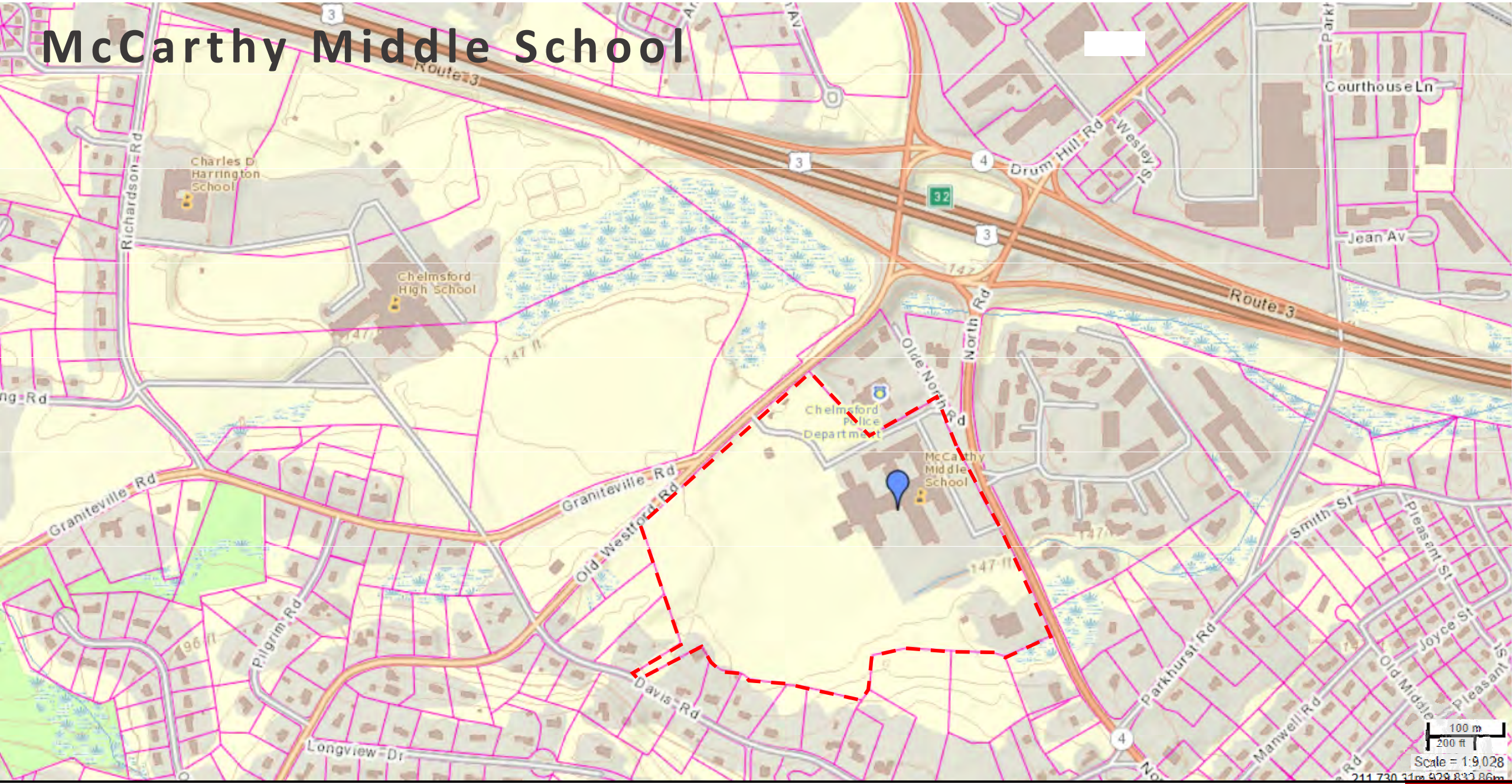
McCarthy Middle School



Dore & Whittier Architects Inc.

A2-1

McCarthy Middle School

ARCHITECTURAL ASSESSMENT

GENERAL DESCRIPTION

The Middle School was designed by Rich & Tucker Associates and constructed in 1959. A renovation and addition in 2006 by Flansburgh Associates updated the technology in classrooms, plumbing and lighting fixtures, fire alarm, and new Library.

The building is two-stories, with a gross floor area of approximately 156,732 SF.

The building is generally described as a concrete framed structure, with load-bearing interior and exterior walls. Expansion joints are utilized to segregate into multiple buildings, and as such best fits the description of a Type II-A/II-B construction as defined by the current building code. The building does not have an automatic fire suppression system (sprinklers) throughout all areas.

Current enrollment is approximately 864 students in grades 5-8. There are approximately 114 full time staff members.

The building survey for this report was conducted on February 16, 2016.

Image 1

Image 2

GENERAL CODE CONSIDERATIONS

As an occupied building with approved occupancies, significant code upgrades are not required to continue using the building, unless specifically identified as issues requiring remediation by the Building Inspector. However, as the building currently stands, any plans for significant renovations or additions should be planned in awareness of the following limitations.

At 156,732 square feet in area, a simple analysis of the building occupancy, construction type, and fire protection features, suggests that the building appears to significantly exceed the maximum allowable area for its construction type and primary use occupancy. As such, it is likely that any planned additions or major renovations would require the addition of fire walls to subdivide the building, or the inclusion of a fire sprinkler system throughout in order to meet current code.

Image 3

Image 4

Image 5

Image 6

As the building is currently not sprinklered throughout and is in excess of 7500 square feet in gross area, any significant planned renovations or addition would require the inclusion of fire sprinklers throughout the building, per MGL chapter 148. We note that this requirement would also benefit the building height and area limitations mentioned previously.

A more in-depth analysis of the building occupancies and strategies to satisfy building height and area limitations would be required to confirm code requirements.

Based on the construction type, building area, and lack of sprinkler systems, the current code would require the different occupancy areas, such as the gym, auditorium, administrative offices, and library be separated from the educational uses by rated fire walls.

Building codes have been modified since the building was constructed. While building codes allow the building to continue to be used for its current purpose without mandatory upgrades (unless specific items have been identified by the Building Inspector as being unsafe), school administrations and building owners choosing to undertake renovations will be required to bring facilities into compliance with current building codes. Any such renovations should consider the following code compliance measures as options:

- Complete sprinkler installation throughout.
- Replace wired glass throughout as it is no longer accepted as fire-rated.
- Upgrade structural and partition walls to meet seismic requirements.
- Upgrade accessibility needs throughout the facility to be fully compliant.

ACCESSIBILITY

The building includes many conditions that are not accessible and do not meet the current Massachusetts Architectural Access Board (MAAB) Rules or the Americans with Disabilities Act (2010) (ADA) Standards.

EXTERIOR SITE AND BUILDING ENTRANCE

The main entrance is handicap accessible (Image 2 and 3). However, due to the bus drop off area accessible parking is not located within the minimum distance of the front door. Accessible parking is provided along the side of the building in several locations with access to different points of the building such as near the cafeteria and gym (Image 4 & 5). Most exterior doors appear to be accessible for exiting. Ramps are located at doors where a transition to grade is required.

INTERIOR SPACES

The building includes barriers to accessibility, as it does not include an accessible route throughout the building. Several efforts have been made to improve access throughout the building, including a lift at the side entrance near the cafeteria/gym (image 8) and the installation of raised walkway in the hallway (Image 9). Access to other spaces remains non-conforming.

The Performing Arts wing is accessible from the exterior however, from within the building a steep non-compliant ramp (Image 10) and stairway (Image 11) are the only means to access this area.

An elevator, lift or revised interior ramp is required to connect these floors.

Renovations and repairs to the toilet rooms to meet accessibility requirements include:

- Regrade ramp in corridor to meet required maximum slope, install handrails on each side and new textured flooring or regrade to meet requirements of sloped walkway (Image 10)

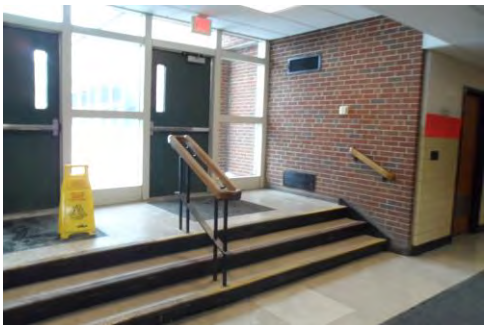


Image 7

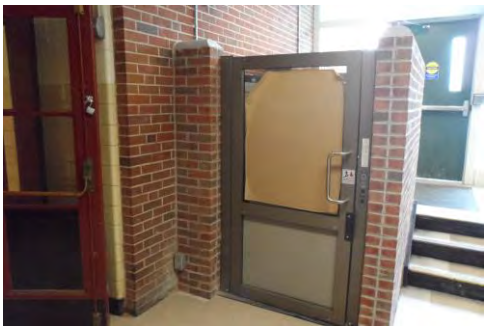


Image 8

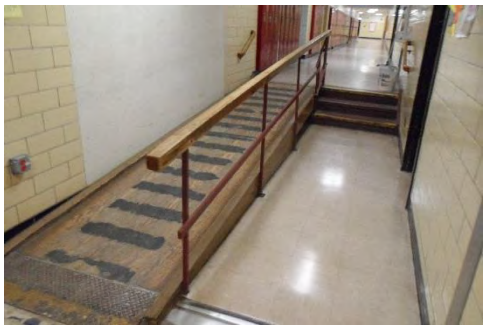


Image 9

Image 10

Image 11

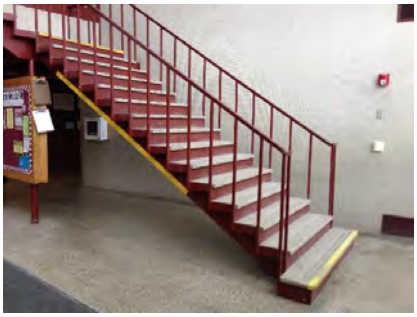


Image 12

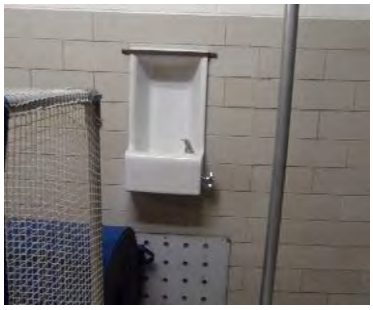


Image 13

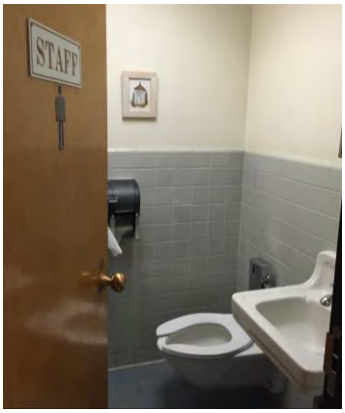


Image 14

- At stairway to theater remove existing handrail and install new handrails that are compliant for diameter and extensions beyond the top and lowest risers (Image 11).
- Multiple entries (classrooms, offices, etc.) do not have at least 12" clear at the door, especially 18" minimum clear for pulling the door open if it has a closer. (Image 9).
- Stairways do not provide handrails and guard rails that meet code. Remove existing handrails and guard rails and install railings with extensions at both the top and bottom of the risers and guardrails that provide less than 4" opening (Image 12).
- Some areas do not provide cane protection. (Image 12) Install barriers to prevent someone from walking into or under the stairway.
- Several drinking fountains do not provide the required space clearance below and are not at the proper height. These fountains should be replaced with drinking fountains that meet accessibility requirements (Image 13).
- Many areas do not have push / pull clearances that meet accessibility requirements.
- Doors throughout the facility have knob hardware which should be replaced with lever hardware (Image 14)
- Several restrooms are not fully accessible or do not have accessories located properly (ie. Fixtures are located too high or not located correctly) (Image 15)
- The auditorium stage is not accessible from the auditorium (Image 16). A lift should be installed from the main floor to the stage
- The auditorium control platform is non-accessible to someone in a wheelchair (Image 17).

Discussions of additional specific conditions representing accessibility barriers are included in the following sections.

EXTERIOR

FOUNDATION

Foundations are poured in-place concrete, and grade is at the top of the foundation walls. It is assumed the foundation walls are generally in good condition. Many areas around the foundation were blocked from view due snow conditions.

Bulleted List of Specific Issues

- Foundation walls below grade are formed in place concrete that is in good to fair condition.
- Multiple top of foundation exposed corners are in fair to poor condition. One example seen at the Aux Gymnasium northwest corner foundation. (Image 18).
- Some areas around the foundation were parging

Bulleted List of Recommendations:

- Further investigation is warranted to determine the cause of cracking.
- Review areas of parging

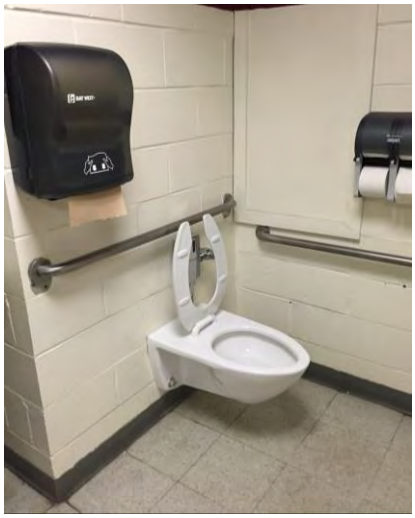


Image 15

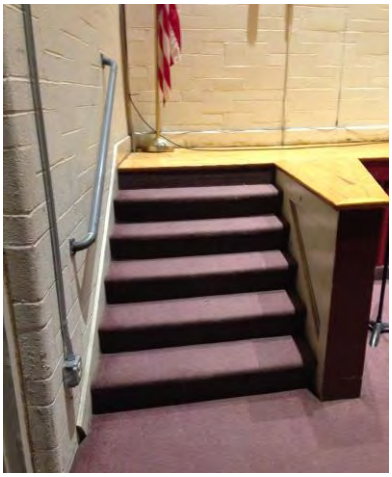


Image 16

WALLS

The building has a brick and mortar exterior veneer with cmu backup.

Bulleted List of Specific Issues:

- Exterior walls are mostly brick veneer w/CMU backup in fair condition. There are indications of moisture infiltration in some areas (Image 19 & 20).
- Some brick are protruding/cracking from the wall at southeast corner along North Rd. (Image 19).
- Wall cavity moisture/efflorescence is seen in multiple brick/opening locations (Image 20).
- Some weeps have been blocked by debris or insects.
- Control joints are in fair condition throughout the school.
- Pod classrooms are wood cladding and are in fair to poor condition. Many gutters and downspouts

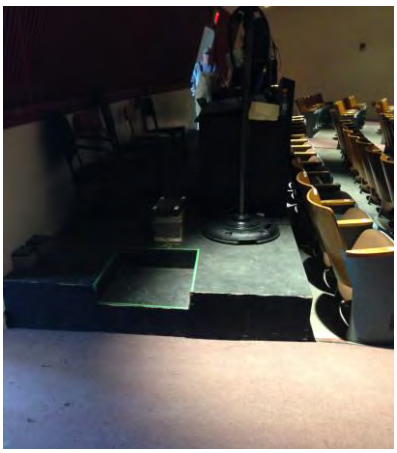


Image 17

Image 18

Image 19

Image 20

Image 21

are damaged or missing causing water runoff and staining. (Image 20).

Bulleted List of Recommendations:

- Discover the source of moisture infiltration and develop program for repair
- Remove bricks that are in need of realignment, install new bricks to allow proper ventilation and drainage from wall cavity.
- Remove debris from weeps to allow proper ventilation and drainage from wall cavity.
- Replace pods
- Install gutters and downspouts that are missing or damaged

WINDOWS

The school underwent a window replacement in 2006. The primary exterior window type is aluminum with insulated glazing with operable section.

Bulleted List of Specific Issues

- Aluminum-framed awning/fixed windows throughout the school and Library addition are in good condition.
- The sealing at the windows appears to be in fair condition.
- Multiple window precast sills have gaps or cracked mortar. Water runoff from the windows is stained below them (Image 22).
- The Gymnasium clerestory films are damaged or deteriorating (Image 23).

Bulleted List of Recommendations:

- Repair precast window sills and retool new mortar.
- Remove existing film at the clearstory and install new Gymnasium clerestory film

DOORS

The exterior doors consist of aluminum storefront and hollow metal doors with hollow metal frames.

Bulleted List of Specific Issues

- Hollow metal doors throughout the school and Library addition are in good condition (Image 24).

Bulleted List of Recommendations:

- No recommendations noted.

Image 22

LOUVERS / OTHER OPENINGS

The louvers are a combination of aluminum fin construction and simple steel mesh construction.

Bulleted List of Specific Issues:

- Aluminum-framed louvers throughout the school are in fair condition. Areas with brick sill have gaps or cracked mortar. Water runoff from the louver is stained below them (Image 24).

Bulleted List of Recommendations

- Repair brick sills and retool new mortar.

Image 23

Image 24

ROOF

Due to recent snow, the team did not attempt to get on the roof for surveying.

Bulleted List of Specific Issues

- 2004 replacement of roof sections with PVC adhered membrane system.
- 2001 existing built-up roof still exist in other areas.
- Recent installation of photo-voltaic cells on roofs.
- Some ceiling tiles were found with stains indicative of a possible roof leak, yet the age of the stains is unknown.

Bulleted List of Recommendations:

- Review roof conditions to verify that no leaks exist.

Image 25

Image 26

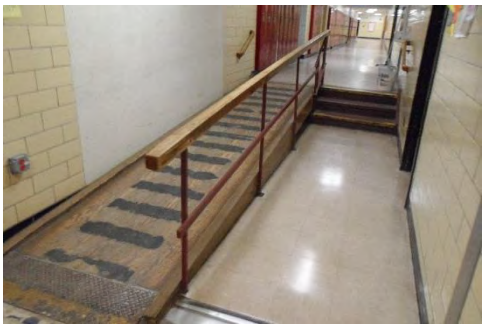


Image 27

Image 28

INTERIOR

FLOORING

The flooring consists of the following: VCT is predominate flooring type in all the classrooms, corridors, and the cafeteria. Carpet tiles are used in the library. Tile is used in the bathrooms. Quarry tile was used in the kitchen. There is a sports flooring system in the gymnasium. All of the custodial and storage spaces are a combination of exposed concrete, sealed concrete, and epoxy painted concrete.

Bulleted List of Specific Issues:

- Sports flooring system in aux gymnasium and large gymnasium with a faux wood finish is in fair condition.
- Corridors in original building have VCT floors in fair condition. Patching is noted in a few locations where door entries have been renovated. Cracking and heaving is also visible in several locations (Image 26).
- Corridor stairs have metal treads in fair condition. Corridor ramp slip resistant membrane is worn and only has plywood membrane surface (Image 27).
- Classrooms, offices, and cafeteria have VCT generally in fair condition. VCT in the Art/Band classrooms appear to be newer, however there are seams and tiles that are popping or separating (Image 28).
- Toilet rooms have porcelain tile in fair condition.
- Locker rooms and athletic offices have sealed/painted concrete in fair condition.
- Library carpet is generally in fair condition. One classroom had an area rug over VCT.
- Custodial closets and storage rooms have sealed/painted concrete in fair condition.
- The quarry tile in the kitchen and servery in fair condition.

Bulleted List of Recommendations:

- Install non-slip material at the ramp to meet current codes.
- Proper slab measures to correct VCT cracking and heaving.

- Replace aux gym floor
- Review conditions of heaving and cracking in the VCT tile, replace and repair tiles
- Clean quarry tile in the kitchen area, replace tiles as needed.

WALLS AND PARTITIONS

The interior walls consist mainly of load bearing CMU walls. All interior walls on the first floor terminate at the underside of the second floor precast floor planks, and all the second floor walls terminate at the underside of the precast roof deck planks.

Bulleted List of Specific Issues

- Corridor walls are largely painted CMU and glazed CMU tile. Most walls are in good shape, however there are some areas have cracking at the glazed CMU walls (Image 29).
- In some classrooms the CMU walls have severe cracking in the corners of the room (Image 30).
- Gypsum wallboard partitions are in generally good condition.

Bulleted List of Recommendations

- Repair the cracked glazed tile wall located near the water fountain
- In classrooms where the CMU block wall is cracking investigation to determine the cause of the cracking remove CMU and replace.

CEILINGS

The primary ceiling type throughout the school is acoustic ceiling tile (2x4)

Bulleted List of Specific Issues

- Acoustic ceiling tile (2x4) and grid that are in classrooms are in good condition, they were recently replaced with renovations.
- Acoustic ceiling tile and grid in the rest of the building is in fair condition, with select areas of staining due to water leaking above the ceiling.
- Older ceilings are cupping and many are damaged at the edges (Image 31).

Image 3

Image 30

Image 31

Image 4

Image 5

Image 34

- Gypsum soffit boards are generally in good condition.

Bulleted List of Recommendations

- Further investigation is warranted to determine the cause of water leaking. Replace stained tiles.
- Replace damaged tiles

DOORS

Most of the interior doors are wood with hollow metal frames, a few of the doors are hollow metal with hollow metal frames. Door panel types vary; some are solid, others have different sized vision panels and louvers. Generally, the doors and frames appear to be in good condition. However, most do not have proper hardware for accessibility. The interior borrowed lights have hollow metal frames and a combination of clear and wired glazing throughout the building.

Bulleted List of Specific Issues

- Most doors are original to construction and are in fair condition. Some of the wood doors and hollow metal doors with hollow metal frames have wired glass. (Image 32)
- The Admin offices wood storefront / borrowed lite system have clear glass (Image 33).

Bulleted List of Recommendations

- Replace door hardware that is not compliant
- Remove all vision panels and side lights with wire glazing
- Remove all wired glass panels from the interior glazed windows and replace with tempered glass.

FIXTURES AND FURNITURE (BUILT- IN)

There are solid wood teacher wardrobes in classrooms throughout the school. Some classrooms have built-in wood casework with cabinets and shelving. Base cabinets with sinks in classrooms are not accessible. Several restrooms have been upgraded with new fixtures and partitions however, fixtures have not been installed to

meet accessibility requirements. In gang toilet rooms at least one of each fixture must be installed to meet accessibility. The benches in the locker rooms are not accessible and there do not appear to be any accessible lockers in the locker rooms or for general use in the corridors.

Bulleted List of Specific Issues

- Teacher wardrobes are in fair condition (Image 34).
- Casework with counters and sinks in classrooms are in fair condition. Cabinets are delaminating and laminate countertops are lifting. These counter areas do not meet current accessibility code (Image 35).
- Toilet rooms in the locker room areas did not meet current code accessibility requirements for minimum heights. Accessories are mounted too high to meet current accessibility code requirements. Compliant under-sink protectors are not installed (Image 36).
- Locker room benches didn't allow proper width for accessibility requirements in current code. No accessible bench with fixed back was noted. Showers did not have accessible controls per current code requirements (Image 37).
- Designated accessible lockers are required in both locker rooms and in the general corridors.

Bulleted List of Recommendations

- Install new teacher wardrobes
- Install new casework and sinks to meet the current code requirements.
- Reinstall toilet fixtures and accessories to the correct height and install pipe guard under accessible sink.

Image 35

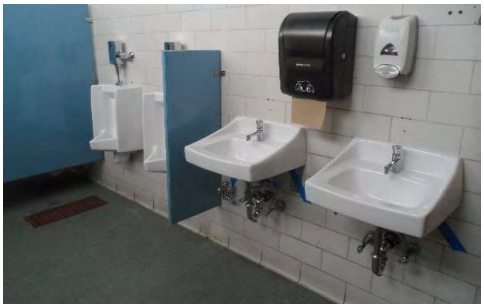


Image 36

Image 37

CIVIL ENGINEERING ASSESSMENT

Nitsch Engineering has performed research of the existing site conditions at the McCarthy Middle School located at 250 North Road in Chelmsford, Massachusetts. Nitsch Engineering has used Chelmsford GIS and design drawings provided by the Town. Nitsch Engineering gathered information during a site visit conducted by Brittney Veeck, EIT on February 17, 2016 and a site visit conducted by Dave Conway, PE on March 4, 2016.

Image 1

GENERAL SITE DESCRIPTION

The existing McCarthy Middle School is located at 250 North Road, Chelmsford, Massachusetts. The site is bounded by Olde North Road and Old Westford Road to the North, North Road to the east, a stream to the south, and Old Westford Road and a wooded area to the west.

There is a parking to the north of school building along Olde North Road and a parking lot to the south of the building along the stream.

There is a track and play fields along the west side of the site.

Image 2

EXISTING SITE UTILITIES

STORM DRAINAGE

Chelmsford GIS shows a closed drainage system in North Road adjacent to the project site and two headwalls discharging to the stream adjacent to the project site.

Image 3

Stormwater runoff from the roof of the building appears to be collected in downspouts on the building that discharge to a below grade closed drainage system (Image 1). Stormwater runoff from the paved parking lots to the north and south of the building is collected in catch basins (Image 2). The catch basin appear to discharge through a headwall into the stream adjacent to the site, however, it is also possible they drain to the drain main in North Road.

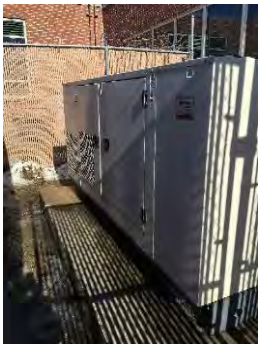


Image 4

Image 5

Image 6

Image 7

Image 8

Sewer

There are town sewer mains in Old Westford Road, Olde North Road, and North Road adjacent to the project site. There is also a force main in North Road adjacent to the site.

Three sewer manholes were observed onsite. Two of the manholes were observed in the sidewalk and lawn area adjacent to Olde North Road. One sewer manhole was observed in the lawn to the east of the building along North Road. Sewer service for the building likely connects into the sewer main in Olde North Road, North Road, or both.

Water

The Town of Chelmsford is split up into three separate water districts: the Chelmsford Water District, the North Chelmsford Water District, and the East Chelmsford Water District.

Two fire hydrants were observed on site. One of the hydrants was in the parking lot to the south of the school and the other was to the east of the school along North Road. A water valve was observed next to the building along the south east face in the parking lot (Image3). Water may enter the building at this corner.

It is unclear where the water service from the building is connected but it may connect to water mains in Olde North Road, North Road, and/or Old Westford Road.

Natural Gas

There is a gas meter and generator located along the west face of the building near in the parking lot area (Image 4). No gas valves were observed on site. Gas service for the building likely connects to a gas main in North Road or Olde North Road.

ELECTRICAL

There is a transformer located along the southern end of the building along the parking lot (Image 5 and 6). Electrical services enter the building along the southern face of the building. No overhead wires were observed onsite so the building is likely fed from underground electrical service.

EXISTING SITE CONDITIONS

SOILS

Based on the Natural Resources Conservation Service (NRCS) Middlesex County Soil Survey the site of the McCarthy Middle School property is on soil classified as Udorthents (Urban Land Complex) and Urdorthents (sandy).

PAVEMENT/CURBING

The asphalt pavement within the site is in generally good condition (Image 7 and 8). There is some accumulation of sediment in paved areas on site and some areas of ponding/icing.

Walkways onsite are asphalt and are generally in fair condition with some areas of cracking/degradation. There are some areas of ponding (Image 9).

Curbing on site is either vertical granite curb, concrete curb, or asphalt curb. The vertical granite curb on site is in generally good condition. The asphalt curb and concrete curb on site is in fair to poor condition with some areas where the curb is no longer there (Image 10, 11, and 12).

PLAYFIELDS

The McCarthy Middle School fields include the Chelmsford Pop Warner Complex. The Pop Warner Complex includes an eight lane synthetic track, synthetic playfield, accessible stands along one side of the track, field event areas, field lighting and a small utility building. The complex appears to be relatively new and is in excellent condition.

There are six asphalt tennis courts at the school. The tennis courts are severely cracked and there does not appear to be

Image 9

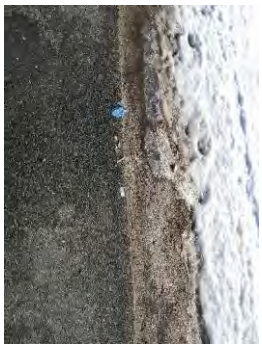


Image 10

Image 11

Image 12

any accessible path to the tennis courts. There are no lights on the courts and the fence surrounding the courts is low. The condition of the tennis court paving is bad enough to make the courts almost unusable.

PERMITTING CONCERNS

Portions of the McCarthy Middle School site are wetland resources or are within the buffer zones of wetland resources. A portion of the south parking lot and south driveway are within a wetland buffer zone and a FEMA Zone A. Also a small portion of the building and much of the south parking lot and driveway are within the 200-foot Riverfront Area associated with the stream to the south of the school. The site does not appear to be located within a Wellhead Protection Area.

RECOMMENDATIONS

- Mill and overlay sections of pavement where cracking/degradation has occurred.
- Regrade paved areas to prevent ponding which can lead to ice patches in the cold weather.
- Replace areas of asphalt curb that have been damaged.
- Reset vertical granite curb as needed
- Confirm walkways and courtyard areas are ADA accessible.

Image 13

Image 14

STRUCTURAL – MCCARTHY MIDDLE SCHOOL

The purpose of this report is to assess the structure of the existing building, comment on the existing structure and comment on the structural integrity of the building.

Basis of the Report

This report is based on visual observations during our site visit on February 16, 2016. During the visit we did not remove any finishes or take measurements; so, our understanding of the structure is limited.

Existing Conditions

We observed the exterior masonry façade and noted various cracks in the kitchen wing. We observed rotting wood and peeling paint where the wood panel and the ground interface. This occurs at the modular wings and at the exterior wood doors at the kitchen wing.

The exterior masonry façade exhibited some water staining.

On the east side of the building, we observed a canopy over the main entrance. The canopy construction consists of six (6) steel posts which appeared to be embedded in the ground. We noted excessive deterioration to the base of the columns, which included delamination of the steel material. We struck the steel with a screw-driver and were unable to penetrate the wall of the column. Foundations were not observable. Ramp railings exhibited similar deterioration due to water sitting at the bases of the posts.

On the south side of the auditorium, we observed an exterior canopy structure supported by steel columns. We noted that one of the columns was significantly bent – probably due to a vehicular collision. The base of the columns exhibited rusting, peeling paint and deterioration due to moisture.

At the exterior handicap entrance to the gym, we observed a canopy attached to the main building. The underside of the canopy construction consists of a painted metal deck which appeared to be rusting due to moisture. At the time of the visit, we observed water from melting snow dripping from the eave.

We observed a concrete pad at the loading dock and noted significant deterioration and spalling.

We observed the exterior façade of the modular classrooms and did not observe a downspout over the exterior metal ramp. Wood decks were observed at the tops of the metal exterior ramps. We observed the wood decks and did not note any visible foundations; the PT wood posts were in contact with the ground.

In the boiler room, we observed rust staining on the structure above, and the concrete floor.

We observed water damage at various ceiling tiles.

Roof ladders exhibited moderate rusting and peeling paint.

MECHANICAL ASSESSMENT

The McCarthy Middle School was built in 1959 as a high school. The mechanical systems were extensively renovated in 2006, as the building was converted from steam to hot water. The building received new condensing hot water boilers, unit ventilators, air handlers, and pumps. New heating distribution piping was run in the ceiling to replace the steam piping in the crawlspaces. The pneumatic controls system was replaced with DDC controls. In 2005, the administration area received a new air conditioning system consisting of a variable refrigerant flow ductless heat pump system. The school mostly consists of unit ventilators for all the classroom spaces and the cafeteria. The library is served by a rooftop unit with gas heat and full air conditioning. The auditorium and both gyms are served by air handlers that are heat only, with limited economizer cooling. Exhaust air is provided throughout the building primarily through the use of roof mounted exhaust fans. The only air conditioning is in the administration area, library, music offices, portable classrooms, a second floor classroom and in a few other scattered administrative spaces. Operable windows are located throughout the school, offering additional ventilation. Overall, equipment is in good condition since the renovation was fairly recent.

Image 1 - Condensing Boilers

Image 2 - Condensing Boilers (Rear)

Image 3 – Building Heating Pumps

Image 4 – DDC Control Panel

COOLING PLANT:

The building is not provided with a central cooling plant. The Administration area is served by ductless heat pumps tied into a single VRF condensing unit, so all offices have their own temperature control. The library is cooled by a 17.5 ton Trane rooftop unit with DX cooling. The music area offices are cooled by a 2-1/2 ton ducted horizontal unit ventilator with an add-on DX coil. The 2nd floor classroom is cooled by a 3 ton ducted horizontal unit ventilator with an add-on DX coil. (Image 18) The portable classrooms are cooled by 4 ton rooftop units with DX cooling.

Specific Issues:

- R-22 refrigerant is being phased out, making it more difficult and more expensive to obtain.

Image 5 – Typical Low Wall Exhaust Grille

Image 6 – Admin Area Ductless Heat Pump

Image 7 – Admin Area Condensing Unit

Image 8 – Library RTU

- The refrigerant piping insulation has deteriorated at the condensing units on the roof. (Image 13)

Recommendations:

- Consider replacing all cooling equipment that utilizes R-22 refrigerant.
- Reinsulate exposed rooftop refrigerant piping serving condensing units. Wrap closed cell insulation with a UV light rated jacket.

HEATING PLANT:

There are four (4) gas fired condensing boilers manufactured by Aerco, model Benchmark 2.0, each with an input capacity of 2,000 MBH and a gross output of 1760 MBH. (Image 1 & 2) These four boilers were installed in 2006 and are in excellent condition. Each boiler is provided with dual low water cut-offs and all operating and safety controls. The boilers are sequenced from an Aerco boiler management system controller. There are no motorized isolation valves at each boiler, which allows system return water to circulate through idle boilers and mix with the hot water coming out of the active boilers. This mixing reduces overall system water supply temperature, which makes the overall heating plant less efficient. Hot water expansion is handled through the use of two 600 gallon vertical style expansion tanks which are insulated. There is also a five gallon chemical shot feeder in the system for chemical treatment of the piping system. The heating system is designed to run on 30% propylene glycol for freeze protection. The heating hot water piping itself is schedule 40 black steel and is insulated with fiberglass insulation. One vent serves two boilers. These two stacks exit the building separately and are both constructed of double wall stainless steel. This breeching system penetrates the roof within the mechanical room. Combustion air is brought into the boiler room through two wall mounted louvers, with a high opening and a low opening that terminates 2 ft above the floor. The openings are dampened using electric actuators. In addition, combustion air is directly ducted to each boiler from a common roof mounted intake vent. The boiler room is ventilated by a roof mounted fan. The boiler room is heated via a vertical and a horizontal

propeller style unit heater, which are tied into a wall mounted thermostat. Heating hot water is circulated throughout the building in a variable primary pumping scheme using two (2) Armstrong model 5x4x11.5 4030 base mounted end suction pumps, rated for 510 GPM at 80 ft of head. (Image 3) These pumps are variable speed pumps, controlled by a Square D Econoflex variable speed drives with no bypass. The pump was running at 60 Hz, which is unexpected on a 38 degree day. The pump should be running at reduced speed at moderate outdoor temperatures. The steam tunnels have been abandoned in place. The electric room, off the boiler room, has no ventilation.

Specific Issues:

- The boilers do not have motorized isolation valves which allow for mixing and reduced overall system supply water temperature.
- Pumps are running at full speed at moderate outdoor air temperatures.
- There is no ventilation in the electric room.

Recommendations:

- Install motorized isolation valves at each boiler to close when that boiler is idle.
- Investigate why pumps are not modulating down at warmer outdoor temperatures.
- Provide ventilation in the electric room.

Image 9 – Missing Moisture Elimination Screen on Library RTU

Image 10– Canopy Kitchen Hood

Image 11– Slide Gates Inside Kitchen Hood

Image 12– Kitchen Unit Ventilator

Image 13 – Deteriorated Refrigerant Piping Insulation

Image 14– Gym Air Handlers

Image 15– Slopetop Radiation at Gym Clerestory

Image 16– Portable Air Conditioner

AUTOMATIC TEMPERATURE CONTROLS:

The building is served by Novar/Trend Tridium based direct digital controls. (Image 4) The school is nearing the end of a controls upgrade that started in 2014. Trend combination temperature sensors/CO2 sensors are being retrofitted to each classroom to provide demand control ventilation at each unit ventilator. In the boiler room, the Trend system monitors HWS temp, HWR temp, OA temp, HW differential pressure and boiler alarms. The Trend system controls pump start/stop and speed, differential pressure bypass valve position and split air conditioner start/stop. The air handlers in the big gym, small gym and auditorium are variable speed operating from 80-100% based on either ventilation or temperature demand. The Trend system monitors CO2, opens the outside air damper and increases fan speed as necessary. When temperature setpoint is not being maintained, fan speed is increased. The boilers are sequenced and operate via the stand alone boiler management controller. Boiler faults are picked up by the Trend system. The portable classrooms are controlled by stand-alone programmable thermostats. Utility type spaces and bathrooms are controlled by local controls with no night setback capability. The boiler plant is equipped with an automatic outdoor air reset control function which provides energy savings when the building load does not require high temperature water due to warmer outdoor conditions.

ADMINISTRATION:

The Administration area is heated by hot water slopetop baseboard radiation. Each room has its own temperature control. The perimeter offices of the administration area are cooled by wall mounted ductless heat pumps that are part of a variable refrigerant flow system that is tied into a single outdoor condensing unit. (Image 6 & 7) Each room has its own heat pump providing individual temperature control. Each room is also exhausted by ceiling mounted registers, tied into a central exhaust system. Dr. Steve's anteroom is heated by a wall mounted convector and is ventilated by a ceiling mounted exhaust register. Room 141 is heated by slopetop baseboard radiation and is ventilated by a ceiling mounted exhaust register. Administration bathrooms and utility spaces are exhausted by ceiling mounted registers, tied into a central exhaust system.

CAFETERIA:

The cafeteria is served by four wall mounted vertical unit ventilators and two concealed horizontal ducted unit ventilators. Hot water slopetop baseboard radiation is run under the windows. These unit ventilators are supplemental sources of make-up air for the kitchen hood, as air is drawn into the kitchen through transfer grilles/open doors. Within the unit ventilators is a supply fan, hot water coil, face and bypass dampers, a filter rack and outside/return air dampers. The unit ventilators are provided with electric actuators. Each unit ventilator is controlled via the standalone wall mounted sensor tied into the Trend DDC control system. The cafeteria is exhausted through high wall grilles tied into a central exhaust fan. The faculty dining room is provided with a wall mounted vertical unit ventilator and is exhausted through a low wall grille tied into a central exhaust system.

KITCHEN:

The kitchen functions as a warming kitchen. The hood has no Ansul fire suppression system. The hood has an interior panel with adjustable slide gates to adjust airflow through the slide gate openings. (Image 10 & 11) Partial make-up air is supplied via a wall mounted vertical unit ventilator which draws in fresh air through a high louver. (Image 12) The remainder of the hood make-up air is transferred from the cafeteria via open doors/transfer grilles. The kitchen offices are heated by slopetop baseboard radiation. The offices are ventilated by a ceiling exhaust register.

Specific Issues:

- Kitchen Hood unnecessarily runs at full speed wasting energy

Recommendations:

- Install a variable speed demand control kitchen hood control system. This system monitors the heat and smoke given off by cooking processes and adjusts hood airflow to compensate. When little cooking is taking place, the hood runs at reduced airflow, saving energy.

Image 17 – Auditorium Air Handler

Image 18– Roof Mounted Condensing Unit & Fans

Image 19– Auditorium Return Fan

Image 20– Typical Classroom Unit

CLASSROOMS:

Single wall mounted vertical unit ventilators are provided in each classroom. (Image 20) These units provide outside air through the use of a through wall louver system which is ducted to the back of the unit ventilator. Within the unit is a supply fan, hot water coil, face and bypass dampers, a filter rack and outside/return air dampers. The unit ventilators are provided with electric actuators. Each unit ventilator is controlled via the standalone wall mounted sensor tied into the Trend DDC control system. This combination temperature/CO2 sensor provides demand control ventilation to more closely match fresh air damper ventilation settings with actual room occupancy. The unit ventilators are manufactured by Trane.

Each classroom is provided with a low wall mounted exhaust register which communicates to a central roof mounted exhaust fan through a galvanized sheet metal duct collection system (Image 5).

The chorus room is served by two wall mounted vertical unit ventilators. The music area contains high clerestory windows. Inverted slopetop radiation is run below these windows to pick up the heat loss.

The home economics room is cooled by a portable air conditioner with hot condenser air ducted to a window opening (Image 16).

Some of the small classrooms off the corridor leading to the cafeteria do not have unit ventilators. They are served by slopetop baseboard radiation, high wall exhaust registers and operable windows.

Recommendations:

- Continue to provide routine maintenance on all the unit ventilators such as motor and shaft lubrication, filter changes and coil cleaning.
- Add unit ventilators to small classrooms with high occupancy loads to improve ventilation levels.

LIBRARY:

The library is served by a 17.5 ton constant volume roof top unit, which consists of a supply and exhaust fan, filter section, gas furnace and direct expansion cooling coil (Image 8). This roof top unit is associated with a galvanized sheet metal duct distribution system which delivers and returns the conditioned air to and from the spaces via ceiling diffusers and grilles. The unit delivers a mixture of outside air and return air, which is then conditioned through the unit's gas furnace or DX cooling coil. The library is broken into 3 temperature zones – north exposure, south exposure and center/clerestory. Duct mounted hot water coils further heat/reheat the tempered air being supplied by the rooftop unit. Hot water slopetop baseboard radiation is run along the perimeter of the library as supplemental heat. The fresh air damper at the rooftop unit is controlled by CO2 sensors in the space to match fresh air damper ventilation settings with actual room occupancy

Specific Issues:

- Moisture elimination screen has fallen out of the outside air hood on the rooftop unit (Image 9).
- Access door at RTU filter section is loose.

Recommendations:

- Reinstall moisture elimination screen on RTU.
- Tighten filter access door on RTU.

AUDITORIUM:

The auditorium is served by a 6800 CFM Trane indoor air handler and remote return air fan. (Image 17 & 19) The air handler consists of a supply fan, filter section and hot water coil. The unit is associated with a galvanized sheet metal duct distribution system which delivers supply air to large ceiling diffusers. The unit delivers a mixture of outside air and return air, which is then heated through the hot water coil. The return fan draws air back from the auditorium and returns most to the air handler with the remainder being exhausted out a wall louver. The auditorium has no air conditioning. It is provided with economizer cooling, which uses cool outdoor air to provide cooling during moderate weather. The fresh air damper at the air handler is controlled by CO2 sensors in the space to match fresh air damper ventilation settings with actual room occupancy.

GYMNASIUM:

The main gym is served by two 6800 CFM Trane indoor air handlers, hung exposed from the gym ceiling, free blowing supply air into the gym (Image 14). These air handlers consists of a supply fan, filter section, hot water coil, and face and bypass dampers with external bypass. Each air handler draws in ventilation air through a wall louver located at the rear of the unit while return air is drawn in from the bottom of the unit. The unit delivers a mixture of outside air and return air, which is then heated through the hot water coil. The gym is provided with economizer cooling, which uses cool outdoor air to provide cooling during moderate weather. A roof mounted exhaust fan, tied into low wall mounted grilles, provides exhaust and economizer relief. The fresh air damper at the air handler is controlled by CO2 sensors in the space to match fresh air damper ventilation settings with actual room occupancy.

Inverted slopetop radiation is run below the clerestory windows to pick up the heat loss.

The small gym/physical education room is served by a 3850 CFM Trane indoor air handler. This air handler consists of a supply fan, filter section, hot water coil and internal face and bypass damper. The unit is associated with a galvanized sheet metal duct distribution system which delivers supply air to ceiling diffusers. Return air is drawn back to the unit through high wall grilles. The unit delivers a mixture of outside air and return air, which is then heated through the hot water coil. The small gym is provided with economizer cooling, which uses cool outdoor air to provide cooling during moderate weather. A roof mounted relief hood, tied into the return ductwork, provides economizer relief. A roof mounted exhaust fan, tied into low wall mounted grilles, provides general exhaust. The fresh air damper at the air handler is controlled by CO2 sensors in the space to match fresh air damper ventilation settings with actual room occupancy.

Inverted slopetop radiation is run high in the small gym to provide supplemental heating.

The locker rooms are served by exposed horizontal unit ventilators, hung from the ceiling, free blowing supply air in the space. The locker rooms and storage rooms are exhausted via ceiling mounted exhaust registers tied into a

central rooftop exhaust fan.

Offices in the gym area are heated by slopetop baseboard radiation and ventilated via a ceiling exhaust register.

EXHAUST SYSTEMS:

Throughout the building, general exhaust is provided through the use of roof mounted exhaust fans. These fans serve areas such as toilet rooms, storage rooms, custodial closets, mechanical spaces and electric rooms. The manufacturer is primarily Dayton with some Greenheck fans that were installed during the 2006 hot water conversion project. All the fans are associated with their own independent galvanized sheet metal duct distribution systems and all terminate within the spaces with ceiling or wall mounted grilles. Overall the fans appear to be functioning. A couple of the Dayton fans are noisy and should be checked for bearing issues.

Specific Issues:

- Check a noisy Dayton fans for bearing issues.

Recommendations:

- Provide routine maintenance on all exhaust fans such as replacing belts and lubricating their motors and shafts. Replace fans as necessary.

COMMON AREAS:

The common areas such as corridors, vestibules, restrooms and lobbies are provided with supplemental heat through the use of wall/ceiling mounted cabinet unit heaters, fin tube radiation and wall mounted convectors. The main lobbies are served by concealed cabinet unit heaters that are ducted to wall grilles. Some of the original steam cabinet unit heaters that are recessed in walls have been abandoned in place. Utility type spaces are heated by horizontal unit heaters. The corridors are ventilated by high wall registers tied into a central exhaust system.

Recommendations:

- Provide routine maintenance on all unit heaters, such as motor and shaft lubrication, filter replacement and coil cleaning.

PORTABLE CLASSROOMS:

The portable classrooms are air conditioned, heated and ventilated via Rheem 4 ton rooftop units. The rooftop units are provided with electric heat. The corridors leading to the portables are heated by electric baseboard. The portable classrooms are poorly insulated, resulting in high energy costs.

Recommendations:

- Replace portable classroom units with a permanent well insulated addition to the building, heated by the building's efficient gas-fired hot water heating system. If the portable classrooms are to remain in use, the rooftop units should be replaced with heat pump style rooftop units to minimize electric heating by capturing heat from the surrounding air.

ELECTRICAL ASSESSMENT

The original building was constructed in 1959 with the Library addition constructed in 2005. A modular classroom addition has also been added over the years. Most of the systems original to the 1959 building are over 56 years old and, although functioning, have outlived their intended useful life. The facility's electrical service is provided by National Grid and is secondary metered. Other incoming utilities include telephone, cable TV, fiber, and fire alarm.

The power distribution system original to the 1959 building is obsolete and is in poor condition and should be replaced. Most of the lighting systems have been retrofitted with T8 lamps and ballasts, but most of the light switches and wiring were reused. Many of the areas are in need of lighting upgrades due to poor condition of the fixtures. The fire alarm system is addressable but it is obsolete. Parts are no longer manufactured but may still be available. System has full coverage, however, the notification devices consist of horns. Voice evacuation is currently required by code.

The emergency generator and transfer switches were installed in 2005 and are in good condition, however the existing panels that it back fed are in poor condition. The emergency transfer switch and lighting panels are not in compliance with current codes as there are no electrical and physical separation from non-emergency systems.

The 2005 Library addition and equipment installed during the upgrade are in good condition.

Image 1 – Main Switchboard

Image 2 – Typical Original FPE Panels

Image 3 – Flush FPE Panels in Corridor

POWER DISTRIBUTION SYSTEM

The primary service runs underground into a vault mounted transformer behind Receiving. Secondary service consists of a bus duct between the transformer vault and a 2,000 ampere, 120/208 volt, 3 phase, 4 wire switchboard. The switchboard has a pringle fused main disconnect switch. The two distribution sections consist of breakers.

The switchboard manufactured by Federal Pacific, FPE, is original to the building, is obsolete, and is in poor condition. Most local and remote panelboards are also FPE original and are generally full and in poor condition. Panels are of the breaker type, and generally not located within electric closets.

The main switchboard has rear access. Electric room door is not equipped with panic hardware. The door swings into the electric room; required to swing out. The space layout does not meet code for working clearances.

The motor control starters are original and are in poor condition.

A 200 amp disconnect switch has also been tapped to the switchboard to feed the elevator.

A 600 Amp main circuit breaker distribution panel tapped to the switchboard was provided to service the normal and normal/emergency surface panelboards during a receptacle upgrade in 2005. The panels are located in corridors and are in good condition. Panels were manufactured by Eaton/Cutler-Hammer. The conduit fittings have been color coded for ready ID; Yellow – N/E Power, Blue – Normal Power. The normal only panels are generally full.

The switchgear provided during the 2005 addition was manufactured by Eaton/Cutler-Hammer and is in good condition.

The portable pods 1-4 are fed with one 150A main circuit breaker load center.

The sports field lighting is fed from its own dedicated electric service directly from the street.

Recommendations:

1. Provide new pad mounted transformer to replace existing vault transformer.
2. The original FPE switchgear is in poor condition, generally full and should be replaced. The existing feeders and branch circuits would be refed from the new switchgear.

Image 4 – Typical 2005 Panels in Corridor

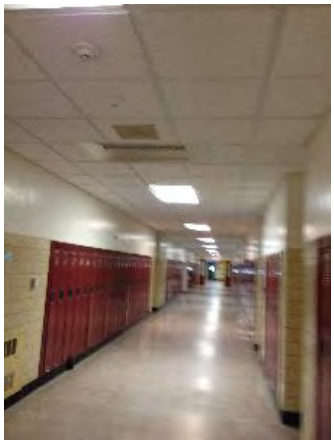


Image 5 – Corridor Lights

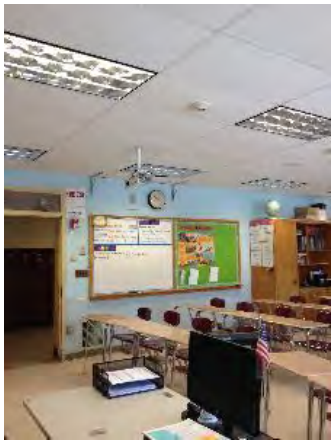


Image 6 – Classroom Lights

INTERIOR LIGHTING

The corridor lights consist of recessed 2x4 troffers with acrylic lens and two T8 lamps. Occupancy sensors exist in corridors to control lights in addition to local switches. Typical classroom has three rows of four 2x4 recessed parabolic fixtures with three T8 lamps controlled with an occupancy sensor and three wall switches.

Cafeteria has 2x4 recessed parabolic fixtures with two T8 lamps. Fixtures are controlled with occupancy sensors.

The kitchen has 2x4 recessed lensed fixtures with T8 lamps. Fixtures are controlled with local switches. The hood has globe fixtures with incandescent lamps without guards.

Office areas have 2x4 recessed parabolics with T8 lamps and occupancy sensors.

The gym has 2x4 fluorescent high bays with (2) T5HO lamps with lens and wireguards. Fixtures are controlled with occupancy sensors with wireguards.

The locker rooms 1x4 surface wraparound fixtures with two T8 lamps and circline fixtures controlled with local switches. Fixtures are in poor condition.

Showers have circline surface lensed fixtures with compact florescent lamps.

The auditorium house lights flood lamps consist of incandescent recessed down lights lamped with LED flood lamps. Fixtures are controlled with door entry stations. Performance lights consist of source four at front of house mounted on catwalk and four wall torms.

Auditorium does not have isle lights for use during performances.

The stage work lights consist of RLM pendant fixtures, most with burned out bulbs. Wall mounted globe fixtures also exist. Stage has three pipes with Source Fours, Fresnels and border lights for performances. An ETC Express 48/96 lighting control console is used.

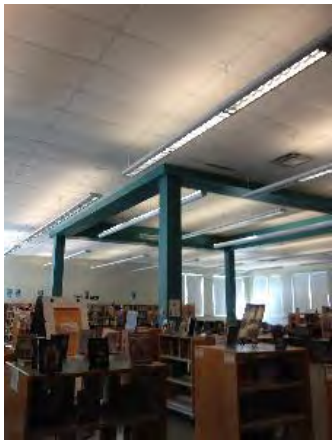


Image 7 – Library Lights

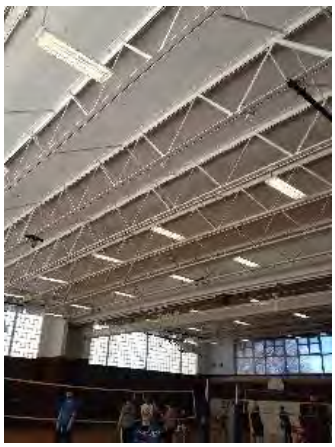


Image 8 – Gym Lights

Image 9 – Locker Room Lights

The dimming system consists of a 400 amp, 120/208 volt, 3 phase, 4 wire floor mounted FPE switchboard construction series system. The switchboard has (36) 2.4Kw dimmers. The dimming system is original and in poor condition.

The library constructed in 2006, has pendant direct/indirect linear fixtures with parabolic baffles with two T8 lamps. Lights are controlled with occupancy sensors and multiple switches.

The school does not have automatic dimming in areas with daylight contribution.

Overall the lighting is in fair to good condition. A fair amount of occupancy sensors are located throughout the school.

Image 10 – Auditorium Lights

The facility does not have an automated lighting control system.

Recommendations:

1. Replace lighting under a renovation program with LED sources with automatic dimming in spaces with daylight contribution.
2. Provide an automated lighting control system.

Image 11 – Pole Lights

EXTERIOR LIGHTING

The front drop-off roadway lighting consists of 15' steel poles with LED cobra head fixtures. Poles have visible corrosion.

Fixtures at doors range from jelly jar sconces to wall pack fixtures with compact florescent lamps.

The rear parking areas are lit with up-tilted LED building mounted floods. The area lacks pole mounted lights.

The exterior lighting is timeclock controlled.

Recommendations:

1. Replace building mounted HID and compact fluorescent sconces with LED fixtures of the cut-off type.
2. Provide uniformed pole mounted LED fixtures of the cut-off type for parking areas.

Image 12 – Exterior Wall Fixtures

EMERGENCY STANDBY SYSTEM

The facility has an exterior natural gas generator in a weatherproof sound attenuated enclosure. The generator has two 200 amp breakers.

The generator is rated at 100kW, 120/208 volt, 3 phase, 4 wire, manufactured by Olympian G100F3. The generator is within a fenced area.

A 200 ampere, 120/208 volt, 3 phase, 4 wire Asco series 300 automatic transfer switch ATS 1 is located in the boiler room and replaced the original ATS. The switch is fed with MI cable from the emergency source including the start circuit. The switch in part feeds the boilers, pumps, ATC compressors and sump pumps.

A second 200 ampere, 120/208 volt, 3 phase, 4 wire Asco series 300 automatic transfer switch ATS 2 is located in the main electric room.

The portable pods have emergency battery units.

The generator remote annunciator is located in the main electric room.

A system of emergency only fixtures exists throughout the facility with incandescent lamps with inadequate coverage.

The generator, transfer switches and panels provided in 2005 are in good condition. The emergency transfer switch and emergency panels feeding emergency lighting at the school are not housed within 2 hour rated dedicated rooms and therefore are not in compliance with current codes for life safety systems.

Exit signs are generally of the LED type with battery back-up. Exit signs in the gym have wireguards.

Recommendations:

1. Upgrade existing emergency lighting, panels and feeders to comply with code. Provide dedicated emergency closets with 2-hour rating to house new panels.

Image 13 – Exterior Generator

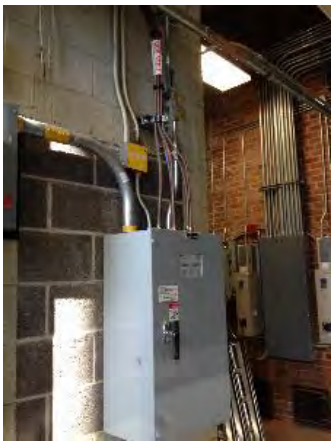


Image 14 – ATS 1 in Boiler Room

Image 15 – Emergency Only Light Fixture in Locker Rooms

FIRE ALARM SYSTEM

The fire alarm system consists of a Gamewell/FCI 632 addressable control panel located in the main lobby. The system was installed during 2005, however the panel is obsolete. Parts are no longer manufactured but may still be available. The form of alarm transmission is via a local energy master box. The master box with a lever is located at the main entrance. A knox box is located adjacent to master box and also at Receiving. The IMSA cable runs underground between the street and the master box.

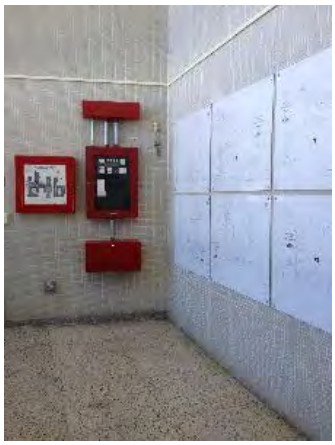


Image 16 – FACP in Main Lobby

The notification appliances consist of horn/strobes in the school.

The facility has full coverage of smokes and heats.

Manual pull stations exist at exterior doors. Pull stations have tamperproof covers.

Corridor doors have magnetic door holders.

Nurse's suite has smoke detectors and strobes but no carbon monoxide detectors were noted in sleeping areas.

Main kitchen hood does not have fire suppression system.

Local plug-in CO detectors noted in science classrooms.

Image 17 – Roof PV Panels

The stage fire curtain control panel is connected to the fire alarm system.

The stage, auditorium and gym have beam detectors with protective wireguards.

The fire alarm system generally has adequate coverage of detection and notification appliances.

Current codes require voice evacuation for Pre K-12, Group E occupancies.

Image 18 – 300 Kw Exterior Inverter

Recommendations:

1. Replace fire alarm control panel with new FCI E3 which is backwards compatible with the existing devices.

2. Replace horns with speakers for general voice evacuation under a renovation. This will require new twisted pair speaker wiring.

LIGHTING PROTECTION SYSTEM

The facility does not have a lightning protection system.

DATA/TELEPHONE/CLASSROOM INTERCOM/CLOCK SYSTEM

The School's IT/MDF is located in a Storage Room. The MDF room serves each IDF room in a star topology with 62.5 - micron multi-mode fiber. The floor mounted rack wiring lacks proper wiring management cable tray/support structures.

In general, data wiring is Cat5 with Cat6 upgrades throughout the building. IDF data racks are generally wall mounted. Emergency branch circuits have been run to each rack.

The school's telephone system is a hosted system. Handsets in the school are manufactured by Polycom.

The existing clock system is a standard electric 1462 time controller and seems to be operational; however, this system is obsolete.

A Rauland tele-center paging system is used for the facility.

Most classrooms are equipped with A/U control systems for projector, and computer connections. Each classroom also contains a sound reinforcement system. Projectors are ceiling mount type.

The Auditorium existing Mackie Onyx 24-4 mixer local sound system is used with a center loud speaker, front of house.

A system of surface raceways has been installed to accommodate the various communications cables added over the years. There are numerous locations where communications cables are run exposed.

The building contains an Aiphone MK-2MOD Video/Intercom door communication system at the Main Office to release the main entry door.

Image 19 –Exterior 300 kVA Step-Down Transformer & Disconnect Switches

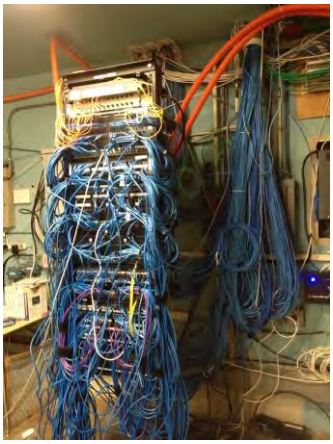


Image 20 - IT/MDF Room Data Rack

The building also contains an intrusion system, one CCTV camera at the Main Lobby and an access control system with three card readers.

Access control is manufactured by S2 and there are micro-nodes located in the IDF racks to service the access controlled doors. The system's head end is located at the Central Administration Office.

MISCELLANEOUS

The facility has a recently installed roof mounted ballasted photovoltaic system disconnected to the grid. The inverter feeds a 600A, 480V disconnect switch, a 300kVA step-down transformer and a 1200A secondary switch located on the exterior.

One 300 kW Solectria SGI300 inverters is located in the exterior within a fenced area.

The facility does not have a lightning protection system.

The typical classroom has a fair amount of receptacles added during the receptacle upgrade in 2005.

Kitchen receptacles are not GFI protected and are sparsely located.

The facility does not have a bi-directional antenna system used to enhance communications with portable radios by First Responders.

PLUMBING ASSESSMENT

Presently, the plumbing systems serving the building are cold water, hot water, sanitary, waste and vent system, storm drain piping, and natural gas. Municipal sewer and municipal water service the building.

All toilet room fixtures were replaced in 2015 and are water conserving type.

Image 1 – Wall Hung Water Closet

FIXTURE

Water closets are wall hung vitreous china with automatic sensor flush valves (Image 1).

Image 2 – Wall Hung Urinal

Urinals are wall hung vitreous china with automatic sensor type flush valves (Image 2).

Lavatories are wall hung vitreous china. The lavatories are fitted with sensor type faucets (Image 3).

Image 3 – Wall hung Lavatory

Utility sinks are wall hung enameled steel sink with wall mounted faucet. Faucets are not equipped with vacuum breakers (Image 4).

Drinking fountains are a mix of stainless steel wall mounted push bar type and recessed vitreous china push button type (Image 5 and 6).

Classroom sinks are counter mounted stainless steel with hot & cold water handle faucets (Image 7).

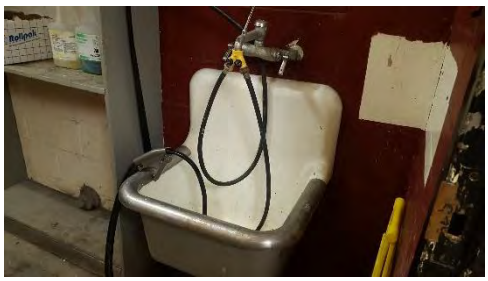


Image 4 – Utility Sink

Art sinks are counter mounted stainless steel with hot & cold handle faucets equipped with a vacuum breaker and thermoplastic trough style sink with (2) wall mounted faucets. Art sinks are equipped with sediment traps. (Image 8, 9, & 10).

Teachers' Lounge sink is a counter mounted stainless steel sink with hot & cold water handle faucet (Image 11).

Science sinks are epoxy resin type with gooseneck faucet equipped with vacuum breakers. Sinks are not equipped with acid neutralization tanks or collection system (Image 12).

Kitchen area fixtures are in good condition. The 3-compartment pot washing sink is piped to a floor mounted grease interceptor (Image 13).

Locker room showers are surface mounted with metering shower valves. Water supply temperature to showers is controlled by master mixing valve located in recessed cabinet in locker area. Shower is no longer in use and is now utilized for storage (Image 14 & 15).

WATER SYSTEM

The domestic water service is located in the Mechanical Room. The service appears to be 4" in size and includes a meter (Image 16).

Piping is copper tubing with sweat joints. The majority of piping is insulated. In general, the valves are in good condition.

The building domestic hot water is generated through a gas-fired water heater. The water heater has a gas input of 1,000,000 BTUH. Hot water is stored in a 320 gallon tank. The hot water system is recirculated but the master mixing valve is not working (Image 17, 18, 19).

GAS

Building is serviced by natural gas. The gas meter is located along exterior of building. Gas service is 4" in size (Image 20).

Gas is supplied to heating boilers, water heater, kitchen equipment and emergency generator.

Gas piping is black steel with either welded or threaded joints depending on pipe size (Image 21).

Image 5 – Drinking Fountain

Image 6 – Drinking Fountain

Image 7 – Classroom Sink

Image 8 – Art Sink

SANITARY DRAINAGE SYSTEM

In general, cast iron is used for sanitary drainage. Piping and fittings above slab are no-hub with coupling joints and bell and spigot. Where visible, the cast iron pipe appears to be in good condition. Smaller pipe sizes appear to be copper for waste (Image 22).

ROOF DRAINAGE SYSTEM

The flat roofs are collected by roof drains and interior cast iron rain leaders (Image 23).

RECOMMENDATIONS

Plumbing fixtures meet current code for water conservation.

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

1. We recommend video inspection of existing drains to confirm integrity and correct pipe invert.
2. Provide new high-efficiency gas-fired domestic water heater once the existing water heater has expired.
3. Install new mixing valve.
4. Inspect hot water expansion tank for corroded fitting and leaks.
5. Provide reduced pressure backflow preventers at Janitor's closet soap dispenser.
6. Paint gas piping exposed to exterior.

Image 9 – Art Sink

Image 10 – Sediment Trap

Image 11 – Teacher's Lounge Sink

Image 12 – Science Sink

Image 14 – 3-Compartment Sink

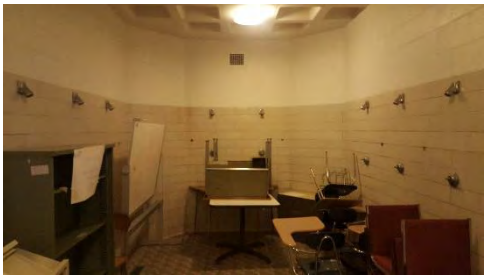


Image 15 – Boys Locker Room Showers

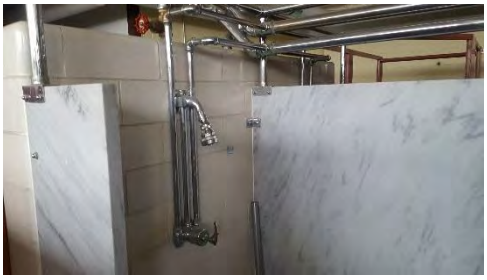


Image 16 – Girls Locker Room Showers

Image 17 – Domestic Water Service & Meter

Image 137 – Gas Fired Water Heater & Tank

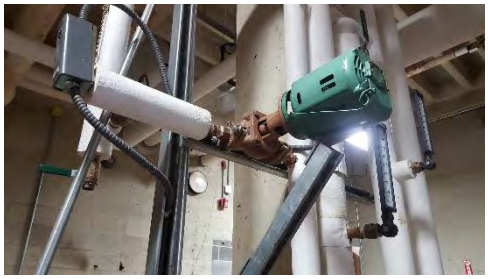


Image 18 – Hot Water Recirculating Pump

Image 19 – Mixing Valve

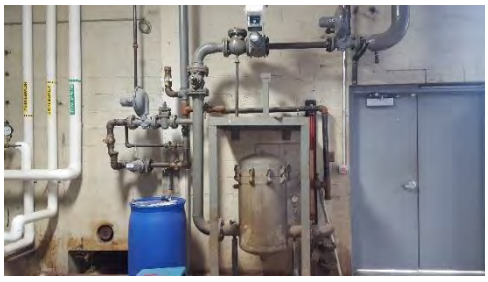


Image 20 – Gas Service & Meters

Image 18 – Gas Piping

Image 19 – Cast Iron Sanitary Piping

Image 20 – Cast Iron Rain Leader

FOODSERVICE EQUIPMENT ASSESSMENT

The McCarthy Middle School serves approximately 900 students in grades 5 through 8. The equipment here is in much better condition than what was observed at the Parker Middle School.

Image 1

The kitchen serves the school lunch program at two serving lines with two cashier terminals exiting at the center of the serving lines. As with the Parker there appears to be a separate third line dedicated to snacks. The serving line is rather simple and equipped with hot wells but no cold wells. It does have an outdated sneeze guard system. The serving lines' base cabinets are galvanized steel and appear to be holding up well. However, galvanized steel is no longer acceptable in a kitchen environment.

KITCHEN EQUIPMENT

The kitchens area is in very good condition. The floor, walls and ceilings are complaint with the health code. There is some wear and tear as expected, but nothing of major concern. Some equipment is newer and also in good condition but other equipment is older and in need of repair or is non-compliant with modern codes.

Image 2

Exhaust Hood Image 1 and 2:

- The hood is rather old and non-compliant with current standards. It is type II hood, meaning it is not designed to filter out grease-laden vapors. However, the range below the hood is capable of producing grease-laden vapors. Also note that there is no fire suppression system for surface protection for the range top. Also non-compliant.
- The hood hanging structure is visible. Modern hoods have the structure hidden above the ceiling and the construction of the hood is made so that it is easy to clean and provides adequate lighting at the cooking surfaces. This hood lacks those features and the low lighting levels are a code related deficiency.

Image 3

Steamer (Image 2):

- The pressure steamer shown here is no longer commonly used. It provides for fast cooking times however these types of steamers will often destroy the consistency of the food. Additionally, the high-pressure steam condition presents a hazard where steam burns are more likely.

Wood table (Image 4):

- Wood topped table can be seen in this image. Wood topped work surfaces are not allowed in a kitchen unless it is being used for scratch baking purposes. There is no scratch baking taking place in this kitchen.
- Image 5 is a close up of the table shown in Image 4. Mold can be seen growing between where the wood slats are glued together. This kitchen seems to mainly be a warming kitchen so the risk is low but all wood topped tables should be eliminated.

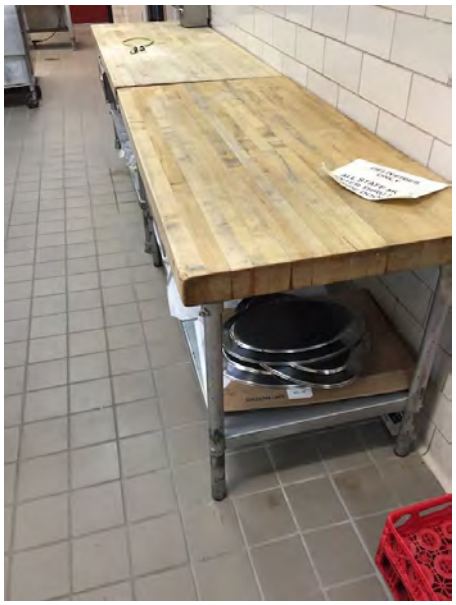


Image 4

Stainless steel table Image 5:

- This image is of the stainless steel table that has small buckets being used as the feet for this table to make it a suitable working height.

Image 4

Recommendations:

1. Eliminate all wood surfaces and replace with appropriate stainless steel tables.
2. Add appropriate mobile worktables to provide for additional flexible work surfaces.
3. Add hand sink to provide for hand washing stations.
4. Replace the antiquated cooking equipment and exhaust hood to better prepare and allow more cooking at this facility.
5. Supply a new hood and fire suppression system for code compliance and for tie in to the building fire alarm system.
6. A targeted refit of foodservice equipment for this kitchen is estimated to cost approximately $210,000.

UEC universal environmental consultants

March 11, 2016

Ms. Michele Rogers
Dore & Whittier Architects
260 Merrimac Street
Newburyport, MA 01950

Reference: Hazardous Materials Determination Survey
McCarthy Middle School, Chelmsford, MA

Dear Ms. Rogers:

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

Enclosed please find the report for limited hazardous materials determination survey at the McCarthy Middle School, Chelmsford, MA.

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

Very truly yours,

Universal Environmental Consultants

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Ammar M. Dieb
President

UEC:\216 071\McCarthy Middle School Report.DOC

Enclosure

REPORT
FOR
HAZARDOUS MATERIALS DETERMINATION
SURVEY
AT THE
MCCARTHY MIDDLE SCHOOL
CHELMSFORD, MASSACHUSETTS

PROJECT NO: 216 071.00

Survey Date:
March 4, 2016

SURVEY CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 BREWSTER ROAD
FRAMINGHAM, MA 01702

1.0 INTRODUCTION:

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

As part of the proposed renovation and demolition project, UEC was contracted by Dore & Whittier Architects to conduct the following services at the McCarthy Middle School, Chelmsford, MA:

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

Information included in this report was based on the AHERA Management Plans and on a determination inspection performed by UEC. Limited testing was performed as part of this study. It is recommended that once a detailed scope of work is identified for a renovation or a demolition project, a comprehensive Environmental Protection Agency (EPA) NESHAP inspection including asbestos testing for all suspect materials and testing for other hazardous materials including, Polychlorinated Biphenyls (PCB's) and Lead Based Paint (LBP) should be performed, which would provide a more accurate hazardous materials abatement costs and scope.

Additional testing and abatement plans for EPA review are required to be performed should PCB's be found in the caulking.

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

Refer to samples results.

2.0 FINDINGS:

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

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

Number of Samples Collected

Six (6) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material

1. Grey 9” x 9” vinyl floor tile at rear gymnasium
2. Tan 12” x 12” vinyl floor tile at custodian office
3. Wall plaster at custodian office
4. Duct joint tape cloth at rear gymnasium HVAC room
5. Vertical caulking in brick at hallway
6. Newer window framing caulking

Samples Results

Type and Location of Material	Sample Result
1. Grey 9” x 9” vinyl floor tile at rear gymnasium	2% Asbestos
2. Tan 12” x 12” vinyl floor tile at custodian office	2% Asbestos
3. Wall plaster at custodian office	No Asbestos Detected
4. Duct joint tape cloth at rear gymnasium HVAC room	No Asbestos Detected
5. Vertical caulking in brick at hallway	2% Asbestos
6. Newer window framing caulking	No Asbestos Detected

3.0 OBSERVATION AND COST ESTIMATES:

OBSERVATIONS:

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

1. Tan 12” x 12” vinyl floor tile and mastic were previously found to contain asbestos.
2. 9” x 9” Vinyl floor tile and mastic were found to contain asbestos. The ACM was found mostly under newer 12” x 12” vinyl floor tiles.
3. Yellow adhesive associated with cove base were either assumed or previously found to contain asbestos.
4. Interior vent caulking was previously found to contain asbestos.
5. Grey sink coating was previously found to contain asbestos.
6. Pipe and hard joint insulation was previously found to contain asbestos. The ACM was found throughout the building including crawl spaces.
7. Black ceiling mastic was previously found to contain asbestos. The ACM was found in the kitchen walk-in cooler.
8. Ceiling plaster at auditorium was previously found to contain asbestos.
9. Interior glazing caulking in doors was previously found to contain asbestos.
10. Vertical caulking was found to contain asbestos.
11. Exterior residual door framing caulking was previously found to contain asbestos.
12. Exterior expansion joint caulking was previously found to contain asbestos.
13. Exterior unit vent framing caulking was previously found to contain asbestos.
14. Exterior white window glazing caulking was previously found to contain asbestos.
15. Insulation inside boilers was assumed to contain asbestos.
16. Glue holding blackboard was assumed to contain asbestos.
17. All remaining suspect materials were found not to contain asbestos.
18. Underground sewer pipe was assumed to contain asbestos.
19. Damproofing on exterior and foundation walls was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal in an EPA approved landfill that does not recycle.

20. Roofing materials were 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.
21. Painted surfaces were assumed to be LBP. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations.
22. Visual inspection of various equipments such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's. Tubes, thermostats, exit signs and switches were assumed to contain mercury. It would be very costly to test those equipments and dismantling would be required to access. Therefore, the above mentioned equipments should be disposed in an EPA approved landfill.
23. Caulking materials were assumed to contain PCB's.

COST ESTIMATES:

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

Location	Material	Approximate Quantity	Cost Estimate ($)
Various Locations	Multiple Layers of Vinyl Floor Tile and Mastic	75,000 SF	375,000.00
	9" x 9" Vinyl Floor Tiles and Mastic	2,500 SF	10,000.00
	Pipe and Hard Joint Insulation	Unknown	25,000.00
	Cove Base Mastic	4,000 LF	20,000.00
	Door with Windows	25 Total	2,500.00
	Vent Caulking	240 LF	2,400.00
	Vertical Caulking	Unknown	50,000.00
	Sinks	85 Total	8,500.00
	Blackboards	Unknown	20,000.00
	Hidden ACM	Unknown	50,000.00
	Miscellaneous Hazardous Materials	Unknown	50,000.00
Kitchen	Mastic in Walk-In Cooler	150 SF	1,500.00
Custodian Office	Tan 12" x 12" Vinyl Floor Tile and Mastic	400 SF	2,000.00
Boiler Room	Boilers	3 Total	25,000.00
	Pipe and Hard Joint Insulation	Unknown	5,000.00
Crawl Spaces	Pipe and Hard Joint Insulation	Unknown	50,000.00
Auditorium	Ceiling Plaster	750 SF	15,000.00
Exterior	Door Framing Caulking	50 Total	5,000.00
	Expansion Joint Caulking	2,400 LF	24,000.00
	Unit Vent Grille Caulking	250 LF	2,500.00
	Window Glazing Caulking	200 LF	2,000.00
	Transite Sewer Pipes	Unknown[1]	50,000.00
	Roofing Materials	147,954 SF	147,954.00
	Damproofing on Exterior/Foundation Walls	Unknown[1]	275,000.00

Location	Material	Approximate Quantity	Cost Estimate ($)
PCB's Remediation[2]			75,000.00
Estimated costs for ACM Inspection and Testing Services			10,000.00
Estimated costs for PCB's Testing and Abatement Plans Services[2]			35,000.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			121,646.00
		Total:	**1,460,000.00**

[1]: Part of total demolition and Excavation.
[2]: Should results exceed EPA limit.

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

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

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

5.0 LIMITATIONS AND CONDITIONS:

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

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

Inspected By:

Jason Becotte
Asbestos Inspector (AI-034963)

		McCARTHY MIDDLE SCHOOL	Health, Safety & Welfare	Code Compliance	Functional Use of Building or Site	Handicap Accessibility	Extending the Life of the Building (Maintenance)	Energy Efficiency / Energy, Water Saving	Hazardous Material Abatement	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
		185,614 GSF													
1	**Site & Civil**														
	1.01	Mill and overlay sections of pavement where cracking/ degradation has occurred.			x		x			$30,360					completed
	1.02	Regrade paved areas to prevent ponding which can lead to ice patches in the cold weather	x				x			$22,770					completed
	1.03	Replace areas of asphalt curb that have been damaged.					x			$1,139		$1,139			
	1.04	Reset vertical granite curb as needed.					x			$6,072		$6,072			
	1.05	Ensure walkways and courtyard areas are ADA accessible.		x		x	x			$15,180			$15,180		
		TOTAL									$0	$7,211	$15,180	$0	**$22,391**
2	**Structural Elements**														
	2.01														
		TOTAL									$0	$0	$0	$0	$0
3	**Exterior Architectural Elements**														
	3.01	Repair damaged foundation walls					x			$15,180				$15,180	
	3.02	Verify proper weeping in brick walls - investigate causes of eflorecence			x		x			$7,590				$7,590	
	3.03	Install proper gutters and downspouts			x		x			$22,588	$22,588				Note locations of repairs
	3.04	Repair precast window sills and retool mortar					x			$159,390		$159,390			
	3.05	Remove existing existing window film in gym - install new film			x					$43,263		$43,263			Note loctions for repairs
	3.06	Repair mortar around brick louver sills					x			$15,180	$15,180				
	3.07	Replace the kal wall in the gym					x	x		$469,973	$469,973				
		TOTAL									$507,741	$202,653	$0	$22,770	$733,164

4	**Interior Architectural Elements**														
	4.01	Renovate classroom entryways to meet push / pull clearances				x				$273,240			$273,240		
	4.02	Replace handrails that do not meet accessibility requirements								$37,950		$37,950			
	4.03	Replace non-accessible drinking fountains								$30,360	x			$30,360	
	4.04	Provide lift or ramp to the control booth in the auditorium or relocate controls to provide accessibility								$60,720			$60,720		
	4.05	Replace gym floor								$485,305	$485,305				second gym only
	4.06	Replace VCT flooring where patches have made - correct under slab conditions								$22,770	x			$22,770	
	4.07	Resolve flooring transitions where wood platform has been installed								$30,740			$30,740		
	4.08	Repair toilet room flooring								$69,449		$69,449			
	4.09	Replace library carpet								$79,923			$79,923		
	4.10	Replace quarry tile								$84,856		$84,856			
	4.11	Repair cracks in CMU block walls - investigate cause								$7,590	$7,590				
	4.12	Investigate locations where ceiling tiles are stained - replace tiles - repair leaks								$1,518	x			$1,518	
	4.13	Remove doors and sidelights with wire glass - replace								$75,900				$75,900	
	4.14	Replace non compliant toilet fixtures and accessories								$113,850	x			$113,850	
	4.15	Replace locker room benches with accessible benches								$6,831	x			$6,831	
	4.16	Provide accessible lockers in locker room and corridors								$7,590	x			$7,590	
	4.17	Replace non-compliant door hardware								$45,540	$45,540				
	4.18	Renovate non accessible single user toilet rooms to be compliant								$425,040	$425,040				
	4.19	Renovate sinks and cabinets in classrooms - provide accessibility								$1,024,650	$1,024,650				
		TOTAL									$1,988,125	$192,255	$444,622	$258,819	$2,883,821

5	**Mechanical - HVAC**														
	5.01	Consider replacing all cooling equipment that utilizes R-22 refrigerant.					x			$98,670				$98,670	
	5.02	Reinsulate exposed rooftop refrigerant piping serving condensing units. Wrap closed cell insulation with a UV light rated jacket.					x			$3,036				$3,036	
	5.03	Install motorized isolation valves at each boiler to close when that boiler is idle.					x	x		$15,180				$15,180	
	5.04	Investigate why pumps are not modulating down at warmer outdoor temperatures.					x	x		$1,518				$1,518	
	5.05	Install ventilation in the electric room.	x		x					$7,590			$7,590		
	5.06	Install a variable speed demand control kitchen hood control system. This system monitors the heat and smoke given off by cooking processes and adjusts hood airflow to compensate. When little cooking is taking place, the hood runs at reduced airflow, saving energy.						x		$15,180		$15,180			
	5.07	Continue to provide routine maintenance on all the unit ventilators such as motor and shaft lubrication, filter changes and coil cleaning.					x			$22,770				$22,770	
	5.08	Add unit ventilators to small classrooms with high occupancy loads to improve ventilation levels.	x							$60,720	$60,720				
	5.09	Reinstall moisture elimination screen on RTU.					x			$2,277				$2,277	
	5.10	Tighten filter access door on RTU.					x			$531				$531	
	5.11	Provide routine maintenance on all exhaust fans such as replacing belts and lubricating their motors and shafts. Replace fans as necessary.					x			$27,324				$27,324	
	5.12	Provide routine maintenance on all unit heaters, such as motor and shaft lubrication, filter replacement and coil cleaning.					x			$7,590				$7,590	
	5.13	Replace portable classroom units with a permanent, well insulated addition to the building, heated by the buildings efficient gas-fired hot water heating system.			x			x		$30,360			$30,360		
	5.14	Replace rooftop units on portable classrooms with heat pump style rooftop units to minimize electric heating by capturing heat from the surrounding air.						x		$37,950			$37,950		
	5.15	Reinstall moisture elimination screen in outside air hood of library RTU.					x			$2,277				$2,277	
	5.16	Tighten handle on the access door at the library RTU filter section.					x			$531				$531	
	5.17	Investigate why the building heating pumps are not modulating down in moderate weather.					x	x		$3,795				$3,795	
	5.18	Add motorized valves to each boiler to prevent the dilution of supply water temperature due to circulation through idle boilers. The energy savings from the efficiency of higher supply water temperatures will result in short payback.						x		$30,360				$30,360	
	5.19	Insulate refrigerant lines on roof that have deteriorated/missing insulation. The energy savings will result in short payback.						x		$3,036				$3,036	
		TOTAL									$60,720	$15,180	$75,900	$218,896	$370,696

6	**Electrical**														
	6.01	Provide new pad mounted transformer to replace existing vault transformer.					x			$121,440			$121,440		vault replacement may not be school responsibility
	6.02	The original FPE switchgear is in poor condition, generally full and should be replaced. The existing feeders and branch circuits would be refed from the new switchgear.					x			$121,440			$121,440		
	6.03	Replace lighting under a renovation program with LED sources with automatic dimming in spaces with daylight contribution.						x		$1,831,453			$1,831,453		
	6.04	Provide an automated lighting control system.						x		$422,643			$422,643		
	6.05	Replace building mounted HID and compact fluorescent sconces with LED fixtures of the cut-off type.						x		$34,155			$34,155		
	6.06	Provide uniformed pole mounted LED fixtures of the cut-off type for parking areas.						x		$18,975					completed
	6.07	Upgrade existing emergency lighting, panels and feeders to comply with code. Provide dedicated emergency closets with 2-hour rating to house new panels.		x						$563,524			$563,524		
	6.08	Replace fire alarm control panel with new FCI E3 which is backwards compatible with the existing devices.			x					$30,360					completed
	6.09	Replace horns with speakers for general voice evacuation under a renovation. This will require new twisted pair speaker wiring.		x						$281,762					completed
	6.10	Install lightning protection system.	x							$140,881					existing
	6.11	Install GFI protected receptacles in the kitchen.	x							$4,175					located at panel
	6.12	Add receptacles to kitchen.	x							$1,708	$1,708				
	6.13	Install a bi-directional antenna system to enhance communications with portable radios used by First Responders.	x		x					$75,900			$75,900		
		TOTAL									$1,708	$0	$3,170,556	$0	$3,172,263
7	**Plumbing**														
	7.01	Confirm by video inspection of existing drains to confirm integrity and correct pipe invert.			x					$3,036				$3,036	
	7.02	Provide new high-efficiency gas-fired domestic water heater once the existing water heater has expired.						x		$37,950					existing
	7.03	Install new mixing valve.			x					$8,349				$8,349	
	7.04	Inspect hot water expansion tank for corroded fitting and leaks.					x			$1,518				$1,518	
	7.05	Provide reduced pressure backflow preventers at Janitor's closet soap dispenser.					x			$7,590					completed
	7.06	Paint gas piping exposed to exterior.					x			$3,795				$3,795	
		TOTAL									$0	$0	$0	$16,698	$16,698
8	**Fire Protection**														
	8.01	Install Sprinklers throughout the facility	x	x	x					$1,837,579			$1,837,579		
	8.02														
		TOTAL									$0	$0	$1,837,579	$0	$1,837,579

9	**Hazardous Material**															
	9.01	Tan 12" x 12" vinyl floor tile and mastic were previously found to contain asbestos.							x							
	9.02	Remove and replace 9" x 9" Vinyl floor tile and mastic that were found to contain asbestos. The ACM was found mostly under newer 12" x 12" vinyl floor tiles.							x							
	9.03	Remove and replace yellow adhesive at cove base that is assumed or previously found to contain asbestos.							x							
	9.04	Remove and replace interior vent caulking that was previously found to contain asbestos.							x							
	9.05	Remove and replace grey sink coating that was previously found to contain asbestos.							x							
	9.06	Remove and replace pipe and hard joint insulation that was previously found to contain asbestos. The asbestos containing material was found throughout the building, including in crawl spaces.							x							
	9.07	Remove and replace black ceiling mastic that was previously found to contain asbestos. The asbestos containing material was found in the kitchen walk-in cooler.							x							
	9.08	Remove and replace the ceiling plaster at the auditorium that was previously found to contain asbestos.							x							
	9.09	Remove and replace interior glazing caulking in doors that was previously found to contain asbestos.							x							
	9.10	Remove and replace vertical caulking that was previously found to contain asbestos.							x							
	9.11	Remove and replace exterior door caulking that was previously found to contain asbestos.							x							
	9.12	Remove and replace exterior expansion joint caulking that was previously found to contain asbestos.							x							
	9.13	Remove and replace exterior unit vent framing caulking that was previously found to contain asbestos.							x							
	9.14	Remove and replace exterior white window glazing caulking that was previously found to contain asbestos.							x							
	9.15	Remove and replace insulation inside boilers that was assumed to contain asbestos.							x							
	9.16	Remove and replace glue holding blackboard that was assumed to contain asbestos.							x							
	9.17	Remove and replace underground sewer pipe that was assumed to contain asbestos.							x							
	9.18	Remove and replace damproofing on exterior and foundation walls that was assumed to contain asbestos.							x							
	9.19	Remove and replace roofing materials that was assumed to contain asbestos.							x							
	9.20	Remove and repaint surfaces that are assumed to be lead based paint.							x							
	9.21	Replace various equipment such as tubes, thermostats, exit signs and switches that were assumed to contain mercury.							x							Haz/Mat includes cost associated with complete renovation or demolition; additional costs are included should results exceed EPA limits
	9.22	Remove and replace caulking materials were assumed to contain PCBs.							x							
		HAZMAT ALLOWANCE								**$1,752,000**			$1,752,000			

GENERAL NOTES

1. Refer to each section of the Report for more detailed information. Before moving forward with a specific project, a detailed review of the scope of work and a re-assessment of the cost estimate for that scope should be performed.

2. Some items should be completed in combination with other items. Some of these suggestions may be noted above. We recommend that once a scope of work is desired to be pursued, a mini-study should be done to confirm which work should be done together. See the next general note below for additional information.

3. Due to the conceptual nature of these recommendations and estimates and the complexity of existing conditions, several solutions may be provided to achieve the end result. Existing conditions in some areas may limit the ability to fully implement the proposed scope of work. Part or all of this work may trigger other renovation requirements related to code, seismic, sprinklers or handicap accessibility. Once a determination is made to move forward