3.3.2 Evaluation of Existing Conditions

A. INTRODUCTION

B. PDP SUMMARY UPDATE

A. INTRODUCTION

In the absence of new additional information about the existing conditions of the high school property, a brief summary is presented below of the design team's findings. Please refer to the (PDP) Preliminary Design Program report for a detailed and thorough analysis of the existing conditions.

B. PDP SUMMARY UPDATE

BUILDING & ACCESS CODE

The Stoneham High School was originally constructed in 1968 with a small addition in 1981. As a result of the age of the building and minimal renovations during its lifespan, there are numerous areas where compliance with the current building code (780 CMR 9th Edition, Massachusetts State Building Code) is not achieved. Notable areas of noncompliance include

the lack of a sprinkler system, aging fire alarm system, multiple construction types, insufficient protection of exit stair enclosures, and inaccessible areas and building features that do not comply with 521 CMR, Architectural Access Board Rules and Regulations.

Compliance with the accessibility provisions of 521 CMR and the Americans with Disabilities Act is deficient in many areas throughout the existing high school including the following key elements:

- Toilet rooms are not accessible. The limited signed accessible toilet rooms are not fully compliant (e.g. door clearances, room layouts, toilet paper dispenser locations, etc.).
- The elevator is not accessible based on the size of the cab and locations of controls/signage. The elevator is also not located to provide adequate access compared to normal travel paths.
- Not all entrances are accessible as they are not served by compliant ramps
- The theater is not provided with accessible seating and the seating/walkways are on a slope that exceeds the maximum 5% slope. An accessible route is also not provided from the theater seating to the stage.
- Gymnasium bleacher seating is not accessible
- Locker rooms are not accessible
- A majority of door hardware is non-accessible knobs requiring twisting
- Stairs are generally not compliant as they have abrupt nosings, and non-compliant handrails due to shape, no extensions, etc.

CIVIL

Nitsch Engineering has visited the site and reviewed various studies, surveys and reports related to the site and offers the following:

Site Utilities:

Storm Water - The storm drainage system consists of a catch basin to manhole system typical for its era of construction. Stormwater is collected by the catch basins and directed via stormwater piping to drain manholes forming a network that collects and directs the stormwater off site. Roof drains from the school building tie into this system as well. It is likely that any field subdrainage from the athletic fields connects into this system as well.

The main feature of the stormwater system on site is a 36-inch diameter storm drain line that runs from north to south through the site. The 36-inch line begins at a headwall located adjacent to the rear of 19 Emerald Court, runs approximately between the soccer and softball fields, continues under the varsity track/football field and discharges just beyond the bleachers. From the school's original construction documents, it appears that the line was installed when the site was developed as a school and a stream/ditch the followed a similar path was filled. The storm drainage system on the site ties into the 36-inch drain at various points along its route.

There appears to be minimal to no stormwater features that attempt to address stormwater quality, rate or volume on site. There was no evidence of stormwater infiltration systems, bio-retention ponds or other water quality features on site. Along the northern edge of the property, adjacent to the residential properties along Emerald Court, there is a series of swales that direct stormwater runoff along the property line and into catch basins that tie into the 36-inch line.

Sanitary Sewer - The school is served by the town sanitary sewer system by way of an 8-inch service from the site connecting to the 8-inch town sewer in Franklin Street. The 8-inch sewer serving the site runs under the entrance drive (Franklin Place) to the front of the school building. The existing building has two sewer services that tie in to the 8-inch sewer services. Elevation of the inverts on

the services indicate that one service serves the main floor while the other service serves the lower floor. There was no indication on the construction documents or field observations of any external grease traps for the kitchen flows.

Water - Original construction documents and field observations indicate that water service to the site and building is by way of a 12-inch water line located under the entrance drive, that connects to the 10-inch water line located in Franklin Street. The 12-inch line transitions to an 8-inch line that runs around the building with connections at various points for fire hydrants, building services and irrigation connections.

Natural Gas - The building is served by natural gas, with the gas meter assembly located to the right of the main building entrance. The gas service runs up the driveway (Franklin Place) and is a 4-inch plastic line. The main located in Franklin Street is a 12-inch.

Permitting:

Wetlands Protection Act (310 CMR 10.00) and Town of Stoneham Wetland Protection By-Law - There are wetland resource areas subject to protection under the Wetlands Protection Act and Town of Stoneham Wetland By-law at the north end of the site (stream and bank) and south end of the site (bordering vegetated wetlands). Work within 100 feet of these resource areas will require the approval of the Town of Stoneham Conservation Commission.

Other Permitting - Review of MassGIS permitting layers indicate that the site is not within a Priority Habitat of Rare Species or Estimated Habitats of Rare Wildlife or within any Surface Water Supply Protection Zone or within any Flood Hazard area.

LANDSCAPE

Warner Larson Landscape Architects visited the site on July 8th, 2020 to observe existing conditions and prepared a Landscape Existing Conditions Report which was submitted October 6, 2020 for inclusion in the PDP. In addition to information collected during our site visit, we subsequently reviewed other existing conditions documentation provided by Perkins + Will and other sources. That report excluded utilities and drainage which were reviewed separately by Nitsch Engineering.

There have been no substantive changes or updates to the Landscape Existing Conditions Report submitted on October 6, 2020 that might impact the final evaluation of alternatives. The reader should refer to the Landscape Existing Conditions Report included in the PDP submission for the existing site conditions analysis.

ARCHITECTURAL

The existing Stoneham High School was built in 1968 as a new public junior high school facility for the town of Stoneham. A senior high school addition to the junior high school was constructed in 1980. Currently, the facility is still owned and run as a high school. The building has been fairly maintained over the past 52 years, but the building enclosure systems and finishes are at the end of their useful life.

Much of the interior within the Stoneham High School have generally not been updated (with exception to the gymnasium and 1980 wing roofs, which were replaced in 1983), leading to worn ceilings, walls, and floors with moderate to minimal damage. Original doors, hardware, floors and lockers are still present in many of the spaces and would require replacement or major repair and refinishing. The classrooms and corridors still have the original VAT (vinyl asbestos tile) flooring, but numerous pieces have been removed and replaced throughout the building. Most flooring shows signs of damage at door locations in main corridors and classroom entries. The VAT does contain asbestos which poses a health hazard and would need to be abated. The main lobby has an interesting large format ceramic tile with a circle pattern which is in good condition. Auditorium flooring is generally worn and past its useful life.

The majority of the interior walls are concrete and exposed brick masonry – which could make selective renovation difficult. The interior CMU and brick masonry walls appear to be in good condition, but plaster walls show signs of moderate to fair signs of damage throughout classrooms and corridors. Most corridors cafeteria and classrooms have ceramic wall tile which is in fair shape except for tile base which is cracked and damaged in many areas and should be replaced. The acoustic ceiling tiles show a large amount of water damage and misalignment throughout entire building. Ceilings in the majority of the school are an asbestos-positive tested application and in need of abatement and complete replacement. Ceilings tiles are frequently falling out of ceilings and need to be contained quickly due to asbestos concerns – even observed a trash bag covering a ceiling hole in kitchen area. The ceiling heights in many spaces including corridors are currently around 8'-0" - 8'-8" in height. Auditorium seating shows signs of excessive use and fabric/cushion is falling apart in vast majority of seating.

The building is a reinforced concrete frame with brick infill. The exposed exterior concrete frame is spalling in many locations and requires some patching and repairs. The brick infill appears to be in average condition. The aluminum window system single-pane glazing which should be replaced to meet the new energy code. The single pane windows that are operable do not have screens and open to a width not allowable by code. The windows in the 1981 addition appear to have water infiltration issues and the caulking at all doors and windows is deteriorated, contains asbestos, and should be removed. The rubber roof is older and has outlived its warranty period.

All windows are original to the time of construction. Most are metal framed and all have single-pane glazing that is not thermally broken. The windows are fixed or awning type. All windows require replacement to meet the Energy Code. Existing curtainwalls do not meet the Energy Code and are rotting and will need to be replaced with all new. The gymnasium has Kalwall window system which is original to the building and has yellowed significantly. This system is worn and is broken in many areas and should be replaced. Many doors have damaged and bent frames so they do not close properly. Because the doors are not on an alarm system it is a constant challenge to keep the building secure. The hollow metal doors and panic hardware are of varying vintages and while operable, they are aging, worn, and should be replaced.

STRUCTURAL

Based on visual observations, the existing building is structurally in fair condition. Concrete spalling and surface cracking was spotted at multiple locations throughout the building which should be addressed. Minor cracks in masonry wall are observed at multiple locations. Signs of water intrusion found in mechanical rooms and some ceiling spaces. About 10% of sunshades are found to be spalling heavily with horizontal concrete delamination. The expansion joints are not compliant with current standard. Structurally substantial alteration or Level 3 alterations will require anchoring of masonry walls to existing diaphragms and seismic upgrade of the entire building. The existing building framing poses no major structural issues in its existing condition.

FOOD SERVICE

The Stoneham High School Foodservice Program is a robust program that receives, stores, and produces meals for a majority of the schools within the district. The finishes and foodservice equipment within the kitchen are original and more than 40 years old. Throughout the many years of use and through program evolution the existing facility is not only outdated and worn but also lacks the flexibility to efficiently serve the district's needs.

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

HVAC

The assessment of the HVAC systems for the school is based on a walk through of the building on July 8, 2020. There are not any existing HVAC drawings that we are aware of or had received and the HMFH existing conditions report dated March 12, 2018 did not address the HVAC systems. The following evaluation is based only on observations from our site visit.

There are no central cooling systems for the school. Air conditioning is accomplished via an air cooled DX rooftop

unit (for a limited administration area), air cooled split type units and window type residential air conditioning units. There is a central heating plant, which consists of four (3) 3 million BTU input (2.75 million BTU output) gas fired condensing boilers that serve hot water baseboard heaters, hot water unit ventilators, heating/ventilating type air handling units and cabinet unit heaters throughout the building. The boilers were installed in 2016 and are good working condition. There are two (2) 15 HP base mounted end suction type hot water pumps. Each boiler also has an associated in line pump to maintain constant water flow through the boiler.

There does appear to be a pneumatic type control system for the main heating plant. The other systems (exhaust fans, unit ventilators, split AC units, rooftop unit, etc) appear to have local electric type controls.

With the exception of a few select systems, most of the existing equipment is well past its useful life and should be removed and replaced with new systems that can support any proposed option. Whether or not the new boilers remain will need to be evaluated based on the energy goals of the new project.

The systems for each type of space within the school are described in the following sections.

Classrooms and Restrooms:

Each classroom unit has a heating only unit ventilator. There are some classrooms that have residential type through the wall air conditioning units. Most of the unit ventilators appear to be original to the building.

There are a number of exhaust fans of varying age and condition that provide general exhaust for classroom and common areas as well exhaust fans for restrooms.

There are also ceiling mounted heating and ventilating ducted type units that serve the common corridor areas. Based on discussions with one of the building engineers, these units are operational and are not controllable. There are key switches that turn the units on and off but the staff does not have the keys. The units operate when the main heating system is operational.

There are several specialty classrooms on the 2nd floor west side of the building that have air cooled split type air conditioning units. Each AC unit is either 3 or 3.5 tons. These classrooms include art rooms and special education rooms. The refrigerant piping for each unit is run through an existing outside air or relief air intake hood. This may result in water leakage through the hood and is recommended to be further investigated.

Gymnasium:

The Gymnasium space is served by four (4) heating/ ventilating only units. In speaking with one of the building engineers, they have had issues with these units and finding replacement parts for the units. One of the four units appears to have been replaced.

Locker Rooms & Weight Rooms:

The Men's and Women's Locker Rooms and Weight Rooms have exhaust systems and make up air systems (heated only). There are also unit heaters within the locker room spaces.

Cafeteria / Kitchen Area:

The Cafeteria area is served by heating only unit ventilators. The kitchen area has several kitchen exhaust hoods, make up air is delivered to the space via makeup air fans. It could not be observed if the makeup air is being heated or if its unconditioned air.

Main Auditorium:

The Auditorium seating and backstage areas, as well as the auditorium support areas (Practice Rooms and Band/Chorus Room) are served by large, ceiling mounted heating and ventilating units. These units appear to be of the same age and condition of those that serve the gymnasium space.

Library:

The Library space is served by heating only unit ventilators and has general exhaust grills connected to one of the general exhaust fans located on the roof. See Figure M19.

Science Classrooms:

The Science Classrooms are served by heating only unit ventilators and also have residential type through the wall AC units. In addition, each Science Classroom has two (2) four foot chemical fume hoods, each connected to an associated exhaust fan on the roof. There is no observable mechanical means of make up provided to the spaces for the fume hood exhaust. See Figure M20 for a typical fume hood.

Shop Areas:

There are several shop spaces in the basement area that are been converted to other types of space (ie, baseball hitting net space). These rooms have exhaust systems that appear to have been decommissioned. One of the shop spaces has a large dust collection system. In speaking with one of the building engineers, the equipment has not been operational for a long time. Also, one of the shop spaces has a large welding exhaust hood with several sidewall exhaust fans, which also has not been operational. There is a free standing kiln located within one of the shops (located beneath the welding hood) that does get utilized. It is unclear whether one of the fans gets turned on when the kiln is in operation.

Administrative Areas:

A 10 ton air cooled DX, gas heated rooftop unit provides heating and cooling for the administrative areas adjacent to the main entrance to the school. The unit appears to be in good working condition.

Common Areas:

There are wall mounted and ceiling mounted unit heaters located throughout the building and at entry locations. Many of the units are beyond their useful life.

Controls:

There is a pneumatic system for the main heating plant in the basement mechanical room. All other equipment appeared to have local, electric controls.

No central BMS system was observed.

ELECTRICAL

The assessment of the Electrical systems for the school is based on a walk through of the building on July 8, 2020 and the HMFH existing conditions report dated March 12, 2018. The Electrical systems range from original vintage 1966 to 1980 as part of addition/renovation projects to more recent upgrades. Existing main switchboard being replace with a new switchboard being an example of a more recent upgrade. The service size is adequate for the current usage; however, would not be adequate from both a voltage standpoint and capacity in any renovation program that would update the existing school. Due to the age of the existing wiring and distribution equipment, these should not be re-used. Due to the existing distribution equipment being located throughout the building, any update would require relocation of existing equipment which would require substantial work in extending and splicing of existing circuits. Life safety lighting and exit signs, do not conform with code and would need to be updated. The fire alarm system is not compliant with current code and is in need of an upgrade.

It is our recommendation, taking into consideration the age and general condition of the existing equipment, that the existing fire alarm system be replaced with a new addressable system, existing lighting and lighting controls be upgraded to new energy efficient and code compliant system. Existing electrical distribution equipment needs to be replaced.

Electrical Distribution System:

There is one service present at the facility. The service is rated at 120/208 Volt, 3 Phase, 4 Wire. The existing main switchboard has a 2000-amp rated electronic trip main circuit breaker. The switchboard is manufactured by Square D and is in good condition. The main switchboard has been recently upgraded. Due to space restraints at existing main switchboard location would prohibit increased distribution equipment at the present location.

The utility company transformer is located in a locked room adjacent to the Main Electric Room. The site is on one secondary meter located indoors within the Main Electric Room. The service is underground to the utility transformer, and overhead busduct from transformer vault to main switchboard.

There are electrical sub-panels located throughout the building, both in janitor closets, mechanical spaces and exposed in public areas. The panels are circuit breaker type; and are in poor condition, most are original to the building. Kitchen panel have no shunt trip breakers,

or GFCI circuit breakers. None of the outlets in the kitchen were GFCI. The panels are manufactured by Federal Pacific Electric and Gould ITE, with Gould ITE and Federal Pacific Electric both having gone out of business years ago.

Interior Lighting System:

All lighting throughout the building appears to be fluorescent, with recessed 1x4 and 2x2 fixtures in common corridors and surface mounted fixtures in the classrooms, cafeteria and most other spaces. One notable exception would be the theatrical lighting in the theater.

Light levels appear adequate; however, the fixtures are in poor condition and contribute a substantial amount of glare.

Lighting controls are of the manual type. With keyed toggle switches controlling the common corridor lighting, and normal toggle switches in all other spaces. In any renovation program, lighting controls that comply with the latest energy code shall be provided throughout and all lighting should be replaced with high efficiency LED fixtures.

Emergency Lighting System:

There is an emergency generator present that services normally off emergency lighting throughout the common corridors, emergency lighting will only come on, if the lighting in the corridor is already switched on. Off hours, with the corridor light normally off, no emergency light would come on. With ATS and electrical panel mounted in main electrical room next to generator, and both being in poor condition. These are are original to the building and should be replaced, at over 50 years, they have outlived their useful life.

The generator is rated at 100KW / 125kVA, 120/208V, 3 Phase, 4 Wire, diesel fired and is manufactured by Kohler.

Site Lighting System:

The lighting at the site consists of perimeter lighting which lights the area walkways from the exterior walls of the building, and pole lighting lights the driveway and parking. The perimeter lighting and parking lot lighting are controlled with a time clock in the school's main office.

The school also has lighting for the football field, which is controlled via electrical panel in garage, and softball field lighting which is controlled via control panel in field house. The site lighting is in poor condition and inadequate.

Fire Alarm System:

The fire alarm system is an original FCI Conventional system. The system is obsolete, with limited coverage of notification devices, and no smoke detector coverage in building. Complete smoke detector coverage is required in building with no sprinkler coverage, and this building does not have a sprinkler system. The fire alarm system is an immediate need of replacement.

Access Control System:

The main entry doors are controlled via card access. Most of the perimeter access doors do not appear to be alarmed. The windows are operable and are not alarmed.

Video Surveillance System

There is a video surveillance system for the entire building perimeter and entry and common areas within the building. The system is connected to a town wide CCTV system. We could not obtain access to the equipment and the manufacturer is unknown at this time.

PLUMBING

In general, the plumbing systems and fixtures appear to be original to the building. These systems, while continuing to function, have served their useful life. Most of the systems could continue to be used with maintenance and replacement of failed components as they age.

All plumbing fixtures are in working condition. In general, the fixtures appear to have served their useful life. Water conservancy is governed by provisions of the Plumbing Code. The code does not mandate that plumbing fixtures be upgraded. However, where new fixtures are to be installed, as will be the case with any renovations to the existing high school, new fixtures need to be of the water conserving types with lead free faucets and be supplied with lead free water piping systems.

Domestic hot water is supplied by a gas-fired boiler and associated storage tank. The kitchen is served by its own gas-fired storage tank type heater. Both of these water heating systems have served their useful life and should be replaced.

Sanitary and roof drainage piping systems are made of cast iron. Where visible, the piping systems appear to be in fair condition. There are areas where new piping has been installed.

Rainwater from flat roof areas are collected in roof drains that appear to be in good condition and were clear of debris. Internal storm water piping was not visible.

The natural gas service to the school is in good condition. This system could stay and be re-used in a renovation.

The Boy's and Girl's locker rooms and shower areas are older and in fair condition but not being used currently. The shower area layouts do not meet current ADA or plumbing code requirements.

The cafeteria kitchen plumbing equipment is older and in need of replacement. The interior grease trap on the three-compartment sink is in fair condition and could remain. The dishwasher does not drain through a grease interceptor and it should per current plumbing code requirements.

Each science lab is equipped with sinks that empty into a central limestone chip neutralization system as they should. Hot and cold water serving the science labs is not a non-potable water system and should be. Emergency showers are located in each lab classroom but are only supplied with domestic cold water. By code, these should be supplied by a separate tempered water system and should be located near the exit door from each classroom. Gas is supplied to each lab classroom and feeds bench mounted turrets on benches. However, the main gas shut-off valve to each classroom is located at the teacher bench. By code, these should be located near the exit to the room.

FIRE PROTECTION

The existing building is not equipped with an automatic fire suppression system.

TECHNOLOGY

Structured Cabling System: The school facility is served by an MDF/Head End Room on the second floor and four IDFs/Tech Closets. The MDF is the central nervous system of the facility from a data networking perspective. It currently contains the school's network servers and storage, core and edge switches, district-wide and school fiber terminations, network video recorders for security, and network related UPS equipment.

The MDF is in the corner of a larger second floor classroom that appears to have been repurposed as an IT workspace. The IDFs are strategically located in the Library, Guidance, Room 151 and Room 028 to minimize cable distances. Horizontal cabling in the MDF and IDFs are run from the ceilings to the racks mostly exposed with little or no cable management.

The MDF is connected to each IDF via 6-strand OM3 multimode fiber in a star topology. The fiber is armored for added protection. The district fiber, which terminates in its own patch panel, is installed in innerduct.

The IDFs are not dedicated, secure or environmentally treated spaces. Racks are either wall mounted using shelving or freestanding cabinets. MDF and IDF data racks do not appear to be properly grounded.

Horizontal cabling extends from the MDF/IDFs to individual outlets and components in classrooms, offices and other spaces in the school. Some of this cabling is also used for security system connectivity. The cabling consists of a combination of different standards including Category 5, 5E and 6. The Categoiry 6 cabling appears to be used for the wireless connectivity for the most part. All data cables are terminated on patch panels (Cat 5, 5E and 6) in the MDF and IDFs and extended to network switch electronics via varying types of patch cables.

Classrooms are generally equipped with two data jacks for general use and one data jack for wireless access point connectivity. Pathways for data cabling are surface mounted in many cases. Cabling for classroom handsets is independent of the data network.

Data and Voice Communication System: The MDF and IDFs are equipped with network switches by HP ProCurve

(now Aruba). The switches are primarily J4903A (2800 series) for general use and J9146A (2900 series) for PoE applications such as wireless APs and security.

The ProCurve 2800 series switches each consist of 44 x 10/100/1000 ports, 4 dual-personality ports for RJ-45 10/100/1000 or mini-GBIC fiber 1000 connectivity, advanced prioritization, and traffic-monitoring capabilities. These switches are currently being utilized for basic routing at the edge of the network with district fiber connected to GBICs in the MDF.

The ProCurve 2900 series switches each consist of 24 x 10/100/1000 ports with PoE and 4 dual-personality ports for RJ-45 10/100/1000 or mini-GBIC connectivity. The 2900 series supports up to four 10-Gigabit (CX4 and/or SFP+) ports.

There are wireless access points in most classrooms and gathering spaces. The access points are Aruba 210 series with dual radios and 802.11ac technology. The APs are typically installed on the walls in classrooms and ceilings of larger spaces such as the Cafeteria.

The phone system is based on the NEC Univerge platform with both analog and digital endpoints untilized in classrooms and offices. Some classrooms have an analog handset capable of making outsoide calls. Other classrooms have more simplified analog handsets that appear to only serve as a means of communication woth the main office through the intercom system. Classroom phones are typically located adjacent to the corridor doors. Office are typically equipped with NEC DTZ-12D-3 digital handsets. These handsets are well supported on the NEC Univerge SV9000 and SV8000 Series communications platforms. VoIP technology is not currently utilized at this time.

Distributed Communication System: The Intercom system is a Bogen Mulitcomm 2000 Series Building Communication System. The system appears to be a replacement of an older (perhaps opriginal) system. All original speakers and cabling were re-used and connected to the Multicomm 2000. The master clock system is a Simplex Master Time Controller. The intercom main equipment is located in a storage room adjacent to the Main Office. The admin console is located at the main reception desk.

Classrooms are equipped with two-way intercom speakers, secondary clocks and handsets (see telephony summary). Much of the equipment is no longer functional and has reached the end of its serviceable life. Many corridor speakers appear to be broken or coming detached from the wall. Many secondary clocks are not functioning. As a result, the school has installed battery operated clocks in many spaces that are not synchronized or integrated.

GEOTECHNICAL

LGCI reviewed surficial geologic map of the site. The surficial geologic map indicates that the natural soils in the general vicinity of the site mostly consist of the following: Thin Till – generally less than 10 to 15 feet thick, non-sorted, non-stratified matrix of sand, some silt, and little clay that contains scattered pebbles, cobbles and boulders; coarse deposits – The coarse deposits consist of sand, sand and gravel, and gravel deposits; and bedrock outcrops – The Surficial Geologic Map indicated the presence of abundant rock outcrops on the eastern and western sides of the site.

LGCI engaged Northern Drill Service, Inc. (NDS) of Northborough, Massachusetts to advance seven (7) preliminary borings (B-1 to B-7) at the site. The borings extended to depths ranging between 4 feet and 20 feet beneath the ground surface.

The preliminary borings indicated subsurface conditions that consisted of about asphalt or 0.7 to 1.4 feet of topsoil, overlying 2 to 12.1 feet of fill, overlying natural sand, overlying bedrock.

The existing fill generally consisted of silty sand and contained up to 30 percent fines.

The drillers lost drilling water during drilling in the fill in most of the preliminary borings, indicating that the fill possibly contains voids. This observation combined with the observation of hard drilling and the split spoon or casing refusals encountered within the fill layer, suggest that the fill likely contains blasted rock. In consideration of the above, we believe that the fill is deeper than indicated in the preliminary borings.

A layer of buried organic soil was encountered beneath the fill in one (1) preliminary boring and extended to a depth of about 2.5 feet beneath the ground surface.

Refusal on apparent rock was encountered in five (5) of our borings at depths ranging between 3.5 and 6 feet beneath the ground surface. To confirm and characterize the rock, one (1) rock core was obtained in one (1) preliminary boring. The rock core barrel was retracted and cleared to continue rock coring. The rock generally consisted of hard to very hard, slightly weathered to fresh, extremely fractured to sound, fine-grained, gray Granodiorite.

Groundwater was observed in the preliminary borings at depths ranging between 3.5 and 9 feet beneath the ground surface.

LGCI recommended removing the topsoil, the existing fill, and the buried topsoil, and supporting the proposed building on shallow footings bearing on Structural Fill placed directly on top of the natural sand or on bedrock.

For footings supported on a minimum of 6 inches of Structural Fill placed directly over the natural sand after removing the surficial topsoil, the subsoil, if any, and the existing fill, LGCI recommended a net allowable bearing pressure of 4 kips per square foot (ksf).

Based on our field observations and the results of the grain-size analyses, the onsite soils are not suitable for reuse as Structural Fill. Some of the natural soil and existing fill, free of organic matter, may be used as Ordinary Fill.

LGCI indicated in its preliminary report that the contractor may consider mobilizing a rock crusher to the site. Existing cobble and boulders and imported blasted rock can be processed by blending them with the existing fill and natural soil and crushing them to produce a well graded material

Depending on the finished floor elevation of the proposed building, rock removal may be needed to achieve a level building pad.

To further characterize the existing fill, and explore for the depths to the bottom of the existing fill and buried organic soil, LGCI recommends performing addition al explorations during the next phase of the project. The explorations should include test pits and soil borings. The additional explorations should also include the installation of groundwater observation well to assess the need for under-slab drainage system under the proposed building.

ENVIRONMENTAL SITE ASSESSMENT

Findings:

The site was undeveloped wooded land until approximately 1968 when the existing school was built.

The existing Site building footprint and layout has remained largely unchanged since 1968. The building has a concrete slab-on-grade foundation, brick/masonry exterior walls, cinder block interior walls, and tiled concrete floors. The building has a total of 248,986 sf of finished area. The school building has driveways around it. Franklin Place connects the main school parking area to Franklin Street. The Site has several outdoor athletic fields surrounding the school building.

The Site is currently heated by natural gas-fired forced hot water systems. The original heating source was #2 fuel oil which was converted to natural gas in 2010.

The Site had one former 15,000-gallon UST and one former 500-gallon UST; both USTs were removed in 2010. The USTs were transported to Lawrence, MA for disposal. According to Form UST FP-290R, evidence of a leak was observed from the 500-gallon UST during removal. Supporting documentation including the UST removal permits, Form UST FP-290R, and disposal receipts are included in Appendix B.

Based on a review of state and government agency databases, there was one reported historical spill incident of pesticide/herbicide on the property in 1985. This case was closed on the date of notification. The Site is listed as a Massachusetts generator of hazardous waste and waste oil. No other release of oil or hazardous materials (OHM) was documented or identified at the property.

The Site does not use significant quantities of hazardous materials or generate significant quantities of hazardous waste. Minor quantities of waste oil and other automotive fluids used/generated in the maintenance garage are stored in secure storage containers located in the garage,

prior to offsite disposal.

No prior Environmental Site Assessment report(s) for the property were known or available for the Site.

During the 2010 fuel oil UST removal, evidence of leak was observed around the 500-gallon UST as noted on the FP-290R Form. No notification was made to the MassDEP and no additional documentation regarding the leak was found. In the absence of additional documentation (soil sampling results, UST closure report), this is considered to be a recognized environmental condition (REC #1).

Opinions:

One recognized environmental condition (REC #1) associated with the 500-gallon #2 fuel oil UST removed in 2010 was identified at the Site. No information relative to response actions completed was available in the state and local databases and records reviewed.

Future construction or demolition activities in the vicinity of the former 500-gallon #2 fuel oil UST may encounter petroleum-impacted soil that would require special handling and disposal.

No other recognized environmental conditions (RECs), historical recognized environmental conditions (HRECs), controlled recognized environmental conditions (CRECs), or business environmental risks (BERs) were identified at the Site. Mold and wetlands were not identified as significant environmental issues at this Site.

Conclusions:

One recognized environmental condition (REC #1) was identified in connection with the Site. The evidence of a leak from the former 500-gallon #2 fuel oil UST constitutes a recognized environmental condition. The UST removal permit, Form UST FP-290R, and disposal receipt for the 500-gallon #2 fuel oil UST are included in Appendix B. No UST closure report or confirmatory soil sampling results for this UST were found.

HAZARDOUS MATERIAL

Universal Environmental Consultants (UEC) was contracted by Perkins + Will, to conduct the following services at the High School, Stoneham, Massachusetts as part of the feasibility study of the school:

- Asbestos Containing Materials (ACM) 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
- Airborne Mold inspection and sampling
- Radon sampling
- Underground Oil Storage Tanks

Please refer to the HAZ MAT Report dated August 10, 2020.