

HILLSIDE ELEMENTARY SCHOOL

HVAC

M-01 Heating Plant:

Observations:

The existing boilers have recently been upgraded. (2) Steam boilers (circa 2000) manufactured by H.B. Smith have 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 boilers are controlled by a Johnson-Metasys DDC system. The newer boiler breeching connects to the original masonry chimney.



Recommendations:

Since the boilers utilize a positive pressure flue venting system, the chimney should be fitted with a metal chimney liner for protection of the building occupants. Should major upgrades in M-02 or M-03 be undertaken, we recommend a changeover of the boiler trim to operate as hot water in lieu of steam. Cost is included in M-02 & M-03.

M-02 Heating & Ventilating Systems:

Observations:

Classrooms - Most classrooms are served by steam unit ventilators with supplemental fin-tube radiation. The units are original to the building and appear to be in fair to poor condition and have well exceeded their expected operating life. 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.



Kitchen – The kitchen contained very old cooking hoods and a sidewall exhaust fan that appears to be a non-code compliant installation. However, no food preparation is performed at this school.

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Multi-Purpose Rooms - The rooms are served by steam 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 a newer gas-fired heating/cooling rooftop unit manufactured by Aaon.

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

Recommendations:

Spaces such as the classrooms and older multi-purpose room 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. In addition, boilers should be retrofitted to operate as hot water (instead of steam). New piping, pumps and controls are required. Previously installed heater exchangers can be removed.



M-03 Cooling Systems:

Observations:

Office Areas – The administration area currently utilizes window air conditioners to cool the space.

Media Center – The media center utilizes a newer gas-fired heating/cooling rooftop unit manufactured by Aaon.

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

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units 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 also be given to provide cooling to the classrooms and multi-purpose room. Vertical, self-contained heating/cooling units are recommended for the classrooms, while multiple rooftop units with heating/cooling are recommended for the larger spaces (multi-purpose room, gym).

M-04 Temperature Control Systems:

Observations:

With the exception of the boilers and newer additions, the control of the heating, ventilation and temperature control of the spaces is accomplished via a pneumatic control system, which is interconnected via P/E switches to a newer DDC system. The DDC system provides global start/stop of the HVAC equipment. The newer, temperature control air compressor was operating excessively, indicating the system may have air leaks. The system appears to be marginally adequate for task at hand. The newer additions have been fitted with new Johnson-Metasys DDC controls.



Recommendations:

While the present system may be functional and familiar to the operating staff, we recommend that a complete upgrade of the existing pneumatic temperature control system be initiated. A new system of direct digital controls (DDC) should be employed. The DDC system will automate the operation of the HVAC equipment, aid in maintenance efforts, signal trouble alarms and reduce overall building energy usage. The new DDC system should be based on Johnson-Metasys (or another compatible company), which is currently in use in the District. The system will be networked to a district-wide monitoring system

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M-05 Plumbing:

Observations:

The main domestic water service enters the building in the rear northwest corner of the building in the lower level Boiler Room. Service size is 3" with a 2" meter and there is no backflow prevention.

Domestic water heating is provided by a large horizontal indirect heated storage tank which is heated with boiler water. There is a separate gas fired summer water heater to provide hot water during boiler shut down periods.

Natural gas also enters the building in the Boiler Room and supplies the boilers and a six burner kitchen range/oven and a double stack oven.

The school Kitchen 2-compartment sink has a floor mounted grease interceptor on the waste line.

The large toilet rooms on the first floor in the center of the building have ADA compliant fixtures in both the Boy's and Girl's room and a high/low dual drinking fountain between the entrances. The toilet rooms on the lower level do not have ADA fixtures. The nurse's office toilet room fixtures are in good condition but are not ADA compliant.

The only ADA compliant drinking fountains are at the far north wing of the building.

Kindergarten classes have individual toilet rooms with juvenile water closets. These classrooms also have counter sinks with drinking bubblers outside of the toilet room. These counter sinks are showing age and the faucets and bubblers are quite worn.

Roof drainage appears to be in good condition and functioning properly.

Recommendations:

The lower level toilet rooms should be modified for ADA accessibility. Toilet rooms that have been modified should be corrected for the proper clearances and insulations and all faucets, traps and flush valves should be replaced due to age and conservation purposes.

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Classroom sinks should have the old faucets and drinking bubblers replaced.

Drinking fountain locations should have an ADA compliant fixture.

M-06 Fire Protection:

Observations:

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

Recommendations:

All existing limited area sprinkler system should remain operational.

ELECTRICAL

E-01 Service Entrance:

Observations:

A JCP&L utility pole # 62294LVT with primary overhead electric, at the rear of the building, runs primary voltage underground to a 300 kVA padmounted transformer. From the transformer 208/120V, 3 phase, 4 wire runs underground to an exterior mounted C/T & meter combination with partitions on two sides and a sloped roof. Recently installed Murray switchgear backfeeds the old 600A service panelboards in the sub-basement. The new service entrance is 1200A MCB. It seems that a 400A cb is feeding a 600A MCB at DP1 and a 225 A cb is feeding a 400A MCB at MP. PSE&G is the utility company serving electrical power under account #1262512603. In June of 2006 the max demand was 94.5 kw/263A.



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Recommendations:

Panelboard labels seem to be incorrect between the old and new services. Clearance must be maintained in front of all electrical equipment. This area cannot be used for storage. The current space is in violation. Rectify.

Should it be decided to fully or partially air-condition the subject building then the electrical service entrance will have to be replaced/upgraded. (500 KVA minimum)



E-02 Distribution:

Observations:

Local panelboards distribute power to lighting, devices and equipment. Most older vintage 208V panelboards were found to be loaded to circuit breaker capacity and lacking spares or spaces. Newer computer panels have been installed to feed computer areas.

Recommendations:

Any addition to the original section will require new panelboard placement. Should substantial modifications take place requiring connection to antiquated panelboards the panels should be replaced in their entirety as parts are scarce if available at all. (Frank Adam & old Square D panelboards).



E-03 Devices:

Observations:

Local receptacles were sparse as the building is 1960's vintage. Currently additional power has been provided via power poles and surface mounted raceway.

Recommendations:

As the building is block wall construction any renovation would likely require surface mounted raceway and outlets built into new partition walls.

E-04 Normal Lighting:

Observations: The majority of the building is served via linear fluorescent fixtures with T-8 lamps. 2x4, 1x4 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 and utility areas with HID in the boiler room etc. The existing Multi-purpose rooms are served via Hi-Bay & 2x2 HID's. Limited incandescent was seen in Multi-purpose, storage and utility rooms. The new Media center utilizes direct/indirect fluorescent with down lights.



Recommendations:

Replace all incandescent lighting with compact fluorescent except in Multi-purpose theatrical performance areas. Clean and/or replace all acrylic diffusers that have turned yellow.

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.

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.

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E-07 Egress Lighting:

Observations:

Egress lighting was deficient at this facility.

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.

Recommendations:

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

E-09 Fire Alarm:

Observations:

An EST-2 serves as the F.A.C.P. It is a digital addressable system. It is located in the main office with an annunciator at the entrance vestibule 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.

Recommendations:

Provide and install stopper II covers over pull stations to prevent nuisance tripping.



E-10 Tele/data:

Observations:

Telephone enters 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

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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.)



E-11 Clock/Speaker/Intercom:

Observations:

A new central clock system was seen located in the Main office. Standard time clock/speaker combinations were seen located throughout. A Telecor XL intercom system was also located in the Main office.

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. A VCR was located in the Main office to record the main entrance 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.