LINCOLN 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.

Lincoln Elementary School	Analysis	Recommendations
Building Systems		
Plumbing		
Domestic Water		
Water Service	Water Service includes the following: 4" duct tile iron water service supplied by the local municipal water utility and 3" water meter with bypass piping and valves.	
Water Distribution Piping	Piping system is copper with small areas of galvanized piping. Domestic water pipe mains are routed under the building and are in fair condition. There is no domestic cold water soft piping system. Backflow preventers are in fair condition.	Backflow preventer shall be maintained, repaired, and tested. Galvanized piping shall be replaced. Repair all leaks, provide new pipe insulation, extend hot water return & supply piping, and provide domestic water piping system routed above floor.
Fire Sprinkler System	There is no automatic fire sprinkler system in the building.	Existing water service is not capable of supporting a whole building automatic fire sprinkler system. A properly sized water service would be required.
Sanitary and Storm Piping		
Sanitary Waste	Sewers include the following: 6" cast iron sewer lateral discharging to the local municipal sewage utility with no backwater valve on the sewer lateral.	
Sanitary Waste and Vent Piping	Piping system material is Cast Iron & Galvanized. PVC located in repaired areas and sections. Sanitary piping system is in fair condition. Solid waste interceptors are not present.	Repair all leaks, determine system quality and proper flow, and replace any problem areas. Existing cast iron and galvanized piping shall be replaced.
Kitchen Equipment	Grease interceptor are not present. Natural gas systems is black iron steel and supplying equipment pressure is 0.5 pound with single regulators for the equipment.	Provide a grease interceptor for kitchen sink per the Wisconsin plumbing code.
Storm System	Sewers are 6" cast iron & galvanized steel in fair condition, with lateral discharging to the local municipal storm piping with no backwater valve. Interior roof drain and conductor piping system discharges to storm sewer with no sump pump.	Repair all leaks, determine system quality and proper flow, replace any problem areas, and provide new pipe insulation as required.
Plumbing Equipment		
Water Heater	1qty. 75-gal. with 120 degree storage temperature in fair condition.	Provide domestic hot water heating plant for any new addition and new domestic hot water piping with ne balancing valves.
Circulator Pumps	1qty. 5 gpm. It is in fair condition.	
Plumbing Fixtures		
Plumbing Fixtures		Provide senor operated valves and faucets, fixtures, trim, wall mounted fixtures where possible, and floor drains. Replace non-ADA compliant fixtures with compliant ones.
Water Closets	Water Closets are mix of floor mount with flush valve and wall mount with flush valve fixtures. Flush valves are manual lever and one sensor battery operated. The majority of the fixtures are in fair condition and ADA compliant.	
Lavatories	Lavatories are mix of wall mount fixtures. Faucets are manual lever. The majority of the fixtures are in fair condition and ADA compliant.	
Lavatory Wash Stations	Lavatory Wash Stations are mix of wall mount fixtures. Faucets are sensor hard wired operated. The majority of the fixtures are in fair condition and ADA compliant.	
Urinals	Urinals are mixture of floor mount with flush valve and wall mount with flush valve fixtures. Flush valves are manual lever and sensor battery operated. The majority of the fixtures are in fair condition and ADA compliant.	
Electrical Water Coolers	Electrical Water Coolers are without bottle filling stations. The majority of the fixtures are in poor condition and not ADA compliant.	

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Plumbing		
Sinks - General	The majority of the fixtures are in poor condition and not ADA compliant.	
Sink - Classroom	The majority of the fixtures are in fair condition and not ADA compliant.	
HVAC		
Heating System		
Boiler Plant	Served by three Thermal Solutions sealed combustion hot water boilers each rated at 1,320,00 btu gross output. They were installed in 2003 and are in good condition. The ASHRAE service life expectancy is about 20-25 years.	Continue preventative maintenance on the systems. They should continue to serve the building for another 5-10 years.
Piping and Pumping	The piping and pumping system is a primary-secondary variable flow arrangement served by variable frequency drives to modulate pump speed with a stand-by pump in place. The system pumps are in satisfactory condition. The ASHRAE service life expectancy is about 20-25 years.	Continue preventative maintenance on the systems. They should continue to serve the building for another 5-10 years.
Ventilation and Air Conditioning Systems		
Air Handling Units	Served by classroom unit ventilators, packaged rooftop units, and indoor air handling units. The air handling equipment is in good condition.	Continue with the current maintenance program on all air handling equipment.
	The classrooms are served by unit ventilators that contain both hot water heating and chilled water cooling coils. The chiller and pumps are in good condition.	The chiller should continue to serve the building for another 10 years or more.
	The office and special education areas are served by single zone packaged rooftop heating and cooling units. Hot water fin pipe radiation provides heat at the perimeter walls.	
	The multi-purpose room is served by a single zone indoor air handling unit that is a heating-only unit.	Plans should be made to replace the existing unit with a new unit with both hot water heating and chilled water cooling coils.
	Air conditioning for the building is provided by a Trane 90-ton air-cooled chiller within an outdoor enclosure. The piping and pumping system is a primary-secondary variable flow arrangement served by a variable frequency drive.	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	Served by a Trend digital temperature control system installed in 2003. A Johnson Controls F-Ex head-end system was installed in 2018. The fin pipe radiation in the office, the air handling unit damper, and valve actuators are controlled pneumatically. The digital control system is in good condition.	New equipment added should be controlled by the digital control system as an extension of the existing system. Recommended that the building control system be upgraded to a system of one manufacturer.

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Electrical		
Electric Service		
Utility Service	The service is 1,200 amp 208Y/120 volt 3-phase 4-wire. The power panel is a Square D from 1999. The main disconnect is a circuit breaker and the distribution is circuit breakers. Outside the Garage, the utility transformer and a transocket are located. The maximum demand on the service is 166 KW. The switchboard has a surge protection device.	The existing main electric services for this facility is adequately sized. If additions and/or additional air conditioning loads are added, a service upgrade will be required.
Panelboards		
	The panelboards are Square D. A majority of the panelboards have space for additional circuit breakers.	The newer panelboards are in good condition. Additional panelboards can be added when needed. Replace all older panelboards and feeders.
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	Classrooms have 2x4 acrylic lens 3-lamp fixtures. Existing fixtures were converted to T8 lamps and electronic ballasts in 2012. Classrooms have occupancy sensors and 2 switches to control separate rows. Some have dual level switching.	
Corridors	Corridors have 2x4 acrylic lens 2-lamp fixtures. Existing fixtures were converted to T8 lamps and electronic ballasts in 2012. The fixtures are 12 feet on center. There is a 3-way switch on each end of the corridor with no occupancy sensors.	Provide ultrasonic occupancy sensors in corridors.
Exterior Lighting	Building mounted wall pack fixtures are metal halide. The area lights serving the parking lot and driveways are LED. The exterior lighting is controlled from the BAS.	Replace existing metal halide wall packs with new LED wall pack fixtures.
Emergency Egress Lighting	There are battery powered emergency lights and exit lights in the corridors.	
Wiring Devices		
	Receptacles and toggle switches are 15A and 20A. Most are original. In a classroom, there are one or two receptacles per wall. Receptacles 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 an EST2 addressable fire alarm system. Control panel is in the Boiler Room, pull stations by all exterior doors, horn strobe appliances in the corridors, smoke detectors in corridors and classrooms, heat detectors in mechanical rooms, horn strobe appliances in classrooms, and duct smoke detectors in the air handling units operating at 2000 CFM or more.	Additional fire alarm devices can be added to the existing system.
Clock System		
	There is a Simplex 2350 hard wired synchronized clock system. The clock master controller is in the Main Office. There battery powered analog clocks in the classrooms, offices, and public areas.	Existing system is at the end of its service life. We recommend a central wireless master clock with GPS receiver. Replace all hard wired clocks with battery GPS clocks.
Intercom System		
	There is a Rauland intercom system located in the Main Office. There are recessed ceiling mounted speakers in the corridors and surface wall mounted speakers in the classrooms. The bell system is toned through the speakers.	Additional intercom speakers can be added. Provide new rack components as required.

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Electrical		
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 future VoIP phone system.
Data System		
	The MDF data rack is located in the server room with floor mounted data racks. The MDF data rack distributes fiber optic cable to IDF data racks in the building. The IDF data racks are wall mounted fully enclosed cabinets. The data cable is CAT6.	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. The CATV splitters are located in the corridor ceiling at each classroom. There is a CATV jack, a ceiling mounted projector or smartboard, and a sound system in each classroom.	Additional CATV jacks can be added.
Security System		
	There is a Radionics security system located in the Server Room. The security system has motion sensors in the corridors and contact switches on all exterior doors. There is an AI phone and lockdown push button located in the office.	Additional security devices can be added.
CCTV System		
	There is no CCTV system in this building. There is one camera that monitors the front entry hall with a live feed to a monitor in the Main Office. The system does not record.	Add a new IP based CCTV system.
Access Control System		
	There is a Brivo door access control system for this building. There are electric strikes on 6 exterior doors. There are FOB readers at each door.	Additional doors can be added to this system.