UTILITIES

CITY WATER:

A 4" water service enters the building on the west side of the facility in electrical room west of the boiler room. The water service has a shutoff valve and a water meter. There is evidence of corrosion on the domestic water service entering the facility.

This portion of the incoming domestic water service piping is recommended to be replaced when feasible.

The incoming water service does not have a reduced pressure backflow preventer as noted on the life safety survey report.

The cold-water fill to the boiler does have a reduced pressure backflow preventer.

SEWAGE (STORM):

The two (2) story classroom addition has interior roof drains and the remaining portion of the facility has gutters with down spouts. The down spouts drain to grade.

It is recommended that roof drains and underground drain lines be rod out to point of discharge to make sure lines are clear of debris and draining properly.

SANITARY SEWER:

The sanitary main size and discharge direction outside the building was not evident.

PLUMBING:

The plumbing fixtures are not water savers and most are original to the facility. The fixtures appear to be in working order.

The water closets are wall hung and floor mounted with manual flush valves.

The urinals are wall-hung and floor mounted with manual flush valves.

The lavatories are wall-hung with push button and 2 handle faucets.

The service sinks basins are wall hung and have vacuum breakers on the faucets.

The kitchen has a three (3) compartment sink with direct waste connection to the interior sanitary piping.

There is a grease trap for the three-compartment sink located outside on the south side of the kitchen.

There is a laundry tub in the art room that has a faucet with a vacuum breaker.

There are sinks in the teacher's lounge and third floor classroom.

There are science lab sinks with faucets that have hose connections in the science classrooms. The faucets have vacuum breakers.

There is no point of use neutralization basins located in the science lab case work. It appears that there is no central neutralization basin located in the facility. In addition the sanitary and vent piping do not appear to be chemical resistant or glass material.

If chemicals and caustic materials are being utilized in these areas the current plumbing code requires that the piping system be acid resistant and that the chemical waste materials be neutralized prior to being discharged into the sanitary system.

There is a simplex sump pump in the lower band room storage area. The sump pump does not have battery back-up.

It is recommended to provide battery back-up for the sump pump.

There is a sewage ejector located in the lower band storage room.

There are single level non ADA electric water coolers in the building.

It is recommended to provide hi/lo ADA electric water coolers. It is recommended to replace the existing electric water coolers with new hi/lo type ADA accessible electric water coolers.

There are floor drains in some of the gang toilet rooms. There are three toilet rooms that do not have floor drains.

It is recommended to provide floor drains in these toilet rooms.

Based on the original drawings there is drain tile located around the east and south band room footings, and the north (under corridor floor slab), south and west and east (located adjacent to the stage) side of the gymnasium footings. The window area wells, C102 entry, and at two (2) stair wells (boiler room and band room) connected to the drain tile backs up and cause water to enter the band room, Corridor C102 entry, and the boiler room.

It is recommended that this drain tile system should be inspected for deficiencies and corrections made to the drain tile system as soon as possible.

The piping system appears to not have leaks at the present time. The domestic galvanized water piping distribution system is between 47 and 90 years old and at the end of its life cycle.

It is recommended that the domestic galvanized water piping distribution system be replaced in the near future as it will fail.

There is a strong sewer odor in the women's toilet room T-1 (1920 portion of the facility) on the first floor. The sewer odor is evident on the second and third floors in the same general location. There is an issue with a deteriorated sanitary main located at the ceiling of the boiler room that will require further investigation to determine if that is the cause. The sanitary and vent piping distribution system is 47 to 90 years old and at the end of its life cycle.

It is recommended that the sanitary and vent piping distribution system be replaced in the near future.

The piping system does have a tempered water-mixing valve which is required by current codes.

GAS SERVICE:

The gas service is located outside on the west wall of the boy's toilet room B-1. The incoming gas service has shutoff valves painted red, pressure reducing station, meter and gas vent lines. The gas pipe size up stream of the PRV is 1-1/2" and 4" on the discharge of the gas pressure-reducing valve. The gas main enters the building on the west wall of the boiler room.

The building staff brought to our attention that there is an issue with available gas capacity service at the double oven and range/oven in the kitchen.

It is recommended that a survey of the gas service be done to confirm that there are no other issues causing the problem, such as deficient gas service size, improperly operating gas regulator, deficient gas piping distribution size, etc.

WATER HEATERS:

An A.O. Smith Model # HW-300-932, 300,000 mbh input gas water heater is located in the boiler room with a storage system. The water heater has circulating pumps, relief valves, aqua stats, etc.

The water heater and two (2) storage tanks were installed in 2003 and are in good condition.

HEATING PLANT:

There are two (2) Weil McClain steam boilers in the boiler room. Boiler number 1 is a Weil McLain # 88 and boiler # 2 is a Model #BG-988-WS. Boiler # 1 has a Power Flame power burner # WCR3-G-25B 2 HP, with a boiler capacity of 5,150,000 btu input minimum and 3,112,000 btu output maximum. Boiler # 2 has a Power Flame power burner # WCR2-G-20B, 3/4 HP, with a boiler capacity of 2,713,000 btu minimum input and 1,689,000 btu maximum output. The boiler has an Illinois Life Safety School Code gas train. The power burner has a control panel with alarm, flame supervisor and on/off switch, and the life safety lamp indicators on it.

Boiler B-1 was installed in 2008 and boiler B-2 was installed in 1985. The boilers appear in good condition. And we have not been made aware of any functional issues with the boilers. With proper care, maintenance, and water treatment to date and beyond, they may be utilized for continued use in the facility through their life expected 35 years life span.

There is an emergency fuel shutoff switch at the boiler room exit.

There is a chemical treatment system and a water softener system for the boiler system located in the boiler room.

HEAT DISTRIBUTION:

Steam is provided throughout the facility in pipe tunnels and exposed over head to fin-tube radiation, convectors, unit ventilators, and air handling units.

Some of the convectors are non functional and parts are no longer available.

It is recommended that these convector units be replaced at a minimum.

The steam and condensate piping distribution system has leaks which requires 250 gallons of fresh make up water per day.

At a minimum, the pipe leak should be investigated and repaired as soon as possible as it becomes difficult to properly maintain boiler water treatment balance which could lead to premature failure of seals, gaskets, etc.

The steam heating piping distribution system is 47 to 90 years old, and at the end of its life cycle.

It is recommended that the steam piping distribution system be replaced in the near future with new hot water heating piping sized for possible future air conditioning. The existing steam boilers maybe used as the central heating plant and then a new hot water heat exchanger can be provided for the hot water heating. The existing unit ventilators, fin-tube and air handling units would be replaced with new unit ventilators in all classrooms and new air handling units for the gymnasium, etc. A future chiller maybe added to provide air conditioning in the facility.

COOLING PLANT:

The facility does not have a central cooling plant.

Localized cooling is provided via through-wall air conditioning units in the main office, guidance office, computer lab, cafeteria, and teachers' lounge.

There is a Carrier 48-HJE-008 roof top unit providing cooling to the library and a Goodman # PCK060 cooling only roof top unit serving the band room.

The remaining portion of the facility is not air-conditioned.

VENTILATION:

The facility utilizes unit ventilators in the cafeteria, air handling units serving the gym, fin-tube in most classrooms, and cooling only roof top unit serving the library and band room, and operable windows in the classrooms and offices to provide outside air and exhaust make up air to the facility. These systems are 47 to 50 years old and at the end of its life cycle.

As noted above, it is recommended that the exiting unit ventilators, fin-tube and air handling units be replaced with new unit ventilators in all classrooms, new air handling units for the gymnasium, etc. to provide ventilation outside air to the occupied spaces.

Classrooms and most offices have operable windows which are providing code compliant outside air ventilation per the code at the time the building was constructed. Current code requires the natural or mechanical ventilation air be provided during the periods that the rooms or spaces are occupied. The code requires 15 CFM of outside air per person in an average classroom.

There is a room on the second floor noted on the life safety report being used as an office that does not have any ventilation. Code compliant ventilation will need to be provided or the room cannot have occupants.

There is an exhaust hood system in the kitchen. The kitchen exhaust hood has an exterior side wall mounted exhaust fans. Water is migrating into the side wall exhaust fans and into the interior space.

A solution would be to replace the existing exhaust fans with new inline exhaust fans, each within a weather tight exhaust duct, extend up the wall vertically above the roof per code and terminate with a proper gooseneck termination to prevent water infiltration.

There are roof mounted and 2 side wall exhaust systems in the toilet areas and locker rooms.

The janitor's closets do not have exhaust. Life safety code does not require the janitor closets be provided with exhaust**.**

However, if chemicals are stored in the Janitor closets it is recommend that they be provided with exhaust.

The art room kiln has an exhaust duct connection to the outside.

There is a fume hood in a science room that is not operating.

It is recommended to replace the fume hood if chemical preparation is being performed in the science room within the fume hood.

There is a general exhaust in one of the science rooms.

There is a dust collector exhaust system (Torit Day 5 hp) in the shop with available duct connections.

Combustion air for the boilers is provided via a 50"x34" wall louver with two (2) automatic operated dampers in the boiler room.

TEMPERATURE CONTROLS:

The facility has pneumatic manual temperature controls for boiler reset.

The building is indexed from day/night manually at the panel in the boiler room.

Classrooms have pneumatic room thermostats.

There is a temperature control air compressor located in the boiler room.

The boiler plant is controlled by a Heat Timer panel.

It is recommended that the 47 to 90 year old pneumatic temperature control system be replaced in conjunction with the new HVAC system to provide a new Direct Digital temperature control system with a main computer and a Web based interface and a to control the facility.

FIRE PROTECTION:

The facility does not have a fire protection sprinkler system.

*As an enhancement, it is recommended to provide a complete fire sprinkler system in the facility. Due to existing conditions all new sprinkler piping will be routed exposed. A new fire protection system may require a separate incoming water service and possibly a fire booster pump***.**

ELECTRICAL SERVICE:

The electrical service in the building is a 600A, 120/208V, 3 phase, 4 wire main distribution panel with a 600A main circuit breaker. This service is fed from a pad-mounted transformer located in the back of the facility. The service is located in the Electrical Room which is adjacent to the Boiler Room. The main distribution panel is a 600A panel with circuit breaker distribution. The main distribution panel serves distribution panelboards throughout the facility. The emergency service, which is fed by a 50A/3P circuit breaker in the MDP, consists of a 100A, 120/208V, 3-phase, 4-wire panelboard which feeds exits signs, emergency lighting and fire alarm control panel.

The existing electrical service has reached the end of its life cycle and is undersized for the size and use of the building. A modern school of this size would be supplied with a minimum 2000A service size at 208 Volts. While the existing demand fits within the existing service size per information from the utility company, the existing service is not able to accommodate modern HVAC loads and computer/technology loads typically found in a modern school. In addition, several members of the building staff reported that circuit breakers in the panelboards frequently become overloaded and trip due to the lack of existing electrical capacity in the building at this time.

It is recommended to upgrade the electrical service to a new 120/208V, 3-phase, 4 wire, 2000A service along with the previously noted HVAC recommendations. If not feasible at this time, a stop gap to prevent the current circuit breaker tripping would be to provide a new 100A panel fed by the MDP to alleviate overloading on existing circuits in electrical panels.

The light switches and the receptacles in the building have reached the end of their life cycle and require replacement.

LOCAL FIRE ALARM SYSTEM:

The fire alarm system is based on equipment as manufactured by Simplex. The main fire alarm panel is relatively new, and is a low end Simplex 4006 zoned fire alarm control panel. A new upgraded, addressable fire alarm system meeting current codes would provide a more reliable solution and would enable first responders to handle an emergency response more effectively.

*It is recommended to provide a new addressable fire alarm system for the school along with replacement of all existing fire alarm system devices. In addition, we recommend visual device coverage throughout the entire school to comply with accessibility code requirements***.**

EXIT SIGNS:

The facility utilizes surface mounted and recess mounted exit signs. Several of the exit signs are dim and have reached the end of their life cycle and require replacement.

It is recommended to replace the exit signs with new energy efficient LED type exit signs, including new wire guards in the gymnasium.

EMERGENCY LIGHTING:

Surface mounted individual battery pack emergency light fixtures are utilized throughout the common areas for lighting the path of egress. The majority of the emergency light fixtures in the building are obsolete.

It is recommended to replace them with more efficient battery life emergency fixtures.

TYPICAL LIGHTING

In general, lighting throughout the facility consists primarily of recessed, surface and pendant mounted fluorescent T8 luminaries. The majority of lighting in the building is outdated/inefficient equipment and several spaces have very dim lighting levels. The older lighting in the building has reached the end of its life cycle and requires replacement.

It is recommended to replace the interior lighting throughout the facility with new, energy efficient T5 fluorescent lighting.

The exterior of the building and surrounding areas are illuminated by HID wall packs and flood lights. In a few locations, residential incandescent fixtures are located at the underside of the entrance canopies.

It is recommended to replace the incandescent fixtures with proper damp location rated commercial light fixtures with LED lamping.

AUTOMATIC HEAT DETECTION:

The facility utilizes heat detectors and smoke detectors which are generally placed in the proper locations. A damaged fire detector was observed in Storage 124A and should be replaced as soon as possible.

It is recommended that the required yearly inspection include a concise inspection and testing of all devices with a detailed checklist of items in need of repair/replacement.

INTERCOMMUNICATION SYSTEM:

The facility utilizes a Bogen switchbank intercom system; communication to classrooms is via speaker unit with call back button. The intercom system is approximately 35 years old and parts for this system are difficult to obtain. Currently, the intercom is not able to notify the Gymnasium or the Band Room due to inoperable components in the system. Further there are no speakers in the corridors for notification. While this is not a code violation the system does not meet NEMA SB-40 2008, which is the standard for mass notification in new educational facilities.

At a minimum, the nonfunctioning intercom components in the bad room and gymnasium should be investigated and repaired as soon as possible to restore communication to these spaces. As an enhancement, it is recommended that the intercom system be replaced in its entirety with a new intercom system that will provide complete coverage of the school.

The master clock system is a Simplex #2350 Master Clock unit (approximately 35 years old) which controls the program bells and only a portion of the clocks throughout the facility. The remainder of the clocks are battery operated.

It is recommended that a wireless master clock system be installed throughout the facility to provide true synchronization of the clocks throughout the building and minimize ongoing maintenance costs due to shortage of replacement parts for the existing 35 year old system.

Although several cameras are located throughout the building, only two cameras are operable. These two cameras can be viewed by the principal over the Internet.

It is recommended to provide additional new IP based cameras to cover the common areas, entrances and administrative areas of the facility, as well as a new head end DVR and multiplexer.

There is a sound system serving the gymnasium. The cafeteria has no sound system or speakers. The owner has expressed concerns with the intelligibility and operational capacity of the existing sound system.

It is recommended to provide a new sound system in the cafeteria and replace the existing sound system in the gymnasium to allow the spaces to be used for multiple events.

There is no security or access control system serving the school.

It is recommended to provide a security and access control system to protect the building and prevent unauthorized individuals from entering the building.

TECHNOLOGY:

There is one low voltage data cable run exposed to the teacher location in every classroom and office. Additionally each classroom is provided with a projector that interfaces to the computer at the teacher location. There appears to be one (1) smart board in use at this facility.

It is recommended to route the exposed low voltage wiring to conceal the wiring system.

Most modern schools have low voltage capacity for student computers and a teacher computer location as well as a smart board or projector location to interface with the teacher computer.

It is recommended to provide an upgrade to the MDF to provide low voltage connectivity for four (4) additional student computer locations per classroom. Additionally, a surface raceway low voltage rough-in should be provided between the teacher computer location and the smart board location for smart board connectivity. By extending the new electrical service as recommended above, these new technology loads can be accommodated.