National Fire Protection Association (NFPA). Static and residual flow values will need to be determined from a hydrant flow test. Fire Pump may be required if the hydrant flow test result shows inadequate flow and pressure. A new dedicated fire service to the building will be required from the site and which than feed the automatic fire sprinkler system covered throughout the building. NFPA-13 standard would require that all areas of the building to be protected with wet fire suppression sprinklers. Unheated area will require a dry system. Provide sprinklers and a standpipe system throughout the building to comply with current code as part of any major alteration.

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EXISTING CONDITIONS:
FOOD SERVICE

CRABTREE MCGRATH ASSOCIATES, INC.

EXECUTIVE SUMMARY

The Consentino Middle School Food Service program is a robust program that receives, stores, and produces meals for the Middle School. The finishes and foodservice equipment, in most cased, are original and more than 50 years old. Throughout the many years of use and through program evolution the existing facility is not only worn and outdated but also lacks the flexibility to adapt and efficiently serve the district's needs.

Improving cooking and serving equipment will modernize the program and allow it to more easily meet the demands of health code regulations as well as improve the appeal of the food offerings. Modernizing workstations, cooking equipment, and finishes will allow kitchen staff to focus on food production and operate more efficiently. Overall, the program is well run and the staff are highly trained and dedicated. However, they lack the full complement of tools needed to truly operate at a higher level of service.

KITCHEN AND SERVERY

General Overview

The Consentino Middle School Foodservice Program currently serves a population of approximately 750 students in grades five through eight. The original kitchen is mostly intact with minor modifications and equipment upgrades done throughout the years. Major infrastructure items such as the exhaust hood and sinks have not change since the 1968 installation. The walk-in cooler and freezer have been replaced at some point since the original equipment installation. Overall, the kitchen is very clean and of high-quality finishes that have held up well over many years of use. These finishes are appropriate but showing signs of normal wear and tear.

The walls are a mix of porcelain tile and painted block. Both types are in great condition with broken tiles at corners where impacts commonly occurred. The Storage room is a painted block wall material with a vinyl tile floor. The vinyl tile is not appropriate for a modern kitchen as it can be very slippery (Image 1). The floor within the kitchen production and serving area is terrazzo and look as good as the day it was installed.

The ceiling in the kitchen area is a hard gypsum ceiling that is in good condition. The hood includes panels that seal off the surface above, not commonly seen in older facilities. In this case it is a benefit to

being able to keep the area above clean. The walk-in cooler and freezer are not sealed with panels to the ceiling above. Some debris was observed on top of the walk-ins with no clear way to clean it.

The tray washing room is not used for its original purpose. The dish machine has been removed and the room is used for storage. This is common as we find the replacement cost of the machine is high and often not replaced in favor of lower cost disposable trays. The balance of the tray washing equipment has been left in place making for poor utilization of the remaining space.

The following specific issues will reference codes and standards. For the purposes of this report when the health code is referenced, we are citing requirements of the Federal Food Code, 2017 addition, published by the FDA as well as the Merged Massachusetts Food Code 2013 addition.

We will also reference the National Sanitation Foundation (NSF). This is an independent governing body that develops standards for foodservice equipment and facility design. All equipment, in commercial kitchens must be built in accordance to NSF standards as a requirement of the food codes.

Specific Issues	Recommendations
Wood surfaces are not allowed in a kitchen unless it is being used in a specific task as part of baking or other dough processing. Wood surfaces are difficult to maintain in the long term and they require frequent oiling and other maintenance. If not oiled the wood shrinks and splits causing health code violation since the gaps fill with debris and it is not possible to clean and sanitize. In turn this is a health code violation. To mitigate this the existing table has been clad with a plastic laminate. This laminate is an improvement but still not code complaint in a commercial heavy use setting. Damage and worn through the surfaces can be seen. This is the case at other tables as well. All food contact surface materials should be stainless steel where possible or other appropriate	Replace the table with a stainless-steel table built to NSF standards.

materials. The health code states materials must be durable, easy to clean, and tables must be built to NSF standards for use in a foodservice application. (Image 2)	
The existing exhaust hoods are mesh filter hoods. Mesh filter hood are no longer allowed in modern applications. Current NFPA 96 code mandates the use of baffle style washable hood filters. Mesh filter tend to accumulate grease witch in heavy grease applications can be a fire hazard. In this case the risk is low as school foodservice is light on grease however, low levels of grease are present. (Image 3).	Replace the hood system with a new unit that includes a modern fire suppression system equipped with the latest in fife safety features.
The lighting levels beneath the exhaust hood are not adequate. The health code requires a minimum of 50-foot candles below the hood and for any area that is being used to prepare food. (Image 4).	Replacement hood system should be equipped with a modern LED lighting and hood controls.
The serving counters shown here are a series of counters joined together to form a serving line. The counters are outdated and do not meet modern food protection sneeze guard standards. The counters are organized into three serving lines that meet in the centers and then exit out of the kitchen after the to the cashier. Modern counters with the latest in food safety are needed. (Image 4).	Replace the food counter with new sneeze guards and modern hot and cold serving equipment that is capable of maintaining proper holding temperatures.
The cooler and freezer appear to have been replaced once already. The current walk-in is delaminating and other sighs of moisture infiltration between the metal skin and insulation is present. Seals are also failing resulting in moisture infiltration and in the case of the freezer ice buildup. The R-value of the insulation is likely compromised. (Image 5).	Replacement of the walk-in cooler and freezer is recommended. Modern coolers have much stricture R-value requirements and more efficient mechanical systems.

Corrosion has set-in at the cooler floor and lighting level are poor and don't meet modern standards for lighting levels. Replace the walk-in cooler. (Image 6).	Replacement of the walk-in cooler and freezer is recommended.
The storage shelves within the walk-in cooler and freezer are original to 1968. The protective zinc coating on the shelving has begun to rub off and the shelves have failed. Additionally, zinc is no longer approved as a food contact surface due to zinc leach into food. (Image 7).	Replacement of the walk-in shelving is recommended. Replace with a non-corrosive shelving system.
Food Preparation Sink Piping The health code requires that the drain piping at food preparation sinks be air gapped to protect the food contact surface, in this case the sink bowl, from cross contamination in the event of a plumbing backup into the sink basin. (Image 8).	Modernizing the plumbing system is required in order to be complaint with modern health code standards.

Image 1

Image 2

Image 3

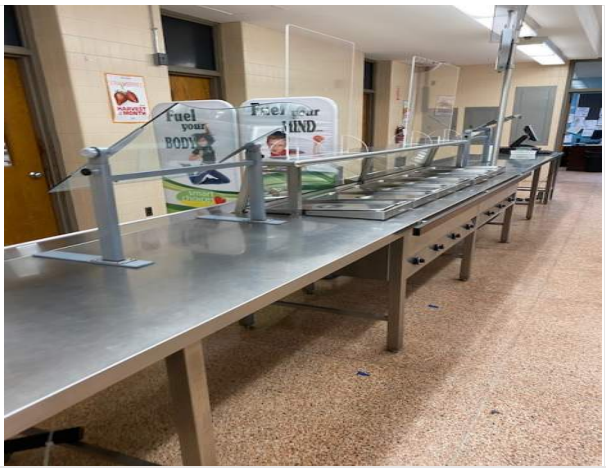

Image 4

Image 5

Image 6

Image 7

Image 8

EXISTING CONDITIONS: THEATRICAL

PORT LIGHTING SYSTEMS

EXECUTIVE SUMMARY

The existing theatrical equipment, curtains, and rigging are outdated and need to be upgraded / replaced to conform to current standards. No Theatrical Lighting systems or equipment are provided.

INTERIOR

CAFETORIUM / STAGE / PLATFORM

Consentino Middle School has a basic performance platform on one end of the 87'-9" long by 51'-3" wide cafeteria. (Image 1) The cafeteria can be sub-divided into three (3) sections by two (2) movable wall room dividers.

Physical Space: The platform area itself is a raised section of floor along one of the short sides of the cafeteria. (Image2) The platform area is 29'-9" wide by 18'-3" deep. The floor appears to be a light-colored heavy-duty flooring tile on concrete slab and is raised 2'-8" above the cafeteria floor. The exposed bar joists above the platform are level and even across the bottom at 13'-4" AFF with a sloped roof above ranging from a high point of 21'-3" down to 17'-3" on the sides.

Existing Lighting: The Cafeteria is lit by long banks of recessed fluorescent troffers. (Image 1) Above the platform- there are eight (8) white porcelain coated metal work lights (Image 3) surface mounted on exposed boxes and conduit. Each lamp is fitted with a single medium screw base (E26) lamp- we assume these to be 60w equivalent LED lamps on a single ON/OFF switch. There are also two (2) consumer grade five (5) arm ceiling fans each with three (3) frosted tulip shaped fluted glass shades with 60w equivalent LED lamps. The fans are on wall mounted independent speed controls with a single ON/OFF switch for the lights.

Existing Curtains: There are existing curtains on the platform. (Image 2, 4) Downstage are a small dead hung green valance and a two (2) part green main curtain on ADC 170 Bi-parting track. Additionally, there are two (2) diagonal black masking legs on ADC 170 walk along track on the sides of the platform. An upstage pipe appears to be for hanging backdrops.

Existing Rigging: The existing rigging is suspended from the bar joists over the platform, and a series of Schedule 40 1.5" Pipes laid across the tops of the bar joists and held in place by gravity. There is an electric movie screen that appears to be broken suspended just upstage of the main curtain.

ANSI Standards

-ANSI E1.4-2 – 2021 Entertainment Technology - Statically Suspended Rigging Systems
-ANSI E1.4-1 – 2016 Entertainment Technology - Manual Counterweight Rigging Systems
-ANSI E1.47 – 2017 Entertainment Technology - Entertainment Rigging System Inspections

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Specific Issues	Recommendations
General Lighting for Cafeteria. Older fluorescent troffers on switches only. (Image 1)	Upgrade cafeteria lighting to LED with occupancy / vacancy sensing daylight harvesting and a dedicated architectural lighting control system.
Platform Lighting is only white light and not very useful for theatrical purposes. (Image 3)	Add LED Color changing wash lights over the platform. Remove fans, conduit and work lights from under the bar Joists - (They can be replaced or reinstalled above the joist level.) Merge platform theatrical and work lighting systems with architectural lighting control system.
No front light or downstage theatrical light for platform. (Image 3)	Add color changing LED front light to provide face light for the platform and down light over the front edge of the platform.
Curtains: The existing curtains appear to be original to the building. They are Cotton Velour with a Flame Retardant (FR) treatment and natural fiber Jute webbing. (Image 7,8) Stage Drapes and Curtains must meet NFPA 701 Class “A” Fire Rating. (Minimum) Most Flame Retardant (FR) cotton velour curtains will maintain their flame retardant abilities for between 1 and 5 years, and need to be cleaned and re-treated as the protection degrades.	Replace all curtains with Inherently Flame Retardant (IFR) fabrics. These just need to be cleaned occasionally, and do not need to be re-treated. Change the diagonal side curtains to two (2) sets of side legs, add two (2) borders and add an upstage curtain on a bi-parting traveler track.

Rigging: The existing suspension hardware utilizes undersized (non-rated) chain and passing loop (Dog) chain, with unrated through bolts and "S" hooks to secure the ends. (Image 11, 12) The Valance "pipe" is currently made up of three (3) sections of galvanized electrical conduit held together with silver duct tape. (Image 9) The 20' side tracks are suspended only on the ends while the center points are not supported. (Image 5) There is an approximately 10' section of 2x4 tied to the building steel with knotted brown natural rope. (Image 10)	The existing rigging should be replaced / upgraded to meet current ANSI Standards. (See ANSI Standards on first page) Replace all suspension hardware, pipes and tracks, as well as supplemental support steel. Add new pipes for Valance, Borders, upstage scenic, and Lighting (x3). Replace all tracks.

Image 7

Image 8

Image 9

Image 10

Image 11

Image 12