4

EVALUATION OF EXISTING CONDITIONS

4.1

SUMMARY EVALUATION OF EXISTING CONDITIONS

DISTRICT TITLE TO PROPERTY

The Burlington High School is located on property acquired by the town for the purpose of erecting a school building. See section 4.2 for formal description.

PROPERTY AVAILABLE FOR DEVELOPMENT

The existing high school is on a fully developed property including roadways, utilities, fields and parking. The district has no restrictions against the future continued use of this property for educational purposes where this school is located.

HISTORIC REGISTRATIONS

The property is not in a Historic District. In addition, the property is not inventoried by the Massachusetts Historical Commission (MHC).

DEVELOPMENT RESTRICTIONS

There are no known restrictions on the use of the property for school purposes. There are regulatory restrictions related to wetlands that will be considered in the planning phase.

NEED FOR SOILS EXPLORATION

Test borings have been completed and were located in areas most likely to accommodate a building expansion project or a building replacement project. The initial data indicates good bearing native soils for conventional spread footings. Though testing does indicate possible contaminates in the soils, they may be reused on site as part of future redevelopment. Further evaluation will be required at a later phase with added borings and testing.

INITIAL EVALUATION OF EXISTING CONDITIONS

Following this introduction are the following documents representing the initial evaluation of the site:

- Code and Accessibility Evaluation
- Existing Building Evaluation
- Structural Evaluation of Existing Building
- Mechanical, Electrical, Plumbing, Security & Technological Evaluations of Existing Building
- Hazardous Materials Report
- Site Analysis
- Infrastructure Evaluation

In addition, attached to the PDP as Appendix are the following documents related to building and site evaluation:

- Geo-environmental Report
- Preliminary Geo-Technical Report
- Existing conditions Traffic Study

4.2

LEGAL TITLE TO PROPERTY

DISTRICT TITLE TO PROPERTY

BHS and the associated property where it is located is owned outright by the Town of Burlington. The legal property name for the parcel is the Town of Burlington, 123 Cambridge Street. The Town has designated this parcel as “Burlington High School”.

4.3

CODE AND ACCESSIBILITY ANALYSIS

BURLINGTON HIGH SCHOOL- CODE REVIEW

Introduction

Burlington High School is an existing mixed occupancy building. The proposed scope of work involves the renovation of the existing building as well as various additions. This code summary is based on site visits to review existing conditions and review of the proposed architectural plans.

Following is a list of applicable codes:

Code Type	Applicable Code (Model Code Basis)
Building	780 CMR: Massachusetts State Building Code,10th Edition • Amended 2021 International Building Code (IBC) • Amended 2021 International Existing Building Code (IEBC)
Fire Prevention	527 CMR: Massachusetts Fire Prevention Regulations M.G.L. Chapter 148 Section 26G – Sprinkler Protection
Accessibility	521 CMR: Massachusetts Architectural Access Board Regulations 2010 ADA Standards
Electrical	527 CMR 12.00: Massachusetts Electrical Code • Amended 2023 National Electrical Code
Elevators	524 CMR: Massachusetts Elevator Code • Amended ASME A17.1-2013/CSA B44-13
Mechanical	2015 International Mechanical Code (IMC)
Plumbing	248 CMR: Massachusetts Plumbing Code
Energy Conservation	2021 International Energy Conservation Code (IECC) Burlington is a stretch community so applicable 225 CMR

International Existing Building Code

The 2021 International Existing Building Code with Massachusetts amendments allows for 3 separate compliance methods, the Prescriptive Method (in general, altered areas must comply with the code for new construction), Work Area Method (level of compliance is based on the classification of work), and Performance Compliance Method (numerical method that allows tradeoffs for deficiencies). This report is based on the Work Area Method.

1. Work Area and Classification of Work:

The requirements in the IEBC area based on the classification of the work as Alteration Level 1, 2 or 3. This is based on the extent of the project “work area”, which is defined as the area within which architectural reconfiguration will occur (IEBC Chapter 2). Areas where the only work will be new finishes, furnishings, or installation of new building systems are not classified as part of the work area. The levels of work are defined as follows:

Level 1 Alteration	No architectural reconfiguration, no work area.
Level 2 Alteration	Aggregate size of work areas (architectural reconfigured area) does not exceed 50% of the gross building area.
Level 3 Alteration	Aggregate size of all work areas (architectural reconfigured area) exceeds 50% of the gross building area.

The proposed work area is expected to exceed 50% of the gross existing building area and therefore the project will be classified as a Level 3 Alteration and IEBC Chapters 7, 8 and 9 apply. The proposed scope of work also includes additions which requires compliance with IEBC Chapter 11.

2. Occupancy Classification:

- Use Group E (educational)
- Use Group A-1 and A-3 (assembly with and without fixed seating)
- Use Group B (business)

3. Construction Type:

Based on field observations the existing building construction is Type IB-Non-Combustible. Existing construction is composed of structural concrete frame (columns and beams), concrete slabs on grade and upper floor, CMU veneer with masonry backup walls.

Construction Type IB (non-combustible / protected) is proposed for the new additions, in keeping with the existing type of construction classification.

4. Height and Area Limitations

A new addition cannot increase the building height or area beyond that allowed by IBC Chapter 5 for new construction:

Code Reference	Type IB– Use Group A1,A3, E Fully Sprinklered			
	Height	Area		
IBC Tables 504.3, 504.4 & 506.2: Tabular Value	6 St. (180 ft)	A1; unlimited A3:unlimited E : unlimited		
IBC Section 506.2 Frontage Increase (100% Open Perimeter	-	Not required. Unlimited already allowed.		
Height and Footprint Area Allowed	**6 St. (180 ft)**	**unlimited**		
Actual Height and Footprint Area	**3St. (<70 ft) Varies per option. Range from 120,000 SF to 194,000 SF total [See note below.]**			

Existing building contains mixed-use occupancies with and without fire separations. Any additions must comply with IBC section 508 Mixed Use and Occupancy in order to determine whether firewalls between existing and addition are required. Since allowable area is unlimited, NO firewalls are anticipated.

5. Fire Resistance Ratings:

The following table summarizes the required fire resistance ratings for new building elements of Type IIB construction, based on IBC **Table 601** and other applicable code provisions:

Building Element	Fire Resistance Rating (Hours)
Primary Structural Frame	2
Exterior Bearing Walls	2
Interior Bearing Walls	2

Exterior Non-Bearing Walls	0 (Fire Separation Distance > 30 feet)
Interior Non-Bearing Walls	0
Floor Construction	2
Roof Construction	1

Building Element (Within the Work Area)	**Fire Resistance Rating (Hrs)**	**Opening Protectives (Hrs)**
Existing vertical openings (IEBC 802.2.1-exceptions 4/6) Fully Sprinklered-3 stories	30 minutes	30 minutes
New shafts < 4 stories (IBC 713.4)	1[A, C]	¾ (1 @ stairs)
New shafts 4 stories (IBC 713.4)	2[C]	1½
Corridor walls - Fully Sprinklered (IBC Table 1020.1)	0	0
Storage Under Stairs (IBC 1011.7.3) (Not less than stair rating if enclosed, otherwise 1-hour rating required)	1	¾
Elevator Control Room (IBC 3005.4 & 524 CMR 13.03(2))	1	¾
Emergency Electrical Room (527 CMR 12.00 700-10(D)(2))	2[B]	1½
BDA Room (NFPA 72 Section 24.3.6.8)	2	1 1/2

A. In lieu of rated shaft enclosure, the annular space around a duct penetrating a floor may be protected by approved noncombustible material that resists the passage of flames and smoke (IBC 717.6.3).
B. No rating is required for the room when fully sprinklered, however a 2-hr rating is still required for the emergency feeder-circuit wiring and rooms containing an emergency generator (NFPA 110 Section 7.2.1.1).
C. Where walls expose the stair at an angle of less than 180 degrees either the stair wall or adjacent wall must be 1 hour rated with 3/4 hour opening protectives for a distance of 10 feet from the stair wall. Otherwise, the exterior walls of the stairs do not require a fire rating (IBC Section 1023.7).

Incidental Accessory Occupancies (IBC Table 509)	
Room or Area	**Separation and/or Protection**
Furnace room where any piece of equipment is over 400,000 Btu per hour input	Smoke Resistant*
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	Smoke Resistant*
Waste and linen collection rooms over 100 square feet.	Smoke Resistant*

*Must be separated from the remainder of the building by construction capable of resisting the passage of smoke and doors shall be self- or automatic-closing upon detection of smoke.

6. Exterior Wall Openings & Fire Resistance Rating:

The exterior walls of the new addition must comply with the fire rating requirements of the IBC. The exterior wall rating requirements and opening limitations are based on the fire separation distance for each wall. The fire separation distance is measured perpendicular to the exterior wall to the centerline of a public street, an interior lot line, or an imaginary lot line between two buildings on the same lot (IBC 702.0). Where the fire separation distance is more than 10 ft the wall is not required to be rated and the allowable area of openings is not limited (IBC Table 602 and Section 705.8.1 Exception 2).

All new exterior walls shall have a fire separation distance greater than 30 feet in order to not require a fire rating and openings are not limited.

7. Vertical Openings:

All existing vertical openings in the work area connecting two or more floors must be enclosed with 1 hour rated construction and approved opening protectives unless the openings meet one of the exceptions in IEBC 803.2.1. New vertical openings are required to comply with IBC 712 & 713. If the building is fully sprinklered existing shafts connecting no more than three stories do not require a fire-resistance rating (IEBC 803.2.1 Exception 6).

Existing Building will be fully sprinklered as part of any renovation options.

8. Interior Finishes:

The existing interior finish of walls and ceilings in the work area and in all exits and corridors serving the work area must comply with the code requirements for new construction (IEBC 803.4). All newly installed wall and ceiling finishes, and interior trim materials must also comply with IBC Table 803.11 (IEBC 702.1, 702.2, 702.3). The requirements are summarized below:

Walls & Ceilings (IBC Table 803.11) – Fully Sprinklered

Use Group:	B	A
Exit Enclosures	Class B	Class B
Exit Access Stairs & Corridors	Class C	Class B
Rooms & Enclosed Spaces	Class C	Class C

The existing wall finishes generally consist of painted CMU or gypsum wallboard that complies with the above requirements. All new finishes will follow these requirements.

New Floor Finishes

Since the building will be equipped with an automatic sprinkler system, traditional floor coverings such as vinyl and other resilient floor coverings as well as carpeting passing the DOC FF-1 pill test are allowed throughout the building, including exit passageways and exit access corridors (IBC Section 804.4.2).

9. **Exterior Finish**

Exterior wall finishes must fully comply with the requirements of IBC. Combustible materials are generally not permitted to be used as an exterior wall finish for this type of construction.

Existing Exterior Wall Cladding materials (concrete, CMU) are non- combustible as permitted by Code. The use of plastic materials as part of any new exterior wall assembly, i.e. foam plastic rigid insulation shall comply with IBC 1404.8. The wall assembly must be tested in accordance with NFPA 285 (IBC 2603.5.5).

10. Means of Egress:

Existing means of egress conforming to the requirements of the building code under which the building was constructed shall be considered compliant means of egress if, in the opinion of the code official, they do not constitute a distinct hazard to life (IEBC 805.2).

The new means of egress must comply with the code requirements for new construction, including the following:

- Maximum exit access travel distance must not exceed 250 feet in this fully sprinklered buildings (IBC Table 1017.2).

- Maximum dead-end corridor length must be less than 20 ft or 2.5 times the least width of space (up to 50 ft is permitted in Use Group E areas) (IBC 1020.4).

- All rooms or spaces with an occupant load greater than 49 people or a common path of travel distance over 75 ft must be provided with two egress doors swinging in the direction of egress and illuminated exit signs at each exit (IBC Table 1006.2.1 & Sections 1010.1.2.1 & 1013.1). Boiler rooms require two means of egress if the room is greater than 500 sqft. and includes individual fuel-fired equipment greater than 400,000 Btuh input capacity. If required one of the two required exit access routes from the boiler room is permitted to be a fixed ladder or alternating tread device (IBC Section 1006.2.2.1).

- Doors serving rooms and spaces with more than 49 people and doors along the path of egress travel from such rooms must be provided with panic hardware (IBC 1010.1.10). Doors from main electrical rooms with equipment rated 1,200 amps and over 6 feet wide must swing in the direction of egress with panic hardware (IBC 1010.1.10).

- All means of egress lighting and exit signs throughout the building must be provided with an emergency power supply to assure continued illumination for not less than 1.5 hours in case of primary power loss (IBC 1008.2 & 1008.3.4).

- Remote means of egress must be separated by ⅓ of the diagonal dimension of the room or space they serve (IBC 1007.1.1). The distance between exits must otherwise be measured in a straight line between exit doors.

- Permanent means of access to any roof containing mechanical equipment must be provided in accordance with the Mechanical Code. If the roof contains any gas-fired equipment access via a hatch and permanent or foldaway inside stairway or ladder is required in accordance with Section 9.4.3 of the National Fuel Gas Code (NFPA 54).

- All exits must discharge to the exterior of the building except that a maximum of 50% of the number and capacity of the exit enclosures are allowed to exit through areas on the level of discharge if the exit enclosures discharge to a free and unobstructed path of travel to an exterior exit that is readily visible from the discharge of the exit enclosure (IBC 1028.1).

  Existing building contains multiple exit stairs from the second floor Any proposed alterations or addition shall maintain the egress condition.

- All exits must provide access to a public way (IBC 1028.5). At least two of the exit discharge paths must be accessible, they cannot include exterior stairs along the path (IBC 1009.1 & 1009.2(4)). Where two accessible discharge paths cannot be provided, an exterior area for assisted rescue in accordance with IBC Section 1009.7 is required.

- A two-way communication system is required outside each elevator on the 2nd (IBC 1009.8).

- The elevators must be sized to accommodate the loading and transportation of an ambulance gurney or stretcher sized 24” wide by 84” long with 5” radius corners (524 CMR 35.00 (2.27.12(1)).

There are a couple of existing elevators installed in the past few years.
The MA Elevator Code does not require a stretcher sized elevator when elevators are installed within the footprint of an existing building (524 CMR 35 Section 2.27.12(1))

A two-way communication system will be installed outside each elevator.

11. Energy Code Provisions for Existing Buildings

New work is subject to the International Energy Conservation Code (IECC) with Massachusetts Amendments (Stretch Code where adopted . Since Burlington is a stretch community, stretch code 225 CMR is applicable.
Energy Code requirements for existing buildings are described in IECC 2021 Chapter 5 (modified in 225 CMR) .C503.1 indicates that the alterations (new elements and addition) must conform to the energy requirements of the IECC (225CMR) as they relate to new construction only, without requiring the unaltered portions to comply.

All new construction will meet Energy Code provisions for new buildings .
All altered elements will meet the requirements of Chapter 5 as amended.

12. Accessibility for Persons with Disabilities

Massachusetts Architectural Access Board Regulations
Alterations to the building must comply with the requirements of the Massachusetts Architectural Access Board Regulations (521 CMR). For existing building alterations the requirements of 521 CMR are based on the cost of the proposed work:

A. If the cost of the proposed work is **less than $100,000,** only the new work must comply.

B. If the cost of the proposed work is **greater than $100,000** then all new work must comply and the existing building must include an accessible public entrance, toilet room, telephone and drinking fountain (if public phones and drinking fountains are provided) (521 CMR Section 3.3.1(b)). Exempt work when calculating the cost of work includes roof repair or replacement, window repair or replacement, and repointing and masonry repair work unless the exempt work exceeds $500,000.

C. If the cost of the proposed work is **greater than 30% of the full and fair cash value** of the existing building, the entire building is required to comply with 521 CMR (521 CMR Section 3.3.2). There is no exempt work, i.e. the entire project costs apply to determining the 30% criteria.

The cost of all work performed on a building in any 36 month period must be added together in determining the applicability of 521 CMR (521 CMR Section 3.5). The full and fair cash value of the existing building is determined by using the 100% equalized assessed value of the building on record with the city assessor's office.

Since it is expected that the cost of the renovation will trigger the 30% threshold, all portions of the building open to the general public (students) must be upgraded to comply in full with the current requirements of 521 CMR. Any employee-only areas such as staff lounges, staff bathrooms, and staff work areas are not required to comply with 521 CMR, as long as public access is not permitted.

Full compliance with 521 CMR includes the following major provisions:

- All public entrances must be accessible (521 CMR 25.1).

Existing entrances are located at grade level.

- All public and common use areas must be accessible and provided with an accessible route thereto (521 CMR Section 12.2.2 and 20.1).

- Each toilet room must include accessible fixtures (521 CMR 30.1).

Latest version of the plumbing code has more stringent requirements for plumbing fixture counts. Additional Code compliant plumbing fixtures including toilets, urinals, lavatories and drinking fountains will be provided.

Americans with Disabilities Act Guidelines

The ADA Guidelines are not enforced by the Commonwealth of Massachusetts, they can only be enforced through a civil lawsuit or complaint filed with the U.S. Department of Justice. Compliance with the ADA Guidelines is triggered by renovations to the existing building. All renovations to the building must be made to ensure that, to the maximum extent feasible, the altered portions of the facility are readily accessible to and usable by individuals with disabilities (28 CFR Part 36 Section 36.402(a)). Alterations made to provide an accessible path of travel to altered areas and accessible facilities (i.e. provide accessible toilet facilities) are not required if the cost exceeds 20% of the total cost of the alteration (28 CFR Part 36 Section 36.403(f)). However, if the cost to meet these accessibility requirements does exceed 20%, alterations are still required to the maximum extent that the area can be made accessible without exceeding the 20% criteria (28 CFR Part 36 Section 36.403(g)). The ADA also contains less stringent dimensional requirements for some building elements in an existing building where it is infeasible to meet the requirements for new construction (ADA Section 4.1.6).

The proposed scope of work will bring all public areas in the building into compliance with MAAB access code requirements. All non- public areas will also follow MAAB requirements (most stringent) to the extent possible. (i.e. all new elements will comply.

4.4

EXISTING CONDITIONS | BUILDING CONDITIONS

Burlington High School is a two-story (multi-level) structure built in 1971 and composed mostly of poured concrete and concrete masonry block with aluminum framed gang windows and doors. Minor accessibility upgrades were implemented in the 1990s and the addition of elevators and ramps in the 2000s.

Program spaces are generally arranged between and adjacent to two generously sized ramps (streets) that run the length of the building, with a total elevation differential of about 20 feet.

Outside, the facades maintain their original character, primarily exposed concrete structure. Fenestration is composed of Gang windows occupying entire bays. The roof consists of low-pitch EPDM roofing membrane, mostly covered with photovoltaic panels. See BUILDING ENVELOPE below for more detailed description.

Inside, the spaces have generally maintained their original layout and materials, with minor alterations over the years. Some areas have been renovated more recently, namely one of the gymnasiums and the upper southeast portion of the building has been outfitted for offices. See INTERIOR for more detailed description.

BUILDING ENVELOPE

Roof

According to the BHS Educational Program provided by the district, the roof is a low pitched fully adhered rubber membrane roof which was replaced in 2011. The roof is mostly covered with photovoltaic panels. There are no known deficiencies with the roof at this time, though signs of aging and bubbling are occurring.

We have no record of any later installation or roof work, so if the current roof is the one installed in 2011, the EPDM still has a number of years left before needing additional work.

Any roof alterations (beyond basic repairs) as a result of renovation or new work must comply with the current Energy Code. (2021 IECC with Stretch Code amendments). Therefore, It is recommended to do a full replacement with Code compliant insulation thickness. This approach not only improves thermal performance overall, but also gives a single starting point for the entire roof as far as expected longevity and warranties.

Exterior Walls

According to the educational program provided by the district, the Existing exterior walls are a combination of exposed concrete and CMU (striated) and original to the building. A visual inspection of the interior side of exterior walls suggests the walls are not insulated, however further investigation would need to be completed to confirm this. At the classroom bays, large expanses of ganged windows take about 2/3 of the façade. In general, the concrete appears to have aged well, exhibiting only the weathering and staining anticipated for a building of this vintage.

Based on available drawings, it is expected the insulating value of the current wall assembly to be low and not conform to current code requirements. As per Chapter 5- Existing Buildings, alterations to the existing building envelope shall comply with the code requirements for new construction without requiring the unaltered portions to comply with Energy Code. (IECC 2021-C503.1)

On the other hand, altered components need to comply with stretch code amendments to section 503.1, effectively requiring a component performance alternative to be no greater than 110% UA.

Openings

Existing fenestration consists of large aluminum framed ganged windows, with double pane insulated glass and operable venting sashes at the middle portion of the frames. This fenestration is not original to the building but part of window replacement work done in 2000.

While a more in-depth evaluation may be necessary to locate the exact point of failures, it is likely that the perimeter sealants may have exceeded their serviceable time, so it is recommended to replace the perimeter sealant and backer rod at each bank of windows, to reduce air / water infiltration and increase building envelope performance.

According to the educational program provided by the district the replacement windows are low E. Although the existing glazing provides thermal insulation, it may not be sufficient to meet current code. Any new or replaced fenestration in the existing building must be a High-Performance triple glazing insulated glass system. See additional recommendation in the Conclusions section below.

Building Entrances

The building consists of two main entries; The primary main entrance (auditorium) and secondary main entrance at the gym. The Primary Main entrance was made fully accessible sometime in the last decade and includes a ramp and secure entry vestibule foyer. The gym entrance appears to provide accessibility to a person in a wheelchair, however the approach ramp appears to be steeper than allowed by current code. From the interior, although accessible, the path leading to the main entrance is circuitous and does not take the same route taken by the student population. Some of the other entrances around the building are recessed into the exterior, however none have canopies.

INTERIOR

First Floor

Classrooms

The first floor is generally in fair to good condition. Walls between room/spaces are mostly painted CMU & concrete with some newer GWB wall partitions which have been added over the years. Exterior walls are predominantly exposed concrete and concrete masonry units, ceilings are mostly exposed concrete structure with acoustic ceiling tile inserted between beams, and floors are VCT or carpet tile. Casework is outdated and not MAAB compliant. Some lecture halls or classrooms are set up as amphitheater seating, and are not fully handicap accessible.

Renovation considerations must include casework upgrades to meet MAAB requirements and should include painting wall surfaces.

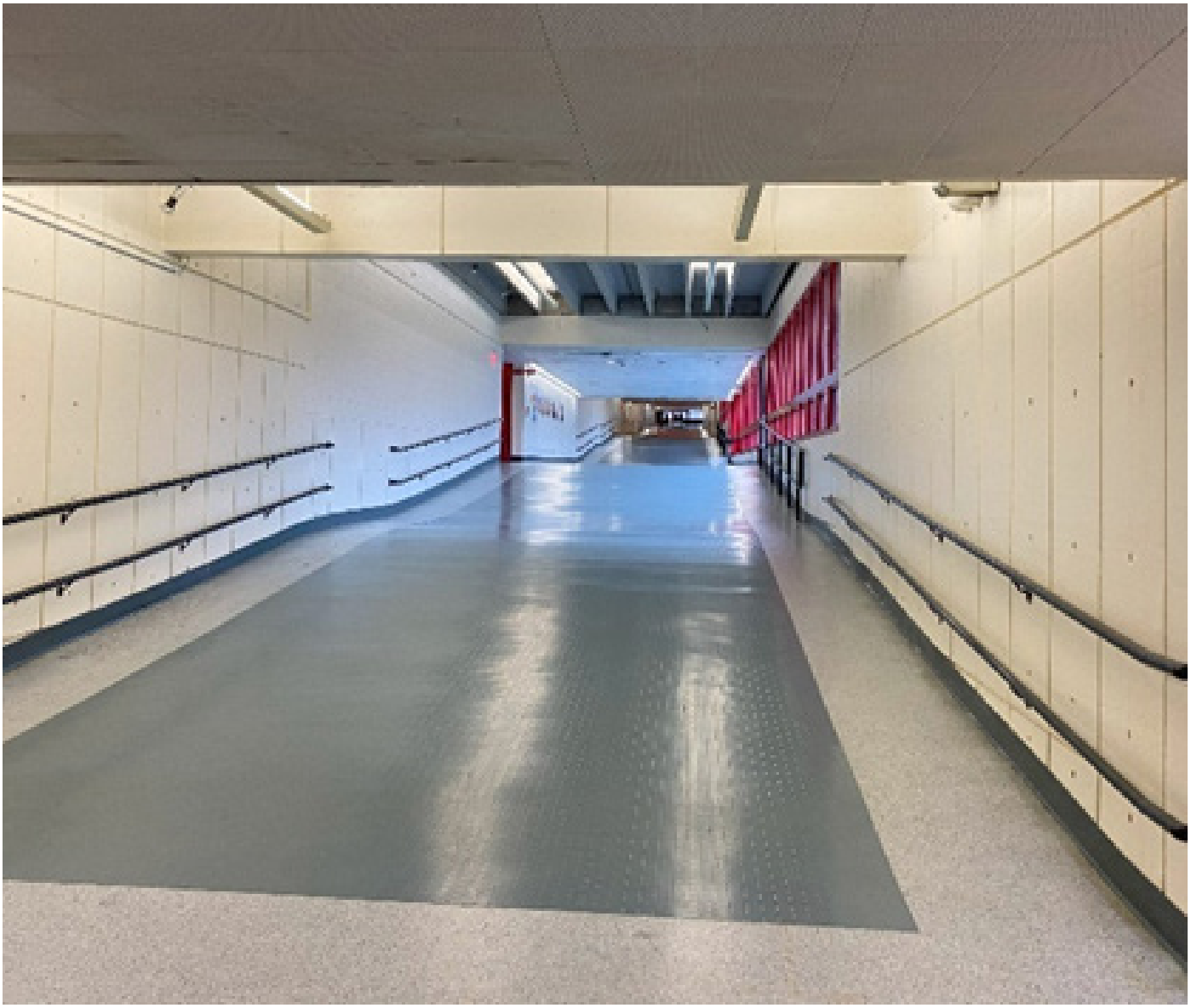
Science Classrooms

Walls between Science Classroom spaces are generally painted concrete masonry units. The science classrooms are located in the core of the building so there is no direct exposure to daylighting nor views out from windows. Ceilings are exposed concrete structure with ACT infill between beams and floors are VCT. Casework and fixed workspaces are outdated and not MAAB compliant.

Renovation considerations must include casework upgrades to meet MAAB requirements and should include painting wall surfaces.

Corridors

The main circulation paths (streets) have exposed concrete walls, concrete masonry units, and aluminum windows, and the ceilings area mix of exposed concrete and perforated ceiling tiles. The flooring is a mix of VCT with rubber at the sloped portions. Windows appear to be in generally good condition. Though the streets connect all of the programmatic spaces, departments of the building still appear/feel disconnected from each other.



Toilets Rooms

Records indicate that the toilet rooms were renovated in 2000, however it not believed that this was for all of the toilet rooms throughout the building. The toilet rooms are a combination of multi-user and single-user toilets to accommodate handicap accessibility requirements. Walls are either painted CMU or glazed tile. Ceilings are ACT and Drywall. Floors are mosaic tile. Generally all materials and fixtures are in good condition. However, due to the most recent (and more stringent) version of the plumbing code, **additional code compliant plumbing fixtures including toilets, lavatories, urinals and drinking fountains will be required.**

Gymnasium

There are two gymnasiums in the building. One has a newer wood floor that is in good condition and the other has a rubber floor. Both gyms are in generally good condition. The walls are painted CMU and concrete masonry units. The gym roofs are exposed concrete structure with steel trusses. Bleachers in the wood floor gym appear to be in good condition and not outdated. Gym equipment appears functional.

Renovation considerations should include replacement of gym equipment (backboards, scoreboard and curtain).

Locker Rooms/Showers

The locker rooms walls are painted concrete and CMU, and the floor is finished concrete. The bathrooms and showers attached to the locker rooms have concrete and CMU walls and mosaic tile flooring. Ceilings in the locker rooms are exposed concrete structure and painted GWB ceilings in the bathrooms. The fixtures in the bathrooms are in generally good shape though minor upgrades may be needed. Locker room renovations occurred in 2009, however the finishes have grown tired over time.

Renovation considerations should include full reorganization and renovation of these spaces.

If all areas of locker rooms / showers are available to the students, HC access must be provided to comply with MAAB requirements.

Auditorium

The auditorium has gone through several upgrades over the years. These upgrades include the sound system, chair replacement, and lighting controls. According to the educational program provided by the district, there is seating for approximately 800 people. Access to the stage stairs on either side, and no railings exist. The orchestra pit is below the stage with netting over the top. There is no direct accessible route onto the stage. There is an accessible route to get into the auditorium, however the path is not along the typical student path. Walls are made of striated CMU and the ceiling have acoustic paneling

If the control room is open to the students, HC access must be provided to comply with MAAB requirements.

Cafeteria

Generally, finishes in the existing cafeteria are in good condition. The flooring is VCT, walls are painted concrete & aluminum gang windows and ceilings are exposed concrete structure with ACT infill between beams. The cafeteria is split into two sides with seating and the kitchen and service areas in the middle. Egress from this space is via 2 sets of doors leading to the main hallway and a set of doors at the exterior sides, leading directly to the exterior.

Media Center

The media center/library is split into two separate spaces; the upper library and lower library (located at higher portion of street and lower portion of street. The spaces are well maintained. Finishes are carpet flooring, CMU and exposed concrete walls (both painted) and the ceiling in the main space is exposed concrete structure. Casework/Fixed furniture look worn and outdated. However, layout modifications (say, stacks or circ desk) and / or new building systems installation may require replacement of carpet and finished ceilings.

Doors & Hardware

Most doors open into the classrooms, which is acceptable for spaces under 50 occupants. There are some spaces where the occupancy may exceed 50-music rooms for example- therefore the door swing must be in the direction of egress.

Most doors have lever handles, but a few locations still have knob type, which is not MAAB compliant. According to the educational program provided by the district, teachers are concerned about the locking mechanisms on classroom doors, which break and prevent them from being able to secure classrooms.

Hardware may need selective or complete replacement to comply with applicable accessibility code requirements, life safety requirements and user requirements for student and staff safety based on school security protocols.

It is assumed that a number of doors will require replacement given the age of the building and condition of many doors, and the need in certain locations for abatement.

Doorknobs need to be replaced.

Second Floor

Like the first floor, the second floor is in fair to good condition. The second floor contains mostly classrooms, and a few department offices. The second floor is multi-level with no clear accessible path between wings.

Classrooms

Floors (VCT) and ceiling (exposed concrete structure with ACT infill) in the classrooms seem good, but walls require painting. Walls bordering upon the corridor have a painted drywall finish, however it appears the corridor side of the walls use the recessed lockers as the final finish, so noise may be an issue. Dividing walls between classrooms are not original to the building and appear to be thin.

Not every classroom at this floor has storage casework.

Wall mounted projectors rely on the existing markerboards for the quality of their images. MB surfaces are in fair condition. If the technology proposed for visual devices continues to rely on markerboard for projection (such as a wall or ceiling mounted projector) it is recommended to replace existing with a whiteboard surface that is optimized for projection, with minimal glare or reflection.

Corridors
Finish Materials - VCT, ACT and structural glazed tile / plaster look in fair to good condition.

Corridors at the second floor(s) have VCT flooring, perforated tile ceiling and exposed structural concrete ceilings, and the walls are Painted CMU or lined with recessed lockers (See Classrooms section above). The finishes appear to be in fair condition but are growing tired.

Signage
Currently many of the room signs are mounted on the doors, which is not in compliance with MAAB.

Signage needs replacement to meet MAAB requirements and to address proposed room numbering.

Conveying Systems

This Facility has a number of passenger elevators connecting the first to second floor(s) which are not original to the building, and they appear to be of sufficient size to meet code requirements (for existing hoistway exception). According to the educational program provided by the district the elevators were added in 2014.

CONCLUSION

Overall the Building appears well maintained and in serviceable condition for its intended use, Nevertheless there are certain deficiencies which would need to be addressed in conjunction with any proposed work. These issues can be divided in two categories: Code related issues and General Upgrades.

Among Code related issues are the thermal value of the existing envelope, and certain aspects of HC accessibility compliance with MAAB, namely, lack of HC accessibility to few areas of the Locker room, lack of access to the auditorium, room signage and HC accessible hardware at certain doors.

- The current envelope is not energy efficient. Exterior Walls lack insulation, and Windows, despite having double-pane insulating glazing, most likely do not meet the latest Energy Code requirements, let alone today's industry standards for energy efficient buildings. By Code, if a fenestration component is altered, that component would have to be replaced with Energy Code compliant window systems. (Code base U-value 0.30 as a minimum; high performance glazing – triple glazing, U-value .28 or better is recommended). It is recommended to replace ALL the windows with thermally efficient triple glazing and thermally broken aluminum frames.
- Similarly, exterior walls may need upgrading. By Code, if a wall is altered, or a component is removed so that access to the wall cavity becomes accessible, that portion of the wall would have to comply with Energy Code. Moreover, if the Project has energy performance LEED requirements or is pursuing utility incentives, it will be difficult to achieve the goals with a poorly insulated building. Logistically, rather than avoiding disruption to the wall it may be more practical to remove interior finishes to allow flexibility for building systems installations and insulation.
- Handicap Accessibility an issue throughout. There are existing elevators, however the paths between them are not convenient for a person requiring accessibility.
- A few doors still have knob type hardware. These would have to be replaced with lever type to comply with accessibility requirements.
- The auditorium is not a fully accessible space. If available to students, this space must be HC accessible.
- Room signage is mounted on doors which is not in compliance with MAAB. New signage, with braille will be required on the wall adjacent to the door.

Recommended General upgrades would include the following:

- Removing and replacing dropped ceilings to facilitate access to new building systems installations.
- Flooring replacement at areas required to be removed due to abatement (Refer to HazMat report).
- General painting of interiors
- Updating visual display surfaces in conjunction with proposed visual display devices.
- Casework is outdated in some locations and requires replacement in others. Renovations and modifications may also make necessary the relocation and replacement of some casework. It is assumed that most of the casework will be replaced to make all classrooms consistent.
- A number of doors will require replacement given the age of the building and condition of many doors, and the need in certain locations for abatement.

END OF REPORT

4.5

EXISTING CONDITIONS | STRUCTURAL ASSESSMENT

BURLINGTON HIGH SCHOOL

TAPPÉ ARCHITECTS

STRUCTURAL
EXISTING CONDITIONS REPORT
MAY 20, 2024

Burlington High School

Burlington, Massachusetts

Structural Assessment

May 20, 2024

PURPOSE

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

SCOPE

1. Description of existing structure
2. Comments on the existing condition
3. Comments on the feasibility of renovation and expansion

BASIS OF THE REPORT

This report is based on our visual observations during our site visit on April 10, 2024, review of the available Architectural drawings of the construction of the original school prepared by Earl R. Flansburgh & Associates dated February 9, 1971, and Master Plan update report prepared by Knight, Bagge & Anderson, Inc., dated March 27, 2017.

During our site visit, we did not remove any finishes or take measurements, so our understanding of the structure is limited to the available drawings and observations of the exposed structure and the exterior facade.

BUILDING DESCRIPTION

The school is located on Cambridge Street in Burlington, Massachusetts. The existing school was constructed in 1971 and there have been no substantial renovations or additions to the school since the original construction.

EXISTING BUILDING

The existing structure is essentially a two story reinforced concrete structure with a partial Ground level floor and partial second level floor, several mechanical penthouse structure project above the main roof level. The exterior grade around the building slopes around the building from the first floor down to ground floor level. The foundations supporting the structure are reinforced concrete walls and footings. The lowest level floors are a concrete slab on grade. The typical supported floors and the floors are precast concrete double tees supported on cast-in-place reinforced concrete beams, columns and walls. The roof of the Gymnasium is framed with wood fiber panels spanning between steel bulb tees supported on long span open web steel joists. The joists are supported on cast-in-place reinforced concrete walls. The roof above the stage in the Auditorium is metal deck supported on

open web steel joists. The entire school is contiguous but structurally divided in to structurally independent structures separated by way of expansion joints.

EXISTING CONDITIONS

We observed some signs of leaks in the ceilings. We observed cracks in the stems and flanges of the exposed precast concrete double tees that have been repaired in the past. We did not see any connections between the top of the interior masonry walls and the structure.

The exterior façade is cast-in-place concrete for the most part, we observed some damage to the walls at the corners and observed past repairs to the surface of a portion of a wall where the original concrete has spalled.

We did not perceive any perceptible vibrations due to footfall on the supported floor. We did not observe any signs of foundation settlement.

Based on our observations, majority of the school structure is in good condition and there are no major structural concerns at this time.

Typical Floor Framing and Roof Construction

Typical Gymnasium Roof Construction

Example of past repairs to the flanges and stems of the precast concrete double tees

Damage to the exterior concrete gacade

FEASIBILITY OF RENOVATION AND EXPANSION OF THE STRUCTURE

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

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.

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 addresses the scenario 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 in fair condition. All of the structural components that are visible appear to be in sound condition except the items noted above.

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 requiring modifications to the existing structure and additions would likely require that the structure be updated to meet the requirements for the Code for New Construction.

4.6

EXISTING CONDITIONS | MECHANICAL, ELECTRICAL, TECHNOLOGY & SECURITY ASSESSMENTS

BURLINGTON HIGH SCHOOL

TAPPÉ ARCHITECTS

MECHANICAL
EXISTING CONDITIONS REPORT
MAY 28, 2024

HVAC

Existing Conditions

HVAC Systems

The existing school is equipped with a natural gas fired, hot water heating system and DX cooling system with boilers, pumps, air-cooled condensing units, rooftop air handling units, variable air volume units with hot deck-cold deck, pneumatic controls, and sporadic electronic controls. A majority of the equipment is original to the building, beyond its useful life, is in disrepair and in need of replacement.

The existing mechanical room is located toward the back, lower portion of the building. The mechanical room is equipped with three (3) gas fired, fire tube boilers, Kewanee model H2W-300-K boilers, rated for 300 boiler horsepower each. There are three (3) hot water lead/standby base mounted circulating pumps which pump water to eight (8) secondary single primary pumps within the building serving the building heating systems. The existing boilers, pumps and associated equipment were installed back in 1972 and are in various levels of disrepair.

Photo 1 - Boiler

Photo 2 - Pumps

The Classrooms, Administration area, Library, Auditorium, and Cafeteria are provided with heating, ventilating and air conditioning rooftop air handling units with hot water heating hot deck/DX cooling air cold deck and return fans located in roof level mechanical penthouses. All units are original to the building and appear to be in disrepair. Each rooftop unit is provided with an air-cooled condensing unit on the top of the mechanical penthouse. Rooftop air handling units provide air through separate ductwork distribution to dual duct variable air volume terminal units that mix the cold deck/hot deck for individual zone space temperature control. The ceiling space within each zone is used as a return air plenum. Each zone has been provided with a space sensor. All spaces have also been provided with fintube radiation at the exterior walls to provide supplemental heating.

The kitchen is equipped with a hot water heating Make-up Air Unit (MAU) with large exhaust hoods for both the dishwasher and cooking equipment that are exhausted up through the roof to upblast exhaust fans. Exhaust hoods are provided with individual sprinkler systems and emergency shutoff switches.

Various IT/MDF and electrical rooms have been provided with VRF Ductless Split indoor units with individual room controls for cooling. These units are located within the rooms to maintain temperature and the outdoor condensing units are located on the roof. Refrigerant piping is run between them. They appear to be in fairly good condition.

The Locker Rooms, Paint Spray Booth, and Miscellaneous Shop Areas have been provided with heating and ventilating from hot water heating heating/ventilating units throughout the building, associated exhaust fans and an insulated duct distribution systems from the dual duct heating and cooling system.

The science classrooms are provided with chemical exhaust hoods with controls and make-up air systems that do not appear to be functioning and appear to have failed.

Photo 3 – Rooftop Exhaust Fans

Photo 4 – Exhaust Hood with Make-up Air Fan

Photo 5 – Air-Cooled Condensing Unit

Photo 6 – Penthouse Air Handling Unit

Restrooms and gang bathrooms are exhaust through exhaust registers on the ceiling and rooftop exhaust fans. Controls are operated continuously during occupied hours and do not operate during unoccupied hours. Heating is provided by hot water terminal equipment.

Each entry, stair and miscellaneous other spaces in the building have been provided with terminal hot water heaters. Miscellaneous spaces, such as storage rooms, are provided with hot water heating, where required, and an exhaust air system.

All existing automatic temperature controls are pneumatic and a DOS based front end; the system has degraded over time, is not maintainable due to unavailable replacement parts, has many air leaks and has left the building with little to no control in most areas.

Recommendations

Existing boilers will be replaced with new high efficiency condensing boilers. Main system and secondary pumps will be replaced with new high efficiency pumps with variable frequency drive (VFD) motors.

Main heating equipment and rooftop air handling equipment serving the classrooms, administration area, library, auditorium, and cafeteria will be replaced with new, high efficiency equipment with new air-cooled condensing unit and energy recovery to meet new energy conservation codes.

Hot deck/cold deck systems are very inefficient and will be removed for a high efficiency ductwork distribution system that will meet the new IECC and Massachusetts energy conservation codes. New terminal equipment should be removed and replaced with new and existing pneumatic controls should be removed and replaced with new electronic controls.

The existing hot water distribution system will be modified to provide new heating, ventilating and air conditioning equipment with heating and reinsulated in accordance with the latest energy conservation codes. All existing hot water distribution piping will be cleaned and flushed prior to re-use and replaced where required.

The kitchen heating and ventilating systems will be removed and existing exhaust hoods and associated ductwork and accessories will be removed and replaced with a new Make-up Air Unit (MAU) with new ductwork and UL listed exhaust hoods and exhaust fans.

Exhaust fans and exhaust registers will be removed and replaced with new. Existing ductwork will be reused as much as possible and cleaned.

New hot water terminal heating equipment shall be provided for all miscellaneous spaces, entryways, storage spaces, and electrical rooms where required.

New automatic temperature control systems shall be provided for all new equipment, and new building management systems will be provided for maintenance control of discharge air temperatures, supply and return water temperatures, outdoor air system control as required for a full and complete heating, ventilating and air conditioning system. Building management systems shall provide new graphics for scheduling, monitoring and alarming for building maintenance personnel.

BURLINGTON HIGH SCHOOL

TAPPÉ ARCHITECTS

ELECTRICAL
EXISTING CONDITIONS REPORT
MAY 29, 2024

May 29, 2024

Tappe Architects

6 Edgerly Pl, Boston, MA 02116

Attn: Christopher D Blessen, AIA, LEED AP

RE: Town of Burlington - Burlington Hight School - Existing Conditions (Electrical)

Dear Chris:

Please find our high-level assessment of existing conditions of the Electrical Systems (power, lighting, and fire alarm) at Burlington HS as observed from our site visit on April 17, 2024. The Mechanical, Plumbing, and Fire Protection Systems assessment is performed by other consultants.

Summary

The existing Burlington High School was originally constructed in 1971 based on existing drawings that were reviewed. The school consists of typical classroom & instructional spaces as well as a cafeteria, media center, gymnasium, kitchen and other general office and support spaces. There are separate tenancies within the building such as a local tv station and a Burlington DPW automotive shop. The school consists of three levels.

The major building systems include three separate 3000A, 480Y/277V distribution switchboards. One emergency generator rated 240kW/300kVA, 480Y/277V. The existing electrical equipment was in bad condition. The existing distribution appeared to be original, and most equipment was dated 1971. This is long past the recommendation of upgrades. The existing generator is additionally very old, and a full replacement is recommended as well as all distribution equipment.

Code deficiencies exist with the emergency power system and the fire alarm system. In general, all systems and infrastructure are outdated and in need of complete renewal especially for occupant comfort, reliability, efficiency and the environmental impacts of carbon emissions.

The existing lighting system was composed of fluroscent fixtures with led retrofit lamps. It is recommended that these fixtures be replaced with full LED type. Exit signs throughout space were damaged. The building engiener indicated that students often knock them off. It is recommended they be replaced with vandal type such as Evenlite Sentry CDI-1- die cast exit or Evenlite Sentry CDW. Additionally lighting controls were limited and/or nonexistent. It is recommended a full lighting control system be installed to help reduce energy usage.

The existing fire alarm system was very old. The exact date could not be confirmed. The system had been upgraded in parts, but the system remained dated. It is recommended that a new fire alarm system be provided.

1. Normal Power Systems
   - The main electrical service is split into three separate distributions.
     - Distribution 1 is via a pad mount utility transformer located adjacent to the school. This transformer serves a 3000A, 480Y/277V Main Switchboard located in the lower level of the school.
       i. This switchboard was far past its recommended life span (manufactured 1971) and had visible past fire damage.
       ii. 

Figure 1 Switchboard 1 Fire Damage
       iii. In addition, any parts and pieces for modifications to this switchboard would be costly and hard to acquire due to its age. It is recommended that this unit is replaced in kind.
       iv. There was a power factor correction unit installed as an accessory to the switchboard. This unit was also past its life expectancy. Further analysis could be performed to decide if a new power factor correction unit would be required. The buildings electrical loads have changed since the electrical equipment was installed in 1971 and therefore a power factor correction unit might not be needed.

Figure 2 Power Factor Correction unit SWBD 1 , dated 1994.

- Distribution 2 is via an underground vault utility transformer located adjacent to the school. This transformer serves a 3000A, 480Y/277V Main Switchboard found in the lower level of the school.
    i. This switchboard was far past its recommended life span (manufactured 1971) and had no visible fire damage.
    ii. In addition, any parts and pieces for modifications to this switchboard would be costly and hard to acquire due to its age. It is recommended that this unit is replaced in kind.
    iii. There was a power factor correction unit installed as an accessory to the switchboard. This unit was also past its life expectancy. Further analysis could be performed to decide if a new power factor correction unit would be required. The buildings electrical loads have changed since the electrical equipment was installed in 1971 and therefore a power factor correction unit might not be needed.
    iv. Distribution 3 is via an underground vault utility transformer located adjacent to the school. This transformer serves a 3000A, 480Y/277V Main Switchboard found in the lower level of the school.
        1. This switchboard was far past its recommended life span (manufactured 1971) and had visible past fire damage.

Figure 3 Switchboard 2 Fire Damage

2. In addition, any parts and pieces for modifications to this switchboard would be costly and hard to acquire due to its age. It is recommended that this unit is replaced in kind.
3. There was a power factor correction unit installed as an accessory to the switchboard. This unit was also past its life expectancy. Further analysis could be performed to decide if a new power factor correction unit would be required. The buildings electrical loads have changed since the electrical equipment was installed in 1971 and therefore a power factor correction unit might not be needed.

- Satellite power exists throughout the campus where needed. The age of this equipment varied by location. However, most of this equipment was far past its life expectancy and should be replaced. Any parts and pieces for modifications to these panels would be costly and hard to acquire due to their age.
- An electrical study should be performed to analyze the existing buildings' electrical systems. This would include providing arc flash labels on all electrical equipment as required by NFPA 70 110.26 & 70E.
- Electrical receptacle seen were of the non-tamper resistant type. Per NEC 406.12 all education facilities must have tamper resistant receptacles. It is recommended that the existing receptacles be replaced to follow the updated electrical code.
- Megger testing shall be performed on any feeders that are planned to be reused.

- Existing utility bills were analyzed. A combined peak demand of approximately 1150 kW was obtained over the past 2 years. The existing service is rated a combined maximum load of 5900kW. The existing distribution could be further analyzed to determine if all electrical equipment must be replaced in kind to maintain a max capacity of 5900kW, or if some pieces of equipment can be taken out of service. This would require further in-depth evaluation. For instance, switchboards 1 and 2 could be shut down. Switchboard 3 replaced in kind. Loads from switchboard 1 and 2 would be refed from new switchboard 3.

2. Emergency Power Systems
   - A 250kW/300kVA, 480Y/277V Superior brand generator was located on site. Model #240R461, S# 05081826
   - It is reported that this unit primarily serves emergency lighting as well as some pumps. This was confirmed based on electrical circuit directories. This is not code acceptable to have a single transfer switch when there are more than one type of distribution system required.
   - Modern codes required separate transfer switches for life safety systems (NEC 700 & 701) and other optional standby loads (NEC 702). A second and/or third transfer switch and separation of loads should be planned. Additional distribution panels and electrical equipment maybe required for distribution of power.
   - The unit is natural gas-fired and a source for on-site combustion. Natural gas generators are not acceptable means of providing emergency power. Natural gas generators typically are rejected by AHJs. Additionally, the required 10s of time for transfer of power via the automatic transfer switch can be hard to attain with a natural gas generator. It is recommended to investigate the possibility of adding a diesel generator.

Figure 4 Generator.

3. Lighting Systems
   - Interior lighting is primarily fluorescent-type fixtures with led retrofit lamps.
   - A mixture of lay-in fixtures, surface-mounted fixtures and pendant style fixtures were observed.
   - The light layout appeared adequate throughout although specific light level readings were not taken.
   - Overall energy efficiency improvements can be made by converting all lighting to LED-type lighting rather than retrofitting lamps.
   - Lighting controls were nonexistent or very limited. It's recommended to provide a whole lighting control system replacement/upgrade.

4. Fire Alarm Systems
   - There is a Fire Lite Fire Alarm system. The fire alarm system appeared to be original in some areas and new in other areas. During our brief walk through, fire alarm coverage appeared adequate, however the entire system should be surveyed in detail and corrected as needed. The system should be replace/upgraded to current components.

Figure 5 FACP.

Figure 6 FATC.

BURLINGTON HIGH SCHOOL

TAPPÉ ARCHITECTS

TECHNOLOGY
EXISTING CONDITIONS REPORT
MAY 28, 2024

EXISTING TECHNOLOGY SYSTEMS

Utilitarian Spaces and Systems

Utilitarian technology spaces are located strategically throughout the school. The MDF, located in the media center, is dedicated to equipment and cabling distribution. Some IDF locations are dedicated spaces, while others are shared. Single mode fiber is run between all distribution locations. There are two demarcation locations at the high school.

Data Cabling Systems and Connectivity

There are fiber connections (6 strands of SM) from the MDF to the following areas:

- Front office D-Marc
- Room 249
- Room 205
- Room 197
- Room 189
- Room 178
- Room 106
- CO (12 strands)

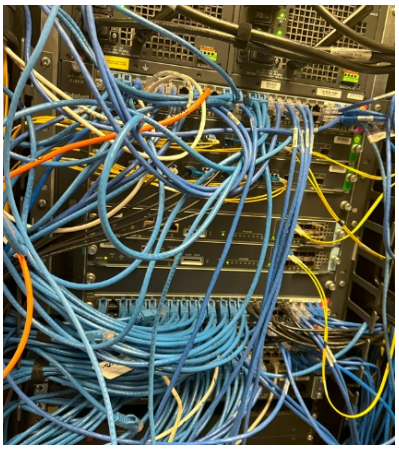
There is an additional IDF location that runs 6 strands of single mode fiber to:

- Room 133
- Room 137
- Room 220
- Room 222
- Room 231B
- Business Office
- TV Studio (12 strands)

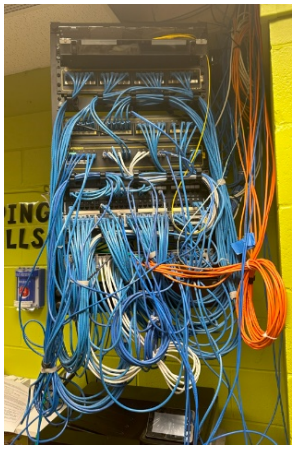
12 strands of single mode fiber connect town hall to all schools and town buildings in a star topology, with a redundant loop between all buildings.

Data cabling is mostly a combination of legacy Category 5 and Category 5e. There are several instances of exposed fiber and cabling throughout the building.

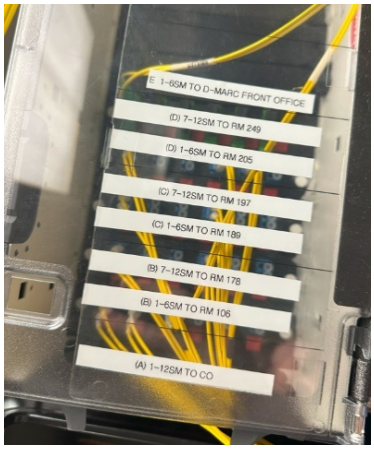
Newer network switches are Cisco 9300's and 3850's. Other switches and controllers include one Cisco Catalyst 3560G and a Cisco Catalyst 4510 chassis. The district has standardized on Cisco as a manufacturer for network switch electronics and Meraki for wireless technology.



MDF Patch panels and Electronics



IDF Patch Panels and Electronics



MDF Fiber breakdown

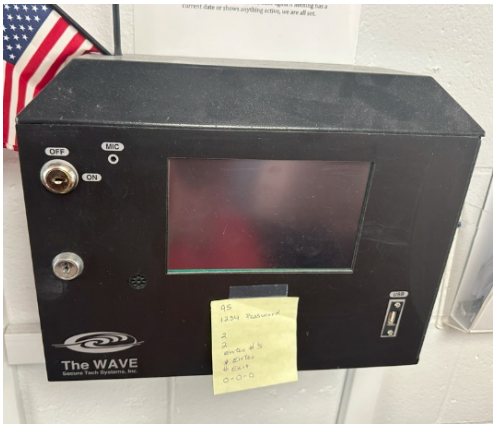
Intercom/Clocks/Phones

The school also contains a legacy but functional Bogen Multicom-2000 public address system located adjacent to the library. The school uses an on-premise Cisco VoIP system. Classrooms have one analog phone which functions as a call button, and one Cisco VoIP handset used for inerschool and outside communication.

The console for the WAVE system is located in a Library office along with the Bogen PA console. This system seamlessly integrates with the school's public address system for all emergency functions.

Bogen Multicom-2000 Equipment

Typical classroom PA phone / speaker



The WAVE console

Public address speakers are of an older vintage and spacing is inadequate for proper coverage. New public address endpoints should be considered as part of any new building project. Clocks have been sporadically replaced with battery operated clocks.

Instructional Technology

Typical Classrooms and Learning Spaces are equipped with the following:

Wireless coverage throughout (Wireless access points are Cisco Meraki)

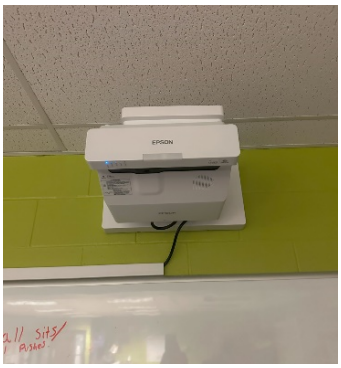
Typical Classroom AP

Typical Wall AP

Gymnasium AP

Classroom projectors are Epson 685W's, utilizing markerboards as projection surfaces. There is high to low HDMI cabling at all projector and teacher locations. Many classrooms have multiple data connections for student and teacher use.

The high school utilizes iPads for student one-to-one devices. Classrooms also have a Lightspeed Redcat system with a media converter for teacher speech reinforcement. Teachers computing devices are Macbooks.



UST Projector

Lightspeed Redcat

Lightspeed Media Converter and Mic.

Miscellaneous

- The high school is the home of B-CAT (Burlington Cable Access Television)
- The Committee Conference Room has a dedicated local AV system
- There are two digital signage locations in the main lobby
- There are two point of sale devices on each side of the cafeteria, four total
- There is a Viking Model K-2000 Multi-Input voice dialer / announcer in the main office

4.7

EXISTING CONDITIONS | PLUMBING & FIRE PROTECTION ASSESSMENTS

BURLINGTON HIGH SCHOOL

TAPPÉ ARCHITECTS

PLUMBING
EXISTING CONDITIONS REPORT
MAY 28, 2024

Plumbing

Existing Conditions

Plumbing Systems

The existing school building is equipped with several plumbing systems including domestic hot and cold water; sanitary drain, waste, and vent; natural gas; storm drainage; laboratory waste and vent; and compressed air.

The building's domestic water is supplied underground through a four-inch (4") ductile iron service. The four-inch (4") domestic water supply is equipped with a strainer, isolation valves, and a 2" meter. The water service piping is a mixture of ductile iron and copper, appears to be in good condition.

Photo 1 - Water Service

Photo 2 - Water Meter

Only the exposed piping scattered throughout the building could be observed and evaluated. The domestic water piping is hard drawn copper tube and appears to be in fair to good condition, with some evidence of previous leaks. New piping and repairs have been done with copper tube and pressed fittings.

Reduced pressure backflow preventers are provided for boiler make-up water and science classrooms.

The main domestic water heating plant is located in the mechanical room and consists of an H.B. Smith model G81-1735 gas-fired cast iron boiler with an Everhot model 16 indirect water heater. Heated water is stored in one the original Patterson-Kelley Control-Flo 500 tank-type indirect water heaters. The domestic hot water system appears to be a recirculated single temperature system. A thermostatic mixing valve could not be found. The piping around the water heater and storage tank is in good condition.

Photo 3 - Water Heater

Photo 4 - Storage Tank

The boiler vent piping is insulated single wall galvanized steel and has been retrofitted with a draft inducer fan. The water heating boiler is common vented with the heating system boilers to a masonry chimney.

Combustion air is provided by an exterior louver with high and low openings with motorized dampers as well as an air handling unit. It is unknown how these are interlocked with the boilers and water heater.

Photo 5 – Draft Inducer Fan

Photo 6 – Combustion Air

There is a 30-gallon State model ES630D0RT electric water heater located in the basement corridor which appears to serve the science classrooms. There is a small electric water heater (nameplate data not accessible) which serves the early childhood wing. There is also a State model SBD-81-199NE gas-fired atmospheric water heater which serves the kitchen.

Photo 7 – Electric Water Heater

Photo 8 – Kitchen Water Heater

What could be seen of the existing sanitary drain, waste and vent system appears to be a combination of drainage pattern copper and cast iron. The majority of the piping is hub and spigot cast iron with either gasketed or leaded and caulked joints, with some no-hub cast iron pipe with rubber couplings and stainless steel bands with shields. Copper drainage piping is limited primarily to fixture connections. Visible piping appeared to be in good condition, with little evidence of active leaks.

What could be seen of the existing storm drainage piping is hub and spigot cast iron with either gasketed or leaded and caulked joints, along with some no-hub cast iron pipe with rubber couplings and stainless steel bands with shields. Visible piping appeared to be in good condition. Storm water is collected through cast iron roof drains with interior storm drainage piping. Some piping is insulated.

Waste and vent piping serving the science classrooms is primarily glass with stainless steel band clamp couplings with some polypropylene pipe with mechanical or heat fused joints and fittings used for repairs. There was no evidence of an acid neutralization or pH adjustment system.

Photo 9 – Water Piping

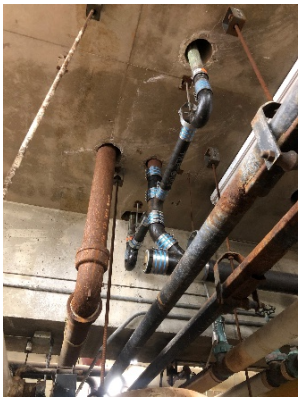


Photo 10- Sanitary & Storm Drain Piping

Photo 11 – Glass Waste Piping

Photo 12 – Polypropylene Piping

The building is equipped with a natural gas service located inside the boiler room. The natural gas system serves the domestic water heater, building heating equipment, kitchen equipment, and science classrooms. The kitchens and science classrooms do not appear to be equipped with emergency gas shutoffs, and the kitchen system does not appear to be interlocked with the kitchen exhaust. Gas piping is steel with welded or threaded fittings, and appears to be in good condition. MegaPress fittings have been used for repairs.

Photo 13 – Gas Service

Photo 14- Gas Meter

The total combined load of all gas fired equipment is unknown at this time.

The heating system boilers' exhaust vent piping appears to be insulated positive pressure galvanized steel. The boilers are common vented and extend to an exterior factory-built chimney. The boiler gas train components are vented to the exterior with schedule 40 threaded steel.

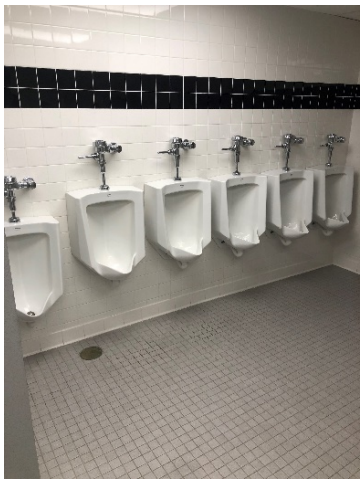
Plumbing Fixtures

Restroom plumbing fixtures include wall hung toilets, urinals, and lavatories with manual flush valves and mechanical metering faucets.

There are various other fixtures located throughout the building including drinking fountains and bottle fillers, service sinks, laboratory sinks, classroom and general use sinks, gang style and single-user showers, emergency eye wash and shower stations, floor drains, and kitchen equipment.

Various original plumbing fixtures, flush valves, and faucets have been replaced over the years.

Toilet



Urinals

Lavatories

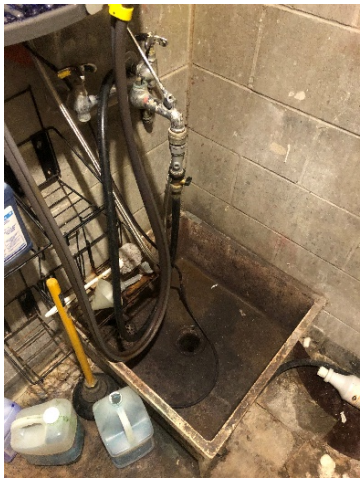
General Use Sink

Water Cooler with Bottle Filler

Faculty Restroom

Classroom Sink with Drain Pump

Roof Drain



Mop Sink

Gang Shower

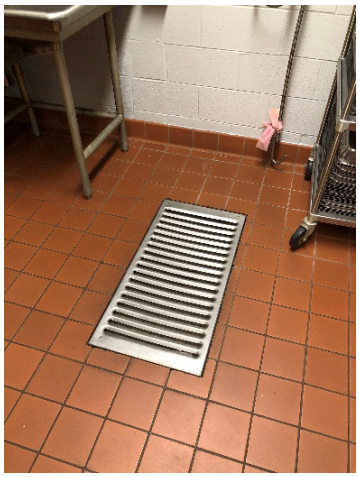
Lab Cup Sink

Emergency Safety Station

Kitchen equipment includes prep sinks, pot wash sinks, trough drains, floor drains, hand wash sinks, and laundry equipment. Only the triple pot scullery sink is connected to a recessed grease interceptor. The kitchen hood is equipped with an integral chemical suppression system. The cooking equipment gas supply is equipped with a manual emergency shutoff, which is interconnected with the hood suppression system. The water supply to the cooking equipped is equipped with a dual check valve and pressure reducing valve.

Scullery Sink

Emergency Shut-Off



Trough Drain

Grease Interceptor

Dual Check & PRV

Hand Wash Sink

Deficiencies

There were various deficiencies noted. While many of the items may have been allowed by the codes in force at the time of construction, they do not meet the latest edition of the codes and would most likely need to be addressed during any major renovation.

These items include:

- We suspect that the hot water recirculation piping for lavatories is not installed in accordance with the current energy efficiency code requirement (piped to within 24" of the fixture supply) and would have to be modified.
- Plumbing fixtures appear to be in good condition, but may not meet current codes for flow rates and/or accessibility.
- Trip lever on accessible toilets is not on the accessible side of the fixture.
- The kitchen fixtures do not drain through a grease interceptor.
- Grease trap does not have proper signage.
- A scullery sink is not trapped properly.
- Automatic detergent and sanitizer dispenser water connections are not protected with backflow preventers.
- An exterior sanitary drain is installed above grade.
- Sanitary drain is connected to acid waste drain piping.
- PVC drain piping has been used for repairs and on some fixtures and roof drains.
- Lab waste is not equipped with a pH adjustment system.
- Non-potable water piping is not identified as such.
- Some rooftop plumbing vents may be too close to fresh air intakes.
- Various hose connections throughout the building are not equipped with vacuum breakers.
- There are some service sinks which are not fixed in place and are sitting on top of floor drains.
- Floor drains throughout the building do not appear to be equipped with automatic trap primers.
- Kitchen gas supply may not be properly interlocked with the kitchen hoods.
- Domestic water piping insulation thickness may not meet current energy code requirements should be inspected and replaced where it has been damaged or does not meet current energy code requirements.

Recommendations

All deficiencies noted above should be addressed.

Although the storm and sanitary drainage system piping appears to be in good condition, a minimal amount was visible during our visit, therefore extensive investigation should be conducted prior to reuse or modifications if the existing cast iron drainage piping system needs to last for an extended period of time, as should be expected with a major renovation.

Although it appears to be in fair to good condition, we do not believe that the existing domestic water piping system in the building would last for an extended period of time, as should be expected with a major renovation, and would be prone to failure before the building reached its life expectancy. Due to its' unknown condition and age, any major renovation should consider the replacement of the domestic water piping system in the building.

With the replacement of the water piping in the original building, the hot water piping system should be modified to provide the proper water temperature to the various fixtures, with the hot water serving the kitchen and janitorial sinks, and tempered water serving the remainder of the fixtures. Hot water piping for

the lavatories should be re-piped to meet the energy code requirements, and all emergency eye wash and shower stations should be equipped with thermostatic mixing valves and tempered water.

The water heater and storage tank are reaching the end of their life expectancy and should be replaced. Consideration should be given to installing two water heaters and storage tanks for redundancy and maintenance/repair.

The natural gas piping could remain and be modified as needed. The kitchen gas system should be interlocked with new carbon monoxide detectors, and all emergency shut-off systems should be tested. The gas piping for the science classrooms should be modified to include a main emergency shut off valve for each classroom.

In general, the existing plumbing fixtures, while dated and worn, are in fair to good condition and functional and could remain in service. However, many fixtures may fail to comply with current accessibility and water conservation standards. In addition, the existing water closets and urinals may not function properly with the newer water conserving flush valves. Given the assessed value of the existing building, the respective cost of any proposed building renovation or addition could require replacement of most of the existing fixtures.

A chemical injection type pH adjustment system should be installed to serve the science classrooms. All acid waste piping should be investigated for deterioration.

Substantial renovations would require the existing floor drains, floor sinks, and unused showers to be retrofitted with automatic trap primers or the space in which they are installed to be equipped with a hose bibb.

Any work to the building should include an analysis of the current fixture count and plumbing code requirements, and provide the correct type and quantity of plumbing fixtures, including separate restroom facilities for faculty and kitchen staff.

If not replaced, damaged or malfunctioning fixtures or equipment should be repaired.

BURLINGTON HIGH SCHOOL

TAPPÉ ARCHITECTS

FIRE PROTECTION EXISTING CONDITIONS REPORT

MAY 28, 2024

Fire Protection

Existing Conditions

The current school building was not fully sprinklered at the time of construction. There have been no modifications, renovations, or additions which would have required retrofitting the building with an automatic fire suppression system since that time.

There is a limited area sprinkler system which is tapped off of the domestic cold water piping in the basement. The sprinkler system serves the stage and adjacent storage room, and includes 2½" valved hose connections on either side of the proscenium.

Photo 1 – Sprinkler Service

Photo 2- Stage Hose Connection

Photo 3 – Storage Room Sprinklers

Photo 4- Sprinklers above Stage

The existing kitchen hoods are equipped with integral fire suppression systems.

Deficiencies

The existing building does not meet current code requirements.

The cross connection between the potable water system and the sprinkler system is not protected with a double check valve assembly as required per 310CMR 22.22.

The stage catwalk is not sufficiently open (less than 70%) and is an obstruction to the sprinklers above.

Discussion

The current Massachusetts State Building Code requires all newly constructed buildings of Use Group E – Educational which are over 12,000 square feet in area to be equipped with an automatic sprinkler system providing complete building coverage. In addition, legitimate stages are required to be equipped with automatic standpipe systems.

Massachusetts General Laws, Part I, Title XX, Chapter 148, Section 26G, requires automatic sprinkler systems be installed in all buildings, including additions, with a gross area totaling more than 7,500 square feet. This law is only triggered if a new building is constructed, an addition is built onto an existing building, or major alterations or modifications are planned for an existing structure. Major alterations and modifications are further defined and discussed in the 2009 advisory memorandum issued by the Executive Office of Public Safety and Security's Department of Fire Services.

Hydrant flow test data was not available, so it is unknown at this time if the existing public water supply system is of adequate capacity to support a fire sprinkler system without the installation of a fire pump.

If a fire pump is required, it would need to be diesel engine driven, or electric motor driven with an emergency generator for back-up. The fire pump and controller need to be located within a dedicated 2-hour fire rated room with exterior access.

Based on the building's footprint, the building will need to have at least two separate sprinkler system risers.

A standpipe system does not appear to be required.

Floor control valves would be required.

The building appears to be of non-combustible construction, so sprinklers would not be required in the non-combustible interstitial spaces above suspended ceilings.

Recommendations

In accordance with Chapter 34 of the current Massachusetts State Building Code, existing buildings in Use Group E are not required to be retrofitted with an automatic fire sprinkler system unless they undergo major alterations or a change in use. However, because of the proven property and life-saving benefits of these systems, this office would recommend retrofitting the original building in the near future regardless of renovation plans.

4.8

ENVIRONMENTAL BUILDING ANALYSIS

BURLINGTON HIGH SCHOOL

TAPPÉ ARCHITECTS

HAZMAT
EXISTING CONDITIONS REPORT
APRIL 25, 2024

FINAL REPORT
FOR
HAZARDOUS MATERIALS IDENTIFICATION
STUDY
AT THE
HIGH SCHOOL
BURLINGTON, MASSACHUSETTS

PROJECT NO: 224 219.00

Survey Dates:
April 15, 2024 – April 19, 2024
April 25, 2024

CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 Brewster Road
Framingham, MA 01702

UEC universal environmental consultants

April 29, 2024

Mr. Charlie Hay, Principal
Tappe' Architects
6 Edgerly Place
Boston, MA 02116

Reference: Report for Hazardous Materials Identification Study
High School, Burlington, MA

Dear Mr. Hay:

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

Enclosed please find the report for the hazardous materials identification study at the High School, Burlington, MA.

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

Very truly yours,

Universal Environmental Consultants

Ammar M. Dieb
President

UEC:\224 219.00\Report.DOC

Enclosure

INTRODUCTION:
Universal Environmental Consultants (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-three years of experience.

UEC was contracted by Tappe' Architects to conduct the following services at the High School, Burlington, Massachusetts:

- Asbestos Containing Materials (ACM) determination inspection and sampling.
- Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures inspection.
- PCB's Caulking Inspection.
- Lead Based Paint (LBP) inspection.
- Mercury in Rubber Flooring inspection.

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination and quantities of types of ACM found and cost estimates for remediation. ***A comprehensive survey per the Environmental Protection Agency (EPA) NESHAP regulation would be required prior to any renovation or demolition activities.***

Bulk samples analysis for asbestos was performed using the standard Polarized Light Microscopy (PLM) Method in accordance with EPA standard. Bulk samples were collected by Massachusetts licensed asbestos inspectors Mr. Leonard J. Busa (AI-001899) and Mr. Jason Becotte (AI-034963). Samples were analyzed by Massachusetts licensed laboratories EMSL and Asbestos Identification Laboratory, Woburn, MA.

Samples results are attached.

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 be ACM based on findings that the results of at least one sample collected from that area shows that ACM is present in an amount equal to or greater than 1 percent in accordance with EPA regulations. Per the Department of Environmental Protection (DEP) regulations, any amount of asbestos found would trigger compliance for proper disposal as asbestos. No additional suspect and accessible ACM were found during this survey.

Hidden ACM may be found during the renovation and demolition activities.

Number of Samples Collected:
February 2, 2018
Two (2) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Suspect Material

1. Fire curtain at stage
2. Fire curtain at stage

Sample Results:

Type and Location of Suspect Material	**Sample Result**
1. Fire Curtain at stage	50% Asbestos

2. Fire Curtain at stage 50% Asbestos

October 22, 2018
Thirteen (13) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Suspect Material

1. Textured ceiling plaster at auditorium
2. Textured ceiling plaster at auditorium
3. Textured ceiling plaster at auditorium
4. Textured ceiling plaster at auditorium
5. Textured ceiling plaster at auditorium
6. Textured ceiling plaster at auditorium
7. Textured ceiling plaster at auditorium
8. 2' x 4' Suspended acoustical ceiling tile at pre-school
9. 2' x 4' Suspended acoustical ceiling tile at fitness center
10. Joint compound at center offices
11. Joint compound at pre-school
12. Sheetrock at center offices
13. Sheetrock at pre-school

Sample Results:

Type and Location of Suspect Material	**Sample Result**
1. Textured ceiling plaster at auditorium	No Asbestos Detected
2. Textured ceiling plaster at auditorium	No Asbestos Detected
3. Textured ceiling plaster at auditorium	No Asbestos Detected
4. Textured ceiling plaster at auditorium	No Asbestos Detected
5. Textured ceiling plaster at auditorium	No Asbestos Detected
6. Textured ceiling plaster at auditorium	No Asbestos Detected
7. Textured ceiling plaster at auditorium	No Asbestos Detected
8. 2' x 4' Suspended acoustical ceiling tile at pre-school	No Asbestos Detected
9. 2' x 4' Suspended acoustical ceiling tile at fitness center	No Asbestos Detected
10. Joint compound at center offices	No Asbestos Detected
11. Joint compound at pre-school	No Asbestos Detected
12. Sheetrock at center offices	No Asbestos Detected
13. Sheetrock at pre-school	No Asbestos Detected

April 15, 2024
Twenty-one (21) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Suspect Material

1. Exterior window framing caulking
2. Exterior window framing caulking
3. Exterior window framing caulking
4. Exterior window framing caulking
5. Exterior window framing caulking
6. Exterior window framing caulking
7. Exterior window framing caulking
8. Exterior door framing caulking
9. Exterior door framing caulking
10. Exterior door framing caulking
11. Exterior roll-up door framing caulking
12. Exterior door framing caulking

13. Exterior residue door framing caulking
14. Vertical grey caulking by column
15. Vertical grey caulking by column
16. Vertical grey caulking by column
17. Vertical grey caulking by column
18. Exterior damproofing on foundation walls
19. Exterior damproofing on foundation walls
20. Exterior unit vent grille caulking
21. Black/grey paint on exhaust stack from boiler room

Sample Results:

Type and Location of Suspect Material	**Sample Result**
1. Exterior window framing caulking	No asbestos Detected
2. Exterior window framing caulking	No asbestos Detected
3. Exterior window framing caulking	No asbestos Detected
4. Exterior window framing caulking	No asbestos Detected
5. Exterior window framing caulking	No asbestos Detected
6. Exterior window framing caulking	No asbestos Detected
7. Exterior window framing caulking	No asbestos Detected
8. Exterior door framing caulking	No asbestos Detected
9. Exterior door framing caulking	No asbestos Detected
10. Exterior door framing caulking	No asbestos Detected
11. Exterior roll-up door framing caulking	No asbestos Detected
12. Exterior door framing caulking	No asbestos Detected
13. Exterior residue door framing caulking	No asbestos Detected
14. Vertical grey caulking by column	No asbestos Detected
15. Vertical grey caulking by column	No asbestos Detected
16. Vertical grey caulking by column	No asbestos Detected
17. Vertical grey caulking by column	No asbestos Detected
18. Exterior damproofing on foundation walls	18% Asbestos
19. Exterior damproofing on foundation walls	18% Asbestos
20. Exterior unit vent grille caulking	No asbestos Detected
21. Black/grey paint on exhaust stack from boiler room	No asbestos Detected

April 25, 2024
Sixty-six (66) bulk samples were collected from materials suspected of containing asbestos, including:

Type and Location of Suspect Material

1. Black sink coating at room 311
2. Black sink coating at room 414
3. Red duct sealant at penthouse 6
4. Red duct sealant at penthouse 7
5. Red duct sealant at storage room
6. Red duct sealant at storage room
7. Interior window glazing caulking
8. Interior window glazing caulking
9. Fume hood at room 143
10. Fume hood at room 145
11. Tab table at room 143
12. Tab table at room 145
13. White/brown 12” x 12” vinyl floor tile at room 109
14. White/brown 12” x 12” vinyl floor tile at room 113
15. Mastic for white/brown 12” x 12” vinyl floor tile at room 109

16. Mastic for white/brown 12” x 12” vinyl floor tile at room 113
17. Dark grey 12” x 12” vinyl floor tile at central office side main corridor
18. Dark grey 12” x 12” vinyl floor tile at central office side main corridor
19. Yellow mastic for dark grey 12” x 12” vinyl floor tile at central office side main corridor
20. Yellow mastic for dark grey 12” x 12” vinyl floor tile at central office side main corridor
21. Reddish 12” x 12” vinyl floor tile at cafeteria side main corridor
22. Reddish 12” x 12” vinyl floor tile at cafeteria side main corridor
23. Yellow mastic for reddish 12” x 12” vinyl floor tile at cafeteria side main corridor
24. Yellow mastic for reddish 12” x 12” vinyl floor tile at cafeteria side main corridor
25. Beige/grey 12” x 12” vinyl floor tile at science center
26. Beige/grey 12” x 12” vinyl floor tile at boiler room entrance hallway
27. Mastic for beige/grey 12” x 12” vinyl floor tile at science center
28. Mastic for beige/grey 12” x 12” vinyl floor tile at boiler room entrance hallway
29. Blue/grey 12” x 12” vinyl floor tile at main corridor by room 144
30. Blue/grey 12” x 12” vinyl floor tile at main corridor by room 144
31. Mastic for blue/grey 12” x 12” vinyl floor tile at main corridor by room 144
32. Mastic for blue/grey 12” x 12” vinyl floor tile at main corridor by room 144
33. Tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office
34. Tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office
35. Mastic for tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office
36. Mastic for tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office
37. White/grey 12” x 12” vinyl floor tile at pre-school
38. White/grey 12” x 12” vinyl floor tile at pre-school
39. Mastic for white/grey 12” x 12” vinyl floor tile at pre-school
40. Mastic for white/grey 12” x 12” vinyl floor tile at pre-school
41. Seal blue 12” x 12” vinyl floor tile at pre-school room B6
42. Seal blue 12” x 12” vinyl floor tile at pre-school room B6
43. Yellow mastic for seal blue 12” x 12” vinyl floor tile at pre-school room B6
44. Yellow mastic for seal blue 12” x 12” vinyl floor tile at pre-school room B6
45. White/brown 12” x 12” vinyl floor tile at electric room by Bay Path
46. White/brown 12” x 12” vinyl floor tile at electric room by Bay Path
47. Yellow mastic for white/brown 12” x 12” vinyl floor tile at electric room by Bay Path
48. Yellow mastic for white/brown 12” x 12” vinyl floor tile at electric room by Bay Path
49. Generator exhaust insulation
50. Generator exhaust insulation
51. Generator exhaust insulation
52. Exhaust duct insulation
53. Exhaust duct insulation
54. Exhaust duct insulation
55. Heat exchanger insulation
56. Heat exchanger insulation
57. Heat exchanger insulation
58. Tank insulation
59. Tank insulation
60. Tank insulation
61. Mud on flange end at boiler room
62. Mud on flange end at boiler room
63. Mud on flange end at boiler room
64. Hard joint insulation at boiler room
65. Hard joint insulation at boiler room
66. Hard joint insulation at boiler room

Sample Results:

Type and Location of Suspect Material	**Sample Result**

1. Black sink coating at room 311	3% Asbestos
2. Black sink coating at room 414	3% Asbestos
3. Red duct sealant at penthouse 6	5% Asbestos
4. Red duct sealant at penthouse 7	5% Asbestos
5. Red duct sealant at storage room	5% Asbestos
6. Red duct sealant at storage room	5% Asbestos
7. Interior window glazing caulking	2% Asbestos
8. Interior window glazing caulking	2% Asbestos
9. Fume hood at room 143	20% Asbestos
10. Fume hood at room 145	20% Asbestos
11. Tab table at room 143	20% Asbestos
12. Tab table at room 145	20% Asbestos
13. White/brown 12” x 12” vinyl floor tile at room 109	4% Asbestos
14. White/brown 12” x 12” vinyl floor tile at room 113	4% Asbestos
15. Mastic for white/brown 12” x 12” vinyl floor tile at room 109	7% Asbestos
16. Mastic for white/brown 12” x 12” vinyl floor tile at room 113	7% Asbestos
17. Dark grey 12” x 12” vinyl floor tile at central office side main corridor	No Asbestos Detected
18. Dark grey 12” x 12” vinyl floor tile at central office side main corridor	No Asbestos Detected
19. Yellow mastic for dark grey 12” x 12” vinyl floor tile at central office side main corridor	No Asbestos Detected
20. Yellow mastic for dark grey 12” x 12” vinyl floor tile at central office side main corridor	No Asbestos Detected
21. Reddish 12” x 12” vinyl floor tile at cafeteria side main corridor	No Asbestos Detected
22. Reddish 12” x 12” vinyl floor tile at cafeteria side main corridor	No Asbestos Detected
23. Yellow mastic for reddish 12” x 12” vinyl floor tile at cafeteria side main corridor	No Asbestos Detected
24. Yellow mastic for reddish 12” x 12” vinyl floor tile at cafeteria side main corridor	No Asbestos Detected
25. Beige/grey 12” x 12” vinyl floor tile at science center	4% Asbestos
26. Beige/grey 12” x 12” vinyl floor tile at boiler room entrance hallway	4% Asbestos
27. Mastic for beige/grey 12” x 12” vinyl floor tile at science center	7% Asbestos
28. Mastic for beige/grey 12” x 12” vinyl floor tile at boiler room entrance hallway	7% Asbestos
29. Blue/grey 12” x 12” vinyl floor tile at main corridor by room 144	No Asbestos Detected
30. Blue/grey 12” x 12” vinyl floor tile at main corridor by room 144	No Asbestos Detected
31. Mastic for blue/grey 12” x 12” vinyl floor tile at main corridor by room 144	No Asbestos Detected
32. Mastic for blue/grey 12” x 12” vinyl floor tile at main corridor by room 144	No Asbestos Detected
33. Tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office	No Asbestos Detected
34. Tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office	No Asbestos Detected
35. Mastic for tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office	7% Asbestos
36. Mastic for tan/white-brown 12” x 12” vinyl floor tile at main corridor by custodian office	7% Asbestos
37. White/grey 12” x 12” vinyl floor tile at pre-school	No Asbestos Detected
38. White/grey 12” x 12” vinyl floor tile at pre-school	No Asbestos Detected
39. Mastic for white/grey 12” x 12” vinyl floor tile at pre-school	No Asbestos Detected
40. Mastic for white/grey 12” x 12” vinyl floor tile at pre-school	No Asbestos Detected
41. Seal blue 12” x 12” vinyl floor tile at pre-school room B6	No Asbestos Detected
42. Seal blue 12” x 12” vinyl floor tile at pre-school room B6	No Asbestos Detected
43. Yellow mastic for seal blue 12” x 12” vinyl floor tile at pre-school room B6	No Asbestos Detected
44. Yellow mastic for seal blue 12” x 12” vinyl floor tile at pre-school room B6	No Asbestos Detected
45. White/brown 12” x 12” vinyl floor tile at electric room by Bay Path	No Asbestos Detected
46. White/brown 12” x 12” vinyl floor tile at electric room by Bay Path	No Asbestos Detected
47. Yellow mastic for white/brown 12” x 12” vinyl floor tile at electric room by Bay Path	No Asbestos Detected
48. Yellow mastic for white/brown 12” x 12” vinyl floor tile at electric room by Bay Path	No Asbestos Detected
49. Generator exhaust insulation	No Asbestos Detected
50. Generator exhaust insulation	No Asbestos Detected
51. Generator exhaust insulation	No Asbestos Detected
52. Exhaust duct insulation	No Asbestos Detected
53. Exhaust duct insulation	No Asbestos Detected
54. Exhaust duct insulation	No Asbestos Detected
55. Heat exchanger insulation	60% Asbestos

56. Heat exchanger insulation	60% Asbestos
57. Heat exchanger insulation	60% Asbestos
58. Tank insulation	80% Asbestos
59. Tank insulation	80% Asbestos
60. Tank insulation	80% Asbestos
61. Mud on flange end at boiler room	No Asbestos Detected
62. Mud on flange end at boiler room	No Asbestos Detected
63. Mud on flange end at boiler room	No Asbestos Detected
64. Hard joint insulation at boiler room	No Asbestos Detected
65. Hard joint insulation at boiler room	No Asbestos Detected
66. Hard joint insulation at boiler room	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.

Refer to the AHERA Management Plan for condition of ACM.

1. Fire curtain was found to contain asbestos.
2. Black sink coating was found to contain asbestos.
3. Red duct sealant was found to contain asbestos.
4. Interior window glazing caulking was found to contain asbestos.
5. Transite chalkboard was assumed to contain asbestos.
6. Transite panel inside fume hood was found to contain asbestos.
7. Transite lab table was found to contain asbestos.
8. White/brown 12” x 12” vinyl floor tile was found to contain asbestos.
9. Mastic for white/brown 12” x 12” vinyl floor tile was found to contain asbestos.
10. Beige/grey 12” x 12” vinyl floor tile was found to contain asbestos.
11. Mastic for beige/grey 12” x 12” vinyl floor tile was found to contain asbestos.
12. Mastic for tan/white-brown 12” x 12” vinyl floor tile was found to contain asbestos.
13. Heat exchanger insulation was found to contain asbestos.
14. Tank insulation was found to contain asbestos.
15. Tank insulation was assumed to contain asbestos.
16. Damproofing on foundation walls was found to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal in an EPA approved landfill that does not recycle. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval.
17. 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 in an EPA approved landfill that does not recycle. A non-traditional abatement plan would have to be prepared and submitted to the DEP for approval.
18. Roofing material was assumed to contain asbestos.
19. Exterior walls are cement. Unable to determine if suspect ACM exist without destructive testing.
20. All other suspect materials were found not to contain asbestos. Hidden ACM may be found during renovation and demolition activities.

Polychlorinated Biphenyls (PCB’s)-Electrical Equipment and Light Fixtures:
Observations and Conclusions
Visual inspection of various equipments such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB’s and mercury. Ballasts in light fixtures were assumed not to contain PCB’s 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 equipments and dismantling would be required to access. Therefore, the above-mentioned equipment should be disposed of in an EPA approved landfill as part of the demolition project.

PCB's in Caulking:
PCB's are manmade chemicals that were widely produced and distributed across the country from the 1950s to 1977 until the production of PCB's was banned by the US Environmental Protection Agency (EPA) law which became effective in 1978. PCB's are a class of chemicals made up of more than 200 different compounds. PCB's are non-flammable, stable, and good insulators so they were widely used in a variety of products including electrical transformers and capacitors, cable and wire coverings, sealants and caulking, and household products such as television sets and fluorescent light fixtures. Because of their chemical properties, PCB's are not very soluble in water, and they do not break down easily in the environment. PCB's also do not readily evaporate into air but tend to remain as solids or thick liquids. Even though PCB's have not been produced or used in the country for more than 30 years, they are still present in the environment, in the air, soil, and water and in our food. EPA requires that all construction waste including caulking be disposed as PCB's if PCB's level exceeds 50 mg/kg (ppm). An abatement plan might also be required.

Observations and Conclusions:
Building caulking was assumed to contain PCB's.

Lead Based Paint (LBP):
Observations and Conclusions
LBP was assumed to exist 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:
Rubber flooring at one of the gymnasiums was assumed to contain mercury.

COST ESTIMATES:
The cost includes removal and disposal of all accessible ACM, other hazardous material, and an allowance for removal of inaccessible or hidden ACM that may be found during renovation or demolition project.

Location	Material	Approximate Quantity	Cost Estimate ($)
Throughout	Various Types of Flooring Materials	115,000 SF	690,000.00
	Interior Windows	325 Total	97,500.00
	Sinks	12 Total	3,600.00
	Transite Chalkboards	100 Total	50,000.00
	Transite Fume Hoods	8 Total	24,000.00
	Transite Lab Tables	150 SF	6,000.00
	Miscellaneous Hazardous Materials	Unknown	75,000.00
	Light Fixtures	1,200 Total	60,000.00
Stage	Fire Curtain	1 Total	9,500.00
Gymnasium	Rubber Flooring System	5,000 SF	84,000.00
Boiler Room	Tank Insulation	240 Sf	12,000.00
	Boiler Insulation	240 SF	12,000.00
	Heat Exchanger Insulation	50 SF	3,000.00
Exterior	Transite Sewer Pipes	Unknown[1]	75,000.00

Location	Material	Approximate Quantity	Cost Estimate ($)
	Roofing Materials	Unknown	450,000.00
	Thru-Wall Flashing	Unknown[1]	150,000.00
	Damproofing on Walls	4,000 Tons[1]	1,200,000.00
Estimated costs for NESHAP Inspection and Testing Services			17,500.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			280,900.00
		TOTAL:	**$ 3,300,000.00**

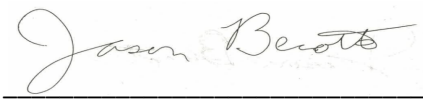
[1]: Part of total demolition.

DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:
Asbestos samples were collected using a method that prevents fiber release. Homogeneous sample areas were determined by criteria outlined in EPA document 560/5-85-030a. Bulk material samples were analyzed using PLM and dispersion staining techniques with EPA 600/R-93/116 method.

Inspected By:

Leonard J. Busa
Asbestos Inspector

Inspected By:



Jason Becotte
Asbestos Inspector

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: 131800702

131800702

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: Burlington, MA Building Name High School

Sample	Result	Description of Material	Sample Location
1		stage fire curtain	Auditorium
2		1 1	1

Reported By: Jason Beaupre Date: 2-2-18 Due Date:

Received By: Date:

REC'D 16:15:55
EMSL-BOSTON FEB 02 2018
VI

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: 131800702
Customer ID: UEC63
Customer PO:
Project ID:

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

Project: High School / Burlington, MA

Phone: (617) 984-9772
Fax: (508) 628-5488
Received Date: 02/02/2018 4:15 PM
Analysis Date: 02/05/2018
Collected Date: 02/02/2018

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**
1 *131800702-0001*	Auditorium - Stage Fire Curtain	White Fibrous Homogeneous		50% Non-fibrous (Other)	50% Chrysotile
2 *131800702-0002*	Auditorium - Stage Fire Curtain	White Fibrous Homogeneous		50% Non-fibrous (Other)	50% Chrysotile

Analyst(s)
Elizabeth Stutts (2)

Steve Grise, Laboratory Manager
or Other Approved Signatory

Initial report from: 02/05/2018 12:13:00

OrderID: 131808192

131808192

CHAIN OF CUSTODY

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

PLM
48 hour TAT

Town/City: Burlington MA Building Name High School

Sample	Result	Description of Material	Sample Location
1		Textured ceiling plaster	Auditorium
2		"	"
3		"	"
4		"	"
5		"	"
6		"	"
7		"	"
8		2x4 SAT	Pre-school
9		"	fitness center
10		Joint Compound	central offices
11		"	Pre-school
12		sheet rock	central offices
13		"	Preschool

Reported By: Jason Beattie Date: 10-22-18 Due Date: ----------

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

ESHWI 2:35
OCT 23 2018

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: 131808192
Customer ID: UEC63
Customer PO:
Project ID:

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

Project: High School / Burlington MA

Phone: (617) 984-9772
Fax: (508) 628-5488
Received Date: 10/23/2018 2:35 PM
Analysis Date: 10/25/2018
Collected Date: 10/22/2018

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

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
1 131808192-0001	Auditorium - Textured Ceiling Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2 131808192-0002	Auditorium - Textured Ceiling Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3 131808192-0003	Auditorium - Textured Ceiling Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
4 131808192-0004	Auditorium - Textured Ceiling Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
5 131808192-0005	Auditorium - Textured Ceiling Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6 131808192-0006	Auditorium - Textured Ceiling Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7 131808192-0007	Auditorium - Textured Ceiling Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8 131808192-0008	Pre-School - 2x4 SAT	Gray/White Fibrous Homogeneous	50% Cellulose 35% Min. Wool	15% Non-fibrous (Other)	None Detected
9 131808192-0009	Fitness Center - 2x4 SAT	Gray/White Fibrous Homogeneous	50% Cellulose 35% Min. Wool	15% Non-fibrous (Other)	None Detected
10 131808192-0010	Central Offices - Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11 131808192-0011	Pre-School - Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
12 131808192-0012	Central Offices - Sheet Rock	Brown/Gray Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
13 131808192-0013	Pre-School - Sheet Rock	Brown/Gray Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected

Initial report from: 10/25/2018 19:09:37

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:	131808192
Customer ID:	UEC63
Customer PO:	
Project ID:	

Analyst(s)
John McCarthy (13)

Steve Grise, Laboratory Manager
or Other Approved Signatory

Initial report from: 10/25/2018 19:09:37

Asbestos Identification Laboratory.
165 New Boston St., Ste 227
Woburn, MA 01801
781-932-9600
Web: www.asbestosidentificationlab.com Email:
mikemanning@asbestosidentificationlab.com

NVLAP® Testing Lab Code: 200919-0

Batch: 115124

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

Project Information

Burlington HS,
Burlington,
MA

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

Dear Ammar Dieb,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project. The Analysis Method is BULK PLM ANALYSIS, EPA/600/R-93/116The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.
Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Information provided by the customer can affect the validity of results. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. All customer information will be maintained in confidentiality. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations. Department of Health Certification: AAL-121
- State of Vermont, Department of Health Environmental Health License AL934461

Thank you Ammar Dieb for your business.

Michael Manning
Owner/Director

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

Project Information

Burlington HS,
Burlington,
MA

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
1 / 1269030	Window Frame Caulk	By Door #22	pink	Non-Fibrous 100	None Detected
2 / 1269031	Win Fr	Walkway to Main Entrance	pink	Non-Fibrous 100	None Detected
3 / 1269032	Vertical Win Fr	Superintendant	pink	Non-Fibrous 100	None Detected
4 / 1269033	Horizontal Win Fr	Superintendant	pink	Non-Fibrous 100	None Detected
5 / 1269034	Win Fr	So. West	pink	Non-Fibrous 100	None Detected
6 / 1269035	Horiz Win Fr	Cafe	pink	Non-Fibrous 100	None Detected
7 / 1269036	Vert Win Fr	Cafe	pink	Non-Fibrous 100	None Detected
8 / 1269037	Door Frame Caulk	Door #29	red	Non-Fibrous 100	None Detected
9 / 1269038	Door Fr	Door #13	red	Non-Fibrous 100	None Detected
10 / 1269039	Door Fr	Auditorium Entrance Door #41	red	Non-Fibrous 100	None Detected
11 / 1269040	(Gray) Roll-up Door Fr	Maintenance Door #41	gray	Non-Fibrous 100	None Detected
12 / 1269041	Door Fr	Entrance to Gym Lobby	red	Non-Fibrous 100	None Detected
13 / 1269042	Residue Gray Door Fr by #12		multi	Non-Fibrous 100	None Detected
14 / 1269043	Vertical Gray Caulk at Column	Entrance to Ground Floor, Elevator #1	gray	Non-Fibrous 100	None Detected
15 / 1269044	Vert Gray Caulk at Column	By Door #31	gray	Non-Fibrous 100	None Detected
16 / 1269045	Vert Gray Caulk at Column	By Door #8	gray	Non-Fibrous 100	None Detected

Sampled: April 15, 2024 **Received:** April 15, 2024 **Analyzed:** April 15, 2024

Tuesday 16 April 2024

Analyzed by: Valerie Jasmette **Batch:** 115124

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

Project Information

Burlington HS,
Burlington,
MA

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
17 / 1269046	Vert Gray Caulk at Column	By Door #40	gray	Non-Fibrous 100	None Detected
18 / 1269047	Damproofing on Foundation	By Door #25	black	Non-Fibrous 82	Detected Chrysotile 18
19 / 1269048	DP on Foundation	By Door #25	black	Non-Fibrous 82	Detected Chrysotile 18
20 / 1269049	(Large) Grill Caulk	Boiler Rm	gray	Non-Fibrous 100	None Detected
21 / 1269050	Black/Gray Paint on Exhaust Stack	Boiler Rm	multi	Non-Fibrous 100	None Detected

Sampled: April 15, 2024 **Received:** April 15, 2024 **Analyzed:** April 15, 2024

Tuesday 16 April 2024

Analyzed by: Valerie Thouette **Batch:** 115124

CHAIN OF CUSTODY

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

Town/City: Burlington, MA Building Name Burlington H.S.

Sample	Description of Material	Sample Location
1	window frame caulk	By door #22
2	win fr	walkway to main ENTIANCE
3	verticle win fr	superintendant
4	horizontal win fr	" " "
5	win fr	so. west
6	horiz. win fr	CAFE
7	vert. win fr	CAFE
8	Door frame caulk	door #29
9	Door fr	door #13
10	Door fr	Auditorium entrance door #41
11	(grey) roll-up door fr	maintenance dept
12	Door fr	ENTRANCE to Gym Lobby
13	residue grey door fr by #12	
14	verticle grey caulk e column	ENTIANCE to Ground Floor, elevator #1
15	vert. grey caulk e column	by door #31
16	vert. grey caulk e column	By door #8
17	vert. grey caulk e column	by door #40
18	dampproofing on foundation	by door #25
19	dp on foundation	By door #25
20	(Large) Grille caulk	Boiler rm

Reported By: [signature] Date: 4/15/24 Due Date: 24-Hours

Received By: [signature] Date: 4/15/24

21 Black-grey paint on exhaust stack from boiler rm

Asbestos Identification Laboratory.

165 New Boston St., Ste 227
Woburn, MA 01801
781-932-9600

Web: www.asbestosidentificationlab.com Email:
mikemanning@asbestosidentificationlab.com

NVLAP® Testing Lab Code: 200919-0

Batch: 115771

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

Project Information

High School,
Burlington,
MA

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

Dear Ammar Dieb,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project. The Analysis Method is BULK PLM ANALYSIS, EPA/600/R-93/116The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.
Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Information provided by the customer can affect the validity of results. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. All customer information will be maintained in confidentiality. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

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- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations. Department of Health Certification: AAL-121
- State of Vermont, Department of Health Environmental Health License AL934461

Thank you Ammar Dieb for your business.

Michael Manning
Owner/Director

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

Project Information

High School,
Burlington,
MA

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
1 / 1277447	Black Sink Coating	Room 311	black	Non-Fibrous 97	Detected Chrysotile 3
2 / 1277448	Black Sink Coating	Room 414	black	Non-Fibrous 97	Detected Chrysotile 3
3 / 1277449	Red Duct Sealant	Penthouse 6	red	Non-Fibrous 95	Detected Chrysotile 5
4 / 1277450	Red Duct Sealant	Penthouse 7	red	Non-Fibrous 95	Detected Chrysotile 5
5 / 1277451	Red Duct Sealant	300s Storage Room	red	Non-Fibrous 95	Detected Chrysotile 5
6 / 1277452	Red Duct Sealant	300s Storage Room	red	Non-Fibrous 95	Detected Chrysotile 5
7 / 1277453	Interior Window Glazing	Hallway	gray	Non-Fibrous 98	Detected Chrysotile 2
8 / 1277454	Interior Window Glazing	Hallway	gray	Non-Fibrous 98	Detected Chrysotile 2
9 / 1277455	Fume Hood	Room 143	multi	Non-Fibrous 80	Detected Chrysotile 20
10 / 1277456	Fume Hood	Room 145	multi	Non-Fibrous 80	Detected Chrysotile 20
11 / 1277457	Lab Table	Room 143	multi	Non-Fibrous 80	Detected Chrysotile 20
12 / 1277458	Lab Table	Room 145	multi	Non-Fibrous 80	Detected Chrysotile 20
13 / 1277459	White / Brown Spots 12x12 VFT	Room 109	tan	Non-Fibrous 96	Detected Chrysotile 4
14 / 1277460	White / Brown Spots 12x12 VFT	Room 113	tan	Non-Fibrous 96	Detected Chrysotile 4
15 / 1277461	Black Mastic	On #13	black	Non-Fibrous 93	Detected Chrysotile 7
16 / 1277462	Black Mastic	On #14	black	Non-Fibrous 93	Detected Chrysotile 7

Sampled: April 25, 2024 **Received:** April 26, 2024 **Analyzed:** April 26, 2024

Monday 29 April 2024

Analyzed by: Elaine Marsh **Batch:** 115771

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

Project Information

High School,
Burlington,
MA

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
17 / 1277463	Dark Gray 12x12 VFT	Main Corridor (Central Office Side)	multi	Non-Fibrous 100	None Detected
18 / 1277464	Dark Gray 12x12 VFT	Main Corridor (Central Office Side)	multi	Non-Fibrous 100	None Detected
19 / 1277465	Yellow Mastic	Main Corridor (Central Office Side)	yellow	Non-Fibrous 100	None Detected
20 / 1277466	Yellow Masitc	Main Corridor (Central Office Side)	yellow	Non-Fibrous 100	None Detected
21 / 1277467	Reddish 12x12 VFT	Main Corridor (Cafeteria Side)	multi	Non-Fibrous 100	None Detected
22 / 1277468	Reddish 12x12 VFT	Main Corridor (Cafeteria Side)	multi	Non-Fibrous 100	None Detected
23 / 1277469	Yellow Masitc	Main Corridor (Cafeteria Side)	yellow	Non-Fibrous 100	None Detected
24 / 1277470	Yellow Masitc	Main Corridor (Cafeteria Side)	yellow	Non-Fibrous 100	None Detected
25 / 1277471	Beige / Gray 12x12 VFT	Science Center	tan	Non-Fibrous 96	**Detected** Chrysotile 4
26 / 1277472	Beige / Gray 12x12 VFT	Boiler Room Entrance Hallway	tan	Non-Fibrous 96	**Detected** Chrysotile 4
27 / 1277473	Black Mastic	On #25	black	Non-Fibrous 93	**Detected** Chrysotile 7
28 / 1277474	Black Mastic	On #26	black	Non-Fibrous 93	**Detected** Chrysotile 7
29 / 1277475	Blue / Gray 12x12 VFT	Main Corridor along Room 144	blue	Non-Fibrous 100	None Detected
30 / 1277476	Blue / Gray 12x12 VFT	Main Corridor along Room 144	blue	Non-Fibrous 100	None Detected
31 / 1277477	Mastic	Main Corridor along Room 144	yellow	Non-Fibrous 100	None Detected
32 / 1277478	Mastic	Main Corridor along Room 144	yellow	Non-Fibrous 100	None Detected

Sampled: April 25, 2024 **Received:** April 26, 2024 **Analyzed:** April 26, 2024

Monday 29 April 2024

Analyzed by: Elaine Maple **Batch:** 115771

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

Project Information

High School,
Burlington,
MA

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
33 / 1277479	Tan / White Brown Streaks 12x12	Main Corridor along Custodial Office	tan	Non-Fibrous 100	None Detected
34 / 1277480	Tan / White Brown Streaks 12x12	Main Corridor along Custodial Office	tan	Non-Fibrous 100	None Detected
35 / 1277481	Black Mastic	Main Corridor along Custodial Office	black	Non-Fibrous 93	Detected Chrysotile 7
36 / 1277482	Black Mastic	Main Corridor along Custodial Office	black	Non-Fibrous 93	Detected Chrysotile 7
37 / 1277483	Whtie / Gray 12x12 VFT	Preschool	tan	Non-Fibrous 100	None Detected
38 / 1277484	Whtie / Gray 12x12 VFT	Preschool	tan	Non-Fibrous 100	None Detected
39 / 1277485	Black Mastic	Preschool	black	Cellulose 3 Non-Fibrous 97	None Detected
40 / 1277486	Black Mastic	Preschool	black	Cellulose 3 Non-Fibrous 97	None Detected
41 / 1277487	Sea Blue 12x12 VFT	Room B6 (Preschool)	blue	Non-Fibrous 100	None Detected
42 / 1277488	Sea Blue 12x12 VFT	Room B6 (Preschool)	blue	Non-Fibrous 100	None Detected
43 / 1277489	Yellow Mastic	Room B6 (Preschool)	yellow	Non-Fibrous 100	None Detected
44 / 1277490	Yellow Masitc	Room B6 (Preschool)	yellow	Non-Fibrous 100	None Detected
45 / 1277491	White / Brown Streaks 12x12	Electric Room by Bay Path	white	Non-Fibrous 100	None Detected
46 / 1277492	White / Brown Streaks 12x12	Electric Room by Bay Path	white	Non-Fibrous 100	None Detected
47 / 1277493	Yellow Mastic	Electric Room by Bay Path	yellow	Non-Fibrous 100	None Detected
48 / 1277494	Yellow Mastic	Electric Room by Bay Path	yellow	Non-Fibrous 100	None Detected

Sampled: April 25, 2024 **Received:** April 26, 2024 **Analyzed:** April 26, 2024

Monday 29 April 2024

Analyzed by: Elia Marks **Batch:** 115771

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

Project Information

High School,
Burlington,
MA

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
49 / 1277495	Generator Exhaust Insulation	Generator Room	blue	Fiberglass 5 Cellulose 5 Non-Fibrous 90	None Detected
50 / 1277496	Generator Exhaust Insulation	Generator Room	blue	Fiberglass 5 Cellulose 5 Non-Fibrous 90	None Detected
51 / 1277497	Generator Exhaust Insulation	Generator Room	blue	Fiberglass 5 Cellulose 5 Non-Fibrous 90	None Detected
52 / 1277498	Exhaust Duct Insulation	Boiler Room	gray	Fiberglass 20 Mineral Wool 20 Cellulose 10 Non-Fibrous 50	None Detected
53 / 1277499	Exhaust Duct Insulation	Boiler Room	gray	Fiberglass 20 Mineral Wool 20 Cellulose 10 Non-Fibrous 50	None Detected
54 / 1277500	Exhaust Duct Insulation	Boiler Room	gray	Fiberglass 20 Mineral Wool 20 Cellulose 10 Non-Fibrous 50	None Detected
55 / 1277501	Heat Exchanger Insulation	Boiler Room	multi	Cellulose 20 Non-Fibrous 20	**Detected** **Chrysotile 60**
56 / 1277502	Heat Exchanger Insulation	Boiler Room	multi	Fiberglass 10 Cellulose 10 Non-Fibrous 20	**Detected** **Chrysotile 60**
57 / 1277503	Heat Exchanger Insulation	Boiler Room	multi	Fiberglass 10 Cellulose 10 Non-Fibrous 20	**Detected** **Chrysotile 40** **Amosite 20**
58 / 1277504	Tank Insulation	Boiler Room	multi	Non-Fibrous 20	**Detected** **Chrysotile 80**
59 / 1277505	Tank Insulation	Boiler Room	multi	Non-Fibrous 20	**Detected** **Chrysotile 80**
60 / 1277506	Tank Insulation	Boiler Room	multi	Non-Fibrous 20	**Detected** **Chrysotile 40** **Amosite 40**
61 / 1277507	Mud on Flange End	Boiler Room	gray	Fiberglass 30 Mineral Wool 30 Cellulose 10 Non-Fibrous 30	None Detected
62 / 1277508	Mud on Flange End	Boiler Room	gray	Fiberglass 30 Mineral Wool 30 Cellulose 10 Non-Fibrous 30	None Detected

Sampled: April 25, 2024 **Received:** April 26, 2024 **Analyzed:** April 26, 2024

Monday 29 April 2024

Analyzed by: Elaine Maple **Batch:** 115771

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

Project Information

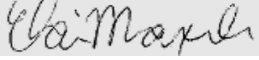
*High School,
Burlington,
MA*

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

FieldID LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
63 1277509	Mud on Flange End	Boiler Room	gray	Fiberglass 30 Mineral Wool 30 Cellulose 10 Non-Fibrous 30	None Detected
64 1277510	Hard Joint Pipe Insulation	Penthouse 6	multi	Fiberglass 30 Mineral Wool 30 Cellulose 10 Non-Fibrous 30	None Detected
65 1277511	Hard Joint Pipe Insulation	Penthouse 6	multi	Fiberglass 30 Mineral Wool 30 Cellulose 10 Non-Fibrous 30	None Detected
66 1277512	Hard Joint Pipe Insulation	Penthouse 7	multi	Fiberglass 30 Mineral Wool 30 Cellulose 10 Non-Fibrous 30	None Detected

Sampled: April 25, 2024 **Received:** April 26, 2024 **Analyzed:** April 26, 2024

Monday 29 April 2024

Analyzed by: 

Batch: 115771

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: Burlington, MA Building Name High School

Sample	Description of Material	Sample Location
1	Black sink coating	Room 311
2	" "	Room 414
3	Red Duct sealant	Penthouse 6
4	" "	Penthouse 7
5	" "	300's storage Room
6	" "	" "
7	Interior window Glazing	Hallway
8	" "	" "
9	Fume Hood	Room 143
10	" "	Room 145
11	Lab table	Room 143
12	" "	Room 145
13	White/Brown spots 12x12 VFT	Room 109
14	" "	Room 113
15	Black mastic	on # 13
16	" "	on # 14
17	Dark Gray 12x12 VFT	main Corridor (central office side)
18	" "	" "
19	Yellow mastic	" "
20	" "	" "

Reported By: Jason Becotte Date: 4-25-24 Due Date: **24-Hours**

Received By: Date: 4/26/24

CHAIN OF CUSTODY

PLM

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

Town/City: Burlington, MA Building Name High school

Sample	Description of Material	Sample Location
21	Reddish 12x12 VFT	main corridor (cafeteria side)
22	" "	" "
23	Yellow mastic	" "
24	" "	" "
25	Beige/Gray 12x12 VFT	science center
26	" "	Boiler room entrance Hallway
27	Black mastic	on #25
28	" "	on #26
29	Blue/Gray 12x12 VFT	main corridor along Room 144
30	" "	" "
31	mastic	" "
32	" "	" "
33	Tan/white Brown streaks 12x12	main corridor along custodial Office
34	" "	" "
35	Black mastic	" "
36	" "	" "
37	white/Gray 12x12 VFT	Pre school
38	" "	" "
39	Black mastic	" "
40	" "	" "

Reported By: Jason Becotte Date: 4-25-24 Due Date: **24-Hours**

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

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Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM

Town/City: Burlington, MA Building Name High School

Sample	Description of Material	Sample Location
41	seablue 12x12 VFT	Room B6 (Preschool)
42	" "	" "
43	Yellow mastic	" "
44	" "	" "
45	white/Brown streaks 12x12	Electric Room by Bay Path
46	" "	" "
47	Yellow mastic	" "
48	" "	" "
49	Generator Exhaust Insulation	Generator Room
50	" "	" "
51	" "	" "
52	exhaust Duct Insulation	Boiler Room
53	" "	" "
54	" "	" "
55	Heat exchanger Insulation	Boiler Room
56	" "	" "
57	" "	" "
58	Tank Insulation	Boiler Room
59	" "	" "
60	" "	" "

Reported By: Jason Becotte Date: 4-25-24 Due Date: **24-Hours**

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

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Tel: (508) 628-5486 - Fax: (508) 628-5488
adieb@uec-env.com

PLM

Town/City: Burlington, MA Building Name High school

Sample	Description of Material	Sample Location
61	mud on Flange End	Boiler Room
62	" "	" "
63	" "	" "
64	Hard Joint Pipe Insulation	Penthouse 6
65	" "	" "
66	" "	Penthouse 7

Reported By: Jason Becotte Date: 4-25-24 Due Date: **24-Hours**

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

4.9

METHODS & ASSUMPTIONS

For the purposes of the PDP submission the existing conditions plan of the Burlington High School was developed using existing floor plan drawings provided by the Town that were confirmed in the field through visual confirmation, and a full building scan completed in Spring/Summer of 2024. Site plan information consists of available record documentation including satellite images and regulatory mapping. The site has also been inspected by the landscape and civil engineering team. A site survey has been completed.

Building systems were inspected and reviewed by the applicable engineering trades and supplemented with discussions with on-site personnel who operate the building.

Preliminary test borings were completed on the High School property in locations most likely to be considered for an addition or replacement building. Results of geo technical investigation are included in the PDP submission.

Field testing has occurred for ACM's within the building including laboratory confirmation. The ACM report is included with the PDP submission.

A preliminary traffic study is complete and included in the PDP submission. This reflects the existing condition only and a future conditions report will be prepared once a preferred option is selected.

During the PSR phase at a minimum additional information will be prepared related to traffic for the proposed condition. A flow test will also be performed.

The Designer anticipates making any further recommendations on testing and field investigation based on the preferred option that is established by the District at the PSR and schematic phases. As is customary, it is anticipated at a minimum that supplementary investigations for geo-tech, ACM investigation and possibly supplementary survey will be required during the Design Development phase should be the project be approved and proceed into later phases.