

SAUKVILLE ELEMENTARY SCHOOL: BUILDING SYSTEMS SUMMARY

The following is summary of Plumbing, HVAC and Electrical needs. This is not intended to be a comprehensive list, but a summary of existing building system needs and possible recommendations as identified by the engineering team. Full engineers' reports are located later in this document.

Saukville Elementary School	Analysis	Recommendations
Building Systems		
Plumbing		
Domestic Water		
Water Service	Water Service includes 6" Ductile Iron water service with a 2" water meter. Items are located on the main level and 1.5" Copper water service with 1" water meter. Both with bypass piping and a water softener and located on the tunnels.	
Water Distribution Piping	Three pipe system is uninsulated copper with areas of galvanized piping. Domestic cold water piping system is in poor condition. Domestic hot water return piping system is in poor condition. Backflow preventers are in fair condition.	Backflow preventer shall be maintained, repaired, and tested. Galvanized piping in shall be replaced. Repair all leaks, insulate, and provide properly sized system. Piping shall be routed above floor.
Fire Sprinkler System	There is no automatic fire sprinkler system in the building.	Existing water service is capable of supporting an automatic fire sprinkler system, but testing is required.
Sanitary and Storm Piping		
Sanitary Waste	Sewer includes the following: Sewer lateral discharging to the local municipal sewage utility. There is not a backwater valve on the sewer lateral.	
Sanitary Waste and Vent Piping	System material is Cast Iron, Galvanized & PVC. Sanitary piping system is in poor condition. The lower lever drainage system is in poor condition. Solid waste interceptors are not present that serves the art sinks. They are in fair condition.	Repair leaks, inspect system, and provide maintenance. All clay, cast iron, and galvanized piping shall be replaced. Provide properly sized system.
Kitchen Equipment	Grease waste piping system or grease interceptor were located in the building. Natural gas system pressure is 1/2 pounds without the need of regulators. Welding gas system consists of portable gas cylinder charts.	Provide a grease interceptor for kitchen sink per the Wisconsin plumbing code.
Storm System	Sewers are Cast Iron & Galvanized in poor condition with lateral discharging to the local municipal storm piping and no backwater valve. Interior roof drain and conductor piping discharges to storm drainage system and to grade. Exterior rain gutters discharge to grade storm sewer. The lower level and tunnels are served by two sump pumps in fair condition.	Repair leaks, inspect piping, replace problem areas, insulate, and provide maintenance. Cast iron and galvanized piping shall be replaced. Provide properly sized system.
Plumbing Equipment		
Gas Water Heater	2qty. Main Level – 60 gallon. Lower Level / Tunnel – 40 gallon. 120 degree storage temperature, in fair condition. The main level gas water heater is located in a difficult area.	Provide equipment for new building addition and domestic hot water piping with balancing valves.
Electric Water Heater	2 qty. NW area – 40 gallon. SW area – 40 gallon. 120 degree storage temperature, in fair condition.	
Water Softener	2qty. Main Level - 75gpm. Lower Level / Tunnel - 50gpm, in fair condition.	
Circulating Pumps	3qty. Main Level – 8gpm. NW – 5gpm. SW – 5gpm, in poor condition.	
Sanitary Ejector and Pump	1qty. 40 gpm, in poor condition	Provide sanitary ejector pump(s).
Clear Water Sump and Pump	2qty. 40 gpm, in poor condition.	Provide new clear water pump(s).
Plumbing Fixtures		
Plumbing Fixtures		Provide sensor operated valves and faucets, new fixtures and trim, wall mounted fixtures, and floor drains. Replace non-ADA compliant fixtures with ADA compliant ones.
Water Closets	Water Closets are mix of floor mount with tanks or flush valves. Flush valves are manual and sensor operated. The majority of fixtures are in poor condition and ADA compliant.	
Lavatories	Lavatories are mix of wall mount with faucets are manual lever. The majority of the fixtures are in fair condition, ADA compliant, and not at child height.	



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Lavatory Wash Stations	Lavatory Wash Stations are sensor battery operated. The majority of the fixtures are in fair condition and ADA compliant.	
Urinals	Urinals are mix of floor mount and wall mount with flush valve. Flush valves are manual and sensor battery operated. The majority of the fixtures are in fair condition and ADA compliant.	
Electrical Water Coolers	Electrical Water Coolers are a mix of with and without bottle filling stations. The majority of the fixtures are in fair condition, ADA compliant, and not at child height.	
Sinks - General	The majority of the fixtures are in poor condition and not ADA compliant.	
HVAC		
Heating System		
Boiler Plant	The building is served by three Thermal Solutions hot water boilers each rated at 1,320,000 btu gross output, installed in 2013, and in excellent condition. The ASHRAE service life expectancy is about 20-25 years.	Continue preventative maintenance. They should continue to serve the building for another 15-20 years.
Piping and Pumping	The piping and pumping system is a primary-secondary variable flow arrangement, in excellent condition, and served by variable frequency drives. A stand-by pump is in place. The ASHRAE service life is about 20-25 years.	Continue preventative maintenance. They should continue to serve the building for another 15-20 years.
Ventilation and Air Conditioning Systems		
Air Handling Units	Served by classroom unit ventilators, packaged rooftop units, and indoor air handling units. The original indoor air handling equipment has been well maintained and is in fair condition.	Continue with the current maintenance program on all air handling equipment.
	Six classrooms are served by new unit ventilators, installed in 2013, that contain hot water heating and direct-expansion cooling coils. The direct-expansion cooling coils are piped to residential-style condensing units on the roof.	
	The multi-purpose room is served by a vertical constant volume indoor air handling unit that was converted to hot water in 2013. The vertical air handling unit is within a small storage room and is not easily accessible for maintenance.	
	The gymnasium is served by a heating-only indoor air handling unit with pneumatic control.	
	A classroom addition is served by an indoor constant volume air handling unit. The cooling coil is piped to a roof-mounted Trane condensing unit. The units are in excellent condition and should continue to serve for another 15-20 years.	Plans should be made to replace the indoor equipment and upgrade all constant volume systems to VAV systems. All duct-mounted hot water booster coils would be replaced with VAV boxes with hot water reheat coils.
	The office area is served by a Lennox gas-fired packaged rooftop unit, installed in 2007, with direct-expansion cooling. They appear to be in good condition. The Lennox unit should serve the office area for another 5-10 years. The Trane units should serve the building for another 10-15 years.	
	The rest of the classrooms are served by two Trane 35-ton cooling-only packaged rooftop units. The outdoor condensing unit serving the indoor classroom air handling unit appears to be about 10-15 years old. The unit is in good condition and should continue to serve for another 10-15 years.	To address the current COVID-19 situation as well as future health concerns, we recommend installing bipolar ionization equipment within all existing air handling units.
Control Systems		
System	The building is served by a mixture of control system, including a Trend digital control system, Johnson Controls digital control system, ASI digital control system, and a pneumatic control system.	The system should be upgraded to a complete digital control system of a single manufacturer.

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Electrical		
Electric Service		
Utility Service	The service is 1,600 amp 208Y/120 volt 3-phase 4-wire. The main switchboard is a Square D, installed in 1974, and in the Electrical Room. The transformer is outside the Custodial Room, while the meter is inside. The CT's are inside the transformer. The maximum demand on the service is 134 KWs. There is no surge protection device.	The existing service for this facility is adequately sized. If building additions are added, an upgrade will be required. Provide surge protection device on main service.
Panelboards		
	The panelboards in the newer areas are Square D. The panelboards in the older areas are Cutler Hammer. A majority of the panelboards are full.	The newer panelboards are in good condition. Additional panelboards can be added. Replace older panelboards.
Generator		
	This building does not have a generator.	Add an emergency generator and automatic transfer switch to power life safety loads.
Light Fixtures & Controls		
Classrooms	The classrooms have 2x4 acrylic lens 2-lamp or 4-lamp fixtures. Existing fixtures were converted to T8 lamps and Electronic ballasts in 2012. Classrooms have 2 switches to control separate rows. The rooms have no occupancy sensors.	Provide dual technology occupancy sensors automatic lighting shut-off.
Corridors	Corridors have 2x4 acrylic lens 2-lamp fixtures. Existing fixtures were converted to T8 lamps and electronic ballasts in 2012. There are 3-way switches for manual control. Corridor has 24/7 night light fixtures and no occupancy sensors.	Provide ultrasonic occupancy sensors in corridors.
Gymnasium	The gym has new 6-lamp high bay fixtures with T8 lamps.	
Exterior Lighting	Building mounted canopy fixtures are metal halide and wall packs are LED. There is one utility pole light to serve the parking lot. The exterior lighting is controlled from the BAS.	Provide new pole mounted LED area lighting for the parking lot.
Emergency Egress Lighting	There are fluorescent exit lights and battery powered emergency lights in the corridors.	Provide new battery powered LED exist lights.
Wiring Devices		
	The receptacles and toggle switches are commercial grade 5A and are original to the building. There are 1-2 receptacles per wall. Many have been added in surface plastic raceway.	Replace any broken switches and receptacles. Add additional receptacles to classrooms as required.
Fire Alarm System		
	There is a Simplex 4002 conventional zoned fire alarm system. The control panel is located in the Maintenance Room, pull stations are by all exterior doors, horn appliances and smoke detectors are in the corridors, no horn devices are in open classrooms, and no duct smoke detectors are in the air handling units operating at 2000 CFM or greater.	Remove the existing conventional zoned fire alarm system and replace with a new addressable fire alarm system.
Clock System		
	There is a Primex central wireless master clock system. Clocks are battery powered. There are analog clocks in the classrooms, offices, and other public areas.	Provide additional clocks as required.
Intercom System		
	There is a Rauland Telecenter intercom system located in the Health Room. There are recessed ceiling mounted speakers in the corridors and classrooms, which have push to call buttons. The bell system is toned through the speakers.	Additional intercom speakers can be added. Replace old intercom speakers with new.
Phone System		
	There is a Mitel SX-2000 LIGHT analog PBX phone system located in the server room. The phone cabling is CAT5 and is routed back to the server room and punched down on wall mounted voice wiring blocks.	Provide CAT6 wiring for new phones to accommodate the future VoIP phone system.



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Data System	The MDF data rack is located in the server room with floor mounted data racks. It distributes fiber optic cable to wall mounted enclosed IDF data racks. The data cable is CAT6 which is routed to patch panels in the data rack.	Additional data can be added. If an addition would require that the data cable have a total installed length of over 300 feet, then an additional IDF data rack will be required.
CATV System	There is a CATV service to this building. Splitters are located in the corridor ceiling in classrooms. There is a CATV jack and a ceiling mounted projector or smart board in each classroom.	Additional CATV jacks can be added.
Security System	There is a Radionics security system located in the Maintenance Room. The system has motion sensors in the corridors.	Additional security devices can be added.
CCTV System	An IP based CCTV system was added to exterior of building and is in good working order.	Add a IP based CCTV system to the interior of the building.
Access Control System	There is a Brivo door access control system for this building. There are electric strikes on 7 exterior doors. There are FOB readers at each door.	Additional doors can be added to this system.