

HERITAGE MIDDLE SCHOOL

HVAC

M-01 Heating Plant:

Observations:

The existing boilers have recently been upgraded. (4) hot water boilers (circa 2000) manufactured by Patterson Kelly have been installed. New hot water distribution pumps have also been installed. The space heating boilers produce domestic hot water in the winter months, while a stand-alone water heater produces hot water during the summer months. The connection of the domestic hot water heater's breeching is not code compliant. The boilers are controlled by a Johnson-Metasys DDC system. The newer boiler breeching and stack has been routed up the side of the building. The stack has signs of corrosion at the bottom. We suspect that this is due to the firing of only the domestic water heater during the summer months. Also, the drain cap has been removed at the bottom of the riser.

Recommendations:

Provide cap and drain line for the stack and correct the venting of the domestic water heater.



M-02 Heating & Ventilating Systems:

Observations:

Classrooms – All classrooms are served by hot water unit ventilators with supplemental fin-tube radiation. The units appear to be in fair condition. Some newer classrooms are served by either a new RTU or new unit ventilators with remote condensing units. Scattered throughout the school are window air conditioners to provide cooling to select rooms. Operating along with the unit ventilators, are exhaust fans, which assist in maintaining building pressure.

Some fans were not energized and some appeared in need of repair.



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Gymnasium - The room is served by hot water heating & ventilating (H&V) units. The units are original to the building and appear to be in fair condition, though they have exceeded their expected operating lives.

Multi-Purpose Room - The new multi-purpose room has a new gas-fired heating rooftop unit.

Auditorium - The room is served by hot water heating & ventilating (H&V) units. The units are original to the building and appear to be in fair condition, though they have exceeded their expected operating lives.

Media Center - The media center utilizes newer unit ventilators with hot water coils and condensing units.

Miscellaneous Areas – The main circulation corridors utilize hot water cabinet unit heaters, but currently receive no ventilation to the space.

Recommendations:

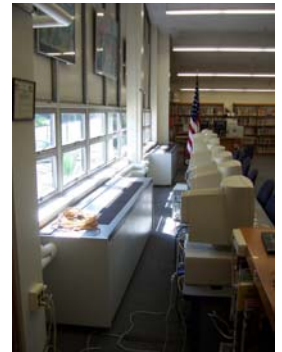
Spaces such as the auditorium and gymnasium should have the HVAC equipment replaced since it has been in service long after its expected operating life. The new equipment will replace the existing equipment in-kind, except that additional outdoor ventilation air will be introduced per today's codes and the new equipment will be fitted with microprocessor controllers to integrate with a building control system. Areas that receive little or no ventilation must be upgraded as required. Exhaust fan maintenance should be addressed by repairing units where possible and replacing those in bad repair.

M-03 Cooling Systems:

Observations:

Office Areas – The media center utilizes newer unit ventilators with hot water coils and remote condensing units to provide space cooling. An old, GE air handling unit (model #RGWE76) serves the main desk/visitors area.

Some offices still utilize window air conditioners. A couple of interior offices have no means of ventilating the spaces.



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Media Center – The media center utilizes newer unit ventilators with hot water coils and remote condensing units to provide space cooling.

Multi-Purpose Room - The new multi-purpose room has a new gas-fired heating rooftop unit.

Music Rooms - The music rooms served by a new gas-fired heating rooftop unit.

Cafeteria – The cafeteria utilizes newer air handlers with remote condensing units to provide space cooling.

MDF Closet - The room containing the school's computer server does not have any independent cooling system. The room was quite warm at the time of our visit.

Recommendations:

Though no immediate upgrades are required, consideration should be given to eliminate the thru-the-wall units and old GE unit with split systems or rooftop units. The new rooftop units will be more efficient, provide better ventilation, acoustics and temperature control throughout the areas. There is, however, an immediate need to provide a cooling system for the server room to protect the equipment. Consideration should be given to provide cooling to the classrooms, auditorium, cafeteria and gymnasium. Vertical, self-contained heating/cooling units are recommended for the classrooms, while multiple rooftop units with heating/cooling are recommended for the larger spaces (i.e. auditorium, old gymnasium).

M-04 Temperature Control Systems:

Observations:

The control of the heating, ventilation and temperature control of the spaces is accomplished via a newer DDC System.

The DDC system provides global start/stop of the HVAC equipment.



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Recommendations:

The existing DDC system should be expanded to include the new cooling units.

M-05 Plumbing

Observations:

The main domestic water service enters the building in the water service room at the southeast area of the building adjacent to the boiler room. Service size is 4" with a pressure reducing valve set at 70 psi. There is no backflow prevention on the service.

Domestic water heating is provided by a Raypak gas fired water boiler with a large vertical storage tank. This system is operable 12 months of the year. A 119 gallon RUDD electric water heater is located adjacent to the Raypack boiler but apparently not used.

There is backflow prevention on the domestic water make-up line to the boilers.

Natural gas enters the building in both boiler room at the southeast side of the building and supply the boilers.

There is a 1-1/2" gas line that runs across the roof to a rooftop HVAC unit on the north end of the building. There is natural gas being supplied to some science classrooms.

Roof drains on the flat roof areas are in good condition and appear to properly drain the roof.

Student toilet room plumbing fixtures in the new addition at the southeast area of the building are in very good condition and meet all ADA requirements. The student toilet rooms in the southeast wing have older original fixtures with metering faucets. The ground floor and the second floor toilet rooms do not meet ADA requirements. Most of the lavatory sink faucets are push-down metering type and are showing corrosion and wear. The traps below most sinks are also showing corrosion. The first floor student toilet rooms do have ADA fixtures but no leg protection on the designated lavatory sink.

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The first floor faculty toilet room fixtures in the center of the building are in good condition but do not meet ADA requirements.

The Nurse's office toilet room is currently being up-graded and appears it will meet all ADA requirements.

There are two toilet rooms at the back of the Auditorium that do not meet ADA requirements.

Recommendations:

With existing backflow prevention provided on the boiler make-up water supply line, there are not immediate upgrade requirements for the domestic water service.

Worn and corroded lavatory faucets in the southeast toilet rooms should be replaced with new conservation type faucets. Fixture traps should be replaced as needed.

All lavatory sinks throughout the school designated as an ADA type fixture should be provided with all required leg protection insulation on piping and have the proper faucets to meet all ADA requirements.

Older drinking fountain stations should be up-graded to comply with ADA standards.

M-06 Fire Protection:

Observations:

There are limited wet sprinkler systems located in storage rooms throughout the building.

Recommendations:

All existing limited area sprinkler systems should remain operational.

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ELECTRICAL

E-01 Service Entrance:

Observations:

A JCP&L utility pole # 100K JC788LVT, adjacent the boiler room, off of a Foxcroft Drive pole line runs primary voltage underground to a 480/277V, 3 phase, 4 wire pad mounted transformer. From the transformer the service enters the basement electrical room via bus duct. A 1993 vintage Square "D" "QED" switchgear line-up is connected to the original C/T cabinet and a G.E. main circuit breaker. The main breaker did not have identifiable markings on it to determine the rating. Although the horizontal bus is 4,000A. Several spaces were present in the I-Line style MDP's. JCP&L is the utility company serving electrical power under account #100006467466. In July of 2007 the max demand was 374.4 kw/451A.



Recommendations:

Service grade TVSS was not seen. Provide and install. Utility Company should be called out to verify transformer rating and life cycle.

Should it be decided to fully or partially air-condition the subject building then the electrical service entrance will have to be replaced/upgraded.

E-02 Distribution:

Observations:

Local panelboards distribute power to lighting, devices and equipment. Most 208V panelboards were found to be loaded to circuit breaker capacity and lacking spares or spaces.

Newer computer panels have been installed in the addition areas but not in the original spaces. Most newer kitchen equipment needs to be run at 208V but panels are at capacity. 480V power is in excess due to old electric baseboard replacement with gas systems.



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Recommendations:

Install new step-down transformers 480 to 208/120 for the original building spaces that are in need of 208 power. Consider running gas to new kitchen appliances that are all electric. Newer area computer panel configurations do not utilize the full potential of the transformers installed and therefore should be upgraded.



E-03 Devices:

Observations:

Local receptacles were sparse as the building is 1964 vintage. Currently additional power has been provided via power poles and surface mounted raceway. Kitchen hood equipment (fed in slab) reportedly is not disconnected under fire conditions via e-stop.

Recommendations:

As the building is block wall construction any renovation would likely require surface mounted raceway and outlets built into new partition walls. Rectify kitchen hood electrical equipment not disconnected under fire conditions.

E-04 Normal Lighting:

Observations:

The majority of the building is served via linear fluorescent fixtures with T-8 lamps. 2x4 and 2x2 recessed prismatic troffers are used in most office areas, newer classrooms and some corridors. Surface or pendant mounted prismatic wrap fixtures are used in older classrooms, corridors, the old media center and utility areas with fluorescent industrials with tube schrouds in the basement. The gymnasium is illuminated via Hi-bay acrylic H.I.D. and the Auditorium by surface mounted fluorescent with recessed incandescent for performances. Kitchen fixtures are clear sealed acrylic surface mounted linear fluorescents. Limited direct/indirect fluorescent is used in computer labs and such.



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Recommendations:

Most light levels are adequate even though lighting systems are dated.

E-05 Emergency lighting:

Observations:

Emergency lighting is supported by the use of local and remote unitized battery packs with local and remote unitized heads.

Recommendations:

Coverage seems deficient. Employ the services of a lighting professional to meter and record emergency lighting levels and add battery ballasts to existing fixtures to supplement existing conditions.



E-06 Exit Lighting:

Observations:

Exit lighting was provided by mostly battery backed up fixtures. Units were seen with a mixture of incandescent and replacement L.E.D. sticks. Wire guards are missing from gym units.

Recommendations:

Replace exit signs with factory L.E.D. units as the L.E.D. light sticks do not meet NFPA 101 required face illuminances. Provide and install wire guards seen missing at gym.



E-07 Egress Lighting:

Observations:

Egress lighting was deficient at this facility.

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Recommendations:

Provide and install combination normal and emergency light fixtures incorporating local or remote battery ballasts.

E-08 Exterior Security lighting:

Observations:

Wall mounted H.I.D. fixtures are located around the perimeter. H.I.D. with reflector cone post tops were seen at walkways and small parking areas for pedestrian traffic. Cobra Head style H.I.D. fixtures were seen in large parking lots.

Recommendations:

H.I.D. cannot be used for emergency lighting. See E-07.

E-09 Fire Alarm:

Observations:

An EST-3 serves as the F.A.C.P. It is a digital addressable system reportedly installed around 2002-3 when the addition was added. It is located in the electrical room of the new addition with an annunciator at the main office for firefighter diagnosis. Manual pull stations (MPS) were seen to be located at the exits without covers to prevent nuisance alarms. Smoke detectors were seen throughout. Area of Refuge signs were seen at selected stairtowers but no two way communication was present.

Recommendations:

Provide and install stopper II covers over pull stations to prevent nuisance tripping. Install two way communication in stairtowers for Area of Refuge system.

E-10 Tele/data:

Observations:

Telephone enters overhead from a utility pole # 100K JC788LVT,



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adjacent the boiler room, off of a Foxcroft Drive pole line and enters the building through the original electric room where the demarc exists. The services are fiber optic (FO), CATV, and Copper phone lines. Voice over internet protocol (VOIP) is distributed through a Meridian system and utilizes Cisco IP handsets. Copper is distributed to the desktop for telephone and computer services via surface mounted raceways and power poles where block walls exist and in partitions where available.

The telephone service is provided by Verizon PRI-T1, digital circuits and various copper POTS lines. The telephone service is distributed to users over combined voice and data network via Cisco Unity Servers.

Recommendations:

Verify TIA/EIA standards were used for distance limitations, cable mapping, etc. Verify TVSS devices were used on utility and emergency links (faxes, 911, F.A.C.P. dialer, etc.) Verify that all computer power feeds originate from a panel employing a transient voltage surge suppressor (TVSS) device. If TVSS devices are missing provide and install.



E-11 Clock/Spaker/Intercom:

Observations:

A Latham central clock system was seen located in the Main office. Standard time clocks were seen located throughout. A Multicom 2000 intercom system was also located in the Main office. Speakers were seen throughout but it was related that the phone system was used for paging except in the new addition where it was related that paging is done over speakers.

Recommendations:

No recommendations at this time.



E-12 Security:

Observations:

A camera is located at the main entrance with a weatherproof call-in button and speaker. An LG VCR was located in the Main office to record the main entrance

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activity. A Radionics Alpha II system keypad was seen for security system interaction. Motion detectors were seen at interior corridor spaces and ground floor classrooms.

Recommendations:

No recommendations at this time.

E-13 New Auditorium Sound System

E-14 New Auditorium Stage Lighting System

E-15 New Auditorium Ambient Lighting System