Specific Issues	*Recommendations*
Many ground-level egress doors to the outside discharge onto an elevated concrete landing pads. In general where public means of egress are provided, they must be made accessible. (Figure 1).	Completely replace pads at exit doors and either provide ramps or sloped walks in lieu of stairs; or raise grade flush with exit pad. Provide the least-cost alternative that maximizes utility of space around the school. (Qty: aprox. 7)
Exterior drinking fountain is not accessible, and not on a stable accessible route. (Figure 2).	Provide accessible drinking fountain along a stable walkway surface. (Qty: 1)
Many doorways in the building do not comply with some aspect (or multiple aspects) of rules for clear maneuvering space in front of the door. Often the issue is inadequate pull-side clearance on the latch side of the door of 18" minimum. Toilet room doors are the prime offenders of this kind. At many locations where pull-side clearances are not met, door actuators have been installed. (Figure 3-4).	A variance could be sought, in order to avoid disruption of adjacent spaces to doorways. If a variance is not sought or is rejected, space adjacent to doorway must be made by demolition of impeding wall or fixture, or door must be moved. (Qty: approx. 10 locations)
Stairways provide the required handrail extensions at the top and bottom of the stair flights. Stairways do not include compliant guardrails or continuous inner rail with no interruption, as required by the Building Code. Required safety stripes are not installed at the top and bottom of each run. (Figure 5)	Install new compliant handrails and guards at all stairs. Install safety stripes at the top and bottom of each stair run.
At both girl's and boy's locker rooms no accessible shower is provided. Provided showers are generally non-compliant for various reasons. Grab bars are not provided, the required clear floor space in front of the showers are not provided, showers seats are not provided, and controls were non-compliant and do not include a hand-held shower spray unit. (Figure 6).	Provide accessible shower stalls at girl's and boy's locker rooms. (Qty: approx. 4)
Many casework cabinets were modified or added to be made accessible in 2006 upgrades, many sink bases in classrooms still lack the required knee clearance for a front approach with a wheelchair. It appears at least 5% or min. of 1 sink is accessible in each classroom or laboratory where they are provided. (Figure 7).	No action required.

Figure 7—Access. sink base at laboratory classroom

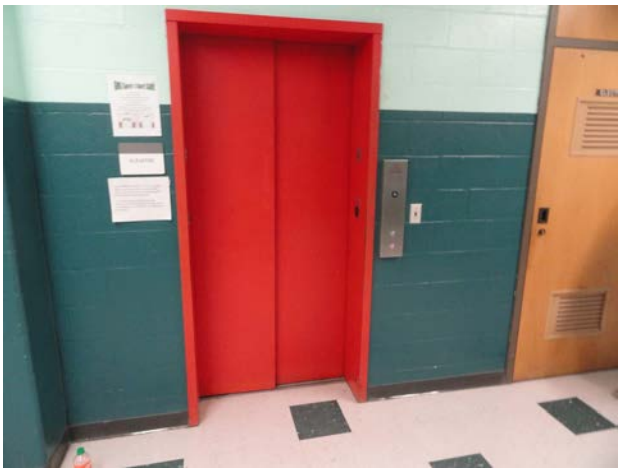

Figure 8—Elevator

Figure 9—Non-accessible drinking fountain

Figure 10—Lever type accessible door hardware

Figure 11—Typical room signage

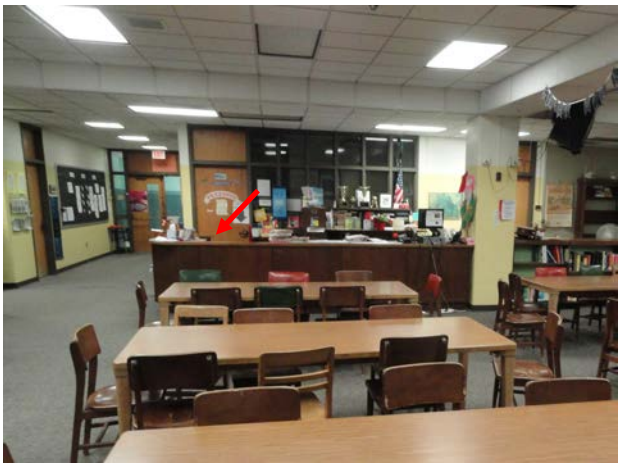

Figure 12—Library transaction counter

Specific Issues	*Recommendations*
Elevator appears to be compliant in its cab dimensions (including controls and markings) based upon MAAB exceptions put forth for existing elevator configurations. (Figure 8).	No action required
According to the building custodial manager, all but 6 drinking fountains have been upgraded to compliant models. (Figure 9).	Replace non compliant drinking fountains with new accessible fountains. (Qty: approx. 6)
Door hardware appears to have been updated in full to compliant lever hardware. (Figure 10).	No action required.
Accessible room identification signage appears to be provided throughout the school. (Figure 11).	No action required.
The library check out desk does not provide an accessible transaction counter. (Figure 12).	Provide accessible transaction counter. (Qty: 1)
Cafeteria stage 2006 upgrades included a lift, and new compliant handrails.	No action required.

Figure 13—Lift at cafeteria stage

CIVIL ENGINEERING ASSESSMENT

GENERAL SITE DESCRIPTION

Nitsch Engineering has performed research of the existing site conditions at the Galvin Middle School located at 55 Pecunit Street in Canton, Massachusetts. Nitsch Engineering used Canton GIS and design drawings provided by the owner. Nitsch Engineering gathered information during a site visit conducted by Madeline DeClerck, EIT on Wednesday, November 16, 2016.

The Site is bounded by Pecunit Street to the southwest, Raven Road to the northwest, the Lt Peter M Hansen School to the southeast and wetlands/woods to the northeast. There are two paved asphalt entrances to the site along Pecunit Street. Parking was observed to be 90 percent full during the time of the site visit (2pm) however, multiple cars were in line for student pick up. There was no indication that this pattern of traffic was obstructive to the overall traffic flow for drop off or pick up times. The Bus pick up zone was separated from the other vehicles on the site.

SOILS

Soils on site consist of Urban Land 0 to 15 percent slopes (building, roller rink, baseball field) and Udorthents, sandy soils on the athletic field (soccer field).

PAVEMENT/CURBING

Specific Issues	*Recommendations*
The asphalt pavement within the site is in generally fair condition with some areas of cracking and degradation (Image 1). The asphalt pavement and curbing of the northwest driveway and parking lot were in poor condition (Image 2 and 3).	The pavement at the northwest driveway and parking lot should be milled and overlaid as soon as possible. The remaining paved areas on site were in sufficient condition for current needs. However, crack sealing of the remaining paved areas should occur within the next 5 years and a mill and overlay within the next 15 years.
There is some vertical granite curb and concrete curb onsite. The condition of the curb varies throughout the site. Some curb is in good condition and some is in poor condition and has been degraded (Image 3).	Replace sections of curb that are degrading, first replacing the curbing along the northwest driveway. Reset curb at the bus loop where the curb has collapsed and there is a lip where the sidewalk meets the curb causing a hazard for students boarding the busses.
There are no signs at the second driveway entrance to Galvin Middle School and the existing signs at the main entrance are aged and in need of replacing.	It is recommended that the main sign for the Middle School is replaced and increased in size. Signage should be added to direct traffic to the specific services on site and indicate the main entrance of the school. Signage should be also be added to the second entrance on Pecunit Street to direct traffic appropriately.

Image 1

Image 2

Image 3

ACCESSIBILITY (ADA) COMPLIANCE

Specific Issues	*Recommendations*
Non-ADA compliant area drain covers in walkways/ pavement (Image 2).	Replace all non-ADA compliant area drains with ADA grates.
An accessible route was indicated from the parking lot off of Pecunit Street to the upper entrance of the campus near the bus drop off location (Image 1). This route does not appear to meet accessibility cross slope and longitudinal slope requirements.	Handicap van accessible space are provided in the bus loop and can be accessed off of the second entrance to the school off of Pecunit Street. This should be considered the accessible route to the main entrance and signs should be provided to indicate this.

STORMWATER

Based on site observations and the Canton Stormwater Base Map prepared by Kleinfelder, dated June 2013, the stormwater on site is collected in a series of catch basins and discharges to an MS4 outfall to the north of the site. This outfall is hydrologically connected to Ponkapoag Brook. Nitsch Engineering's site visit occurred after a 24-hour 1/2 inch storm the previous day. There were occurrence of standing water at the northwest parking lot after the storm.

No infiltration/detention system was observed or indicated on the design plans. The site does not likely meet the current Massachusetts DEP Stormwater Standards. Future development or upgrades to the high school site will likely require conformance to the Massachusetts DEP Stormwater Standards with the implementation of stormwater detention and/or water quality treatment. Town of Canton storm-water standards that exceed Mass DEP standards will also need to be met.

Specific Issues	*Recommendations*
The site stormwater is collected in a closed drainage system. This includes catch basins, drain manholes, underground piping, and infiltration system. Water quality units were not observed on site. Catch basins should be cleaned and maintained to perform properly and maintain the water quality of the stormwater discharged to the municipal drainage system (Images 2-4).	All catch basins should be cleaned and inspected at least four (4) times per year. The infiltration system should be inspected annually and sediment should be removed as necessary or as recommended by the manufacturer.

Image 1

Image 2

Image 3

Image 4

SANITARY SEWER

Specific Issues	*Recommendations*
The sanitary sewer pipe on the site is assumed to be original to the building which was constructed in 1971.	We recommend a video inspection of the sanitary sewer service in the next five (5) years to determine the condition of the pipes. Replace any damaged or collapsed section of pipe immediately.
The sanitary sewer structure in the northeast corner of the athletics fields is exposed and approximately 8-10 inches above the ground elevation (Image 1).	If feasible, we recommend lowering the frame and grate of this sewer manhole to be flush with finish grade.

WATER

Based on site observations, water services enters the building from a water main on Pecunit Street and enters the building at the southeast facing wall. Fire hydrants were observed along the driveway of the site.

Specific Issues	*Recommendations*
Fire hydrants should be maintained and tested to ensure they are working properly.	We recommend flushing of the hydrants on a regular basis.

GAS

The gas meter was observed on site on the southeast facing wall and it is assumed that the gas services enters the same wall from a gas main in Pecunit Street.

Image 1

STRUCTURAL ASSESSMENT

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 visit on November 15, 2016. During the visit, we did not remove any finishes or take measurements; so, our understanding of the structure is limited. Drawings for the existing structure were not available at the time this report was written.

EXISTING CONDITIONS

The William H. Galvin Middle School is essentially a three story academic structure with a Gymnasium, Library and Cafetorium. The original school was constructed in 1971 with renovations completed in 2002. The structure is performing well for the most part. The majority of the structure consists of two-way cast in place concrete slabs spanning between square cast in place concrete columns. The gymnasium roof construction consists of a metal roof deck on long span metal joists spanning between steel girders and steel columns. Various expansion joints separate the building into multiple structures.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

UPPER FLOORS AND ROOFS

We observed interior masonry walls and noted some separation at various joints, especially outside classroom 313. Similarly, we observed hairline cracks through the floor finishes in various locations.

We observed various expansion joints throughout the structure that appeared to be performing well.

On the roof, we observed roof drains and did not note any major debris or clogs. Solar panels cover approximately 75% of the roof area. We noted various small roof membrane patches. A red brick chimney projects above the high roof. Roof ladders exhibited surface rusting.

Specific Issues	*Recommendations*
We observed interior masonry walls in the boiler room and noted several wall-to-structure clips.	When a future renovation is planned, we would recommend identifying all structural masonry walls and installing seismic clips to brace the tops of all the masonry walls.
We observed metal grate stairs in the boiler room and perceived rattling in the grating	We would recommend adding reinforcing welds to the grating on the boiler room stairs.
Masonry block popup roof structures were observed with light rust staining on the façade emanating from surface-mounted metal structures which exhibited moderate surface rusting.	We would recommend removing loose material with a wire brush and painting the steel to prolong the serviceable life of the miscellaneous steel elements.

FOUNDATIONS AND FIRST FLOOR

We observed the outside face of the foundation wall and noted that the foundation consists of cast in place concrete, rising approximately 8 inches above grade.

EXTERIOR

We observed control joints in the red brick façade and noted that the joint material was in fair condition.

Specific Issues	*Recommendations*
We observed steel lintels in the masonry façade and noted signs of rusting. We observed metal railings at the loading dock and noted moderate to heavy deterioration to the bases of the railing posts.	We would recommend routine maintenance which would include cleaning the lintels and metal posts with a wire brush and painting to prolong the life of the lintels and railing posts.
We observed the red brick masonry exterior façade and noted light cracking in various locations and minor movement along flashing lines at the low roof.	We would recommend performing routine maintenance which would include sealing cracks to resist water infiltration. We would recommend repointing at open joints.
We observed cast in place concrete at the loading dock and noted moderate cracking and spalling.	Repair cracks and spalls in the loading dock, which includes removing loose material and sealing the cracks.

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

ARCHITECTURAL ASSESSMENT

TERMINOLOGY

Building Condition scale of terms used throughout this report are as follows:

"Excellent": new or nearly new condition with few or no blemishes or compromises of quality or function.

"Very Good": highly functional condition with slight wear and tear and/or minor compromises of quality or function.

"Good": median functional condition with noticeable wear and tear and/or compromises of quality or function.

"Fair": below median functional condition with significant wear and tear and/or major compromises of quality or function. Seriously worn parts or elements, minor structural compromise. Possible near-future safety hazard.

"Poor": nearly– or completely non-functional condition with major wear and tear and/or serious compromises of quality or usability. Missing parts or elements, major structural damage or condition. Immediate safety hazard or danger.

EXTERIOR

FOUNDATION

Foundations are cast-in-place (CIP) concrete, typically not visible above grade, except at the south-west elevation where site slopes and are exposed 12" to 15' above grade.

Specific Issues	*Recommendations*
Visible portions of foundations are generally in good to fair condition with few, minor cracks. Exposed areas on the south-west elevations show signs of surface "map cracking" due to moisture and shrinkage. (Figures 1-2).	Repair any cracks in foundation larger than hairline with sealant or by parging; method to be determined by an experienced subcontractor. Although not an immediate structural concern, if left unaddressed, concrete could start spalling off the face of the rebar in areas showing signs of "map cracking." (Qty: approx. 50 LF)
At the front (south-east) corner it appears the foundation and masonry have encountered impact damage. (Figures 3).	Repair cracks with sealant or by parging; method to be determined by an experienced subcontractor.
Minor deterioration is occurring at the top of foundation walls in some areas. (Figure 4)	Monitor areas showing deterioration, for worsening condition.
The loading dock landing on the rear (north-east) elevation has some cracking, and deterioration at corner. (Figure 5).	Remove spalled and loose concrete back to solid mass, drill and set tie pins to anchor new concrete, and form and repair edge to align with adjacent landing. Install rubber dock bumpers for future protection.
Concrete spalling can be seen at some foundation locations. (Figure 6).	Remove spalled and loose concrete back to solid mass, repair areas with sealant or parging; method to be determined by an experienced subcontractor. (Qty: approx. 100 SF)

Figure 1—Minor cracking at west side foundation

Figure 2—"Map cracking" at foundation

Figure 3—Impact damage to brick and foundation

Figure 4— Deterioration at top of foundation wall

Figure 5—Loading dock landing cracking and damage

Figure 6— Minor spalling

WALLS

The building was constructed in 1971. Typical wall construction consists of a running bond brick veneer, 1" air space, and a 1/2" parging on CMU backup, as referenced in the original record drawings. The brick is generally in good to very good conditions, except for areas on the back (north) elevation where there are moisture problems, as noted below. Some sections at rear (north-west) elevations have been repointed. Bands of precast concrete panels run horizontally at each level, and are typically in good to very good condition. There were no widespread issues with flashings or weeps.

Specific Issues	*Recommendations*
Brick and precast concrete panel, expansion joint sealants have failed in multiple areas and are protruding from their joints. (Figure 7)	Remove damaged/failed sealant and replace with new backer rod and sealant joints. (Qty. approx. 100 LF)
Front (south-east) corner it appears the foundation and masonry have encountered impact damage. (Figure 8).	Remove and replace damaged masonry from attic stock. Repoint and otherwise repair mortar joints damaged/involved in this area.
Pipe penetration at rear (north) elevation is leaking . (Figure 9).	Remove loose concrete around penetration where spalling and reparge.
Steel loose lintels in some locations have rusted and expanded. Sealant below lintel appears to have failed. (Figure 10).	Clean and coat exposed steel loose lintels and repair cracked mortar joints. Remove damaged/failed sealant and replace with new backer rod and sealant joints. (Qty: approx. 40 LF)
Brick joints at rowlock sills at north elevations have failed at multiple locations. Moisture has infiltrated below sill. (Figure 11-12).	Minimally joints should be cleaned and repointed in the near future. If problem continues, a drip cut and extension of the brick sill could be required. (Qty: approx. 50 window locations)

Figure 7—Expansion joint failure

Figure 8– Impact damage to brick and foundation

Figure 9—Efflorescence at CMU veneer

Figure 10– Loose lintel corrosion and sealant failure

Figure 11—Failed joints at rowlock sill

Figure 12—Failed joints at rowlock sill

WALLS (CONTINUED)

Specific Issues	*Recommendations*
Moisture damage and some type of fungal growth on the face of the brick veneer can be seen at north elevations. (Figure 13-14).	Use a weak cleaning solution compatible with brick veneer to remove staining. (Qty: approx. 1000 SF)
Precast concrete panel at rear elevation (north-west) corner has cracked at miter joint. (Figure 15).	Seal miter joint and fill adjacent cracked areas with cementitious crack filler.
Exterior electrical outlet at rear (north-west) entrance is uncovered and exposed to the elements. (Figure 16).	Install weatherproof non-metallic cover at all exposed electrical receptacles. (approx. 3 receptacles)
Kitchen loading dock at rear (north-west) elevation has brick damage above the steel lintel at the left-hand side. (Figure 17).	Remove and replace damaged masonry from attic stock. Repoint and otherwise repair mortar joints damaged/involved in this area.
Precast concrete panels are stained at library entrance. It appears water has gotten under the roof fascia and run down the face of the CIP concrete panels. (Figure 18).	At the next re-roofing remove fascia and reinstall new fascia over membrane roof with a 1” minimum overhang and drip edge detail. Minimize the number of joints to minimize water runoff. Use a weak cleaning solution compatible with cast in place concrete to remove staining. (Qty: approx. 500 SF)

Figure 13—Fungal growth on face of brick

Figure 14– Fungal growth on brick joints

Figure 15– Cracking at corner of precast panel

Figure 16—Exposed exterior electrical outlet

Figure 17—Damaged brick above lintel at loading dock

Figure 18—Exposed exterior electrical outlet

WINDOWS AND CURTAIN WALL

According to the 2013 window and door replacement record drawings, nearly the entire complement of windows in the existing building were replaced with what appear to be heavy commercial thermally broken aluminum windows and storefront with 1" insulated glazing, and 1" insulated spandrel glass.

Generally windows are in excellent to very condition and operating sash appear to work properly and seal well; curtain wall is in excellent to very good condition.

Specific Issues	*Recommendations*
Windows installed in punched openings in the '71 construction appear to be performing well; however water staining due to sill runoff, are noted around many openings. Refer to "WALLS" section for brick rowlock sill issues. (Figure 19).	Refer to "WALLS" section for brick rowlock sill recommendations. Perform regular window maintenance and periodic adjustment to maintain good working order.
Window and standup A/C units are installed in multiple locations. Air leakage is an issue with both installation conditions, and will effect interior thermal environment. (Figures 21-22). According the facilities manager an integrated A/C system has been installed in the administrative suite, and 3rd floor interior classrooms.	If thermal comfort becomes a problem install an integrated A/C system throughout school.

EXTERIOR DOORS

According to the 2013 window and door replacement record drawings, nearly the entire complement of exterior doors in the existing building were replaced, with new Fiberglass Reinforced Polyester (FRP) doors and aluminum doors with glazing at storefront systems.

Generally exterior doors' are in excellent to very good condition.

Specific Issues	*Recommendations*
Door at loading dock on rear (north-west) elevation appears to have original frame with minimal rust. (Figure 23).	Monitor condition of door frame, if conditions worsen replace existing with new hollow metal frame.

Figure 19—2013 windows installed in '71 openings

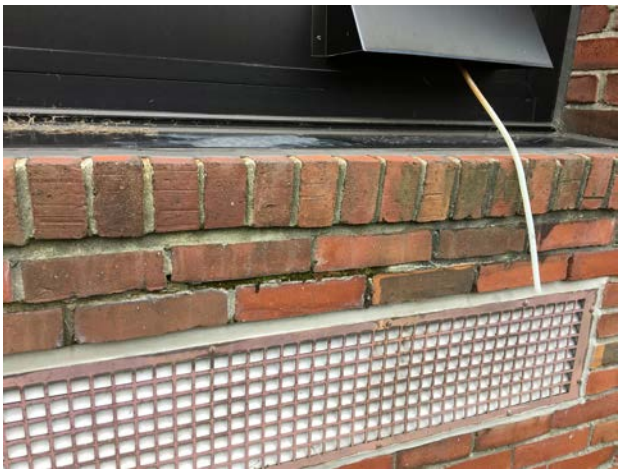

Figure 21—Stand up A/C unit exhaust

Figure 22—Window A/C unit installation

Figure 23—Loading dock door with original frame.

LOUVERS AND OTHER OPENINGS

Louvers on this building are typically smaller grille-type louvers, for the unit ventilators at classrooms. Intake/ exhaust louvers made up of blades within a frame can be found near kitchen and mechanical room areas.

Generally louvers and grilles' condition varies widely, from good to fair, though most appear to be functioning reasonably well. New sealant has been installed at several grill-type louvers (Figure 26), but existing failing sealant still remains in some areas.

Specific Issues	*Recommendations*
Paint finish is failing on grill-type louvers in most locations, many of which also have failed sealant. It appears the sealant has been replaced in some grill-type louvers already. (Figures 24-25).	Remove original finish, and repaint. Pull out failed sealant and install new sealant joints. (Qty: approx. 50 louvers)
Failed sealant joints at blade type louvers. (Figure 26).	Pull out failed sealant and install new sealant joints (Qty: approx. 3 louvers)

Figure 24—Typical unit vent louver

Figure 25—Typical re-sealed unit vent louver

Figure 26—Blade-type louver at mechanical room

ROOF

The 1971 original roof system was a built up roof on a 4" concrete slab. The entire roof, minus the gymnasium, was replaced in full with a Sarnafil white PVC, fully adhered membrane roof, installed 1997. According to the roofing survey by Russo-Barr Associates (2013), the roof is 16 years old, out of warranty, and projected for replacement in 2022. The gymnasium roof was replaced with a Sarnafil white PVC, fully adhered membrane roof, in 2008. The roof is warranted until 2028 (20 years). The modular classrooms have a black EPDM roof, 15 years old, with no warranty in place, projected for replacement in 2018.

A ballasted photovoltaic (PV) solar panel system was installed +/- 5 years ago, on the majority of the roofs, with the exceptions of the low roof adjacent to the gym. Condition of roof at areas where PV panels have been installed is fair to poor. Low roof adjacent to gym is in good condition, although leaking still appears to be a problem in this area.

Specific Issues	*Recommendations*
Significant ponding is occurring at areas around PV panels. (Figures 27-29) . Roof with same construction type, with no PV panels, shows no sign of ponding (Figure 30). It appears the ballasted PV system is interfering with the drainage of the roof system.	Install new roof with tapered insulation to roof drains and scuppers. A taller, ballasted rack-mounted PV system is recommended to avoid interference with the roof drainage system. The roof slab and structural framing should be evaluated to verify there is enough load capacity to support the system's weight and any loads associated with wind uplift . (Qty: approx. 55,000 SF)

Figure 27—Ponding at EPDM roof

Figure 28—Ponding at EPDM roof

Figure 29—Ponding at EPDM roof

Figure 30—Low roof adjacent to gymnasium

INTERIOR

FLOORING

Flooring material in the school consists of original 9" x 9" vinyl asbestos tile (VAT), which has been replaced in some heavy traffic areas and classrooms with 12" x 12" VCT, broadloom carpet in a small number of classrooms and the library, painted concrete in maintenance areas, quarry tile in kitchen and associated spaces, and ceramic tile in restrooms.

Condition of most VCT is good to very good, original VAT is generally in fair, ceramic tile is good to fair, but carpeting and painted concrete condition ranges from poor to fair at best.

Specific Issues	*Recommendations*
Painted concrete floor finish in the fitness and technology rooms are heavily worn and are in fair to poor condition. (Figure 31).	Remove original paint, fill holes and cracks as necessary and top with high-performance concrete sealer. (Qty: approx. 3,000 SF)
South-east stair VCT at landing has cracked and been displaced. (Figure 32).	Replace VCT at stair landing. (Qty: approx. 10 SF)
Ceramic tile flooring has failed at showers in the boy's locker room, and floors have been patched where existing partitions have been removed. (Figure 33).	
Floor drain at boy's first floor restroom, adjacent to the technology classroom, appears to be settling and is causing cracking in the ceramic tile floor. (Figure 34).	Remove floor finish, re-level floor drain and associated plumbing . Under-slab work will likely require a new floor finish throughout the restroom.
Original VAT is generally in fair condition, but are a bit dingy. (Figure 35).	Deep clean tile floors . If a new floor is installed, asbestos tile must be abated or encapsulated due to hazardous nature of the original material. Refer to haz-mat report for additional information. (Qty: approx. 13,000 SF)
Classrooms and support spaces with updated VCT flooring are generally in good to very good condition. (Figure 36).	Deep clean tile floors as needed. (Qty: approx. 20,000 SF)

Figure 31—Tech room concrete floor heavily worn

Figure 32—Stair floor tile cracking and displacement

Figure 33—Boys locker room patching and failing tile floor finish

Figure 34—Settling around floor drain

Figure 35—Work room original floor tile

Figure 36—Updated VCT tile at classroom

INTERIOR

FLOORING (CONTINUED)

Specific Issues	*Recommendations*
Flooring at the lobby and most corridors has been replaced with VCT tile and shows sign of wear but is in good to very good condition. (Figure 37).	Deep clean tile floors. (Qty: approx. 20,000 SF)
Metal stair nosing and risers are beginning to rust in some areas. (Figure 38).	Clean and recoat exposed metal nosing and risers. Generally at all stairs safety stripes should be installed at the top and bottom of each run. (Qty: approx. 1,500 LF)
Carpet in the classrooms and library appears to be in fair to poor condition, and is seeing wear at high-traffic spots such as doorways, and has some stains and runs. Carpet in library is buckling in some locations. (Figure 39).	Replace carpeted areas, with new VCT or linoleum flooring. (Qty: approx. 15,000 SF)
Cafeteria original VAT flooring appears to be in good to fair condition, showing signs of wear. (Figure 40).	Deep clean tile floors. If a new floor is installed, asbestos tile must be abated or encapsulated due to hazardous nature of the original material. Refer to haz-mat report for additional information.
Original quarry tile at kitchen and associated spaces is in good condition, but are dingy. (Figure 41).	Deep clear quarry tile floor and base. (Qty: approx. 4,000 SF)
The original composition gymnasium floor has been replaced +/- 3 years ago, with a hardwood sports floor and is excellent condition. The new floor is dimensionally taller than the existing system resulting in a less than ideal transition at each door landing. (Figure 42).	No action required.

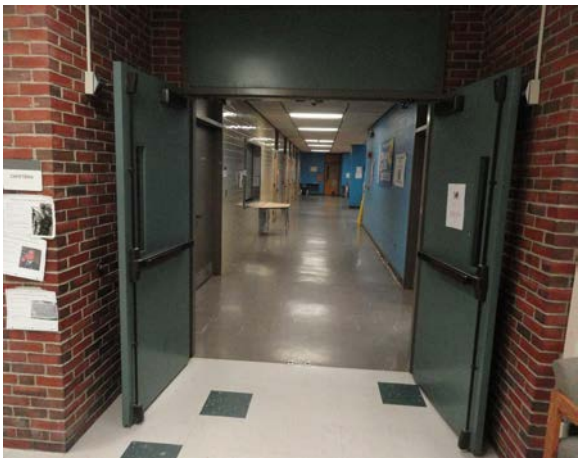

Figure 37—Corridor transition from updated tile flooring to original

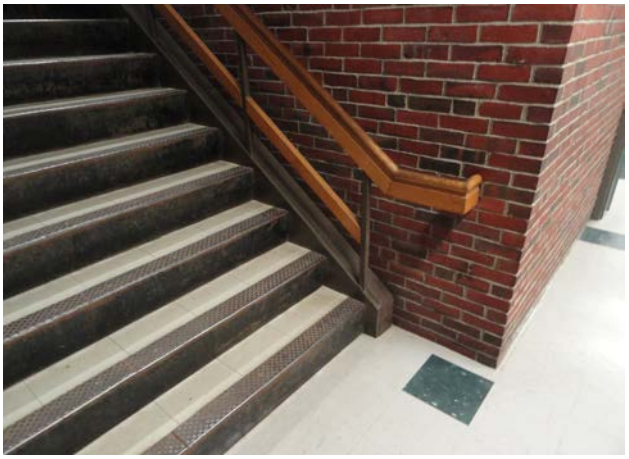

Figure 38— Rusting stair nosing and risers

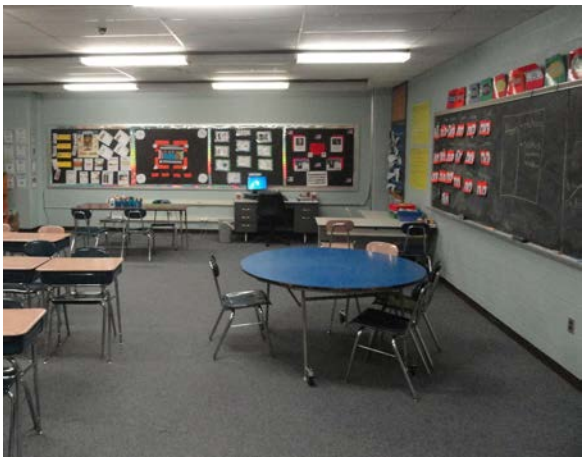

Figure 39—Classroom with carpet

Figure 40— Original vinyl asbestos tile at cafeteria

Figure 41—Original quarry tile at kitchen

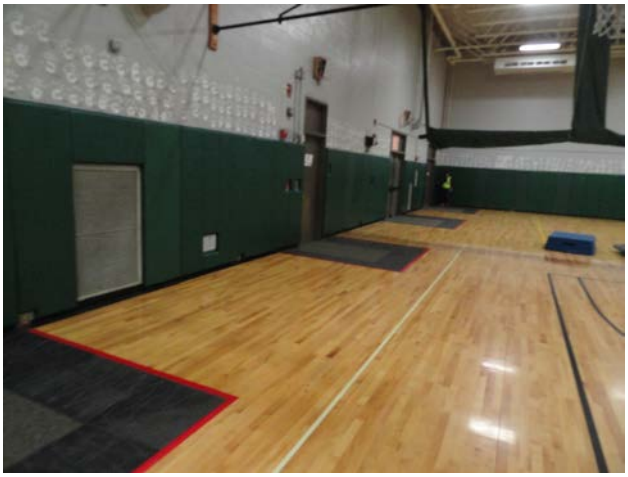

Figure 42— Raised gym floor with tapper at door landing

WALLS AND PARTITIONS

Interior wall and partition material consists primarily of painted CMU (concrete masonry units), with an occasional GWB (gypsum wall board), metal stud partition. Both are finished with paint typically. Lobby interior partitions and stair enclosures are brick veneer walls on CMU.

Other miscellaneous wall types or characteristics are illustrated below.

Condition of most CMU and GWB partitions is good to very good, with very few cosmetic blemishes or areas of deeper damage.

Specific Issues	*Recommendations*
Mechanical rooms, south wall has a thin crack from the bottom two courses of CMU through the foundation wall to the floor . (Figure 43)	Seal crack and repaint. (Qty: approx. 5 LF)
Cracked interior brick corner at main entry lobby. (Figure 44)	Seal crack. (Qty: approx. 2 LF)
Ceramic tile surrounds at water fountains are typically in good to very good condition, but are dingy particularly at the base. (Figure 45)	Deep clean ceramic tile at corridor water fountain surrounds. (Qty approx. 300 SF)
Main lobby brick veneer wall finish is in good to very good condition. (Figure 46)	No action required.
Corridor CMU walls are in very good condition, and were recently painted per information from the custodial manager. (Figure 47)	No action required.
Toilet rooms feature full height ceramic tile, in good to very good condition. (Figure 48)	No action required.

Figure 43—Crack at mechanical room foundation wall

Figure 44—Main Lobby, cracked glazed tile base

Figure 45—Typical tile surround at water fountains

Figure 46—Main lobby brick veneer wall finish

Figure 47—Typical corridor

Figure 48—Typical full height wall tile at restrooms

CEILINGS

Ceilings throughout the building are typically one of three main types: ACP (acoustic ceiling panels) in a suspended metal grid, suspended metal pan ceiling, or "Tectum" acoustical panels . Generally light fixtures are original surface mounted with the exception of the administrative suite and updated restrooms, which have updated ACP, grid and recessed mounted light fixtures.

Other miscellaneous ceiling types or characteristics are illustrated below.

Condition of ACP ceilings varies: most is fair to good, but there are some panels that are water-stained or broken. The Tectum panels are in good condition despite their age. Suspended metal pan ceilings are in fair to poor condition.

Specific Issues	*Recommendations*
Water stains at ACP in classroom, several locations. (Figure 49)	Replace ACP tiles. (Qty: approx. 5,000 SF)
Computer room and library ACP and metal grid conditions vary from good to poor condition. ACP soffits enclosing mechanical equipment are in particularly poor condition. (Figure 50).	Replace metal grid and ACP tiles, and consider creating GWB soffits with access panels where enclosing mechanical units. (Qty: approx. 5,000 SF)
Administrative suite features updated ACP, metal grid and recessed light fixtures and appears to be in very good condition. (Figure 51).	No action required.
Main lobby, corridor, and stair "tectum" acoustical panels are in generally good condition, with few exceptions. (Figure 52).	Replace stained or damaged tiles. (Qty: approx. 500 SF)
Kitchen suspended metal pan ceiling is rusting, damaged and has been displaced in some areas. (Figure 53).	Replace ceiling with metal grid and tiles with "wet location", washable (food-service grade) ACPs. (Qty: approx. 4,000 SF)
Girl's and boy's locker room painted exposed ceilings are in good condition. (Figure 54).	No action required.

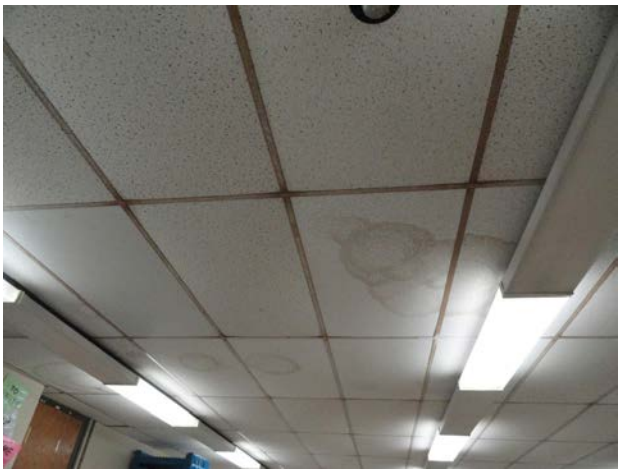

Figure 49—Water stains in ACP, several locations

Figure 50—Sagging ACP and metal grid at computer room

Figure 51—Updated ACP at administrative suite

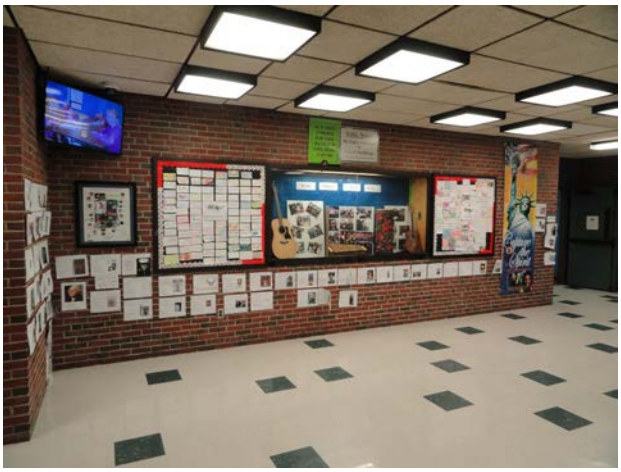

Figure 52—Metal ceiling in '62 wing rusting

Figure 53—'54 wing exposed ceiling structure

Figure 54—Girl's locker room painted exposed ceiling

INTERIOR DOORS

Interior doors throughout the building are typically of two main types. "Public" doors are predominately flush wood doors, with a natural finished. These include the vast majority of doors in the building. "Private," or service doors are hollow metal, painted. Frames for all doors are typically hollow metal, painted. Most classroom main doors , and hollow metal corridor doors, have wire glass vision panels .

Other miscellaneous door types or characteristics are illustrated below.

Condition of doors ranges widely in the building. Doors in high traffic areas, especially classrooms and the kitchen, and in good to fair condition. Lower traffic doors such as communicating doors between classrooms are typically in good to very good condition.

Door hardware issues have already been covered in the Accessibility section.

Specific Issues	*Recommendations*
Typical flush natural finish doors with wood transom panel, in good condition (Figure 55).	Retain doors of this type except where breakage or excess wear has occurred (approx. qty 30 leafs to be replaced).
Flush hollow metal doors at workroom—repurposed storage room. (Figure 56)	Retain doors of this type except where breakage or excess wear has occurred (approx. qty 10 leafs to be replaced).
Typical hollow metal door, painted, with wired glass vision panel in stair enclosure. (Figure 57)	See below.
Typical classroom wood door with wire glass vision panel, natural finish. (Figure 58)	See below.
Typical hollow metal corridor door, painted, with wire glass vision panels. (Figure 59)	See below.
Wired Glass: Wired glass is a safety concern and is not allowed under present building code: the wire actually weakens the glass, increasing likelihood of breakage even from a small amount of pressure, and once broken, the wire can increase injuries.	Replace all wired glazing with appropriate glazing type per its location. (Qty: approx. 200 SF)

Figure 55—Typical flush wood door with transom panel

Figure 56—Hollow metal service door with transom panel

Figure 57—Hollow metal door with wired glass

Figure 58—Typical wood door with wired glass

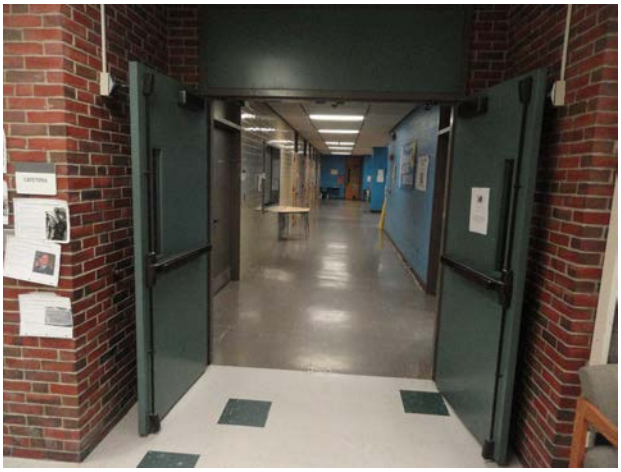

Figure 59—Typical corridor doors with wired glass

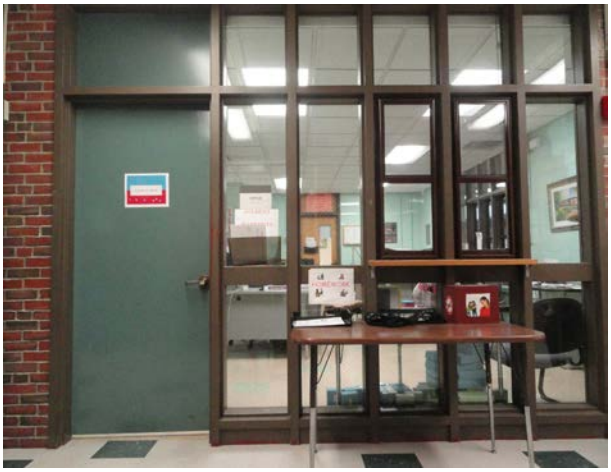

Figure 60—Hollow metal administrative suite door

FIXTURES AND EQUIPMENT

Fixtures throughout the building consist mainly of classroom sink casework, other storage casework, book-cases at window walls integrated with unit ventilators, window shades, short throw projectors, smartboards and the like. Generally, these fixtures range in condition from fair to very good.

Display surfaces such as tack boards, chalk boards and marker boards are another main type of fixture. For the most part, these are in good condition.

Toilet room fixtures and equipment consist of toilet compartment screens, dispensers, trash containers, towel dispensers, clothing hooks, etc. These items are generally in good to very good condition.

Other miscellaneous equipment include items like fire extinguishers and cabinets, drinking fountains, corridor lockers for student personal storage, locker-room lockers, stage equipment, etc.

Specific Issues	*Recommendations*
Toilet compartments appear to have been replaced in full, with few exceptions. Condition of updated toilet compartments are very good. (Figure 61-62).	Replace original toilet compartments. (Qty: approx. 6 compartments)
Corridor lockers appear to be in very good condition (Figure 63)	No action required
Updated accessible drinking fountain at corridor in good condition. (Figure 64). According to the building custodial manager, all but 6 original drinking fountains have been replaced.	Replace remaining original drinking fountains (Qty: approx. 6 fountains)
Fire extinguisher cabs are too high off the floor. Code dictates they be 18 inches AFF. (Figure 65) .	Lower and re-fit extinguisher cabinets with new cab with view window. (Qty: approx. 50 locations)
Boy's locker room lockers are rusting, bent, and many doors have been displaced. (Figure 66) .	Replace all lockers in boy's locker room. (Qty: approx. 100 LF)

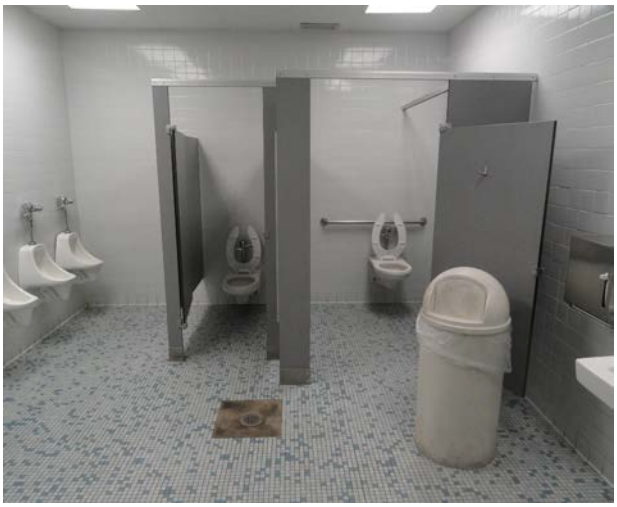

Figure 61—Toilet compartment screens

Figure 62—Original toilet compartment screen

Figure 63—Corridor storage lockers

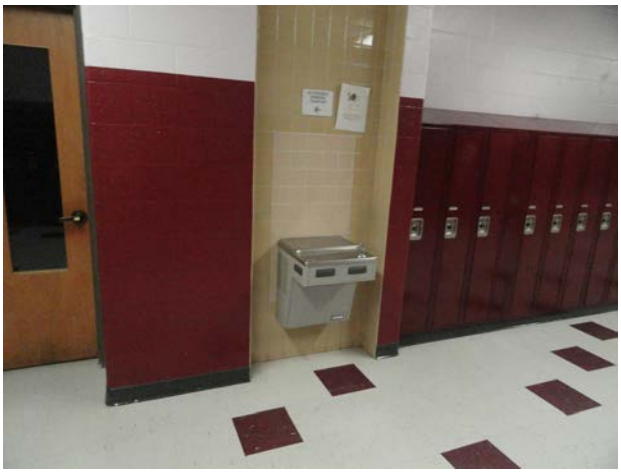

Figure 64—Updated accessible drinking fountain

Figure 65—Fire extinguisher cabinet

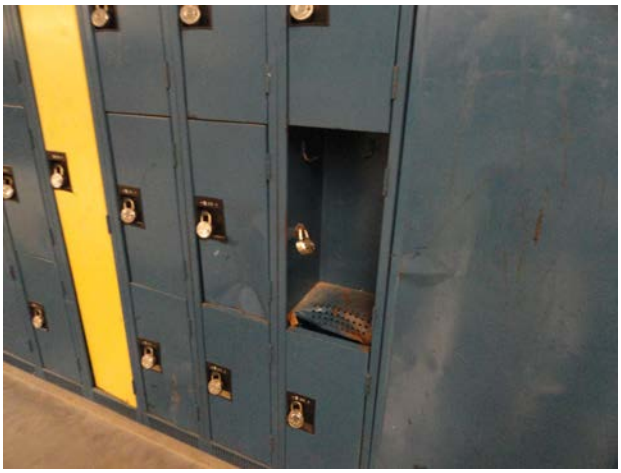

Figure 66—Boy's locker room lockers

FIXTURES AND EQUIPMENT (CONTINUED)

Specific Issues	*Recommendations*
Several classrooms have an original chalkboard writing surfaces. (Figure 67).	Consider replacing chalkboard writing surfaces with marker-board writing surfaces. (Qty: aprox. 1,000 SF)
Metal storage casework appear to be original to the building and ranges from good to poor condition. In many areas casework has been retro-fitted to include accessible sink units, or additional sink units have been added. (Figure 68).	Replace or recondition all storage millwork and countertops. Where possible new countertops should comply with accessibility requirements.
Science room storage millwork and countertops appear to be in good condition. While original countertops and sinks do not meet accessibility requirements , accessible sinks have been added in some labs. (Figure 69).	See accessibility section for recommendations.
Short throw projectors have been installed in most general classrooms. Some projectors have been wired to speakers, and some are using a "smartboard" technology. (Figure 70).	Consider installing short throw projectors in remaining classrooms (Qty: approx. 10 classrooms)
Integrated window wall bookcases run the gamut of condition from poor up to good; however, if unit ventilators are to be removed, the casework will need to be replaced. (Figure 71).	Replace all window wall casework with new.

Figure 67—Original classroom chalk board

Figure 68—Original storage casework with retro-fitted accessible sink casework

Figure 69—Science lab original millwork

Figure 70—Short throw projector at classroom

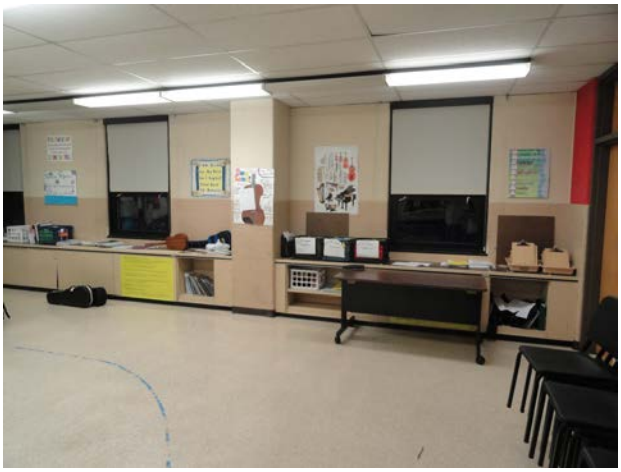

Figure 71—Integral window storage

HVAC ASSESSMENT

In general, the school's heating equipment is in good condition as the boilers have recently been replaced. A new DDC system was also recently installed. However, the majority of the existing hot water piping and terminal heating equipment is originally installed equipment. There is an antiquated Pneumatic Control System installed in the building.

HOT WATER PLANT

The William H. Galvin Middle School is heated by a hot water boiler plant consisting of two (2) gas fired hot water boilers, hot water system pumps, boiler circulator pumps, combustion air intake and combustion by-product exhaust flues, and pneumatic controls. One boiler is manufactured by Viessmann, model Vertomat VSB 89 and has an approximate heating capacity of 3,000 MBH output, and maximum input of 3,361 MBH. The second boiler is manufactured by HB Smith, model 28A series – 13 and has an approximate heating capacity of 3,297 MBH output, and a maximum input of 3,844 MBH. It was stated the boilers were installed approximately 10 years ago, though the tag on the boilers show 2000 indicating the boiler plant is approximately 16 years old. The Viessmann boiler is a high efficiency condensing boiler and the HB Smith boiler is an atmospheric type boiler. (Figure 1)

The flue gases are vented separately through the use of individual breeching that terminates through the mechanical room and up to the roof. Combustion air for the boilers is provided through the use of an inline fan with ductwork. (Figure 2)

Hot water is distributed from the boiler to the building heating equipment by three base mounted end suction hot water pumps. Each pump has a 15hp motor. Heating hot water is circulated throughout the building to classroom unit ventilators, unit heaters, convectors, etc. The hot water piping and insulation located within the main boiler room appears to be in good condition. The pumps & piping distribution system were installed with the heating hot water plant & appear to be in very good condition. (Figure 3)

The boiler burners are dual fuel burners. Dual fuel burners allowed the school to operate on either natural gas or #2 fuel oil, whichever was less expensive. The fuel oil piping has been disconnected and is no longer used. The fuel oil storage tank located outside has been drained and is scheduled to be removed next year. (Figure 4)

Specific Issues	*Recommendations*
	The existing hot water plant including hot water boilers, pumps, accessories and controls should continue to be maintained in accordance with manufacturers recommendations.

Figure 1

Figure 2

Figure 3

Figure 4

SUPPLEMENTAL AC SYSTEMS

The majority of the building is not air-conditioned. The Computer Lab is served by a ductless split system AC unit. There are other split systems or window air conditioning units where needed .

Specific Issues	*Recommendations*
	The ductless split systems should continue to be maintained in accordance with manufacturers recommendations.

INTERIOR ROOMS

There are three rooftop units that feed interior spaces. The units are cooling-only rooftop units. Two units are Carrier Model 50TJ-028 (25 ton cooling) and one is Carrier model 50TJ-016 (15 ton cooling). One unit serves third floor interior classrooms, one unit serves second floor classrooms and one unit serves first floor office/nursing area. The units were replacement units as evident from the existing curb in place and the curb adapter for the replacement units. No manufacturer date was visible on the rooftop equipment. The units appear to be nearing the end of their expected useful service life. (Figure 5)

Specific Issues	*Recommendations*
The units appear to be near the end of their useful life expectancy.	Consider replacing all three RTUs within five years.

CAFETERIA AND KITCHEN

The Cafeteria is served by five (5) indoor wall mounted unit ventilators located at the exterior wall. Each unit has a hot water coil, supply fan and filter. Ventilation air is introduced to each of these units through a wall-mounted louver. Tempered air is distributed to the space through a unit mounted supply grille. The outside air that is introduced is exhausted at the stage through two exhaust grilles located near the floor at each side of the stage.

The units are original to the building, in poor condition and past their useful service life. (Figure 6, Figure 7, Figure 8)

The kitchen has one unit ventilator to feed the space.

Specific Issues	*Recommendations*
Unit vents and perimeter HW FTR are original and past lifespan.	Provide all new unit ventilators with direct digital controls with CO2 sensors for Demand Ventilation Control.
None	Existing ductwork and air distribution devices should be cleaned .
Make-up Air in Kitchen	A unit ventilator does not provide adequate make up air for the amount of air that is exhausted in a kitchen. A new dedicated make-up air unit should be installed.

Figure 5

Figure 6

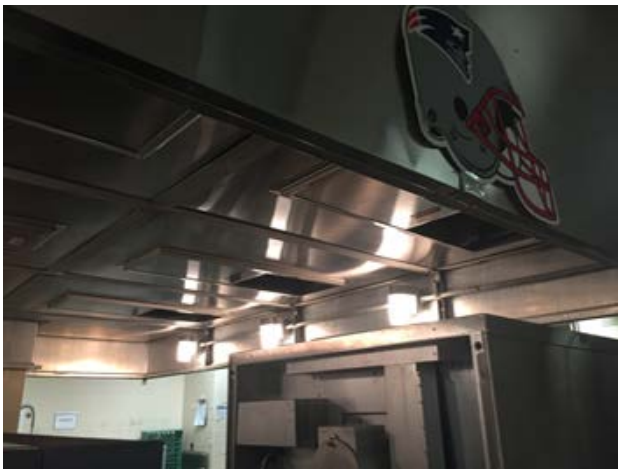

Figure 7

Figure 8

CLASSROOMS

Wall mounted classroom unit ventilators are utilized for the heating and ventilation requirements of the majority the classroom spaces. The unit ventilators are original to the building. Ventilation air is introduced to each of these units through an exterior wall-mounted louver. Each unit is equipped with a hot water heating coil, supply fan and filter. The classroom spaces are provided with exhaust systems to remove any outdoor air that is introduced through the unit ventilators which helps maintain a neutral pressure within the space. Classroom (exhaust) is served by various central roof mounted exhaust fan systems. The majority of classrooms with exterior walls also have perimeter hot water fin tube radiation. The unit ventilators and fin tube radiation appear to be originally installed equipment and is generally past its expected useful service life.

Specific Issues	*Recommendations*
Unit vents and perimeter HW FTR are original and past lifespan.	Provide all new unit ventilators with direct digital controls with CO2 sensors for Demand Ventilation Control.

LIBRARY

The Library is served by four (4) indoor wall mounted unit ventilators located at the exterior wall. Each unit has a hot water coil, supply fan and filter. Ventilation air is introduced to each of these units through wall-mounted louvers. Tempered air is distributed to the space through a unit mounted supply grille. The outside air that is introduced is exhausted at the stage through two exhaust grilles located near the floor at each side of the stage.

The units are original to the building, in poor condition and past their useful service life.

Specific Issues	*Recommendations*
Unit vents and perimeter HW FTR are original and past lifespan.	Provide all new unit ventilators with direct digital controls with CO2 sensors for Demand Ventilation Control.

GYM

The Gym is served by seven (7) indoor horizontal unit ventilators located at the Gym ceiling. Each unit has a hot water coil, supply fan and filter. Ventilation air is introduced to each of these units through a wall-mounted louver. Tempered air is distributed to the space through a unit mounted supply grille. The outside air that is introduced is exhausted at two low wall mounted exhaust grilles up to roof mounted exhaust fans.

The units are original to the building, in poor condition and past their useful service life. (Figure 9)

Specific Issues	*Recommendations*
Unit vents and perimeter HW FTR are original and past lifespan.	Provide all new unit ventilators with direct digital controls with CO2 sensors for Demand Ventilation Control.

Figure 9

EXHAUST SYSTEMS

The majority of classroom spaces are exhausted through roof mounted exhaust fans. There are also dedicated exhaust fans which are roof mounted for areas such as the gang toilets, Kitchen hood, storage rooms and the large group spaces such as the Gym and Cafeteria These areas utilize a galvanized sheet metal duct distribution system from the space to the roof mounted exhaust fans. The majority of the exhaust fans appear to be original and past their useful life. The majority of the existing exhaust air ductwork appears to be original. (Figure 10, Figure 11)

Specific Issues	*Recommendations*
	Rooftop exhaust air fans should be replaced with new.

RESTROOMS

Interior restrooms did not have any installed terminal heating equipment. Air is drawn in by associated exhaust systems and space temperature is maintained by adjacent space.

Rest rooms with an exterior wall or roof have hot water convector units that are original to the building. The restrooms are typically exhausted by ceiling or sidewall exhaust air grilles that are connected to exhaust air fans that are located on the Roof .

Specific Issues	*Recommendations*
	Existing cabinet unit heaters, hot water fin tube radiation, and convectors should continue to be maintained in accordance with manufacturers recommendations. If renovation is considered, new terminal heating units should be provided.

Figure 10

Figure 11

ENTRYWAYS AND CORRIDORS

The main entryways are heated by hot water convector units or unit heaters that appear to be originally installed equipment; some of the unit heaters show signs of corrosion on the cabinets. The majority of corridors are not provided with code required fresh air ventilation. The corridors are heated by a combination of hot water convectors and fin tube radiation that appears to be in poor to fair condition. (Figure 12)

Specific Issues	*Recommendations*
	Existing cabinet unit heaters, hot water fin tube radiation, and convectors should continue to be maintained in accordance with manufacturers recommendations. If renovation is considered, new terminal heating units should be provided.

CONTROLS

The majority of the building HVAC systems and the heating plant are controlled by an antiquated pneumatic control system. The pneumatic compressor appears to be in good condition. (Figure 13)

Specific Issues	*Recommendations*
Lack of controllability is directly related to wasteful use of energy.	The ATC system should be upgraded to convert all pneumatic controls with new DDC controls.

Figure 12

Figure 13

ELECTRICAL ASSESSMENT

ELECTRICAL ASSESSMENT

POWER DISTRIBUTION SYSTEM

The secondary service runs underground between the pad mounted transformer and a 1200 Ampere, 277/480V, 3Ø, 4 W switchboard located in the main electric room. (Figure 1)

The switchboard consists of a 1200 amp main breaker/c/t section plus a distribution section. The switchboard was manufactured by Zinsco and is original to the building. Most panelboards are located flush in corridors, boiler room, kitchen, cafetorium, etc. and are generally also original to the building. Most panels are full. The facility is secondary metered with the meter located in the electric room. (Figure 2)

The switchgear was manufactured by GE, and with the exception of a couple of newer panelboards, original, and in poor condition and should be replaced. (Figure 3)

Specific Issues	*Recommendations*
Obsolete manufacturer and age of equipment.	Replace all panelboards throughout the facility. Extend and reconnect existing branch circuits to new panelboards located in new dedicated electric closets.

Figure 1

Figure 2

Figure 3

EMERGENCY STANDBY SYSTEM

The facility has an interior natural gas emergency generator manufactured by Katolight located in the Boiler Room. The generator is in fair condition. A 400 ampere Asco series 300 automatic transfer switch is located in the electric room. (Figure 4) (Figure 5)

A separate emergency only panel is located adjacent to the ATS. A system of emergency only, normally off, lighting system exists throughout the facility. The emergency only lights consist of recessed incandescent fixtures. Existing signs generally have battery back-up. Exterior doors do not have emergency lights.

The emergency system is not in compliance with current codes and should be replaced with a code compliant system. Current codes require a separate transfer switch and dedicated panels within 2 hour rated closets with fire rated feeders.

Specific Issues	*Recommendations*
Separation of emergency and life safety equipment is required.	Provide a new exterior generator and two automatic transfer switches with new associated panelboards. Provide circuitry for new emergency lighting. Remove the existing normally off/emergency only lighting system.

Figure 4

Figure 5

INTERIOR LIGHTING

The corridor lighting consists of 1x4 surface wraparound fixtures with 2 T8 lamps controlled with local switches. (Figure 6)

The typical classroom has two rows of surface wraparound fixtures with 2 T8 lamps controlled by row with 2 local switches. A corner mounted occupancy sensor over door also controls lights. (Figure 7)

The cafetorium lighting consists of recessed down lights with LED retrofit lamps. The platform has spot lights and recessed downlight fixtures. All lighting is switched controlled, with dimmer switches for the platform fixtures. (Figure 8)

The kitchen has recessed 2x4 lensed troffers with acrylic lens & 2 T8 lamps controlled with (2) local switches. The hood has incandescent globes without guard with compact fluorescent lamps. (Figure 9)

The gym has 2x4 suspended fluorescent high bay with (4) T5HO lamps on local switches. (Figure 10)

Typical multi-stall toilet room has recessed 2x4 fixtures with 2 T8 lamps and recessed downlights on local switches. (Figure 11)

The media center and offices have recessed 2x4 fixtures with 2 T8 lamps on local switches. (Figure 12)

The lighting consist of utility grade fixtures added or retrofitted over the years and is generally in fair condition. However, the wiring and switches are original.

Specific Issues	*Recommendations*
Not energy efficient lighting fixtures.	Replace existing lighting in throughout the building. Provide occupancy sensors in offices and toilet rooms.

Figure 6

Figure 7

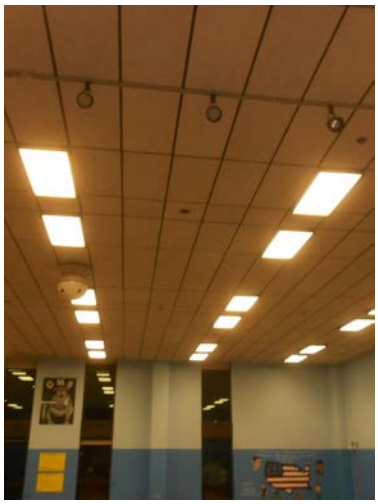

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

EXTERIOR LIGHTING

HID wall packs exist on building, however, most exterior doors do not have a light fixture.

The entrance canopy has surface HID lensed fixtures.

The exterior lights are controlled with time clocks.

Specific Issues	*Recommendations*
Not energy efficient lighting fixtures.	Provide LED cut-off fixtures for roadway and parking areas.
Not energy efficient lighting fixtures.	Provide building mounted LED sconces over all exterior doors. Connect to emergency power.

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FIRE ALARM SYSTEM

The fire alarm system consists of a Notifier non-addressable control panel located in the Custodian Office. A remote LCD annunciator is located in the main vestibule. The form of alarm transmission is via a Sigcom #7315 radio box with exterior antenna. The exterior master box with pull lever is still in place with a red beacon above. (Figure 13) (Figure 14)

The audible/visual signal devices consist of horns and strobes. The strobes are ADA compliant. (Figure 15)

Corridors have heat detectors and horn/strobes. The electric room has a smoke detector. The corridor doors and stairway doors are on magnetic door holders.

Heat detectors exist in the boiler room, media center, gym, cafetorium, platform, kitchen and toilet rooms. The building does not have a sprinkler system. (Figure 16)

Pull stations exist at exterior exist discharge doors.

Toilet rooms have strobes. (Figure 17)

The fire alarm system, in general, has fair coverage however it does not comply with current codes which require voice evacuation throughout the school. The system should be replaced under a renovation program.

Specific Issues	*Recommendations*
Non-addressable, not ADA compliant and speakers are required.	Replace the fire alarm system horns with speakers. Provide smoke detectors and carbon monoxide detectors in the Nurse's suite. Under a renovation program the entire fire alarm system should be replaced.

Figure 13

Figure 14

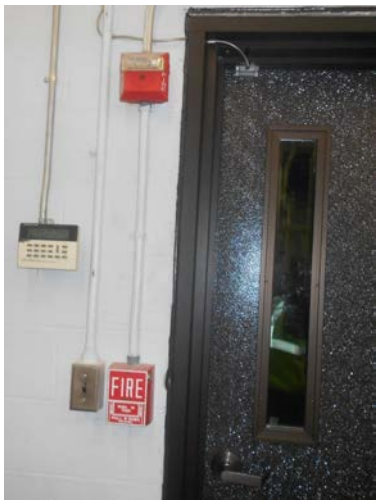


Figure 15

Figure 16

Figure 17

MISCELLANEOUS

Boiler room has an emergency power off, "EPO" switch in the corridor outside the boiler room door. There is no EPO switch at the exterior door of the boiler room.

Receptacles in kitchen are generally not GFI protected and are sparsely located.

There is no EPO in kitchen to shut down equipment under the hood.

Typical classroom has minimal receptacles. A wire mold raceway has been added at projector marker board walls with receptacles. (Figure 18)

The facility does not have a lightning protection system.

The facility has a photovoltaic system.

Specific Issues	*Recommendations*
EPO switches lacking in kitchen.	Install EPO switches to shut down kitchen equipment under the hood.

Figure 18

PLUMBING ASSESSMENT

EXECUTIVE SUMMARY

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary, waste and vent system and natural gas. Municipal water services the Building, while the building sanitary is directed to a Municipal site sanitary system.

The majority of the plumbing systems appear to be original to the building and its renovations. Portions of the system have been updated as part of building renovation and upgrade projects. The plumbing systems, while continuing to function, in general have served their useful life. The school plumbing systems could continue to be used with maintenance and replacement of failed components; however other non-dependent decisions will likely force the plumbing upgrade.

The plumbing fixtures are in fair to poor condition. Attempts have been made to make some bathroom fixtures accessible; however, the majority of fixtures do not meet current accessibility codes. In general, the fixtures appear to have served their useful life. Current Access Code requires accessible fixtures wherever plumbing is provided. In terms of the water conservation fixtures, their use is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require these fixtures to be upgraded, but where new fixtures are installed, as may be required by other codes or concerns, the new fixtures need to be water conserving type fixtures.

Cast iron is used for sanitary, waste, vent and storm piping systems. The building has flat roofs, thus rainwater is collected by interior rain leaders that collect under floor slabs, which are then directed to a site storm system. Where visible the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper. In general, the drainage piping can be reused where adequately sized for the intended new use.

PLUMBING ASSESSMENT

FIXTURES

The water closets are wall hung or floor mounted vitreous china units. Most water closets have manually operated flush valves. The original water closets are top spud china with manually operated flush valves. (Figure 1)

Urinals are wall hung vitreous china with mostly manually operated flush valves. (Figure 2)

Lavatories are wall hung or counter mounted vitreous china. The majority of lavatories have hot and cold water handle faucets. None of the lavatories are fitted with mixing valve to temper the hot water. (Figure 3)

Boys and Girls Showers include tiled surrounds and concealed shower controls and exposed chrome plated metering controls. The Boys showers include a stainless steel soffit to conceal the hot and cold water in a gang shower setup, while the Girls showers include individual stalls with a vertical stainless steel enclosure to conceal supplies. (Figure 4) (Figure 5)The showers for each sex are metered with a tempered water line which comes from a temperature and pressure balancing mixing valve located in the Teacher's Offices. (Figure 6)

Drinking fountains are surface mounted vitreous china type (Figure 7)

Electric water coolers are surface mounted with stainless steel cabinets. (Figure 8)

Janitor's sink are 36" X 36" terrazzo floor receptors. Faucets are equipped with vacuum breakers. (Figure 9)

Staff and Classroom sinks are stainless steel drop-in type with hot and cold water faucets with gooseneck and blade handles. The sinks do not include a bubbler. Art Classrooms do not include plaster traps. (Figure 10)

Science Classroom sinks are made of epoxy integral with countertops. Faucets include serrated nozzles and vacuum breakers (Figure 11) Emergency eyewashes are provided in the Science Classrooms which may be serviced with cold water only. Current Codes require Emergency fixtures to be serviced with tepid water. (Figure 12)

Laundry supply valves and standpipes are provided for clothes washing machines (Figure 13)

Kitchen area fixtures are in fair condition. The pot washing sink is fitted with on-the-floor grease interceptor. (Figure 14) The automatic dishwasher is not directed to a dedicated in-the-floor grease interceptor. The hand sinks are wall mounted stainless steel.

Specific Issues	*Recommendations*
Plumbing Fixtures have exceeded their life expectancy. (Figures 1-14)	Provide new high efficiency low-flow plumbing fixtures throughout.
Emergency eyewashes are serviced by cold water. Code requires tepid water.	Provide hot water, cold water and mixing valve at each emergency fixture to deliver tepid water.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

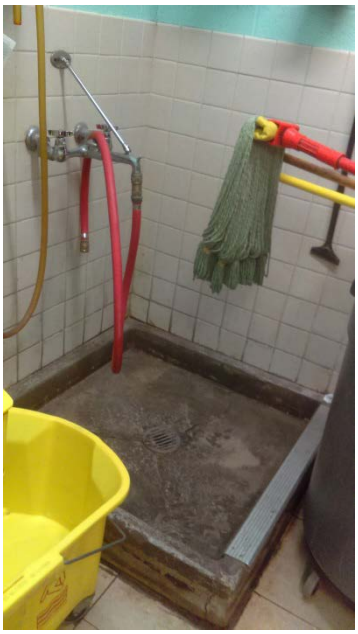


Figure 9

Figure 10

Figure 11

Figure 12

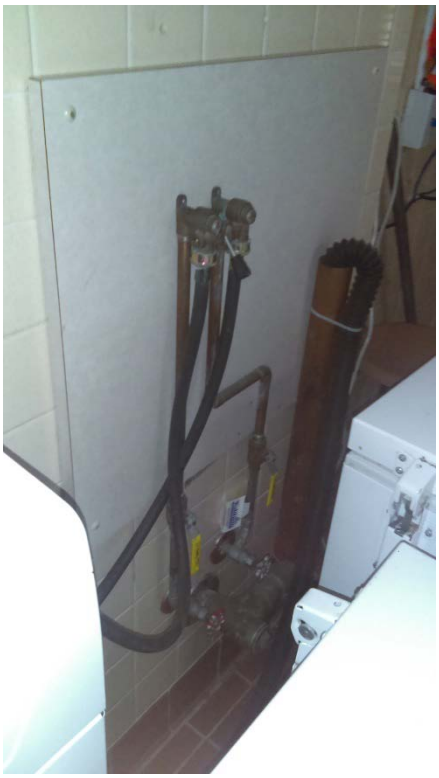


Figure 13

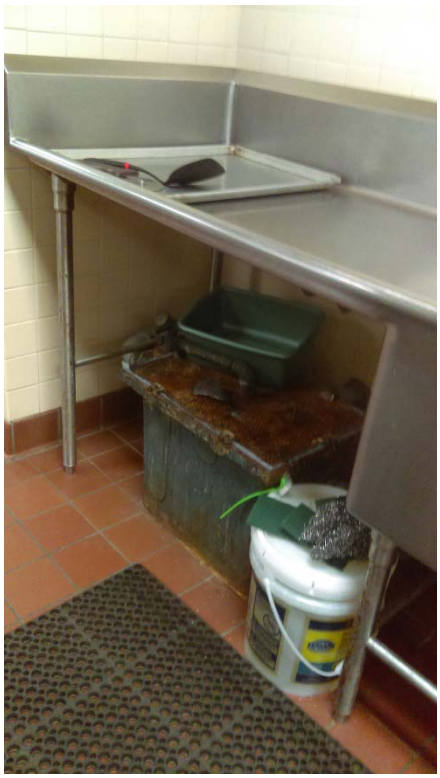


Figure 14

WATER SYSTEMS

The domestic water service is located in the Boiler Room. The service is 4" in size and includes a 3" water meter. The main domestic cold-water distribution is 3" in size. (Figure 15)

A 1" reduced pressure backflow preventer is provided for boiler make-up water in Mechanical Room. (Figure 16) Piping, where exposed, is copper with sweat joints. The majority of the piping is insulated and labeled. Original gate valves appear to be in poor condition where the more recently installed ball valves are in fair condition. All valves do not include identification tags.

The building domestic hot water is generated through (2) two Ruud gas-fired storage type water heaters. Each water heater has a gas input of 75,000 BTUH and a storage capacity of 72 gallons. The hot water systems are recirculated. There is an expansion tank on the system, but no master mixing valve prevent scalding. (Figure 17) (Figure 18)

The domestic water heater and storage tanks are in good condition.

Specific Issues	*Recommendations*
Existing domestic water piping, insulation and gate valves should be replaced.	Provide new domestic water distribution piping, including insulation and ball valves.
Domestic water heaters are nearing its life expectancy and is inefficient per current standards.	Replace domestic water heater with high efficiency unit, including mixing valve, expansion tank and recirculation pump.

Figure 15

Figure 16

Figure 17

Figure 18

GAS

The gas service for the original building is an elevated pressure system. Natural gas supplies the heating boilers, the domestic water heater, the Kitchen equipment and Science Classroom turrets. A gas meter and pressure regulator to reduce from elevated pressure to a low pressure which is provided for the Building gas requirements. (Figure 19)

Gas piping is black steel with a combination of screwed and welded joints and fittings depending on pipe size and time of installation. (Figure 20)

Science Classroom turrets are isolated at each Classroom by a master gas shutoff valve located in a stainless steel box with lockable door. (Figure 21)

Specific Issues	*Recommendations*
None (Figures 1-3)	

Figure 19

Figure 20

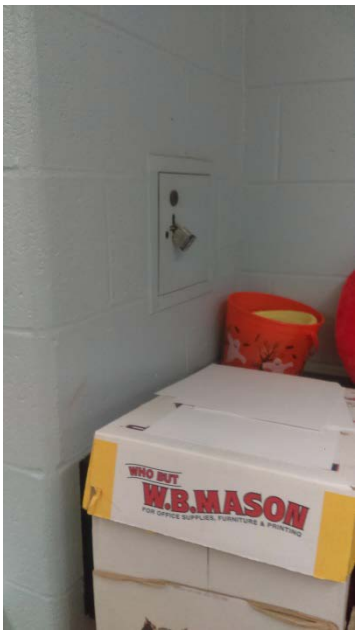


Figure 21

DRAINAGE SYSTEMS

Cast iron is used for the sanitary waste, vent and storm system. Piping and fittings are hub and spigot with what appears to be lead oakum joints. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper.

Roof Drains and associated rain leader piping are in fair condition. (Figure 22)

In general, the cast iron drainage is nearing its life expectancy and the piping should be replaced.

The Science Classrooms include acid resistant polypropylene piping with mechanical fittings where some sinks are directed to a network of glass piping with mechanical fittings. The Staff was not aware of an acid neutralization tank located anywhere in the building. (Figure 23) (Figure 24)

Specific Issues	*Recommendations*
Buried drainage piping may need replacement due to vintage.	Video tape all buried drainage piping to determine pipe condition and check for leaks. Replace piping as required.
Acid Neutralization system is not maintained. Staff unaware of location	Provide acid neutralization system and monitor to a Building Management System.

Figure 22

Figure 23

Figure 24

FIRE PROTECTION ASSESSMENT

The existing William H. Galvin Middle School was constructed in 1971 and partially renovated in 2002. The School is 133,151 square feet. The building does not contain an automatic sprinkler system.

Specific Issues	*Recommendations*
Compliance with Massachusetts General Law M.G.L. Chapter 148 Section 26G is required in all existing buildings which exceed 7,500 square feet in area and undergo major alterations. Under these conditions, an existing building must provide a full sprinkler fire suppression system. A major alteration is defined as a reconfiguration of walls, doors, windows, mechanical systems, etc., which effectively makes installation of sprinkler systems easier and which affects more than 33% of the building area or more	A hydrant flow test will be required to determine Municipal water supply capacity.

UEC universal environmental consultants

January 23, 2017

Ms. Jon Richardson
Dore & Whittier Architects
260 Merrimac Street
Newburyport, MA 01950

Reference: Hazardous Materials Determination Survey
William H. Galvin Middle School, Canton, MA

Dear Mr. Richardson:

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 William H. Galvin Middle School, Canton, MA.

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

Very truly yours,

Universal Environmental Consultants

_____
Ammar M. Dieb
President

UEC:\216 440.00\William H. Galvin Middle School Report.DOC

Enclosure

REPORT
FOR
HAZARDOUS MATERIALS DETERMINATION
SURVEY
AT THE
WILLIAM H. GALVIN MIDDLE SCHOOL
CANTON, MASSACHUSETTS

PROJECT NO: 216 440.00

Survey Date:
January 18, 2017

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 William H. Galvin Middle School, Canton, 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 was 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 Asbestos Identification Laboratory, Woburn, MA.

Refer to samples results.

2.0 FINDINGS:

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

All suspect materials were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. A homogeneous area shall be determined to contain asbestos based on findings that the results of at least one sample collected from that area shows that asbestos is present in an amount >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

Forty eight (48) bulk samples were collected from the following materials suspected of containing asbestos:

Type and Location of Material

1. Hard joint insulation at boy's locker room
2. Hard joint insulation at girl's locker room
3. Hard joint insulation at second floor above ceiling
4. Black sink coating at room 106
5. Black sink coating at room 106
6. Grey sink coating at second floor faculty room
7. Grey sink coating at second floor faculty room
8. Spray on fireproofing at third floor above ceiling
9. Spray on fireproofing at third floor above ceiling
10. Spray on fireproofing at third floor above ceiling
11. Spray on fireproofing at second floor above ceiling
12. Spray on fireproofing at second floor above ceiling
13. Spray on fireproofing at first floor above ceiling
14. Spray on fireproofing at first floor above ceiling
15. Tectum suspended acoustical ceiling tile at third floor hall
16. Tectum suspended acoustical ceiling tile at third floor hall
17. 2' x 4' Suspended acoustical tile at room 306
18. 2' x 4' Suspended acoustical tile at room 203
19. 2' x 4' Suspended acoustical tile at room 102
20. Lab counter top at room 328
21. Lab counter top at room 328
22. Interior window glass glazing caulking at third floor hall
23. Interior window glass glazing caulking at second floor library
24. Interior window glass glazing caulking at first floor locker room
25. 12"x 12" Beige w/ red fleck vinyl floor tile at stairwell
26. 12"x 12" Beige w/ red fleck vinyl floor tile at room 306
27. 12"x 12" Beige w/ red fleck vinyl floor tile at room 203
28. Black mastic on 12"x 12" Beige w/ red fleck vinyl floor tile at stairwell
29. Black mastic on 12"x 12" Beige w/ red fleck vinyl floor tile at room 306
30. Black mastic on 12"x 12" Beige w/ red fleck vinyl floor tile at room 203
31. 12"x 12" Newer white vinyl floor tile at third floor hall
32. 12"x 12" Newer white vinyl floor tile at second floor hall
33. 12"x 12" Newer white vinyl floor tile at first floor hall
34. Yellow glue on 12"x 12" newer white vinyl floor tile at third floor hall
35. Yellow glue on 12"x 12" newer white vinyl floor tile at second floor hall
36. Yellow glue on 12"x 12" newer white vinyl floor tile at first floor hall
37. 12"x 12" New tan vinyl floor tile at room 101
38. 12"x 12" New tan vinyl floor tile at room 102
39. Yellow glue on 12"x 12" new tan vinyl floor tile at room 101
40. Yellow glue on 12"x 12" new tan vinyl floor tile at room 102
41. 12"x 12" Old tan vinyl floor tile at room 104
42. 12"x 12" Old tan vinyl floor tile at first floor hall by locker rooms
43. Black mastic on 12"x 12" old tan vinyl floor tile at room 104
44. Black mastic on 12"x 12" old tan vinyl floor tile at first floor hall by locker rooms
45. 12"x 12" Grey vinyl floor tile at cafeteria
46. 12"x 12" Grey vinyl floor tile at cafeteria
47. Black mastic on 12"x 12" grey vinyl floor tile at cafeteria
48. Black mastic on 12"x 12" grey vinyl floor tile at cafeteria

Samples Results

Type and Location of Material	Sample Result
1. Hard joint insulation at boy's locker room	No Asbestos Detected
2. Hard joint insulation at girl's locker room	No Asbestos Detected
3. Hard joint insulation at second floor above ceiling	No Asbestos Detected
4. Black sink coating at room 106	No Asbestos Detected
5. Black sink coating at room 106	2% Asbestos
6. Grey sink coating at second floor faculty room	No Asbestos Detected
7. Grey sink coating at second floor faculty room	No Asbestos Detected
8. Spray on fireproofing at third floor above ceiling	No Asbestos Detected
9. Spray on fireproofing at third floor above ceiling	No Asbestos Detected
10. Spray on fireproofing at third floor above ceiling	No Asbestos Detected
11. Spray on fireproofing at second floor above ceiling	No Asbestos Detected
12. Spray on fireproofing at second floor above ceiling	No Asbestos Detected
13. Spray on fireproofing at first floor above ceiling	No Asbestos Detected
14. Spray on fireproofing at first floor above ceiling	No Asbestos Detected
15. Tectum suspended acoustical ceiling tile at third floor hall	No Asbestos Detected
16. Tectum suspended acoustical ceiling tile at third floor hall	No Asbestos Detected
17. 2' x 4' Suspended acoustical tile at room 306	No Asbestos Detected
18. 2' x 4' Suspended acoustical tile at room 203	No Asbestos Detected
19. 2' x 4' Suspended acoustical tile at room 102	No Asbestos Detected
20. Lab counter top at room 328	No Asbestos Detected
21. Lab counter top at room 328	No Asbestos Detected
22. Interior window glass glazing caulking at third floor hall	2% Asbestos
23. Interior window glass glazing caulking at second floor library	2% Asbestos
24. Interior window glass glazing caulking at first floor locker room	2% Asbestos
25. 12"x 12" Beige w/ red fleck vinyl floor tile at stairwell	2% Asbestos
26. 12"x 12" Beige w/ red fleck vinyl floor tile at room 306	5% Asbestos
27. 12"x 12" Beige w/ red fleck vinyl floor tile at room 203	2% Asbestos
28. Black mastic on 12"x 12" Beige w/ red fleck vinyl floor tile at stairwell	5% Asbestos
29. Black mastic on 12"x 12" Beige w/ red fleck vinyl floor tile at room 306	10% Asbestos
30. Black mastic on 12"x 12" Beige w/ red fleck vinyl floor tile at room 203	10% Asbestos
31. 12"x 12" Newer white vinyl floor tile at third floor hall	No Asbestos Detected
32. 12"x 12" Newer white vinyl floor tile at second floor hall	No Asbestos Detected
33. 12"x 12" Newer white vinyl floor tile at first floor hall	No Asbestos Detected
34. Yellow glue on 12"x 12" newer white vinyl floor tile at third floor hall	No Asbestos Detected
35. Yellow glue on 12"x 12" newer white vinyl floor tile at second floor hall	No Asbestos Detected
36. Yellow glue on 12"x 12" newer white vinyl floor tile at first floor hall	No Asbestos Detected
37. 12"x 12" New tan vinyl floor tile at room 101	No Asbestos Detected
38. 12"x 12" New tan vinyl floor tile at room 102	No Asbestos Detected
39. Yellow glue on 12"x 12" new tan vinyl floor tile at room 101	No Asbestos Detected
40. Yellow glue on 12"x 12" new tan vinyl floor tile at room 102	No Asbestos Detected
41. 12"x 12" Old tan vinyl floor tile at room 104	2% Asbestos
42. 12"x 12" Old tan vinyl floor tile at first floor hall by locker rooms	2% Asbestos
43. Black mastic on 12"x 12" old tan vinyl floor tile at room 104	10% Asbestos
44. Black mastic on 12"x 12" old tan vinyl floor tile at first floor hall by locker rooms	10% Asbestos
45. 12"x 12" Grey vinyl floor tile at cafeteria	2% Asbestos
46. 12"x 12" Grey vinyl floor tile at cafeteria	2% Asbestos
47. Black mastic on 12"x 12" grey vinyl floor tile at cafeteria	15% Asbestos
48. Black mastic on 12"x 12" grey vinyl floor tile at cafeteria	15% Asbestos

3.0 OBSERVATION AND COST ESTIMATES:

OBSERVATIONS:

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

1. Interior window glazing caulking was found to contain asbestos.
2. Black sink coating was found to contain asbestos.
3. 12" x 12" Beige/red fleck vinyl floor tile and mastic was found to contain asbestos.
4. 12" x 12" Old tan vinyl floor tile and mastic was found to contain asbestos.
5. 12" x 12" Grey vinyl floor tile and mastic was found to contain asbestos.
6. Paper under hardwood floors was assumed to contain asbestos.
7. Glue holding blackboard was assumed to contain asbestos.
8. Transite panels were assumed to contain asbestos.
9. Flexible connectors were assumed to contain asbestos.
10. All remaining suspect materials were found not to contain asbestos.
11. Underground sewer pipe was assumed to contain asbestos.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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	Black Sink Coating	9 Total	2,250.00
	Interior Windows	190 Total	41,000.00
	12"x 12" Beige/red Vinyl Floor Tile/Mastic	41,000 SF	205,000.00
	12"x 12" Old Tan Vinyl Floor Tile/Mastic	5,000 SF	25,000.00
	12"x 12" Grey Vinyl Floor Tile/Mastic	5,000 SF	25,000.00
	Blackboards	150 Total	30,000.00
	Hidden ACM	Unknown	25,000.00

Location	Material	Approximate Quantity	Cost Estimate ($)
	Miscellaneous Hazardous Materials	Unknown	25,000.00
Gymnasium	Hardwood Floor and Paper	9,500 SF	95,000.00
Stage	Hardwood Floor and Paper	800 SF	8,000.00
Science Room	Transite Panels	100 Sf	1,000.00
Exterior	Transite Sewer Pipes	Unknown[1]	50,000.00
	Roofing Materials	133,151 SF	399,453.00
	Damproofing on Exterior/Foundation Walls	3,000 Tons[2]	450,000.00
PCB's Remediation[3]			50,000.00
Estimated costs for ACM Inspection and Testing Services			9,500.00
Estimated costs for PCB's Testing and Abatement Plans Services[3]			25,000.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			133,797.00
		Total:	**1,600,000.00**

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

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

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

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

5.0 LIMITATIONS AND CONDITIONS:

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

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

Inspected By:

Jason Becotte
Asbestos Inspector (AI-034963)

Asbestos Identification Laboratory

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

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

Batch: 19190

NVLAP®
Lab Code: 200919-0

January 23, 2017

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

Project Number:
Project Name: Gavin Middle School, Canton, MA

Date Sampled: 2017-01-18
Work Received: 2017-01-19
Work Analyzed: 2017-01-20

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

Dear Ammar Dieb,

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

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

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

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

Thank you Ammar Dieb for your business.

Michael Manning
Owner/Director

January 23, 2017

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

Project Number:
Project Name: Gavin Middle School, Canton, MA

Date Sampled: 2017-01-18
Work Received: 2017-01-19
Work Analyzed: 2017-01-20

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
1 / 214275	Hard Joint Insulation	Boy's Locker Room	gray	Mineral Wool 35 Non-Fibrous 65	None Detected
2 / 214276	Hard Joint Insulation	Girl's Locker Room	white	Mineral Wool 25 Non-Fibrous 75	None Detected
3 / 214277	Hard Joint Insulation	2nd Floor AC	white	Mineral Wool 35 Non-Fibrous 65	None Detected
4 / 214278	Black Sink Coating	Room 106	black	Non-Fibrous 100	None Detected
5 / 214279	Black Sink Coating	Room 106	black	Non-Fibrous 98	Detected Chrysotile 2
6 / 214280	Gray Sink Coating	2nd FL Faculty Room	gray	Cellulose 20 Non-Fibrous 80	None Detected
7 / 214281	Gray Sink Coating	2nd FL Faculty Room	gray	Cellulose 20 Non-Fibrous 80	None Detected
8 / 214282	Spray-On Fire Proofing	3rd Floor AC	white	Mineral Wool 60 Non-Fibrous 40	None Detected
9 / 214283	Spray-On Fire Proofing	3rd Floor AC	white	Mineral Wool 60 Non-Fibrous 40	None Detected
10 / 214284	Spray-On Fire Proofing	3rd Floor AC	white	Mineral Wool 60 Non-Fibrous 40	None Detected
11 / 214285	Spray-On Fire Proofing	2nd Floor AC	white	Mineral Wool 60 Non-Fibrous 40	None Detected
12 / 214286	Spray-On Fire Proofing	2nd Floor AC	white	Mineral Wool 60 Non-Fibrous 40	None Detected
13 / 214287	Spray-On Fire Proofing	1st Floor AC	white	Mineral Wool 60 Non-Fibrous 40	None Detected
14 / 214288	Spray-On Fire Proofing	1st Floor AC	white	Mineral Wool 60 Non-Fibrous 40	None Detected

FieldID LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
15 214289	Tectum SAT	3rd FL Hall	multi	Cellulose 80 Non-Fibrous 20	None Detected
16 214290	Tectum SAT	3rd FL Hall	multi	Cellulose 80 Non-Fibrous 20	None Detected
17 214291	2x4 SAT	Room 306	multi	Mineral Wool 50 Cellulose 30 Non-Fibrous 20	None Detected
18 214292	2x4 SAT	Room 203	multi	Mineral Wool 50 Cellulose 30 Non-Fibrous 20	None Detected
19 214293	2x4 SAT	Room 102	multi	Mineral Wool 50 Cellulose 30 Non-Fibrous 20	None Detected
20 214294	Lab Counter Top	Room 328	brown	Non-Fibrous 100	None Detected
21 214295	Lab Counter Top	Room 328	brown	Non-Fibrous 100	None Detected
22 214296	Interior Window Glaze	3rd Floor Hall	brown	Non-Fibrous 98	**Detected** **Chrysotile 2**
23 214297	Interior Window Glaze	2nd Floor Library	brown	Non-Fibrous 98	**Detected** **Chrysotile 2**
24 214298	Interior Window Glaze	1st Floor Locker Room	brown	Non-Fibrous 98	**Detected** **Chrysotile 2**
25 214299	12x12 VFT Beige w/ Red Fleck	Stairwell	white	Non-Fibrous 98	**Detected** **Chrysotile 2**
26 214300	12x12 VFT Beige w/ Red Fleck	Room 306	white	Non-Fibrous 95	**Detected** **Chrysotile 5**
27 214301	12x12 VFT Beige w/ Red Fleck	Room 203	white	Non-Fibrous 98	**Detected** **Chrysotile 2**
28 214302	Black Mastic	On #25	black	Non-Fibrous 95	**Detected** **Chrysotile 5**
29 214303	Black Mastic	On #26	black	Non-Fibrous 90	**Detected** **Chrysotile 10**
30 214304	Black Mastic	On #27	black	Non-Fibrous 90	**Detected** **Chrysotile 10**
31 214305	12x12 VFT Newer White	3rd FL Hall	white	Non-Fibrous 100	None Detected
32 214306	12x12 VFT Newer White	2nd FL Hall	white	Non-Fibrous 100	None Detected

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
33 / 214307	12x12 VFT Newer White	1st FL Hall	white	Non-Fibrous 100	None Detected
34 / 214308	Yellow Glue	On #31	yellow	Non-Fibrous 100	None Detected
35 / 214309	Yellow Glue	On #32	yellow	Non-Fibrous 100	None Detected
36 / 214310	Yellow Glue	On #33	yellow	Non-Fibrous 100	None Detected
37 / 214311	12x12 VFT New Tan	Room 101	gray	Non-Fibrous 100	None Detected
38 / 214312	12x12 VFT New Tan	Room 102	gray	Non-Fibrous 100	None Detected
39 / 214313	Yellow Glue	On #37	yellow	Non-Fibrous 100	None Detected
40 / 214314	Yellow Glue	On #38	yellow	Non-Fibrous 100	None Detected
41 / 214315	12x12 VFT Old Tan	Room 104	tan	Non-Fibrous 98	Detected Chrysotile 2
42 / 214316	12x12 VFT Old Tan	1st FL Hall by Locker Rooms	tan	Non-Fibrous 98	Detected Chrysotile 2
43 / 214317	Black Mastic	On #41	black	Non-Fibrous 90	Detected Chrysotile 10
44 / 214318	Black Mastic	On #42	black	Non-Fibrous 90	Detected Chrysotile 10
45 / 214319	Gray 12x12 VFT	Cafe	gray	Non-Fibrous 98	Detected Chrysotile 2
46 / 214320	Gray 12x12 VFT	Cafe	gray	Non-Fibrous 98	Detected Chrysotile 2
47 / 214321	Black Mastic	Cafe	black	Non-Fibrous 85	Detected Chrysotile 15
48 / 214322	Black Mastic	Cafe	black	Non-Fibrous 85	Detected Chrysotile 15

Monday 23 January

Analyzed by:

End of Report

Batch: 19190

CHAIN OF CUSTODY

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

PLM
48-hour TAT

Town/City: Canton, MA Building Name Galvin Middle School

Sample	Result	Description of Material	Sample Location
1		Hard Joint Insulation	Boys locker room
2		"	Girls locker room
3		"	2nd Floor AC
4		Black sink coating	Room 106
5		"	"
6		Gray sink coating	2nd Fl. Faculty room
7		"	"
8		Spray-on Fire Proofing	3rd floor AC
9		"	"
10		"	"
11		"	2nd floor AC
12		"	"
13		"	1st floor AC
14		"	"
15		Tectum SAT	3rd fl. Hall
16		"	"
17		2x4 SAT	Room 306
18		"	Room 203
19		"	Room 102
20		Lab Counter top	Room 328

Reported By: Jason Becotte Date: 1-18-17 Due Date: _____

Received By: [signature] Date: 1/19/17

CHAIN OF CUSTODY

PLM

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

Town/City: Canton, MA Building Name Galvin Middle School

Sample	Result	Description of Material	Sample Location
21		Lab countertop	Room 328
22		Interior window Glaze	3rd floor Hall
23		"	2nd floor Library
24		"	1st floor Locker room
25		12x12 VFT Beige w/Red Fleck	Stairwell
26		"	Room 306
27		"	Room 203
28		Black mastic	on # 25
29		"	on # 26
30		"	on # 27
31		12x12 VFT newer white	3rd Fl. Hall
32		"	2nd Fl. Hall
33		"	1st Fl. Hall
34		yellow glue	on # 31
35		"	on # 32
36		"	on # 33
37		12x12 VFT new tan	Room 101
38		"	Room 102
39		Yellow Glue	on # 37
40		"	on # 38

Reported By: Jason Becotte Date: 1-18-17 Due Date: ____

Received By: ____ Date: ____

CHAIN OF CUSTODY

PLM

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

Town/City: Canton, MA Building Name Galvin Middle school

Sample	Result	Description of Material	Sample Location
41		12x12 VFT Old Tan	Room 104
42		1 1	1st fl. hall bg Locker rooms
43		Black mastic	on # 41
44		1 1	on # 42
45		Gray 12x12 VFT	Cafe
46		1 1	|
47		Black mastic	|
48		1 1	|

Reported By: Jason Becotte Date: 1-18-17 Due Date: ----------

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

FOODSERVICE EQUIPMENT ASSESSMENT

MIDDLE SCHOOL KITCHEN

The Galvin Middle School kitchen serves a population of approximately 790 students in grades 6 through 8th. The physical space is original in many instances with some newer equipment added over time. The floor finish within the kitchen area has held up well but signs or wear are visible. The ceiling is original and not up to the modern standards of a smooth washable tile. The floors are constructed of a high quality quarry tile and walls consist of very nice glazed tile that has held up well.

The district Foodservice Director indicted that the walk in cooler and freezer refrigeration system was recently replaced. However, the wall panels are original with indications that doors have been replaced in one case and the gaskets on the remaining door is failing.

Base on feedback from the operator the future goals of the middle school foodservice program is to move away from the cafeteria line and mimic what is present at the Canton High School servery. At the middle school grade levels it is customary to move away from the standard cafeteria line and move to a more free flow servery. At these grades students are able to quickly identify the food options and make selections and proceed through the serving process.

Other observations:

Specific Issues	*Recommendations*
The clothes washer is in among the foodservice zone. Adjacent to the washer is a chest freezer (Figure 1). Non food functions such as hand towel and mop head washing must be segregated to prevent cross contamination of food or food contact surfaces.	Future renovation must include appropriate separation of functions. Presently, the availability of power, water supply, and drainage is driving the placement of these units.
The ceiling finished are outdated and require kitchen rated ceiling tiles in order to comply with current health code standards (Figure 2).	Replace the tile with the appropriate tile rated for a kitchen environment. Tiles must be smooth and washable.
Figure 3 and 4 are images of the transition point between the kitchen and the walk-in cooler. The floor is degrading at the transition point and the cove base at the wall is separating from the cooler wall.	Provide a threshold at the transition point. Repair failing gaskets and repair the coving .
The shelving shown in Figure 5 is outdated. Modern standards require that shelved be compliant with health code meaning it is NSF certified as a unit that can be used to store food and is easily cleaned.	Replace shelving with NSF certified shelving.
Due to a lack of sufficient work surfaces standard school desks are being used to house a microwave oven (Figure 6).	Replace with an NSF certified table that is constructed to be used in a foodservice environment. For example non corrosive stainless steel construction and coved transitions at back splash transitions.
The exhaust hood is original. Beyond the opening is a mesh filter system. Mesh filters are no longer allowed. Additionally, it is not clear that the filter can be removed for cleaning (Figure7).	Replace the hood with a modern code compliant hood. A new hood will have adequate lighting with removable filters that are easily cleaned to prevent the buildup of grease.

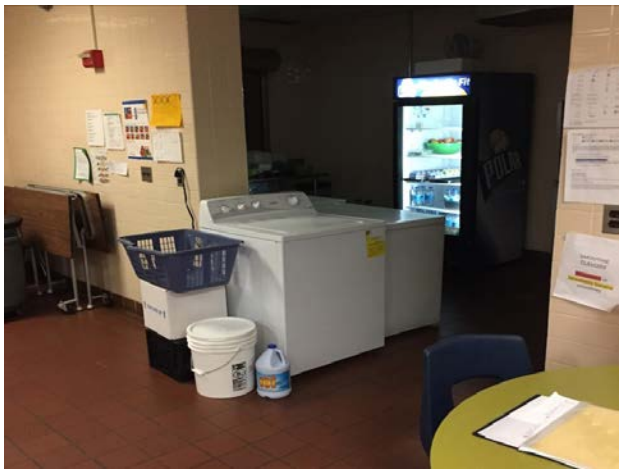


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Specific Issues	*Recommendations*
The prep sink shown in Figure 8 has a direct connection to the sanitary drain system. The local, state, and national health codes require that the drain lines from food preparation sinks be air gapped so that waste backups do not contaminate food contact surfaces.	To remedy this condition a floor sink is required. Installing a floor sink will mean trenching to allow for running of plumbing waste lines nearby sanitary waste line.
The knife holder is a hand made item constructed of wood. Wood is not a suitable material for a kitchen environment. (Figure 9).	Replace with a commercially made NSF compliant knife storage cabinet.
The serving line in Figure 10 is no longer adequate to server the modern school lunch. The sneeze guards are no longer code compliant and completely missing in certain areas.	New serving counters are needed. New counters will address the ability to serve food at proper temperatures and address the lack of the sneeze shields.
Wood in a kitchen environment is only allowed when used as part of certain baking functions. As seen in Figures 11 and 12 the wood seen has begun to degrade and it not being used in a baking function.	Replace the serving counter with one built to modern NSF standers . NSF standards require that food contact surfaces be smooth, durable, and easy to clean. They are also typically made of non corrosive stainless steel.

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

TECHNOLOGY ASSESSMENT

DATA/TELEPHONE/INTERCOM/CLOCKS

The schools MDF room is located on the second floor near the Student Resource Center. The room contains dedicated cooling and is adequate in size. The data cabling is CAT 5 throughout. The MDF room is the center of a star topology with 12 strands of multi-mode fiber run to four IDF rooms (Figure 1). The Galvin School is connected to a district WAN where the High School is the hub.

In general, the network is in good condition, technology has been added over time to accommodate new equipment which means most of the data is run surface mounted in surface raceways.

Wireless coverage seems to be adequate in a majority of the school. In general, Ruckus wireless access nodes are installed on the ceilings in corridors.

The video distribution system consists of a coax distribution system with central VCRs and cable in the head end room (Figure 3). This type of system is antiquated. There are TV monitors in classrooms which are also antiquated and should be replaced with current technology (Figure 5).

Most classrooms are equipped with teacher workstations that are connected to wall mounted projectors, the cabling is done in surface mounted raceways. Docking cameras are utilized in the classroom to display information on the projection screen.

The telephone system is a Mitel VOIP system 3300 CXII controller that has recently been installed and is consistent throughout all the school buildings (Figure 2). There is one analog public line in the administration area for students to make outside calls.

The classroom intercom system is a Rauland telecenter and is in good conditions, classrooms contain a combination speaker and digital clock. (Figure 4)

Portable local sound systems are utilized for the gym, and cafetorium. There is no A/V systems in these spaces.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Specific Issues	*Recommendations*
CAT 5 cabling is used throughout for tel/data wiring.	CAT 5 is adequate for the short term. As technology increases and bandwidth requirements increase at a minimum the wireless access node outlets and teacher stations should be upgraded to CAT 6 or CAT 6A.
TV monitors with VCRs are located in classrooms	All antiquated TV monitors should be removed and replaced with up to date display technology.
The existing video distribution is central VCR's disturbing video over coax.	This is an antiquated technology that is limiting functionality. Data should be installed at projector locations to accommodate streaming video to the classrooms.

SECURITY SYSTEM

The School is equipped with an intrusion detection system which consists of door contacts, motion sensors, keypads and a control panel (Figure 6). The manufacturer of the intrusion system is DSC. The system is operational and in fair condition.

The School is equipped with CCTV system that consists of 25 cameras. The cameras are analog type and manufactured by Hikvision (Figure 7). There are (2) 16 channel Hikvision NVRs located in the MDF room (Figure 9). Cameras are generally located indoors in corridors with only two noted outside.

The School s equipped with a two way door intercom system at the main entry manufactured by Aiphone. There is an audio only intercom station outside the main entry and two master stations, one at each administration desk (Figure 8). The main entry door can be unlocked using the Aiphone master station.

Specific Issues	*Recommendations*
The CCTV system is analog and there is minimal exterior coverage.	The current system is in good condition however, analog cameras have become obsolete. There is minimal exterior camera coverage additional cameras should be added and they should be IP type.
There is no access control system.	An access control system should be provided at key entry points and at areas in the building that can help partition the building for after hours activities and lock down situations. The platform should be rolled out and standardized for all school buildings.

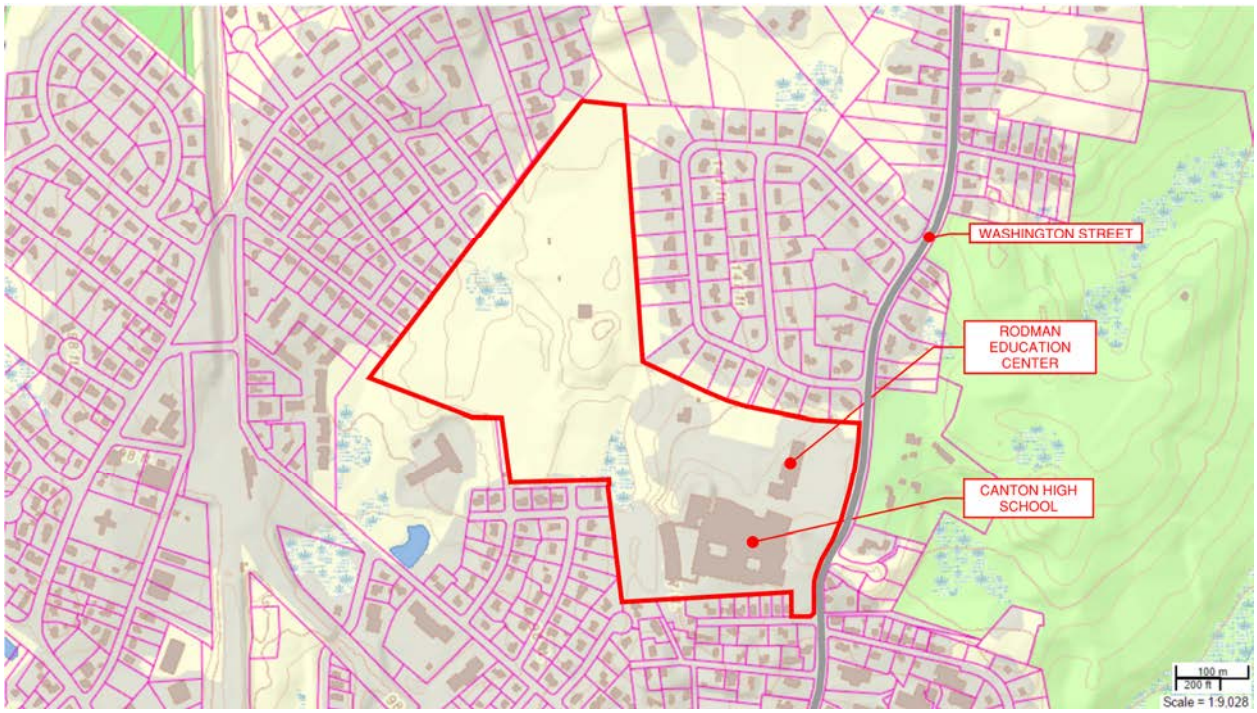
Figure 7

Figure 8

Figure 9

CANTON HIGH SCHOOL - EXISTING CONDITIONS ASSESSMENT SUMMARY

SITE CONTEXT—HIGH SCHOOL AND RODMAN BUILDING



Map 1—MA GIS map of Canton High School site, with Rodman Educational Center

Map 2—MA GIS aerial image of Canton High School site, with Rodman Educational Center

GENERAL DESCRIPTION

Canton High School is a grade 9-12 high school located on Washington Street, a short walk from the downtown center of Canton. The site is characteristic of the locale, being uneven terrain of moderate to steeper slopes, downward from east to west, with visible rock ledge outcrops in several places around the site. The site is approximately 51.43 acres (MA GIS measurement) and includes Town park facilities and a multi-sport stadium with concession/toilet building. (Maps 1, 2)

The school's gross floor area is 265,603 GSF and was built in two main parts : 1959, and a major renovation/ addition in 2007. The two periods of construction are somewhat intermixed, the central portion for the most part being the '59 construction, with the '07 construction added on or infilling spaces in the original figure. The main entrance lobby is from '07, with the gymnasium to its right from '59 (Figure 1). The cafeteria was an '07 addition (Figure 2). The library was a gut renovation of a '59 portion (Figure 3). A large classroom wing, known as "C Wing" was built into the side of the considerable slope on the site, and is from '59 (Figure 4). The rear of the building, viewed from the south, is a mixture of '07 infill elements between and around '59 sections (Figure 5). The Auditorium (not pictured here) was a gut renovation of '59 elements.

The building's floor levels in the various wings and segments vary considerably, resulting in many interior level changes within an overall story of the building, usually accomplished with stairs and ramps, or ramps alone. Overall the main body of the school is two stories (going up from the main level), with the hillside classroom "C Wing" being three stories (going down from the main level). Two elevators serve the two-story portion and the three-story hillside portion respectively. The gross floor area of the building is as follows:

Level 4	Upper level of main building	60,183 sf
Level 3—Entry	Main Level, including C Wing Upper	160,155 sf
Level 2	C Wing Middle + Mech Room	30,128 sf
Level 1	C Wing lowest	15,137 sf
Total		265,603 GSF

The building construction is similar between the two main eras of construction, having CIP concrete foundations, slab-on-grade, steel superstructure with concrete slab-on-deck over steel joists, and steel roof deck over steel joists. An initial Regulatory Assessment is included herein.

Current enrollment is 941 students in grades 9-12 as of October 1, 2016. Peak staff during the day numbers approximately 145 people.

Typical for all the buildings in this report, the building survey was conducted on November 14-15, 2016. Weather was fair and pleasant with temperature in the upper 50's on the 14th, and cool and rainy on the 15th, allowing a variety of conditions to be observed. Note that eastern Massachusetts had been experiencing prolonged drought conditions throughout the winter, spring, and summer of 2016, so ground conditions were very dry.

Figure 1—North front– Main Entrance of school

Figure 2—North-eastern Cafeteria wing

Figure 3—Northwestern library wing and link

Figure 4—West classroom wing built into hillside

Figure 5—South façade

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INTRODUCTION

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

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

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

Main portion of High School (Wings A-F)	$25,378,000
G Wing (curved 3-story element)	$7,208,600
Total—Full and Fair Cash Value	$32,586,600

This value will be used later in this Assessment to calculate the applicable compliance thresholds.

The gross floor area (GFA) of the building is 247,803 SF.

The Existing Building Code uses the type of work and the affected area to determine when increasing levels of compliance are required. When considering a proposed scope of work for the building, a careful consideration of the various degrees of compliance will need to be considered. Refer to the Regulatory Overview section of this report for a more detailed description of the various compliance paths outlined in the Existing Building Code.

THE INTERNATIONAL EXISTING BUILDING CODE (IEBC)

The Performance Compliance path described in the IEBC provides a simple yet comprehensive over-

view of the general life safety aspects of a building. Although designed as a building code compliance path, it can also be used as an assessment tool. This assessment will utilized the value and scoring based method of the Performance Compliance path to assign a score to the building as it is currently configured and maintained. The systems and basis for scoring are based on the building code for new construction (the International Building Code or IBC) and scores are determined by the degree of compliance with the IBC for various systems. Similar to previous comments, a failing score in any category as part of an assessment does not compel any corrective action - it simply indicates how the building would be viewed under current codes. It is intended to illustrated the relative general and life safety performance of the existing building.

The two different major periods of construction (1959 original and 2007 addition/renovation) represent similar construction types as defined in the IBC. Both building eras include skeletal steel structure, and/or noncombustible walls and framing systems, noncombustible interior construction, and exterior non-load bearing walls of masonry. As such, the building would be classified as Type II-B construction per Table 601 of the IBC.

Because the 2007 era is substantially separated from the 1959 original construction, separate evaluation tables were completed for these two portions of the facility. These two separate evaluations are indicated on the following pages, followed by an area-weighted average score for the entire facility.

The final evaluation scores reveal that, due to the relatively small size of the 2007 addition and general full compliance with the current edition of the building code, the building receives the highest fire, egress, and life safety values of any building evaluated as part of this study.

For the 1959 building, the addition of fire walls segregate the large floor area into separate fire areas with respect to allowable area resulting in a relatively minor negative score for the area. This nearly acceptable area coupled with other life safety improvements incorporated during renovations, such as sprinklers, standpipes, and an addressable fire alarm system, afforded the original construction some positive score values, but not enough to result in the minimum passing scores for an educational occupancy.

The area weighted average score—while not an actual methodology prescribed by the code—indicates that the facility when viewed as a whole achieves a nearly acceptable level of fire, egress, and life safety under the Performance Compliance method. The overall configuration of the means of egress systems and components (doors, corridors, stairs) is generally in compliance with the code. Some improvements to life safety features could still be undertaken as part of an alteration project and, depending on the compliance path selected as part of that alteration work, some components may still be required to be upgraded to comply with more specific requirements of the Code.

Table 1401.7 Summary Sheet - Building code - *1959 Original Construction*

Existing Occupancy	E	Proposed Occupancy	E		
Year building was constructed	1959	Number of Stories	2	Height in feet	40 +/-
Type of construction	II-B	Area per floor	149,143/70,611		
Percentage of open perimeter increase	80%				
Completely Supressed	Yes	Corridor wall rating	2 hour/1 hour/ 0 hour		
		Type	Varies		
Compartmentation	No	Required door closers	Yes		
Fire resistance rating of vertical opening enclosures	1 hour				
Type of HVAC system	Unit vents, RTU, FTR	, serving number of floors	2		
Automatic fire detection	Yes	Type and location			
Fire alarm system	Yes	Type			
Smoke control	No	Type			
Adequate exit routes	Yes	Dead ends	No	Length in feet	NA
Maximum exit access travel distance	274 feet	Elevator controls	Yes		
Means of egress lighting	No	Mixed Occupancies	Yes		
Standpipes	Yes	Patient abilty for self preservation	N/A		
Incidental use	Yes	patient concentration	N/A		
Smoke compartment less than 22,500 sq. ft.	No	Attendant-to-patient ratic	N/A		

Safety Parameters	Fire Safety (FS)	Means of Egress (ME)	General Safety (GS)
1401.6.1 Building Height	1	1	1
1401.6.2 Building Area	-1	-1	-1
1401.6.3 Compartmentation	0	0	0
1401.6.4 Tenant and Dwelling Unit Separations	0	0	0
1401.6.5 Corridor Walls	0	0	0
1401.6.6 Vertical Openings	6	6	6
1401.6.7 HVAC Systems	0	0	0
1401.6.8 Automatic Fire Detection	8	8	8
1401.6.9 Fire Alarm System	-3	-3	-3
1401.6.10 Smoke Control	****	0	0
1401.6.11 Means of Egress	****	0	0
1401.6.12 Dead Ends	****	2	2
1401.6.13 Maximum Exit Access Travel Distance	****	5	5
1401.6.14 Elevator Control	0	0	0
1401.6.15 Means of Egress Emergency Lighting	****	****	0
1401.6.16 Mixed Occupancies	0	0	0
1401.6.17 Automatic Sprinklers	6	3	6
1401.6.18 Standpipes	6	6	6
1401.6.19 Incidental Use	0	0	0
1401.6.20 Smoke Compartmentation	0	0	0
1401.6.21.1 Patient Ability for Self-preservation	****	0	0
1401.6.21.2 Patient Concentration	****	0	0
1401.6.21.3 Attendant-to-patient Ratic	****	0	0
Building Score - total value	23	27	30

Table 1401.7 Summary Sheet - Building code - *2007 Addition*

Existing Occupancy	E	Proposed Occupancy	E		
Year building was constructed	2007	Number of Stories	3	Height in feet	40' +/-
Type of construction	II-B	Area per floor	10,178/16,825/19,302		
Percentage of open perimeter increase	60%				
Completely Supressed	Yes	Corridor wall rating	0 hour		
		Type	CMU		
Compartmentation	No	Required door closers	No		
Fire resistance rating of vertical opening enclosures	1 hour				
Type of HVAC system	Unit vent, FTR	, serving number of floors	3		
Automatic fire detection	Yes	Type and location			
Fire alarm system	Yes	Type			
Smoke control	No	Type			
Adequate exit routes	Yes	Dead ends	No	Length in feet	NA
Maximum exit access travel distance	180 feet	Elevatory controls	Yes		
Means of egress lighting	No	Mixed Occupancies	No		
Standpipes	Yes	Patient abilty for self preservation	N/A		
Incidental use	No	patient concentration	N/A		
Smoke compartment less than 22,500 sq. ft.	No	Attendant-to-patient ratio	N/A		

Safety Parameters	Fire Safety (FS)	Means of Egress (ME)	General Safety (GS)
1401.6.1 Building Height	2	2	2
1401.6.2 Building Area	27	27	27
1401.6.3 Compartmentation	0	0	0
1401.6.4 Tenant and Dwelling Unit Separations	0	0	0
1401.6.5 Corridor Walls	0	0	0
1401.6.6 Vertical Openings	4	4	4
1401.6.7 HVAC Systems	0	0	0
1401.6.8 Automatic Fire Detection	8	8	8
1401.6.9 Fire Alarm System	0	0	0
1401.6.10 Smoke Control	****	0	0
1401.6.11 Means of Egress	****	10	10
1401.6.12 Dead Ends	****	2	2
1401.6.13 Maximum Exit Access Travel Distance	****	6	6
1401.6.14 Elevator Control	2	2	2
1401.6.15 Means of Egress Emergency Lighting	****	****	0
1401.6.16 Mixed Occupancies	0	0	0
1401.6.17 Automatic Sprinklers	6	3	6
1401.6.18 Standpipes	12	12	12
1401.6.19 Incidental Use	0	0	0
1401.6.20 Smoke Compartmentation	0	0	0
1401.6.21.1 Patient Ability for Self-preservation	****	0	0
1401.6.21.2 Patient Concentration	****	0	0
1401.6.21.3 Attendant-to-patient Ratio	****	0	0
Building Score - total value	61	75	78

Table 1401.9 Evaluation Formula

1959 Original Construction Evaluation:				Score	Pass	Fail
23	(FS) -	*29*	(MFS)=	-6		X
27	(MS) -	*40*	(MMS)=	-13		X
30	(GS) -	*40*	(MGS)=	-10		X

2007 Addition Evaluation:				Score	Pass	Fail
61	(FS) -	*29*	(MFS)=	32	X	
75	(MS) -	*40*	(MMS)=	35	X	
78	(GS) -	*40*	(MGS)=	38	X	

Area Weighted Average Evaluation:				Score	Pass	Fail
29	(FS) -	*29*	(MFS)=	0		X
35	(MS) -	*40*	(MMS)=	-5		X
38	(GS) -	*40*	(MGS)=	-2		X

SPRINKLER PROTECTION REQUIREMENTS

The entire building is equipped with fully automatic sprinkler systems in compliance with M.G.L. c.148 s.26G. All public schools larger than 7500 Gross Square Feet (GSF) require a sprinkler system to be installed throughout the facility. Any future alterations or additions would require that the sprinkler system be maintained or extended to provide full coverage for the facility.

INTERNATIONAL ENERGY CONSERVATION CODE

As of May 18, 2017, the Town of Canton is now a STRETCH community and as such, alterations to the energy consuming systems or building envelope would be required to comply with the International Building Code Appendix AA: Stretch Energy Code as amended by the State of Massachusetts. This appendix incorporates the International Energy Conservation Code (IECC), 2015 Edition with amendments. The IECC requires that any alteration, renovations, or repairs to an existing building conform to the provisions of the code, but do not require that un-altered portions to comply. Essentially this means that any system or portion of a system that is altered would be designed in compliance with the energy code, but there is no provision that the entire facility be brought into full compliance. The project may incorporate additional energy performance improvements beyond those required by the code.

A Life Cycle Cost Analysis (LCCA) would be required to be conducted for any alterations to an Energy System in accordance with M.G.L. c. 149 s. 44m.

Standards for the Treatment of Historic Structures

The building and property is not listed on, nor is it eligible for listing on the National or State Registry of Historic Places.

ACCESSIBILITY

Canton High School, having undergone a comprehensive renovation/addition project in 2007, is at a very high level of compliance with the accessibility requirements of 521 CMR (The Massachusetts Architectural Access Board, or MAAB Rules). Any proposed new work will be required to comply with those standards as well.

If the cost of any proposed work exceeds $100,000, the code requires that an accessible entrance, toilet room, drinking fountain, and telephone (if drinking fountains and telephones are provided) be provided (all of these elements are already in place), in addition to the compliance requirements of the proposed work. When the cost of work exceeds 30% of the full and fair cash value (calculated above), then the entire facility will be required to comply with the MAAB Rules. For the Canton High School, this 30% threshold dollar value would be $9,775,980.

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

Although the building is generally at a very high level of accessibility when compared to peer institutions of similar age, a couple of deficiencies or non-compliant conditions were noted. If a major alteration exceeding the 30% threshold were undertaken, all of these items would require correction.

Specific Issues	*Recommendations*
An accessible route is provided from accessible parking spaces to the main entrance, including curb ramps that appear to comply with slope requirements. (Figures 1 –2) There is a gentle grade from the bus drop off loop to the main entrance that appears to comply with slope requirements for accessible route. (Figures 2-3) Pavement is generally in good to very good condition.	No Action Required.
Total parking for the high school is 180 spaces, all paved & striped. In addition, there are seven (7) marked, signed accessible spaces, one of which is van -accessible. MAAB specifies six (6) accessible spaces for total parking between 151 – 200 spaces (Figure 4)	No Action Required.
The main entrance, composed of three pairs of 36” wide doors, has a call button/ intercom at accessible height, a motorized operator on one set of doors, and the actuator button all accessible (Figure 1). There is an interior vestibule door set that complies with minimum distance from the outer set of doors.	No Action Required.

Figure 1—Accessible entrance

Figure 2—Accessible route from bus drop off loop

Figure 3—Accessible route to bus drop-off loop

Figure 4—Accessible route from H/C parking spaces

ACCESSIBILITY (CONTINUED)

Specific Issues	*Recommendations*
There are four courtyards in this school, three of which are accessed by the general public, and one which is essentially a light-well. All the public courtyards are accessible, with exits at grade and level and moderately-sloped walks in very good condition (Figure 5).	No Action Required.
Sections of the building built at different times or at different grades have interior corridor grade changes. This confluence of four major corridors pictured has a short stair with rail details constructed the MAAB standards, and an elevator nearby (Figure 6).	No Action Required.
The main corridor grade change shown in Figure 6 is handled by this front-to-back through-cab elevator, which does not provide the minimum accessible cab dimensions, but does have controls at proper height, and a 36" wide doorway (Figure 7).	Because this is a front-to-back cab configuration, it may be reasonable to assume that a wheelchair-bound person would not need to turn around in the cab. The building manager is advised to check the 2007 code analysis for guidance on this. A variance may have been obtained for this older elevator cab.
The same grade change in a different part of the building is handled by this motorized stair lift, which appears to be in good working order and condition. Also note proper stair rail details. (Figure 8)	No Action Required.
A third solution to the same grade change is to pair an accessible ramp with the compliant stair within the width of the corridor. Again, note compliant railing designs, intermediate landing, and nonslip floor finish surfaces. The corridor to the left of this photo had an accessible ramp across its entire width. (Figure 9)	No Action Required.
It appears that doors in the '59 wings of the building were altered during the 2007 renovation to be accessible. Typically classroom doors swing out into the corridor, and have 18" of clearance on the pull side, and at least 12" on the push side due to closers on these doors. Note that the floor pattern coincides with the door swing, a helpful guide so that users can avoid getting hit with a door in the face if it should suddenly open. (Figure 10)	No Action Required.

Figure 5—accessible outdoor courtyard

Figure 6—Grade change in main corridor

Figure 7—Elevator

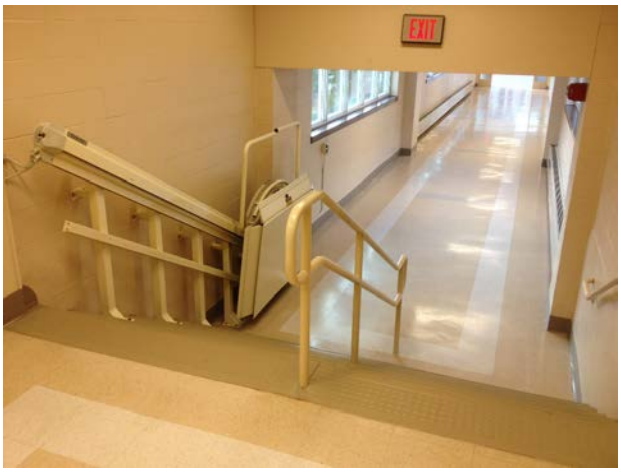


Figure 8—Grade change with motorized stair lift

Figure 9—Corridor grade change w/ accessible ramp

Figure 10—Typical door maneuvering clearances

ACCESSIBILITY (CONTINUED)

Specific Issues	*Recommendations*
Toilet rooms in the '59 sections of the building appear to have been brought into MAAB compliance during the 2007 renovation. All toilet rooms featured accessible stalls, compliant clearances and maneuvering spaces, and compliant equipment. (Figure 11)	No Action Required.
Some gang toilet rooms feature under-mounted sinks in countertops. Counter height, maneuvering clearances for front approach, apron dimension, knee clearance, pipe insulation, faucet wrist blades, mirrors, and accessories all appear to be in compliance. (Figure 12)	No Action Required.
Kitchenettes and other casework with sinks, such as in Science Labs, are accessible. Counter height, maneuvering clearances for front approach, apron dimension, knee clearance box-out, faucet wrist blades, and accessories all appear to be in compliance. However, in this kitchenette there are two microwaves, and both are out of reach range (Figure 13)	Provide countertop microwave if this kitchenette is used by a wheelchair user.
Single user toilet rooms appear to be in compliance. All toilet rooms feature compliant clearances and maneuvering spaces around fixtures, and compliant accessory placement and control dimensions. (Figure 14)	No Action Required.
Drinking fountains in the building are of two types: the integral cooler hanging off the wall, and the cooler within the wall and projecting fountain (shown in Figure 15). Both meet MAAB dimensional requirements.	No Action Required.

Figure 11—Accessible toilet stall

Figure 13—Accessible kitchenette

Figure 12—Accessible sink top

Figure 14—Accessible single-user toilet room

Figure 15—Accessible fountains

ACCESSIBILITY (CONTINUED)

Specific Issues	*Recommendations*
The grade change in the Main Lobby is negotiated with a compliant ramp that is paired with the stair at the end of the space. (Figure 16)	No Action Required.
The auditorium has accessible wheelchair positions at several locations around the hall. The ones in the back are level, protected by railings, and feature fixed companion seating. (Figure 17)	No Action Required.
Though not ideal, the accessibility of the stage requirement is met with the installation of a lift at stage left. A ramp is the preferred means of access, but may have been structurally impractical in the recent renovation. (Figure 18)	No Action Required.
The accessible wheelchair positions located in the middle of the seating does not have a level floor. This may have been a compromise of the renovation, as leveling would be functionally and structurally impractical, but technically does not meet the requirement. (Figure 19)	No Action Required.
Side aisles are equipped with dual-height handrails in compliance with the ramp requirements. (Figure 20)	No Action Required.

Figure 16—Main Lobby accessible ramp

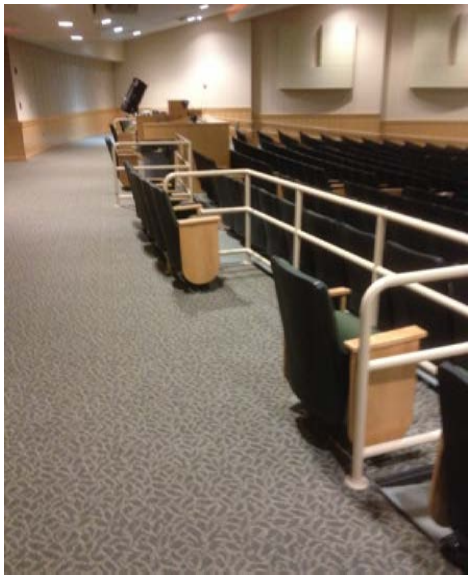


Figure 17—Auditorium: accessible positions

Figure 18—Auditorium: accessible positions

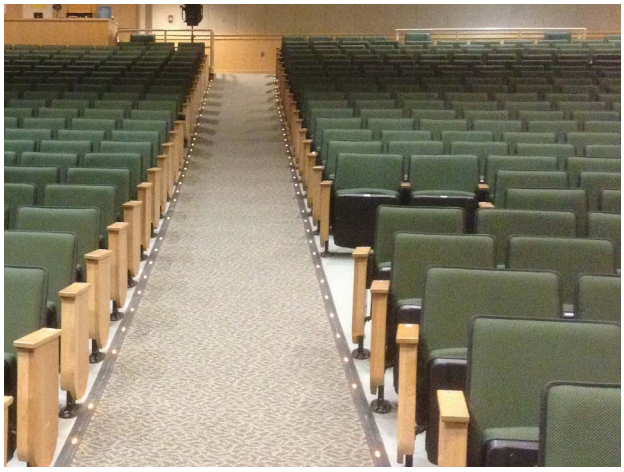


Figure 19—Auditorium: non-level H/C position

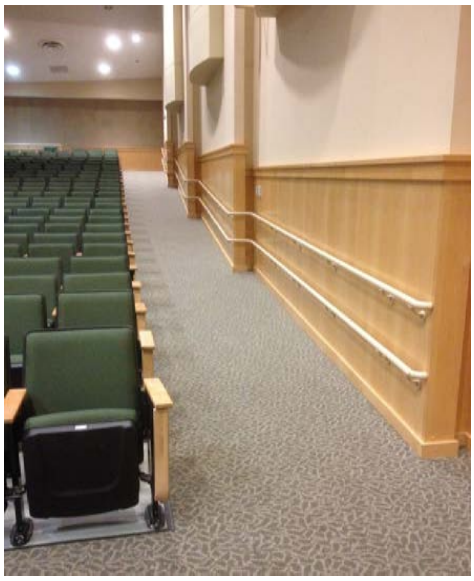


Figure 20—Auditorium: compliant ramp

CIVIL ENGINEERING ASSESSMENT

GENERAL SITE DESCRIPTION

Nitsch Engineering has performed research of the existing site conditions at the Canton High School located at 900 Washington Street in Canton, Massachusetts. This includes the athletic facilities; the football/track, baseball, softball and multi-use fields. Nitsch Engineering used Canton GIS and design drawings provided by the owner. Nitsch Engineering gathered information during a site visit conducted by Madeline DeClerck, EIT on Monday November 14, 2016.

The Site is bounded by Washington Street to the east, the Rodman Building to the North, Lewis Street (and multiple other residential streets) to the South, and the athletic fields to the northwest. There are two paved asphalt entrances to the site from Washington Street and an entrance to the student parking/athletic facilities off of Reynolds Street.

Parking is available at multiple lots on campus, none of which were observed to be full at the time of the site visit. It does not appear that there is a need for additional parking. Signage for parking and drop off areas were observed and appeared to be adequate in delineating parent and bus drop off locations.

SOILS

Soils on site consist of Canton fine sandy loam, 8 to 15 percent slopes, Udorthents loamy, and Charlton-Hollis-Urban land complex, 3 to 15 percent slopes.

PAVEMENT/CURBING

Specific Issues	*Recommendations*
The asphalt pavement within the site is in generally fair condition with some areas of cracking and deterioration (Image 1-3).	Pavement on site is sufficient for current needs, but crack sealing of existing pavement should occur within the next 5 years and a mill and overlay within the next 15 years.
There is some vertical granite curb and concrete curb onsite. The condition of the curb varies throughout the site. Some curb is in good condition and some is in poor condition and has been damaged (Image 4).	Replace sections of curb that are damaged.

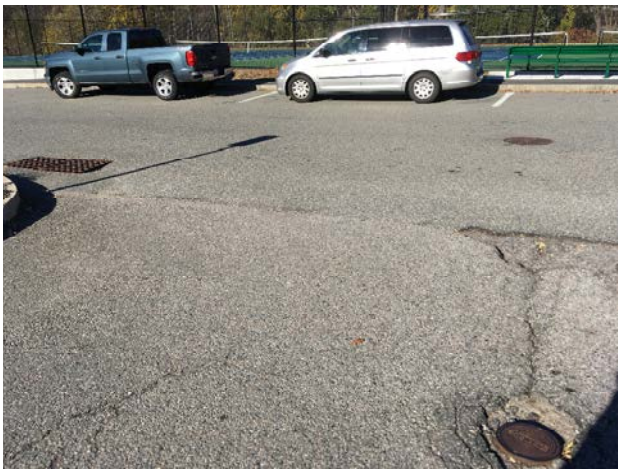


Image 1

Image 2

Image 3

Image 4

STORMWATER

According to civil utility design plans completed by Graves Engineering, Inc. the existing roof drainage from the high school is collected into the underground detention system #2 in the north parking lot. This stormwater exits the detention system through a outlet control structure, combines with onsite drainage and is collected in a 24-inch reinforced concrete pipe (RCP). The 24-inch pipe runs along the west of the Rodman Building along the south side of the residential homes on Wildewood Drive (to the north of the high school tennis courts). According to the Canton Stormwater Base Map dated June 2013, the 24-inch RCP pipe discharges at an MS4 outfall to the northeast of the High School. This outfall is hydrologically connected to a wetland to the south and to the north.

The remainder of the site; the foundation drainage, courtyard, and storm run off south of the High School are collected in a closed drainage system and conveyed through a 12-inch drain line and a series of manholes to the west of the High School. The drain line is routed west to a field along the west driveway and enters the underground detention field #1. This stormwater is treated through a vortechnics water quality structure and is discharged to a wetland with a rip rap apron, according to the Massachusetts Department of Environmental Protection (DEP) wetland GIS map. The parking lot drainage is also collected, passes through a water quality structure and discharged at the rip rap apron.

The site does not likely meet the current Massachusetts DEP Stormwater Standards.
Future development or upgrades to the high school site will likely require conformance to the Massachusetts DEP Stormwater Standards with the implementation of stormwater detention and water quality requirements as well as any additional standards set by the Town of Canton. Any development within 100 feet of a Massachusetts jurisdictional wetland will require permitting through the Canton Conservation Commission and the Massachusetts DEP. No future work will be allowed within 25 feet of the wetlands.

Specific Issues	*Recommendations*
The site stormwater is collected in a closed drainage system. This includes catch basins, drain manholes, underground piping, and stormwater control infrastructure. Catch basins and the water quality units should be cleaned and maintained to perform properly and maintain the water quality of the Stormwater discharged to the municipal drainage system or to wetlands (Image 5-8).	All catch basins should be inspected and cleaned at least four times per year; water quality structures and detention or infiltration systems should be inspected at least once per year and cleaned as necessary or as specified by the manufacturer.
There is a drainage swale outside the outfield fence of the baseball field. IT was observed that part of the swale was gravel, but the majority of the swale is grass (Image 9 and 10).	The gravel in the swale should be cleaned and maintained, and the grass swale should be cleared of debris (leaves or equipment) when necessary.

Image 5

Image 6

Image 7

Image 8

Image 9

Image 10

SANITARY SEWER

According to civil utility design plans completed by Graves Engineering, Inc. there are five (5) existing sanitary sewer services and one (1) kitchen waste service from the High School. The 8-inch kitchen waste service is discharged to the grease trap located to the northeast of the High School and continues ease, combines with the Rodman Building sanitary sewer and discharges to the 8-inch sanitary sewer main in Washington Street. After discussion with the Director of Facilities, there was no indication of sanitary sewer issues for the High School.

Specific Issues	*Recommendations*
The grease trap shall be cleaned and maintained in order to function properly.	We recommend cleaning the grease trap on annual basis.

WATER

According to civil utility design plans completed by Graves Engineering, Inc. there are two existing 6-inch domestic water services and an 8-inch fire protection services entering the High School Building. One domestic water service enters the northwest corner of the building is original to the High School (1959). The second domestic water and the fire protection services enters the building on the south face, were constructed in 2007.

Specific Issues	*Recommendations*
Fire hydrants were observed on site.	We recommend flushing of hydrants on a regular basis.

GAS

The gas service enters the building at the south face, size unknown, connects to the 3-inch gas service in Washington Street. There was no indication that the facilities experienced any issues with the gas service.

STRUCTURAL ASSESSMENT

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 visit on November 14, 2016. During the visit, we did not remove any finishes or take measurements; so, our understanding of the structure is limited. Drawings for the existing structure were not available at the time this report was written.

EXISTING CONDITIONS

The Canton High School is essentially a two story academic structure with a Gymnasium, Library and Auditorium. The original school was constructed in 1959 with a major addition and renovation completed in 2007. The structure is performing well for the most part. The majority of the 2007 structure consists of composite slabs on steel beams spanning between steel columns, brace frames and masonry walls. The gym roof construction consists of metal roof deck on long span metal joists spanning between the perimeter walls. Expansion joints separate the building into multiple structures.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

UPPER FLOORS AND ROOFS

We observed ceilings and noted various areas of minor water staining.

We observed the west curved classroom structure in the 1959 portion of the high school. The construction consists of hollow structural steel columns on the exterior, and the wall construction consists of concrete masonry block.

We observed the concrete masonry block walls and noted light cracking. The light cracking is due to shrinkage and is not a structural concern. A crawlspace exists under the lowest level and cast in place concrete walls and floor structures were noted. Signs of past repairs were observed as evidenced by debris from coring.

We observed expansion joints throughout the structure that appeared to be performing well.

We observed visible portions of the roof structure at the stage and noted steel framing and masonry wall infills that appeared to be in sound condition.

Solar panels cover approximately 50% of the roof area. Masonry block popup roofs were observed with light shrinkage cracking and scaling paint.

Specific Issues	*Recommendations*
We observed interior masonry walls and did not note any anchorage to the floor or roof structure at the top.	When a future renovation is planned, we would recommend installing seismic clips to brace the tops of all masonry walls.
We observed interior masonry walls and noted some separation at joints, especially at the stair wells. We also noted hairline vertical cracks in various locations including 3/8”wide cracks in the partition walls in the cafeteria.	We would recommend sealing the cracks, monitoring the cracks and notifying the architect if cracks continue to form in the cafeteria.
On the roof, we observed roof drains and did not note any major debris or clogs. We observed light debris around various drain bodies	We would recommend cleaning out all roof drains.

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

FOUNDATIONS AND FIRST FLOOR

In the corridor near the cafeteria, we observed the first floor and noted signs of past repairs to the flooring including tape over flooring joints. This is not a major structural concern.

Specific Issues	*Recommendations*
We observed the concrete slab on grade in the boiler room and noted hairline cracks, light cracking and heavy cracking that is not a structural concern. We observed similar cracks in the concrete slab on the exterior of the building, on the other side of the door.	We would recommend sealing cracks in the concrete slab on grade to resist moisture and chemical infiltration. We would recommend flash patching where different elevations present a tripping hazard.
In the basement weight lifting room, we observed round concrete columns supporting concrete beams and concrete first floor slabs. From the underside of the concrete slab, we observed light to moderate cracking with efflorescence. In various isolated areas, we observed rusting metal deck.	Further investigation would be required to determine the severity of the deterioration to the floor structure in these locations.
From the basement, we observed utility tunnels and crawlspaces that appeared to be in good structural condition for the most part.	We would recommend sealing any cracks in the first floor concrete slab structure where active leaks and efflorescence are found.

EXTERIOR

We observed control joints in the red brick façade and noted that the joint material was in fair condition.

Specific Issues	*Recommendations*
We observed exterior cast in place concrete retaining walls and noted rust staining emanating from the base of railing posts. We observed the metal railing on top of the retaining wall and noted moderate deterioration to the post bases.	We would recommend removing loose material and painting the steel to prolong the serviceable life of the railing structure.
We observed the exterior façade of the 1959 structure and noted exposed concrete foundation walls that exhibited concrete spalling and exposed reinforcing steel.	We would recommend cleaning loose debris from the façade and coating the exposed reinforcing with a bonding agent and a cementitious patch.
We observed steel lintels in the masonry façade of the 1959 structure and noted signs of moderate rusting.	We would recommend routine maintenance which would include cleaning the lintels with a wire brush and painting to prolong the life of the lintels.
We observed cast in place concrete at the loading dock and noted moderate cracking.	We would recommend repairing cracks in the loading dock which would include removing loose material and sealing the cracks.

Figure 13

Figure 14

Figure 15

Figure 16

Figure 17

Figure 18

ARCHITECTURAL ASSESSMENT

TERMINOLOGY

Building Condition scale of terms used throughout this report are as follows:

"Excellent": new or nearly new condition with few or no blemishes or compromises of quality or function.

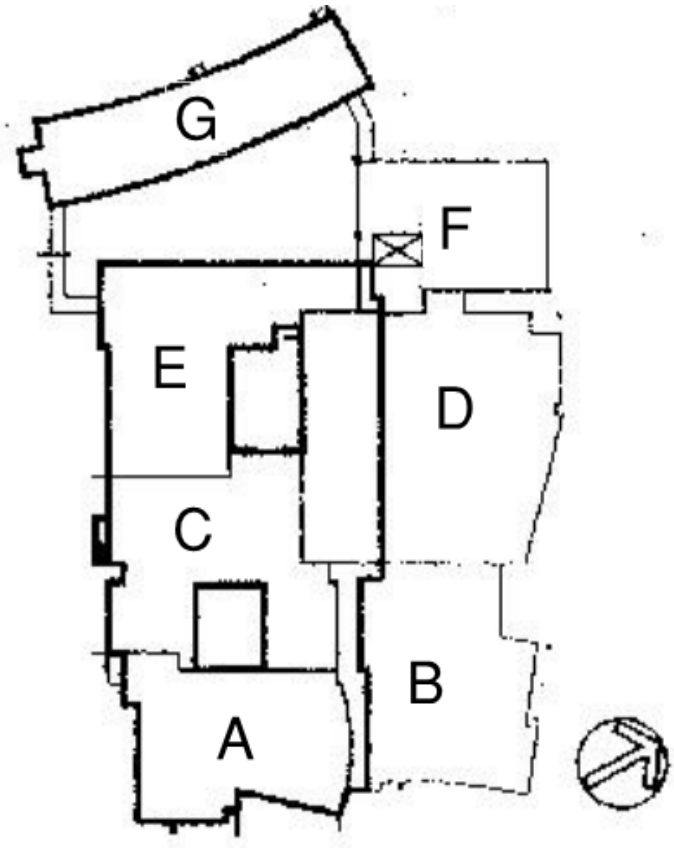
"Very Good": highly functional condition with slight wear and tear and/or minor compromises of quality or function.

"Good": median functional condition with noticeable wear and tear and/or compromises of quality or function.

"Fair": below median functional condition with significant wear and tear and/or major compromises of quality or function. Seriously worn parts or elements, minor structural compromise. Possible near-future safety hazard.

"Poor": nearly– or completely non-functional condition with major wear and tear and/or serious compromises of quality or usability. Missing parts or elements, major structural damage or condition. Immediate safety hazard or danger.

Building locations are designated using the school's existing nomenclature system for wings, as follows (see Drawing 1 below):



Drawing 1—Building Key Plan

EXTERIOR

FOUNDATION

Foundations are cast-in-place (CIP) concrete, typically not visible above grade, except at the rear (south) elevation where they are exposed in some places 18" to 5'-0" above grade. Finish is unimproved, with the stripped formwork impressions and ties visible. A chamfer detail is evident at some locations.

Specific Issues	*Recommendations*
Formwork tie plug hole evident, which should be parged with cementitious coating to seal against rusting. (Figure 1)	Seal any tie plug holes evident on exposed areas of foundation at South elevation. (qty. 100 holes)
Visible portions of foundations are generally in good to very good condition with few, very minor cracks. (Figures 2-4).	Repair any cracks in foundation larger than hairline with sealant or by parging; method to be determined by an experienced subcontractor. (Qty> assume 2,000 SF)
The loading dock on the rear (south) elevation has some cracking where a steel railing was apparently cored and epoxied into place. (Figure 5)	Remove spalled and loose concrete back to solid mass, drill and set tie pins to anchor new concrete, and form and repair crack to match profile of stair. Incorporate metal tread into repair. (Qty. 1 stair)

Figure 1—Foundation wall showing tie plug hole

Figure 2—Foundation wall with electrical conduit

Figure 3—Retaining wall/ stair areaway at Mech Room

Figure 4—Foundation wall steps at '59 construction

Figure 5—Loading dock stair with cracking

WALLS

The building was constructed in 1959, with additions and renovations in 2002. These eras of construction have markedly different exterior wall construction: 1959 wings are assumed to be brick veneer bonded to CMU back-up, most likely with no cavity and no insulation (drawings were not available at the time of this report). There are fields of the façade clad in Exterior Insulation Finish System (EIFS) at the clerestory level of the Library wing, and the west façade of "B Wing", as well as other less visible areas. The curved "C wing" ('59) is clad on its west façade with what appears to be limestone veneer panels, in fair to good condition.

Exterior wall construction in the 2002 areas is typically ground-faced CMU, assumed to be cavity veneer construction, over metal stud & gypsum sheathing backup wall with fiberglass batt cavity insulation; or over CMU backup with 1-1/2" rigid polystyrene insulation in the masonry cavity. There are limited areas of brick veneer, what appears to be autoclaved concrete "stone" masonry veneer, and metal panel construction on the 2002 areas as well.

The brick is generally in very good condition with very few issues and little wear and tear considering the age of the building. CMU and autoclaved concrete "stone" veneers are generally in good to very good condition, with specific issues noted below. There were no widespread issues with flashings or weeps, except as noted below.

Figure 6—Displaced flashing at Cafeteria egress door

Figure 7– Efflorescence at ground-faced CMU veneer

Figure 8—Efflorescence at CMU veneer

Figure 9– Loose lintel corrosion and flashing damage

Figure 10—Damage at delivery door overhang

Figure 11—Failed sealant at brick joint

WALLS (CONTINUED)

Specific Issues	*Recommendations*
At the west façade of "C" wing, limestone panels near the bottom of the building are damaged, both from years of wear and tear, as well as vandalism (Figure 12).	Repair displaced/ out of plan limestone panels at exit stair. With cleaners approved for use on stone, attempt to remove graffiti (test on non-visible area first). It may be that no further removal is possible, and the damage is cosmetic and not functional. (250 SF)
Some cracking was noted in the limestone veneer near the top of a doorway on the west facade. (Figure 13)	Repair cracked limestone using sealant in damaged joint. (1@)
There is moisture damage and some type of fungal growth on the face of the autoclaved concrete "stone" veneer at the north elevation. Water is running down the sloped coping, and because there is no drip edge overhang on the coping, it is running down the face of the stone at each coping joint. (Figure 14)	This is a cosmetic issue at this point, but could become a real issue if left unresolved. Consider removing coping and reinstall a new coping with a 1" minimum overhang, slope to inside (roof), and drip edge detail. Minimize the number of coping joints/ pieces to minimize water runoff. (Qty. 200 LF) Use a weak cleaning solution compatible with concrete "stone" veneer to remove staining. (Qty. 2,300 SF)
A fair amount of the 2007 construction is clad in EIFS, which is generally in good to very good condition; however, this material has been known for failures resulting in water penetration and wicking, particularly at flashings and where it meets grade or contacts a roof surface. Fortunately there are very few details like that on this building, and it appears that detail execution conform to best practices. The EIFS should be watched closely and well-maintained. (Figure 15)	Perform comprehensive maintenance of all EIFS surfaces as recommended by manufacturer, including flashing repairs, crack repairs, removing all failed sealants at EIFS panels and installing new sealant joint systems, and re-coating stucco finish with new compatible finish coating system where repairs or renewal are required.
At a high roof area on the Library wing, it appears a scupper and downspout has been overflowing, causing repeated wetting of the EIFS and degradation of the weathering finish. Repairs have been attempted but look to be ineffective. (Figure 16)	Resize, re-fabricate, and install the roof scupper and/or divide the runoff load by adding more scuppers. Move the scupper away from the wall. Repair/replace the EIFS for this entire area, and ensure that water has not infiltrated behind this immediate problem area or migrated elsewhere. Repair any water-damaged materials. Ensure that all flashing and sealant details are re-executed properly.
Several sealant joints have failed at EIFS construction. It appears sealant was too thinly applied. Foam backer rod is now exposed. (Figure 17)	Carefully remove failed sealant joints and replace in kind. (Qty. assume 200 LF)

Figure 12—Damaged & vandalized limestone veneer

Figure 13– Spalled/ chipped limestone veneer

Figure 14—Moisture damage/ fungal growth on veneer

Figure 15—EIFS at west façade of "E" wing

Figure 16—Damaged EIFS/ leaking downspout

Figure 17—Failed sealant joint at EIFS

WALLS (CONTINUED)

Specific Issues	*Recommendations*
At several locations on high EIFS walls viewed from the roof, a lack of overhang in the roof coping detail has caused water to run down the wall surface repeatedly in the same place, causing staining. This appears to be cosmetic at this point, but may become a moisture problem over time (Figure 18).	Confirm that EIFS integrity has not been compromised in water-stained areas, especially near bottom of wall. Repair any issues noted. Ideally, at the next re-roofing, install a coping with at least 1" projection out from the wall surface, and a drip edge detail to avoid water running down the wall.
At an elevator penthouse projecting above the roof, the painted finish has failed, and some cracking was noted on all sides of the penthouse. It appears sealant has been added since construction on the flashing reglet top edge, and at some cracks in CMU below the scupper, as well as other locations. (Figure 19)	Investigate causes of cracking—could it be thermal movement due to inadequate/no insulation in this penthouse? Mechanical movement due to elevator vibration/inadequate rail anchorage? Repair/ mitigate causes. Repair any cracks in wall with sealant and recoat CMU with concrete block waterproofing coating. Add additional projection to scupper to direct water away from CMU. (Qty. penthouse wall area 1,600 SF)
Sealant joint failure or near-failure was observed in several locations at the 2007 masonry veneer construction. It appears in some instances too thin a coat of sealant was applied over the foam backer rod; the sealant has cracked and retreated, the foam is exposed and is degrading in sunlight (Figure 20). Other locations show sealant cracked and/or lost most pliancy.	Inspect all sealant joints building-wide. Note all deficient areas. Strip out failed or near-failing sealant joints, replace degraded backer rod as required, and re-seal with compatible sealant systems, color to match existing or specified color. (Qty. assume 150 LF)
A hole was noted in the outer shell of a CMU at the Delivery area, east elevation, B wing. (Figure 21)	Repair or replace the pierced CMU. Remove the stage weight from the area, as this might have been thrown against the building to make the hole.

Figure 18—Water-stained EIFS wall on rooftop area

Figure 19– Painted CMU elevator penthouse

Figure 20—Failed sealant joint to ground-face CMU

Figure 21—Hole in CMU at Delivery area

WINDOWS AND CURTAIN WALL

It appears the entire complement of windows in the building were replaced with heavy commercial windows, curtain wall, and storefront with dual-pane glazing units (assumed to be Low-E coated glass). The '59 "G" wing also had its fenestration replaced with aluminum windows with insulated glass, but it appears to have been an older upgrade project than the 2007 add/reno.

Generally windows are in very good condition and operating sash appear to work properly and seal well; curtain wall and storefront are in very good condition.

Specific Issues	*Recommendations*
Most entrances, stair towers and building linkages are fenestrated with aluminum storefront systems, in this case augmented by structure in pocket details between banks of storefront glazing. These pockets can sometimes be sources of leakage, and some minor sealant degradation was noted in a few areas (Figure 20).	Check all storefront glazing sealant joints for degradation and replace any failed or near-failing sealants. (Qty. assume 200 LF)
Punched openings in '07 masonry walls appear to be performing well; however both water staining due to sill runoff, and well as efflorescence were noted around many openings. The opening pictured has a bit of both. (Figure 21)	Water staining is mostly a cosmetic issue at this point, though continued wetting could sponsor fungal or vegetative growth (moss/algae) over time. At next re-roofing, install a coping detail with minimum 1" overhang and drip edge detail to minimize façade wetting. See "WALLS" section for recommendations on efflorescence.
Windows installed in punched openings in the '59 construction appear to be performing well; however given the issues with sealants elsewhere on this building, some preventive maintenance is warranted. (Figure 22)	Check all punched opening window glazing sealant joints for degradation and replace any failed or near-failing sealants. (Qty. assume 200 LF)
Extruded aluminum pan sills at storefront/curtain wall, have an expansion detail that, though probably installed correctly, has an excessive gap. Neighboring sections of sill panning are misaligned. This could lead to leakage or other issues (Figure 25).	Investigate interior further for any signs of leakage. Neatly fill expansion seams with a bead of sealant, of a type that will stay pliable with movement of aluminum.
At "G" wing, the upgraded windows have insulating glass, date unknown, and it is probably not Low-E coated. There appears to be some kind of issue with the finish on the windows, perhaps early stages of failure, which should be investigated. (Figure 24)	Replace entire window system on G wing with thermally broken ribbon storefront system, with Low-E glazing units.
At a few openings on B wing, at the Administration suite, window sills sit just above the sidewalk level, creating a direct path for water infiltration if the sealant joints fail. This is a common result of this detail. (Figure 25)	This is an advisory only, as no active leakage was reported. In a future window replacement, the Owner might consider changing this detail to create a water-dam type detail with sill at least 12" above the sidewalk level on the exterior.

Figure 20—Main Entry storefront system

Figure 21—'07 wall, typical punched opening windows

Figure 22—'59 wing with windows installed in '07

Figure 23—Displaced sill pan, Cafeteria storefront

Figure 24—Failing finish, "G" wing west windows

Figure 25—Window sill detail just above sidewalk

EXTERIOR DOORS

Doors in this building mainly consist of aluminum entrance doors in curtain wall or storefront frames, and hollow metal service doors in hollow metal frames, with other types as noted below.

Generally the condition of the exterior doors is good to very good, and most appear to work well, and have adequate functional weather stripping and leak protection at heads.

Specific Issues	*Recommendations*
Main entrance doors are in very good condition and appear to be in good working order with adequate weather stripping. These doors are secured with remotely-power-actuated locks with an intercom link to the main office, and have an inner vestibule as part of an important weather and temperature regulation system as well as a security feature. (Figure 26)	Perform regular maintenance and periodic adjustment to maintain good working order.
Egress doors are generally in good to very good condition and appear to be in good working order with adequate weather stripping (Figure 27).	Perform regular maintenance and periodic adjustment to maintain good working order.
The coiling overhead delivery door at the Kitchen/ Maintenance area is in good condition, with tight weather seals; however its galvanized steel frame paint coating is failing, apparently due to poor preparation. (Figure 28)	Remove failed paint from door frame. Select appropriate coating system. Re-prep galvanized surface according to paint manufacturer's recommendations, and re-paint with primer and two finish coats. (Qty. one large opening frame)
Service and utility doors are generally in good condition and appear to be in good working order with adequate weather stripping. We are pleased to note that out-swinging service doors have a rigid extruded weather protector/drip edge at the window head (Figure 29).	Perform regular maintenance and periodic adjustment to maintain good working order.
Aluminum secondary access and egress doors, such as into courtyards or out from stair towers, are typically mounted in storefront or curtain wall, and are generally in good to very good condition. They appear to be in good working order with adequate weather stripping (Figure 30).	Perform regular maintenance and periodic adjustment to maintain good working order.

Figure 26—Main Entrance doors

Figure 27—Egress Door, '59 wing

Figure 28—Coiling overhead delivery door

Figure 29—Hollow metal service door

Figure 30—Door in storefront system, courtyard

LOUVERS AND OTHER OPENINGS

Louvers on this building are generally of two types. The vast majority are intake/exhaust louvers made up of blades or vanes within a frame, serving the full range of mechanical equipment and unit ventilators, and appear to be from the 2007 construction. There are a few smaller grille-type louvers, typically found on the '59 construction.

Generally the condition of louvers and grilles is good to very good, and most appear to be functioning well.

Specific Issues	*Recommendations*
Louvers in EIFS walls and their sealant joints typically are in very good condition, with no issues noted (Figure 32).	None.
Louvers in brick walls are typically in the '59 construction. They appear to be louvers installed in '07 in either new, cut-in openings or in existing openings. Their sealant joints typically are in very good condition, with no issues noted (Figure 33).	None.
A louver on the east face of C wing has lost its sheet metal weather hood, which was lying on the membrane roof below it. Presumably this louver in this location has issues with wind-driven rain penetration. (Figure 34)	Confirm that a storm-rated louver was installed, with moisture vanes in the blades and a positive drainage system to the exterior. If so, re-install the metal hood with better fastening methods than previously employed. If not, consider installing a storm-rated louver for this opening location.
Louvers in ground-face CMU walls and their sealant joints typically are in good to very good condition, with no issues noted; however it was noted that some openings have lost mortar in head flashing joints (Figure 35), which should not affect performance of the flashing, but should be monitored.	Monitor louver openings for leaks.
A louver at the east side of the Auditorium (A wing) had what appeared to be minor vegetative growth (algae or moss) on the brick below it, possibly due to repeated wetting from condensation of exhaust air from the louver, or runoff from the louver sill. It does not appear to be an issue now but should be monitored (Figure 36)	Monitor louver openings for leaks. Monitor brick for further growth.
Louvers in limestone veneer walls and their sealant joints typically are in very good condition, with no issues noted. Below or near some of them are grilles, a few of which are damaged and should be replaced. (Figure 37)	Replace damaged grilles with similar product. (qty. 4 locations)

Figure 32—Louver in EIFS at Library, F wing

Figure 33—Louvers in '59 brick wall, stage flyhouse

Figure 34—Louver with detached weather hood

Figure 35—Typical louver in ground-faced CMU wall

Figure 36—Louver in '59 brick wall, Auditorium

Figure 37—Typical unit vent louver and grille in stone

ROOF

The roof is a single-ply Sarnafil PVC membrane, apparently fully-adhered, over a low-slope deck, and was white when installed. According to a 2013 survey by Russo-Barr Associates, the roofs were installed in two phases, in 2006 and 2007. Curiously, the 2006 roof areas are warranted until 2026 (20 years), and the 2007 areas until 2021 (15 years). The roof has multiple levels, typically accessed via building-mounted ladders. Most areas of the white roof are now discolored from years of residue accumulating on the membrane, especially in recessed or lower-lying areas; however the roof is overall in good condition. Most sections of the roof appear to have auxiliary drains, which are set at a higher elevation than primary drains.

The roof of the Library (F Wing) is a moderately sloped black EPDM membrane, with adhered neoprene fins running with the slope, that look like standing seams (Figure 42). This higher roof area has light gage sheet metal gutters and downspouts that drain directly onto the low-slope membrane roof areas surrounding it.

The Main Entrance pavilion and the Cafeteria (both at B wing) have exaggerated "cornice" or roof projection elements, that have very slight slope to drain to scuppers. The scuppers either have boxes and downspouts, or drain directly onto the low-slope membrane roof areas surrounding them (Figure 40).

Much of the roof area is covered by solar PV panels in a low-slope, ballasted rack mounted application, sitting on membrane slip sheets that protect the primary roof membrane (Figure 38). Conduit and control gear are mounted on Unistrut stand-up blocks made of recycled plastic sitting directly on the membrane (Figure 40).

Walkway pads are the fully adhered, textured membrane type and are in good condition.

Specific Issues	*Recommendations*
It does not appear to be the case, but the roof drainage may be impaired in major storm events by the layout of the solar panels. Provisions have been made for drainage but these should be confirmed. Most roof drain sumps were clear, but a few had leaves and debris in them. (Figures 38, 39)	Building manager should witness a major storm event on the roof and confirm that all water is flowing normally with no ponding or other detention of water by PV racks. Clean leaves and debris out of roof drain sums as necessary.
Cornice projection elements are drained by scuppers, which direct water from at least 36" above, directly onto the roofing membrane. (Figure 40)	Install splash blocks under scuppers where they discharge onto lower roofs.
There are many locations where roofing membrane is wrinkled, puckered, or otherwise misaligned where it makes a transition from horizontal to a vertical termination detail. For the most part this is a cosmetic issue and should not affect performance, as long as seams are well sealed and were not compromised by the puckering when first installed. (Figure 41)	The building manager should inspect the roofing membrane periodically at these locations to make sure no premature wearing or failure due to unusual movement is taking place. If any leaks develop, puckers at seams would be a likely place to start looking for a compromise in the membrane system.
At locations where roofing membrane is not covered with solar panels, it was wrinkled and puckered in a pattern that is translating the insulation board seams through the membrane. This is a cosmetic condition due to different movement rates of membrane and insulation due to temperature that should not affect performance. A few small areas of localized ponding were observed. (Figure 43)	None.

Figure 38—Solar PV panels at B wing roof

Figure 39—Solar PV panels and roof drains

Figure 40—Roof cornice with scupper and PV conduit

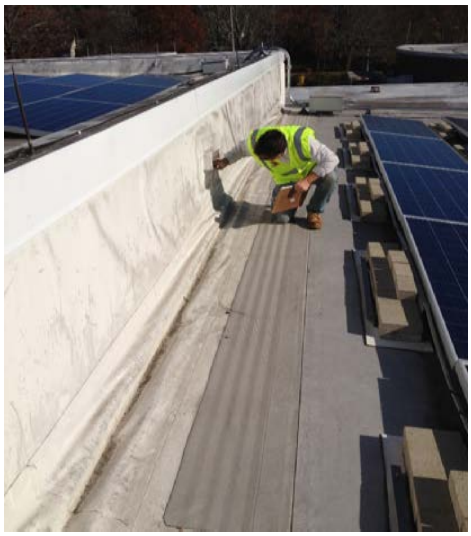


Figure 41—Membrane vertical transition

Figure 42—Library F wing low-sloped roof

Figure 43—Puckering at insulation panel joints

ROOF (CONTINUED)

Specific Issues	*Recommendations*
At a short building step in E wing, a metal roof edge coping was detached from its sub-cleat. There are a few other locations where copings are misaligned or detached. (Figure 38)	Snap coping back onto its cleat, and ensure that other copings throughout the building are secured and realigned with their roof edges.
At the same building step in E wing, a short ladder is installed in the exposed narrow CMU strip. It has only two attachment plates, making the ladder a lever arm each time it is used. The ladder attachment plates have cracked the CMU and created holes in the block shells, which were repaired with sealant. The ladder has since been shored up with concrete bricks. (Figure 39)	Remove the ladder, repair the CMU, and reinstall it with four separate points of support. Fill attachment CMU cores solid with mortar prior to toothing them in to the wall. Alternately, remove the ladder and provide a free-standing galvanized steel "stile" ladder with padded feet to protect the membrane, and secure it to the building with a waterproofed cable or chain.
Where the white membrane was flashed into an existing '59 brick wall, it appears the existing reglet and counter-flashing termination were re-used. For the most part, the counter flashing appears to be in good condition, new flashings were installed where needed to augment existing, and no irregularities or major issues were observed. Note heavy discoloration of membrane at pictured location, a low-lying section of roof (Figure 40)	No pervasive issues were noted with sealants at termination details, but the building manager should inspect these joints periodically for signs of wear and renew sealants when necessary.
The gutter and downspout from the sloped Library roof drains directly onto the membrane roofing below it. There is no angled bottom leg of the downspout to slow the velocity of the rain water. The electrical conduit directly under the spout is rusting. (Figure 41)	Add a horizontal bottom leg to the downspout to: slow and redirect water velocity; channel water to the roof drain nearby; and protect the electrical conduit and roofing membrane directly underneath the present downspout. Clean leaves out of roof drain sump.
The roof has many dual "bubble" acrylic skylights as well as other rooftop mechanical equipment and appurtenances. Generally, membrane flashings and transitions appear to be correctly installed and are in good to very good condition despite the discoloration. (Figure 42)	None; other than periodic review and inspection of membrane transitions, flashings, and equipment to stay on top of any degradation and make needed repairs.
Though not strictly part of the roof, the cornice elements are clad in metal panels that are tied to the roofing system. It was noted on the Cafeteria cornice (B wing), north side, a corner support of four soffit panels has detached. (Figure 43) Around the corner on the west side, a recessed light has become detached from its position in the metal panel.	The metal panels appear to be weather proofed with sealant, which will need to be removed to access the panel support structure above the soffit. Remove the detached panels, repair or replace the failed structure or support element, and reinstall the panels. While the soffit is opened up, inspect the other attachments to neighboring panels to see if there is any corrosion or other more widespread distress that needs further attention. Repair and re-install recessed downlight.

Figure 38—Detached coping

Figure 40—'59 brick wall counter flashing

Figure 42—Typical curb detailing

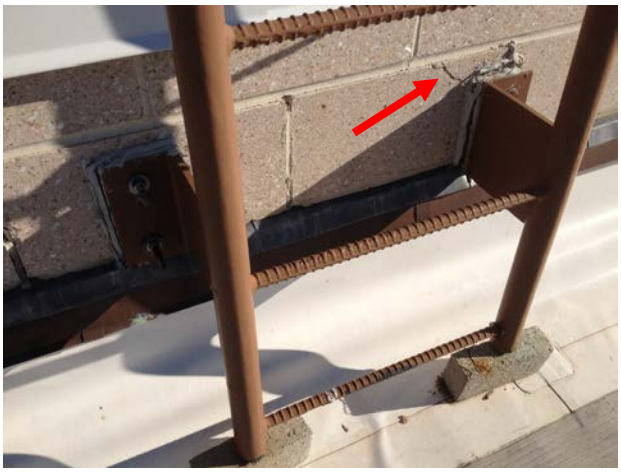


Figure 39—Damage at roof ladder support

Figure 41—Downspout at Library roof

Figure 43—Detached panels at Cafeteria cornice soffit

INTERIOR

FLOORING

Flooring material in the school consists primarily of the following: vinyl composition tile; sheet linoleum; carpet; rubber raised disc flooring; ceramic mosaic tile; ceramic quarry tile; strip hardwood; and what appears to be a resilient vinyl tile.

Condition of most flooring materials is good to very good, with any exceptions illustrated below.

Specific Issues	*Recommendations*
Sheet linoleum is present in many classrooms of the 2002 construction, the cafeteria, the main lobby, and other selected areas. It is in good to very good condition, apart from the occasional gouge or scrape (Figure 44).	None.
Flooring in most corridors is VCT. Generally it is in good to very good condition; however at several building movement or expansion joints, the joint cover was not provided at the floor, thus the tile has cracked and/or popped (Figure 45).	Remove damaged tile. Install compatible joint cover assembly. Reinstall new tile to match existing. (Qty. 14 locations)
Stairwells, sloped corridors, corridor links with G wing, and ramps are finished with resilient rubber flooring with a raised disc pattern, which is in good to very good condition. Some corridors finished in VCT have patterns in the floor (Figure 46).	None.
Certain discrete areas, such as the administrative offices, computer labs, and the distance learning lab are carpeted, which is in very good condition overall, and may have been recently replaced. (Figure 47)	None.
Some areas under rubber disc flooring are experiencing slab cracking, which is translating through the floor finish (Figure 48).	Determine the cause of the cracking. Remove flooring, repair/fill crack with sealant, and reinstall new flooring. (Qty. 6 locations)
Resilient vinyl tile flooring is used in some corridor spaces between the Auditorium and Cafeteria Servery areas, and is generally in good condition; however there are several locations where the tile has delaminated from the subfloor, apparently from slab movement or cracking, and has typically been repaired by taping the edges down with colored duct tape (Figure 49).	Determine the cause of the cracking. Remove flooring, repair/fill cracks with sealant, and reinstall new flooring. If the crack is along/near a building movement or expansion joint, consider installing a metal movement joint in the floor along the line to alleviate future issues with the finish. (Qty. 8 locations)

Figure 44—Sheet linoleum in classroom

Figure 45—VCT in corridor at expansion joint

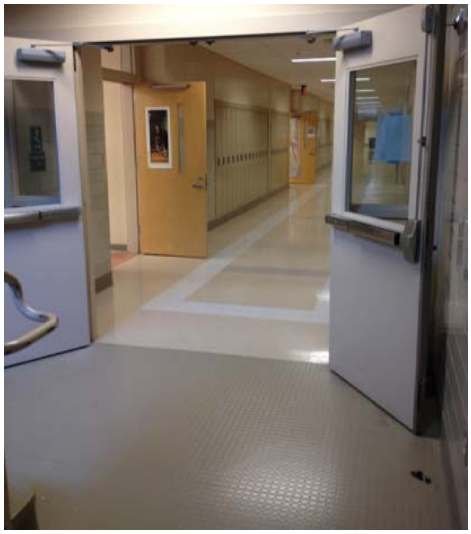


Figure 46—Stairwell rubber and VCT flooring

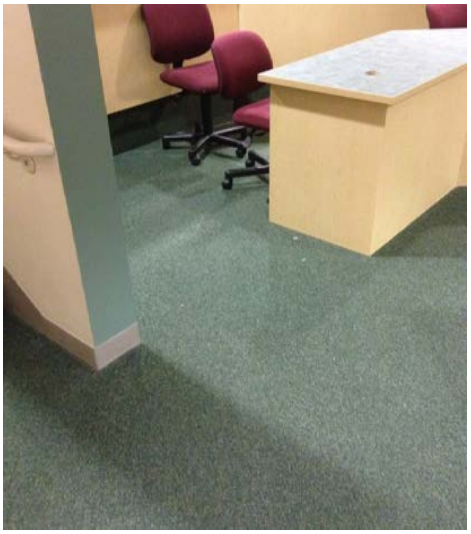


Figure 47—Carpeting in Distance Learning Rm.

Figure 48—Rubber disc floor over slab cracking

Figure 49—Resilient vinyl tile over slab crack

INTERIOR

FLOORING (CONTINUED)

Specific Issues	*Recommendations*
Floor finish in toilet rooms, lockers, showers, and other wet locations is typically 2 x 2 ceramic mosaic tile. It is generally in good to very good condition, with the occasional bit of damage as shown. Boys team locker rooms appeared to have the most damaged tile of any individual space. Boys' locker shower area has minor diagonal cracking due to movement of underlying substrate. (Figure 50)	Survey all tile floors to determine exact repair needs. Repair or replace tiles and grout as required. (Qty. assume 8 repairs of 5 or fewer tiles)
The gymnasium features a sprung hardwood strip floor, in excellent condition. The floor was in the process of being professionally refinished at the time of our survey. Lines will be re-applied as part of refinishing once sanding is completed. (Figure 51)	None.
Flooring in kitchen and prep areas is 6 x 6 quarry tile, in good to very good condition. We did not observe any significant damage, and the tile has been very well-maintained (Image 52).	None.
The resilient rubber flooring at the drinking fountain outside the locker rooms is delaminating from the subfloor, apparently due to repeated continuous wetting. (Figure 53)	Confirm that the plumbing for the fountain is not leaking (which does not appear to be the case, but potential cause should be eliminated). Remove the flooring, and the previous adhesive, and reinstall flooring with a new coat of water-resistant adhesive.
The library features strip hardwood flooring in the main space, and carpet behind the lending desk. All finishes are in very good to excellent condition. (Figure 54)	None.

Figure 50—Ceramic mosaic tile in toilet room

Figure 51—Hardwood strip gym floor being refinished

Figure 52—Kitchen quarry tile floor

Figure 53—Rubber disc floor, moisture damage

Figure 54—Library strip hardwood flooring

WALLS AND PARTITIONS

Interior wall and partition materials consist of: painted CMU (concrete masonry units); ground-face CMU in some public/ feature locations; painted GWB (gypsum wall board) over metal stud partitions or furring in the vast majority of educational and support spaces; feature walls of autoclaved concrete masonry "stone" veneer in the main lobby; wood paneling at the Auditorium lobby; and glazed terra-cotta masonry units in corridors of '59 portions of the building.

Overall condition of most walls and partitions is good to very good, with very few cosmetic blemishes or areas of deeper damage or wear and tear. Some specific issues are noted below.

Specific Issues	*Recommendations*
Most wet locations, such as toilet rooms, feature painted CMU, generally in good to very good condition. We did not note very much wear and tear at all; it is well-maintained (Figure 55).	None.
A series of large cracks was noted in the cafeteria at the point where the 2002 construction was joined to the '59 building in the renovation. It appears inadequate provisions were made for minor settling and movement between the two structures, resulting in cracking of finish ground-faced CMU at shells and mortar joints. (Figure 56) *These cracks extend to adjacent floor materials as well, noted previously.*	To properly repair these cracks, the CMU will need to be removed, the joint between the two eras of construction traced, and proper continuous isolation/movement joints provided with new finish reinstallation. Patches will just allow cracks to recur. (Qty. 2 locations)
Walls in typical educational spaces are painted GWB and are generally in good to very good condition. Isolated examples of wear & tear and damage were noted. (Figure 57)	Repair any incidental dings, scrapes, or mars in walls and repaint. (Qty. assume 2,000 SF of wall)
A recurring type of crack was noted in several rooms in both 2002 and '59 era wings: on exterior GWB walls between windows, a horizontal crack appears at roughly 48" AFF, extending through all the window wall segments in that room. Some rooms have another crack at 96" AFF just over window heads. (Figure 58)	This joint appears to coincide with a normal horizontal construction joints in the GWB sheets. The movement causing the cracking may be due to minor stress or post-construction shrinkage in the exterior wall. The cracks can be surface-repaired and repainted. (Qty. assume 1,600 SF)
Some GWB partition corners are not protected with vinyl corner guards, and have damage due to impact. (Figure 59)	Repair damage and repaint. Consider adding corner guards at all outside-facing corners at GWB partitions. (Qty. assume entire building SF x $/sf)
Some windows in renovated '59 construction have water damage to GWB areas surrounding the window, and solid surface plastic sills in some cases have become loose or detached. (Figure 60)	Investigate cause/ source of leakage; repair. Repair and repaint GWB. Re-attach sills. (Qty. assume 10 locations)

Figure 55—Painted CMU at wet locations

Figure 56—Crack in GF CMU at Cafeteria

Figure 57—Typical classroom with painted GWB

Figure 58—Recurring crack type at exterior walls

Figure 59—Damage at unprotected GWB corners

Figure 60—Moisture damage at window sill

Walls and Partitions (Continued)

Specific Issues	*Recommendations*
Main lobby finishes of autoclaved concrete "stone" veneer and ground-face CMU are both in very good condition. (Figure 61)	None
'59-era corridor walls have glazed terra-cotta tile up to 6'-0" AFF and painted CMU above that. All surfaces are in good to very good condition, with minor local wear here and there. (Figure 62)	None.
The curved feature wall outside the Auditorium is paneled with a light-species wood, probably birch. It is in very good condition, with no noticeable blemishes. (Figure 63)	None.

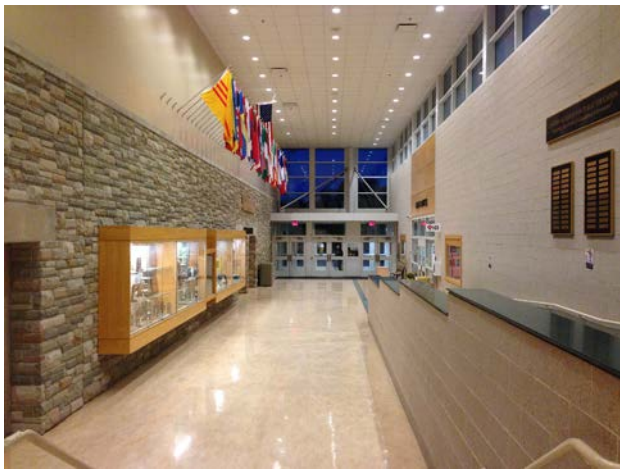


Figure 61—Main lobby: "stone" veneer and GF CMU

Figure 62– Glazed terra-cotta in '59 G wing

Figure 63—Wood paneling at Auditorium lobby

CEILINGS

Ceilings throughout the building are almost universally ACP (acoustic ceiling panels) in a suspended metal grid, typically 2' x 4' tiles, with 2' x 2' in certain feature areas, and 4' x 4' tiles in the Cafeteria. There are some "hard" GWB ceilings and soffits in certain feature spaces like the Library and Cafeteria, and small mechanicals soffits here and there throughout the building.

Condition of ACP ceilings is typically good to very good, but there are some panels that are water-stained, dinged, or broken.

Specific Issues	*Recommendations*
Typical classroom ACP ceilings tiles are in very good condition (Figure 64).	None.
Water stains were noted at ACP in various locations. Stains were often seen around ceiling-mounted mechanical equipment, emergency shower assemblies (which are concealed above the ceiling in this building—re. Figure 65), or at joints between differing building masses such as the entrance to G wing corridor link.	Repair any plumbing leaks in equipment or other water sources, or leaks in roofing membrane. Replace stained tiles. (Qty. assume 75 tiles)
ACP ceiling with an integral trim system were used in the Library to create layered soffits. GWB soffits were used on the side areas of the space. All are in excellent condition (Figure 66).	None.
Corridor ceilings are typically 2 x 4 ACP and are generally in very good condition. Ceiling panels in G wing are cut on the gentle radius, thus do not have tegular edges. (Figure 67)	None.
ACP in the cafeteria is large-scale 4' x 4' tile, presumably of increased thickness to span that distance. It is in very good condition, although a few tiles were askew and not seated properly in the grid. (Figure 68)	Seat tiles properly in the grid.
Soffits of painted GWB construction were noted in feature areas like the corridor crossing at D, E, and F wings, the Athletic entrance (figure 69), Distance Learning Lab, and other isolated areas. All soffits are in good to very good condition.	None.
Kitchen ACP is non-porous, washable type, in very good condition.	None.
The Locker Rooms are finished with ACP ceilings, and they are set at 8'-0" AFF. There is considerable damage from vandalism in these spaces. ACP at low height is not suitable for areas prone to vandalism.	Consider changing the ACP panel type to gypsum panels with hold-down clips, or some other type of more vandal-resistant material that still absorbs sound, such as perforated plywood or Tectum. (Qty. 4,500 SF)

Figure 64—Typical ACP tiles in classroom

Figure 65—Water stains on ACP

Figure 66—ACP with edge trim and GWB soffits

Figure 67—ACP ceiling in '59 G wing, on radius

Figure 68—4'x 4' ACP in Cafeteria, with GWB soffits

Figure 69—GWB soffits in Athletic entrance lobby

INTERIOR DOORS

Interior doors throughout the building are typically of two main types. "Public" doors are flush wood doors, natural finish. Door specification appears to be plain sliced birch, random or center balance matched. These include the vast majority of doors in the building, and most have a glass vision panel of 4" W x 24" H, or a half-glass elevation at more major spaces. "Private," or service doors are hollow metal, painted. Frames for all doors are typically hollow metal, painted.

Condition of doors ranges from fair (very few), through good (most), to very good (few). Doors in high-traffic areas obviously have more wear and tear.

Door hardware issues are covered in the Accessibility section of the Code Assessment.

Specific Issues	*Recommendations*
Typical clear finished flush wood door in good condition (Figures 70, 71).	None.
Typical hollow metal door and hollow metal frame in corridors, both with wired glass lites. Wired glass is a safety concern and is not allowed under present building code: the wire actually weakens the glass, increasing likelihood of breakage even from a small amount of pressure, and once broken, the wire can increase injuries. (Figure 72)	Consider replacing wired glass with another type of glass that meets the code requirements of the opening. (Qty. 30 door leafs + 15 frame sidelights)
Flush wood door with half-glass lites in Library entrance, in very good condition. (Figure 73)	None.
Flush wood doors at Auditorium, with sound and light-treatment hardware package, in good condition. (Figure 74)	None.
Typical flush hollow metal doors in fire-rated opening, in very good condition. (Figure 75)	None.

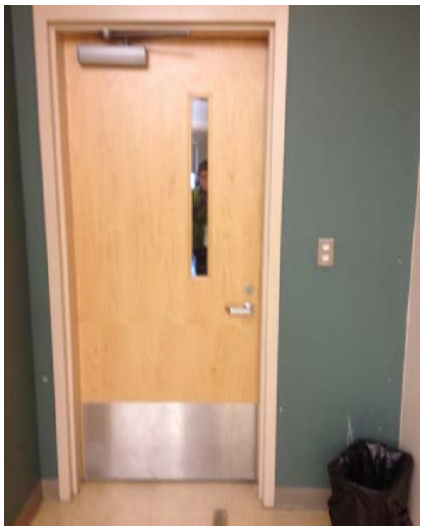


Figure 70—Typical flush wood classroom door

Figure 71—Typical flush wood classroom doors

Figure 72—Hollow metal door with wired glass

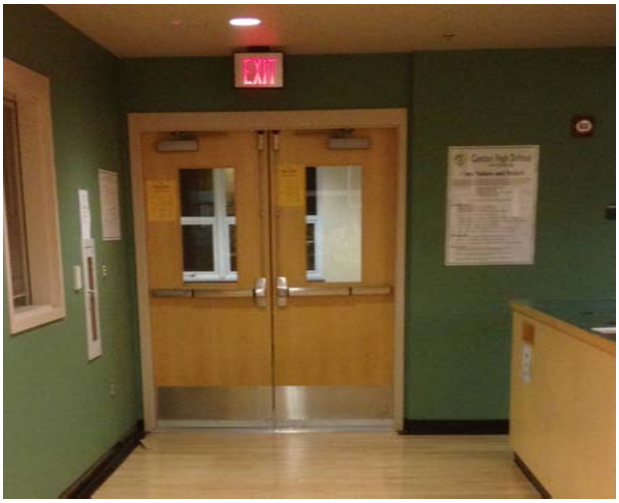


Figure 73—Flush wood, half-glass door at Library

Figure 74—Flush wood door at Auditorium

Figure 75—Flush metal fire-rated opening

FIXTURES AND EQUIPMENT

Fixtures throughout the building consist mainly of casework at classrooms, science rooms, storage rooms, kitchenettes, administrative offices, wall-mounted display cabinets, built-in closets, and the like. Generally, these fixtures range in condition from good to very good.

Display surfaces such as tack boards and marker boards are another main type of fixture. For the most part, these are in good to very good condition.

Toilet room fixtures and equipment consist of toilet and shower compartment screens, dispensers, trash containers, towel dispensers, clothing hooks, etc. These items are generally good to very good condition, with the notable exception of the boys locker room and team room, where some equipment has taken a beating.

Lockers are another major fixture category. Hall lockers are generally in good condition; gym lockers range from fair to good condition.

Other miscellaneous equipment include items like fire extinguishers and cabinets, stage equipment, science lab fixed equipment (vent hoods), etc.

Specific Issues	*Recommendations*
Science room casework consists of solid-door base cabinets and glass-front upper cabinets, with chemical-resistant tops and backsplashes, generally ranging from fair to very good condition. Some rooms, notably Chemistry labs, have more wear and tear (Figure 76).	Clean stains and soiling off cabinets with wood-friendly cleaner, at Science Labs. (Qty. 10 science labs)
A typical classroom casework outfit is as shown. (Figure 77) These pieces are generally in good to very good condition.	None.
Most whiteboards and tack boards are in good condition. A few whiteboards have excess marker residue buildup. (Figure 78)	Deep-clean all white boards. (qty. 71 CR's and Labs)
Toilet partitions are of solid-core laminate, and range in condition from fair (few) to good (most). A few could use a good deep cleaning (Figure 79)	Deep-clean toilet partitions throughout the building. (qty. 22 TR's)
Corridor lockers are painted metal, and appear to be in good condition; however, at 12" wide, they are not optimum width to store backpacks. (Figure 80)	Consider replacing hall lockers with fewer, wider units of 16—18" wide. (Qty. 950 openings)
In both the gym locker rooms and the team locker rooms, damage from vandalism was noted in the shower areas. Curtains are torn, partitions are loose, and the H/C seat is ripped off the wall in the H/C shower stall of the boys team room (Figure 81).	Tighten loose partitions. Replace curtains. Re-install shower seat. (Qty. 2 team rooms)

Figure 76—Typical science room casework

Figure 77—Typical classroom casework

Figure 78—Typical tack board and marker board setup

Figure 79—Typical toilet room partitions

Figure 80—Typical student corridor lockers

Figure 81—Damaged H/C shower stall equip.

FIXTURES AND EQUIPMENT (CONTINUED)

Specific Issues	*Recommendations*
In the Team locker room, many of the wide, large size locker doors have been bent. The doors still appear to close, but with some difficulty (Figure 82).	Repair or replace team locker doors.
Gym lockers are generally in very good condition. (Figure 83)	None.
Gymnasium fixed equipment includes the following: • Motorized divider curtain • Motorized and manual-pull bleacher seating • Motorized retractable basketball goals • Wall padding All equipment appears to be in good to very good condition (Figure 84)	None.
The Distance Learning Lab is a raked-seating lecture-style hall with wood built-in desks with front panels and plastic laminate tops. Each seat has a drilled grommet hole and a phone/data jack underneath but curiously no power outlet. (Figure 85)	Consider wiring this lecture hall for power outlets at each seat, if the use is consistent with that type of need (qty—75 seats).
The instrument lockers in the Band Room are made of plastic, laminate, and wire. They appear to be in very good condition. We noted a tack board had fallen off the wall in this room. (Figure 86)	Reinstall tack board at band room.
The fume hoods at the science labs range in condition from good to very good. Chemistry Lab hood appears to have seen the hardest use and has the most wear and tear. (Figure 87)	Deep-clean fume hoods. Continue with routine maintenance and safety inspections. (Qty. 10 Science Labs)

Figure 82—Damaged team room lockers

Figure 83—Typical Gym lockers

Figure 84—Gymnasium with various fixed equipment

Figure 85—Distance Learning Lab casework

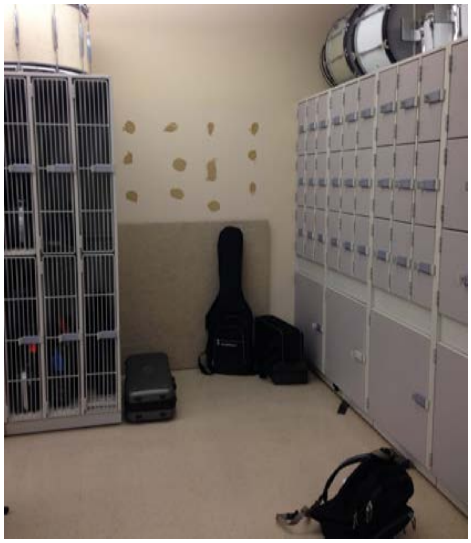


Figure 86—Band Room lockers/ tack board

Figure 87—Typical fume hood at Science Lab

HVAC ASSESSMENT

The Canton High School had a recent renovation that occurred in 2007 where all the classrooms unit ventilators were replaced as well as the rooftop units, boilers, pumps and control system. The school mostly consists of rooftop air handlers and indoor air handling units which provide heating, ventilation and for some areas, air conditioning. These units are associated with duct distribution systems for the supply and return air. Some areas utilize fan powered constant air volume terminal units with reheat coils for individual space temperature control. The general classrooms utilize unit ventilators for their heating, ventilation, and in some spaces air conditioning. Exhaust air is provided throughout the building through the use of roof mounted exhaust fans. (Figure 11) The buildings overall temperature control system is handled with direct digital controls which are manufactured by Honeywell Controls. It appears that the building has received above average maintenance over the years and appears to functioning properly .

COOLING PLANT

The building is not equipped with a central chiller plant. Majority of the cooling provided for the building is through the use of the roof top units which are equipped with direct expansion cooling sections. Some spaces that are served with unit ventilators are provided with split cooling systems which are served by roof mounted condensers. These specific rooms are the Language Lab, Teacher Planning, Teacher Office, Aerobics Lab and Fitness Lab. These condensers appear to be relatively new and in good working condition. There are also indoor air handling units which also utilize split cooling system with outdoor condensers and those spaces are the Auditorium and Media center. (Figure 1, 2 & 3)

Specific Issues	*Recommendations*
None.	Provide regularly scheduled routine maintenance on all roof top units and split cooling systems.

Figure 1

Figure 2

Figure 3

HEATING PLANT

There are two (2) gas fired non-condensing cast iron Burnham boilers, model PV1123WCP that were installed in the 2007 renovation (Fig. 4). There was also a third boiler of the same style and manufacture, however that boiler has since been replaced with a high efficiency gas fired condensing boiler manufactured by Viessmann, model CT3-89 which was installed approximately two years ago (Fig. 5). The two cast iron Burnham boilers each have a capacity of 5,773 MBH and are equipped with a Power Flame Burner, model BCCR4-GO-25 which is a duel fuel burner for oil and gas. The condensing Viessmann boiler has a capacity of 3,361 MBH and is equipped with a Riello burner, model RS100. The original boiler plant utilized number two fuel oil as its main fuel source however under the 2007 renovation the boiler plant was converted to natural gas. The existing 8,000 gallon outdoor oil tank (Fig. 17), interior fuel oil pumps (Fig. 18) and tank level controls are still intact and will be removed this year. The currently installed Burnham cast iron boilers have had several cast iron sections removed due to a factory defect, this condition has been rectified by the manufacture. Both boilers are functional and operate as a backup/secondary means of heating during peak heating days when the single Viessmann condensing boiler cannot maintain the desired hot water loop temperature. The boilers modulate as required through the use of their own individual controllers (Fig. 15). The boiler plant and hot water loop temperature setpoint are activated/adjusted through the Honeywell control system. There are no motorized isolation valves at each boiler, which allows system return water to circulate through idling 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 vertical non-insulated bladder style expansion tanks (Fig. 8). There is also a five gallon chemical shot feeder in the system for chemical treatment of the piping system (Fig. 12). The heating hot water piping itself is schedule 40 black steel and is insulated with fiberglass insulation. From an outward appearance the piping system appears to be in good condition however, several sections of piping should be removed/cut so the internal condition of the piping can be determined. The fiberglass insulation is in fair condition although there are some sections of piping within the boiler room which are missing or have damaged sections of insulation. Air and dirt removal is accomplished through an incline separator which is insulated however is not equipped with an air vent (Fig. 13).

The non-condensing boilers are vented into a common double wall galvanized steel breeching system which travels within the original masonry chimney and exits the building through the roof and terminates with a rain cap (Fig. 9). The condensing boiler has a dedicated double wall breeching system which exits the building alone and travels up the building façade and terminates with an exit cone. (Fig.10)

Combustion air is introduced into the boiler room through the use of an indoor air handling unit which is mounted within the boiler room. This unit is equipped with a hot water coil and supply fan and is controlled by the Honeywell control system. Upon receiving an enable command from control system

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

the air handling unit is activated. This unit provides combustion air for all three boilers and does not appear to have any means of varying air flow since there is no variable speed drive associated with the unit. This provides more outside air than required when only one boiler is operating and increases energy use due to the air handling units fan operating at full power whenever any of the boilers are activated.

Heating hot water is circulated throughout the building through a primary/secondary pumping system. The primary pumps are the boiler pumps, each boiler is equipped with a Taco inline pump sized at 260 GPM with ten feet of head and a 1.5 HP motor (Fig. 7). The secondary pumps are the main building pumps which are base mounted end suction pumps manufactured by Taco. Each has a capacity of 800 GPM at 160 feet of head and are equipped with a 30 HP motor (Fig. 6). The primary boiler pumps are equipped with typical starters but the secondary pumps are controlled via two variable speed drives which are manufactured by Fuji Electric, model AF-300 F11 (Fig. 14).

Specific Issues	*Recommendations*
There is no insulation on the vertical expansion tanks.	Both expansion tanks should be insulated.
The air separator associated with the hot water system does not have an air vent.	An air vent should be installed on the air separator.
Several section of piping within the boiler room do not have insulation (Fig. 19).	Any and all sections of piping insulation that is missing, damaged or soiled should be replaced.
There is no VFD on the indoor air handling unit used for combustion air.	A variable speed drive should be installed on the indoor air handling unit within the boiler room.
There is some minor corrosion occurring at the base of the vertical breeching stack associated with the non-condensing boilers (Fig. 11).	The minor corrosion on the breeching stack should be grinded, prepped and painted with a high temperature epoxy paint to prevent further corrosion. The cause of the corrosion should be investigated to determine if there is a roof leak or if its merely condensation.

Figure 10

Figure 11

Figure 12

Figure 13

Figure 14

Figure 15

Figure 16

Figure 17

AUTOMATIC TEMPERATURE CONTROLS

The building is served by a Honeywell direct digital control system which was installed in 2007 (Fig. 21 & 22). This system has not been updated with new software nor has the controllers been replaced with newer versions. Per the facility's mechanical personnel the town is in the process of providing new software updates and new controllers. The control system provides temperature sensors in each classroom which provides control of the hot water control valve for heating purposes (Fig. 23 & 25). Those spaces that are equipped with supplemental cooling are provided with separate cooling only thermostats. There did not appear to be any Carbon Dioxide sensors in any of the classrooms which indicates that there is no control or modulation of the outside air damper based on population. This should be implemented to provide greater energy saving in times where the classroom population is less than original designed. The larger group spaces such as the Media Center, Gym, Auditorium etc are equipped with temperature and Carbon Dioxide sensors which allows for demand control ventilation (Fig. 24). The boilers are sequenced and operate via the standalone boiler management controllers and are monitored through the buildings Honeywell control system for alarms and heating demands (Fig. 27). Utility type spaces and toilet rooms are controlled by local controls with no Honeywell integration (Fig. 26). 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 (Fig. 28). All building mechanical systems are currently scheduled and temperature controlled through the Honeywell DDC system. The main front end computer system which houses the Honeywell controls platform is found in the custodial office within the boiler room. This main computer provides all the graphical and numerical information for all the equipment throughout the building (Fig. 20). The Honeywell system is web accessible and does trend software points and provide alarm indications. The current control system is operating properly however the upgrades that are going to be provided will ensure accuracy and system functionality.

Specific Issues	*Recommendations*
RTU-9 & 10 associated with Gym require new Microtech controllers. According to the facilities mechanical personnel these controllers are currently being purchased.	Provide software upgrades and updated controllers throughout to help maintain the buildings functionality and increase system controllability.
There are no CO2 sensors installed within the classrooms.	Provide CO2 sensors within all classrooms with unit ventilators and provide the necessary wiring and programming to allow for demand control ventilation. This will increase energy savings throughout the building.

Figure 18

Figure 19

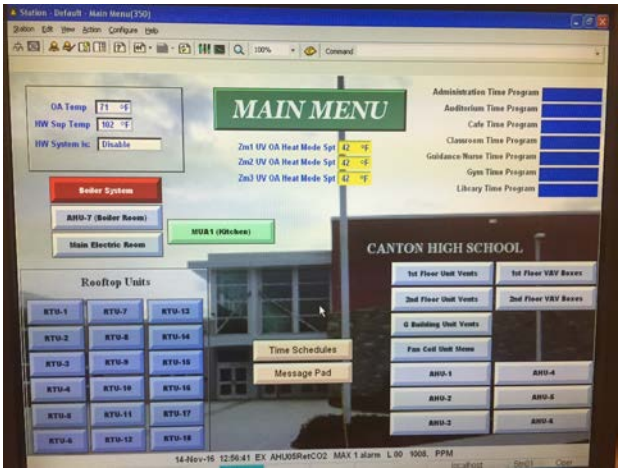


Figure 20

Figure 21

Figure 22

Figure 23

Figure 24

Figure 25

Figure 26

Figure 27

Figure 28

Figure 29

CLASSROOMS SPACES

Majority of classrooms including Science rooms utilize unit ventilators as their main heating and ventilation source (Fig. 30). Only a selected few rooms such as the Language Lab, Teachers Planning, Teacher Office, Aerobics Lab and Fitness Lab are provided with unit ventilators that are equipped with split direct expansion cooling, these unit vents are associated with outdoor roof mounted condensers and refrigerant piping interconnecting the two components. In any case, all the unit ventilators provide outside air through the use of an exterior wall louver system which is ducted to the back of the unit ventilator. The unit ventilators within the Science rooms on the first and second floors are ceiling mounted unit ventilators and are equipped with the same outside air duct connection (Fig. 31). However, these ceiling units are associated with a galvanized sheet metal duct distribution system that travels from the unit's discharge and terminates at ceiling mounted diffusers (Fig. 32 & 33). These units all appear to be noisier then the wall mounted unit vents in the rest of the building. The noise is being generated from what appears to be the motor/shaft of the supply fans. It is unclear as to what the actual issue is however, previous experience with these style units typically points to an issue with non-greased bearing or un-balanced shafts. Within all of these units is a supply fan, hot water coil, a filter rack and outside/return air dampers. The unit ventilators are manufactured by AAF, which was McQuay and is now known as Daikin McQuay. Each unit ventilator is controlled via the wall mounted thermostat which reports back to the DDC system. All of the classrooms along the perimeter are provided with wall mounted hot water fin tube radiation which is also controlled through the same wall mounted thermostat (Fig. 34). All spaces are provided with either a wall or ceiling mounted exhaust register which communicates to roof mounted exhaust fans. These fans help maintain a neutral pressure within the space by removing the same amount of air that is being introduced by the unit ventilators outside air connection (Fig. 35 & 36).

There are some spaces that are internal to the building and are not provided with any exterior walls. These spaces such as the Band and Chorus rooms, Photo Lab, Computer Lab, OT/PT rooms and Dark room are tempered through the use of rooftop units. These rooftop units are associated with a galvanized sheet metal supply and return duct distribution system which resides within the ceiling cavity. Within these duct distribution systems are duct mounted, constant air volume, fan powered terminal units with hot water reheat coils. The combination of the fan powered terminal unit and its hot water reheat coil provide individual temperature control for each room. Each individual space is provided with one fan powered terminal unit. The roof top unit delivers a constant 60 degree supply air temperature which is then reheated through the use of the fan powered hot water reheat coil based on the individual occupant temperature set point. The roof top units do have a manufacture provided DDC controller to operate and function the gas fired furnace and direct expansion cooling, this controller/ terminal strip is interfaced with the Honeywell control system.

Figure 30

Figure 31

Figure 32

Figure 33

Figure 34

Figure 35

Specific Issues	*Recommendations*
The Science Classroom unit vents are noisy and according to the staff it is effecting the teaching environment.	Provide service and maintenance on all unit ventilators including vacuuming coils, stroking isolation valves, lubricating motors/shafts, verify shaft alignment, clean filters and provide the proper water treatment for the piping system .
There are no CO2 sensors installed within the classrooms.	Provide CO2 sensors within all classrooms with unit ventilators and provide the necessary wiring and programming to allow for demand control ventilation. This will increase energy savings throughout the building .

LARGE GROUP SPACES:

The large group spaces such as the Café, Servery, Auditorium, and Distance Learning Lab are all provided with single roof top units dedicated to each individual space, which provide heating, ventilation and air conditioning to the spaces (Fig. 51, 52 & 54). All these roof top unit units are associated with galvanized sheet metal duct distribution systems which deliver and return the tempered air to and from the spaces (Fig. 37 & 38) within the café, fin tube radiation is utilized at the perimeter for supplemental heating (Fig. 39). These units consist of a supply and return fan, filter section, direct expansion cooling coil, and gas fired furnaces. The roof top units that were installed as part of the renovation in 2007 are manufactured by McQuay and Aaon. The Auditorium does have two indoor air handling units located above the stage in a mechanical penthouse. These units in conjunction with one rooftop unit was provided under the 2007 renovation, the two air handling units serve the stage and front half of the Auditorium while the one rooftop unit serves the rear of the Auditorium (Fig. 42, 43, 44, 45, & 46). The Media Center is also provided with two indoor air handling units. The air handling units are similar to the rooftop units and have the same components with the exception being that the indoor air handling units utilize hot water as their heat source in lieu of a gas fired furnace and split cooling condenser with refrigerant piping for cooling in lieu of a direct expansion cooling system (Fig. 47, 48, 49 & 50).

The kitchen is provided with a full commercial cooking hood which is equipped with a fire suppression system. The hood has a dedicated gas fired make up air unit manufactured by Reznor and an exhaust fan associated with it. Both of these components are controlled via a push button located in the kitchen (Fig. 40, 41 & 53).

Figure 36

Figure 37

Figure 38

Figure 39

Figure 40

Figure 41

The Locker rooms and Gym spaces are provided with rooftop units similar to those indicated above however these rooftop units are not provided with any air conditioning. All of these spaces are only provided with heating and ventilation air through the use of the roof top units and their associated supply and return duct distribution systems.

The roof top units do have a manufacture provided DDC controller to operate and function the gas fired furnace and direct expansion cooling, this controller/terminal strip is interfaced with the Honeywell control system. As for the indoor air handling units, there is no manufacture's DDC controller. All controls associated with these indoor units are provided and controlled by Honeywell, along with other manufactured products such as Belimo actuators for damper control. Each indoor air handling unit is provided with a Honeywell direct digital controller which communicates back to the main head end system which displays all its values through the Honeywell Logic and front end software. This is typical of the rooftop units with the exception of a third party controller which is interfaced with the Honeywell Logic and front end software.

Specific Issues	*Recommendations*
RTU-9 & 10 associated with Gym require new Microtech controllers. According to the facilities mechanical personnel these controllers are currently being purchased.	Provide routine maintenance and annual service on all rooftop units including coil vacuuming, condensate drain pan vacuuming, motor lubrication, shaft alignment, refrigerant charge, belt changes and filter changes.

Figure 42

Figure 43

Figure 44

Figure 45

Figure 46

Figure 47

Figure 48

Figure 49

Figure 50

Figure 51

Figure 52

Figure 53

Figure 54

ADMINISTRATION/OFFICE AREAS:

All the Administration areas and general offices are tempered through the use of rooftop units. These rooftop units are associated with a galvanized sheet metal supply and return duct distribution system which resides within the ceiling cavity (Fig.56). Within these duct distribution systems are duct mounted constant air volume fan powered terminal units with hot water reheat coils. The combination of the fan powered terminal unit and its hot water reheat coil provide individual temperature control for each room. Each individual space is provided with one fan powered terminal unit. The roof top unit delivers a constant 60 degree supply air temperature, which is then reheated through the use of the fan powered hot water reheat coil based on the individual occupant temperature set point. The roof top units do have a manufacturer provided DDC controller to operate and function the gas fired furnace and direct expansion cooling, this controller/terminal strip is interfaced with the Honeywell control system. Each zone is provided with a wall mounted Honeywell thermostat for temperature control (Fig. 55).

Specific Issues	*Recommendations*
None	Provide routine maintenance and annual service on all rooftop units including coil vacuuming, condensate drain pan vacuuming, motor lubrication, shaft alignment, refrigerant charge, belt changes and filter changes.

SHOP AREAS:

There are two shops within the building, a Technical Engineering Metal shop and a Technical Engineering Wood shop. Both of these spaces are heated and ventilated through the use of one rooftop unit. The unit is associated with a duct distribution system which provides tempered ventilation air to the spaces through ceiling mounted diffusers and returns. The metal shop utilizes exposed ductwork within the space with duct mounted diffusers (Fig. 57).

The Metal shop has a canopy style hood constructed of galvanized sheet metal, which communicates to a roof mounted centrifugal exhaust fan. Under the hood is where the welding booths are located. These booths serve as a dedicated area where students can weld and their associated fumes can be extracted by the hood. The space is also equipped with a dust filtration unit (smoke eater) which is located high on the wall. This unit's filter was dirty and in need of replacement. (Fig. 58 & 59)

The Wood shop is equipped with a Donaldson Torit dust collection system. The unit is located outside adjacent to the space and its galvanized sheet metal ductwork, supply and return enter the room through the exterior wall. The ductwork is distributed throughout the space and has several drop down connections which in most cases do not connect to any equipment and are capped/closed at the blast gates. It would appear that this system is not being used to its full potential, there was only one piece of equipment which appeared to be a planer that was actual connected to the system. The remaining drops where not connected to anything. It's unclear as to why other components are not connected to the system. Considering the dust located on the floor and on the equipment it would appear

Figure 55

Figure 56

Figure 57

Figure 58

Figure 59

Figure 60

that more pieces of equipment should be connected to the system as well as providing floor sweeps throughout the shop to help keep the dust down and make cleaning easier (Fig. 60 & 61).

Specific Issues	*Recommendations*
The filter in the Metal shop dust filtration unit is dirty and in need of replacement.	Change/clean the filters on the dust filtration unit in the Metal shop.
The dust collection system in the Wood shop is not connected to all the equipment.	Determine why equipment not connected; remedy the issue(s), and connect equipment.
	Provide routine maintenance and annual service on the rooftop unit including coil vacuuming, condensate drain pan vacuuming, motor lubrication, shaft alignment, refrigerant charge, belt changes and filter changes.

EXHAUST SYSTEMS:

Throughout the building, general exhaust is provided through the use of roof mounted exhaust fans. These fans are located in areas such as Toilet rooms, Storage rooms, Shower areas, Custodial closets, Mechanical spaces and Electric rooms. Also all spaces associated unit ventilators are provided with general exhaust to help maintain neutral pressures within spaces. These fans are all associated with their own independent galvanized sheet metal duct distribution systems and all terminate within the spaces with ceiling or wall mounted grilles (Fig. 62, 63, 64, 65, 66, 67 & 68). The majority of all these fans are controlled via the building control system, the Honeywell platform provides scheduling so all these fans and similar components can be activated and deactivated based on an occupied and unoccupied schedule. Overall, most of the fans appeared to be functioning and in fair condition.

Specific Issues	*Recommendations*
None	Provide routine maintenance on all exhaust fans such as replacing belts and lubricating their motors and shafts.

Figure 61

Figure 62

Figure 63

Figure 64

Figure 65

Figure 66

Figure 67

Figure 68

COMMON AREAS:

The common areas such as Corridors, Restrooms and Lobbies are all heated and ventilated via local roof top units that serve that general area. The corridors and vestibules are provided with supplemental heat through the use of wall/ceiling mounted cabinet unit heaters and fin tube radiation. Each component is controlled via a wall mounted thermostat which communicates back to the Honeywell control system. Many radiators within the corridors were damaged, although this does not appear to be effecting the heating performance of the fin tube radiators. As of right now it may lead to future issues if it is not repaired or replaced. (Fig. 69 thru 78)

Specific Issues	*Recommendations*
Many of fin tube radiators located within the corridors were damaged and in need of repair or replacement.	Provide routine maintenance on all equipment such as motor and shaft lubrication, filter replacement and coil cleaning. Repair or replace damaged units.

Figure 69

Figure 70

Figure 71

Figure 72

Figure 73

Figure 74

Figure 75

Figure 76

Figure 77

Figure 78

ELECTRICAL ASSESSMENT

EXECUTIVE SUMMARY

The original building was constructed in 1959 with a full renovation (gut rehab) plus an addition ending in 2007. The Electrical Systems are in good condition.

The facility's electric service is provided by Eversource and is secondary metered, other incoming utilities include telephone, cable tv, fiber, and fire alarm.

POWER DISTRIBUTION SYSTEM

The three phase primary power runs overhead along the rear of the school roadway where it transitions to underground at Pole #123 with one (1) 4" conduit and one (1) 4" spare into a pad mounted transformer (Figures 1 & 2).

The secondary service runs underground between the transformer and the secondary switchboard in the electric room located in the basement. The secondary Meter #5109011 is located on the exterior.

The switchboard is rated at 5,000 amperes, 277/480 volt, 3 phase, 4 wire and has a main circuit breaker section, C/T section, and four (4) distribution sections. The switchboard is a GE Spectra Series board and has spare breakers, as well as space provisions. The board sits on a housekeeping pad (Figure 3).

A 400 ampere main circuit breaker/C/T section is located adjacent to the board and services the fire pump. The fire pump service is fed directly from the switchboard connected ahead of the main breaker (Figure 4).

Local and remote panelboards are also manufactured by GE. A distribution panel in the main electric room has two breaker spaces covered with cardboard. (Figure 6)

The dry type transformers meet TP-1, 1996 efficiency (Figure 5).

The switchgear is in good condition.

The electric room doors swing out and are equipped with panic hardware.

Specific Issues	*Recommendations*
Distribution panel has breaker space covered with cardboard.	Provide blank metal cover for breaker space in distribution panel.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

EMERGENCY STANDBY SYSTEM

The facility has an exterior Caterpillar diesel generator within a walk-in weatherproof, sound attenuated enclosure on a base mounted fuel tank (Figure 7). The generator breakers consist of a 400 amp breaker for the fire pump, one (1) 800 amp breaker for the standby ATS and one (1) 225 amp breaker for the life safety ATS.

The automatic transfer switches are manufactured by Zenith; one (1) rated at 800 amp located in the main electrical room and one (1) rated at 600 amp but fed with a 225 amp feeder is located in the emergency room. Remote emergency panels are fed with 2 hour rated MI cable (Figures 8 & 9).

The remote annunciator is located in the facilities office in the basement (Figure 10).

The emergency lighting consists of normal/emergency fixtures. Various emergency fixtures also contain emergency ballast with battery back-up.

The Exit signs consist of cast aluminum units with LED sources (Figure 11).

The emergency system is in good condition.

Specific Issues	*Recommendations*
None	None

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

PHOTOVOLTAIC SYSTEM

The facility has a roof mounted self-ballasted photovoltaic system connected to a 500 kW inverter located at grade on the exterior near the transformer (Figure 12). The inverter was manufactured by Solectria, Smartgrid 500 Series (Figure 13). The inverter has integral A/C and DC disconnect switches.

The PV system conduits rise up on the exterior of the building (Figure 14).

Specific Issues	*Recommendations*
None	None

Figure 12

Figure 13

Figure 14

INTERIOR LIGHTING

The corridor lighting consists of 1x4 recessed parabolic fixtures with two (2) T8 lamps (Figure 15). The main hallways and lobbies have recessed 6" down lights with two (2) horizontal compact fluorescent lamps (Figure 16).

The typical classroom has two (2) rows of pendant mounted indirect fixtures with two (2) T8 lamps controlled with a two position low voltage switch plus an on/off switch. The fixtures are equipped with 2-step ballasts for dual-level lighting. The science labs have three (3) rows of fixtures. Classrooms have occupancy sensors (Figure 17).

The metal and wood shop have surface mounted troffers with three (3) T8 lamps controlled with two switches.

The kitchen has recessed 2x4 troffers with three (3) T8 lamps. The cafeteria and servery have 6" and 8" recessed downlights with two (2) compact fluorescent lamps (Figure 18).

The gymnasium has suspended 2x4 high bay fluorescent fixtures with four (4) T5HO lamps with protective wire-guards.

The locker rooms have recessed 2x4 troffers with three (3) T8 lamps controlled with key switches. The weight room has 2x2 recessed parabolic fixtures with two (2) T5 lamps (Figure 19).

The media center is lit with 10" recessed down lights with two (2) compact fluorescent lamps on high ceilings and pendant rows of indirect fixtures with two (2) T8 lamps on lower ceiling areas controlled with key switches (Figure 20).

The distance learning lab has recessed 8" down lights with two (2) compact fluorescent lamps controlled with multi-level switches.

The TV studio has surface mounted 2x4 troffers with three (3) T8 lamps for work lights. There is a pipe grid with receptacles used for performance lighting. The performance lighting consists of clamp mounted compact fluorescent fixtures. Fixtures are controlled through the lighting console in the control room (Figure 21).

The dark room has recessed 2x4 troffers with dual-level controls for general lighting. Two suspended plug-on dark room lights are used for processing film. An "in-use" light exists outside the room door (Figure 22).

Auditorium has 8" recessed down lights with two (2) CFL lamps for general lighting and 4" recessed down lights with one (1) CFL lamp over the outer isles. The inner isles have floor mounted LED continuous edge strips for Isle lights (Figure 23). Front of house has one (1) electric with performance fixtures. The stage has three (3) electrics with source four performance fixtures. Overhead LED cylinders are used for work lights. The lighting control console is located at the rear of the auditorium.

Utility spaces typically have wraparound fixtures with two (2) T8 lamps.

The interior lighting is in good condition.

An automated lighting control system exists with relay panels and low voltage switches within each room.

Specific Issues	*Recommendations*
Compact fluorescent down lights exist throughout the school.	Retrofit down lights with LED sources.

Figure 15

Figure 16

Figure 17

Figure 18

Figure 19

Figure 20

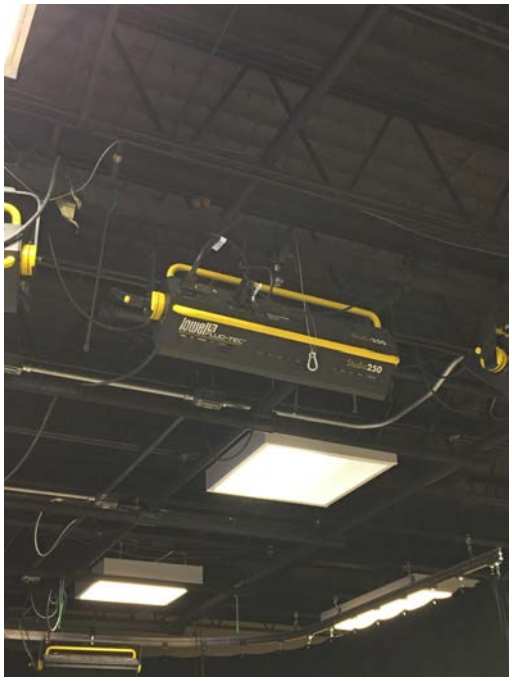


Figure 21

Figure 22

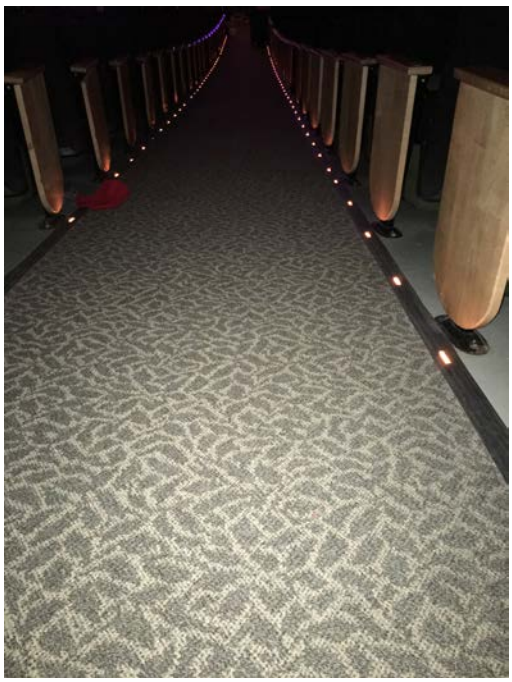


Figure 23

EXTERIOR LIGHTING

The roadways and parking areas are lit with pole mounted square shoebox style fixtures with HID lamps. The fixtures are of the cutoff type. Various poles have CCTV cameras (Figure 24).

HID wall packs exist on perimeter of building. Cylinders are located over doors (Figure 25).

Under canopy lights consist of recessed down lights with two (2) CFL lamps, some with emergency battery ballasts and remote test switch (Figure 26).

All HID and CFL fixtures should be retrofitted/replaced with LED sources.

Specific Issues	*Recommendations*
HID pole fixtures.	Retrofit/ replace HID pole fixture heads with LED sources.
HID wall packs and cylinders.	Replace HID wall packs with LED wall sconces.
Compact fluorescent down lights.	Retrofit CFL down lights with LED sources.

Figure 24

Figure 25

Figure 26

FIRE ALARM SYSTEM

The fire alarm system consists of an addressable Gamewell fire alarm control panel and voice evacuation cabinet located at the main vestibule (Figure 27).

A flush mounted exterior local energy master box #7115 is located at the main entrance along with a knox box and a Red Beacon over the box

The audible/visual signaling devices consist of speaker/strobes that are ADA compliant. Speaker/strobes are located throughout the facility including classrooms. Pull stations exist at exit discharge doors (Figure 28).

Smoke detectors exist in corridors, stairwells, and other large spaces open to egress corridors. Electric rooms have smoke detectors with remote alarm indicators.

Corridor doors are held open with magnetic door holders.

Heat detectors exist in the kitchen.

H&V units have duct smoke detectors with remote test stations.

The sprinkler system is supervised.

The fire alarm system is in good condition.

Specific Issues	*Recommendations*
None	None

Figure 27

Figure 28

MISCELLANEOUS

The communications services consisting of fiber, telephone, cable TV, and fire alarm originate at rise Pole # 1/89/3 at rear of school and enter the building underground in four (4) 4" conduits into the communications room in the basement (Figure 29).

The field house and stadium lights have their own dedicated electric services fed from pole mounted transformers. The field house has a 200 amp, 120/240 volt, 1 phase, 3 wire service. The stadium has a separate 400 amp service (Figure 31).

The football/soccer/track field and the tennis courts have sports lighting. The field house has an ESL 1500 series fire alarm control panel and a Sigcom radio box (Figure 30). The roadway lights consist of LED floods on utility poles with overhead wiring.

The school has a lightning protection system.

The boiler room corridor door has an emergency off switch but none exist at the exterior doors.

Typical classrooms have a fair amount of receptacles. GFI type outlets typically exist near sinks. Various kitchen and servery receptacles are not GFI type.

Specific Issues	*Recommendations*
Boiler room emergency power off switch.	Provide EPO switch to shot boilers at exterior door. Provide tamperproof cover over existing EPO switches.
Non-GFI outlets in Kitchen and Servery.	Change non-GFI outlets in Kitchen and Servery to GFI type.

Figure 29

Figure 30

Figure 31

PLUMBING ASSESSMENT

EXECUTIVE SUMMARY

Presently, the Plumbing Systems serving the building are cold water, hot water, tempered water, sanitary, waste and vent system, special waste and vent system, storm drain piping, and natural gas. Municipal sewer and municipal water service the Building.

Construction of a building addition and renovation occurred in 2007. The majority of the plumbing systems were replaced at that time. The plumbing fixtures are in good condition.

FIXTURES

The water closets installations vary throughout the building. Predominately water closets are wall hung vitreous china with electronic sensor operated flush valves. (Figure 1) In three story classroom wing water closets are floor mounted vitreous china with manual flush valves. (Figure 2) Single user bathrooms adjacent to Stage have floor mounted vitreous china water closets with manual flush valves.

Urinals are wall hung vitreous china with electronic sensor operated flush valves. (Figure 3) In three-story classroom wing urinals are wall hung vitreous china with manually operated flush valves.

In student bathrooms' lavatories are wall hung, multi-station, wash fountains with electronic sensor operating metering faucets. (Figure 4)

In single user bathrooms adjacent to Stage, lavatories are counter mounted vitreous china with two handle faucets. (Figure 5)

In single user bathrooms' lavatories are wall hung vitreous china with electronic sensor faucets. (Figure 6)

Electric water cooler types vary throughout the building. There are recessed type with hi-lo stainless steel bowls (Figure 7) as well as surface mounted, wall hung, with hi-lo stainless steel bowls. (Figure 8) Some water cooler bubbler spouts have been damaged.

Janitor's sink are either trap standard mounted, enameled cast iron sinks with vacuum breaker faucet (Figure 9) or floor mounted composite slop sink with wall mounted vacuum breaker faucet. (Figure 10)

Science classroom sinks are resin type with cold and hot water faucets. (Figure 11) Classrooms contain an emergency shower fixture fed by the tempered water system. (Figure 12) Sinks are piped to an interior acid neutralization system located in the Mechanical Room.

Staff sinks are single bowl, counter mounted stainless steel, with gooseneck faucet.

Kitchen area fixtures are in good condition. The pot washing sink is fitted with an in-floor grease interceptor. (Figure 13)

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

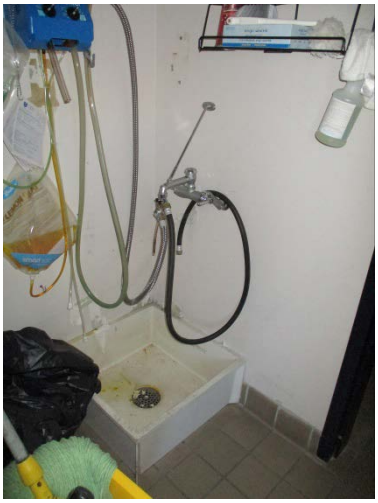


Figure 9

Figure 10

Figure 11

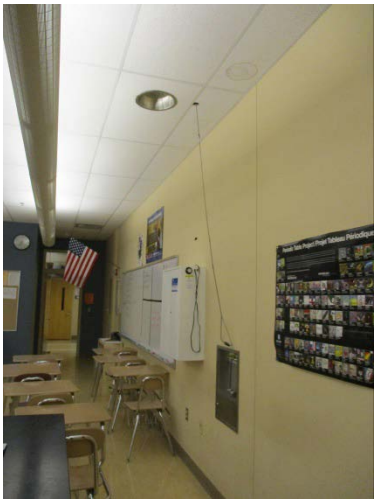


Figure 12

WATER SYSTEMS

The main domestic water service is located in the Basement Mechanical Room. The service is 6" in size and includes a 3-inch compound meter. (Figure 14) The main domestic cold-water distribution is 6-inch in size.

Piping, where exposed, appears to be copper with sweat joints. The majority of the piping is insulated. Piping and valves appear to be in good condition.

A separate dedicated non-potable system is provided for the science classrooms. Dedicated system is protected with reduced pressure backflow preventer.

Tempered water system is provided to the emergency fixtures in the science rooms. Tempered water system is recirculated.

Domestic hot water for the building is generated through two tank type water heaters. Each water heater has a natural gas input of 800,000 BTUH and 400 gallons of water storage. The hot water systems are recirculated. There is a thermostatic mixing valve and expansion on the system. The water heaters are approximately halfway through their life expectancy. (Figure 15)

Non-potable hot water for the Science classrooms is generated through a single tank type water heater. The water heater has a natural gas input of 199,000 BTUH and 125 gallons of water storage. The non-potable hot water system is recirculated. There is a thermostatic mixing valve and expansion on the system. The water heater is approximately halfway through its life expectancy. (Figure 16)

GAS

Natural gas is supplied to the building. The meter is on the exterior of the building adjacent to the Basement mechanical room. (Figure 17)

Gas piping supplies the heating boilers, potable and non-potable water heaters, HVAC equipment, Kitchen, and Science classrooms.

Gas piping is black steel with a combination of screwed and welded joints and fittings depending on the time of installation. Gas piping is in good condition.

Natural gas is provided in the science classrooms. Classrooms are equipped with emergency shutoff valves.

Natural gas is provided for kitchen cooking equipment. Kitchen supply is not equipped with an emergency automatic shutoff valve.

DRAINAGE SYSTEMS

Cast iron is used for sanitary and storm drainage. Where visible, the cast iron pipe appears to be in good condition. Smaller pipe sizes appear to be copper.

In general, the cast iron drainage piping can be reused even in a major renovation where adequately sized for the intended new use.

Acid waste and vent piping acid resistant polypropylene with fused joints. Special waste is directed to an acid neutralization system located in the Basement mechanical room. (Figure 18)

Specific Issues	*Recommendations*
In general plumbing fixtures meet current plumbing code for water conservations.	Additional measures can be taken by installed high efficiency, low flow, plumbing fixtures to conserve water.
Gas supply to kitchen cooking equipment is not equipped with an emergency gas shutoff valve interlocked with CO monitor.	Install emergency gas valve on kitchen equipment gas supply. Interlock valve with CO detector in order to shutdown gas if CO is detected near kitchen hood.
Bubblers at water coolers are damaged.	Replace damaged bubblers.
Water heaters are at half their life expectancy.	When water heaters fail replace with high efficiency condensing type gas fired units.

Figure 13

Figure 14

Figure 15

Figure 16

Figure 17

Figure 18

FIRE PROTECTION ASSESSMENT

EXISTING CONDITIONS

The 8-inch fire service enters the Basement Mechanical Room. The fire service is controlled by an exterior post indicator valve (PIV). (Figure 1)

There is an electric, 15 horsepower, fire pump. Fire pump is rated for 300 gallons per minute at 50 PSI boost. Signs of major corrosion evident at base of fire pump. (Figure 2)

After the fire pump the fire sprinkler main is 4-inch in size, runs through a 4-inch double check valve assembly and then four wet sprinkler zone risers. (Figures 3 & 4)

The Fire Department connection is a 4-inch Storz type.

Sprinkler piping is black steel with coupling joints on larger pipe size and threaded joints on smaller size branch piping. The piping appears to be in good condition.

Standpipe valves are provided in three story classroom wing and at three story stair adjacent to Mechanical Room. Some valves are exposed however valves are predominately located in recessed cabinets. Not all cabinets are labelled.

Sprinkler heads are quick response type. At ceiling areas sprinklers are semi-recessed type. (Figure 5) In non-ceiling areas sprinklers are upright type. Some escutcheons are missing on semi-recessed sprinklers.

All areas of the building appear to be protected.

The kitchen hood is protected with a water spray suppression system. (Figures 6)

Specific Issues	*Recommendations*
Fire pump has significant corrosion.	Replace fire pump with new horizontal fire pump.
Some semi-recessed sprinkler heads missing escutch-eons.	Replace all missing escutcheons
Some fire department valve cabinets not labelled.	Provide labels on all fire department valve cabinets.
	Owner to continue to inspect and maintain existing sprinkler system per current NFPA 25 recommenda-tions.

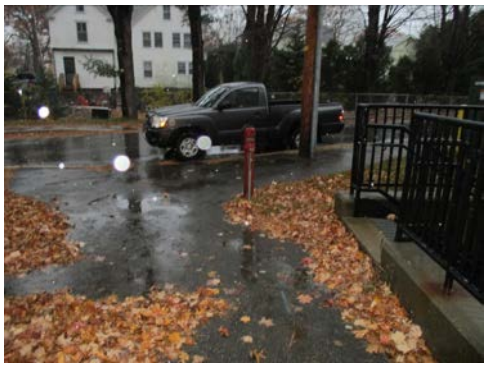


Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

FOODSERVICE EQUIPMENT ASSESSMENT

HIGH SCHOOL KITCHEN

The Canton High School kitchen serves a population of approximately 950 students in grades 9 through 12. The facility underwent a renovation and expansion in 2007. As part of that renovation the kitchen was completely renovated and reequipped with all new foodservice equipment (Figure 1 & 2). At that time the servery was completely renovation to be a scatter styles servery organized with multiple service points (Figure 3 & 4).

Overall the staff are pleased and the facility does not have any major issues other than the normal wear and tear seen in this type of setting. However, we have identified specific issues that need to be addressed.

Specific Issues	*Recommendations*
The hardness of the water at this facility generated the most complaints from the staff. During our visit it was noted that two steamers were down and awaiting repair (Figure 5).	We recommend a water softener be added to soften the water to the entire kitchen.
Hard water is also affecting the pot and pan washer and all boiler based equipment.	We recommend a water softener be added to soften the water to the entire kitchen.
The walls in the mop are not clad with a durable finish (Figure 6).	Repair the wall and clad with either stainless steel or fiberglass reinforced paneling.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

TECHNOLOGY ASSESSMENT

TECHNOLOGY ASSESSMENT

DATA/TELEPHONE/INTERCOM/CLOCKS

The schools MDF room is located in room 4420. (Figure 1) The MDF is the center of a star topology for the building as well as the other school buildings. There are seven IDF Rooms fed with 50 micron multimode fiber. (Figure 2) The schools are fed with single mode fiber with exception to Rodman Education center which is fed with multimode fiber. The MDF room and remote IDF rooms are adequately sized and conditioned. The room is not equipped with a centralized UPS. UPS power is accomplished via rack mounted units (Figure 3), and a Panduit server rack with integral 5 KVA UPS for the servers. (Figure 4) There were two tower servers that were located on the floor. (Figure 5) The equipment racks were not grounded to the tele communication ground bus which is located in the room and is bonded to the cable tray. (Figure 6)

In general the network is in good condition cabling is CAT 6 throughout. Cables in the IDF's and MDF's are neatly dressed and the rooms are clean. (Figure 7)

Wireless coverage seems to be adequate in the majority of the school. Ruckus wireless access nodes are installed on the ceiling in the corridors. (Figure 8)

The high school is equipped with educational spaces such as computer tabs, and specialty classrooms which contain a large number of data drops. (Figure 9) In general, the quantity and location of tel/data drops is adequate.

A typical classroom is equipped with a teacher workstation which consists of two data, one voice , two BNC video jacks, one coax CATV drop, (1) video RCA (yellow), two sets of audio RCA (white and red), one 15 pin SVGA, and a speak-on jack. (Figure 10) The VGA and speak-on jack run to a ceiling mounted projector. There is also two student data jacks. (Figure 11) The teacher desk has a VCR/DVD player, VOIP phone handset, and mixer/amp for audio.

The telephone system has been upgraded from a Candial to a Mitel VOIP system. The Mitel 3300 CX11 controller is sitting on a desk and should be mounted in the rack. (Figure 12)

The classroom intercom system is a Telecor II with (2) 125 watt amplifiers. The system is operational and in good condition. (Figure 13)

The clock system is a Sapling instar clock system with remote clocks throughout the building. (Figure 14)

The school was equipped with a coax broadband distribution system that seems to have been disconnected. (Figure 15)

The Auditorium is equipped with an appropriate A/V system for High School Theatrical activities and is operational.

The Cafeteria and Gymnasium are equipped with local WMA-75 Peavy sound systems with aux inputs and speakers for sound reinforcement. (Figure 16)

Specific Issues	*Recommendations*
Mitel 3300 CX11 controller is resting on a desk and should be rack mounted.	Rack mount the Mitel equipment and secure properly to avoid damage and allow proper air flow.
Equipment racks are not grounded to telecommunications grounding system	Install bonding jumper from rack to the cable tray above that is connected to the telecommunications grounding system.
Ceiling mounted projectors are utilized in most classrooms. Ceiling mounted projectors are obsolete as compared to current classroom technology.	Interactive LED displays or interactive ultra short throw projectors would be recommended in the classrooms as this is the latest classroom display technology.

Figure 1

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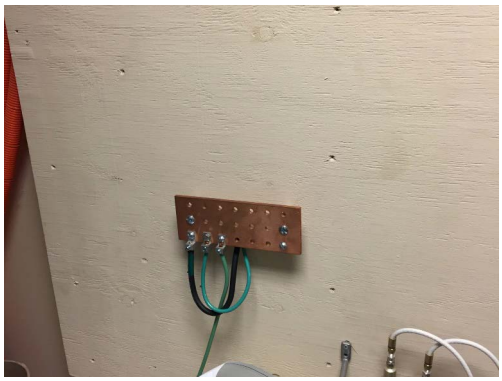

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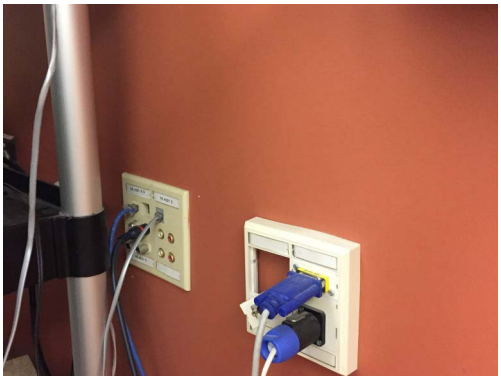

Figure 10

Figure 11

Figure 12

Figure 13

Figure 14

Figure 15

Figure 16

SECURITY SYSTEM

The school is equipped with an intrusion detection system which consists of door contacts, motion sensors, key-pads (Figure 17) and a control panel. The Manufacturer of the intrusion system is DSC. The system is operational and in good condition.

The school is equipped with an access/control system which consists of card readers (Figure 18), door controllers and access control software. The access control system is manufactured by Keyscan and has been standardized in other schools. (Figure 19)

The school is equipped with CCTV cameras throughout the building, typically in corridors. (Figure 20) The exterior perimeter is also covered with CCTV cameras as well as the parking lot which contains numerous pole mounted cameras. (Figure 21) Overall, the coverage is good. The cameras are not IP type, however, they are in good condition. They are Hikivision NVR's installed in a locked rack within the MDF Room. (Figure 22)

The school is equipped with a two way door intercom system at main entry points which communicate back to administration stations that can unlock the doors. (Figure 23)

Specific Issues	*Recommendations*
No panic buttons where noted.	Panic buttons should be added in key areas such as Admin and in the Principal and Vice Principal offices. They will be programmed to lock doors if an access control system is installed, send a tone over the paging system, and alert the Police Department.

Figure 17

Figure 18

Figure 19

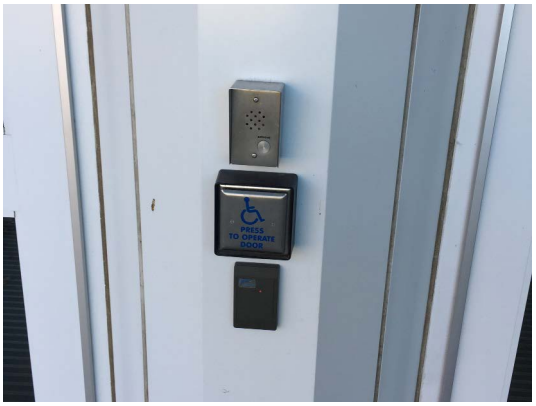

Figure 20

Figure 21

Figure 22

Figure 23

SUMMARY

A Capital Improvement Plan (CIP) is a road map for managing the District's physical plant and facilities. It details the issues present in each building, the cost estimated to fix or repair them, and an orderly prioritization of the issues with sensitivity to their cost and logistical factors. This allows the facilities team to plan reasonable funds each year as well as prepare for larger capital costs that are less frequent.

CIP STUDY METHODOLOGY

As demonstrated in previous sections of this report, the consulting team conducted existing conditions surveys throughout the building and noted deficiencies. These were tabulated in a spreadsheet, organized by consulting discipline, as follows:

- Site & Civil
- Exterior Architectural Elements
- Interior Architectural Elements (Including Kitchen)
- Mechanical/ HVAC
- Electrical
- Plumbing
- Fire Protection
- Technology
- Hazardous Materials

The spreadsheet was cost-estimated by the building cost consultant, including base construction cost, a design contingency of 10%, and a "soft costs" multiplier of 20%. Once this data was received by the architects, the team assigned priorities to the CIP items as follows:

- Immediate/High Priority (1-3 years): Items that should/must be done due to safety or code concerns, mission-critical items, immediate breakage/serviceability issue, immediate and pressing educational need, "Low-Hanging Fruit" (items that are relatively easy and/or not costly to take care of), or efficiency measures that will pay high dividends in the short term for a relatively low capital investment. These items were broken down into Year 1/ Year 2/ Year 3 estimated costs for the immediate capital planning needs of the District.
- Medium Priority (4-6 years): Items not of immediate concern, more expensive or creating more upheaval in the school, more comprehensive in nature, or items that are specifically timed to the estimated/anticipated 4-6 year end of life of the component or system.
- Low Priority (7-10 years) or Under Full Renovation Project: Items of a very low concern, most able to be planned for in the long term, items that are specifically timed to the estimated/anticipated 7-10 year (or longer) end of life of the component or system, or items that are so comprehensive that doing them under a full renovation scenario makes the most financial and logistical sense.
- Ongoing Maintenance: Items that fall under general building maintenance that are not capital in nature (in and of themselves), or can be done a little at a time under an organized building maintenance program. Ideally, the facilities team does not defer building maintenance to the point where it accumulates and a capital project is required to take care of it. Daily maintenance does not fall into this category.

MARILYN G RODMAN EDUCATIONAL & ADMINISTRATIVE CENTER

The building's gross floor area is 53,965 GSF and was built in 1949, with an undated classroom addition seamlessly added onto the north end; presumably shortly thereafter, and a cafeteria enlargement project in 2007 which was part of the phased reno/add to the High School. The school had accessibility upgrades in 2001, a new elevator installed in 2015, and a window upgrade at a relatively recent, unknown date.

Generally, the exterior and interior of the building is in fair condition. There are major exterior maintenance issues that will present themselves in the near future. Additionally, "misfit" issues develop from old classroom spaces that have been adapted for new uses. The building recently had mechanical upgrades and has some minor accessibility issues. Most notably there are deficiencies with building electrical and plumbing systems, lack of adequate mechanical ventilation and air conditioning in many spaces (given combined Office and PK/Daycare uses), and no sprinkler system in the building.

CONCLUSIONS

The total estimated CIP cost for Rodman EEC is roughly $12.7M. The numbers alone do not adequately reflect the concerns at Rodman.

- High Priority Items were estimated for a Y1—Y3 total of $2,459,141. The team was not asked to provide a Y1-Y3 annual breakdown for this building.
- Medium Priority Items were estimated at $1,690,362.
- Low Priority or Under Full Renovation Items were estimated at $6,946,370.
- Ongoing Maintenance Items were estimated at $1,530,921.

Much like the Galvin MS previously discussed, these numbers might suggest that, "while there is a significant high priority budget of over $2.45M, there are a lot of costs that can be pushed out to Y7 or longer. Nothing too urgent here."

Again, this is an incorrect interpretation of the situation. In assigning priorities, the design team found that many of the large ticket items were matters of some urgency to be corrected in the building that could easily be classified as High Priority, but were more appropriate to be included under the "Full Renovation" scenario. With nearly $7M of future costs attributed to this building, the case for a full renovation gets stronger.

One would also note that Ongoing Maintenance is significantly higher than other buildings in the district, mainly due to a backlog of abatement issues still pending.

This analysis will be brought to bear in the overall vetting of the building program options.

The cost estimate and prioritization spreadsheet that follows provides all the backup detail related to this discussion and recommendations.

Lt Peter M Hansen Elementary School

The school's gross floor area is 69,204 GSF and it was built in 1968, with an addition of modular space in 1996 and a classroom addition finished in 2016 which removed the modulars. The school had accessibility upgrades in 2003 including a new elevator, additional accessibility work in 2006, and a window upgrade in 2014.

Overall, the interior and exterior of the building is in good condition, with some older areas in fair condition, and the new addition in excellent condition. The older sections have typical building maintenance items, but its main failings are deficiencies with MEP systems, particularly original unit vents in the older portion, and low amounts of natural lighting due to "slit" type windows in many spaces, or no windows in some spaces.

Conclusions

The total CIP costs estimated for Hansen are just over $4.1M.

- High Priority Items were estimated for a Y1—Y3 total of $1,496,213. The team was able to effectively balance the priority of items each of the three years, taking into account logistical combinations and cost amortizations in some cases, which averaged to about $499,000 per year.
- Medium Priority Items were estimated at $360,813.
- Low Priority or Under Full Renovation Items were estimated at $1,081,472.
- Ongoing Maintenance Items were estimated at $28,370.

The numbers reflect a building that, though recently added onto, still has some facility challenges ahead; both in the near term and in the 7-10 year horizon. Fortunately, no category is overwhelming or particularly out of balance. As expected, Ongoing Maintenance is low, reflecting that many issues have been dealt with either through effective ongoing maintenance or as part of the recent addition project.

The cost estimate and prioritization spreadsheet that follows provides all the backup detail related to this discussion and recommendations.

JOHN F KENNEDY ELEMENTARY SCHOOL

The school's gross floor area is 59,666 GSF and was built in 1964, with additions in 2008 (elevator) and 2011 (classrooms). The school had accessibility upgrades in 1998 and sprinklers installed in 2016, but has not had any other major upgrades in its lifespan.

The interior and exterior of the building is in surprisingly good condition for its age, credited to excellent maintenance over the years and very solid construction. There are a few minor building maintenance items, but its main failings are deficiencies with MEP systems, and lack of adequate mechanical ventilation in a few key spaces.

CONCLUSIONS

The total CIP costs estimated for JFK are just over $8M. The CIP numbers generally support the theme that this building is in reasonable condition and capable of serving the district for many more years if it keeps getting upgrades. This is with respect to facility conditions only; educational programs and how they are served by the facility is another matter.

- High Priority Items were estimated for a Y1—Y3 total of $2,937,795. The team was able to balance the priority of items each of the three years, taking into account logistical combinations and cost amortizations in some cases, which averaged about $979,300 per year.
- Medium Priority Items were estimated at $670,351.
- Low Priority or Under Full Renovation Items were estimated at $4,418,221.
- Ongoing Maintenance Items were estimated at $41,341.

Though JFK has some pressing near-term needs, spreading those budgets over three years results in a manageable budget of just under $1M annually. What these numbers also tell us is that, much like Galvin, there are some major items totaling $4.4M that would make the most sense to undertake in a renovation scheme. Because JKF is in reasonable condition otherwise, it might make sense to wait a few years to take care of some of the more major items. Although it would be ideal to resolve all the issues in the first three years, there are more urgent needs in the district that need to be prioritized and addressed.

The cost estimate and prioritization spreadsheet that follows provides all the backup detail related to this discussion and recommendations.

Dean S Luce Elementary School

The Luce Elementary School's gross floor area is 69,410 GSF and was built in 1954, with a major addition in 2000. Overall, the interior and exterior of the building is in good condition, with some older areas in fair condition. The older sections have typical building maintenance items, but its main failings are deficiencies with MEP systems, and original, low-performing windows in some areas.

Conclusions

The total CIP costs estimated for Luce are just over $5.9M. The CIP numbers reflect several issues.

- High Priority Items were estimated for a Y1—Y3 total of $1,924,691. The team was able to balance the priority of items each of the three years, taking into account logistical combinations and cost amortizations in some cases, which averaged about $641,564 per year.
- Medium Priority Items were estimated at $1,684,935.
- Low Priority or Under Full Renovation Items were estimated at $1,374,949.
- Ongoing Maintenance Items were estimated at $938,283.

All three categories are nominally similar; around $1.6M plus or minus $300K. High priority items are a manageable amount, especially when amortized over three years. These numbers also indicate that the building has significant but not overwhelming needs that will present themselves in a relatively well-spaced-out manner (if projections match reality). It is also noted that Ongoing Maintenance is a relatively high category and more emphasis could be placed on getting that backlog under control.

The cost estimate and prioritization spreadsheet that follows provides all the backup detail related to this discussion and recommendations.

WILLIAM H GALVIN MIDDLE SCHOOL

The school's gross floor area is 133,543 GSF and was mostly built in 1971, with a small modular-construction addition built in 2002 on its north side. Apart from this addition and some ongoing maintenance, the school has not had any major enhancements or upgrades. As such, the interior and exterior of the building is generally in fair to good condition, with some accessibility challenges, but most notably has major deficiencies with MEP systems, lack of adequate mechanical ventilation in many spaces, and no sprinkler system in the building.

An issue that is somewhat lost in the mechanics of a CIP study is the lack of natural light and views in several internal spaces in the building. It is not appropriate to put a cost on these items (unless a radical measure is proposed to correct them, which was not feasible in this case), but we know how important they are, and they will be taken into consideration by the design team going forward.

CONCLUSIONS

The total estimated CIP cost for Galvin Middle School is nearly $14.5M. Just looking at the numbers does not initially tell the story of what is of concern at Galvin Middle School.

- High Priority Items were estimated for a Y1—Y3 total of $2,231,209. The team was not asked to provide Y1-Y3 annual breakdown for this building.
- Medium Priority Items were estimated at $734,980.
- Low Priority or Under Full Renovation Items were estimated at $11,483,542.
- Ongoing Maintenance Items were estimated at $41,290.

These numbers might initially suggest that, "while there is a significant high priority budget of over $2.2M, there are a lot of costs that can be pushed out to Y7 or longer. Nothing too urgent here."

This, however, is not an accurate interpretation. In assigning priorities, the design team found that many of the large ticket items were matters of some urgency that could easily be classified as High Priority, but were more appropriate to be included under the "Full Renovation" scenario. With almost $11.5M of future costs to this building, the case for a full renovation or replacement gets stronger.

That notion should be coupled with the previously mentioned issues of the lack of natural light and views in many internal spaces. This is something of vital importance that cannot be rectified in this particular building simply because of the depth of the floor plate and the fact that it is three stories. It is a structural failing of this building best addressed with a radical renovation or building replacement.

This analysis will be brought to bear in the overall vetting of the building program options.

The cost estimate and prioritization spreadsheet that follows provides all the backup detail related to this discussion and recommendations.

CANTON HIGH SCHOOL

The school's gross floor area is 265,603 GSF and was built in two main parts: the original building in 1959, and a major renovation/ addition that modernized all parts of the school in 2007. Generally, the interior and exterior of the building is in very good condition, and with a few minor exceptions is in good repair. It does not need major work, either in terms of the physical condition of the facility or the fit between educational programs and facilities.

CONCLUSIONS

Canton High School's overall estimated CIP cost was about $1.7M. As would be expected for a recently renovated building, CIP cost estimates were relatively low for the High School.

- High Priority Items were estimated for a Y1—Y3 total of $788,090. The team was able to balance the priority of items each of the three years, taking into account sequences and logistical combinations that made sense, which averaged about $262,700 per year.
- Medium Priority Items were estimated at $236,557.
- Low Priority Items were estimated at $549,252.
- Ongoing Maintenance Items were estimated at $141,418.

The cost estimate and prioritization spreadsheet that follows provides all the backup detail for these priority recommendations.

		RODMAN EDUCATION CENTER	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	Quantity	Cost of Repair / Replacement (5/2016 $)	Designer / Pricing Contingency (10%)	Soft Cost (20%)	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs)	On Going Maintenance	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
		52,118 GSF																						
1	**Site & Civil**																							
	1.01	Crack seal areas of pavement where cracking/ degradation has occurred.					x			53,000 SF	$37,950	$3,795	$8,349	$50,094					$50,094				
	1.02	Mill and overlay sections of pavement where cracking/ degradation has occurred.					x			53,000 SF	$37,950	$3,795	$8,349	$50,094					$50,094				
	1.03	Replace damaged curb					x			20 lf	$863	$86	$190	$1,139									
	1.04	Clean drainage swale, remove sediment and reseed					x			60 lf	$10,350	$1,035	$2,277	$13,662								$13,662	
	1.05	Clean existing catch basins.					x			15 ea	$4,600	$460	$1,012	$6,072					$6,072				
	1.06	Install splash pad or crushed stone at canopy roof drain					x			1 ea	$575	$58	$127	$759					$759				
	1.07	Video inspect sanitary sewer service					x			1 loc	$1,725	$173	$380	$2,277							$2,277		
	1.08	Flush fire hydrants 1x year					x			4 loc	$920	$92	$202	$1,214							$1,214		
		TOTAL																	$107,019	0	3491.4	13662	$124,172
2	**Structural Elements**																							
	2.01	Repoint masory					x			23,200 SF	$933,800	$93,380	$205,436	$1,232,616									
	2.02	Clean and paint exposed railing and columns, refinish	x				x			75 lf	$2,588	$259	$569	$3,416					x			$3,416	
	2.03	Install anchors at railing bases					x			1 ea	$1,150	$115	$253	$1,518									
	2.04	Seal concrete cracks in foundation					x			100 lf	$9,200	$920	$2,024	$12,144									
	2.05	Brace parapets at future renovation					x			1000 lf	$100,625	$10,063	$22,138	$132,825									
		TOTAL																	$0	$0	$0	$3,416	$3,416
3	**Exterior Architectural Elements**																							
	3.01	Repair cracks in foundation					x			20 lf	$1,840	$184	$405	$2,429							$2,429		
	3.02	Repair concrete where spalling is occuring					x			100 SF	$11,500	$1,150	$2,530	$15,180					$15,180				
	3.03	Remove grade 4" below vent to reduce water intrusion into vent.					x			1 ea	$575	$58	$127	$759								$759	
	3.04	Repair spalling concrete landing at guardrail base, north elevation					x			1 ea	$1,035	$104	$228	$1,366					x			$1,366	
	3.05	Remediate mortar joint deterioration at roof parapet					x			400 SF	$16,100	$1,610	$3,542	$21,252								$21,252	
	3.06	Repair leaks in masonry wall and clean effloresence					x			11,600 SF	$200,100	$20,010	$44,022	$264,132								$264,132	
	3.07	Repair limestone veneer crack with sealant					x			4 lf	$115	$12	$25	$152						$152			
	3.08	Reinforce limestone and brick veneer façade					x			200 lf	$8,050	$805	$1,771	$10,626							$10,626		
	3.09	Repair spalling limestone surround at main entrance					x			40 SF	$6,900	$690	$1,518	$9,108								$9,108	
	3.10	Repair cracking limstone where handrail has been removed					x			2 SF	$690	$69	$152	$911								$911	
	3.11	Clean stains and fungal growth from limestone					x			1 ea	$28,750	$2,875	$6,325	$37,950								$37,950	
	3.12	Repair cracks in limestone lintles					x			20 lf	$2,760	$276	$607	$3,643									
	3.13	Repair building expansion joint at original / addition intersection					x			100 lf	$9,200	$920	$2,024	$12,144									
	3.14	Repair mortar joints at limstone and brick					x			200 lf	$6,900	$690	$1,518	$9,108									
	3.15	Investigate movement in façade and seal cracks					x			600 lf	$34,500	$3,450	$7,590	$45,540									
	3.16	Clean stains and fungal growth from brick					x			23,200 SF	$133,400	$13,340	$29,348	$176,088									
	3.17	Replace cementitious canopy soffit with metal soffit system					x			40 SF	$4,140	$414	$911	$5,465									
	3.18	Refinish canopy metal columns					x			20 lf	$690	$69	$152	$911									
	3.19	Re-mortar under chimney cap					x			30 lf	$2,070	$207	$455	$2,732									
	3.20	Replace concrete at top-of-wall at areaway					x			25 lf	$5,750	$575	$1,265	$7,590									
	3.21	Reset and re-finish pipe railing system at areaway	x				x			25 lf	$1,438	$144	$316	$1,898									

		RODMAN EDUCATION CENTER	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	Quantity	Cost of Repair / Replacement (5/2016 $)	Designer / Pricing Contingency (10%)	Soft Cost (20%)	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs)	On Going Maintenance	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
	3.22	Seal cracks at brick ramp knee walls					x			25 lf	$1,725	$173	$380	$2,277									
	3.23	Repair concrete ramp spalling concrete, install new concrete topping					x			120 SF	$12,420	$1,242	$2,732	$16,394									
	3.24	Re-secure curtain wall mutin at main entry					x			2 ea	$1,150	$115	$253	$1,518									
	3.25	Remove window AC units and patch window openings			x			x		40 ea	$41,400	$4,140	$9,108	$54,648									
	3.26	Refinish metal doors at east and north elevations					x			4 ea	$920	$92	$202	$1,214									
	3.27	Replace louvers with storm resistant louvers			x		x			35 ea	$28,175	$2,818	$6,199	$37,191									
	3.28	Replace failed sealant at louvers					x			35 ea	$6,762	$676	$1,488	$8,926									
	3.29	Re-finish louver at curtain wall spandrel panel					x			1 ea	$345	$35	$76	$455									
	3.30	Re-finish louvers at grade					x			3 ea	$1,035	$104	$228	$1,366									
	3.31	Provide water test at roof over technology office, repair roof	x		x		x	x		1 ea	$1,725	$173	$380	$2,277									
	3.32	Install 30' ramp with a 1:12 slope at main entry				x				1 ea	$46,000	$4,600	$10,120	$60,720									
	3.33	Replace concrete pads at egress doors with ramps	x			x				1 ea	$5,750	$575	$1,265	$7,590									
	3.34	Re-surface concrete ramp at rear central egress, 5' x 30'					x			1 ea	$2,588	$259	$569	$3,416									
		TOTAL																	$15,180	$152	$13,055	$335,478	$363,865
4		**Interior Architectural Elements**																					
	4.01	Abate and replace VCT					x		x	250 SF	$2,875	$288	$633	$3,795							$3,795		
	4.02	Infill VCT where floor finish is missing					x			50 SF	$2,300	$230	$506	$3,036									
	4.03	Deep-clean rug at classroom					x			1 ea	$575	$58	$127	$759									
	4.04	Re-finish gynasium wood floor					x			8,500 SF	$58,650	$5,865	$12,903	$77,418							$77,418		
	4.05	Re-finish VCT treads at stairs	x				x			500 SF	$5,750	$575	$1,265	$7,590						$7,590			
	4.06	Re-finish / re-paint risers at stairs					x			500 SF	$2,875	$288	$633	$3,795								$3,795	
	4.07	Re-finish level 2 wood floor					x			1000 SF	$4,600	$460	$1,012	$6,072									
	4.08	Replace damaged window shades					x			10 ea	$2,875	$288	$633	$3,795							$3,795		
	4.09	Patch and repair walls where unit ventilators have been removed					x			150 SF	$5,175	$518	$1,139	$6,831							$6,831		
	4.10	Provide wall furring to conceal exposed conduit			X		x			41,500 SF	$334,075	$33,408	$73,497	$440,979									
	4.11	Re-paint interior surfaces					x			52,118 SF	$149,839	$14,984	$32,965	$197,788						$197,788			
	4.12	Repair and re-paint gypsum board ceilings in toilet rooms near windows					x			1,500 SF	$5,175	$518	$1,139	$6,831								$6,831	
	4.13	Repalce metal grid and ACP tiles at addtition corridors	x				x			3000 SF	$24,150	$2,415	$5,313	$31,878									
	4.14	Replace ACPs at pre-k classroom ceilings					x			11,000 SF	$88,550	$8,855	$19,481	$116,886									
	4.15	Re-paint hard ceilings at typical classrooms					x			12,000 SF	$27,600	$2,760	$6,072	$36,432									
	4.16	Paint tounge and groove ceiling adjacent to elevator addition					x			8,800 SF	$22,770	$2,277	$5,009	$30,056									
	4.17	Replace ceiling in teacher / staff lounge with new metal grid and ACPs					x			600 SF	$5,520	$552	$1,214	$7,286									
	4.18	Re-finish doors and frames					x			100 ea	$13,800	$1,380	$3,036	$18,216									
	4.19	Provide new hinges for closet door					x			1 ea	$230	$23	$51	$304									
	4.20	Re-finish wood storage cubbies					x			6 ea	$1,380	$138	$304	$1,822									
	4.21	Lower handles at storage casework			x	x	x			3 ea	$311	$31	$68	$410									
	4.22	Replace casework with new code compliant units			x		x			6 ea	$24,840	$2,484	$5,465	$32,789									
	4.23	Replace metal corridor lockers			x		x			500 lf	$115,000	$11,500	$25,300	$151,800									
	4.24	Install freestanding basketball and backboard assemblies			x					2 ea	$13,800	$1,380	$3,036	$18,216									

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	4.25	Subdivide large classroom into offices with gypsum board walls			x					2,000 SF	$115,000	$11,500	$25,300	$151,800										
	4.26	Subdivide large classroom into smaller daycare with gypsum board walls			x					2,000 SF	$115,000	$11,500	$25,300	$151,800										
	4.27	Install full height gypsum board walls at pre-k toilet rooms	x		x					2 ea @ 50 sf	$1,840	$184	$405	$2,429										
	4.28	Install intermediate handrail at stair outside multi-purpose room (assume 3'-6" elevation change)		x		x				1 ea	$1,035	$104	$228	$1,366										
	4.29	Replace existing baluster and gaurdrail and wall handrail at stair		x		x				250 lf	$69,000	$6,900	$15,180	$91,080										
	4.30	Replace door knobs with accessible lever type handles				x				20 ea	$11,500	$1,150	$2,530	$15,180										
	4.31	Instal code compliant threshold				x				6 ea @ 10 SF	$1,380	$138	$304	$1,822										
	4.32	Lower sinks to accommodate childrens height of 2'-6"				x				8 ea	$23,000	$2,300	$5,060	$30,360										
	4.33	Lower toilets and urinals to accommodate pre-k heightt				x				9 ea	$36,225	$3,623	$7,970	$47,817										
	4.34	Install accessible single toilet rooms				x				6	$207,000	$20,700	$45,540	$273,240										
	4.35	Install accessible counters and sink				x				8 ea	$27,600	$2,760	$6,072	$36,432										
	4.36	Repaint lower level unoccupied space								3,500 SF	$8,050	$805	$1,771	$10,626										
	4.37	Update existing locker room toilet rooms to be accessible								2 @ 75 SF	$51,750	$5,175	$11,385	$68,310										
	4.38	Update existing shower room with accessible units								2 ea	$11,500	$1,150	$2,530	$15,180										
		TOTAL																	$0	$205,378	$91,839	$10,626	$307,843	
5		**Mechanical - HVAC**																						
	5.01	Remove abandoned fuel oil storage and assoc. plumbing			x		x	x		1 ea	$15,000	$1,500	$3,300	$19,800										
	5.02	Remove abandoned exterior louvers and air intake and patch wall			x		x	x		5 ea	$5,000	$500	$1,100	$6,600						x		$6,600		
	5.03	Clean existing duct work					x			52118 SF	$182,000	$18,200	$40,040	$240,240								$240,240		
	5.04	Ventilate public food pantry to exterior	x					x		750 SF	$3,000	$300	$660	$3,960					$3,960				completed	
	5.05	Exhaust copy room to the outdoors	x					x		675 SF	$3,000	$300	$660	$3,960							$3,960			
	5.06	Install high efficiency A/C system to replace the numerous stand-alone split & window A/C systems for higher efficiency and improved controllability.			x			x		52,118	$2,500,000	$250,000	$550,000	$3,300,000							$3,300,000			
	5.07	Provide demand-controlled ventilation using CO2 sensors			x			x		2 ea	$10,000	$1,000	$2,200	$13,200										
	5.08	Provide mechanical ventilation at corridors		x				x		7,000 SF	$42,000	$4,200	$9,240	$55,440										
	5.09	Upgrade ATC system to convert all remaining pneumatically controlled equipment to communicate with the DDC control system & to integrate all existing stand-alone equipment such as the AHU serving the Food Pantry, all exhaust fans, and various A/C systems.			x		x	x		52,118	$235,000													
												$0	$0	$0								$0		
		TOTAL																	$3,960	$0	$3,303,960	$246,840	$3,554,760	
6		**Electrical**																						
	6.01	Provide a new primary service, new pad mounted transformer, and new secondary service. Remove existing vault mounted transformers.			x		x	x		1 ea	$100,000	$10,000	$22,000	$132,000							$132,000			
	6.02	Provide new switchgear including new switchboard and new panels to replace existing. Provide variable frequency drives, VFDs to replace existing motor control center. All new switchgear to be housed in new electric rooms.			x		x	x		1 ea	$350,000	$35,000	$77,000	$462,000					$154,000.00	$154,000.00	$154,000.00			
	6.03	Provide a new exterior generator with two transfer switches and associated panelboards with new emergency lighting. Remove existing generator and emergency only lighting system.			x		x	x		1 ea	$250,000	$25,000	$55,000	$330,000										
	6.04	Provide new emergency lighting		x				x		52,118 SF	$50,000	$5,000	$11,000	$66,000										
	6.05	Replace wiring and switches throughtout building			x		x	x		52,118 SF	$400,000	$40,000	$88,000	$528,000						x				
	6.06	Install occupancy sensors in all rooms			x			x		50 ea	$20,000	$2,000	$4,400	$26,400										
	6.07	Install wall mounted LED sconce exterior lighting at building perimeter	x		x			x		52,118 SF	$7,500	$750	$1,650	$9,900										

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	6.08	Replace entire fire alarm system with code compliant system with voice evacuation	x	x				x		52,118 SF	$160,000	$16,000	$35,200	$211,200										
	6.09	Change non-GFI outlets to GFI at daycare classrooms and boiler room	x	x				x		10 ea	$50	$5	$11	$66										
	6.10	Provide additional receptacles in classrooms and offices where needed to eliminate extension cord usage.	x		x					15 ea	$7,500	$750	$1,650	$9,900										
	6.11	Provide tamper resistant receptacles in daycare and Pre-K wings.	x		x			x		20 ea	$1,200	$120	$264	$1,584										
	6.12	Provide two-way communications system at elevator lobbies.	x		x			x		3 ea	$15,000	$1,500	$3,300	$19,800										
																			$0			x		
		TOTAL																	$154,000	$154,000	$286,000	$0	$594,000	
7	Plumbing																							
	7.01	Replace plumbing fixtures with new high efficiency low-flow plumbing fixtures throughout.					x	x		52,118 SF	$208,500	$20,850	$45,870	$275,220										
	7.02	Install new domestic water distribution piping, including insulation and ball valves.					x	x		52,118 SF	$417,000	$41,700	$91,740	$550,440								$550,440		
	7.03	Replace domestic water heater with high efficiency unit, including mixing valve, expansion tank and recirculation pump.					x	x		1 ea	$30,000	$3,000	$6,600	$39,600										
	7.04	Video investigate buried drainage piping to check condition					x			1 ea	$10,000	$1,000	$2,200	$13,200										
	7.05	Replace simplex ejector with new duplex sewage ejector in Mechanical Room. Basin shall include air and water tight cover, vented through roof.					x	x		1 ea	$15,000	$1,500	$3,300	$19,800										
		TOTAL																	$0	$0	$0	$550,440	$550,440	
8	Fire Protection																							
	8.01	Provide hydrant flow test.					x			1 ea	$3,500	$350	$770	$4,620						$4,620				
		TOTAL																	#REF!	#REF!	#REF!	#REF!	#REF!	
9	Technology																							
	9.01	Install wireless access node outlets upgrade teacher stations to CAT 6 or CAT 6A.			x		x			52,118 SF	$60,000	$6,000	$13,200	$79,200						$79,200				
	9.02	Install access control system at key entry points and areas in the building that can help partition the building for after hours activities and lock down situations. The standardized KeyScan access control should be utilized.	x		x					5 ea	$30,000	$3,000	$6,600	$39,600						$39,600				
		TOTAL																	$0	$0	$0	$0	$0	
#	Hazardous Material																							
	10.01	Hidden Vinyl Floor Tiles and Mastic							x	5,000 SF	Incl Below													
	10.02	Sinks							x	2 ea	Incl Below													
	10.03	Pipe Insulation							x	150 lf	Incl Below													
	10.04	Hidden Pipe and Hard Joint Insulation							x	2,500 lf	Incl Below													
	10.05	Blackboards							x	unknown	Incl Below													
	10.06	Hidden ACM							x	unknown	Incl Below													
	10.07	Miscellaneous Hazardous Materials							x	unknown	Incl Below													
	10.08	Gymnasium hardwood Floor and Paper							x	5,300 SF	Incl Below													
	10.09	Old shop room hardwood floor and paper							x	1,000 SF	Incl Below													
	10.10	Generator Room Flexible Connector							x	1 ea	Incl Below													
	10.11	Exterior Transite Sewer Pipes							x	unknown	Incl Below													
	10.12	Exterior roofing materials							x	52,118 SF	Incl Below													
	10.13	Damproofing on Exterior / Foundation walls							x	1,500 tons	Incl Below													
																								Haz/Mat includes cost associated with complete renovation or demolition; additional costs are included should results exceed EPA limits
		HAZMAT ALLOWANCE									$785,000		$157,000	$942,000								$942,000		

CAPITAL IMPROVEMENT PLAN

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	TOTALS									$9,276,637	$825,664 $10,102,300											

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 with a specific improvement line item, a mini study specific to the scope of work should be done to confirm the scope of work, prepare sketches as necessary and prepare a refined cost estimate.

	HANSEN ELEM 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	Quantity	Cost of Repair / Replacement (5/2016 $)	Designer / Pricing Contingency (10%)	Soft Cost (20%)	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs)	On Going Maintenance	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
	64,000 GSF																					
1	**Site & Civil**																					
1.01	Crack seal areas of pavement where cracking/ degradation has occurred.					x			57,000 SF	$32,775	$3,278	$7,211	$43,263					$43,263				
1.02	Mill and overlay sections of pavement where cracking/ degradation has occurred.	x				x			57,000 SF	$32,775	$3,278	$7,211	$43,263					$43,263				
1.03	Reseed and stabalize landscape along east roadway					x			300 SF	$1,725	$173	$380	$2,277								$2,277	
1.04	Install missing chain link fence	x		x		x			50 lf	$4,600	$460	$1,012	$6,072					$6,072				
1.05	Replace damaged granite curb.					x			20 lf	$1,035	$104	$228	$1,366					$1,366				
1.06	Regrade and pouraccessible pedestrial ramp			x	x				1 loc	$34,500	$3,450	$7,590	$45,540									
1.07	Video inspect sanitary sewer service	x		x		x			1 ea	$1,725	$173	$380	$2,277									
1.08	Clean existing catch basins.	x				x			14 ea	$3,220	$322	$708	$4,250							$4,250		
1.09	Flush fire hydrants 1x year	x				x			2 ea	$460	$46	$101	$607							$607		
	TOTAL																	$93,964	0	4857.6	2277	$101,099
2	**Structural Elements**																					
2.01	Repair and monitor cracks in the Cafeteria by removing failed CMU and installing a proper building movement joint.					x			40 lf	$5,520	$552	$1,214	$7,286									
2.02	Clean out all roof drains	x				x			1 ls	$16,560	$1,656	$3,643	$21,859					x			$21,859	
2.03	Repair cracks in boiler room floor					x			20 SF	$345	$35	$76	$455									
2.04	Repair concrete cracks in foundation					x			2000 SF	$11,500	$1,150	$2,530	$15,180									
2.05	Seal tie plug holes					x			100 @	$5,750	$575	$1,265	$7,590									
2.06	Clean and paint steel loose lintels					x			60 lf	$1,725	$173	$380	$2,277									
2.07	Repair loading dock cracks in steps					x			40 SF	$1,150	$115	$253	$1,518									
	TOTAL																	$0	$0	$0	$21,859	$21,859
3	**Exterior Architectural Elements**																					
3.01	Repair hairline cracks in foundation					x			20 lf	$1,380	$138	$304	$1,822							$1,822		
3.02	Repair spalling concrete					x			15 SF	$1,725	$173	$380	$2,277					$2,277				
3.03	Remove spalled and loose concrete at loading dock back to solid mass, drill and set tie pins to anchor new concrete, and form and repair edge and face of loading dock foundation.					x			1 ea	$5,750	$575	$1,265	$7,590								$7,590	
3.04	Clean stained exposed concrete foundation					x			500 SF	$5,750	$575	$1,265	$7,590					x			$7,590	
3.05	Clean stained precast concrete panel					x			5,540 SF	$76,452	$7,645	$16,819	$100,917								$100,917	
3.06	Relace failed sealants at precast concrete panel					x			500 lf	$6,900	$690	$1,518	$9,108								$9,108	
3.07	Clean and coat exposed steel lintels, replace backer rod and sealant joints					x			200 lf	$16,100	$1,610	$3,542	$21,252						$21,252			
3.08	Repair brick and concrete at base of wall at rear elevation					x			20 lf	$2,070	$207	$455	$2,732							$2,732		
3.09	Repair damaged precast concrete corner at north-east elevation					x			1 ea	$1,150	$115	$253	$1,518								$1,518	
3.10	Insulate and seal existing penetrations					x			2 ea	$575	$58	$127	$759								$759	
3.11	Repair leaks in masonry wall and clean effloresence					x			20 SF	$2,300	$230	$506	$3,036								$3,036	
3.12	Re-mortar and re-seal under precast sill at north-west elevation.					x			30 lf	$863	$86	$190	$1,139									
3.13	Reset precast concrete panel at roof level					x			1 ea	$575	$58	$127	$759									
3.14	Remove finish from overhead door, repaint with primer and two finish coats.					x			1 large	$575	$58	$127	$759									
3.15	Replace door wire glass with saftey glazing and add weatherstripping					x			1 pair	$3,680	$368	$810	$4,858									
3.16	Replace failed sealant at blade-type louvers					x			4 ea	$690	$69	$152	$911									
3.17	Replace worn sealant at roof termination					x			1,000 lf	$9,200	$920	$2,024	$12,144									
3.18	Remove and seal obsolete roof curb					x	x		1 ea	$288	$29	$63	$380									
3.19	Replacing parapet roof flashing					x			20 lf	$2,760	$276	$607	$3,643									
3.20	Replace roof at main entry vestibule					x			100 SF	$3,450	$345	$759	$4,554									

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	3.21	Patch holes in roof membrane where fasteners have fallen out. Install new flashing where it is bent or has pulled away from the membrane.					x			30 lf	$1,380	$138	$304	$1,822									
	3.22	Replace concrete pads at egress doors with ramps		x	x	x				15 ea	$86,250	$8,625	$18,975	$113,850									
	3.23	Repair roof membrane above gym where leaking is occuring	x				x			300 SF	$10,350	$1,035	$2,277	$13,662									
		TOTAL																	$2,277	$21,252	$4,554	$130,518	$158,601
4		**Interior Architectural Elements**																						
	4.01	Remove original paint from concrete floors, fill holes and cracks as necessary and top with high-performance concrete sealer.					x			1,500 SF	$10,350	$1,035	$2,277	$13,662							$13,662		
	4.02	Test concrete floor for moisture and replace VCT					x			20 SF	$230	$23	$51	$304									completed in 2016
	4.03	Replace cceramic mosaic tiles					x			5 SF	$288	$29	$63	$380									complete except for boy & girl locker rooms
	4.04	Replace ceramic mosaic tiles					x			8 ea	$13,800	$1,380	$3,036	$18,216							$18,216		
	4.05	Install saftey strips at top and bottom of stair runs	x	x						3 stairs	$5,175	$518	$1,139	$6,831						$6,831			
	4.06	Abate and replace VAT flooring	x				x		x	10,000 SF	$115,000	$11,500	$25,300	$151,800								$151,800	
	4.07	Replace carpet with new carpet tile, rubber floor, VCT or linoleum			x		x			1,200 SF	$19,320	$1,932	$4,250	$25,502									project started in 2016
	4.08	Deep-clean quarry tile flooring					x			2,400 SF	$16,560	$1,656	$3,643	$21,859							$21,859		
	4.09	Re-finish gym wood floor					x			4,500 SF	$31,050	$3,105	$6,831	$40,986							$40,986		
	4.10	Remove damaged ceramic tile, replace tile and grout as necessary.					x			5 SF	$288	$29	$63	$380									complete
	4.11	Seal hairline crack in CMU at Classroom 220					x			5 lf	$460	$46	$101	$607						$607			
	4.12	Install cornerguards at 2016 classroom addition					x			10 ea	$1,725	$173	$380	$2,277								$2,277	
	4.13	Replace broken or stained acoustic concealed spline tiles.					x			3,000 SF	$31,050	$3,105	$6,831	$40,986									
	4.14	Replace broken or stained ACPs					x			100 SF	$1,150	$115	$253	$1,518									
	4.15	Replace cafeteria light fixtures, acoustical panels and grid with new ACP and recessed light fixtures.					x			3,000 SF	$69,000	$6,900	$15,180	$91,080									
	4.16	Replace kitchen abuse resistant ACPs					x			500 SF	$5,175	$518	$1,139	$6,831									
	4.17	Replace flush natural wood doors					x			20 leafs	$11,500	$1,150	$2,530	$15,180									
	4.18	Replace hollow metal doors					x			10 leafs	$5,175	$518	$1,139	$6,831									
	4.19	Replace hollow metal doors with vision panel	x				x			5 leafs	$5,463	$546	$1,202	$7,211									
	4.20	Replace natural wood doors with vision panel	x				x			5 leafs	$5,750	$575	$1,265	$7,590									
	4.21	Replace wire glass vision panels with rated tempered glass	x							175 SF	$10,063	$1,006	$2,214	$13,283									
	4.22	Replace storage casework and countertops				x	x			25 CRs	$120,750	$12,075	$26,565	$159,390									
	4.23	Replace storage casework and countertops at staff work room and nurses								2 rooms	$9,660	$966	$2,125	$12,751									
	4.24	Install covers at exposed plumbing	x				x			5 ea	$863	$86	$190	$1,139									
	4.25	Install privacy curtain at nurses office	x		x					2 ea	$230	$23	$51	$304									
	4.26	Re-fit and lower fire extinguishers in new cabinets	x		x	x				22 ea	$3,036	$304	$668	$4,008									
	4.27	Replace damaged wall padding panels at gymnasium					x			10 ea	$2,300	$230	$506	$3,036									
	4.28	Install compliant handrails and guardrails at all stairs	x	x						3 stairs	$27,600	$2,760	$6,072	$36,432									
	4.29	Create alvoces for defibrillator cabinets				x				5 ea	$2,300	$230	$506	$3,036									
	4.30	Install compliant sinks in toilet rooms				x		x		20 ea	$69,000	$6,900	$15,180	$91,080									
	4.31	Install accessible toilets				x		x		6 ea	$24,150	$2,415	$5,313	$31,878									
	4.32	Install accessible urinals				x		x		3 ea	$11,040	$1,104	$2,429	$14,573									
	4.33	Install accessible toilet rooms				x		x		5 ea	$201,250	$20,125	$44,275	$265,650									
	4.34	Move adjacent wall to provide 18" min clear at pull side				x				10 ea	$17,250	$1,725	$3,795	$22,770									

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		TOTAL																	$0	$7,438	$94,723	$154,077	$256,238
5		**Mechanical - HVAC**																						
	5.01	Replace missing pipe insulation sections.		x			x	x		100 lf	$1,650	$165	$363	$2,178										completed
	5.02	Install air separator on HW system air vent.		x			x			1 ls	$4,850	$485	$1,067	$6,402						x			$6,402	
	5.03	Install VFD on indoor AHU within Boiler Room		x			x	x		1 ls	$6,500	$650	$1,430	$8,580									$8,580	
	5.04	Repair corrosion on boiler stack and repaint with high-temp coating.					x			1 ls	$3,850	$385	$847	$5,082					$5,082				completed	
	5.05	Provide software and controller upgrades to help maintain sysem controllability and efficiency.		x	x		x	x		1 ls	$15,000	$1,500	$3,300	$19,800								$19,800		
	5.06	Provide demand-controlled ventilation using CO2 sensors and associated wiring in all classrooms and other high-occupancy educational spaces.						x		86 ea	$250,000	$25,000	$55,000	$330,000								$330,000		
												$0	$0	$0									$0	
		TOTAL																	$5,082	$0	$349,800	$14,982	$369,864	
6		**Electrical**																						
	6.01	Provide blank metal panel cover on distribution panel		x						1 ea	$1,000	$100	$220	$1,320								$1,320		
	6.02	Retrofit CFL down-lights with LED lamps - assume 247,800 SF x $/sf						x		1 ea	$155,000	$15,500	$34,100	$204,600					$68,200.00	$68,200.00	$68,200.00			
	6.03	Retrofit HID exterior pole lights with LED lamps/ heads.						x		40 ea	$60,000	$6,000	$13,200	$79,200										completed
	6.04	Replace HID wall packs with LED wall sconce fixtures.						x		30 ea	$22,500	$2,250	$4,950	$29,700										completed
	6.05	Provide emergency power-off switch to boilers at exterior doors. Provide tamper proof covers at existing EPO switches on interior.		x	x					2 ea	$2,000	$200	$440	$2,640						x				
	6.06	Change non-GFI outlets to GFI at Kitchen and Servery	x	x						20 ea	$1,000	$100	$220	$1,320										existing
																			$0		x			
		TOTAL																	$68,200	$68,200	$69,520	$0	$205,920	
7		**Plumbing**																						
	7.01	Install emergency gas valve on kitchen equipment gass supply, interlock with CO detector for auto shutdown in presence of CO near hood.	x	x						1 ls	$3,850	$385	$847	$5,082										complete
	7.02	Replace damaged bubblers at water coolers.					x			4 ea	$15,400	$1,540	$3,388	$20,328								$20,328		
																						$0		
		TOTAL																	$0	$0	$0	$20,328	$20,328	
8		**Fire Protection**																						
	8.01	Replace fire pump with new horizontal fire pump.		x			x			1 ea	$48,850	$4,885	$10,747	$64,482						$64,482				
	8.02	Replace missing sprinkler head escutcheons.					x			20 ea	$1,700	$170	$374	$2,244						$2,244				
	8.03	Provide labels on all FD valve cabinets.		x						3 ea	$65	$7	$14	$86						$86				
												$0	$0	$0						$0				
		TOTAL																	$0	$0	$0	$0	$0	
9		**Technology**																						
	9.01	Rack mount Mitel equipment					x			1 ea	$2,500	$250	$550	$3,300						$3,300				
	9.02	Properly ground equipment racks - install bonding jumper.	x	x						1 ea	$1,500	$150	$330	$1,980						$1,980				
	9.03	Add panic buttons connected to 911 dispatch in Admin, Principal, VP offices.	x		x					3 ea	$2,500	$250	$550	$3,300						$3,300				
																				$0				
		TOTAL																	$0	$0	$0	$0	$0	
#		**Hazardous Material**																						
	10.01								x		Incl Below													
	10.02								x		Incl Below													
	10.03								x		Incl Below													

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10.04								x		Incl Below												
10.05								x		Incl Below												
10.06								x														
10.07								x														
10.08								x		Incl Below												
10.09								x														
10.10								x		Incl Below												
10.11								x		Incl Below												
10.12								x														
10.13								x														
10.14								x														Haz/Mat includes cost associated with complete renovation or demolition; additional costs are included should results exceed EPA limits
	HAZMAT ALLOWANCE									$800,000		$160,000	$960,000								$960,000	
										$2,643,291	$184,329											
											$2,827,620											

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 with a specific improvement line item, a mini study specific to the scope of work should be done to confirm the scope of work, prepare sketches as necessary and prepare a refined cost estimate.

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	54,800 GSF																					
1	**Site & Civil**																					
1.01	Crack seal areas of pavement where cracking/ degradation has occurred.					x			101,180 SF	$58,179	$5,818	$12,799	$76,796					$76,796				
1.02	Mill and overlay sections of pavement where cracking/ degradation has occurred.	x				x			101,180 SF	$58,179	$5,818	$12,799	$76,796					$76,796				
1.03	Replace damaged granite curb.					x			30 lf	$1,553	$155	$342	$2,049								$2,049	
1.04	Clean existing catch basins.					x			12 ea	$2,760	$276	$607	$3,643					$3,643				
1.05	Add one way signage at bus loop, enter only, exit only.	x		x					4 ea	$2,300	$230	$506	$3,036					$3,036				
1.06	Video-inspect sanitary sewer and replace any collapsed sections.	x		x		x			1 ea	$1,725	$173	$380	$2,277							$2,277		
1.07	Flush fire hydrants 1x year					x			4 loc	$920	$92	$202	$1,214							$1,214		
	TOTAL																	$160,270	0	3491.4	2049.3	$165,811
2	**Structural Elements**																					
2.01	Remove and replace bent canopy column at front entrance.	x				x			1 ea	$1,150	$115	$253	$1,518									
2.02	Clean out all roof drains	x				x			1 ls	$16,560	$1,656	$3,643	$21,859					x			$21,859	
											$0	$0	$0									
	TOTAL																	$0	$0	$0	$21,859	$21,859
3	**Exterior Architectural Elements**																					
3.01	Repoint mortar ant brick masonry wall base					x			10 lf	$288	$29	$63	$380							$380		
3.02	Clean graffitti off limestone veneer, and repair any cracks with stone cement or other means. Assume (6) cracks.					x			1,000 SF	$16,100	$1,610	$3,542	$21,252					$21,252				
3.03	Repair failed flashing at entry canopies and clean brick.					x			6 ea	$1,725	$173	$380	$2,277								$2,277	
3.04	Repair cracked brick in veneer.					x			100 SF	$10,350	$1,035	$2,277	$13,662					x			$13,662	
3.05	Replace spalled brick at wall base, and install 24" wide gravel trench detail at same location.					x			20 SF	$3,450	$345	$759	$4,554								$4,554	
3.06	Remove window A/C units and re-install insulating glass units.					x	x		25 ea	$25,875	$2,588	$5,693	$34,155								$34,155	
3.07	Repair damaged window parts.					x			10 ea	$5,750	$575	$1,265	$7,590						$7,590			
3.08	Replace damaged translucent panels (Kalwall or equivalent)					x	x		180 SF	$12,420	$1,242	$2,732	$16,394							$16,394		
3.09	Replace all failed sealants at punched window openings.					x			200 lf	$2,760	$276	$607	$3,643								$3,643	
3.10	Install kick plates at all exterior door pairs.					x			3 opgs	$518	$52	$114	$683								$683	
3.11	Prep and paint all exterior doors.					x			30 ea	$5,175	$518	$1,139	$6,831								$6,831	
3.12	Replace all grilles with storm-rated louvers. 25 opgs.					x			250 SF	$20,125	$2,013	$4,428	$26,565									
3.13	Replace all larger louvers with storm-rated louvers with integral bird screens. 8 opgs.					x			50 SF	$4,025	$403	$886	$5,313									
3.14	Provide louver at boiler room for tempered outside makeup air.					x			1 ea	$2,300	$230	$506	$3,036									
3.15	Repair PVC roof membrane at one delaminated patch location.					x			1 SF	$575	$58	$127	$759									
3.16	Relocate split system condenser to main roof directly adjacent to canopy, and remove jerry-rigged curb from canopy.			x		x			1 ea	$2,875	$288	$633	$3,795									
3.17	Install scupper on Library as secondary warning device.	x	x			x			1 ea	$2,300	$230	$506	$3,036									
3.18	Install dual primary/secondary roof drain structures in existing sump openings. Run secondary drain parallel with primary and exit building at wall base with "cow's tongue" brass outlet.	x	x			x			14 ea	$40,250	$4,025	$8,855	$53,130									
3.19											$0	$0	$0									
											$0	$0	$0									
	TOTAL																	$21,252	$7,590	$16,774	$65,805	$111,421
4	**Interior Architectural Elements**																					
4.01	At coiling overhead delivery door, remove damaged door seal and replace.					x			1 ea	$345	$35	$76	$455							$455		
4.02	Remove and repair damaged resilient vinyl tile at overhead delivery door.					x			50 SF	$575	$58	$127	$759									completed in 2016
4.03	Remove and replace delaminated VCT at 2nd level corridor.					x			2,885 SF	$26,542	$2,654	$5,839	$35,035									complete except for boy & girl locker rooms
4.04	Remove and replace delaminated VCT at exterior classroom doorways. 5 SF x 15 opgs					x			75 SF	$863	$86	$190	$1,139							$1,139		

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4.05	Sand, refinish, and re-line hardwood gymnasium floor.					x			4,810 SF	$33,189	$3,319	$7,302	$43,809						$43,809			
4.06	Prep and paint all steel parts of exit stairs.					x			4 ea	$11,500	$1,150	$2,530	$15,180								$15,180	
4.07	Remove VCT flooring in Kitchen and replace with quarry tile - 3 doorway transitions of 1/2" to existing floor level	x		x		x			2,325 SF	$69,518	$6,952	$15,294	$91,763									project started in 2016
4.08	Remove and replace delaminated VCT at leaking unit vents. 8 units x 10 SF.					x			80 SF	$920	$92	$202	$1,214							$1,214		
4.09	Repair minor cracks in glazed terra cotta masonry joints.			x		x			40 lf	$3,680	$368	$810	$4,858							$4,858		
4.10	Repair minor cracks in painted CMU masonry joints.			x		x			40 lf	$2,760	$276	$607	$3,643									complete
4.11	Add step to ceiling using Armstrong "Axiom" or similar. 5 classrooms x 30 lf	x		x		x			150 lf	$3,450	$345	$759	$4,554						$4,554			
4.12	Replace wired glass in doors (narrow vision panels and half-glass) with tempered safety glass.	x	x						30 leafs	$27,600	$2,760	$6,072	$36,432								$36,432	
4.13	Replace wired glass in sidelights with tempered safety glass.	x	x						15 opgs	$12,075	$1,208	$2,657	$15,939									completed
4.14	Prep and paint all hollow metal door frames building-wide					x			120 opgs	$16,560	$1,656	$3,643	$21,859									completed
4.15	Prep and paint all hollow metal doors building-wide					x			15 leafs	$1,035	$104	$228	$1,366									
4.16	Deep-clean all whiteboards: (25) 2 12'L and (25) 8' L					x			1 ea	$18,400	$1,840	$4,048	$24,288									
4.17	Remove cloak casework and install full-height storage casework: (25) CRs x 18 lf			x					450 lf	$248,400	$24,840	$54,648	$327,888									
4.18	Replace all corridor hook/shelves with proper student cubbies with overhead shelf, coat area w/ hooks, and footwear cubbie. Material: hardwood, Oak species.			x					625 opgs	$251,563	$25,156	$55,344	$332,063									
4.19	Replace phenolic resin core, laminate-faced countertops in toilet rooms with new, like for like. Double sink tops, 6' wide x 24" deep.					x			8 each	$22,080	$2,208	$4,858	$29,146									
4.20	Replace basketball goal backboard padding.	x		x		x			2 ea	$575	$58	$127	$759									
4.21	Modify electrical room door to swing outward and provide panic hardware.	x	x						1 ea	$2,530	$253	$557	$3,340									
	TOTAL																	$0	$48,363	$7,666	$51,612	$107,641
5	**Mechanical - HVAC**																					
5.01	Fix leaking Unit Vents					x	x		4 ea	$4,500	$450	$990	$5,940									completed
5.02	Remove window A/C units and provide central air conditioning system for the entire school.		x			x	x		54,800 SF	$2,630,400	$263,040	$578,688	$3,472,128						x		$3,472,128	
5.03	Install pipe insulation on any sections without it.		x			x	x		40 lf	$1,120	$112	$246	$1,478								$1,478	
5.04	Install air vent on the DHWH air separator.		x			x			1 ea	$1,850	$185	$407	$2,442					$2,442			completed	
5.05	Install a second inline pump on the new classroom addition zone.		x			x	x		1 ea	$15,800	$1,580	$3,476	$20,856							$20,856		
5.06	Provide and install new boiler jacket casings - existing are damaged.					x	x		2 ea	$3,200	$320	$704	$4,224							$4,224		
5.07	Provide new high efficiency gas fired burner with high modulation, new burner mgt with outdoor air reset, trending, alarms, and output featrues for DDC integration.		x	x		x	x		1 ea	$48,500	$4,850	$10,670	$64,020									
5.08	Provide complete building-wide upgrade to DDC control system, allowing web access, remote monitoring, alarms, trending, etc.	x	x	x		x	x		1 ea	$235,000	$23,500	$51,700	$310,200									
5.09	Upgrade to new unit ventilators with DDC control capability and CO2 demand-controlled ventilation.	x	x	x		x	x		30 ea	$45,000	$4,500	$9,900	$59,400									
5.10	Provide new H&V systems for Cafetorium and Gym, including new CCD controls, and new supply & return duct systems.	x	x	x		x	x		2 ea	$215,000	$21,500	$47,300	$283,800									
5.11	Provide a new, dedicated H&V system for corridors, including ducted supply & return distribution with outside ventilation air.	x	x	x		x	x		1 ea	$126,800	$12,680	$27,896	$167,376									
	TOTAL																	$2,442	$0	$25,080	$3,473,606	$3,501,128
6	**Electrical**																					
6.01	Provide new primary service from street, around and into a new pad-mounted transformer. Provide new secondary service from transformer into building.		x	x		x	x		550 lf	$70,000	$7,000	$15,400	$92,400							$92,400		
6.02	Replace all switchgear in the building.	x	x	x		x	x		1 ea	$300,000	$30,000	$66,000	$396,000									

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	6.03	Provide new exterior standby generator, two automatic transfer switches, and associated panelboards. Provide circuitry for new normal/emergency lighting. Remove the existing normally off/emergency lighting system.	x	x	x		x	x		1 ea	$250,000	$25,000	$55,000	$330,000									
	6.04	Replace existing lighting with new LED lighting throughout building, fixture types like-for-like.	x	x	x		x	x		54,800 SF	$300,000	$30,000	$66,000	$396,000									
	6.05	Provide a basic performance lighting dimming system with RGB, LED lamps.		x	x			x		12 ea	$2,000	$200	$440	$2,640									
	6.06	Provide occupancy sensors in offices and toilet rooms.		x	x			x		54,800 SF	$50,000	$5,000	$11,000	$66,000					$22,000.00	$22,000.00	$22,000.00		
	6.07	Retrofit HID exterior pole lights with LED lamps/ heads.						x		25 ea	$37,500	$3,750	$8,250	$49,500									completed
	6.08	Replace HID wall packs with LED wall sconce fixtures.						x		8 ea	$6,000	$600	$1,320	$7,920									completed
	6.09	Replace fire alarm horns with speakers.	x	x	x					54,800 SF	$26,000	$2,600	$5,720	$34,320									
	6.10	Provide smoke detectors and CO detectors in Nurse's suite	x	x	x					1 ea	$2,000	$200	$440	$2,640									
	6.11	Provide emergency power-off switch to boilers at exterior doors. Provide tamper proof covers at existing EPO switches on interior.		x	x					2 ea	$2,000	$200	$440	$2,640						x			
	6.12	Change non-GFI outlets to GFI at Kitchen, Nurse's Suite, and Boiler Room.	x	x						20 ea	$1,000	$100	$220	$1,320									existing
												$0	$0	$0					$0		x		
		TOTAL																	$22,000	$22,000	$114,400	$0	$158,400
7	Plumbing																						
	7.01	Install emergency gas valve on kitchen equipment gas supply, interlock with CO detector for auto shutdown in presence of CO near hood.	x	x						1 ls	$3,850	$385	$847	$5,082									complete
		TOTAL																	$0	$0	$0	$0	$0
8	Fire Protection																						
		New system 2014 - no issues.																					
												$0	$0	$0						$0			
		TOTAL																	$0	$0	$0	$0	$0
9	Technology																						
	9.01	Install an access control system at primary entry points, and strategic nodes or portals within the building.	x		x					1 ea	$60,000	$6,000	$13,200	$79,200						$79,200			
												$0	$0	$0						$0			
		TOTAL																	$0	$0	$0	$0	$0
#	Hazardous Material																						
	10.01	Sink							x	1 ea	Incl Below												
	10.02	Hidden Pipe and Hard Joint Insulation							x	1,000 lf	Incl Below												
	10.03	Transite within heating cabinets							x	2,500 SF	Incl Below												
	10.04	Interior Windows							x	21 ea	Incl Below												
	10.05	Flexible Connectors							x	2 ea	Incl Below												
	10.06	Pink 12 x 12 Vinyl floor tile mastic							x	300 SF	Incl Below												
	10.07	Blackboards							x	unkn	Incl Below												
	10.08	Hidden ACM							x	unkn	Incl Below												
	10.09	Misc Haz Mat							x	unkn	Incl Below												
	10.10	Exhaust Insulation, Generator Rm							x	25 lf	Incl Below												
	10.11	Hardwood Floor & Paper, Gymnasium							x	3,500 SF	Incl Below												
	10.12	Hardwood Floor & Paper, Stage							x	800 SF	Incl Below												
	10.13	Transite Sewer pipes							x	unkn	Incl Below												
	10.14	Roofing Materials							x	54,800 SF	Incl Below												
	10.15	Dampproofing on exterior foundation walls							x	1,500 T	Incl Below												
	10.16	PCBs remediation							x		Incl Below												

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10.17	ACM Inspection & Testing Services							x		Incl Below												
10.18	PCBs testing and Abatement Plans Services							x		Incl Below												
10.19	Design, Construction Monitoring, and Air Sampling Services							x		Incl Below												Haz/Mat includes cost associated with complete renovation or demolition; additional costs are included should results exceed EPA limits
	HAZMAT ALLOWANCE									$700,000		$140,000	$840,000								$840,000	
	TOTALS									$6,191,863	$549,186											
	CONSTRUCTION COST										$6,741,049											

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 with a specific improvement line item, a mini study specific to the scope of work should be done to confirm the scope of work, prepare sketches as necessary and prepare a refined cost estimate.

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	67,225 GSF																					
1	**Site & Civil**																					
1.01	Crack seal areas of pavement where cracking/ degradation has occurred.					x			66,000 SF	$37,950	$3,795	$8,349	$50,094					$50,094				
1.02	Mill and overlay sections of pavement where cracking/ degradation has occurred.	x			x	x			66,000 SF	$37,950	$3,795	$8,349	$50,094					$50,094				
1.03	Replace damaged granite curb.					x			25 lf	$863	$86	$190	$1,139								$1,139	
1.04	Add a building sign identifying access on Independence Street	x		x					1 ea	$1,150	$115	$253	$1,518									
1.04	Clean existing catch basins.					x			20 ea	$4,600	$460	$1,012	$6,072					$6,072				
1.05	Replant bare exposed dirt patches with grass seed to reduce sediment in runoff.	x		x		x			400 SF	$2,300	$230	$506	$3,036					$3,036				
1.06	Add a drainage structure to the front drive to improve pavement drainage; connect to existing storm system.	x		x		x			1 ea	$11,500	$1,150	$2,530	$15,180									
1.06	Clean exterior grease trap at Kitchen	x				x			1 loc	$1,035	$104	$228	$1,366							$1,366		
1.07	Flush fire hydrants 1x year								4 loc	$920	$92	$202	$1,214							$1,214		
	TOTAL																	$109,296	0	2580.6	1138.5	$113,015
2	**Structural Elements**																					
2.01	Repair concrete floor slab in mechanical room and replace drain bodies.					x			20 SF	$1,610	$161	$354	$2,125									
2.02	Clean out all roof drains	x				x			26 ea	$14,950	$1,495	$3,289	$19,734					x			$19,734	
2.03	Prep and paint steel stair in boiler room					x			1 ea	$1,380	$138	$304	$1,822									
2.04	Repair and seal concrete cracks in foundation					x			2500 SF	$14,375	$1,438	$3,163	$18,975									
2.04	Repair cracks and spalling in concrete foundation and steps.	x		x		x			600 SF	$27,600	$2,760	$6,072	$36,432									
2.05	Prep and paint steel canopy parts					x			1 ea	$5,750	$575	$1,265	$7,590									
	TOTAL																	$0	$0	$0	$19,734	$19,734
3	**Exterior Architectural Elements**																					
3.01	Remove vinyl siding over window heads, abate underlying material (*see below*), and replace with EIFS rainscreen system with full flashing details.	x				x	x		2,100 SF	$108,675	$10,868	$23,909	$143,451							$143,451		
3.02	Remove vinyl siding at roof soffits and canopy ceiling, abate underlying material (*see below*), and replace with metal panel cladding system.	x				x			2,100 SF	$181,125	$18,113	$39,848	$239,085					$239,085				
3.03	Repair apparent leak in wall hydrant and clean efflorescence off CMU veneer at Gym.					x	x		200 SF	$3,450	$345	$759	$4,554								$4,554	
3.04	Repair cracks at CMU joints and repair damaged CMU blocks.					x			50 lf	$4,600	$460	$1,012	$6,072					x			$6,072	
3.05	Repoint brick mortar in select areas.					x			3,000 SF	$120,750	$12,075	$26,565	$159,390								$159,390	
3.06	Clean vegetative growth and staining off brick with mild cleaner.					x			2,500 SF	$17,250	$1,725	$3,795	$22,770								$22,770	
3.07	Replace all windows in '54-'60 sections of building.					x	x	x	5,500 SF	$695,750	$69,575	$153,065	$918,390						$918,390			
3.08	Prep and paint all steel exterior doors.					x			32 ea	$14,720	$1,472	$3,238	$19,430							$19,430		
3.09	Replace failed sealant joints around doors.					x	x	x	8 opgs	$1,877	$188	$413	$2,477								$2,477	
3.10	Replace rusting exterior doors.					x			1 pr.	$3,450	$345	$759	$4,554								$4,554	
3.11	Replace rusting exterior door frames.					x			2 ea	$2,070	$207	$455	$2,732								$2,732	
3.12	Repair dents and Install kick plates on exterior door.					x			1 ea	$575	$58	$127	$759									
3.13	Prep and paint rusting louvers. 8 SF ea					x			18 ea	$2,484	$248	$546	$3,279									
3.14	Replace dented louvers. 1 SF ea					x			8 ea	$1,380	$138	$304	$1,822									
3.15	Install a scupper at '00 area entrance canopy.					x			1 ea	$2,300	$230	$506	$3,036									
3.16	Repoint mortar at brick chimney.					x			350 SF	$20,125	$2,013	$4,428	$26,565									
3.17	Install dual primary/secondary roof drain structures in existing sump openings. Run secondary drain parallel with primary and exit building at wall base with "cow's tongue" brass outlet.	x	x			x			26 ea	$74,750	$7,475	$16,445	$98,670									
	TOTAL																	$239,085	$918,390	$162,881	$202,550	$1,522,906
4	**Interior Architectural Elements**																					

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4.01	Remove damaged VCT at cracks/ joints, sawcut and seal crack, and reinstall new VCT to match existing.					x			100 SF	$1,150	$115	$253	$1,518							$1,518		
4.02	Remove delaminating VCT at stage, stabilize/abate substrate, and replace with new VCT.					x			520 SF	$1,150	$115	$253	$1,518									completed in 2016
4.03	Remove damaged VCT at exterior doorways, and reinstall new VCT to match existing. 5 SF x 10 opgs					x			50 SF	$575	$58	$127	$759									complete except for boy & girl locker rooms
4.04	Sand, refinish, and re-line gymnasium floor.					x			4,800 SF	$33,120	$3,312	$7,286	$43,718							$43,718		
4.05	Deep-clean terrazzoo and tile floors in toilet rooms. 2 gang toilets, 10 single-users	x				x			900 SF	$12,420	$1,242	$2,732	$16,394						$16,394			
4.06	Repair minor cracks in GWB and CMU walls.					x			25 lf	$2,300	$230	$506	$3,036								$3,036	
4.07	Repair dings and scratches in GWB walls and re-paint/ touch-up.					x			100 SF	$460	$46	$101	$607									project started in 2016
4.08	Deep clean tile at toilet room chase walls.					x			100 SF	$1,380	$138	$304	$1,822							$1,822		
4.09	Replace damaged/stained ceiling tiles					x			200 SF	$2,300	$230	$506	$3,036							$3,036		
4.10	Add step to ceiling using Armstrong "Axiom" or similar. 2 classrooms x 30 lf			x					60 lf	$1,380	$138	$304	$1,822									complete
4.11	Prep and paint hollow metal doors and frames building-wide.					x			32 opgs	$4,416	$442	$972	$5,829						$5,829			
4.12	Replace wired glass in doors (narrow vision panels and half-glass) with tempered safety glass.	x	x						52 opgs	$47,840	$4,784	$10,525	$63,149								$63,149	
4.13	Deep-clean classroom white boards - (20) 12' and (24) 8' boards	x		x		x			1 ea	$15,898	$1,590	$3,497	$20,985									completed
4.14	Provide minor casework repairs and adjustments as required.	x				x			21 ea	$12,075	$1,208	$2,657	$15,939									completed
4.15	Remove cloak casework and install full-height storage casework: (18) CRs x 18 lf			x					324 lf	$178,848	$17,885	$39,347	$236,079									
4.16	Replace all corridor hook/shelves with proper student cubbies with overhead shelf, coat area w/ hooks, and footwear cubbie. Material: hardwood, Oak species.	x		x		x			480 opgs	$193,200	$19,320	$42,504	$255,024									
4.17	Replace rusting, failing toilet compartments with phenolic resin core, lamintate-faced partitions. (2) 5-fixture gang toilets, (2) 3-fixture smaller TRs.	x		x	x	x			1 ea	$36,800	$3,680	$8,096	$48,576									
4.18	Repair/replace damaged shelving - allow 8 repairs.					x			1 ea	$1,200	$120	$264	$1,584									
4.19	Provide panic hardware at electrical room doors.	x	x						2 ea	$3,450	$345	$759	$4,554									
	TOTAL																	$0	$22,224	$50,094	$66,185	$138,502
5	**Mechanical - HVAC**																					
5.01	Replace existing hot water pumps with new.		x			x	x		8 ea	$172,000	$17,200	$37,840	$227,040									completed
5.02	Remove PTAC unit in administration and install higher-efficienct central air conditioning rooftop unit and ductwork to the suite.		x			x	x		1 ea	$194,500	$19,450	$42,790	$256,740						x		$256,740	
5.03	Install exhaust fans and ductork to outside from copy areas.	x	x	x					3 ea	$12,600	$1,260	$2,772	$16,632								$16,632	
5.04	Provide new H&V systems for Cafetorium and Kitchen Make-up air, including new DDC controls, and new supply & return duct systems.	x	x	x		x	x		2 ea	$17,000	$1,700	$3,740	$22,440					$22,440			completed	
5.05	Replace HWS and return piping outside of boiler room with new insulated pipe.		x			x	x		1 ea	$65,000	$6,500	$14,300	$85,800							$85,800		
5.06	Clean all supply and return ductwork.	x				x	x		67,225 SF	$235,000	$23,500	$51,700	$310,200									
5.07	Provide mechanical ventilation for the admin interior offices, library interior office, teachers workroom, SPED workroom.	x	x			x			4 ea	$35,000	$3,500	$7,700	$46,200									
5.08	Replace HW convector radiators in toilet rooms, along with new HW branch piping and insulation.		x			x	x		8 ea	$19,500	$1,950	$4,290	$25,740									
5.09	Replace CUH's, HW FTR and convectors in entryways and corridors with new, and new HW branch piping and insulation.		x			x	x		16 ea	$35,000	$3,500	$7,700	$46,200									
5.10	Provide outside ventialtion air to corridors with new H&V units.	x	x				x		4 ea	$48,000	$4,800	$10,560	$63,360									
5.11	Replace all remaining pneumatic controls with DDC system to tie into existing.		x			x	x		39,500 SF	$178,000	$17,800	$39,160	$234,960									
																					$0	
	TOTAL																	$22,440	$0	$85,800	$273,372	$381,612
6	**Electrical**																					
6.01	Provide exterior emergency lights at egress doorways.	x	x						12 ea	$12,000	$1,200	$2,640	$15,840							$15,840		

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	6.02	Replace cafetorium battery with 15 minute time delay.		x						1 ea	$5,000	$500	$1,100	$6,600									
	6.03	Provide self-containted battery emergency lighting in toiet rooms.	x	x						6 ea	$3,000	$300	$660	$3,960									
	6.04	Replace metal halide fixtures with LED source fixtures with dimmable drivers.					x	x		20 ea	$15,000	$1,500	$3,300	$19,800									
	6.05	Provide a basic performance lighting dimming system with RGB, LED lamps.		x	x			x		12 ea	$2,000	$200	$440	$2,640					$880.00	$880.00	$880.00		
	6.06	Replace existing basement lights with LED utility fixtures		x				x		24 ea	$7,200	$720	$1,584	$9,504									completed
	6.07	Provide occupancy sensors in offices and toilet rooms.		x				x		28 ea	$11,000	$1,100	$2,420	$14,520									completed
	6.08	Replace HID exterior surface-mounted fixtures with LED source fixtures.		x				x		14 ea	$10,500	$1,050	$2,310	$13,860									
	6.09	Replace pole-mounted HID parking lights with LED sources.		x				x		12 ea	$18,000	$1,800	$3,960	$23,760									
	6.10	Change FA horns to speakers to enable voice evacuation.	x	x		x				67,225 SF	$20,000	$2,000	$4,400	$26,400									
	6.11	Add system-connected CO detectors in Nurse's suite and Boiler Room	x	x						2 ea	$3,000	$300	$660	$3,960									
	6.12	Provide emergency power-off switch to boilers at exterior doors. Provide tamper proof covers at existing EPO switches on interior.		x	x					2 ea	$2,000	$200	$440	$2,640						x			
	6.13	Change non-GFI outlets to GFI at Kitchen, Basement, and boiler room.	x	x						30 ea	$1,200	$120	$264	$1,584									existing
	6.14	Add (4) quad power outlets at circulation desk in Library		x	x					4 ea	$2,000	$200	$440	$2,640									
																			$0		x		
		TOTAL																	$880	$880	$16,720	$0	$18,480
7	Plumbing																						
	7.01	Replace DHWH with high efficiency model.		x				x		1 ea	$35,800	$3,580	$7,876	$47,256									complete
																						$0	
		TOTAL																	$0	$0	$0	$0	$0
8	Fire Protection																						
		No issues.																		$0			
												$0	$0	$0						$0			
		TOTAL																	$0	$0	$0	$0	$0
9	Technology																						
	9.01	Replace CAT 5/5E cabling with CAT 6E			x		x			67,225 SF	$67,000	$6,700	$14,740	$88,440						$88,440			
	9.02	Install three two additional data drops in each classroom/ teaching station.			x		x			70 ea	$50,000	$5,000	$11,000	$66,000						$66,000			
	9.03	Replace time clock system with GPS wireless to match other schools.			x		x			67,225 SF	$50,000	$5,000	$11,000	$66,000									
	9.04	Install an access control system at primary entry points, and strategic nodes or portals within the building.	x		x		x			15 ea	$60,000	$6,000	$13,200	$79,200						$79,200			
	9.05	Replace door intercom system and front and bus entraces with new 2-way system equal to Aiphone	x		x		x			2 ea	$7,500	$750	$1,650	$9,900									
																				$0			
		TOTAL																	$0	$0	$0	$0	$0
#	Hazardous Material																						
	10.01	Abate siding over windows on '54 building	added DWA						x	2,100 SF	Incl Below												
	10.02	Abate lead paint on wood canopy decking and building soffit.	added DWA						x	3,100 SF	Incl Below												
	10.03	Hidden pipe and hard joint material							x	1000 lf	Incl Below												
	10.04	Blackboards							x	unk	Incl Below												
	10.05	Hidden ACM							x	unk	Incl Below												
	10.06	*Hardwood floor and paper, gymnasium*	*unneccessary?*						*x*	*4,800 SF*	Incl Below												
	10.07	Hardwood floor and paper, cafetorium							x	3,000 SF	Incl Below												
	10.08	Transite sewer pipes							x	unk	Incl Below												
	10.09	Roofing materials							x	67,225 SF	Incl Below												
	10.10	Dampproofing on exterior/ foundation walls							x	1,500 T	Incl Below												

CAPITAL IMPROVEMENT PLAN

	LUCE ELEM 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	Quantity	Cost of Repair / Replacement (5/2016 $)	Designer / Pricing Contingency (10%)	Soft Cost (20%)	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs)	On Going Maintenance	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
10.11	PCBs remediation							x		Incl Below												
10.12	ACM Inspection & Testing Services							x		Incl Below												
10.13	PCBs testing and Abatement Plans Services							x		Incl Below												
10.14	Design, Construction Monitoring, and Air Sampling Services							x		Incl Below												Haz/Mat includes cost associated with complete renovation or demolition; additional costs are included should results exceed EPA limits
	HAZMAT ALLOWANCE									$725,000		$145,000	$870,000								$870,000	
										$4,088,025	$336,302											
											$4,424,327											

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 with a specific improvement line item, a mini study specific to the scope of work should be done to confirm the scope of work, prepare sketches as necessary and prepare a refined cost estimate.

	GALVIN 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	Quantity	Cost of Repair / Replacement (5/2016 $)	Designer / Pricing Contingency (10%)	Soft Cost (20%)	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs)	On Going Maintenance	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
	133,150 GSF																					
1	**Site & Civil**																					
1.01	Crack seal areas of pavement where cracking/ degradation has occurred.					x			90,000 SF	$51,750	$5,175	$11,385	$68,310					$68,310				
1.02	Mill and overlay sections of pavement where cracking/ degradation has occurred.	x				x			90,000 SF	$51,750	$5,175	$11,385	$68,310					$68,310				
1.03	Replace damaged concrete curb.					x			300 lf	$8,625	$863	$1,898	$11,385								$11,385	
1.04	Clean existing catch basins.					x			20 ea	$4,600	$460	$1,012	$6,072					$6,072				
1.05	Replace main school sign					x			1 ea	$17,250	$1,725	$3,795	$22,770					$22,770				
1.06	Add signage for pedestran and car traffic			x					5 loc	$2,875	$288	$633	$3,795							$3,795		
1.07	Replace all non-ADA compliant area drains with ADA grates.				x				20 ea	$32,200	$3,220	$7,084	$42,504							$42,504		
	TOTAL																	$165,462	0	46299	11385	$223,146
2	**Structural Elements**																					
2.01	Install seismic clips at all structural masonry walls.		x			x			133,150 SF	$612,490	$61,249	$134,748	$808,487									
2.02	Clean out all roof drains	x				x			1 ls	$24,840	$2,484	$5,465	$32,789					x			$32,789	
2.03	Reinforce boiler room stairs with additional welds					x			5 lf	$1,104	$110	$243	$1,457									
2.04	Repair concrete cracks in foundation, and seal spider cracks in concrete surface with foundation coating system.					x			620 SF	$10,695	$1,070	$2,353	$14,117									
2.05	Clean and paint steel loose lintels, railing posts, and roof ladders.					x			110 SF	$2,530	$253	$557	$3,340									
2.06	Repair loading dock cracks in steps and spalling.					x			100 SF	$4,600	$460	$1,012	$6,072									
	TOTAL																	$0	$0	$0	$32,789	$32,789
3	**Exterior Architectural Elements**																					
3.01	Repair hairline cracks in foundation					x			50 lf	$3,450	$345	$759	$4,554							$4,554		
3.02	Repair south-east foundation and brick damage					x			1 ea	$2,300	$230	$506	$3,036					$3,036				
3.03	Repair loading dock concrete landing cracking and deterioration					x			1 ea	$575	$58	$127	$759								$759	
3.04	Repair spalling concrete					x			100 sf	$4,600	$460	$1,012	$6,072					x			$6,072	
3.05	Relace failed sealants at precast concrete panel					x			100 lf	$1,380	$138	$304	$1,822								$1,822	
3.06	Repair leaking pipe penetration at masonry					x			1 @ 1 lf	$288	$29	$63	$380								$380	
3.07	Clean and coat exposed steel lintels, replace backer rod and sealant joints					x			40 lf	$3,220	$322	$708	$4,250						$4,250			
3.08	Clean and repoint brick rowlock sills at north elevations					x			50 ea	$3,450	$345	$759	$4,554							$4,554		
3.09	Clean funal growth on brick veeneer north elevations					x			1000 SF	$6,900	$690	$1,518	$9,108								$9,108	
3.10	Repair precast concrete panel miter joint					x			1 ea	$173	$17	$38	$228								$228	
3.11	Repair brick damage at kitchen loading dock lintel					x			1 ea	$1,150	$115	$253	$1,518								$1,518	
3.12	Clean stained precast concrete panles					x			500 sf	$6,900	$690	$1,518	$9,108									
3.13	Remove finish and repaint and reseal grill type louvers.					x			50 ea	$8,625	$863	$1,898	$11,385									
3.14	Replace failed sealant at blade-type louvers					x			3 ea	$173	$17	$38	$228									
3.15	Replace EPDM roof and install rack-mounted PV system					x			55,000 sf	$1,518,000	$151,800	$333,960	$2,003,760									
3.16	Replace concrete pads at egress doors with ramps				x				7 ea	$40,250	$4,025	$8,855	$53,130									
3.17	Replace drinking fountain with accessible exterior drinking fountain				x				1 ea	$6,900	$690	$1,518	$9,108									
											$0	$0	$0									
	TOTAL																	$3,036	$4,250	$9,108	$19,886	$36,280
4	**Interior Architectural Elements**																					
4.01	Remove original paint from concrete floors, fill holes and cracks as necessary and top with high-performance concrete sealer.					x			3,000 sf	$20,700	$2,070	$4,554	$27,324									
4.02	Replace VCT at stair landing.					x			10 sf	$173	$17	$38	$228									
4.03	Repair ceramic tile flooring and re-level floor drain and associated plumbing.					x			1 ea	$20,125	$2,013	$4,428	$26,565									
4.04	Abate and replace VAT flooring	x				x		x	13,000 sf	$149,500	$14,950	$32,890	$197,340									Replace with new VCT flooring

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4.05	Deep-clean VCT flooring					x			40,000 sf	$69,000	$6,900	$15,180	$91,080									
4.06	Clean and recoat exposed metal nosing and risers, at stairs. Generally at all stairs safety stripes should be installed at the top and bottom of each run.		x			x			1,500 lf	$17,250	$1,725	$3,795	$22,770									
4.07	Replace carpeted areas, with new VCT or linoleum flooring.					x			15,000 SF	$138,000	$13,800	$30,360	$182,160									
4.08	Deep-clean quarry tile flooring					x			4,000 SF	$34,500	$3,450	$7,590	$45,540									complete except for boy & girl locker rooms
4.09	Repair cracks in mechanical room concrete wall					x			5 lf	$460	$46	$101	$607							$607		
4.10	Repair cracked interior brick corner at main entry lobby					x			2 lf	$345	$35	$76	$455						$455			
4.11	Deep clean ceramic tile at corridor water fountain surrounds.					x			300 sf	$4,140	$414	$911	$5,465								$5,465	
4.12	Replace damaged/stained ACP tiles at classrooms, computer and library					x			10,000 sf	$80,500	$8,050	$17,710	$106,260									project started in 2016
4.13	Replace damaged/stained "tectum" acoustical panels					x			500 sf	$10,350	$1,035	$2,277	$13,662							$13,662		
4.14	Replace kitchen metal ceiling with metal grid and tiles with “wet location”, washable (food-service grade) ACPs.					x			4,000 sf	$34,500	$3,450	$7,590	$45,540							$45,540		
4.15	Replace flush natural wood doors					x			30 ea	$17,250	$1,725	$3,795	$22,770									complete
4.16	Replace hollow metal doors					x			10 ea	$5,175	$518	$1,139	$6,831						$6,831			
4.17	Replace wire glass vision panels with rated tempered glass	x				x			200 sf	$11,500	$1,150	$2,530	$15,180								$15,180	
4.18	Replace toilet compartments					x			6 ea	$13,800	$1,380	$3,036	$18,216									completed
4.19	Repace drinking fountains		x		x				6 ea	$41,400	$4,140	$9,108	$54,648									
4.20	Re-fit and lower fire extinguishers in new cabinets		x		x				50 ea	$6,900	$690	$1,518	$9,108									
4.21	Replace boy's locker room lockers					x			100 lf	$28,750	$2,875	$6,325	$37,950									
4.22	Replace outdated chalk board surfaces with white board surfaces			x					1000 sf	$28,750	$2,875	$6,325	$37,950									
4.23	Install short throw projectors in classrooms			x					10 ea	$46,000	$4,600	$10,120	$60,720									
4.24	Replace storage casework and countertops at classrooms and labs.			x	x	x			56 ea	$270,480	$27,048	$59,506	$357,034									
4.25	Install compliant handrails and guardrails at all stairs		x		x				5 stairs	$46,000	$4,600	$10,120	$60,720									
4.26	Install accessible shower stalls at girl's and boy's locker rooms				x				4 ea	$11,500	$1,150	$2,530	$15,180									
4.27	Install accessible transaction counter at library				x				1 ea	$5,750	$575	$1,265	$7,590									
4.28	Move adjacent wall to provide 18" min clear at pull side				x				10 ea	$172,500	$17,250	$37,950	$227,700									
	TOTAL																	$0	$7,286	$59,809	$20,645	$87,740
5	**Mechanical - HVAC**																					
5.01	Remove PTAC unit in administration and install higher-efficienct central air conditioning rooftop unit and ductwork to the suite.		x			x	x		1 ea	$315,000	$31,500	$69,300	$415,800									completed
5.02	Install exhaust fans and ductork to outside from copy areas.		x			x			4 ea	$27,200	$2,720	$5,984	$35,904						x		$35,904	
5.03	Replace (3) RTU cooling-only/ventilation units - 2 @ 25T; 1 @ 15T		x			x	x		14,800 SF	$225,000	$22,500	$49,500	$297,000								$297,000	
5.04	Provide new H&V unit for Kitchen and new Make-up air unit, including new DDC controls, and new supply & return duct systems.		x			x	x		1 ea	$12,800	$1,280	$2,816	$16,896					$16,896			completed	
5.05	Clean all existign ductwork	x		x		x	x		133,150 SF	$420,500	$42,050	$92,510	$555,060							$555,060		
5.06	Replace HWS and return piping outside of boiler room with new insulated pipe.		x				x		1 ea	$97,500	$9,750	$21,450	$128,700							$128,700		
5.07	Provide mechanical ventilation for the admin interior offices, library interior office, teachers workroom, SPED workroom.	x	x			x			1 ea	$85,800	$8,580	$18,876	$113,256									
5.08	Replace HW convector radiators in toilet rooms, along with new HW branch piping and insulation.		x			x	x		8 ea	$54,800	$5,480	$12,056	$72,336									
5.09	Replace CUHs HW FTRs and convectors in entryways, stairs, and corridors, along with new HW branch piping and insulation.		x			x	x		18 ea	$63,000	$6,300	$13,860	$83,160									
5.10	Provide outside ventialtion air to corridors with new H&V units.	x	x			x	x		3 ea	$45,000	$4,500	$9,900	$59,400									

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	5.11	Replace all remaining pneumatic controls with DDC system to tie into existing. (assume half of controls must be upgraded)		x			x	x		1 ea	$890,800	$89,080	$195,976	$1,175,856									
																						$0	
		TOTAL																	$16,896	$0	$683,760	$332,904	$1,033,560
6	Electrical																						
	6.01	Replace all panelboards throughout the building.		x				x		1 ea	$725,000	$72,500	$159,500	$957,000							$957,000		
	6.02	Provide new exterior standby generator, two automatic transfer switches, and associated panelboards. Provide circuitry for new normal/emergency lighting. Remove the existing normally off/emergency lighting system.	x	x				x		1 ea	$600,000	$60,000	$132,000	$792,000					$264,000.00	$264,000.00	$264,000.00		
	6.03	Replace existing lighting with LED high efficiency sources, fixture types like-for like. Provide occupancy sensors in enclosed spaces.		x			x	x		133,150 SF	$735,000	$73,500	$161,700	$970,200									
	6.03	Retrofit HID exterior pole lights with LED lamps/ heads.						x		30 ea	$45,000	$4,500	$9,900	$59,400									completed
	6.04	Replace HID wall packs with LED wall sconce fixtures.						x		20 ea	$15,000	$1,500	$3,300	$19,800									completed
	6.05	Change FA horns to speakers to enable voice evacuation.	x	x			x			133,150 SF	$65,000	$6,500	$14,300	$85,800									
	6.06	Replace entire fire alarm system under renovation option.	x	x			x			133,150 SF	$265,000	$26,500	$58,300	$349,800									
	6.07	Provide emergency power-off switch to kitchen equiupment under the hood system.	x	x			x			1 ea	$1,500	$150	$330	$1,980									
	6.08	Provide emergency power-off switch to boilers at exterior doors. Provide tamper proof covers at existing EPO switches on interior.		x	x					2 ea	$3,000	$300	$660	$3,960						x			
	6.09	Change non-GFI outlets to GFI at Kitchen, Boiler Room.	x	x						20 ea	$1,000	$100	$220	$1,320									existing
																			$0		x		
		TOTAL																	$264,000	$264,000	$1,221,000	$0	$1,749,000
7	Plumbing																						
	7.01	Provide new high efficiency water-svaing plumbing fixtures throughout the building.		x			x	x		133,150 SF	$532,600	$53,260	$117,172	$703,032									complete
	7.02	Provide HW/CW mixing valves at each emergency fixture.		x			x			133,150 SF	$38,400	$3,840	$8,448	$50,688								$50,688	
	7.03	Provide new domestic water disribution piping, insulation, and ball valves throughout the building.		x			x	x		133,150 SF	$1,065,500	$106,550	$234,410	$1,406,460									
	7.04	Replace DHWH with high efficiency unit, including mixing valve, expansion tank, and recirc pump.		x			x	x		133,150 SF	$115,500	$11,550	$25,410	$152,460									
	7.05	Video-survey all buried sewer pipe to determine condition and check for leaks. Replace piping as required. (allowance)	x	x			x	x		200 lf	$12,000	$1,200	$2,640	$15,840									
	7.06	Provide acid neutralization system for science labs.	x	x	x		x			1 ea	$55,000	$5,500	$12,100	$72,600									
																						$0	
		TOTAL																	$0	$0	$0	$50,688	$50,688
8	Fire Protection																						
	8.01	Provide hydrant flow test.	x	x			x			1 ea	$3,500	$350	$770	$4,620						$4,620			
	8.02	Install complete, building wide sprinkler system.	x	x			x			133,150 SF	$732,325	$73,233	$161,112	$966,669						$966,669			
																				$0			
		TOTAL																	$0	$0	$0	$0	$0
9	Technology																						
	9.01	Replace CAT 5/5E cabling with CAT 6E					x			133,150 SF	$130,000	$13,000	$28,600	$171,600						$171,600			
	9.02	Remove antiquated TV monitors from classrooms, etc, and replace with interactive projcetors.			x		x			133,150 SF	By other	By other	By other	By other						By other			
	9.03	Install three data drops per classroom/ teaching station to accomdate streaming video.			x		x			133,150 SF	$50,000	$5,000	$11,000	$66,000						$66,000			
	9.04	Install new security system with digital IP cameras, a medium level of coverage, and access control system.	x		x		x			133,150 SF	$400,000	$40,000	$88,000	$528,000									
																				$0			
		TOTAL																	$0	$0	$0	$0	$0
#	Hazardous Material																						
	10.01								x		Incl Below												
	10.02								x		Incl Below												

	GALVIN 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	Quantity	Cost of Repair / Replacement (5/2016 $)	Designer / Pricing Contingency (10%)	Soft Cost (20%)	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs)	On Going Maintenance	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
10.03								x		Incl Below												
10.04								x		Incl Below												
10.05								x		Incl Below												
10.06								x														
10.07								x														
10.08								x		Incl Below												
10.09								x														
10.10								x		Incl Below												
10.11								x		Incl Below												
10.12								x														
10.13								x														
10.14								x														Haz/Mat includes cost associated with complete renovation or demolition; additional costs are included should results exceed EPA limits
	HAZMAT ALLOWANCE									$1,600,000		$320,000	$1,920,000								$1,920,000	
										$13,146,664	$1,154,666											
											$14,301,330											

GENERAL NOTES

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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 with a specific improvement line item, a mini study specific to the scope of work should be done to confirm the scope of work, prepare sketches as necessary and prepare a refined cost estimate.

		CANTON HIGH 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	Quantity	Cost of Repair / Replacement (5/2016 $)	Designer / Pricing Contingency (10%)	Soft Cost (20%)	Estimated Project Cost (5/2016 $)	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs)	On Going Maintenance	High Priority (1-3 yrs)	Medium Priority (4-6 yrs)	Low Priority (7-10 yrs) or under full renovation project	On Going Maintenance	Notes
		247,800 GSF																						
1	**Site & Civil**																							
	1.01	Crack seal areas of pavement where cracking/ degradation has occurred.					x			**125,000 SF**	$71,875	$7,188	$15,813	$94,875					$94,875				
	1.02	Mill and overlay sections of pavement where cracking/ degradation has occurred.	x				x			**125,000 SF**	$71,875	$7,188	$15,813	$94,875					$94,875				Included 25% mill and overlay
	1.03	Replace damaged granite curb.					x			***20 lf***	$1,035	$104	$228	$1,366								$1,366	
	1.04	Clean existing catch basins.					x			**20 ea**	$4,600	$460	$1,012	$6,072					$6,072				
	1.05	Clean and maintain gravel in swale at baseball fields					x			**1 ea**	$5,750	$575	$1,265	$7,590					$7,590				
	1.06	Clean exterior grease trap at Kitchen								**1 loc**	$1,035	$104	$228	$1,366							$1,366		
	1.07	Flush fire hydrants 1x year								**4 loc**	$920	$92	$202	$1,214							$1,214		
		TOTAL																	$203,412	0	2580.6	1366.2	$207,359
2	**Structural Elements**																							
	2.01	Repair and monitor cracks in the Cafeteria by removing failed CMU and installing a proper building movement joint.					x			**40 lf**	$5,520	$552	$1,214	$7,286									
	2.02	Clean out all roof drains	x				x			**1 ls**	$33,120	$3,312	$7,286	$43,718					x			$43,718	
	2.03	Repair cracks in boiler room floor					x			**20 SF**	$345	$35	$76	$455									
	2.04	Repair concrete cracks in foundation					x			**2000 SF**	$11,500	$1,150	$2,530	$15,180									
	2.05	Seal tie plug holes					x			**100 @**	$5,750	$575	$1,265	$7,590									
	2.06	Clean and paint steel loose lintels					x			**60 lf**	$1,725	$173	$380	$2,277									
	2.07	Repair loading dock cracks in steps					x			**40 SF**	$1,150	$115	$253	$1,518									
		TOTAL																	$0	$0	$0	$43,718	$43,718
3	**Exterior Architectural Elements**																							
	3.01	Repair displaced flashing at Cafeteria exterior					x			**10 lf**	$2,875	$288	$633	$3,795							$3,795		
	3.02	Repair leaks in masonry wall and clean effloresence					x			**3,000 SF**	$27,600	$2,760	$6,072	$36,432					$36,432				
	3.03	Repair bent steel loose lintel and CMU at Delivery doorway	x				x			**1 ea**	$2,300	$230	$506	$3,036								$3,036	
	3.04	Remove and replace failed sealants					x			**200 lf**	$27,600	$2,760	$6,072	$36,432					x			$36,432	
	3.05	Clean graffitti off limestone veneer					x			**250 SF**	$2,875	$288	$633	$3,795								$3,795	
	3.06	Repair cracked limestone veneer					x			**1 @ 1 lf**	$575	$58	$127	$759								$759	
	3.07	Remove coping over autoclaved concrete veneer and install new with 1" OH					x			**200 lf**	$27,600	$2,760	$6,072	$36,432						$36,432			
	3.08	Clean stains off autoclaved concrete veneer					x			**2,300 SF**	$21,160	$2,116	$4,655	$27,931							$27,931		
	3.09	Perform comprehensive preventive maintenance on all EIFS facades. Replace all falied sealants within EIFS and joints with other materials.					x			**10,000 SF**	$103,500	$10,350	$22,770	$136,620								$136,620	
	3.10	Repair existing scupper and add additional scupper at high roof element					x			**2 ea**	$2,760	$276	$607	$3,643								$3,643	
	3.11	Repair elevator penthouse CMU and repaint w epoxy coating. Add scupper.					x			**1,600 SF**	$22,080	$2,208	$4,858	$29,146								$29,146	
	3.12	Replace failed sealan joints in masonry.					x			**150 lf**	$2,070	$207	$455	$2,732									
	3.13	Replace pierced CMU exterior veneer by toothing in new one.					x			**1 ea**	$23,000	$2,300	$5,060	$30,360									
	3.14	Replace all failed sealants at storefront and curtain wall.					x			**200 lf**	$2,760	$276	$607	$3,643									
	3.15	Replace all failed sealants at punched window openings.					x			**200 lf**	$2,760	$276	$607	$3,643									
	3.16	Repaint galv metal frame at coiling OH Delivery door					x			**1 ea**	$1,656	$166	$364	$2,186									
	3.17	Reinstall sheet metal hood on louver at Science wing, 2 level					x			**1 ea**	$575	$58	$127	$759									
	3.18	Replace damaged small 8 x 16" grilles at G wing					x			**4 ea**	$1,150	$115	$253	$1,518									
	3.19	Install splash blocks under scuppers					x			**6 ea**	$1,035	$104	$228	$1,366									
	3.20	Repair CMU and ladder at roof step					x			**1 ea**	$2,300	$230	$506	$3,036									
	3.21	Repair detached roof overhang soffit panels					x			**60 SF**	$4,830	$483	$1,063	$6,376									
												$0	$0	$0									
		TOTAL																	$36,432	$36,432	$31,726	$213,431	$318,021
4	**Interior Architectural Elements**																							
	4.01	Remove and repair damaged VCT at cracks/ joints and install joint cover or transition.					x			**14 ea**	$3,220	$322	$708	$4,250							$4,250		
	4.02	Repair cracking and reinstall rubber disc flooring.					x			**6 ea**	$1,035	$104	$228	$1,366									completed in 2016

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4.03	Remove and repair damaged resilient vinyl tile at cracked joints and install joint cover or transition.					x			8 ea	$1,380	$138	$304	$1,822									complete except for boy & girl locker rooms
4.04	Repair cracked ceramic tiles in toilet rooms/ showers - assume 5 or less each location.	x		x		x			8 ea	$2,300	$230	$506	$3,036							$3,036		
4.05	Repair resilient rubber disc flooring at Gym drinking fountain. Confirm fountain is not leaking.	x				x			1 ea	$575	$58	$127	$759						$759			
4.06	Repair cracks in GWB in science rooms.					x			1,600 SF	$7,360	$736	$1,619	$9,715								$9,715	
4.07	Add vinyl corner guards to all outside corners in building - assume bldg 247,800 Sf x $/sf			x		x			1 ea	$28,497	$2,850	$6,269	$37,616									project started in 2016
4.08	Replace damaged ceiling tiles					x			600 SF	$6,900	$690	$1,518	$9,108							$9,108		
4.09	Install gypsum 2 x 4 tiles in locker room			x		x			4,000 SF	$36,800	$3,680	$8,096	$48,576							$48,576		
4.10	Replace wired glass in selected doors and frames - assume 30 leafs plus 15 sidelights	x	x						1 ea	$18,975	$1,898	$4,175	$25,047									complete
4.11	Make repairs to partitons in locker rooms and replace shower curtains.	x		x		x			2 rooms	$1,150	$115	$253	$1,518						$1,518			
4.12	Replace doors on wide team lockers.			x		x			40 opgs	$59,800	$5,980	$13,156	$78,936								$78,936	
4.13	Deep-clean and maintain fume hoods at science labs	x		x		x			8 ea	$18,400	$1,840	$4,048	$24,288									completed
4.14											$0	$0	$0									completed
	TOTAL																	$0	$2,277	$64,970	$88,651	$155,899
5	**Mechanical - HVAC**																					
5.01	Replace missing pipe insulation sections.		x			x	x		100 lf	$1,650	$165	$363	$2,178									completed
5.02	Install air separator on HW system air vent.		x			x			1 ls	$4,850	$485	$1,067	$6,402						x		$6,402	
5.03	Install VFD on indoor AHU within Boiler Room		x			x	x		1 ls	$6,500	$650	$1,430	$8,580								$8,580	
5.04	Repair corrosion on boiler stack and repaint with high-temp coating.					x			1 ls	$3,850	$385	$847	$5,082					$5,082			completed	
5.05	Provide software and controller upgrades to help maintain sysem controllability and efficiency.		x	x		x	x		1 ls	$15,000	$1,500	$3,300	$19,800							$19,800		
5.06	Provide demand-controlled ventilation using CO2 sensors and associated wiring in all classrooms and other high-occupancy educational spaces.						x		86 ea	$250,000	$25,000	$55,000	$330,000							$330,000		
																					$0	
	TOTAL																	$5,082	$0	$349,800	$14,982	$369,864
6	**Electrical**																					
6.01	Provide blank metal panel cover on distribution panel		x						1 ea	$1,000	$100	$220	$1,320							$1,320		
6.02	Retrofit CFL down-lights with LED lamps - assume 247,800 SF x $/sf						x		1 ea	$600,000	$60,000	$132,000	$792,000					$264,000.00	$264,000.00	$264,000.00		
6.03	Retrofit HID exterior pole lights with LED lamps/ heads.						x		40 ea	$60,000	$6,000	$13,200	$79,200									completed
6.04	Replace HID wall packs with LED wall sconce fixtures.						x		30 ea	$22,500	$2,250	$4,950	$29,700									completed
6.05	Provide emergency power-off switch to boilers at exterior doors. Provide tamper proof covers at existing EPO switches on interior.		x	x					2 ea	$3,000	$300	$660	$3,960						x			
6.06	Change non-GFI outlets to GFI at Kitchen and Servery	x	x						20 ea	$1,000	$100	$220	$1,320									existing
																		$0		x		
	TOTAL																	$264,000	$264,000	$265,320	$0	$793,320
7	**Plumbing**																					
7.01	Install emergency gas valve on kitchen equipment gass supply, interlock with CO detector for auto shutdown in presence of CO near hood.	x	x						1 ls	$3,850	$385	$847	$5,082									complete
7.02	Replace damaged bubblers at water coolers.					x			4 ea	$15,400	$1,540	$3,388	$20,328								$20,328	
																					$0	
	TOTAL																	$0	$0	$0	$20,328	$20,328
8	**Fire Protection**																					
8.01	Replace fire pump with new horizontal fire pump.		x			x			1 ea	$48,850	$4,885	$10,747	$64,482						$64,482			
8.02	Replace missing sprinkler head escutcheons.					x			20 ea	$1,700	$170	$374	$2,244						$2,244			
8.03	Provide labels on all FD valve cabinets.		x						3 ea	$65	$7	$14	$86						$86			
																			$0			

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	TOTAL																	$0	$0	$0	$0	$0
9	**Technology**																					
9.01	Rack mount Mitel equipment					x			1 ea	$2,500	$250	$550	$3,300						$3,300			
9.02	Properly ground equipment racks - install bonding jumper.	x	x						1 ea	$1,500	$150	$330	$1,980						$1,980			
9.03	Add panic buttons connected to 911 dispatch in Admin, Principal, VP offices.	x		x					3 ea	$2,500	$250	$550	$3,300						$3,300			
																			$0			
	TOTAL																	$0	$0	$0	$0	$0
#	**Hazardous Material**																					
	NO ISSUES - 2007 PROJECT COMPLETED ABATEMENT																					
	HAZMAT ALLOWANCE											$0	$0								$0	
										$1,731,368	$173,137											
											$1,904,505											

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 with a specific improvement line item, a mini study specific to the scope of work should be done to confirm the scope of work, prepare sketches as necessary and prepare a refined cost estimate.