Livingston School District
Burnet Hill Elementary School

BURNET HILL 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. A hot water heat exchanger has been added to provide hot water for space heating in the newer additions. 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. It should be noted that the boiler room is very crowded with equipment and code clearance to electrical equipment has not been met in several instances.

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. Consideration should be given to correct the electrical code-required clearances. Should major upgrades in M-02 or M-03 be undertaken, we recommend a changeover of the boil 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.

Newer classrooms are served by self-contained heating/cooling units manufactured by Airedale. SGI's are served split-system type units, also manufactured by Airedale.

Kitchen – The kitchen contained a small cooking hood over the stove, which appears to be a code compliant installation.

Multi-Purpose Room - The older room is served by a 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. The newer room is served by a gas-fired, heating/cooling rooftop unit and is in good condition.

Media Center - The media center utilizes self-contained heating/cooling units manufactured by Airedale.

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:
Newer Classrooms – Circa 1999 classrooms are served by self-contained heating cooling units manufactured by

Airedale. SGI's are served split-system type units, also manufactured by Airedale.

Office Areas – The administration area currently does not have a cooling system.

Media Center – The media center utilizes self-contained heating/cooling units manufactured by Airedale is cooled with window air conditioners.

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 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 administration area and the server room to protect the equipment. Consideration should also be given to provide cooling to the classrooms and multi-purpose rooms. 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 & computer/music).

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

M-05 Plumbing:

Observations:

The main domestic water service enters the building in the Boiler Room at the northeast wing of the building. The service size is 2-1/2” with a 2” water meter and backflow preventer.

Domestic water heating is provided by a separate “Lochinvar” hot water boiler and a 119 gallon hot water storage tank. The system appears to be in good working condition.

Natural gas also enters the building in the Boiler Room with the meter on the outside wall. It supplies the two space heating boilers, the domestic water boiler and an eight burner range with two ovens in the adjacent school kitchen.

The school Kitchen 3-compartment sink has a recessed grease interceptor on the waste line.

The Student toilet rooms in the central east area of the original building do not have ADA compliant fixtures. The faucets are metering type and the drinking fountain on the outside wall is not ADA compliant.

The student Boys Toilet room in the central west wing has an ADA compliant urinal and Lavatory sink but the sink only has cold water supplied to it. The water closet is not ADA compliant. The student Girls Toilet room in the central west wing has an ADA compliant water closet and sink but the sink only has a cold water supply also. The drinking fountains directly outside these toilet rooms are not ADA compliant.

The Boy's and Girl's toilet rooms in the newer southeast wing are fully ADA compliant as are the drinking fountains.

Majority of the classrooms have stainless steel counter sinks with drinking bubblers but are in older, worn condition.

Roof drainage for this building appears to be functioning satisfactorily. There are gutters and leaders on the hip roof portions of the building and roof drains with interior conductors on the flat roof portions.

Recommendations:
Original toilet rooms should be modified for ADA accessibility.
Classroom sinks should have the old faucets and drinking bubblers replaced for

Drinking fountain locations should have an ADA compliant fixture.

M-06 Fire Protection:

Observations:

Fire sprinkler service enters the building in the southeast wing in a storage room adjacent to the new Multi-Purpose Room. The 4" service supplies a wet pipe system for the

storage room itself and a dry pipe system that provides attic coverage into the older section of the building.

School Kitchen cooking hood has chemical suppression system.

Recommendations:
The existing sprinkler system should remain operational.

ELECTRICAL

E-01 Service Entrance:

Observations:
A JCP&L utility pole # 61922LVT, at the property line in the back of the parking lot, runs primary voltage underground to a 208/120V., 3 phase, 4 wire pad mounted 300 kVA transformer. From the transformer the service enters the electrical room via underground conduit. Recently installed G.E. Spectra series switchgear backfeeds the old 400A service. The new service entrance is 1600A MCB, 120/208V, 3 phase, 4 wire. PSE&G is the utility company serving electrical power under account #1262512905. In June of 2006 the max demand was 164 kw/456A.

Recommendations:
Remove all storage items from 3 feet infront of all equipment. This is a code violation.

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. A 225kVA “K” rated transformer was seen installed on the line side of the computer distribution panel (CDP) to mitigate harmonics.

Distribution grade TVSS was seen installed on the recently installed CDP. A few spaces exist in the CDP.

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. (Kolton & 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 and 2x2 recessed prismatic and/or parabolic 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 fluorescent industrials/shrouded lamps in the boiler room etc. The old music & SGI rooms are illuminated via 1 lamp fluorescent industrials with wire guards. The existing Multi-purpose room is served via 2 lamp industrials. The new Multi-purpose room is served via Hi-Bay HID’s. Limited direct/indirect fluorescent is used in computer use areas and such.

Recommendations:
The existing Music, SGI & Multi-purpose room lighting is deficient, replace.

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.

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. Damaged fixtures were seen around the perimeter.

Recommendations:
H.I.D. cannot be used for emergency lighting. See E-07. Replace damaged fixtures.

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 underground 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 circutis 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:
An Institutional Systems Service (ISS) central clock system was seen located in the Main office. Standard time clock/speaker combinations were seen located throughout. A Multicom 2000 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 level classrooms.

Recommendations:
No recommendations at this time.