DUNWIDDIE 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.

Dunwiddie Elementary School	Analysis	Recommendations
Building Systems		
Plumbing		
Domestic Water		
Water Service	Water Services include the following: 6" Ductile Iron water service supplied by the local municipal water utility and 2" water meter with bypass piping and valves.	
Water Distribution Piping	Piping system material is majority copper. Domestic cold water hard piping system, domestic hot water supply and return piping system, and backflow preventers are in fair condition.	Backflow preventer shall be maintained. repaired, and tested. Repair all leaks, provide new pipe insulation, and extend hot water return and supply piping to fixtures.
Fire Sprinkler System	There is an automatic fire sprinkler system in the 2016 referendum addition.	Extend the automatic fire sprinkler system throughout the rest of the building.
Sanitary and Storm Piping		
Sanitary Waste	Sewer lateral discharging to the local municipal sewage utility and there is not a backwater valve on the sewer lateral.	Provide entire drain and waste system with auger and/or jetting cleaning maintenance.
Sanitary Waste and Vent Piping	Piping system material is Cast Iron, Galvanized & PVC. Sanitary piping system is in fair condition. The sanitary ejector pump is in poor condition.	Repair all leaks, determine system quality and flow, and replace all old piping. Provide new sanitary piping system.
Kitchen Equipment	Natural gas system is black iron steel & copper and supplies plumbing and kitchen equipment. The system pressure is 1/2 pounds.	
Storm System	Sewer lateral discharging to the local municipal storm piping. Piping material is Cast Iron, Galvanized & PVC and is in fair condition. Interior roof drain and conductor piping system discharges to storm drainage system. Clearwater sump basins are located in the tunnel.	Repair all leaks, determine system quality and flow, and replace problem areas. Provide new pipe insulation and a pump in the tunnels sump basins to discharge water.
Plumbing Equipment		
Water Heater	1qty. 100-gal. with 120 degree storage temperature. It is in good condition.	
Circulating Pump	1qty. 8 gpm. It is in good condition.	
Plumbing Fixtures		
Plumbing Fixtures		Provide new valves, faucets, fixtures, accessories, and floor drains. Replace non-ADA compliant fixtures with compliant ones.
Water Closets	Water Closets are wall mounts with and without concealed flush valves and floor mounts with flush valves. The majority of the fixtures are in poor condition and ADA compliant.	
Lavatories	Lavatories are mix of wall mount and drop in countertop fixtures. The majority of the fixtures are in fair condition, ADA compliant, and not at child height.	
Lavatory Wash Stations	Lavatory Wash Stations are a mix of wall mounts. Faucets are manual, sensor hard wired and battery operated. The majority of the fixtures are in fair condition and ADA compliant.	
Urinals	Urinals are mix of floor and wall mount with flush valves. Flush valves are manual lever. The majority of the fixtures are in fair condition and not 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 fair condition and ADA compliant.	
Sink - Classroom	Sink – Classroom are a mix of with and without drinking fountains. The majority of the fixtures are in fair condition and ADA compliant.	

Dunwiddie Elementary School	Analysis	Recommendations
HVAC		
Heating System		
Boiler Plant	Served by three Thermal Solutions hot water boilers each rated at 1,320,000 btu gross output. They were installed in 2013 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 15-20 years.
Piping and Pumping	The piping and pumping system is a primary-secondary variable flow arrangement and are served by variable frequency drives. A stand-by pump is in place. The pumps were installed in 2013 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 15-20 years.
Ventilation and Air Conditioning Systems		
Air Handling Units	Served by classroom unit ventilators installed in 2013 & 2016, packaged rooftop units, and indoor air handling units. All units are in excellent condition and should continue to serve the building for another 15-20 years.	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 gymnasium is served by two constant volume indoor air handling units that were converted to hot water in 2013. The units have been well maintained and have exceeded their service life expectancy of 30-35 years.	Plans should be made for the replacement of the units with roof-mounted air handling units that would incorporate single-zone VAV control and demand control ventilation.
	The cafeteria is served by a constant volume Lennox 10-ton packaged rooftop unit with gas heat and direct-expansion cooling. It appears to be about 6-7 years old, in good condition, and can continue to serve for another 10-15 years.	
	The office area is served by a Trane 7.5 ton packaged rooftop unit with gas heat and direct-expansion cooling installed in 2016. The RTU is a VAV system with VAV boxes with hot water reheat coils for individual zone control. It is in excellent condition should continue to serve for another 12-17 years.	
	Small individual offices and small group instruction rooms are served by fan coil units installed in 2016 with hot water and chilled water coils. They are in excellent condition and should continue to serve for another 15-20 years.	
	The building is air conditioned by a central chilled water system that consists of a Daikin-McQuay 90-ton air-cooled scroll compressor chiller with a primary-secondary variable flow pumping system installed in 2013. It is in excellent condition and can continue to serve for another 20-25 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 Trend digital temperature control system installed in 2013 and a Johnson Controls F-Ex system installed in 2016. The digital control systems appear to be in good operating condition.	It is our recommendation that the building head-end control system be upgraded to a Tridium/Niagara open protocol platform to be interfaced with the Trend and Johnson Controls F-Ex controllers.

Dunwiddie Elementary School	Analysis	Recommendations
Electrical		
Electric Service		
Utility Service	The service is an 800 amp 277/480 volt 3-phase 4-wire feeding panel "MDP." The power panel "MDP" is Sq. D and is located in the Mechanical Room and installed in 2016. Panel "MDP" feeds a 150 kVA transformer "T-MD" and the chiller. Panel "MD", fed from "T-MD" is a 600 amp 120/208 volt 3-phase 4-wire distribution panel feeding all of the school loads.	The main service panel has been recently updated and the existing main electric services are adequately sized. No work needs to be done at this time.
Panelboards		
	The panelboards are Square D. Some panels have recently been replaced in 2016. A majority of the panelboards have space for additional circuit breakers.	The existing panelboards are in good working order and additional panelboards can be added when required.
Generator		
	This building does not have a generator.	Add an emergency generator and automatic transfer switch to power life safety loads.
Light Fixtures & Controls		
Interior Lighting	All classrooms, office spaces, and corridors in the north addition have LED fixtures with occupancy sensors.	
Classrooms	The classrooms in the original building have 1x4 acrylic lens 2-lamp fixtures in continuous rows and were converted to T8 lamps and electronic ballast in 2012. They have 2 switches for separate rows of fixtures and no occupancy sensors.	Provide dual technology occupancy sensors in classrooms and offices in original building.
Corridors	The corridors in the original building have 1x4 acrylic lens 2-lamp fixtures and were converted to T8 lamps and electronic ballasts in 2012. The fixtures are 12 feet on center with a 3-way switch for manual control and no occupancy sensors.	Provide ultrasonic occupancy sensors in original corridors.
Exterior Lighting	Building mounted wall pack fixtures and canopy fixtures are metal halide. Flood lighting and area lighting is LED. The exterior lighting is controlled from the BAS.	
Emergency Egress Lighting	There are fluorescent exit lights and battery powered emergency lights in the original corridors.	Provide battery powered LED exit lights.
Wiring Devices		
	The receptacles and toggle switches are commercial grade 15A & 20An and most are original to the building. In a classroom, there are one or two receptacles per wall. Many receptacles have been added in surface plastic raceway.	Replace any broken switches and receptacles. Add additional receptacles to classrooms as required.
Fire Alarm System		
	An EST conventional zoned fire alarm system is located in the Maintenance Room. There are pull stations by exterior doors, horn strobe appliances and smoke detectors in the corridors, heat detectors in all mechanical rooms, and no horn strobe devices in the classrooms. There are no duct smoke detectors 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.
Public Address System		
	There is a Telecor XL public address system located in the Mail Room. There are recessed ceiling mounted speakers in the corridors, surface wall mounted speakers in the cafeteria, recessed ceiling speakers in the classrooms, and the bell system is toned through the speakers.	Additional intercom speakers can be added. Replace old intercom speakers with new.

Dunwiddie Elementary School	Analysis	Recommendations
Electrical		
Phone System		
	There is a Mitel SX-2000 LIGHT analog PBX phone system located in the server room. The phone cabling is CAT5, 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.
Data System		
	The MDF data rack is floor mounted and located in the server room. It distributes fiber optic cable to various IDF data racks throughout 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 and CATV jacks are in each classroom. There is a ceiling mounted projector or smartboard in each classroom.	Additional CATV jacks can be added.
Security System		
	There is a Radionics security system. The security control panel is located in the Maintenance Room and has motion sensors in the corridors.	Additional security devices can be added.
CCTV System		
	There is no CCTV system in this building.	Add a new IP based CCTV system.
Access Control System		
	There is a Brivo door access control system for this building, with electric strikes on 4 exterior doors and FOB readers at each door.	Additional doors can be added to this system.