COLLINS ELEMENTARY SCHOOL

HVAC

M-01 Heating Plant:

Observations:
The existing boilers have recently been upgraded. (4) Hot water boilers (circa 1996) manufactured by Patterson-Kelly 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.

M-02 Heating & Ventilating Systems:

Observations:
Classrooms - Most classrooms are served by hot 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 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 and SGI's are served by self-contained heating/cooling units manufactured by Airedale. SGI's are served split-system type units, also manufactured by Airedale.

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

Media Center - The media center utilizes hot water unit ventilators and window air conditioners.

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 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.

M-03 Cooling Systems:

Observations:
Newer Classrooms – Circa 2000 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 is cooled by a window air conditioner.

Media Center – The media center 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 server room to protect the equipment. Consideration should also be given to provide cooling to the classrooms, activity room 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. (media center, multi-purpose, music, 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

M-05 Plumbing

Observations:

The domestic water service enters the building in the north wing Boiler Room. Service size is 3" and there is backflow prevention.

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

Natural gas enters the building in the same Boiler Room and supplies the boilers. Gas also serves a 10-burner kitchen range with dual ovens in the school kitchen.

The school Kitchen has a 2-compartment sink with a recessed in floor grease interceptor on the waste line. The kitchen also has a dishwasher with a hot water booster heater and a rinse sink.

The toilet rooms in the southwest wing do not have some ADA compliant fixtures as does the center hallway toilet rooms. The nurse's office toilet room fixtures are in good condition and are ADA compliant.

There are two ADA compliant drinking fountains stations in the building.

Majority of the classrooms have counter sinks with drinking bubblers. These counter sinks are showing age and the faucets and bubblers are worn.

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

Recommendations:
All toilet rooms should be modified for ADA accessibility. Toilet rooms that have been modified should be corrected for the proper clearances and insulations.

All toilet room faucets and flush valves should be replaced due to the age and wear and for conservation purposes.

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

M-06 Fire Protection:

Observations:

There are several limited area sprinkler systems throughout the building with the sprinkler control locations indicated.

The kitchen cooking hood is equipped with a chemical suppression system.

Recommendations:
All existing limited area sprinkler systems should remain operational.

ELECTRICAL

E-01 Electrical Service

Observations:
The existing electrical service is a 208Y/120 volt, 1200 Amp service with a single 1200 amp main disconnect circuit breaker. The electrical service is obtained from PSE&G, with electric meter number 728002716. There is a 400 amp circuit breaker which back feeds an old existing service and account number 12-625-138-0-4.

The peak electrical demand is 140.0 kw or 389 amps at 120/208 volts which leaves 205 kw or 569 amps available for future renovations or expansions

There is space for additional circuit breakers in the main distribution panel to serve new equipment or additions.

There is a dedicated computer distribution system fed through an isolating transformer and serving computer loads through the school

The electric room service and distribution equipment is relatively new and looks to be in good condition.

There is a TVSS on the main service and a TVSS on the computer distribution panel.

There is no fire pump fed from this service.

There is no generator at this school

Recommendations:
The existing PSE&G electrical service equipment is adequate for the current building needs. This system should be cleaned and serviced periodically to insure long life and proper operation.

E-02 Electrical Distribution

Observations:
The electrical distribution system is all at 120/208 volts. There is a normal power distribution system and a computer distribution system. The computer system was installed in the late '90s and appears to be in good condition. The normal distribution system is combination of newer and older (original) panels in the building.

Recommendations:
The existing distribution system serving the school should be tested and serviced periodically to insure long life and proper operation.

E-03 Devices

Observations:
Local receptacles were sparse in some areas and computer areas were fed with surface mounted raceway.

Recommendation:
As the building is block wall construction, any renovation would likely require surface mounted raceway and outlets built into new partition walls. Additional outlets should be provided as required.

E-04 Normal Lighting

Observations:
The majority of the school has been upgraded to modern T-8 lighting. Some of the corridors still have T12 lamps and fixtures. There is also a mix of direct pendant, indirect pendant, and recessed fixtures in classrooms. For the most part this lighting is appropriate for the use. Some classrooms and areas appear dark and should have lighting upgrades to meet the New Jersey School code and the recommendations of Illuminating Engineering Society. There are some direct light fixtures which have exposed fluorescent lamps. Gym lighting has is Metal Halide with quartz re-strike. The ballasts are noisy in the gym.

Recommendation:
Upgrade the areas of inadequate lighting with new lighting producing a higher level and quality of light.
Additional switching or controls could also be provided to bring the school up to the New Jersey Energy Code (ASHRAE 90.1). Exposed fluorescent lamps should be covered with lenses or plastic tube guards. Replace gym HID lighting with compact fluorescent high bay lighting.

E-05 Exit Signs and Emergency Lighting

Observations:
The school does not have an automatic stand-by generator so in must rely on batteries for exit signage and egress lighting. Exit signs are located appropriately throughout the school. Many are large older units with incandescent lamps and large batteries. Egress lights are also battery backed wall pack type located throughout the school. It appeared to be deficient in egress lighting.

Recommendation:
Upgrade the Exit signs to newer LED style signs which will reduce power consumption and reduce maintenance. Provide additional egress lighting packs where necessary to provide the minimum 1 foot candle average along the path of egress.

E-06 Exterior Lighting

Observations:
Wall mounted HID fixtures are located around the perimeter.

Recommendation:
Replace/ repair fixtures as required, re-lamp and provide additional fixtures in low coverage areas.

E-07 Fire Alarm

Observations:
The fire alarm system is an Edwards Systems Technology IRC-3 addressable fire alarm system which is a mix of newer addressable equipment.

The addressable panel most likely monitors the existing zones through a Zone interface module.

Existing system does not meet current requirements. There are missing several strobes and pull stations.

We could not visibly see the hood Ansul system connection to the fire alarm system.

Recommendation:
Proceed with the board of education's plans to replace the fire alarm system in December of 2007.

E-08 Intercom System

Observations:
The intercom is a Bogan Multicom 2000 located on the general office.

The system is programmable with separate output zones. Classrooms have telephones and no call switches to initiate an intercom call.

Recommendation:
None

E-09 Clock System

Observations:
The existing clock system is an ISS4 from Institutional Service Corp. and is located in the general office. Although the system looks to be in good operation. There were several clocks which were not in sink or had been replaced with battery clocks. This could be from damaged wiring, shorts or open circuits.

Recommendation:
Replace the existing clock system with a new wireless system.

E-10 Security System

Observations:
The school has an existing security system comprising of motion sensors throughout the first floor corridors and classrooms.

Recommendation: None

E-11 Tele/Data:

Observations:
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.