Facilities Assessment Report 6.2
SMMA

SECTION 2
FACILITIES ASSESSMENT

2.1 DEERFIELD ELEMENTARY SCHOOL

The following is a summary of the existing conditions at the Deerfield Elementary School. This report is based on our site visit on October 29, 2014.

SITE

Parking Lots/Access Drives

Total number of parking spaces is 70 (68 standard spaces, 2 accessible spaces).

The West Parking Lot is in overall good-fair condition. Bituminous pavement shows minimal wear and some longitudinal and fatigue cracking along the west edge. The striping is clearly visible. No perimeter curbing exists. The lot contains 34 standard parking spaces. The area also serves the dumpster loading/unloading and service area. The building does not have a loading dock.

The North Parking Lot is in overall good condition. It appears this area was paved within the last two years and shows no signs of wear or cracking. Striping is clearly visible. No perimeter curbing exists. Vehicles utilizing this parking area are accessing directly from a traveled way, which is not ideal for safety. The lot contains 21 parking spaces (20 standard spaces and 1 accessible space).

The Front bus loop/parking area is in overall fair condition. The bituminous pavement shows some wear and contains some edge cracking and transverse cracking. Striping is clearly visible. Perimeter curbing exists only on the outside edge and consists of concrete curbing in fair condition. There is some plow damage and deterioration visible on the curbing. A section of new concrete curbing in front of the building was installed within the past two years and is in good condition. The area contains 15 parallel parking spaces (14 standard spaces and 1 accessible spaces). The loop is one-way, and signage prohibits vehicular traffic from 8:00-8:30 AM and 2:30-3:00 PM.

Walkways

The bituminous walkway adjacent to the North Parking lot is in fair overall condition. The east portion shows some wear and minor cracking, while the west portion contains more significant cracking.

The bituminous walkway around the perimeter of the north wing of the building is in overall good-fair condition, showing some wear and containing minor cracking.

The bituminous walkway around the front bus loop/parking area is in overall good-fair condition, showing minor wear and containing very few cracks. A portion of this walkway in front of the main entrance was paved in the past two years and is good

condition. A new accessible curb cut also exists, but there is no crosswalk across the drive.

The bituminous walkway that runs east to west from the modular building across the grass playfields is in overall poor condition due to significant edge and transverse cracking.

The bituminous walkway around the south and east side of the building is in overall good-fair condition, showing minor wear and containing few cracks.

The ramp at the main entrance is in overall good-fair condition, except that concrete has broken away at one of the handrail posts, diminishing the structural integrity of the handrail. Moisture dripping onto the surface at the top of the ramp was observed which could lead to a slip hazard in winter time.

Circulation

Pick-up and drop-off operations were not observed. Buses utilize the designated one-way loop on the east side of the school.

Accessibility

1. Parking

    a. Three accessible spaces are required for MAAB compliance, and only two are provided.

    b. The parallel parking space in the bus loop also does not meet MAAB criteria (lack of safe area and crosswalk). Slope of accessible space in northern lot should be further investigated to determine if it exceeds MAAB slope requirements.

2. Building Egress Points

    a. Six building egress points on the west side of the building are not accessible due to stairs (and lack of edge protection for one). Two are wood stairs at the modular building, and the remaining four are concrete stairs. Concrete stairs are in overall fair condition and show some signs of wear and deterioration. One handrail on the wood ramp has loosened from its supports.

    b. Four building egress points on the east side of the building are not accessible due to stairs (and lack of edge protection for one). One is a wood stair at the modular building, and the remaining three are concrete stairs. The concrete stairs are in overall fair condition and show some signs of wear, cracking, and deterioration.

    c. Building egress on the north side of the building is not accessible due to 1”+ vertical lip between the ramp and the level landing in front of the door. It appears the short ramp section may have settled over time, causing the elevation difference.

3. Walkways

    a. Two locations along the northern walkway lack detectable warning strips where it ties into parking and roadway areas.

    b. Some of the play structures in the wood fiber play area are not MAAB compliant due to a lack of accessible paths to them (see Play Areas section below).

Utilities

1. Drainage

    a. Runoff from the front bus loop flows off-site and is captured in a catch basin on Deerfield Ave.

    b. It appears a portion of the runoff from the northern parking lot/roadway flows off-site unmitigated.

    c. 2”-3” inches of standing water was observed at the exterior egress to the boiler room (located in lower level). A small area drain did not appear clogged at the surface, so pipe may be blocked further down.

    d. All roof runoff appears to be captured in downspouts that tie into the drainage system.

    e. No known issues or concerns with flooding.

2. Sewer - School is connected to Town Sewer. No known issues or concerns with sewer distribution.

3. Water - No known issues or concerns with water distribution system.

4. Fire Protection – Two hydrants observed on the east side of the school along Deerfield Ave, both within 300’ of the school. There was no hydrant observed on the west side of the school. A large portion of the back (or west) side of the building is beyond the recommended 300’ to a hydrant, and therefore, overall coverage for the building does not appear adequate.

5. Electric/Telecommunications – Several loose, tangled wires observed hanging over the boiler room egress pit. No other known site electrical or telecommunication issues.

6. Gas – Natural gas service is available at the school. The gas meter is located on the east side of the building.

7. Lighting – Site lighting consists of building mounted fixtures, and pole mounted street lights spilling onto the school property. There are no known site lighting issues.

Play Areas

The main bituminous play area west of the building is in overall good-fair condition. Pavement shows some wear and isolated areas of cracking. Pavement markings are quite faded.

The basketball court is in overall good condition, with the pavement showing minimal wear and no observed cracking. Stain and striping is still clearly visible. Basketball hoop poles are leaning inward and may need to be reset in concrete to correct.

The engineered wood fiber play area consists of several play structures. There is a bituminous path that provides access to the wood fiber area, and there is one rubberized path to the swing structure. The remaining play structures lack accessible paths, and therefore are not considered MAAB compliant.

The grass playfields and associated structures appear to be in overall good condition, except that backstops have been partially disassembled. It appears that the baseball fields are no longer in use, as the dirt infields have partially grown in with grass. No accessible path is provided to team benches or spectator bleachers, and therefore, the area is not MAAB compliant.

SEAM AND LONGITUDINAL CRACKING IN WEST PARKING LOT

EDGE CRACKING AND ADJACENT RUTTING IN LANDSCAPE AREA AT FRONT BUS LOOP/PARKING AREA

CRACKING AND HEAVING IN WALKWAY ADJACENT TO NORTHERN PARKING AREA

NON-ACCESSIBLE BUILDING EGRESS POINT ON WEST SIDE OF BUILDING

HANGING WIRES AND STANDING WATER AT BOTTOM OF LOWER LEVEL EGRESS

ARCHITECTURE

SMMA visited the site in the afternoon of October 20, 2014. The weather was mild and cloudy. The school facility consists of a single level load bearing masonry school building with a gable roof constructed in 1953 and renovated in 1995. Modular classrooms were added 30 years ago to the south end of the school. The building area is approximately 35,078 GSF and contains 247 students in grades K-5. The building faces west to Deerfield Avenue. The bus drop-off and pick-up is the loop drive in front of the school, and visitor parking is around the loop drive. Staff and teacher parking are on the east side of the school on both sides of the service drive. The main entry to the school is clearly identified by a large projecting canopy and the entrance is raised two steps above the drive and there is a ramp. The north side is at grade level. The modular classrooms have a wood ramp and wood steps at three entries. The paved play area is located to the south of the building. The service area is in rear of the building and is not visible from Deerfield Avenue.

Enclosure

The roof is a medium sloped gabled roof with a flat roof section over the center. The roof has been replaced recently. There are six to eight inches of loose insulation in the attic. The gabled roof drains to gutters and the downspouts and leaders drain to storm drainage. The roof overhangs the east and west sides of the building. The modular building attached at the south end has two classrooms and a connecting corridor. The 1953 building's walls are load bearing masonry construction with brick exterior and concrete masonry interior. The windows are single glazed steel framed awning style and there is glass block infill above the windows. The entry is aluminum storefront with fixed glass sidelights. There is a mechanical room in the basement with access from a corridor adjacent to the kitchen and from the exterior. The boiler room shows signs it is subject to flooding.

Interior

The interior partitions are typically painted masonry or glazed block wainscot with painted masonry above. Flooring typically is vinyl composition tile in the corridors and classrooms and seamless flooring in the restrooms. Ceilings are suspended acoustical tile with surface mounted light fixtures on concealed spline acoustical tile in the corridors and recessed fixtures in the classrooms. The kitchen has vinyl composition tile floors and painted CMU walls. The gymnasium has cementitious cellulose fiber (Tectum) panel ceiling and recessed lights. There is a wood stage and folding wood partitions in the gym. Door frames are typically hollow metal. The interior doors are wood and some have wire glass vision panels. All doors are in poor condition. The hardware is also in poor condition. Classroom casework is in poor condition. There are no privacy screens between urinals. There is a utility tunnel under the school with floor access doors in classrooms.

Circulation

The building is single floor with a foyer and full length corridor and double doors at the main entry and ends. Some classrooms, the gym, and the modular classrooms

have direct outdoor access. The gymnasium is on a lower level than the corridor. There is an enclosed lift from the corridor to the gymnasium. There is a ramp access to the modular classrooms. Classrooms with outside access at the north end have grade level access to the outside and classrooms with outside access at the south end have landings with steps.

Accessibility

There are no power door operators located at the accessible entry on the accessible route to the building. Door hardware varies in the building with knobs and lever handles throughout the facility. There is a wheelchair lift to the gym level. Other non-compliant items are:

- Wood steps at modular classrooms needs non-slip surface.
- Abrupt level changes greater than ½" at north entry.
- Classroom sinks with bubblers are not compliant.
- Not all accessible toilets are compliant code.
- Missing signage.
- Projections into walkway space.

Security

Steel framed windows and exterior classroom doors have locking hardware. Exterior doors have exit devices (panic hardware) and are locked to prevent unauthorized entry. There is an intercom with remote release at the main entry. The Office /Reception area has visual control of the entry and the entry vestibule. The school has a corridor located motion detection intrusion alarm and 3 cameras. Classroom door hardware does not have classroom side lock-down feature.

NO PRIVACY SCREENS AT URINALS

STRUCTURAL

Purpose

The purpose of this report is to broadly describe the existing structure, comment on the structural integrity of the building and comment on the structural code issues related to any future renovations and expansions.

Basis of the Report

This report is based on visual observations during our site visit on October 13, 2014. As of this writing, there are no drawings or documents relating to the original structure available for review. There are limited layout plans of the general architectural configuration.

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

Building Description

The school, opened in 1953, has a single story structure housing classrooms, administrative offices, cafeteria and gymnasium/auditorium. The foundations are cast-in-place concrete foundations with a concrete slab-on-grade at the 1st floor level. There is a boiler room below the kitchen with cast-in-place reinforced concrete walls and precast concrete plank. The roof is framed with large steel trusses, creating an attic space between the top and bottom of the truss. Steel roof decking spans approximately eight feet between the trusses, and was recently installed as part of a re-roofing renovation, which replaced the previous concrete decking. The trusses are likely supported by the masonry walls at the exterior and main corridor of the building. It was not determined if the trusses bear directly on the masonry, or on steel columns within the masonry walls. There is a modular addition on the south wing of the school, constructed with conventional modular wood framing.

Lateral Force Resisting System

There appears to be no deliberately designed lateral force resisting system as part of the original structural design. Currently, lateral loads (wind loads, potential seismic forces) are resisted by the exterior and interior masonry walls. This is fairly typical of school structures built in this time period, as deliberate lateral force resisting systems (i.e. shear walls, brace frames, moment frames) were not addressed by the building code until 1973.

Existing Conditions

There building appears to be in sound structural condition with no substantial structural defects. The recent replacement of the concrete roof with metal deck most likely provided the roof with additional live load (snow load) capacity by reducing the self-weight of the decking. The new roofing itself should have mitigated

any potential leaks to keep moisture out and help to preserve the integrity of the existing structural elements.

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations or additions are made to the structure, a check for compliance with the Massachusetts State Building Code (780 CMR, Chapter 34 "Existing Structures") is required. The intent of 780 CMR, Chapter 34 is to permit repairs, alterations, additions and/or a change of use without requiring full compliance with the code for new construction. However, depending on the scope of any proposed renovations, a comprehensive structural analysis may need to be performed to determine the impact on the existing structural system. Due to the fact that the lateral force resisting system of the structure is, by default, the interior and exterior masonry walls, any modifications to them will need to be thoroughly reviewed to determine if seismic upgrades to the lateral system is required as a result of proposed building alterations. If any future additions are planned for this building, they should be seismically isolated from the existing structure.

Summary

The existing structure appears to be in sound condition and is performing satisfactorily. A thorough investigation of the existing structure is required if, by nature of the proposed renovations:

1) The capacity of the lateral force resisting system is decrease a (i.e. reduce the amount of, or configuration of the existing masonry walls;
2) There is an increase the seismic loads on the building (i.e. additional building mass in or on top of the structure, such as mechanical roof top units);
3) There is an increase in the effects of the wind loads on the building (i.e. additional roof top mechanical units/roof screens or other projections collecting wind and transferring additional lateral forces to the existing masonry walls).

PLUMBING SYSTEMS

Plumbing Fixtures

The majority of the existing plumbing fixtures in place within the building are original. Some have been replaced with newer battery sensor type flush valves and lavatory faucets (Refer plumbing pic 1). Water closets are floor mounted, vitreous china units with a mix of manual and battery sensor operated flush valves. Stall type urinals are no longer allowed and not compliant.

Some flush valves have been retrofitted with new Rubbermaid Retrofit Kits (battery sensor type flush valves), (Refer plumbing pic 1). The Nurse's room water closet is a floor mounted, vitreous china. Urinals in the toilet core rest rooms are vitreous china, wall hung units with manual operated flush valves. The flush valves are exposed in the room.

Lavatories are wall hung, vitreous china with hot and cold faucets that are either metering or manually operated. Some existing lavatories have been retrofitted with self-metering manual push down Chicago faucets (Refer plumbing pic 2).

The kitchen hand-washing sink is a stainless steel, wall hung unit with a hot and cold gooseneck spout faucet with wrist blade handles. Kitchen scullery sinks are floor standing, stainless steel with coved inside corners. Kitchen food prep sinks with or without food disposer requires an indirect waste (not hard connected) to assure no cross contamination with sanitary sewer and food upon any waste back up (Refer plumbing pic 3).

Classroom sinks are stainless steel, self-rimming single compartment basins with a swing spout faucet with separate hot and cold handles. Several of the existing classrooms have self-rimming stainless steel sinks with standard manual type faucets. These require reducing and limiting the hot water to a maximum of 110 degrees F hot water to dispense at the faucets. Kindergarten class room sinks are not receiving hot water at a timely manner or temperature at their faucets.

Mop basins are floor type, molded stone units with hot and cold faucet with hot and cold handles and elevated vacuum breaker. Custodian's closet mop service basin faucet does not have any integral vacuum breakers (Refer plumbing pic 4). Drinking fountains are a mix of stainless steel and vitreous china, non-recessed non-electric water coolers are single level units with push button activation. Several existing water drinking fountains (non-chilled) on each floor do not include alcove-recessed with high-low handicapped accessible configurations (Refer plumbing pic 5).

Exterior hose bibs are frost proof type. No emergency eyewash / shower stations are located in the mechanical room or nurse's room. Existing original core restrooms are outdated as far back as the original school building was constructed in 1953 and do not meet MAAB requirements.

Roof Storm Drainage

External roof drain systems are presently discharging into site storm boot systems.

Sanitary

The majority of the existing building sanitary waste system, which drains by gravity, is in poor condition. The sanitary effluent discharges below grade to the site sewer drain distribution system.

Existing underground (buried) piping could be not be observed, however the entire underground (buried) sanitary sewer should be tested for any leakage, backup and pipe aging condition by executing static pressure tests and video camera inspections.

A dedicated grease waste line is not in place for the school building. Currently point of use internal floor recessed grease trap is collecting the grease laden effluent from the 3 pot sink.

The above ground sanitary drainage and vent for the school building is currently using cast iron hub and spigot joints (3" or larger). Piping smaller than 3 inch is piped using DWV copper pipe.

Domestic Cold Water Service

Insulation at most piping is of adequate thickness and in fair condition. Some insulation has been removed at locations where repairs have occurred. Some of this insulation was not replaced.

Piping is not adequately labeled throughout the building. Vacuum breakers are present at the majority of fixtures as required by code. Original 1953 construction gate valves are in fair condition. Ball valves installed during the 1995 remodeling are in good condition.

Valve tags are not present throughout the building. Piping is adequately supported where observed either by hangers or floor supports.

Hard water deposits were noted at multiple fixtures throughout the facility with the heaviest of the deposits being at the backflow preventers. The hard water deposits could be causing deterioration of the piping wall thickness throughout the facility.

The existing main domestic water supply enters the basement boiler room complete with one water meter assembly located above just within the tunnel opening from the boiler room. No backflow preventer present for the domestic potable water distribution side. No protected lawn and garden irrigation system or systems required.

The two existing site irrigation systems are currently being fed from reduced pressure-principle backflow preventer located within the food service cafeteria area.

Existing boiler cold water make-up is currently being fed from reduced pressure-principle backflow preventers for HVAC equipment.

The domestic cold water piping distribution within the building supplying the original systems are distributed with "L" type copper tube with wrought or cast copper fittings. The majority of the piping is not insulated to prevent condensation on piping and prevent deterioration of the pipe to extend their life expectancy.

Domestic Hot Water Service

One gas fired 80% thermal efficiency storage water heater was installed in 2012, which is supplying the kitchen area fixtures and the remainder of the building.

The unit is RUUD model no. PH2-75F with 72 gallon storage. This water heater is missing a thermostatic hi/lo mixing valve station. Storage temperature is required to be a minimum of 140 degrees F. Temperature gauges not present to confirm. Cafeteria employee hand wash sinks would require tempering down to 110 degrees F. and all other kitchen plumbing fixtures / equipment to have a 140 degree F hot water system.

The existing domestic hot water distribution system to the original school building does not have a hot water circulation system to the plumbing fixtures. Not having a hot water recirculation system would require a piping heat trap present (Refer plumbing pic 5). No dead legs were observed with more than 12" in length.

The existing domestic hot water is distributed in "L" type copper tube with wrought or cast copper fittings. The majority of the existing hot water (HW) piping is not insulated.

Natural Gas

A new gas service location is present; this service enters the existing basement boiler room and feeds the gas fired boilers and water heater. It appears to be regulated down to low pressure (11" WC). The exterior pressure regulator and gas meter are mounted on the exterior of the building and supported by a concrete house pad. The gas meter and primary pressure regulator are owned by the gas utility company.

The basement boiler room gas supply currently feeds the gas fired domestic water heater and the gas fired heating boilers. Food service equipment within the kitchen area is currently all electric operating.

The existing gas piping appears to be distributed in ASTM A53 schedule 40 black steel pipe.

PLMBG. PIC 1

PLMBG. PIC 2

PLMBG. PIC 3

PLMBG. PIC 4

PLMBG. PIC 5

FIRE SPRINKLER SYSTEMS

Fire Protection System

There are no existing fire sprinkler systems.

MECHANICAL

HVAC System

Boiler Plant

Deerfield Elementary School is a steam heated building served by two Weil McLain Series 88 Boilers. One of the boilers is obviously newer than the other and was a replacement several years ago. The condensate receiver/boiler feed tank is an uninsulated steel tank with duplex pumps. It is located below the steel grid iron stairs to the exterior door which makes access and servicing the unit difficult. The tank show signs of deterioration with a trail of rust around the gasket and along at least one seam.

Steam is distributed to the unit ventilators and other terminal equipment via as series of tunnels that follow the building perimeter. There are three such tunnels leaving the boiler room. The boiler room itself and the tunnel leading toward the front of the building have been abated for asbestos. The piping in the back two tunnels is covered with air cell insulation and mudded plaster on the joints. Both these insulation materials are asbestos containing. Judging by the crushed insulation near the tunnel entrances it is probable the soil in the tunnels has been contaminated with insulation debris. When the abatement was done the pipes within the boiler room were reinsulated with molded fiberglass but it appears to terminate just a foot or two into the one abated tunnel and the rest of the tunnel piping appears to be uninsulated. The boiler stack breeching carrying the exhaust product to the chimney was never reinsulated after the abatement. Subsequent repairs to piping in the boiler room such as around the pumps and condensate tank have also not been reinsulated.

The classrooms each have an old Herman Nelson Unit Ventilator (UV) under the window. The rest of the exterior wall is covered with books shelves which appear to have been hand build. The pneumatic controls are largely non-operational and the units typically run wild with the outdoor air damper and heating control valve both wide open. Lacking a functional thermostat teachers routinely turn the fan of the UV off when the room begins to overheat and back on as the room cools off. Steam traps may be under the unit or below in the tunnel. In the asbestos laden tunnel they are inaccessible but even when above the floor they have not been properly maintained and significant energy is lost as the steam blows by the traps.

MEDIA CENTER UNIT VENTILATOR. UVS ARE TYPICALLY NEARLY OBSCURED WITH FURNITURE, STACKED TEXTBOOKS AND OTHER TEACHING RESOURCES.

The classroom ventilation is balanced via small exhaust grilles in the ceilings of the student coat cubbies in the back of each classroom. The condition of the exhaust fans serving this system though is in dubious condition. Exhaust grilles in the cubbies of several classrooms are ducted together and vented into the attic. A large fan at either end of the building then exhausts air from the attic itself.

At the end of the building there are two modular classrooms added around 2008. The modular classrooms are heated and ventilated via exterior wall hung Heating and Ventilating (H&V) units. The H&V units were originally propane fire but have recently been converted to natural gas. The new gas pipe is routed through the attic and then across the modular unit roof.

ELECTRICAL SYSTEMS

A site visit was made on October 13, 2014 to review the existing electrical systems.

Electric Service

Existing electric service initiates from existing utility pole-mounted transformer located in front of the school building, in a tree area. The service riser conduit shows some tear-downs and rusting parts which possibly contributes to on-going issues with water leaks at the main service equipment located in basement, identified by the electrical department.

Power Distribution Equipment

The utility transformer secondary feeder runs underground towards the school building and terminates in a 400 Amp Main Service Disconnect located in the existing boiler room at basement level. It's manufactured by Siemens. It was recently

replaced upon its failure, appears to be in good and operational condition. The service from the main service disconnect extends to the main power distribution panel named “kitchen panel”, located adjacent to the main disconnect switch. The “kitchen panel” is rated 400 Amp at 120/240v 1 phase 3 wire system, appears to be in good and operational condition.

The existing electric service usage may have reached the maximum available capacity, and therefore it may not be insufficient for any future school upgrades. Most of the new elementary schools with partial air conditioning are designed for approximately 7-9 W/SF, while the existing Deerfield Elementary school’ s electrical service can support approximately 3 W/SF based on existing electrical service size, voltage configuration and building SF size.

Power from the “kitchen panel” in the boiler room is distributed to all sub-panels located throughout the school building. The majority of the sub-panels appear to be “old”. If they’re “original” to the building, they must be dated 1953. The “really old” panel appears to be the one located the kitchen area – a 200 Amp 120/240v 1 phase 3 wire, manufactured by Federal Pacific, which is obsolete. Two other “older looking” panels are located in the Art classroom and the “copy center” in the Admin area. There are a few “newer” panels, which appear to be in good and operational condition. It is assumed that power feeders to all “old” panels are “original”.

Majority of receptacles appear to be “original”. It is assumed that branch wiring feeding receptacles has never been replaced. Branch wiring to classrooms’ unit ventilators appear to be “original” too.

Quantities of receptacles in classrooms appear to be inadequate, and therefore multiple pieces of equipment are plugged into the same receptacles utilizing plug strips.

The on-going issue of “arcing receptacles” was brought to our attention by Facilities. Apparently, during “plugging-in and unplugging” of the computer charging carts, the utilized receptacles “arc”, which leads to their continuous damage followed by their failure and replacement.

The on-going issue of unit ventilators’ motors failing was brought to our attention by Facilities. Each time a unit ventilator motor fails and needs replacement, the “original” wiring doesn’t match the “retrofitted” motor, and a new 240/120v step down transformer is required to be added inside of the unit ventilator’s enclosure.

Interior Lighting and Controls

The existing school lighting system consists mostly of fluorescent recessed, pendant and surface-mounted lensed luminaries. Fluorescent linear lighting fixtures were recently retrofitted with T8 lamps and matching ballasts, and a new LED lighting system was installed in the Gym. In general, the lighting system provides adequate illumination levels throughout, except for Cafeteria.

Occupancy sensors were recently installed in classrooms, corridors and in a few administration offices. Typical classroom is equipped with two rows of recessed lensed 3-lamp 2'x4' luminaries, controlled by two toggle switches in "by-row" manner.

Dedicated corridor lights are controlled by standard wall-mounted toggle switches, while the remaining corridor lights are controlled via new occupancy sensors and respective wall-mounted "occupancy sensor switches". The remaining school areas are controlled by local switches only.

It was brought to our attention by Facilities that the currently installed occupancy control system (manufactured by Lutron, battery-operated) consisting of ceiling-mounted and wall-mounted devices with associated occupancy sensor switches may not operate properly, especially in larger classroom areas. It is unclear if the issue relates to the "sensor motion coverage" ability or product quality itself.

Emergency Egress Lighting and Exist Signs

Existing emergency egress lighting system currently incorporates emergency battery units and remote light heads, and appears to be adequate.

Existing exit signs concept and layout does not comply with code: many exist signs are not self-illuminating (printed), and there are locations in the building where exit signs are missing.

Fire Alarm System

The current fire alarm system is a "retrofitted original" – it's a combination of "older" and "newer" fire alarm equipment and wiring. In general it appears to be adequate, although a few areas are lacking initiating and/or signaling devices. There are no signaling devices in classrooms. The FACP appears to be new, addressable, LCD type, manufactured by ADT. The retrofitted fire alarm system is connected to Fire department alarm loop via exterior wall-mounted Master box, and it is hard-wired.

Exterior Lighting and Controls

Exterior building-mounted lights are provided at egress doors and along the building perimeter. In general, they are in good operational condition, but not full cutoff distribution type. The lights are controlled via time clock located. There is no site lighting at the parking lot areas.

Major Electrical Concerns

1. Majority of power distribution panels are old/beyond their life expectancy, and some panels became obsolete. Power feeders associated with “old” panels are beyond their life expectancy (fig 1).

2. Existing exit signs concept and layout does not comply with code: many exist signs are not self-illuminating (printed), and there are locations in the building where exit signs are missing (fig 2).

3. Existing utility power service is 400Amp at 120/240 1 phase 3 wire system. It may have reached the maximum available capacity.

4. Quantities of receptacles in classrooms and similar educational spaces are inadequate. Majority of receptacles and associated wiring appear to be beyond their life expectancy.

5. Existing lighting control system does not comply with current energy code: although there are occupancy sensors in classrooms and a few offices, the rest of lights are controlled by switches only (no occupancy sensors). Also, there are no daylight sensors in the building.

FIG 1: OLD PANELS

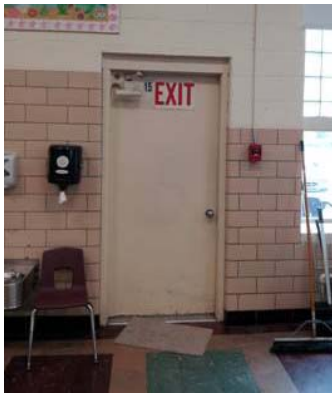


FIG 2: PRINTED EXIT SIGN

Communication Systems

The Deerfield School is connected to the High School via fiber optic cable. The High School serves as the data and telephone service hub for the school district. Verizon FIOS is the primary Internet Service Provider (ISP). Comcast is the secondary (ISP).

Data communications in the Deerfield School are distributed from a single location referred to as the server room which is adjacent to the kitchen. The equipment is installed on a shelf that is not protected, leaving the system vulnerable to damage or tampering. The room is not air conditioned, potentially reducing the useful life of the equipment.

All classrooms in the school have Wi-Fi access. Approximately 10% of the non-classroom spaces have limited Wi-Fi service. The current Wi-Fi coverage is adequate. Every classroom will be equipped with a projector over the course of the current school year.

The telephone switch for the school is capable of transmitting and receiving both digital and analog signals. This equipment is installed in a closet adjacent to the gym. The telephone system performs adequately.

The voice and data cable infrastructure is a combination of Category 5 and 5e rated cable. Category 5 cable is no longer a recognized standard in the industry as it does not have the capacity to transmit data at the current industry standard of 1-Gigabit per second.

Cable TV over Verizon FIOS is available to the School. However, the CATV services are not distributed to the classrooms at this time.

The paging system is comprised of speakers in every classroom. There are no speakers in the corridors or common areas (i.e. gym, cafeteria). The system is currently on a single All-Call zone with no capability of paging a single classroom or wing of the school. The facilities department has submitted a request for upgrades to the system.

The clocks are a combination of original wired devices and independent battery operated devices. Maintaining a common time standard throughout the building is not possible.

Security Systems

The Intrusion Detection System is comprised of door contacts at all exterior doors and Sonitrol sound detection devices distributed in the Corridors only. Rooms with windows to the exterior are not equipped with sound or motion detection devices leaving them vulnerable to intrusion. The detection system is armed and disarmed by use of a keypad. There is no card access system in the building.

The main entrance is locked during the day. Visitors press a button at the door which is equipped with an analog CCTV camera. The signals from the button and

CCTV camera are transmitted to the main office where an attendant can see who is at the door and remotely unlock the door once they establish that the visitor can enter the building. The facilities dept. plans to extend this capability to the principal's office. The school has been wired for three IP-CCTV cameras.

Summary

1. The single Tel/Data Server Room is not adequately secure. The network equipment sits on a shelf in the room and is not rack mounted. The room is not air conditioned, potentially reducing the useful life of the equipment.

2. The Category 5 cable infrastructure does not perform at standards that newer equipment demands.

3. The paging system currently serves classrooms only. Corridors and public areas do not receive announcements. Paging is limited to all-call only.

4. The clock system is a mix of older wired devices and battery powered devices meaning the clocks are not always synchronized.

5. CATV service is available at the school but not distributed throughout the building.

6. The school currently has intrusion detection devices in the corridors, leaving classrooms vulnerable to break-ins.

7. There is no card access system in the school. The main entrances is equipped with a CCTV camera, intercom and door release button controlled at the front desk. The school is wired for three CCTV camera locations.

2.2 DOWNEY ELEMENTARY SCHOOL

The following is a summary of the existing conditions at the Downey Elementary School. This report is based on our site visit on October 29, 2014.

SITE

Parking Lots/Access Drives

The total number of on-site parking spaces is 62, plus an additional 16 off-site parallel parking spaces in the Downey Street right-of-way in front of the school. Therefore, the total number of available parking spaces for the school is 78 (75 standard spaces, 3 accessible spaces).

The south parking lot and access drive is in overall fair condition. Bituminous pavement shows some wear and there are several areas of mild to moderate fatigue and block cracking. The striping is clearly visible. The lot contains 40 parking spaces (39 standard spaces and 1 accessible space). No perimeter curbing exists in the parking area, except at the accessible space. There is vertical granite curbing on both sides of the access drive leading to the parking lot and it is in overall good-fair condition (grout between most joints is missing or deteriorated). The area also serves as the dumpster loading/unloading and service area that contains a loading dock. The concrete at the loading dock is in fair condition due to some observed cracks and spalling at the surface.

The front bus loop/parking area (west of building) is in overall good-fair condition, except that the area from the angled parking area northward is in fair condition. The bituminous pavement shows minor wear and contains some edge cracking and isolated areas of fatigue cracking. In the northern portion, more fatigue cracking was observed. Striping is clearly visible. Vertical granite curbing lines both sides of this area and is in overall good-fair condition. The area contains 15 parallel parking spaces and 7 angled parking spaces (20 standard spaces and 2 accessible spaces). The loop is one-way, and signage prohibits car traffic from 2:30-3:30 PM.

The parallel parking area along Downey Street is in overall good condition. The bituminous pavement shows minimal wear and cracking. The striping is clearly visible. The lot contains 16 parking spaces. The adjacent vertical granite curbing is in good overall condition.

Walkways

The bituminous walkway along the perimeter of the front bus loop is in overall good condition, showing minor wear and cracking.

The concrete plaza at the front entrance and bituminous walkway that leads to the gymnasium doors are in overall good condition, showing minor wear.

The bituminous walkways around the north side of the building and the walkways leading to the playfields are in overall good condition, showing minor wear and cracking.

The bituminous walkways on either side of the access drive leading to the south parking lot area are in overall good-fair condition. The pavement shows some signs of wear and minimal cracking.

The bituminous walkways along Downey Street adjacent to the parallel parking area and the parent pick-up/drop-off lane are in good overall condition, showing minimal wear and cracking.

The gravel path from the front bus loop/parking area to the play fields is in poor condition. The gravel and stone are loose and eroded. One of the swing gates that controls access to the path is broken. The path is not considered accessible. The bituminous walkway along the east side of the building is in overall good condition, showing minor wear and cracking.

Circulation

Pick-up and drop-off operations were not observed. Buses utilize the designated one-way loop on the west side of the school.

Parent's drop-off and pick-up in the designated lane on Downey Street.

Accessibility

Parking

1. If the parking spaces on Downey Street are considered as designated for school parking, then four (4) accessible parking spaces are required for the 78 total parking spaces provided. If those spaces are not considered as part of the school parking, then three (3) accessible parking spaces are required for the 62 total parking spaces. Three accessible spaces are currently provided. Additional information is required to determine whether the three (3) accessible spaces provided are adequate for MAAB compliance.
2. Building Egress points – All exterior building egress points are accessible except for the boiler room door.

Walkways

1. Two curb cuts on either side of access drive to south parking area do not have detectable warning strips.
2. The curb cut at the front entrance to the school does not have a detectable warning strip.
3. The curb cut across from the two angle accessible spaces and the curb cut at the path to the playfields do not have detectable warning strips.
4. The curb cut at the north end of the front bus loop does not have a detectable warning strip.

5. Some of the play structures in the wood fiber play area are not MAAB compliant due to a lack of accessible paths to them (see Play Areas section below).

Utilities

1. Drainage
    a. Erosion of the steep embankment was observed between the southwest corner of the soccer field and northern end of the front bus loop/parking area.
    b. Erosion of gravel path from front bus loop/parking area to the play field was observed.
    c. Wet areas (some standing water) observed along the east face of the building. This may be due to the adjacent grass slope pitching towards the building, as well as the runoff from the steep upland slope percolating into the ground and then building up when it reaches the building foundation wall.
    d. The catch basin south of play fields does not appear to be capturing much runoff due to grading and erosion around the rim.
    e. All roof runoff appears to be captured in downspouts that tie into the drainage system.
2. Sewer – School is connected to Town Sewer. No known issues or concerns with sewer distribution.
3. Water – No known issues or concerns with water distribution system.
4. Fire Protection – Two hydrants observed within 300' of the school, one is northwest of the building on Downey Street and one is southeast of the building adjacent to the parking lot. Over 90% of the building is within 300' of either hydrant, and therefore hydrant coverage appears to be adequate. A fire department connection was observed on the south face of the building.
5. Electric/Telecommunications – No known site electrical or telecommunication issues. A transformer was observed southeast of the building. There is curbing protecting the transformer, but no bollards.
6. Gas – Natural gas service is available at the school. The gas meter is located on the west side of the building.
7. Lighting – Site lighting consists of pole mounted lights, bollard lights, and building mounted fixtures. Some deterioration of concrete light pole bases observed.

Play Areas

The main bituminous play area north of the building is in overall fair condition. The bituminous pavement shows some wear and areas of block and transverse cracking. Some pavement markings are faded. Groundcover in adjacent landscape areas is in overall poor condition and appears eroded.

The basketball court is in overall fair-poor condition, with the pavement containing two areas of significant longitudinal and transverse cracking. The remaining areas contain minimal cracking. Color treatment is quite faded, but striping is still clearly visible. Basketball hoop structures appear to be in good condition.

The engineered wood fiber play areas north and northwest of the building, consist of several play structures. There is a bituminous path that provides access to each of the wood fiber areas, but there are no accessible paths provided to any of the actual structures. Therefore, the areas are not MAAB compliant. Structures appear to be in overall good condition, except some steps and "bridge" crossings are showing rust. Areas are bound by concrete curbing.

The grass playfields and associated structures appear to be in overall good condition. There are two paved paths that lead to the playfields, but no path is provided to either team bench area and therefore lacks full MAAB compliance.

The bituminous tennis courts are in overall good-fair condition. The pavement contains some minor fatigue cracking and surface shows some wear. Nets and perimeter fencing appear to be in overall good condition.

FATIGUE AND BLOCK CRACKING IN SOUTH PARKING LOT

LACK OF ACCESSIBLE PATHS TO PLAY STRUCTURES

EROSION OF STEEP SLOPE ADJACENT TO PLAYFIELDS

ERODED GRAVEL ACCESS PATH TO GRASS PLAYFIELDS; LACK OF DETECTABLE WARNING PANELS

STANDING WATER ALONG BACK (WEST) SIDE OF BUILDING

ARCHITECTURE

SMMA visited the site on the afternoon of October 23, 2014. The weather was cool and raining. The school facility consists of a one level school load bearing masonry building constructed in 1957 and renovated in 2000. The building area is approximately 50,692 GSF and has 298 students in grades K-5. The building faces east towards Downey Street. There is a separate bus lane in front of the school, and visitor parking is also in the drop-off lane. Staff and teacher parking is on the south side of the building, the service drive and kitchen staff parking is on the south side and the service area is visible from the front of the building. The main entry is at grade level and entries around the building are also at grade level. The main entry is protected by a large canopy and other entries are typically recessed. The playing fields are to the north of the school and there is a paved play area to the north of the building.

Enclosure

The 1957 school building was renovated in 2000 and this work included an addition to the west. The gabled sloped roof over the classroom parts of the building is black rubber with a gravel cover. There is a high gabled sloped rubber roof over the cafeteria and gymnasium. The downspouts and leaders drain to site storm system. There is a low sloped roof over the corridor at the gymnasium and cafeteria. This roof recently failed and was replaced. The building walls are load bearing masonry construction with brick and cast stone veneer. Typical construction of the new part of the building includes rigid wall insulation. The brick veneer is in good condition. Window openings are single hung aluminum frames with insulated glass. The town is repairing the counter balances throughout the facility.

Interior

The interior partitions are painted gypsum board with ceramic tile wainscot in the corridors and are generally in good condition. The kitchen, restrooms, and stairwells have ceramic tile wall cover. Classrooms are painted masonry or gypsum board at the exterior walls and painted gypsum board interior partitions. Floor covering is typically vinyl composition tile in the corridors and classrooms. Some floor tile has “bubbled up”. There are ceramic tile mosaics floors in the restrooms. The entry floor is stone. There is carpet in the media center and offices. The kitchen has a quarry tile floor and ceramic tile cove base. Door frames are typically hollow metal. The interior wood doors are in good condition. The hardware is also in good condition. Ceilings are acoustic ceiling tiles with recessed light fixtures. Classroom casework is in poor condition due to drying out because of problems with the mechanical system controls. The toilet partitions have been replaced and subject to rough use. Some work is required to maintain alignment, repair hinges, and braces are needed.

Circulation

This is a single story school with ramps. There is a wheel chair lift to the stage. Some exterior doors stick due to building settlement.

Accessibility

All building entries are accessible and there is an accessible route from parking, bus drop-off, and playing fields. Door hardware uses lever handles throughout the facility. There is a wheelchair lift at the stage. No other accessibility related issues were noted.

Security

Aluminum operable windows have locking hardware. Exterior doors have exit devices (panic hardware) and are locked to prevent unauthorized entry. The main entry doors have an intercom with remote release. The school has a corridor located motion detection intrusion alarm and 3 cameras. The Office /Reception area has visual control of the entry and the entry vestibule. Classroom door hardware does not have classroom side lock-down.

DRY ENVIRONMENT CONDITIONS CAUSE FLOOR AND CABINET PROBLEMS

STRUCTURAL

Purpose

The purpose of this report is to broadly describe the existing structure, comment on the structural integrity of the building and comment on the structural code issues related to any future renovations and expansions.

Basis of the Report

This report is based on visual observations during our site visit on October 13, 2014 and the structural design drawings for the 2000 addition. The design drawings relating to the original portion of the building were not available for review. During our site visit, the only finishes that were removed were a few ceiling tiles to verify the structural framing system; therefore, our understanding of the original portion of the structure is limited and may have to be further refined as the design of any renovation evolves.

Building Description

The original portion of the building was constructed in 1957 and a major addition/renovation was completed in 2000. The foundations of both the original building and the addition consist of cast-in-place concrete walls and footings, with the original portion including a basement boiler room. The existing building is framed with open web steel joists that support metal roof decking. Additional framing is comprised of wide flange steel beams and girders, supported by structural steel columns. The 2000 addition uses similar structural steel elements to frame the single story structure.

Lateral Force Resisting System

The 2000 addition included diagonal steel braced frames to resist the lateral wind and seismic forces. The addition is structurally independent from the existing building, as an expansion joint exists where the two portions of the building meet. There appears to be no deliberately designed lateral force resisting system as part of the original structural design, as it was constructed prior to 1973 when it became a requirement of the building code. The lateral loads for this portion of the building (wind loads, potential seismic forces) are resisted by the exterior and interior masonry walls.

Existing Conditions

There building appears to be in sound structural condition with no substantial defects.

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations or additions are made to the structure, a check for compliance with the Massachusetts State Building Code (780 CMR, Chapter 34 “Existing Structures”) is required. The intent of 780 CMR, Chapter 34 is to permit

repairs, alterations, additions and/or a change of use without requiring full compliance with the code for new construction. However, depending on the scope of any proposed renovations, a comprehensive structural analysis may need to be performed to determine the impact on the existing structural system. Due to the fact that the lateral force resisting system of the original portion of the building is, by default, the interior and exterior masonry walls, any modifications to them will need to be thoroughly reviewed to determine if seismic upgrades to the lateral system are required as a result of proposed building alterations. If any future additions are planned for this building, they should be seismically isolated from the existing structure.

Summary

The existing structure appears to be in sound condition and is performing satisfactorily. A thorough investigation of the existing structure is required if, by nature of the proposed renovations:

1) The capacity of the lateral force resisting system is decrease (i.e. reduce the amount of, or configuration of the existing masonry walls;

2) There is an increase the seismic loads on the building (i.e. additional building mass in or on top of the structure, such as mechanical roof top units);

3) There is an increase the effects of the wind loads on the building (i.e. additional roof top mechanical units/roof screens or other projections collecting wind and transferring additional lateral forces to the existing masonry walls).

PLUMBING SYSTEMS

Plumbing Fixtures

The majority of the existing plumbing fixtures in place within the building are original. Some have been replaced with newer battery sensor type flush valves and lavatory faucets (Refer plumbing pic 1).

Water closets are floor mounted, vitreous china units with a mix of manual and battery sensor operated flush valves. Stall type urinals are no longer allowed and not compliant.

Some flush valves have been retrofitted with new Rubbermaid Retrofit Kits (battery sensor type flush valves), (Refer plumbing pic 1).

The Nurse's room water closet is a floor mounted, vitreous china.

Urinals in the toilet core rest rooms are vitreous china, wall hung units with manual operated flush valves. The flush valves are exposed in the room.

Lavatories are wall hung, vitreous china with hot and cold faucets that are either metering or manually operated. Some existing lavatories have been retrofitted with self-metering manual push down Chicago faucets (Refer plumbing pic 2).

The kitchen hand-washing sink is a stainless steel, wall hung unit with a hot and cold gooseneck spout faucet with wrist blade handles. Kitchen scullery sinks are floor standing, stainless steel with coved inside corners. Kitchen food prep sinks with or without food disposer requires an indirect waste (not hard connected) to assure no cross contamination with sanitary sewer and food upon any waste back up (Refer plumbing pic 3).

Classroom sinks are stainless steel, self-rimming single compartment basins with a swing spout faucet with separate hot and cold handles. Several of the existing classrooms have self-rimming stainless steel sink with standard manual type faucets. These require reducing and limiting the hot water to a maximum of 110 degrees F hot water to dispense at the faucets. Kindergarten class room sinks are not receiving hot water at a timely manner or temperature at their faucets.

Mop basins are floor type, molded stone units with hot and cold faucet with hot and cold handles and elevated vacuum breaker. Custodian's closet mop service basin faucet does not have any integral vacuum breakers (Refer plumbing pic 4).

Drinking fountains are a mix of stainless steel and vitreous china, non-recessed.

Non-electric water coolers are single level units with push button activation. Several existing water drinking fountains (non-chilled) on each floor do not include alcove-recessed with high-low handicapped accessible configurations. Exterior hose bibs are frost proof type (Refer plumbing pic 5).

There is no emergency eyewash / shower station located in mechanical room or nurse's room. The existing original core restrooms are outdated as far back as the original school building was constructed in 1957 and do not meet MAAB requirements.

Roof Storm Drainage

External roof drain systems are presently discharging into site storm boot systems.

Sanitary

The majority of the existing building sanitary waste system, which drains by gravity, is in poor condition. The sanitary effluent discharges below grade to the site sewer drain distribution system.

Existing underground (buried) piping could be not be observed, however the entire underground (buried) sanitary sewer should be tested for any leakage, backup and pipe aging condition by executing static pressure tests and video camera inspections.

A dedicated grease waste line is not in place for the school building. Currently point of use internal floor recessed grease trap is collecting the grease laden effluent from the 3 pot sink.

The above ground sanitary drainage and vent for the school building is currently using cast iron hub and spigot joints (3" or larger). Piping smaller than 3 inch is piped using DWV copper pipe.

Domestic Cold Water Service

Insulation at most piping is of adequate thickness and in fair condition. Some insulation has been removed at locations where repairs have occurred. Some of this insulation was not replaced.

Piping is not adequately labeled throughout the building. Vacuum breakers are present at the majority of fixtures as required by code. Original 1957 construction gate valves are in fair condition. Ball valves installed during the 2000 remodeling are in good condition.

Valve tags are not present throughout the building. Piping is adequately supported where observed either by hangers or floor supports. Hard water deposits were noted at multiple fixtures throughout the facility with the heaviest of the deposits being at the backflow preventers.

The hard water deposits could be causing deterioration of the piping wall thickness throughout the facility.

The existing main domestic water supply enters the basement boiler room complete with one water meter assembly located above just within the tunnel opening from the boiler room. No backflow preventer present for the domestic potable water distribution side. No protected lawn and garden irrigation system or systems installed for site.

Existing boiler cold water make-up is currently being fed from reduced pressure-principle backflow preventers for HVAC equipment.

The domestic cold water piping distribution within the building supplying the original systems is distributed with "L" type copper tube with wrought or cast copper fittings. The majority of the piping is insulated to prevent condensation on piping and prevent deterioration of the pipe, to extend its life expectancy.

Domestic Hot Water Service

One gas fired storage water heater was installed in 2004, which is supplying the kitchen area fixtures and the remainder of the building.

This unit is an A.O. Smith model no. BTR-120-118 with 71 gallon storage. This water heater is missing a thermostatic hi/lo mixing valve station. Storage temperature is required to be a minimum of 140 degrees F. Temperature gauges not present to confirm. Cafeteria employee hand wash sinks would require tempering down to 110 degrees F. and all other kitchen plumbing fixtures / equipment to have a 140 degree F hot water system.

The existing domestic hot water distribution system to the school building does have a hot water circulation system to the plumbing fixtures.

No dead legs were observed with more than 12" in length.

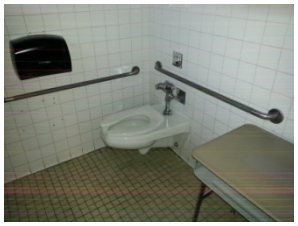
The existing domestic hot water is distributed in "L" type copper tube with wrought or cast copper fittings. The majority of the existing hot water (HW) piping is not insulated.

Natural Gas

A gas service location is present; this service enters the existing basement boiler room and feeds the gas fired boilers and water heater. It appears to be regulated down to low pressure (11" WC). The exterior pressure regulator and gas meter are mounted on the exterior of the building and supported by a concrete house pad. The gas meter and primary pressure regulator are owned by the gas utility company.

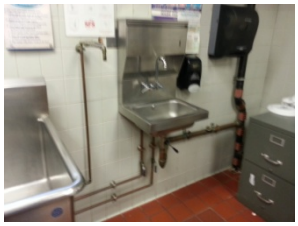
The basement boiler room gas supply currently feeds the gas fired domestic water heater and the gas fired heating boilers. Food service equipment within the kitchen area is currently all electric operating.

The existing gas piping appears to be distributed in ASTM A53 schedule 40 black steel pipe.

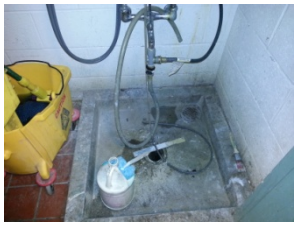


PLMBG. PIC 1

PLMBG. PIC 2



PLMBG. PIC 3



PLMBG. PIC 4

PLMBG. PIC 5

FIRE SPRINKLER SYSTEMS

Sprinklers

The school building is currently being served from an 8" fire service line from the street water main. Cross connection control is provided by use of a 4" AMES 1000SS Silver-bullet double check valve assembly backflow preventer on the fire

service as it enters the building located in the sprinkler room (Refer to fire protection pic 2).

The entire school building appears to be fully protected throughout with a dry automatic fire suppression system.

A dry system has been observed with a dry alarm check valve riser located within the sprinkler room, providing coverage throughout the entire school (Refer to fire protection pic 1).

A fire department connection was observed on the school building next to the entrance to the dedicated sprinkler room exterior door. This system appears to have been designed in accordance with NFPA Standard 13, the Massachusetts State Building Code and the Westwood Fire Department requirements.

Sprinklers are supplied from a one zone control valve riser, consisting of a monitored shut-off valve and flow switch. Inspector's tests are provided at remote locations. The sprinkler zone control valves will report sprinkler flow to the fire alarm system on an entire building zone basis (below 52,000 sq. ft. requirement per zone).

Fire Protection System

Fire protection dry system piping was installed with schedule 40 (non-galvanized) piping with threaded fittings for piping sizes 2" and less and for sizes 2½" and larger, schedule 10 piping with roll grooved fittings and couplings are used.

All valves controlling the flow of water are equipped with supervisory devices that report to the Fire Alarm system.

Existing kitchen hood is not currently protected with a dry agent "Ansul R-102" packaged hood suppression type system.

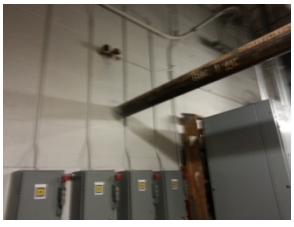
Dry system alarm check valve riser flow test information was not obtained from the test tag conducted by TYCO Sprinkler Grinnell dated Unk.:

- Static Pressure: Unk. psi
- Residual Pressure: Unk. psi
- Flow: Unk. GPM

The school building was observed not having a fire pump present, nor is it being suggested one is required.

FIRE PROT. PIC 1

FIRE PROT. PIC 2



FIRE PROT. PIC 3

MECHANICAL

HVAC System

In 1999, the Downey School was extensively renovated with an addition and at that time, the entire HVAC system was upgraded. Three A.O. Smith Legend boilers were installed in an N+1 arrangement, so, even on the coldest days, two boilers are intended to provide sufficient heat to maintain space comfort. The third boiler would be a standby in the event one of the others is off line for any reason. Boiler #2 was subsequently replaced in 2012 with a pair of stacked HTP boilers.

Each boiler has its own circulating pump which would only run when the boiler is active and a pair of constant volume secondary pumps circulates the water to the building. The UVs are located under a window and are surrounded by continuous book shelves that appear to have been field constructed. The classrooms each have a Trane unit ventilator and there is an exhaust grille located near the door. These are ducted into the corridor and to a central fan.

The DDC system in this school has not been maintained, the computer where the head end resided has disappeared with the critical software and local controllers have often been disabled. The control valves and outside air dampers are frozen in an open position and the teachers regulate temperature by turning the UV fan on and off. In a few rooms, there does not appear to be sufficient flow to maintain temperature in colder conditions.

The Cafetorium has and H&V unit with exposed spiral duct along the exterior wall. Return grilles on the interior wall are then ducted back to the unit.

There are several smaller rooms toward the front of the building that are no longer used for the purpose they were designed for and the ventilation is inadequate. In particular, there is a 7ft. x 8 ft. room still labeled as “storage” that is used for special education tutoring which has no ventilation at all.

ELECTRICAL SYSTEMS

A site visit was made on October 13, 2014 to review the existing electrical systems.

Electric Service

Existing electric service was recently upgraded. It is currently in good and operational condition.

Power Distribution Equipment

The utility transformer secondary feeder runs underground towards the school building and terminates in the Main Switchboard (MSB) located in existing boiler room. The switchboard is manufactured by Square D. It is rated at 120/208v 3 phase 4 wire system and equipped with an 800 Amp Main Circuit breaker (MCB). The

switchboard appears to be in good and operational condition. The power service from the MSB is distributed to all sub-panels located throughout the school building.

The existing electric service capacity shall be adequate for current and future school program upgrades, based on existing service size and voltage configuration.

The majority of the sub-panels appear to be in good and operational condition, except for a two-section panel PK-1 located in the kitchen area.

All receptacles appear to be new and in good condition. A few receptacles in kitchen area were noticed to be non-GFCI which is not in compliance with the current electrical code (MEC).

Interior Lighting and Controls

The existing school lighting system consists mostly of fluorescent recessed-, pendant- and surface-mounted luminaries. All building lights appear to be new, in good and operational condition. Fluorescent linear lights are equipped with T8 lamps. Downlights are equipped with compact fluorescent lamps.

The typical classroom is equipped with three rows of recessed parabolic 3-lamp fluorescent 2'x4' luminaries controlled by two toggle switches. The 2'x4' 3-lamp fixtures are double-switched. There are no occupancy sensors.

All corridor lights are controlled by wall-mounted key-operated switches. There are no occupancy sensors.

The remaining school areas are controlled by local switches only.

Emergency Egress Lighting and Exist Signs

Existing emergency egress lighting system currently incorporates emergency battery units and remote light heads, and appears to be adequate.

Existing exit signs are LED type.

Fire Alarm System

Existing fire alarm system is manufactured by Cerbrus Pyrotronics. It appears to be new, except for the "older" Master box. In general, the quantity of initiating and signaling devices appears to be adequate, and they are in good and operational condition. The existing fire alarm system is connected to Town alarm loop via exterior wall-mounted Master box, and it is hard-wired.

Exterior Lighting and Controls

Exterior building-mounted lights are provided at all egress doors and along the building perimeter. Roadways and parking lots are illuminated by bollards and pole-mounted lights, equipped with metal halide lamps. All exterior lights are controlled by one common time clock located adjacent to panel L3 in the boiler room.

Major Electrical Concerns

1. Kitchen panel is old/beyond its life expectancy. Power feeder associated with this panel is beyond its life expectancy (fig 1).
2. Kitchen receptacles are non-GFCI type and have no GFCI protections (circuit breakers), which is not in compliance with the current electrical code (MEC), (fig 2).
3. Existing lighting control system does not comply with the current energy code: there are no occupancy sensors, no daylight sensors, and no programmable lighting control system for interior lights.

FIG 1: OLD PANELS

FIG 2: KITCHEN RECEPTACLES

Communication Systems

The Downey School is connected to the High School via fiber optic cable. The High School serves as the data and telephone service hub for the School District. Verizon FIOS is the primary Internet Service Provider (ISP). Comcast is the secondary (ISP).

The Downey School is equipped with a Communications Service Entrance Room located adjacent to the boiler room on the east side of the building and a data closet located on the west side of the building. The two rooms are connected via fiber optic cable. The network equipment is rack mounted in secured, air conditioned rooms.

All classrooms in the School have Wi-Fi access. Approximately 10% of the non-classroom spaces have limited Wi-Fi service. The current Wi-Fi coverage is adequate. Every classroom will be equipped with a projector over the course of the current school year.

The telephone switch for the school is capable of transmitting and receiving both digital and analog signals and it performs adequately.

The voice and data cable infrastructure is a combination of Category 5 and 5e rated cable. Category 5 cable is no longer a recognized standard in the industry as it does not have the capacity to transmit data at the current industry standard of 1-Gigabit per second.

Cable TV over Verizon FIOS is available to the school; however, the CATV services are not distributed to the classrooms at this time.

The paging system is comprised of two-way speakers in every classroom as well as one-way speakers in the corridors and common areas (i.e. gym, cafeteria) and exterior speakers to broadcast announcements to the play grounds. The system is relatively new (13-years in service) and performs well.

The clocks are operated from a central master control system and appear to be in good working condition.

Security Systems

The Intrusion Detection System is comprised of door contacts at all exterior doors and Sonitrol sound detection devices distributed throughout. The detection system is armed and disarmed by use of a keypad. There is no card access system in the building.

The main entrance is locked during the day. Visitors press a button at the door to activate a two-way intercom and one-way video transmission to the attendant's desk in the main office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the school.

The school has been wired for three IP-CCTV cameras.

Summary

2. The Category 5 station cabling and fiber optic backbone cable between the two data rooms do not perform at standards that newer equipment demands.

2. CATV service is available at the school but not distributed throughout the building.

3. There is no card access system in the school.

4. The main entrance is equipped with a two-way intercom and one-way video transmission to the attendant's desk in the Main Office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the School.

5. The school is wired for three CCTV camera locations.

2.3 HANLON ELEMENTARY SCHOOL

The following is a summary of the existing conditions at the Hanlon Elementary School. This report is based on our site visit on October 29, 2014.

SITE

Parking Lots/Access Drives

Total number of parking spaces is 59 (56 standard spaces, 3 accessible spaces).

The South Parking Lot is in overall good condition. Bituminous pavement shows minimal wear and cracking, and striping is clearly visible. The adjacent vertical granite curbing along west side is in good condition. The lot contains 41 standard parking spaces.

The North Parking Lot is in overall fair-poor condition. The bituminous pavement against the building (to approximately 15' out) appears relatively new and is in good condition. The remaining bituminous area shows significant wear, and contains extensive fatigue cracking. Some isolated heaving was also observed. A 3'-4' strip along the northern edge of the parking consists of gravel, and it appears that area is necessary to allow for two rows of parking to fit with sufficient aisle width. The northern row of parking is not striped. No perimeter curbing exists, and there is no separation or wheel stop for the southern row against the building. The lot contains 13 striped spaces, though the area can accommodate approximately 32 vehicles. One accessible spaces is provided, however, the slope exceeds MAAB requirements. Striping is clearly visible. An extension of this parking lot is the loading/service area, where a single dumpster was observed, as well as a metal storage container. Two vehicles were observed parking in this area as well, though no striping exists.

The Front bus loop/parking areas is in good overall condition. This area was paved within the last year and shows no signs of wear. The area contains 5 parallel parking spaces (3 standard spaces and 2 accessible spaces). This loop is one-way, and signage prohibits vehicular traffic from 8:15-9:00 AM and 2:45-3:30 PM. The area lacks sufficient separation from the front building entrance as there is no curbing or bollards.

Walkways

Bituminous walkway adjacent to South Parking Lot is in overall good condition, showing only minor wear and very few cracks.

The bituminous walkway around the south and southeast portions of the building is in good overall condition. The pavement seems relatively new, however there are areas of small spread cracking that appear to have occurred during installation. The cracks have not lead to pavement deterioration.

The bituminous walkway along west side of Gay Street is in overall good condition, showing only minor wear and very few cracks.

The bituminous walkway along the north and south side of the school's west wing are in overall good condition, showing minor wear and containing few transverse cracks.

Circulation

Pick-up and drop-off operations were not observed. Buses utilize the designated one-way loop on the east side of the school. It appears that parents pick-up and drop off along the southern parking area off of Gay Street.

Accessibility

1. Parking - The number of accessible parking spaces meets MAAB requirements, however, one of the spaces exceeds MAAB slope requirements and is therefore non-compliant.

2. Building Egress Points

    a. Four building egress points on the north side of the building are not accessible due to steps and lack of edge protection.

    b. One door on the southeast side of the building is not accessible due to steps and lack of edge protection.

    c. Five building egress points on southwest side of building are not accessible due to steps and lack of edge protection.

    d. The north and south egress points to the modular building utilize wooden ramps. The north ramp is in fair condition due to a loose rail and soft footing in some places. The south ramp is also in fair condition due to a loose handrail.

3. Walkways

    a. The sidewalk curb cuts at both the entrance drive and exit drive off of Gay Street lack detectable warning panels.

    b. The sidewalk curb cut for the crosswalk across Gay Street (near the southwest corner of the building) lacks a detectable warning panel.

    c. The bituminous walkway in front of the main building entrance lacks a detectable warning panel prior to entering the driveway/bus loop.

4. Play Areas – The wood fiber play areas are not MAAB compliant due to lack of paved paths to areas, and lack of accessible paths to various structures (refer to play areas section below).

Utilities

1. Drainage – Runoff from a majority of the North Parking Lot and front bus loop appears to flow off-site untreated. No known issues or concerns with flooding.

2. Sewer – School is connected to Town Sewer. No known issues or concerns with sewer distribution.
3. Water- No known issues or concerns with water distribution system.
4. Fire Protection – One hydrants was observed on the east side of Gay Street, approximately 125' away from the east side of the school. Overall coverage for the building does not appear adequate, as several portions of the building are greater than 300' feet away from the hydrant. Fire department connection observed on the north side of the building.
5. Electric/Telecommunications – No known site electrical or telecommunication issues.
6. Gas – Natural gas service is available at the school. The gas meter is located on the north side of the building.
7. Lighting – Site lighting consists of building mounted fixtures.

Play Areas

The main bituminous play area (southwest of building) is in overall good condition. Pavement shows minimal wear and cracking.

The basketball court is in overall good condition, with the pavement showing minimal wear and no observed cracking. Stain and striping is still visible, but slightly faded. Basketball hoop structures appear to be sound.

There are two playground areas, each consisting of play structures installed on an engineered wood fiber surface. The first, containing a climbing dome, is bounded by wood logs. The second, containing a large multi-structure and a swing set, is bounded by plastic logs. No bituminous walkways are provided to either play area, and there are no accessible paths to the actual structures. Therefore, the playground is not considered MAAB compliant.

The grass playfields and associated structures appear to be in overall good-fair condition. No accessible path is provided to team benches or spectator bleachers, and therefore, the area is not MAAB compliant.

FATIGUE CRACKING AND HEAVING/SETTLEMENT IN NORTH PARKING LOT

GRAVEL EXTENSION OF PARKING AREA WITH NO CURBING

LACK OF DETECTABLE WARNING PANEL AT CURB CUT ONTO GAY STREET

LACK OF ACCESSIBLE PATH TO SOME PLAY AREAS AND STRUCTURES

NON-ACCESSIBLE BUILDING EGRESS ON SOUTH SIDE OF BUILDING

ARCHITECTURE

SMMA visited the site on the late afternoon of October 20, 2014. The weather was mild and cloudy. The school facility consists of a single level load bearing masonry school building with a low sloped roof constructed in 1951 and renovated in 2003. Four modular classrooms were added to the west end of the school ten years ago. The building area is approximately 34,280 GSF and has 226 students in grades K-5. The building faces south to Gay Street. The bus loop is on the east side of the school, and visitor parking is around the drive. Staff and teacher parking is on the north side of the site, the service drive and kitchen staff parking is also on the north side. The main entry is at grade level, other entries are grade level, and the modular classrooms have a wood ramp. The paved play area is located to the south of the building. Entries are recessed and the main entry is protected by a large canopy. The service area is in the parking lot on the north side of the building and is partially visible from the front of the building.

Enclosure

The school is a T-shaped single story building. The roofs are low sloped black rubber with gravel cover and the roof over the cafeteria is raised approximately 5'. The low slope roofs drain internally. The black rubber roof membrane is in bad condition and is currently being repaired. The building walls are load bearing masonry construction with brick exterior. There are some large cracks visible on the interior of the building. There are glass blocks with inset steel framed windows in the cafeteria gymnasium. Window openings are single glazed steel frames with awning type vents. The entry is aluminum doors and frames in a wood framed opening with fixed glass. There are utility tunnels under the building. The wood roof structure in the classroom part is a few inches above the acoustic ceiling. There are exposed steel beams in the cafeteria/gym.

Interior

The interior partitions are typically painted masonry. Flooring is vinyl composition tile in the corridors and classrooms and ceramic tile mosaics or sheet vinyl in the restrooms. Ceilings are suspended acoustical tile with surface mounted light fixtures. There is carpet in the media center and offices. The kitchen has sheet vinyl and vinyl composition tile floors, rubber cove base, and painted CMU walls. Door frames are typically hollow metal. The interior wood doors are new. The hardware is also in poor condition. Classroom casework is in poor condition. There are no privacy screens between urinals.

Circulation

Building is single floor with double loaded corridor and double doors at the ends of the corridors. Some classrooms have direct outdoor access. Corridor smoke doors are on magnetic hold open devices.

Accessibility

There are no power door operators located at the accessible entry on the accessible route to the building. Door hardware varies in building knobs and lever handles throughout the facility. There is a wheelchair lift at the stage. In general, there is compliance with earlier codes, however, since the previous renovation was completed the codes have changed and full code compliance will be required if new renovations are done. Other non-compliant items are:

- Wood ramp at modular classroom needs non-slip surface.
- Classroom sinks with bubblers are not compliant.
- Not all toilets are code compliant.
- Missing signage.
- Projections and equipment parked in walkway space.

Security

Steel framed windows and exterior classroom doors can be locked. The school has a corridor located motion detection intrusion alarm. Exterior doors have exit devices (panic hardware) and are locked to prevent unauthorized entry. The entry doors have an intercom with remote release. The Office /Reception area has visual control of the entry and the entry vestibule. Classroom door hardware does not have classroom side lock-down feature.

BRICK AND GLASS BLOCK REPOINTING REQUIRED

SINGLE GLAZED WINDOWS AND RUSTING STEEL FRAMES

STRUCTURAL

Purpose

The purpose of this report is to broadly describe the existing structure, comment on the structural integrity of the building and comment on the structural code issues related to any future renovations and expansions.

Basis of the Report

This report is based on visual observations during our site visit on October 13, 2014. As of this writing, there are no drawings or documents relating to the original structure available for review. There are limited layout plans of the general architectural configuration.

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

Building Description

The school, constructed in 1951, has a single story structure housing classrooms, administrative offices, cafeteria and gymnasium/auditorium. The foundations are cast-in-place concrete foundation walls with a concrete slab-on-grade and a structured concrete slab above the basement crawl spaces and boiler room. The roofs of classrooms and corridors are framed with wood decking supported by wood joists that bear on masonry walls. On the perimeter of the school above the classroom windows, the wood joists are supported by steel beams which, in turn, are supported by steel columns.

Lateral Force Resisting System

There is no deliberately designed lateral force resisting system as part of the original structural design. Currently, lateral loads (wind loads, potential seismic forces) are resisted by the exterior and interior masonry walls. This is fairly typical of school structures built in this time period, as deliberate lateral force resisting systems (i.e. shear walls, brace frames, moment frames) were not addressed by the building code until 1973.

Existing Conditions

There building appears to be in sound structural condition with no substantial structural defects. There is significant cracking in the existing brick walls in the art room (formerly a stage for the auditorium) at the location where a steel roof beam bears on the wall.

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations or additions are made to the structure, a check for compliance with the Massachusetts State Building Code (780 CMR, Chapter 34

"Existing Structures") is required. The intent of 780 CMR, Chapter 34 is to permit repairs, alterations, additions and/or a change of use without requiring full compliance with the code for new construction. However, depending on the scope of any proposed renovations, a comprehensive structural analysis may need to be performed to determine the impact on the existing structural system. Due to the fact that the lateral force resisting system of the structure is, by default, the interior and exterior masonry walls, any modifications to them will need to be thoroughly reviewed to determine if seismic upgrades to the lateral system are required as a result of proposed building alterations. If any future additions are planned for this building, they should be seismically isolated from the existing structure.

Summary

The existing structure appears to be in sound condition and is performing satisfactorily. A thorough investigation of the existing structure is required if, by nature of the proposed renovations:

1) The capacity of the lateral force resisting system is decrease (i.e. reduce the amount of, or configuration of the existing masonry walls;

2) There is an increase the seismic loads on the building (i.e. additional building mass in or on top of the structure, such as mechanical roof top units);

3) There is an increase the effects of the wind loads on the building (i.e. additional roof top mechanical units/roof screens or other projections collecting wind and transferring additional lateral forces to the existing masonry walls).

THE ORIGINAL LOAD BEARING BRICK WALLS IN THE ART ROOM (FORMERLY AND AUDITORIUM STAGE), ARE CRACKED BELOW WHERE A STEEL ROOF GIRDER BEARS ON THEM AT EACH END.

PLUMBING SYSTEMS

Plumbing Fixtures

The majority of the existing plumbing fixtures in place within the building are original. Some have been replaced with newer battery sensor type flush valves and lavatory faucets (Refer plumbing pic 1).

Water closets are floor mounted, vitreous china units with a mix of manual and battery sensor operated flush valves. Stall type urinals are no longer allowed and not compliant.

Some flush valves have been retrofitted with new Rubbermaid Retrofit Kits (battery sensor type flush valves), (Refer plumbing pic 1).

The Nurse's room sink is a wall mounted, vitreous china without any eyewash station (Refer plumbing pic 6).

Urinals in the toilet core rest rooms are vitreous china, wall hung units with manual operated flush valves. The flush valves are exposed in the room.

Lavatories are wall hung, vitreous china with hot and cold faucets that are either metering or manually operated. Some existing lavatories have been retrofitted with self-metering manual push down Chicago faucets (Refer plumbing pic 2).

The kitchen hand-washing sink is a stainless steel, wall hung unit with a hot and cold gooseneck spout faucet with wrist blade handles. Kitchen scullery sinks are floor standing, stainless steel with coved inside corners. Kitchen food prep sinks with or without food disposer requires an indirect waste (not hard connected) to assure no cross contamination with sanitary sewer and food upon any waste back up (Refer plumbing pic 3).

Classroom sinks are stainless steel, self-rimming single compartment basins with a swing spout faucet with separate hot and cold handles. Several of the existing classrooms have self-rimming stainless steel sink with standard manual type faucets. These require reducing and limiting the hot water to a maximum of 110 degrees F hot water to dispense at the faucets. Kindergarten class room sinks are not receiving hot water at a timely manner or temperature at their faucets.

Mop basins are above floor type, stainless steel units with hot and cold faucet with hot and cold handles and elevated vacuum breaker. Custodian's closet mop service basin faucet does not have any integral vacuum breakers (Refer plumbing pic 4).

Drinking fountains are a mix of stainless steel and vitreous china, non-recessed.

Non-electric water coolers are single level units with push button activation. Several existing water drinking fountains (non-chilled) on each floor do not include alcove-recessed with high-low handicapped accessible configurations
(Refer plumbing pic 5).

Exterior hose bibs are frost proof type. There is no emergency eyewash/shower station located in mechanical room or nurse's room. The existing original core restrooms are outdated as far back as the original school building was constructed in 1957 and do not meet MAAB requirements.

Roof Storm Drainage

External roof drain systems are presently discharging into site storm boot systems.

Sanitary

The majority of the existing building sanitary waste system, which drains by gravity, is in good condition. The sanitary effluent discharges below grade to the site sewer drain distribution system.

Existing underground (buried) piping could be not be observed, however the entire underground (buried) sanitary sewer should be tested for any leakage, backup and pipe aging condition by executing static pressure tests and video camera inspections.

A dedicated grease waste line is not in place for the school building. Currently point of use internal floor recessed grease trap is collecting the grease laden effluent from the 3 pot sink.

The above ground sanitary drainage and vent for the school building is currently using cast iron hub and spigot joints (3" or larger). Piping smaller than 3 inch is piped using DWV copper pipe.

Domestic Cold Water Service

Insulation at most piping is of adequate thickness and in fair condition. Some insulation has been removed at locations where repairs have occurred. Some of this insulation was not replaced.

Piping is not adequately labeled throughout the building. Vacuum breakers are present at the majority of fixtures as required by code. Original 1951 construction gate valves are in fair condition. Ball valves installed during the 2003 remodeling are in good condition.

Valve tags are not present throughout the building. Piping is adequately supported where observed either by hangers or floor supports. Hard water deposits were noted at multiple fixtures throughout the facility with the heaviest of the deposits being at the backflow preventers.

The hard water deposits could be causing deterioration of the piping wall thickness throughout the facility.

The existing main domestic water supply enters the basement boiler room complete with one water meter assembly located within the boiler room. No backflow

preventer present for the domestic potable water distribution side. No protected lawn and garden irrigation system or systems installed for site.

Existing boiler cold water make-up is currently being fed from reduced pressure-principle backflow preventers for HVAC equipment.

The domestic cold water piping distribution within the building supplying the original systems are distributed with “L” type copper tube with wrought or cast copper fittings. The majority of the piping is insulated to prevent condensation on piping and prevent deterioration of the pipe, to extend its life expectancy.

Domestic Hot Water Service

One gas fired storage water heater was installed in 2004, which is supplying the kitchen area fixtures and the remainder of the building.

The unit is a RUUD “Ruudglas Pacemaker” model no. PE120-2-B with 119 gallon storage, having 240/208 volts / 4.5/3.38 KW. This water heater is missing a thermostatic hi/lo mixing valve station. This heater provides hot water to cafeteria food service area. Storage temperature is required to be a minimum of 140 degrees F. Temperature gauges not present to confirm. All other kitchen plumbing fixtures require having a minimum of 140 degree F hot water system.

The existing domestic hot water distribution system to the school building does have a hot water circulation system to the plumbing fixtures. Hot water piping heat trap is also missing. No dead legs were observed with more than 12” in length.

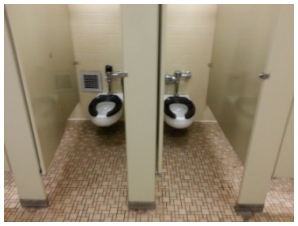
The existing domestic hot water is distributed in “L” type copper tube with wrought or cast copper fittings. The majority of the existing hot water (HW) piping is not insulated.

Natural Gas

A gas service location is present; this service enters the existing basement boiler room and feeds the gas fired boilers. It appears to be regulated down to low pressure (11” WC). The exterior pressure regulator and gas meter are mounted on the exterior of the building and supported by a concrete house pad. The gas meter and primary pressure regulator are owned by the gas utility company.

The basement boiler room gas supply currently feeds gas fired domestic water heater and the gas fired heating boilers. Food service equipment within the kitchen area is currently all electric operating.

The existing gas piping appears to be distributed in ASTM A53 schedule 40 black steel pipe.



PLMBG. PIC 1

PLMBG. PIC 2

PLMBG. PIC 3

PLMBG. PIC 4

PLMBG. PIC 5

PLMBG. PIC 6

FIRE SPRINKLER SYSTEMS

Fire Protection System

There are no existing fire sprinkler systems.

MECHANICAL

HVAC System

Boiler Plant

There are two Weil McLain steam boilers providing heat for this building. One boiler has been replaced in the past three years and at least one section of the other boiler was also replaced at this time.

The condensate receiver and pumps are in fair condition. However the piping particularly the condensate is in critically poor condition with multiple leaks being repaired each year in areas that are accessible. Other leaks are occurring in more difficult to access locations and catastrophic failure is a distinct possibility.

PATCHED STEAM PIPING. THE SMALLER DIAMETER CONDENSATE PIPE HAS BEEN REPLACED TO THE RIGHT OF THE UNION (JOINT).

Steam to the ancient Classroom Unit Ventilators (UVs) and other terminal equipment runs through a series of steam tunnels which generally follow the building perimeter. The piping in these tunnels was originally covered with a combination of Air Cell and Calcium/Magnesium style insulations.

Both of these products are asbestos containing. The insulation, where visible, is in poor condition often due to having been saturated by steam or condensate leaking from the decayed piping. Asbestos laden insulation materials are visible on the sand floor of the tunnels. The tunnels have hatches in many of the classrooms but must be considered confined spaces.

LOOKING DOWN INTO THE STEAM TUNNEL FROM A CLASSROOM HATCH. NOTICE THE DAMAGED ASBESTOS PIPE INSULATION AND DEBRIS ON THE FLOOR.

The gym and cafeteria are heated via finned radiation running several feet above the finish floor. Heating and ventilating units located in a closet were to provide the necessary ventilation. These are in poor condition.

The unit ventilators themselves are in poor condition with dampers and control valves locked into the open position. The original pneumatic controls are no longer working. Teachers attempt to regulate temperature by turning the UV fan on or off as the temperature falls or rises above the comfort level.

ELECTRICAL SYSTEMS

A site visit was made on October 13, 2014 to review the existing electrical systems.

Electric Service

Existing electric service initiates from existing utility pole-mounted transformer located across the street. The transformer secondary extends towards the school overhead via intermediate pole located adjacent to the school building, and then extends to school basement via underground raceway system. No issues related to outdoor service installation were observed.

Power Distribution Equipment

The utility transformer secondary feeder terminates in a 400 Amp Main Disconnect Switch located in existing boiler room at basement level. The service switch is manufactured by Frank Adams. I appear to be “original” and in poor condition, but operational. The service from the main disconnect switch extends to the main power distribution panel named “L-D”, located in the same area. The panel is rated 400

Amp at 120/208v 3 phase 4 wire system. It's manufactured by Siemens, appears to be in good and operational condition.

The existing electric service capacity shall be adequate for the current building program and building systems' load, however, it may not be sufficient for any future school upgrades or building additions.

Most of the new elementary schools with partial air conditioning are designed for approximately 7-9 W/SF, while the existing Hanlon Elementary school' s electrical service can support approximately 4 W/SF based on existing electrical service size, voltage configuration and building SF size.

Power from panel "L-D" is distributed to all sub-panels located throughout the school building. A dedicated electrical service is provided to existing 3-classroom modular building addition. Majority of the sub-panels appear to be "old", their locations are they follows: (2) panels near Music room, (6) panels in corridors, and (1) panel in the boiler room – they are in poor but operational condition. It is assumed that power feeders to all "old" panels are "original". The remaining few panels appear to be in good and operational condition.

The majority of receptacles appear to be "original". It is assumed that branch wiring feeding receptacles has never been replaced. A few receptacles in kitchen area were noticed to be non-GFCI which is not in compliance with the current electrical code (MEC). In a few classrooms it was noticed that receptacles near sinks were non-GFCI type too.

Quantities of receptacles in classrooms appear to be inadequate, and therefore multiple pieces of equipment are plugged into the same receptacles utilizing plug strips.

The on-going issue of "arcing receptacles" was brought to our attention by Facilities. Apparently, during "plugging-in and unplugging" of the computer charging carts, the utilized receptacles "arc", which leads to their continuous damage following by their failure and replacement.

Interior Lighting and Controls

Existing school lighting system consists mostly of "old" fluorescent surface-mounted wraparound fixtures. Lighting fixtures were recently retrofitted with T8 lamps and matching ballasts, and a new fluorescent lighting system was installed in Gym. In general, lighting system provides adequate illumination levels throughout, except for Music room and Cafeteria.

Occupancy sensors were recently installed in classrooms, corridors and in a few administration offices.

The typical classroom is equipped with three continuous rows of surface-mounted wraparound 2-lamp fixtures, controlled by three toggle switches in "by-row" manner.

Dedicated corridor lights are controlled by occupancy sensors and respective wall-mounted “occupancy sensor switches”. The remaining lights in corridors stay “on” all the time (“night lights”).

All other school spaces are controlled by local switches only.

It was brought to our attention by Facilities that the currently installed occupancy control system (manufactured by Lutron) consisting of ceiling-mounted and wall-mounted devices with associated occupancy sensor switches may not operate properly, especially in larger classroom areas. It is unclear if the issue relates to the “sensor motion coverage” ability or product quality itself.

Emergency Egress Lighting and Exist Signs

The existing emergency egress lighting system currently incorporates emergency battery units and remote light heads. In general, it appears to be adequate in most of locations, however, some areas need additional emergency lighting – gym, cafeteria, music room.

Existing exit signs concept and layout does not comply with code: many exist signs are not self-illuminating (printed), and there are locations in the building where exit signs are missing.

Fire Alarm System

The current fire alarm system is a “retrofitted original” – it’s a combination of “older” and “newer” fire alarm equipment and wiring. Smoke detection coverage appears to be inadequate for building without a proper fire protection system (sprinklers). Quantity of signaling devices (horn/strobes and strobe only devices) appears to be insufficient as well. There are no signaling devices in classrooms. The FACP appears to be new, zoned type, manufactured by Specalarm systems/Spectronics. The retrofitted fire alarm system is connected to Fire Department alarm loop via exterior wall-mounted Master box, and it is hard-wired.

Exterior Lighting and Controls

Exterior building-mounted lights are provided at egress doors and along the building perimeter. Lighting fixtures appear to be in poor condition and not full cutoff distribution type. The lights are controlled via time clock. There is no site lighting at parking lot areas.

Major Electrical Concerns

1. Majority of power distribution panels are old/beyond their life expectancy, and some panels became obsolete. Power feeders associated with “old” panels are beyond their life expectancy (fig 1).

2. Existing exit signs concept and layout does not comply with code: many exist signs are not self-illuminating (printed), and there are locations in the building where exit signs are missing (fig 2).

3. Lighting levels in a few spaces appear to be inadequate (Cafeteria and Music).

4. Emergency lighting in some areas is inadequate (gym, cafeteria, music room).

5. Quantities of receptacles in classrooms and similar educational spaces are inadequate. Majority of receptacles and associated wiring appear to be beyond their life expectancy.

6. Existing lighting control system does not comply with current energy code: although there are occupancy sensors in classrooms and a few offices, the rest of lights are controlled by switches only (no occupancy sensors). Also, there are no daylight sensors in the building.

FIG 1: OLD PANELS

FIG 2: EXISTING EXIT SIGNS

FIG 3: INADEQUATE LIGHTING LEVELS

Communication Systems

The Hanlon School is connected to the High School via fiber optic cable. The High School serves as the data and telephone service hub for the school district. Verizon FIOS is the primary Internet Service Provider (ISP). Comcast is the secondary (ISP).

Data communications in the Hanlon School are distributed from a single wall mounted equipment cabinet. There is no air conditioning at this location.

All classrooms in the school have Wi-Fi access. Approximately 10% of the non-classroom spaces have limited Wi-Fi service. The current Wi-Fi coverage is adequate.

Every classroom will be equipped with a projector over the course of the current school year. The telephone switch for the school is capable of transmitting and receiving both digital and analog signals and it performs adequately.

The voice and data cable infrastructure is a combination of Category 5 and 5e rated cable. Category 5 cable is no longer a recognized standard in the industry as it does not have the capacity to transmit data at the current industry standard of 1-Gigabit per second.

Cable TV over Verizon FIOS is available to the school; however, the CATV services are not distributed to the classrooms at this time.

The paging system is comprised of speakers in every classroom. The corridors and gym are not equipped with speakers. The facilities dept. is planning to have speakers installed in these areas in the near future.

The clocks are a combination of original wired devices and independent battery operated devices. Maintaining a common time standard throughout the building is not possible.

Security Systems

The Intrusion Detection System is comprised of door contacts at all exterior doors and Sonitrol sound detection devices distributed in the corridors only. The detection system is armed and disarmed by use of a keypad. There is no card access system in the building.

The main entrance is locked during the day. Visitors press a button at the door to activate a two-way intercom and one-way video transmission to the attendant's desk in the main office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the school.

The school has been wired for three IP-CCTV cameras.

Summary

1. The single Tel/Data Server Room is not air conditioned, potentially reducing the useful life of the equipment. The room is equipped with a wall mounted equipment rack.

2. The Category 5 cable infrastructure does not perform at standards that newer equipment demands.

3. The paging system currently serves classrooms only. Corridors and public areas do not receive announcements. Paging is limited to all-call only.

4. The clock system is a mix of older wired devices and battery powered devices meaning the clocks are not always synchronized.

5. CATV service is available at the school but not distributed throughout the building.

6. There is no card access system in the school.

7. The main entrance is equipped with a two-way intercom and one-way video transmission to the attendant's desk in the Main Office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the School. The school is wired for three CCTV camera locations.

2.4 MARTHA JONES ELEMENTARY SCHOOL

The following is a summary of the existing conditions at the Martha Jones Elementary School. This report is based on our site visit on October 29, 2014.

SITE

Parking Lots/Access Drives

Total number of parking spaces is 61 (58 standard spaces, 3 accessible spaces).

The north parking lot is in overall good-fair condition. Bituminous pavement shows some wear and occasional cracking, and striping is clearly visible. Sloped granite curbing along north and west sides of lot are in good condition. Lot contains 8 standard parking spaces, though additional vehicles parked in non-designated areas were observed. It appeared this was during after-hours pick-up. The loading dock is accessible from this area, and the loading/unloading of dumpsters is also situated in this area.

The south parking lot is in overall fair condition. Bituminous pavement shows some signs of wear and contains seam cracking as well as some minor heaving/settling adjacent to the curbing. Sloped granite curbing in overall good condition. The lot contains 25 parking spaces (24 standard and 1 accessible space). Striping is clearly visible.

The bus lane east of the school is in overall good-fair condition. Bituminous pavement shows minimal signs of wear and minor cracking. Adjacent vertical granite curb in good condition.

The east parking lot and parent drop-off/pick-up lane in overall fair condition. Bituminous pavement shows some wear and contains isolated areas of fatigue cracking, particularly along the east edge adjacent to the sloped granite curbing. The vertical granite curb and slope granite curb area in overall good condition, except for a couple of dislodged slope granite pieces. Area contains 28 parking spaces (26 standard spaces and 2 accessible spaces). Striping is clearly visible. The southern end of the area that connects to the southern parking lot is in fair-poor condition and contains more significant fatigue cracking.

The northern access drive (Reservoir Road) is in overall poor condition. Bituminous pavement shows significant wear and fatigue cracking. Curb along west side consists of slope granite, and is in overall good condition. Curb along east side consists of bituminous berm, and is in overall fair condition.

Walkways

The concrete sidewalk between parent queuing lane and bus queuing lane is in overall good-fair condition. Concrete shows some signs of wear and minor spalling, but no cracking or settling.

The concrete sidewalk/plaza on the west side of bus lane that leads to main entrance is in overall fair condition. Some portions show only minor wear, while other portions show significant spalling and deterioration. Some areas would classify as tripping hazards.

The bituminous walkway that loops around the west and south sides of the building and leads to the play areas is in overall good condition with very few cracks.

The bituminous walkway that encompasses a portion of the baseball field is in good overall condition with very few cracks.

The bituminous walkways that connect the bituminous play area east of the school to the sidewalk at the bus queuing area are in fair condition. The pavement contains some fatigue cracking. Walkways appear to be greater than 5%, and do not have handrails.

Circulation

Pick-up and drop-off operations were not observed. Buses utilize the designated one-way lane that is segregated from the designated parent lane by a median strip and chain link fence.

Accessibility

1. Parking - The number of accessible parking spaces meets MAAB requirements. Three spaces are required, and three are provided. The spaces appear to meet all MAAB criteria.

2. Building Egress Points
    a. Double doors on north side of gymnasium are not accessible due to steps
    b. Double doors on the west side of building to play area may not meet accessibility requirements. It appears that there is not a sufficient level landing at the doors before a 5%-7%. If greater than 5%, handrails are required, but not currently provided.
    c. Double doors on south side of building (adjacent to south parking lot) is not accessible due to the threshold being approximately 1" higher than the walkway grade.
3. Walkways
    a. The walkways to the main bituminous play (east of play area) appear to exceed MAAB slope requirements.
    b. Five (5) walkway curb cut locations at the intersection of Reservoir Road and Spruce Drive (southeast of building) lack detectable warning panels.
    c. The walkway curb cut to the building front plaza and entrance area lacks a detectable warning panel. An approximate 1 SF area of pavement wearing surface if front of the curb cut has deteriorated, creating a potential tripping hazard or obstruction for wheelchairs.

d. The two walkway curb cuts north of the school (at the intersection with Reservoir Road) lack detectable warning panels.

4. Play Areas – The play structures within wood fiber play areas are not considered accessible due to lack of accessible paths to certain structures.

Utilities

1. Drainage – No known issues or concerns with drainage system.
2. Sewer – School is connected to Town Sewer. No known issues or concerns with sewer distribution.
3. Water- No known issues or concerns with water distribution system.
4. Fire Protection – Two hydrants were observed on the north side of the School. A third hydrant was observed just north of Reservoir Road on Spruce drive, approximately 300' east of the school. Overall coverage appears adequate, but a portion of the southern face of the building appears to be greater than 300' away from the nearest hydrant. Fire department connection observed on the north side of the building.
5. Electric – It appears that electric is routed underground to the building from a utility pole in the northeast corner of the Site.
6. Gas – Natural gas service is used at the school. The gas meter is located on the north side of the building, around the corner from the loading area.
7. Lighting – Site lighting consists of pole mounted lights, bollard lights, and building mounted fixtures. Some concrete light pole bases show deterioration.

Play Areas

The main bituminous play area (southeast of building) is in overall good-fair condition. Pavement shows minimal wear and contains some seam cracking.

The basketball court is in overall good-fair condition and contains only a few isolated cracks in the bituminous pavement. Stain and striping is still visible, but faded. Basketball hoop structures appear to be sound.

The Playground consists of several types of play structures, installed on an engineered wood fiber surface. Areas are bounded by concrete curbing with openings for access. Bituminous walkways are provided to each wood chip area, but there are no accessible paths to the actual structures. Therefore, the playground is not considered MAAB compliant.

The baseball field and associated structures appear to be in overall good condition. No accessible path is provided to team benches or spectator bleachers, and therefore, the area is not fully MAAB compliant.

CONCRETE DETERIORATION IN PLAZA/WALKWAY NEAR FRONT ENTRANCE

LACK OF ACCESSIBLE PATHS TO PLAY STRUCTURES

FATIGUE CRACKING AND SETTLEMENT ALONG EDGE OF EAST PARKING LOT

CONCRETE DETERIORATION AT WALKWAY ADJACENT TO BUS LANE

LACK OF DETECTABLE WARNING PANEL AT BUS LOOP CURB CUT, AND PAVEMENT CRACKING

WALKWAY TO BITUMINOUS PLAY AREA/BASKETBALL COURT EXCEEDS MAAB SLOPE REQUIREMENTS

ARCHITECTURE

SMMA visited the site on the afternoon of October 20, 2014. The weather was mild and sunny. The school facility consists of a two level load bearing masonry school building constructed in 1957 and renovated in 2001 with an addition. The building area is approximately 50,796 SF and has 295 students in grades K-5. The building faces east toward Martha Jones Road. There is a separate bus lane in front of the school, and angled visitor parking off the one way road. Staff and teacher parking is on the south side of the site, the service drive and kitchen staff parking is on the north side. The main entry is at grade level and there is a paved play area at the front of the building. Other entries around the building are also at grade level. The main entry is protected by a large canopy and other entries are recessed. The playing fields are to the west and south of the school. The service area is not visible from the front of the building.

Enclosure

There is a high sloped gable roof over the cafeteria and gymnasium. The roof covering is black rubber and it drains to gutters. The roofs over the classroom parts of the building are low sloped black rubber and there is a monitor above the media center. The low slope roofs drain internally. The roof has been patched around the monitor above the library and some leakage persists. A small amount of ponding on the monitor roof was observed. The addition has cavity wall construction with brick and cast stone veneer, and load bearing CMU masonry. Typical construction of the new part of the building has rigid wall and roof insulation. The brick veneer is in good condition with some fine cracks showing in the cast stone sills. There are visible cracks in the mortar joints in the glass block corners. Window openings are single hung aluminum frames with insulated glass. The Owner is repairing the counter balances throughout the facility.

Interior

The interior partitions are painted gypsum board above ceramic tile wainscot in the corridors. The classrooms are painted gypsum board. The kitchen, restrooms, and stairwells have ceramic tile wall cover. Floor covering is typically vinyl composition tile in the corridors and classrooms and ceramic tile mosaics in the restrooms. The entry floor is stone. There is carpet in the media center and offices. The kitchen has quarry tile floor and ceramic tile cove base. Door frames are typically hollow metal. The interior wood doors are in good condition. The hardware is also in good condition. Ceilings are typically acoustic ceiling tiles with recessed light fixtures. Classroom casework is in good condition. The toilet partitions have been replaced with solid plastic and are subject to rough use. Some work is required to maintain alignment, repair hinges, and braces are needed. The toilet automatic flush-o-meters were omitted from the emergency power system and not flushable during power outage conditions.

Circulation

Interior stairs and ramps are code compliant. The elevator cab dimension is 54” X 80” with a 42” entrance.

Accessibility

All building entries are accessible and there is an accessible route from parking, bus drop-off, and playing fields. Door hardware is lever handles throughout the facility. The elevator will not accommodate a 24” X 84” gurney. There is a wheelchair lift at the stage. No other accessibility related issues were noted.

Security

Aluminum operable windows have locking hardware. The school has a corridor located motion detection intrusion alarm and 3 cameras. Exterior doors have exit devices (panic hardware) and are locked to prevent unauthorized entry. The entry doors have an intercom with remote release. The Office /Reception area has visual control of the entry and the entry vestibule. Classroom door hardware does not have classroom side lock-down feature.

A FEW HAIRLINE CRACKS IN GLASS BLOCK MORTAR JOINTS

ROOF LEAKS AT MONITOR IN THE LIBRARY

STRUCTURAL

Purpose

The purpose of this report is to broadly describe the existing structure, comment on the structural integrity of the building and comment on the structural code issues related to any future renovations and expansions.

Basis of the Report

This report is based on visual observations during our site visit on October 13, 2014 and the structural design drawings for the 2001 addition. The design drawings relating to the original portion of the building were not available for review. During our site visit, the only finishes that were removed were a few ceiling tiles to verify the structural framing system; therefore, our understanding of the original portion of the structure is limited and may have to be further refined as the design of any renovation evolves.

Building Description

The original portion of the building was constructed in 1957 and a major addition/renovation was completed in 2001. The foundations of both the original building and the addition consist of cast-in-place concrete walls and footings, with the original portion including a basement boiler room. The pre-2001 portion of the building appears to be is framed with two separate structural systems. The two story classroom wing consists of a cast-in-place concrete pan-joist system supported by concrete columns and foundations. The administration wing, boiler room roof and gymnasium roof are framed with metal roof deck supported by steel girders and beams, and in turn are supported by structural steel columns. The 2001 classroom addition uses similar structural steel elements and incorporated diagonal steel bracing in the design to resist lateral loads. The 2001 addition also included an expansion of the gymnasium, which added an addition ridge frame system to match the original construction.

Lateral Force Resisting System

The 2001 addition included diagonal steel braced frames to resist the lateral wind and seismic forces. The addition is structurally independent from the existing building, as an expansion joint exists where the two portions of the building meet. There appears to be no deliberately designed lateral force resisting system as part of the original structural design, as it was constructed prior to 1973 when it became a requirement of the building code. The lateral loads for this portion of the building (wind loads, potential seismic forces) are resisted by the exterior and interior masonry walls.

Existing Conditions

There building appears to be in sound structural condition with no substantial structural defects.

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations or additions are made to the structure, a check for compliance with the Massachusetts State Building Code (780 CMR, Chapter 34 "Existing Structures") is required. The intent of 780 CMR, Chapter 34 is to permit repairs, alterations, additions and/or a change of use without requiring full compliance with the code for new construction. However, depending on the scope of any proposed renovations, a comprehensive structural analysis may need to be performed to determine the impact on the existing structural system. Due to the fact that the lateral force resisting system of the original portion of the building is, by default, the interior and exterior masonry walls, any modifications to them will need to be thoroughly reviewed to determine if seismic upgrades to the lateral system are required as a result of proposed building alterations. If any future additions are planned for this building, they should be seismically isolated from the existing structure.

Summary

The existing structure appears to be in sound condition and is performing satisfactorily. A thorough investigation of the existing structure is required if, by nature of the proposed renovations:

1) The capacity of the lateral force resisting system is decrease (i.e. reduce the amount of, or configuration of the existing masonry walls;

2) There is an increase the seismic loads on the building (i.e. additional building mass in or on top of the structure, such as mechanical roof top units);

3) There is an increase the effects of the wind loads on the building (i.e. additional roof top mechanical units/roof screens or other projections collecting wind and transferring additional lateral forces to the existing masonry walls).

PLUMBING SYSTEMS

Plumbing Fixtures

Majority of the existing plumbing fixtures in place within the building are original. Some have been replaced with newer battery sensor type flush valves and lavatory faucets (Refer plumbing pic 1).

Water closets are floor mounted, vitreous china units with a mix of manual and battery sensor operated flush valves. Stall type urinals are no longer allowed and not compliant.

Some flush valves have been retrofitted with new Rubbermaid Retrofit Kits (battery sensor type flush valves), (Refer plumbing pic 1).

The Nurse's room sink is wall mounted with a dedicated eyewash station. Eye wash station is inoperable and the tempering water system is not functional (Refer plumbing pics 5 & 6).

Urinals in the toilet core rest rooms are vitreous china, wall hung units with manual operated flush valves. The flush valves are exposed in the room.

Lavatories are wall hung, vitreous china with hot and cold faucets that are either metering or manually operated. Some existing lavatories have been retrofitted with self-metering manual push down Chicago faucets (Refer plumbing pic 2).

The kitchen hand-washing sink is a stainless steel, wall hung unit with a hot and cold gooseneck spout faucet with wrist blade handles. Kitchen scullery sinks are floor standing, stainless steel with coved inside corners. Kitchen food prep sinks with or without food disposer requires an indirect waste (not hard connected) to assure no cross contamination with sanitary sewer and food upon any waste back up (Refer plumbing pic 3).

Classroom sinks are stainless steel, self-rimming single compartment basins with a swing spout faucet with separate hot and cold handles. Several of the existing classrooms have self-rimming stainless steel sink with standard manual type faucets. These require reducing and limiting the hot water to a maximum of 110 degrees F hot water to dispense at the faucets. Kindergarten class room sinks are not receiving hot water at a timely manner or temperature at their faucets.

Mop basins are floor type, molded stone units with hot and cold faucet with hot and cold handles and elevated vacuum breaker. Drinking fountains are a mix of stainless steel and vitreous china, non-recessed. Electric water coolers are bi-level units with push button activation. Exterior hose bibs are frost proof type.

There is no emergency eyewash/shower station located in mechanical room or nurse's room. Custodian's closet mop service basin faucet does not have any integral vacuum breakers (Refer plumbing pic 4).

Existing original core restrooms are outdated as far back as the original school building was constructed in 1957 and do not meet MAAB requirements.

Roof Storm Drainage

External roof drain systems are presently discharging into site storm boot systems.

Sanitary

The majority of the existing building sanitary waste system, which drains by gravity, is in good condition. The sanitary effluent discharges below grade to the site sewer drain distribution system.

Existing underground (buried) piping could be not be observed, however the entire underground (buried) sanitary sewer should be tested for any leakage, backup and pipe aging condition by executing static pressure tests and video camera inspections.

A dedicated grease waste line is not in place for the school building. Currently point of use internal floor recessed grease trap is collecting the grease laden effluent from the 3 pot sink.

The above ground sanitary drainage and vent for the school building is currently using cast iron hub and spigot joints (3" or larger). Piping smaller than 3 inch is piped using DWV copper pipe.

Domestic Cold Water Service

Insulation at most piping is of adequate thickness and in fair condition. Some insulation has been removed at locations where repairs have occurred. Some of this insulation was not replaced.

Piping is not adequately labeled throughout the building. Vacuum breakers are present at the majority of fixtures as required by code. Original 1957 construction gate valves are in fair condition. Ball valves installed during the 2001 remodeling are in good condition.

Valve tags are not present throughout the building. Piping is adequately supported where observed either by hangers or floor supports.

Hard water deposits were noted at multiple fixtures throughout the facility with the heaviest of the deposits being at the backflow preventers. The hard water deposits could be causing deterioration of the piping wall thickness throughout the facility.

The existing main domestic water supply enters the basement boiler room complete with one water meter assembly located within the boiler room. No backflow preventer present for the domestic potable water distribution side. No protected lawn and garden irrigation system or systems installed for site.

Existing boiler cold water make-up is currently being fed from reduced pressure-principle backflow preventers for HVAC equipment.

The domestic cold water piping distribution within the building supplying the original systems are distributed with "L" type copper tube with wrought or cast copper fittings. The majority of the piping is insulated to prevent condensation on piping and prevent deterioration of the pipe, to extend its life expectancy.

Domestic Hot Water Service

One gas fired storage water heater was installed in 2011, which is supplying the kitchen area fixtures and the remainder of the building.

There is an A.O. Smith model no. BTR-198-118 with 99 gallon storage, having 119 CFH gas consumption and a thermal efficiency of 80%. This heater provides hot water to cafeteria food service area and remainder of the school. Storage temperature is required to be a minimum of 140 degrees F. Temperature gauges not present to confirm. All other kitchen plumbing fixtures require having a minimum of

140 degree F hot water system. 120 degrees F. to be distributed to all entire building with the exception of tempered emergency water feeding emergency equipment.

The existing domestic hot water distribution system to the school building does have a hot water circulation system to the plumbing fixtures. Hot water piping heat trap is also missing. No dead legs were observed with more than 12" in length.

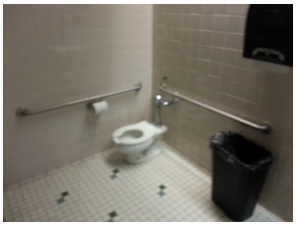
The existing domestic hot water is distributed in "L" type copper tube with wrought or cast copper fittings. The majority of the existing hot water (HW) piping is not insulated.

Natural Gas

A gas service location is present; this service enters the existing basement boiler room and feeds the gas fired boilers. It appears to be regulated down to low pressure (11" WC). The exterior pressure regulator and gas meter are mounted on the exterior of the building and supported by a concrete house pad. The gas meter and primary pressure regulator are owned by the gas utility company.

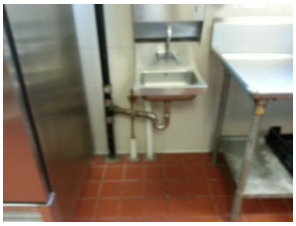
The basement boiler room gas supply currently feeds gas fired domestic water heater and the gas fired heating boilers. Food service equipment within the kitchen area is currently all electric operating.

The existing gas piping appears to be distributed in ASTM A53 schedule 40 black steel pipe.

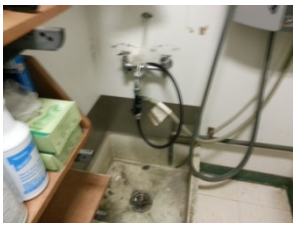


PLMBG. PIC 1

PLMBG. PIC 2



PLMBG. PIC 3



PLMBG. PIC 4

PLMBG. PIC 5

PLMBG. PIC 6

FIRE SPRINKLER SYSTEMS

Sprinklers

The school building is currently being served from a 6" fire service line from the street water main. Cross connection control is provided by use of a 4" double check valve assembly backflow preventer on the fire service as it enters the building located in the boiler room (Refer to fire protection pics 1, 2 & 3).

The entire school building appears to be fully protected throughout with a dry automatic fire suppression system.

A dry system has been observed with a dry alarm check valve riser located within the sprinkler room, providing coverage throughout the entire school (Refer to fire protection pic 1).

A fire department connection was not observed on the school building or site.

This system appears to have been designed in accordance with NFPA Standard 13, the Massachusetts State Building Code and the Westwood Fire Department requirements.

Sprinklers are supplied from a one zone control valve riser, consisting of a monitored shut-off valve and flow switch. Inspector's tests are provided at remote locations. The sprinkler zone control valves will report sprinkler flow to the fire alarm system on an entire building zone basis (below 52,000 sq. ft. requirement per zone), (Refer to fire protection pics 1).

Fire Protection System

Fire protection dry system piping was installed with schedule 40 (non-galvanized) piping with threaded fittings for piping sizes 2" and less and for sizes 2½" and larger, schedule 10 piping with roll grooved fittings and couplings are used.

All valves controlling the flow of water are equipped with supervisory devices that report to the Fire Alarm system.

Existing kitchen hood is not currently protected with a dry agent "Ansul R-102" packaged hood suppression type system (Refer to fire protection pic 4).

Dry system alarm check valve riser flow test information was not obtained from the test tag conducted by TYCO Sprinkler Grinnell dated Unk.:

- Static Pressure: Unk. psi
- Residual Pressure: Unk. psi
- Flow: Unk. GPM

School building was observed not having a fire pump present, nor is it being suggested one is required.

FIRE PROT. PIC 1

FIRE PROT. PIC 2

FIRE PROT. PIC 3

FIRE PROT. PIC 4

MECHANICAL

HVAC System

The HVAC systems for the entire school were upgraded in 2000 when the addition was built.

The boiler plant consists of three one million BTUH, Lochinvar Power Fin, condensing, hot water boilers. Each boiler has an individual 43 GPM primary pump and there are two 130 GPM secondary pumps to circulate water to the terminal equipment. The hot water is mixed with approximately 30% propylene glycol to prevent freezing of piping and coils located on the roof. The secondary pumps are on VFD drives.

The Classrooms are served by heating only unit ventilators (UVs). The Invensyis hot water control valves on the UVs reportedly all failed within five years, many were replaced and failed a second time. The controls are now by-passed and the valves manually set and left open.

There are four hot water heating and ventilating units that serve specific areas. The 4800 CFM cafeteria unit is located in an adjoining mechanical room. The 3600 CFM gymnasium unit is located in the storage room while the other two units serving the Library (2500 CFM) and 1650 CFM Elevator units are on the roof.

The office area is served by 1600 CFM five ton air handler above the ceiling with a remote condensing unit on the roof.

There are four toilet and eight general exhaust fans scattered across the roof at the time of the visit nine or ten of these were running. One of the fans that was not working served the boys, girls and faculty toilet rooms south of the library. The boys bathroom in particular smelled badly.

The art room is treated as a normal classroom with a UV and no special ventilation. The corridors have Runtal baseboard radiation.

The building was equipped with a Honeywell Direct Digital Control Energy Management System in 2000. This system is largely disabled at this time. As previously mentioned UV hot water control valves have been by-passed and teachers typically control room temperature by manipulating the fan. Somewhere along the line the head end computer was lost along with the resident programing.

ELECTRICAL SYSTEMS

A site visit was made on October 13, 2014 to review the existing electrical systems.

Electric Service

Existing electric service was recently upgraded. The new utility transformer secondary feeder is in good and operational condition. However, as it was brought

to our attention by Facilities, the utility service primary side does experience accidental failures a few times a year due to breaking the utility primary overhead wires. The Facilities expressed their desire to add the emergency generator supporting critical loads.

Power Distribution Equipment

The utility transformer secondary feeder runs underground towards the school building and terminates in the Main Switchboard (MSB) located in existing boiler room. The switchboard is manufactured by GE. It is rated at 120/208v 3 phase 4 wire system and equipped with an 800 Amp Main Circuit breaker (MCB). The switchboard appears to be in good and operational condition. The power service from the MSB is distributed to all sub-panels located throughout the school building.

The existing electric service capacity shall be adequate for current and future school program upgrades, based on existing service size and voltage configuration.

Majority of the sub-panels appear to be in good and operational condition, except for one of two panels located in the kitchen area.

All receptacles appear to be new and in good condition. A few receptacles in kitchen area were noticed to be non-GFCI which is not in compliance with the current electrical code (MEC).

Interior Lighting and Controls

Existing school lighting system consists mostly of fluorescent recessed-, pendant- and surface-mounted luminaries. All building lights appear to be new, in good and operational condition. Fluorescent linear lights are equipped with T8 lamps. Downlights are equipped with compact fluorescent lamps.

The typical classroom is equipped with three rows of recessed parabolic 3-lamp fluorescent 2'x4' luminaries and downlights with compact fluorescent lamps. All lights are controlled by three toggle switches. The 2'x4' 3-lamp fixtures are double-switched. There are no occupancy sensors.

All corridor lights are controlled by standard wall-mounted toggle switches. There are no occupancy sensors. The remaining school areas are controlled by local switches only.

Emergency Egress Lighting and Exist Signs

Existing emergency egress lighting system currently incorporates emergency battery units and remote light heads, and appears to be adequate. Existing exit signs are LED type.

Fire Alarm System

Existing fire alarm system is manufactured by Simplex. It appears to be new, except for the "older" Master box. In general, the quantity of initiating and signaling devices

appears to be adequate, and they are in good and operational condition. The existing fire alarm system is connected to Town alarm loop via exterior wall-mounted Master box, and it is hard-wired.

Exterior Lighting and Controls

Exterior building-mounted lights are provided at all egress doors and along the building perimeter. Roadways and parking lots are illuminated by bollards and pole-mounted lights, equipped with metal halide lamps. All exterior lights are controlled by four time clocks located adjacent to panel LP2 in the boiler room.

Major Electrical Concerns

1. One of Kitchen panels appear to be old/beyond its life expectancy. Power feeder associated with this panel is beyond its life expectancy (fig 1).
2. Kitchen receptacles are non-GFCI type and have no GFCI protections (circuit breakers) which is not in compliance with the current electrical code (MEC), (fig 2).
3. Existing lighting control system does not comply with the current energy code: there are no occupancy sensors, no daylight sensors, and no programmable lighting control system for interior lights.

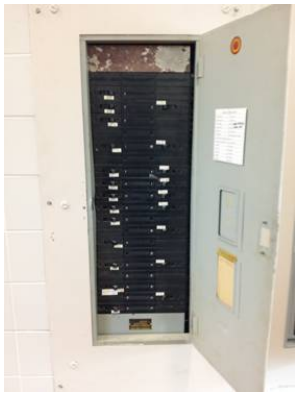


FIG 1: OLD PANEL

FIG 2: NON-GFCI RECEPTACLES

Communication Systems

The Martha Jones School is connected to the High School via fiber optic cable. The High School serves as the data and telephone service hub for the school district. Verizon FIOS is the primary Internet Service Provider (ISP). Comcast is the secondary (ISP).

Data communications in the Martha Jones School is equipped with a Communications Service Entrance/Data Room located within the custodian's office on the east side of the building and a data closet located in the new addition of the building near the library. The two rooms are connected via fiber optic cable. The

network equipment is rack mounted in secured rooms. There is no air conditioning in the data rooms, potentially reducing the useful life of the equipment.

All classrooms in the school have Wi-Fi access. Approximately 10% of the non-classroom spaces have limited Wi-Fi service. The current Wi-Fi coverage is adequate.

Every classroom will be equipped with a projector over the course of the current school year.

The telephone switch for the school is capable of transmitting and receiving both digital and analog signals. This equipment is installed in a closet adjacent to the gym. The telephone system performs adequately.

The voice and data cable infrastructure is a combination of Category 5 and 5e rated cable. Category 5 cable is no longer a recognized standard in the industry as it does not have the capacity to transmit data at the current industry standard of 1-Gigabit per second.

Cable TV over Verizon FIOS is available to the school however the CATV services are not distributed to the classrooms at this time.

The paging system is comprised of two-way speakers in every classroom. The corridors and common areas (i.e. gym, cafeteria) are equipped with one-way paging speakers. The system can be accessed via telephone, giving teachers the capability to make paging announcements from the classroom. The system is currently on a single All-Call zone with no capability of paging a single classroom or wing of the school. The Facilities Department is in the process of adding multiple zone capability to the system.

The clocks are operated by a master clock system and are in good working condition.

Security Systems

The Intrusion Detection System is comprised of door contacts at all exterior doors and Sonitrol sound detection devices distributed throughout. The detection system is armed and disarmed by use of a keypad. There is no card access system in the building. Three doors are equipped with proximity card readers. The doors and cards are programmed by the town.

The main entrance is locked during the day. Visitors press a button at the door to activate a two-way intercom and one-way video transmission to the attendant's desk in the main office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the school.

The school has three IP-CCTV cameras used to monitor the exterior of the building.

Summary

1. The Category 5 station cabling and fiber optic backbone cable between the two data rooms do not perform at standards that newer equipment demands.

2. The two rooms are not air conditioned, potentially reducing the useful life of the equipment.

3. CATV service is available at the school but not distributed throughout the building.

4. The paging system is limited to all-call only.

5. Three doors are equipped with proximity card readers. The doors and cards are programmed by the Town.

6. The main entrance is equipped with a two-way intercom and one-way video transmission to the attendant's desk in the Main Office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the School.

7. The School has three IP-CCTV cameras used to monitor the exterior of the building.

2.5 SHEEHAN ELEMENTARY SCHOOL

The following is a summary of the existing conditions at the Sheehan Elementary School. This report is based on our site visit on October 29, 2014.

SITE

Parking Lots/Access Drives

The total number of spaces 56 (55 standard spaces, 1 accessible space).

The east parking lot is in overall good condition. Bituminous pavement shows minimal wear and cracking, and striping is clearly visible. Lot does not have any perimeter curbing. Some areas have woods posts along the perimeter. Posts are aging, but do not appear to be deteriorating. Lot contains 31 parking spaces (all standard spaces).

The front parking lot/bus loop is in overall good-fair condition. Bituminous pavement shows some signs of wear and contains areas of minor cracking. More extensive fatigue cracking exists along the southern edge of the loop (where parallel parking spaces are) and in isolated areas. The concrete entrance and exit aprons are in poor condition and severely cracked. No curbing exists on either side of the loop, and some minor rutting/damage to lawn area south of spaces was observed. The area contains 9 parallel parking spaces (8 standard and 1 accessible space). Striping is clearly visible. The loop is one way (east to west), and signage prohibits cars from entering between 8:15-9:00 AM and between 2:30 – 3:00 PM.

The northwest parking lot and access drive (west of swing gates) is in overall fair-poor condition, except for the four (4) spaces that appear to have been re-paved recently. A majority of pavement contains significant fatigue cracking, and some potholes are beginning to form in isolated areas. The area contains 12 standard parking spaces, and striping is clearly visible. The area also serves as the loading/unloading area for dumpsters, and a metal storage container is also present.

The northwest parking lot (east of swing gates) in overall good condition. Bituminous pavement shows minimal wear and cracking, and striping is clearly visible. Lot contains 4 standard parking spaces.

Walkways

The bituminous walkway between the front bus loop and both the east parking lot and main bituminous play area is in overall good condition. The pavement shows minimal wear and cracking.

The bituminous walkway between the front bus loop and the front entrance to the west addition is in overall good-fair condition. The pavement shows some wear and minor seam cracking.

The bituminous walkway from the east parking lot to the bituminous rink is in fair condition, due to minor heaving and cracking.

The bituminous walkway that runs from the main bituminous play area to a northern portion of the grass playfields is in overall good condition. The pavement shows minimal wear and cracking.

The concrete walkway along Pond Street is in overall fair condition. The concrete shows some wear and deterioration and contains cracking.

The bituminous walkway from the northwest parking lot to the northwest building egress is in good-fair condition and shows some wear and minor cracking.

The bituminous walkway from the basketball courts to the sidewalk along High Street is in overall fair condition due to surface wear and transverse cracks.

Circulation

Pick-up and drop-off operations were not observed. Bus loading and unloading occurs in the front loop.

Accessibility

1. Parking
    a. The number of accessible parking spaces does not meet MAAB requirements. Three spaces are required, and only one is provided.
    b. Existing space is not compliant, as it does not provide safe zone for someone exiting or entering their vehicle.
2. Building Egress Points
    a. Several building egress locations are not accessible due to the presence of steps.
    b. Both front doors off of the bus loop are not accessible, due to steps. Handrail is non-compliant.
    c. Both doors that provide access to the eastern bituminous play area are not accessible.
    d. One door on north side of building is not accessible.
    e. Two doors on west side of building are not accessible.
3. Walkway - Detectable warning panels are missing from the following locations
    a. Walkway at High Street curb cut
    b. Walkway at all three Pond Street curb cuts (to east parking lot, entrance and exit to front bus loop).
4. Wood fiber play area is not accessible. There is no accessible path to the area, and accessible paths are not provided to play components.

Utilities

1. Drainage
    a. A portion of the roof runoff is surface discharged from downspouts near the two front stair entrances. Runoff from front parking lot/bus loop flows unmitigated to drainage system in Pond Street.
    b. Reports of drainage problem at exterior boiler room access noted. Observed area was filled with leaves, vegetation and debris. Did not observe the drain. It appears that a small portion of pavement at-grade contributes run-off to this area.
2. Sewer – School is connected to Town Sewer.
3. Water- No known issues with water distribution system.
4. Fire Protection – Two hydrants were observed in close proximity to the School. One is located on-site in the northwest parking lot, and the other is located on the opposite side of Pond Street near the entrance to the bus loop. The two locations provide adequate coverage for the School.
5. Electric & Telecommunications– Overhead electric enters the site and then transitions to underground at a pole adjacent to the eastern parking lot. No known site electric distribution issues.
6. Site Lighting – Site lighting is provided by building mounted fixtures and telephone pole mounted lights.

Play Areas

1. Main bituminous play area is in overall good condition. Pavement shows minimal wear and cracking.
2. Basketball Courts – Asphalt in overall fair/poor condition and contains significant cracking throughout. Stain and striping is still visible, but faded. Basketball hoop structures appear to be sound.
3. Playground consist of several types of play structures, installed on an engineered wood fiber surface. Area is bounded by plastic logs. The playground does not meet MAAB accessibility requirements, as there is no accessible path to the overall area, and there are not accessible paths to the various play components.
4. Bituminous rink (east school) is in overall poor condition and contains significant cracking throughout. Striping is still visible, but faded. Chain link fence surrounding area is overgrown and rusted in some areas.
5. Grass playfields are in overall good condition. Portions of the field do not meet MAAB accessibility requirements due to a lack of paved paths to seating areas and team benches.

Miscellaneous Site Features

The fenced in gardening and patio areas appears to be in good-fair overall condition. The brick pavers and bituminous pavement show minimal signs of wear and

cracking. The wood garden beds appear to be in fair condition, and the surrounding landscaping is in fair condition.

The concrete stairs at the two front entrances appears to be in overall fair condition due to age and surface deterioration.

FATIGUE CRACKING IN NORTHWEST PARKING AREA/ACCESS DRIVE

FATIGUE AND TRANSVERSE CRACKING AT BASKETBALL COURTS

LOWER LEVEL PIT/EGRESS AT BOILER ROOM CLOGGED WITH DEBRIS AND VEGETATION

NON-ACCESSIBLE FRONT ENTRANCE AND NON-COMPLIANT HANDRAILS

BLOCK AND FATIGUE CRACKING AT CONCRETE ENTRANCE APRONS

NO ACCESSIBLE ROUTES PROVIDED TO THE WOOD-FIBER PLAY AREA AND STRUCTURES

ARCHITECTURE

SMMA visited the site on the afternoon of October 20, 2014. The weather was mild and sunny. The school facility consists of a three story load bearing masonry structure school building constructed in 1948, and a two level load bearing masonry and steel column addition constructed in 1967. The original building has a shingle covered gabled roof over the three story center part and flat roofs on the wings to each side. The 1967 addition has a low sloped roof over the classrooms and cafeteria, and a gabled roof over the gymnasium. This school is the largest of five elementary schools at approximately 49,586 GSF and has 373 students in grades K-5. The facility faces south to Pond Street and the front drive loop is used for bus drop-off and pick-up and visitor parking. At the building front, there are two small covered porches with landings at the mid-level between the first and second floors. There is an accessible entry on the west side, but it's not visible from the main entry. Grade level accessible entries are provided at several locations around the 1967 addition. The staff and teacher parking lot is on the west side. There is a paved play area on the west side between the building and the teacher parking lot. The playing fields are north and west of the facility. The service entry and drive is located on the east side, and there is parking for staff at this location. Trash containers are not visible from Pond Street.

Enclosure

The central part of the 1948 building and the 1967 gymnasium have medium pitched asphalt shingle roofs, the remainder of the roofs are low sloped rubber with gravel cover. Gable roofs drain to gutters and leaders drain to site storm system. There is some leakage from the leaders above the front canopies. The low slope roofs drain internally. There is some noticeable deterioration of the roof membrane. No ponding was observed. The shingle roofs appear to be in good condition. The 1948 building has load bearing brick and cast stone walls. The gabled end walls of the three story part form sloped parapets with chimneys at each end. Brick work appears to be in good condition although some deterioration of mortar exists and may require repointing in the future, especially on the west side of the 1948 building. The 1967 addition exterior is load bearing masonry wall with brick veneer. Windows in the 1948 building are awning style single glazed steel frames with glass block above. The steel frames are in poor shape, seriously rusted, leak, and cannot be repaired. The openings in the 1967 addition are fixed and single hung non-insulated aluminum windows and storefront.

Interior

The interior partitions in the 1948 building are painted masonry and are in fair to good condition. The 1967 additions partitions are painted CMU. Some wall cracks are visible. The 1967 kitchen, restrooms, and stairwells have ceramic tile wainscot. Floor covering in the 1948 building is vinyl asbestos tile in the corridors and classrooms and ceramic tile in restrooms. The 1967 addition has vinyl composition tile flooring in the corridors and classrooms and ceramic tile in restrooms. The

kitchen has quarry tile floor and base. Door frames in both buildings are typically hollow metal. The interior wood doors in both buildings are in poor condition. The hardware is also in poor condition. Ceilings in the 1948 building are typically exposed concrete waffle slab painted white with pendant light fixtures. The 1967 addition has acoustic ceiling tiles with recessed light fixtures. Classroom casework is in poor condition in the 1948 building and in good to fair condition in the 1967 addition. Wooden corridor hanger racks for the student coats and backpacks do not have compartments to separate students' coats. The boy's toilet on the second level of the 1948 building is being used as a storage room. The attic is also used for storage. Science classroom casework in the 1948 building is in poor condition.

Circulation

The exterior concrete stairs in the 1948 building do not have guards with handrail extensions and an intermediate hand rail. There is a step at the threshold. Interior concrete stairs in the 1948 building do not have 42" high guards, handrail extensions, and have abrupt stair nosings. Ramps have handrails. Stairs in the new building have terrazzo treads and landings with non-compliant stair nosings. The pickets are non-compliant, handrails are not continuous and do not have extensions. Stairs do not have 42" high guards between stair runs and at upper landing. There is an elevator in the 1967 addition connecting the first and second floors. The third level in the 1948 building is not accessible.

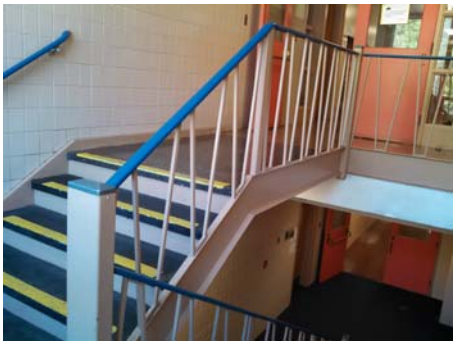
Accessibility

The 1948 building is only accessible through the 1967 addition. The first floor is accessible by ramp from the addition. The second floor of the 1948 building is accessible by ramp from the addition and elevator. There are no power door operators located at the accessible entry on the accessible route to the building. Interior door hardware is combination of knob and some lever handles. Elevator cab will accommodate a wheel chair, but is not sized for a gurney. Restrooms are accessible in the 1967 addition. The 1948 building does not have accessible toilets. Other non-compliant items are:

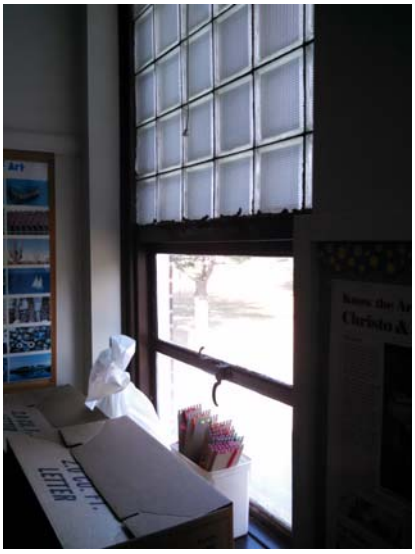
- Insufficient maneuvering space at some locations.
- Classroom sinks not compliant
- Not all toilets are accessible
- Missing signage
- Drinking fountains in the 1948 building
- Thresholds exceed ½" at some openings
- Stair and ramp handrails are not compliant
- Projection into walkway space exceeds limits.
- Access to cafeteria stage

Security

Aluminum and steel operable windows have locking hardware. Some of the steel window frames are rusted and latches are not secure. Exterior doors have exit devices (panic hardware) and are locked to prevent unauthorized entry. The school has a corridor located motion detection intrusion alarm. The entry doors have an intercom with remote release. The Office /Reception area is remote from the main entries, and does not have visual control of the entry and the entry vestibule. Outside the locked doors there is no other means to detect or prevent unauthorized entry. Classroom door hardware does not permit lock-down without the teacher leaving the classroom.



NON-COMPLIANT STAIR GUARD AND HAND RAILS



RUSTING STEEL FRAME WINDOWS IN GLASS BLOCK

STRUCTURAL

Purpose

The purpose of this report is to broadly describe the existing structure, comment on the structural integrity of the building and comment on the structural code issues related to any future renovations and expansions.

Basis of the Report

This report is based on visual observations during our site visit on October 13, 2014 and from structural design drawings from 1948 and drawings of the addition dated May 3, 1967.

Building Description

The original portion of the school is framed primarily by a cast-in-place concrete waffle slab system supported by perimeter masonry walls and interior steel girders and columns. The sloped roof above the attic space is framed with wood rafters supported by wood bearing partitions and steel trusses. The foundation consists of cast in place concrete walls and concrete spread footings. The two story addition is framed with structural steel beams and girders. At the classroom wing, the elevation floor slab consists of 4" composite slab (2½" concrete on 1½" metal deck), with 1½" metal roof deck at the roof level. The roof of the cafetorium is framed with 1½" roof deck on long-span open web steel joists, supported by steel girders and columns. The framing of the gymnasium roof consists of steel trusses that support steel purlins, and in turn, the 1½" metal roof deck.

Lateral Force Resisting System

There appears to be no deliberate designed lateral force resisting system as part of the original structural design or the addition. Currently, lateral loads (wind loads, potential seismic forces) are resisted by the exterior and interior masonry walls. This is fairly typical of school structures built in this time period, as deliberate designed lateral force resisting systems (i.e. shear walls, brace frames, moment frames) were not addressed by the building code until 1973.

Existing Conditions

The building appears to be in sound structural condition with no substantial defects. Several of the wood members in the attic have water stains, but none of the observed members showed any signs of rot or decay. It appears that any water infiltration issues in this space were resolved in a timely manner such that integrity of the structural members remains relatively unaffected. A few minor cracks were observed in the CMU walls at a few locations in the addition.

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations or additions are made to the structure, a check for compliance with the Massachusetts State Building Code (780 CMR, Chapter 34

"Existing Structures") is required. The intent of 780 CMR, Chapter 34 is to permit repairs, alterations, additions and/or a change of use without requiring full compliance with the code for new construction. However, depending on the scope of any proposed renovations, a comprehensive structural analysis may need to be performed to determine the impact on the existing structural system. Due to the fact that the lateral force resisting system of the structure is, by default, the interior and exterior masonry walls, any modifications to them will need to be thoroughly reviewed to determine if seismic upgrades to the lateral system are required as a result of proposed building alterations. If any future additions are planned for this building, they should be seismically isolated from the existing structure.

Summary

The existing structure appears to be in sound condition and is performing satisfactorily. A thorough investigation of the existing structure is required if, by nature of the proposed renovations:

1) The capacity of the lateral force resisting system is decrease (i.e. reduce the amount of, or configuration of the existing masonry walls;

2) There is an increase the seismic loads on the building (i.e. additional building mass in or on top of the structure, such as mechanical roof top units);

3) There is an increase the effects of the wind loads on the building (i.e. additional roof top mechanical units/roof screens or other projections collecting wind and transferring additional lateral forces to the existing masonry walls).

PLUMBING SYSTEMS

Plumbing Fixtures

Majority of the existing plumbing fixtures in place within the building are original. Some have been replaced with newer battery sensor type flush valves and lavatory faucets (Refer plumbing pic 1).

Water closets are floor mounted, vitreous china units with a mix of manual and battery sensor operated flush valves. Stall type urinals are no longer allowed and not compliant.

Some flush valves have been retrofitted with new Rubbermaid Retrofit Kits (battery sensor type flush valves), (Refer plumbing pic 1).

The Nurse's room sink is wall mounted lavatory without any eyewash station. Eye wash station is inoperable and the tempering water system is not present.

Urinals in the toilet core rest rooms are vitreous china, wall hung units with manual operated flush valves. The flush valves are exposed in the room.

Lavatories are wall hung vitreous china with hot and cold faucets that are either metering or manually operated. Some existing lavatories have been retrofitted with self-metering manual push down Chicago faucets (Refer plumbing pic 2).

The kitchen hand-washing sink is a stainless steel, wall hung unit with a hot and cold gooseneck spout faucet with wrist blade handles. Kitchen scullery sinks are floor standing, stainless steel with coved inside corners. Kitchen food prep sinks with or without food disposer requires an indirect waste (not hard connected) to assure no cross contamination with sanitary sewer and food upon any waste back up (Refer plumbing pic 3).

Classroom sinks are stainless steel, self-rimming single compartment basins with a swing spout faucet with separate hot and cold handles. Several of the existing classrooms have self-rimming stainless steel sink with standard manual type faucets. These require reducing and limiting the hot water to a maximum of 110 degrees F hot water to dispense at the faucets. Kindergarten class room sinks are not receiving hot water at a timely manner or temperature at their faucets.

Mop basins are floor type, molded stone units with hot and cold faucet with hot and cold handles and elevated vacuum breaker. Drinking fountains are a mix of stainless steel and vitreous china, non-recessed. Non-electric water coolers are single level units with push button activation. Several existing water drinking fountains (non-chilled) on each floor do not include alcove-recessed with high-low handicapped accessible configurations (Refer plumbing pic 5).

Exterior hose bibs are frost proof type. There is no emergency eyewash/shower station located in mechanical room or nurse's room.

Custodian's closet mop service basin faucet does not have any integral vacuum breakers (Refer plumbing pic 4).

Existing original core restrooms are outdated as far back as the original school building was constructed in 1957 and do not meet MAAB requirements.

Roof Storm Drainage

No internal existing roof drains system for this school to report on. The existing pitched roof storm gutter system (external) currently discharges to site storm boots along the exterior walls of the school. Refer to area drain write up with in the sanitary section of this report.

Sanitary

The majority of the existing building sanitary waste system, which drains by gravity, is in poor condition. The sanitary effluent discharges below grade to the site sewer drain distribution system.

A duplex ejector (storm) was observed for ejecting ground/storm water. Observation could not be made at time of site visit for the boiler room entrance areaway drain due to debris covering up the entire areaway (Refer plumbing pic 3).

Existing underground (buried) piping could be not be observed, however the entire underground (buried) sanitary sewer should be tested for any leakage, backup and pipe aging condition by executing static pressure tests and video camera inspections.

A dedicated grease waste line is not in place for the school building. Currently point of use internal floor recessed grease trap is collecting the grease laden effluent from the 3 pot sink.

The above ground sanitary drainage and vent for the school building is currently using cast iron hub and spigot joints (3" or larger). Piping smaller than 3 inch is piped using DWV copper pipe.

Area drain could not be observed or verified if it ties back into the boiler room duplex sump basin. Areaway retention wall and surrounding grading is pitching towards the building. If it ties back into building this would be required to discharge into the sanitary drain system (Refer plumbing pic 8 and 9).

Domestic Cold Water Service

Insulation at most piping is of adequate thickness and in bad condition. Some insulation has been removed at locations where repairs have occurred. Some of this insulation was not replaced. Piping insulations are not present throughout the entire boiler room.

Piping is not adequately labeled throughout the building and vacuum breakers are present at the majority of fixtures as required by code. The original 1948 construction gate valves are in bad condition but the ball valves installed during the 1967 remodeling are in fair condition.

Valve tags are not present throughout the building. Piping is adequately supported where observed either by hangers or floor supports.

Hard water deposits were noted at multiple fixtures throughout the facility with the heaviest of the deposits being at the backflow preventers. The hard water deposits could be causing deterioration of the piping wall thickness throughout the facility.

The existing main domestic water supply enters the basement boiler room complete with dual water meter assemblies. No backflow preventer present for the domestic potable water distribution side. The other water meter assembly feeds the protected lawn and garden irrigation system.

Existing site irrigations systems are currently being fed from reduced pressure-principle backflow preventer located within the food service cafeteria area. Existing

boiler cold water make-up is currently being fed from reduced pressure-principle backflow preventers for HVAC equipment.

The domestic cold water piping distribution within the building supplying the original systems are distributed with “L” type copper tube with wrought or cast copper fittings. The majority of the piping is not insulated to prevent condensation on piping and deterioration of the pipe life expectancy. Exterior non-freeze wall hydrants are beyond their life expectancy (Refer plumbing pic 6).

Domestic Hot Water Service

One electric water heater was installed in 2010, which is being for the kitchen area fixtures. The remainder of the building is being supplied by cold water only.

The unit is a RUUD “Ruudglas Pacemaker” model no. PE2-80-2 with 80 gallon storage, having 240/208 volts / 4.5/3.38 KW. This water heater is missing a thermostatic hi/lo mixing valve station. This heater provides hot water to cafeteria food service area. Storage temperature is required to be a minimum of 140 degrees F. Temperature gauges not present to confirm. All other kitchen plumbing fixtures require having a minimum of 140 degree F hot water system. Electrical shut off switch panel appears to be too close to water piping. Refer to electrical report for determination.

Cafeteria employee hand wash sink hot water is being fed from a point of use electric water heater and shall not exceed a maximum of 110 degrees F.

The existing domestic hot water distribution system does not have a hot water circulation system to any plumbing fixtures. Heater would require a hot water piping heat trap; none currently present (Refer plumbing pic 5). No dead legs were observed with more than 12” in length.

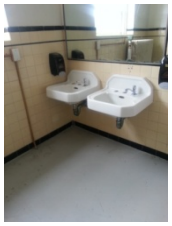
The existing domestic hot water is distributed in “L” type copper tube with wrought or cast copper fittings. The majority of the existing hot water (HW) piping is not insulated.

Natural Gas

One new gas service location is present. Service enters the existing basement boiler room and is regulated down to low pressure (11” WC). The exterior pressure regulator and gas meter are mounted on the exterior of the building and supported by a concrete house pad. The gas meter and primary pressure regulator are owned by the gas utility company.

The basement boiler gas supply currently feeds only the gas fired heating (HVAC) boilers. The existing gas piping appears to be distributed in ASTM A53 schedule 40 black steel pipe.

PLMBG. PIC 1



PLMBG. PIC 2

PLMBG. PIC 3

PLMBG. PIC 4

PLMBG. PIC 5

PLMBG. PIC 6

PLMBG. PIC 7

PLMBG. PIC 8

PLMBG. PIC 9

FIRE SPRINKLER SYSTEMS

Fire Protection System

There are no existing Fire Sprinkler Systems.

MECHANICAL

HVAC System

The building is heated via two Weil McLain 1188, cast iron, and steam boilers with a gross input of 3392 MBH each. The exact age of the boilers is unknown but they are in fair to good condition. The burners are dual fuel gas and oil, however the oil tanks have been removed and the boilers run exclusively on gas at the present time. The condensate receiver/boiler feed tank is uninsulated. A few of the steam traps were replaced last year but most of the terminal equipment traps are in need of servicing or replacement.

The original 1947 wing of the school is heated by directly by the steam. The newer 1967 wing is heated via a steam to hot water heat exchanger. The hot water is circulated by one of two base mounted centrifugal pumps. One of three expansion tanks has been abandoned in place. Missing pipe insulation around the heat exchanger and pumps is evidence of past maintenance.

Controls in the building are pneumatic and the compressor system was replaced two years ago. While the pneumatics work better in this school than most still much of the control on the terminal equipment is non-functional.

It has been reported that the water in the district is very corrosive and particularly at the Sheehan School it “eats” the pipe.

Visible insulation has been abated however it is assumed that insulation on concealed pipes will contain asbestos.

The heating and ventilation delivery in the 1947 wing is via ancient Herman Nelson unit ventilators with steam heat. While the fans typically run quietly the heating and outside air damper control are other issues. The dampers are typically non-functional and frozen into an open position. Most of the pneumatic controls are non-functional and there is evidence that the teachers often control temperature by manually disabling the fan when the room gets warm and then starting it again as the temperature drops.

The unit ventilators in the 1967 wing are American Air Filter (AAF) and hot water heated. Problems with the dampers and temperature control are similar to the Herman Nelson units.

Exhaust grilles in the ceiling of the coat cubby room in both wings were intended to remove excess air introduced by the unit ventilators. Virtually all of the exhaust fans are original or at least 20 year old. Several of the exhaust fans were not functioning at the time of the visit.

ELECTRICAL SYSTEMS

A site visit was made on October 13, 2014 to review the existing electrical systems.

Electric Service

Existing electric service initiates from existing utility pole-mounted transformer located adjacent to the school building. The transformer secondary extends via underground raceway system towards the existing Main Electric/Boiler room located in the school basement (ground floor). No issues related to outdoor service installation were observed.

Power Distribution Equipment

The utility transformer secondary feeder terminates in a 600 Amp Main Service Circuit Breaker, recently replaced. It is in good and operational condition. The service from the main circuit breaker extends to the main power distribution equipment (number of panels and breakers) located in the same room and throughout the building. All panels and circuit breakers (other than the main service breaker) are “old”, manufactured by Federal Pacific, appear to be in poor condition, but operational. It is assumed that all feeders to all panels throughout the building are “original”.

The existing electric service capacity shall be adequate for the current building program and building systems’ load, however, it may not be sufficient for any future school upgrades or building additions.

Most of the new elementary schools with partial air conditioning are designed for approximately 7-9 W/SF, while the existing Sheehan Elementary school’ s electrical

service can support approximately 3.5-4 W/SF based on existing electrical service size, voltage configuration and building SF size.

The majority of receptacles appear to be “original”. It is assumed that branch wiring feeding receptacles is also “original”. Receptacles in kitchen area were noticed to be non-GFCI which is not in compliance with the current electrical code (MEC). Non-GFCI receptacles and extension cords with non-GFCI outlets were observed in classrooms in close proximity to sinks.

Quantities of receptacles in classrooms appear to be inadequate, and therefore multiple pieces of equipment are plugged into the same receptacles utilizing plug strips.

The on-going issue of “arcing receptacles” was brought to our attention by Facilities. Apparently, during “plugging-in and unplugging” of the computer charging carts, the utilized receptacles “arc”, which leads to their continuous damaging following by their failing and replacement.

We were told that this school is one of two Westwood schools with large food refrigeration capacity, which advocates for the generator need.

Interior Lighting and Controls

The existing school lighting system consists of combination of “old” surface-mounted wraparound fixtures and pendant-mounted fluorescent wraparound and parabolic blade fixtures, and “replaced” surface- and pendant-mounted fluorescent wraparound fixtures. Attic has a few “old” incandescent lights. There are also some “newer” recessed lensed 2’x4’ fluorescent fixtures located mostly in the kitchen and library area. Overall, there is currently more of the “old” than “replaced” lights in the building. All fluorescent lights were recently retrofitted with T8 lamps and matching ballasts.

In general, lighting system provides adequate illumination levels throughout, except for Gym and Cafeteria. Gym is equipped with two different styles of lighting fixtures containing metal halide lamps. Lighting levels appears to be inadequate. Cafeteria lighting is a combination of 4’x4’ surface-mounted 6-lamp lights and retrofitted downlights, switched separately by toggle switches. Lighting levels appears to be inadequate. The “performance” lighting at stage are consists of two incandescent directional lights, switched only. There are no occupancy sensors in the building.

A typical classroom in 1967 building addition is equipped with four continuous rows of surface-mounted wraparound 2-lamp fixtures, controlled by three toggle switches in “by-row” manner. A typical classroom in “original” building area consists of two continuous rows of either surface- or pendant-mounted wraparound fixtures (this is the “replaced” version) or linear fluorescent fixtures with parabolic blades (“old” retrofitted lights). All classroom lights in “original” building are controlled by toggle switches in “by-row” manner.

All corridor lights are controlled by local switches. All other school spaces are controlled by local switches only.

Emergency Egress Lighting and Exist Signs

Existing emergency egress lighting system currently incorporates emergency battery units and remote light heads. In general, it appears to be adequate in most of locations, however, some areas need additional emergency lighting.

Existing exit signs concept and layout does not comply with code: many exist signs are not self-illuminating (printed), and there are locations in the building where exit signs are missing.

Fire Alarm System

Current fire alarm system is a “retrofitted original” – it’s a combination of “older” and “newer” fire alarm equipment and wiring. Smoke detection coverage appears to be inadequate for buildings without proper fire protection system (sprinklers). Quantity of signaling devices (horn/strobes and strobe only devices) appears to be insufficient as well. There are no signaling devices in classrooms. The FACP and the FA remote annunciator appear to be new, addressable, LCD type, manufactured by Fire-Lite Alarms/Honeywell. The retrofitted fire alarm system is connected to Fire Department via interior Radio Master Box and exterior antenna. The “old” exterior wall-mounted Master box appears to be abandoned in its existing location.

Exterior Lighting and Controls

Exterior building-mounted lights are provided at egress doors and along the building perimeter. Lighting fixtures appear to be in good operational condition, but not full cutoff distribution type. The lights are controlled via time clock.

Two flood lights are installed on the utility pole and serve as the school side parking lot lighting. It appears to be adequate, in good operational condition, although not of the full cutoff distribution type. Some further review in regards of the exterior parking lot lighting types, appropriate locations and controls is required.

Major Electrical Concerns

1. Majority of power distribution panels are old/beyond their life expectancy, and some panels became obsolete. Power feeders associated with “old” panels are beyond their life expectancy (fig 1).

2. Existing exit signs concept and layout does not comply with code: many exist signs are not self-illuminating (printed), and there are locations in the building where exit signs are missing (fig 2).

3. Receptacles near sinks and kitchen receptacles are non-GFCI type and have no GFCI protections (circuit breakers), which is not in compliance with the current electrical code (MEC).

4. Quantities of receptacles in classrooms and similar educational spaces are inadequate. Majority of receptacles and associated wiring appear to be beyond their life expectancy.

5. Emergency lighting in some areas is inadequate (ground floor spaces).

6. Fire alarm coverage (initiating and signaling devices) is inadequate (administration area, corridors, attic, etc.).

7. Existing lighting control system does not comply with current energy code: there are no occupancy sensors or programmable lighting control system, and there are no daylight sensors either.

FIG 1: OLD PANELS

FIG 2: EXISTING EXIT SIGNS

FIG 3: RECEPTACLES NEAR SINKS

Communication Systems

The Sheehan School is connected to the High School via fiber optic cable. The High School serves as the data and telephone service hub for the School District. Verizon FIOS is the primary Internet Service Provider (ISP). Comcast is the secondary (ISP).

The Sheehan School is equipped with a locking Communications Equipment Cabinet located in the library. The library is air conditioned using a window mounted unit. This same unit is the cooling source for the Communications Equipment Cabinet and will not be adequate as higher capacity equipment is introduced into the school.

All classrooms in the school have Wi-Fi access. Approximately 10% of the non-classroom spaces have limited Wi-Fi service. The current Wi-Fi coverage is adequate. Every classroom will be equipped with a projector over the course of the current school year.

The telephone switch for the school is capable of transmitting and receiving both digital and analog signals and it performs adequately.

The voice and data cable infrastructure is a combination of Category 5 and 5e rated cable. Category 5 cable is no longer a recognized standard in the industry as it does

not have the capacity to transmit data at the current industry standard of 1-Gigabit per second.

Cable TV over Verizon FIOS is available to the School however the CATV services are not distributed to the Classrooms at this time.

The paging system is comprised of speakers in every classroom. There are no speakers in the corridors or common areas (i.e. gym, cafeteria). The system is currently on a single All-Call zone with no capability of paging a single classroom or wing of the school. Teachers have paging capability from the classroom using the telephone interface.

The clocks are wireless. They are operated from a central master control that sets time using GPS technology and the system is in good working order.

Security Systems

The Intrusion Detection System is comprised of door contacts at all exterior doors and Sonitrol sound detection devices distributed in the Corridors only. Rooms with windows to the exterior are not equipped with sound or motion detection devices leaving them vulnerable to intrusion. The detection system is armed and disarmed by use of a keypad. There is no card access system in the building.

The Main Entrance is locked during the day. Visitors press a button at the door to activate a two-way intercom and one-way video transmission to the attendant's desk in the Main Office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the School.

The School has been wired for three IP-CCTV cameras.

Summary

1. A single locking Communications Equipment Cabinet located in the Library. The Library is air conditioned using a window mounted unit. This same unit is the cooling source for the Communications Equipment Cabinet and will not be adequate as higher capacity equipment is introduced into the school.

2. The Category 5 cable infrastructure does not perform at standards that newer equipment demands.

3. The paging system currently serves classrooms only. Corridors and public areas do not receive announcements. Paging is limited to all-call only.

4. The clock system is operated from a central master control that sets time using GPS technology.

5. CATV service is available at the school but not distributed throughout the building.

6. There is no card access system in the school.

7. The main entrance is equipped with a two-way intercom and one-way video transmission to the attendant's desk in the Main Office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the School.

8. The school is wired for three CCTV camera locations.

2.6 THURSTON MIDDLE SCHOOL

The following is a summary of the existing conditions at the Thurston Middle School. This report is based on our site visit on October 29, 2014.

SITE

Parking Lots/Access Drives

The total number of on-site parking spaces is 109 (104 standard spaces, 5 accessible spaces).

The east parking loop and parent queuing access drive is in overall good-fair condition. The bituminous pavement shows some minor wear and there are some isolated areas of mild fatigue cracking. The striping is clearly visible. The lot contains 14 perpendicular parking spaces and 39 angled parking spaces for a total of 53 parking spaces (48 standard spaces and 5 accessible spaces). Curbing along the east side of lot consists of bituminous curb in overall fair-poor condition due to plow damage (some pieces are broken and missing). Curbing along the west side and throughout the island is concrete curb in overall fair condition due to plow damage and deterioration in some areas. The area also serves as the dumpster loading/unloading and service area. The school does not have a loading dock. There is some pavement rutting in front of the dumpster area. There is no vertical curbing or bollards in front of the main entrance at the north end of this area and at the three (3) accessible parking spaces at the south end of this area.

The front bus loop/parking area (west of the building) is in overall good condition. The bituminous pavement shows minimal wear and cracking. Striping is clearly visible. Vertical granite curbing lines the east side of the area, as well as a portion of the west side near both the south entrance and north exit to the site. The granite curbing is in overall good condition. A portion of the remaining west side has no curbing, while the remaining portion where the parallel parking spaces are, has low profile bituminous berm that is in fair condition due to wear from plows. The area contains 27 perpendicular parking spaces, 17 parallel parking spaces, and 12 angled parking spaces, for a total of 56 spaces. The loop is one-way, and signage prohibits car traffic from the area in front of the building from 7:15-8:00 AM and from 1:00-4:00 PM.

Walkways

The bituminous walkway along the perimeter of the front bus loop is in overall good condition, showing minor wear and cracking A portion of the walkway at the southern end of the loop is concrete, and is in overall good-fair condition, showing some wear in parts. The remnants of a metal base of a parking sign was observed sticking out of the ground, adjacent to portion of concrete walkway, and poses a safety and tripping hazard.

The concrete walkway along High Street is in overall fair condition, showing some deterioration and cracking.

The bituminous plazas in front of the school are in overall good condition, showing only minor wear. The concrete sidewalk on the north end of the east parking loop is in overall good-fair condition, showing some wear. The bituminous walkway along the east edge of the east parking loop is in overall good condition, showing only minor wear. The bituminous walkway around the north edge of the school is in overall good condition, showing only minor wear.

Circulation

Pick-up and drop-off operations were not observed. Buses utilize the designated one-way loop on the west side of the school. Parent's drop-off and pick-up in the designated queuing area in the east parking loop.

Accessibility

1. Parking – There are five (5) accessible parking spaces provided on-site, which meets MAAB requirements for the 109 total parking spaces. There are no accessible parking spaces provided in close proximity to the main front egress on the west side of the building. The three accessible spaces just south of the gymnasium are not located near one of the main egress points on either the west or east side of the building. There is no curbing or wheel stops provided at the end of any of the accessible parking spaces.
2. Building Egress points –
    a. The southern front building egress is not accessible due to steps.
    b. Cafeteria (?) door on east side of building is not accessible due to step and lack of edge protection.
    c. The egress at the northeast corner of the modular building is not accessible due to stairs.
3. Walkways
    a. The walkway along High Street lacks detectable warning strips in three locations.
    b. A portion of the walkway along the front bus loop/parking area north of the school exceeds MAAB slope requirements and does not have a handrail. Where the walkway crosses the parking area for the old School House, there is no detectable warning strips provided.
    c. Where the front bus loop walkway intersects the entrance to the east parking loop, both curb cuts lack detectable warning strips.
    d. The concrete sidewalk on the north end of the east parking loop lacks detectable warning strips at the flush areas adjacent to parking spaces.
    e. The flush walkway area in front of the three accessible parking spaces (south end of the east parking loop) does not contain any detectable warning strips.

Utilities

1. Drainage
   a. It appears that runoff from the entire front bus loop/parking area discharges unmitigated and untreated to the Nahatan and High Street drainage systems.
   b. Some roof drains within the southern courtyard area discharge above grade. Pit to lower level egress appears very damp.
   c. No other known flooding or drainage issues.
2. Sewer – School is connected to Town Sewer. No known issues or concerns with sewer distribution.
3. Water- No known issues or concerns with water distribution system.
4. Fire Protection – Two hydrants observed within 300' of the school (one west of the building on High Street and one southeast of the building adjacent to the east parking loop). A majority of the north side of the building is beyond 300' from the closest hydrant, and therefore hydrant coverage appears to be inadequate.
5. Electric/Telecommunications – No known site electrical or telecommunication issues.
6. Gas – Natural gas service is available at the school. Gas pipeline markers were observed running across a portion of the grass playfields. The gas meter is located on the west side of the building.
7. Lighting – Site lighting consists of telephone pole mounted lights and building mounted fixtures. No known site lighting issues.

Play Areas

The grass playfields and associated structures (backstops, fences, bleachers, goals, etc.) appear to be in overall good condition. There is a paved path along the southwest perimeter of the fields, but no accessible paths around the remaining portions of the field or to the team benches and spectator seating areas. Therefore, the play fields lack full MAAB compliance.

Miscellaneous Site Features

The concrete ramps and landings on the east side of the building are in fair condition, and show some signs of deterioration and cracking.

PAVEMENT RUTTING AT DUMPSTER AREA

CONCRETE CURB DAMAGE/DETERIORATION NEAR NORTHEAST ENTRANCE

LACK OF CURBING, WHEELSTOPS AND BOLLARDS AT NORTHEAST ENTRANCE

WALKWAY ALONG FRONT BUS/PARKING LOOP THAT EXCEEDS MAAB SLOPE REQUIREMENTS

CURB RAMP LACKING DETECTABLE WARNING STRIP AT INTERSECTION OF FRONT BUS LOOP AND PARENT QUEUE LOOP

ARCHITECTURE

SMMA visited the site late afternoon of October 23, 2014. The weather was cool and raining. The school facility consists of a multi-level school building constructed in 1939 and renovated and added to in stages with the most recent work done in 2009. The multiple additions to the school have not been consistent with the original design for the school and only addressed the functional and educational needs of the school. The building area is approximately 92,278 GSF and has 798 students in grades 6-8. The building faces west towards High Street and has a tower structure that houses a cell phone communication antenna. The bus lane is in front of the school is shared with visitor parking. Staff and teacher parking and service drive are on the east side or rear of the building. The main entry is at grade level and identified by the large canopy, but it is remote from the administration office. Other entries around the building are at grade level. The playing fields are to the north and east of the school. The service area is not visible from High Street.

Enclosure

The facility is a composition of six connected buildings. The front consists of the original school; north end addition, south end gymnasium, and north end modular classrooms and are located on the west side. The east side or rear of the facility consists of the cafeteria/kitchen and the 8th grade classroom building. The facility is two stories in height. There are two courtyards between the front and the back. The roof over the classroom parts of the facility is low sloped black rubber. The boy's gymnasium has a gable roof with leaks at the gable ends. The building walls of the original and early additions are load bearing masonry construction with brick and stone exterior. The 8th grade classroom building has brick veneer cavity wall with metal stud construction and drywall finish. The west side near the entry and the chimney are areas for repointing and repair. There are other areas around the building needing attention. Expansion joints and sealant need to be checked, repaired, or replaced. Window openings in the original parts are single glazed single hung aluminum frames and single glazed awning type steel frame. The counter balances in the aluminum windows are failing and in constant repair. The single glazed steel frame windows are well past their useful life and should be replaced. The clad wood windows with insulated glass in the 8th grade building are in good condition. Both canopies at the south end of the gym have roof leaks resulting in damage to the soffit.

Interior

The interior partition materials and finishes vary throughout the facility. The partitions in the older parts of the facility are painted concrete block and glazed block. Other finishes found in the facility are: painted plaster, painted drywall, and ceramic tile. The condition of wall finishes is generally fair to good. The floor at the entry to the Administration area is red tile. The kitchen floor finish is vinyl tile. The office floor finish is carpet. The restroom floor finish is typically ceramic tile mosaics. The second floor finish in the original building is hard wood. Locker room floors are

concrete. Door frames are typically hollow metal. The interior wood doors are in poor condition. The hardware is also in poor condition. Many keys are required to access all parts of the building, and the collection of locksets is worn and problematic. Classroom ceilings are acoustic ceiling tiles with recessed light fixtures. The classroom casework in the older parts of the facility is in fair to good condition, this include three science classrooms and prep room in the original building. Fume hoods are not being used perhaps because middle school curriculum does not use caustic chemicals. Science casework in the new science classrooms is good. The toilet partitions have been replaced recently. Urinal screens are not installed. Lecture hall seating on steep risers does not have 42" high guards.

Vertical Circulation

This is a two story school with multiple levels, stairs, and ramps. There is one elevator and a wheel chair lift for the entire facility. In the older buildings, the stairs have abrupt nosings and need a 42" high guard between runs and the upper landing to comply with the current building code. Some handrails do not have extensions at landings.

Accessibility

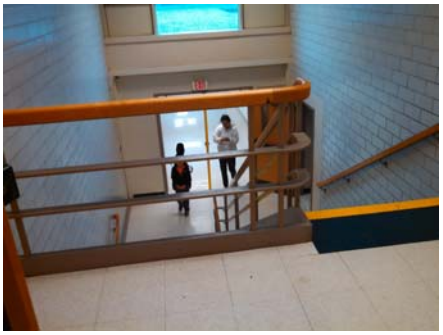
There are no power door operators located at the accessible entry on the accessible route to the building. Once inside the building most of the building is accessible, but access from the gymnasium to and from the girl's locker room is problematic. Interior door hardware is a combination of knobs and lever handles. Other non-compliant items are:

- Insufficient maneuvering space at some locations.
- Science and Art classroom sinks are not compliant
- Not all toilets are accessible
- Missing signage
- Drinking fountains
- Thresholds exceed ½"and some locations have steps.
- Stair and ramp handrails are not compliant

Security

All operable windows have locking hardware. Exterior doors have exit devices (panic hardware) and are locked to prevent unauthorized entry. The school has a corridor located motion detection intrusion alarm and 4 cameras. The entry doors have an intercom with remote release. The Office /Reception area has visual control of the entry, but this entry is not accessible. Classroom door hardware does not permit lock-down without the teacher leaving the classroom.

ATTIC LOUVER LEAK



NON-COMPLIANT GUARD AND HANDRAILS

REPOINT BRICKS AT MAIN ENTRY

SCIENCE LAB CASEWORK IS WRONG FOR MS

STRUCTURAL

Purpose

The purpose of this report is to broadly describe the existing structure, comment on the structural integrity of the building and comment on the structural code issues related to any future renovations and expansions.

Basis of the Report

This report is based on visual observations during our site visit on October 13, 2014, and structural design drawings of the 1997 addition/renovation, and the 2009 modular addition. Structural design drawings of the original construction and additions prior to 1997 were not available.

Building Description

The school, originally constructed in 1939, has undergone several additions and renovations and incorporates several structural systems. The original multistory 1939 portion appears to be comprised of wood joists supported by masonry walls and some supplemental steel girders and columns. This portion includes a cast in place concrete foundation visible in the basement and adjoining crawl spaces. The wood rafters that frame the roof are visible in the attic, as well as a portion of the steel trusses that support the roof above the gymnasium.

The framing above the cafeteria and kitchen area appears to be framed by a system of open web steel joists and structural steel beams and columns. The ground floor of this area appears consist of concrete slab-on-grade with no basement.

The addition to the north of the 1939 section that includes several classrooms and the library/media center is structured with cast-in-place concrete pan-joist system supported by cast-in-place concrete beams and columns. This two story portion of the building also appears to consist of a ground floor slab-on-grade with perimeter concrete foundation walls.

Construction drawings from 1997 indicate a two story classroom addition was constructed on the north side of the school that is framed with structural steel beams, girders and columns, supported by concrete foundation walls and isolated spread footings. The second floor slab consists of a 4½" thick concrete slab (2½" of concrete on 2" composite metal deck), and the roof beams are spanned with 1½" corrugated metal roof deck). This addition also includes diagonal steel brace frames as the designated lateral force resisting system. Also in 1997, a second gymnasium was constructed and framed with reinforced concrete masonry (CMU) walls that support long span steel joists. The CMU walls appear to be designed to resist lateral loads.

There are two modular additions at this school as well. On the North West side, primarily wood framed modular system was added and not construction documents are available for review. On the North East side, design documents of the 2009

modular addition are available for review. The modular framing of this addition consists of 1 ½" metal roof deck supported by light gauge metal purlins, which in turn are supported by structural steel girders and columns.

Lateral Force Resisting System

There appears to be no deliberately designed lateral force resisting system as part of the original structural design or the older additions. The lateral loads for these older sections of the building are resisted by the exterior and interior masonry walls. This is fairly typical of school structures built in this time period, as deliberate lateral force resisting systems (i.e. shear walls, brace frames, moment frames) were not addressed by the building code until 1973. The 1997 additions address lateral forces with detailed diagonal braces and masonry shear walls.

Existing Conditions

There building appears to be in sound structural condition with no substantial defects. There are some signs of water infiltration in the attic above the gymnasium, but this appears to be limited to the vertical surfaces of the masonry walls, as the wood members appear to be in good condition with no signs of rot or decay.

Primary Structural Code Issues Related to the Existing Structure

If any repairs, renovations or additions are made to the structure, a check for compliance with the Massachusetts State Building Code (780 CMR, Chapter 34 "Existing Structures") is required. The intent of 780 CMR, Chapter 34 is to permit repairs, alterations, additions and/or a change of use without requiring full compliance with the code for new construction. However, depending on the scope of any proposed renovations, a comprehensive structural analysis may need to be performed to determine the impact on the existing structural system. Due to the fact that the lateral force resisting system of the older portions of the structure are, by default, the interior and exterior masonry walls, any modifications to them will need to be thoroughly reviewed to determine if seismic upgrades to the lateral system are required as a result of proposed building alterations. If any future additions are planned for this building, they should be seismically isolated from the existing structure.

Summary

The existing structure appears to be in sound condition and is performing satisfactorily. A thorough investigation of the existing structure is required if, by nature of the proposed renovations:

1) The capacity of the lateral force resisting system is decrease (i.e. reduce the amount of, or configuration of the existing masonry walls;

2) There is an increase the seismic loads on the building (i.e. additional building mass in or on top of the structure, such as mechanical roof top units);

3) There is an increase the effects of the wind loads on the building (i.e. additional roof top mechanical units/roof screens or other projections collecting wind and transferring additional lateral forces to the existing masonry walls).

PLUMBING SYSTEMS

Plumbing Fixtures

Majority of the existing plumbing fixtures in place within the building are original. Some have been replaced with newer battery sensor type flush valves and lavatory faucets (Refer plumbing pic 1).

Water closets are floor mounted, vitreous china units with a mix of manual and battery sensor operated flush valves. Stall type urinals are no longer allowed and not compliant. Some flush valves have been retrofitted with new Rubbermaid Retrofit Kits (battery sensor type flush valves), (Refer plumbing pic 1).

The Nurse's room water closet is a floor mounted, vitreous china. Urinals in the toilet core rest rooms are vitreous china, wall hung units with manual operated flush valves. The flush valves are exposed in the room.

Lavatories are wall hung, vitreous china with hot and cold faucets that are either metering or manually operated. Some existing lavatories have been retrofitted with self-metering manual push down Chicago faucets (Refer plumbing pic 2).

The kitchen hand-washing sink is a stainless steel, wall hung unit with a hot and cold gooseneck spout faucet with wrist blade handles. Kitchen scullery sinks are floor standing, stainless steel with coved inside corners. Kitchen food prep sinks with or without food disposer requires an indirect waste (not hard connected) to assure no cross contamination with sanitary sewer and food upon any waste back up (Refer plumbing pic 3).

Classroom sinks are stainless steel, self-rimming single compartment basins with a swing spout faucet with separate hot and cold handles. Several of the existing classrooms have self-rimming stainless steel sink with standard manual type faucets. These require reducing and limiting the hot water to a maximum of 110 degrees F hot water to dispense at the faucets.

Mop basins are floor type, molded stone units with hot and cold faucet with hot and cold handles and elevated vacuum breaker. Drinking fountains are a mix of stainless steel and vitreous china, non-recessed. Non-electric water coolers are single level units with push button activation. Several existing water drinking fountains (non-chilled) on each floor do not include alcove-recessed with high-low handicapped accessible configurations (Refer plumbing pic 5).

Exterior hose bibs are frost proof type. The emergency eyewash/shower station located in mechanical room or nurse's room are non-functional. Custodian's closet mop service basin faucet does not have any integral vacuum breakers (Refer plumbing pic 4).

Existing original core restrooms are outdated as far back as the original school building was constructed in 1939 and do not meet MAAB requirements. Existing lab rooms currently have integral acid epoxy resin resistant built in sink bowls with faucets having integral vacuum breakers built into the faucets with serrated nozzle tips (Refer plumbing pic 10). The new portions of the building wings A and B constructed in the year 2009 are all in excellent condition (Refer plumbing pic 19).

Roof Storm Drainage

There are no internal existing roof drain systems from the original building to report on. The storm system exits at one or two points along each building and appears to connect to the site storm water system. Secondary (emergency) storm system is employed for the B wing of the new portion of the school discharging to grade for visual alarm maintenance awareness.

Sanitary

The majority of the existing buildings sanitary waste system, which drains by gravity and then connects to the existing site sewer system, appears to be in good condition.

Existing underground (buried) piping could be not be observed, however the entire underground (buried) sanitary sewer should be tested for any leakage, backup and pipe aging condition by executing static pressure tests and video camera inspections.

A dedicated grease waste line is not in place for the school building. Currently point of use internal floor recessed grease trap is collecting the grease laden effluent from the 3 pot sink.

The above ground sanitary drainage and vent for all three buildings are currently using cast iron hub and spigot joints (3” or larger). Piping smaller than 3 inch is piped using DWV copper pipe.

Domestic Cold Water Service

Insulation at most piping is of adequate thickness and in fair condition. Some insulation has been removed at locations where repairs have occurred. Some of this insulation was not replaced.

Piping is not adequately labeled throughout the building. Vacuum breakers are present at the majority of fixtures as required by code. Original 1939 construction gate valves are in fair condition, and the ball valves installed during the 2009 remodeling are in good condition. Valve tags are not present throughout the building. Piping is adequately supported where observed either by hangers or floor supports.

Hard water deposits were noted at multiple fixtures throughout the facility with the heaviest of the deposits being at the backflow preventers. The hard water deposits could be causing deterioration of the piping wall thickness throughout the facility.

The existing main domestic water supply enters the basement boiler room complete with a water meter assembly. No backflow preventer present with the water service.

Existing boiler cold water make-up is currently being fed from reduced pressure-principle backflow preventers for HVAC equipment.

The domestic cold water piping distribution within the building supplying the original systems and wing B are distributed with "L" type copper tube with wrought or cast copper fittings. The majority of the piping is insulated to prevent condensation on piping.

Domestic Hot Water Service

One indirect boiler water to water exchanger with cement lined steel storage tank and two electrical domestic storage water heaters are being used for the original building and the new portion of bldg. Breakdown provided below describing the hot water distribution systems.

1. Original base building: Original indirect storage with steam to water heat exchanger bundle has been recently relined with cement. Indirect cement lined storage tank is currently not insulated. Storage capacity is unknown, information not available (built in 1939). Tank has been recently repaired with cement lining.
2. Original 1939 building: One A.O. Smith electric storage water heater model no. DRE 120 with 119 gallon storage, having 240 volts / 6.0 KW. Installed approx. two years ago. This water heater is missing a thermostatic hi/lo mixing valve station. This heater appears to provide hot water to cafeteria food service area. Storage temperature is required to be a minimum of 140 degrees F. Temperature gauges not present to confirm. Cafeteria employee hand wash sinks would require tempering down to 110 degrees F.
3. New school "A" wing building, core restrooms: A.O Smith gas fired storage water heater (2009) model no. GPD-40 with 40 gallon storage and 40 CFH gas consumption. This heater provides hot water to the core restroom lavatories and mop sink (including staff lavatories).

The existing domestic hot water distribution system to the original school building does not appear to have a hot water circulation system to the plumbing fixtures. No dead legs were observed with more than 12" in length.

The existing domestic hot water is distributed in "L" type copper tube with wrought or cast copper fittings. The majority of the existing hot water (HW) piping is insulated for energy savings. Some portions of insulation are missing from some portions of the hot water piping.

Lab Systems

The original building doesn't appear to have a dedicated protected hot and cold water distribution system to the lab class room currently at this time.

Acid neutralization pretreatment system appears to have failed. Alarm panel was active and sending out a message PH out of specification. This system should be wired to building management system, not verifiable.

The existing lab class rooms do not currently have a tempered hot water system to the emergency equipment, due to the central emergency mixing station was taken off line.

Protected none tempered water is supplying the emergency combination eye wash/showers. Several are not MAAB/ADA compliant. In addition, the activation pull handles have been placed above adjacent cabinetry as to avoid obstructing into them. These need to be placed back in their correct installation positions (Refer to ANSI Z358.1-2009 for all installation requirements, including ADA clearances).

Existing acid waste / acid vent systems from the laboratory sinks currently discharge to a passive acid neutralizing lime chip tank system located on the first floor (ground) level portion of the building below the stair well. Piping appears to be Schedule 40 polyethylene (PE) with electrical heat fusion type fittings. This system is then connected to a floor recessed duplex ejector pump basin to be lifted to meet the sanitary building gravity invert. System then discharges by gravity, prior to connecting to the building sanitary main drain (Refer to plumbing pics 11 and 16).

Natural Gas

Two new gas service locations are present, one services and enters the existing basement boiler room and the other feeds the two new building additions. These both appear to be regulated down to low pressure (11" WC). The exterior pressure regulators and gas meter are mounted on the exterior of the building and supported by a concrete house pad. The gas meters and primary pressure regulators are owned by the gas utility company.

The basement boiler gas supply currently feeds the culinary gas stoves, class room lab gas turrets and gas fired heating boilers. New water heater and food service equipment in the kitchen area are currently all electric operating.

All lab class rooms are provided with emergency master gas shut off cabinets to shut down all gas turrets within class room. This includes electrical switch type EPO. Not push button types.

The existing gas piping appears to be distributed in ASTM A53 schedule 40 black steel pipe.

PLMBG. PIC 1

PLMBG. PIC 2

PLMBG. PIC 3

PLMBG. PIC 4

PLMBG. PIC 5

PLMBG. PIC 6

PLMBG. PIC 7

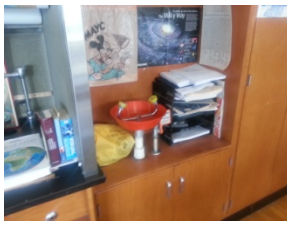
PLMBG. PIC 8

PLMBG. PIC 9

PLMBG. PIC 10

PLMBG. PIC 11

PLMBG. PIC 12



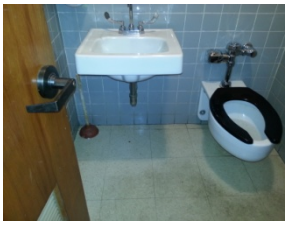
PLMBG. PIC 13

PLMBG. PIC 14

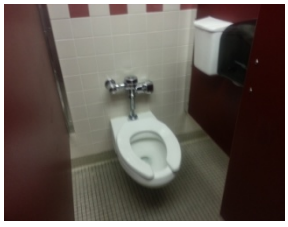
PLMBG. PIC 15

PLMBG. PIC 16

PLMBG. PIC 17



PLMBG. PIC 18



PLMBG. PIC 19

PLMBG. PIC 20

FIRE SPRINKLER SYSTEMS

Sprinklers

The school building is currently being served from an 8" fire service line from the Nahant Street water main. Cross connection control is provided by use of a 6" FEBCO model 806 type YD supervised double check detector check backflow preventer valve assembly on the fire service as it enters the building located in the boiler room (Refer to fire protection pic 4).

The entire school building (including the two newer A and B wings) appear to be fully protected throughout with a wet automatic fire suppression system.

Original School Building:

A dry system has been observed with a dry alarm check valve riser located on the upper floor custodial sink closet, providing coverage within the attic space below the original building attic space (Refer to fire protection pic 8).

A fire department connection was not observed on the school building. This system appears to have been designed in accordance with NFPA Standard 13, the Massachusetts State Building Code and the Westwood Fire Department requirements.

Sprinklers are supplied from sprinkler control valve stations, consisting of a monitored shut-off valve and flow switch. Inspector's tests are provided at remote locations. The original portion of the school building has one sprinkler control valve assembly located in the basement housed within a dedicated sprinkler valve room. These sprinkler zone control valves will report sprinkler flow to the fire alarm system on building zone for zone basis (Refer to fire protection pics 5 and 6).

Each floor area has existing fire hose valve cabinets presently at each floor level for the original school building portion (Refer to fire protection pics 6 and 7).

Fire Protection System

Fire protection wet system and dry system piping was installed with schedule 40 piping with threaded fittings for piping sizes 2" and less and for sizes 2½" and larger, schedule 10 piping with roll grooved fittings and couplings are used.

All valves controlling the flow of water shall be equipped with supervisory devices that report to the Fire Alarm system (Refer to fire protection pic 5).

Existing kitchen hood is not currently protected with a dry agent "Ansul R-102" packaged hood suppression type system.

Wet system alarm check valve riser flow test information was obtained test tag conducted by TYCO Sprinkler Grinnell dated 08.07.2014:

- Static Pressure: 60 psi
- Residual Pressure: 50 psi
- Flow: Unknown GPM

School building was observed not having fire pump present, nor it being suggested one is required.

FIRE PROT. PIC 1

FIRE PROT. PIC 2

FIRE PROT. PIC 3

FIRE PROT. PIC 4

FIRE PROT. PIC 5

FIRE PROT. PIC 6

FIRE PROT. PIC 7

FIRE PROT. PIC 8

MECHANICAL

HVAC System

The HVAC systems in Thurston are varied depending on the age of the addition or renovation.

Boiler Plant

The primary heat source the entire building except for the 7th and 8th grade modules is a pair of 3550 pounds/hr cast iron steam boilers. The condensate receiver/boiler feed tank has been replaced in the past two or three years and is in good condition. There was no evidence of a regular boiler water treatment program.

The boilers were last replaced in 1992 and are in fair condition. While there have been problems with one of the heat exchangers in the past they now appear to be in good condition and the pumps have been well maintained. The boilers are controlled by a local Honeywell “Energy Efficiency” panel.

A few of the steam traps were replaced last year but many others have not been serviced for many years and it is safe to assume that steam blows by.

There are two steam to hot water heat exchangers each with a pair of pumps that serve new/more recently renovated portions of the building. The larger hot water system serves the Cafeteria, Art Rooms and the area of the 1997 Addition. The small loop serves the back 1992 addition.

Any asbestos materials in the boiler room were abated at the time of the boiler replacement in 1992. Wherever there has been subsequent maintenance or repairs the piping is now uninsulated and approximately 25% of the hot piping in the boiler plant is bare. It is probable there is remaining asbestos insulation where pipes are concealed in walls or ceilings.

The buildings pneumatic controls have been problematic but some attempt has been made to maintain the compressors and air dryer. One of the two compressors on the air tank appears to be new.

HVAC Delivery Systems

Much of the original 1938 building is still serviced by steam unit ventilators (Nesbitt) supplemented by steam finned radiation. Some of the units were replace in the 1991 renovations. The controls at the room level are largely non-existent at this point, the pneumatics having failed years ago. Control valves and outside air dampers on the UVs are typically fixed in the open position. If boiler pressure drops below 15 psi more remote classrooms will become cold. At the time of the visit the attic exhaust fans serving the area were not working.

ORIGINAL HERMAN NELSON UNIT VENTILATOR

TYPICAL CLASSROOM VENTILATION EXHAUST OPENING ALMOST COMPLETELY BLOCKED BY A STORAGE CABINET.

The Auditorium is served by a Heating and ventilating unit which is in a recessed cavity in the attic. The heating coil failed several years ago but due to its location it cannot be accessed for repair or replacement.

The Science rooms in the 1938 portion of the building are still served with the original Unit Ventilator system and have no specialized exhaust systems.

The 1992 Addition is served by hot water unit ventilators equipped with DX cooling coils however no remote condensers were ever installed. It was reported that several of these how water coils froze causing considerable damage a year or two ago. The Pneumatic controls have since been abandoned and the outside air closed off and the heating valves manually set wide open. This “solution” leaves the wing without adequate ventilation.

The 1997 wing is also served by unit ventilators this time without cooling potential. As with all the UVs around the school the original pneumatic controls are non-operational and the control valves and outside air dampers are wide open. Local temperature control is accomplished by the individual teacher starting and stopping the UV fan.

The original portion of the gym has an attic H&V unit. The gym addition has two gas fired Renzor H&V units on the roof. These latter units have electric controls with an occupied timer.

The library has two Nesbit Unit ventilators and fin tube behind the perimeter book shelves and one interior ceiling mounted UV. The Thermostat for this latter unit was completely obscured behind books.

The Cafeteria Annex has a 10 ton with gas fired heat and DX cooling and local DDC control.

The large Art Room and Music Room each have 4 Modine Unit heaters, one in each corner and a floor level exhaust. It is reported that the hot water piping to these units is "rotted out."

The small art Room is carved out of a semi subterranean passage and a single unit ventilator and no dedicated exhaust. There have been persistent moisture problems related to the below grade location, rotting and leaking pipes not to mention drying of various art and sculpting materials. There was a strong musty odor in this room.

Several smaller special purpose rooms have been carved out of closet spaces or subdivided leaving areas with inadequate ventilation or temperature control.

The 7th grade modular units (circa 2001) have individual gas fired, Carrier, rooftop air conditioning units of 3-1/2 to 4 tons DX cooling. While showing their age, these units reportedly operate "pretty well". The ten newer 2009 8th grade modulars have individual Trane RTUs. Most of these units are 1400 CFM with a nominal 4 tons of cooling and gas furnace heat. RTU 7 is 5 tons and RTU10 10 tons.

ELECTRICAL SYSTEMS

A site visit was made on October 13, 2014 to review the existing electrical systems.

Electric Service

Four total electric services are provided to the school building - three services are dedicated for school's direct utilization, and the last one is supporting the cell tower installed at the school's roof. The three electric services for school are arranged as outlined further. Electric service #1 supports the "original" school building and the 1997 building addition. It initiates at the street pole and extends underground towards the existing NSTAR transformer located in an underground transformer vault in front of the school building. Electric service #2 was provided directly to Modular classroom building ("L-shape" building added at the "original" school left-front corner). Electric service #3 was provided to a 2009 building addition located at the back (designed as a modular building) via a new pad-mounted transformer. All three electric services dedicated for school use are metered separately. No issues related to outdoor services' installation were observed.

Power Distribution Equipment

Service #1: the transformer secondary feeder terminates in a 3-section 1200 Amp 120/208v 3 phase 4 wire Main Switchboard equipped with a 1200 Amp Main disconnect Switch and a number of branch circuit breakers. It's manufactured by GE, appears to be "old" and in poor condition, although operational. The service from switchboard extends to the main power distribution equipment located in the same room and to panels located throughout the "original" building and the 1997 school building addition.

Majority of the downstream panels in this area appear to be "old" and in poor condition, although operational. One panel in the main electric room ("DP-1"), three panels in the boiler room ("DL", "DP", DB"), all panels in the Maintenance area, and all panels in the 1997 school building addition and all modular buildings "are "newer" and in good operational condition, while the remaining panels throughout the building appear to be "old", although in operational condition.

Two panels located in janitor closet near Lobby 120 are in violation of electrical code clearance requirement. Two kitchen panels are also blocked by kitchen appliances, leaving no clearance in front of them, and one of them doesn't lock properly. Panels in both gyms are installed in very small closets allowing no appropriate clearances required per code. In addition, the same closets contain "old" lighting control equipment (boys gym).

Majority of panels are manufactured by GE. It is assumed that feeders to all "original" panels within "original" school building area are "original" ("old").

Service #2 terminates in a 400 Amp 120/240v 1 phase 3 wire panel equipped with a 400 Amp Main Circuit Breaker. It's manufactured by Square D, appears in good and operational condition. The service from main panel extends to downstream panels located throughout the L-shape Modular building. All downstream panels are in good operational condition.

Service #3 terminates in a 600 Amp 120/240v 1 phase 3 wire panel equipped with a 400 Amp Main Circuit Breaker. It's manufactured by Square D, appears in good and operational condition. The service from main panel extends to downstream panels located in electric closets of this are. All downstream panels are in good operational condition.

Majority of receptacles in "original" building area appear to be "original". It is assumed that branch wiring feeding receptacles here has never been replaced. Branch wiring to classrooms' unit ventilators appear to be "original" too.

Quantities of receptacles in classrooms located in "original" building and in classroom modular building at the school front appear to be inadequate (3-4 per classroom), and therefore multiple pieces of equipment are plugged into the same receptacles utilizing plug strips It is assumed that branch wiring feeding "original" receptacles is "original".

Receptacles in kitchen area were noticed to be non-GFCI which is not in compliance with the current electrical code (MEC). Non-GFCI receptacles were also observed in media center, life skills, and some other areas where they are installed in close proximity to sinks.

The usage of all three existing electric services may have reached or approaching the maximum available capacity, and therefore it may not be insufficient for any future school upgrades. A more detailed investigation will be needed in order to evaluate each of three electric services independently and address based on served SF areas. For record, most of the new middle schools with partial air conditioning are designed for approximately 8-10 W/SF.

Interior Lighting and Controls

Existing lighting system consists mostly of 2- and 3-lamp recessed type fluorescent lensed and parabolic lighting fixtures. All fluorescent lights were recently retrofitted with T8 lamps and matching ballasts, except for a few closets equipped with “older” T12 lamps.

In general, the existing school lighting system provides adequate illumination levels throughout, except for a few areas such as Art room located below Lecture room, Boys Gym, Nurse office area, egress passage from Boys’ and Girls’ locker rooms, where lighting shall be addressed. A few storage rooms near Administration office area have ceiling lights with pull chains and no switches. Boys Gym is equipped with recessed 4-lamp 2’x4’ fluorescent lighting fixtures. Illumination levels in Boys Gym appear to be inadequate, and in addition, the lighting control arrangement here consists of an “old” switch bank installed inside of the Gym’s electrical panel closet, which appears to be an issue with electrical code requirements for maintenance and working clearances. Girls gym is equipped with pendant 2’x4’ fluorescent lighting fixtures with wire guards. Lighting levels here are acceptable, however, the lighting control arrangement appears to be unacceptable – there are no local switches, and “control concept” is done by turning on/off circuit breakers in the power panel, which constantly “opened” for teacher’s access. It was also noticed that lighting in the boiler and pump rooms require some upgrading due to either lacking of lighting fixtures in appropriate locations or lights not operating.

Lighting in a typical classroom located consists of 2’x’4’ 2- or 3-lamp fluorescent fixtures, lensed and/or parabolic, controlled by toggle switches. Lighting levels here are adequate. All classrooms are equipped with occupancy sensors.

All corridor lights are controlled by local switches, either key-operated or toggle. All other school spaces are controlled by local switches only.

The Lecture room lighting is a combination of 6-lamp 4’x’4’ recessed fluorescent lensed lights, switched in “by-raw” manner via wall-mounted key-operated switches, and incandescent downlights. Illumination levels here are acceptable.

"Original cafeteria" area and kitchen are equipped with recessed 2'x4' 2-lamp lensed fluorescent fixtures, while the "Annex cafeteria" area has recessed 2'x4' 3-lamp parabolic fluorescent fixtures, all switched by toggle switches.

Emergency Egress Lighting and Exist Signs

Existing emergency egress lighting system is a combination of emergency battery units and remote light heads in "original" building and Modular classroom buildings, and integral emergency ballasts in 1997 school building addition. In general, it appears to be adequate, however, there are a few locations in the building required additional emergency lighting.

Existing exit signs are mostly LED type with integral back-up batteries. There are a few locations in the building where exit signs are missing or provided by a non-illuminating printed type.

Fire Alarm System

Current fire alarm system is a "retrofitted original" – it's a combination of "older" and "newer" fire alarm equipment and wiring. Smoke detection coverage appears to be adequate for buildings with a full coverage fire protection system (sprinklers), however, the quantity of signaling devices (horn/strobes and strobe only devices) appears to be insufficient in some building areas. There are no signaling devices in classrooms located in "original" building and in the front modular building, nurse office area and some other locations. The FACP appears to be new, addressable, LCD type, manufactured by EST. The retrofitted fire alarm system is connected to Fire Department via existing interior Radio Master Box and exterior antenna. The "old" exterior wall-mounted Master box appears to be abandoned in its existing location.

Exterior Lighting and Controls

Exterior building-mounted lights are provided at egress doors and along the building perimeter. Approximately half of these lights appear to be in poor condition, although operational.

There are two flood lights mounted on utility poles and one pole-mounted double-head light dedicated for parking lots. They appear to be in good condition.

All exterior lights are controlled via five time clocks located in different electric closets. In addition, the flood lights are wired via photocells.

Major Electrical Concerns

1. Majority of power distribution panels are old/beyond their life expectancy, and some panels became obsolete. A few panels (kitchen panels, janitor closet panels, gym panel) are installed in violation of the electrical code for clearances. Power feeders associated with “old” panels are beyond their life expectancy (fig 1).

2. Kitchen receptacles are non-GFCI type and have no GFCI protections (circuit breakers), which is not in compliance with the current electrical code (MEC), (fig 2).

3. Existing lighting control system does not comply with current energy code: although there are occupancy sensors in classrooms, the rest of lights are controlled by switches only (no occupancy sensors). Also, there are no daylight sensors in the building.

FIG 1: POWER DISTRIBUTION PANELS

FIG 2: KITCHEN RECEPTACLES

Communication Systems

The Thurston School is connected to the High School via fiber optic cable. The High School serves as the data and telephone service hub for the school district. Verizon FIOS is the primary Internet Service Provider (ISP). Comcast is the secondary (ISP).

Data communications in the Thurston School are distributed from three data closets. Two of the rooms are air conditioned. The third data closet room is not air conditioned, potentially reducing the useful life of the equipment. The data closets are interconnected via fiber optic cable.

All classrooms in the school have Wi-Fi access. Approximately 10% of the non-classroom spaces have limited Wi-Fi service. The current Wi-Fi coverage is adequate. Every classroom is equipped with a projector. 8th Grade classrooms are equipped with interactive white boards.

The telephone switch for the school is capable of transmitting and receiving both digital and analog signals and it performs adequately.

The voice and data cable infrastructure is a combination of Category 5 and 5e rated cable. Category 5 cable is no longer a recognized standard in the industry as it does not have the capacity to transmit data at the current industry standard of 1-Gigabit per second. Cable TV over Verizon FIOS is available in the Library.

The Paging System is comprised of speakers in every classroom. The system does not interface with the telephone switch making paging from the classrooms impossible. Although new speakers were added to classrooms and corridors that were renovated in 1997 the overall system is nearing the end of its useful life.

The clocks are battery operated. Maintaining a common time standard throughout the building is not possible.

Security Systems

The Intrusion Detection System is comprised of door contacts at all exterior doors and Sonitrol sound detection devices distributed in the corridors only. Rooms with windows to the exterior are not equipped with sound or motion detection devices leaving them vulnerable to intrusion. The detection system is armed and disarmed by use of a keypad.

The main entry and three other doors are equipped with proximity card readers. These units are relatively new and in good working order.

The main entrance is locked during the day. Visitors press a button at the door to activate a two-way intercom and one-way video transmission to the attendant's desk in the main office. The attendant established verbal contact and is able to see who is at the door. Once the visitor is cleared for entry, the attendant remotely unlocks the door and the visitor enters the school.

The School is equipped with three IP-CCTV cameras. Two cameras are installed in the building and one is mounted outside. The signals from the cameras are recorded onto a DVR system located at the High School. Local Police, the Facilities Dept. and IT Dept. have access privileges to view live and recorded footage. The current system is relatively new and in good working order.

Summary

1. The Category 5 station cabling and fiber optic backbone cable between the three data rooms do not perform at standards that newer equipment demands.
2. Two of the three data rooms are air conditioned. The third room is not air conditioned, potentially reducing the useful life of the equipment.
3. The Paging System does not interface with the telephone switch making paging from the classrooms impossible. Although new speakers were added to classrooms and corridors that were renovated in 1997 the overall system is nearing the end of its useful life.
4. The clocks are battery operated. Maintaining a common time standard throughout the building is not possible.
5. Cable TV over Verizon FIOS is available in the Library only.
6. The school currently has intrusion detection devices in the corridors, leaving classrooms vulnerable to break-ins.
7. The Main Entry and three other doors are equipped with proximity card readers.
8. The School is equipped with three IP-CCTV cameras – two inside the school and one outside.