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# **Sutherlin School District**

## **Sutherlin, Oregon**

### **Mechanical and Electrical Systems Report**

**June 13, 2017**

#### **GENERAL**

Sutherlin is located approximately 50 miles south of Eugene on Interstate 5. The population is approximately 8,000. The Sutherlin SD is seeking upgrade to their school buildings and is planning for a bond measure along with State of Oregon matching funds for a total of \$8 million.

On May 25, 2017, MKE & Associates, consulting engineers, conducting a walk-through of the school buildings to assess existing conditions and prepare a report of mechanical and electrical upgrade needs. This report is limited to those portions of the systems readily observable. Sutherlin maintenance staff (Rick & Leonard) also attended the walk and offered insight on the history and condition of the mechanical and electrical systems. School was in session at the time of the visit.

#### **SUTHERLIN HIGH SCHOOL**

The high school building services freshman through senior high school aged students. Total population is about 700 students. The size of the school is nearly 83,000 SF, including a Cafeteria, Auditorium and Gymnasium/Lockers. The current school was constructed in about 1975 and now consists of 10 separate buildings (A to K). Buildings A and D are used for student classrooms. Buildings G, H, J and K are portables providing added classroom space. Building E is the wood shop and Building F is the metal shop. Building C is Gym/Lockers and Building B is the Library, Office and Multi-Purpose uses.

#### **Fire Protection:**

With the exception of the Gym (Building C), the existing campus is not sprinkled and due to the large use of masonry units, exposed roof deck and multiple buildings/covered walks, the addition of sprinklers is not recommended. This will allow use of funds in other areas of need.

There is a Simplex fire alarm panel located in the main office. The panel appears dated and the number of detection heads in the school is limited. In lieu of wet sprinklers, alarm system upgrades are recommended to provide full coverage and ADA compliant coverage.

#### **Plumbing:**

The piping system is galvanized below grade into the school. Most of the above grade distribution piping remains galvanized. There are 3 existing water meters serving the campus. One is for the Gym (Bldg. C); one for the Office/Library/Multi-Purpose (Bldg. B)/Class Rooms (Bldg. A). A third meter serves Buildings B, E, F, G, H, J and K. The below grade service is extensive and suspected to be undersized due to pressure problems experienced. Because of the age of the piping system, it is recommended that the water piping be upgraded to PEX and/or copper. Due to the building construction (and cost savings) exposed piping is recommended.

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**Plumbing:** *(continued)*

New gas-fired, natural draft water heaters have been installed throughout the campus at each building.

In general, the plumbing fixtures are dated but in serviceable shape. Throughout the school fixture trim is dated and a mixture of various types and manufacture. ADA accessibility is lacking and needs to be addressed.

The kitchen is dated although still performing satisfactorily.

**HVAC:**

The entire campus is electric heat only. There is natural gas available to the site. The only area that has cooling is the office in Building B. Buildings B and C are served by forced air constant volume air handlers located in penthouses or attic spaces. The units are good quality and serviceable. In both of these buildings there would be notable energy savings by varying the speed of the fans and the outside air volumes by CO2 sensors.

The Class Room building A has electric baseboard that is beyond useful life. The area of operable windows is not sufficient for natural ventilation. It does not appear that a code compliant ventilation system is in place.

Classroom Building D has two air handlers in the attic with electric duct heaters for individual room temperature control. This is inefficient and violation of all recent energy codes.

Portable buildings G, H, J, and K use either split system heat pumps or wall pack (Bard) HVAC units. It is not recommended to invest in HVAC upgrades for these buildings.

Woodshop Building E is using residential gas condensing furnaces for heat. The units are drawing combustion air from inside the building and air borne wood dust is being ingested. It is strongly recommended that combustion air be ducted directly into the furnaces from outdoors.

Metal shop Building F appears to be properly ventilated and exhausted. Newer gas-fired unit heaters have been installed.

In general, the HVAC systems have reached the end of useful life and should be updated. The pneumatic controls are inefficient/leaking/non-functioning and it is reported that the building is being operated without time schedule, optimum start or reset. This is a huge waste of energy and a high priority for upgrade.

**Electrical:**

The main high school has two 120/208V, 3 Phase, 4W services to accommodate the gymnasium (one service) and main administration and classroom wing. The services have an additional 20 years of life and recommendation is to maintain.

The panelboards should also be maintained at this time as well.

The wood shop and metal shop (Bldg. E & F) have a terminated live feeder from the pole mounted transformer. The feeder needs to be removed.

The wood shop (Bldg. E) has the original Fouch and Federal Pacific main distribution. Recommendation is to replace.

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**Electrical:** *(continued)*

Building A, and portions of D, classrooms have old wrap-around luminaires that are yellowed and need replacement. Recommend replacement with LED luminaires. In addition, automatic controls need to be added to meet current State of Oregon code.

Emergency lighting is deficient in many portions and will need to be upgraded.

The building is not equipped with an American with Disabilities (ADA) compliant annunciation system. Recommendation is to replace/modify to comply with ADA requirement.

The addition of security cameras, lockdown devices, etc. may be items that the school district should budget. In particular, added cameras would be effective to monitor/record activity at outer buildings.

**Estimated Construction Costs:** *(All Items Considered Immediate Needs)*

ADA Fire Alarm Upgrades:	\$80,000
ADA Plumbing Fixtures:	\$80,000
New Plumbing Piping:	\$350,000
New HVAC Controls:	\$300,000
New HVAC/Ventilation (A,B,C,D):	\$430,000
Security:	\$20,000
Power Distribution:	\$30,000
Lighting:	\$85,000
<b>Total:</b>	<b>\$1,375,000</b>

**SUTHERLIN MIDDLE SCHOOL**

The Middle School serves grades 7 and 8. Total population is about 350 students. The size of the school is nearly 35,000 SF, including a Kitchen (A), Multi-Purpose (B) and Gymnasium (F). The original school was constructed in the early 1960's and consists of 9 separate buildings, three of which are modular (G, H and J). Buildings C and E are used for student classrooms. Buildings G, H, J and K are portables providing added classroom space. Building F is Gym/Lockers and Building D is the Library.

**Fire Protection:**

The existing campus is not sprinkled and due to the large use of masonry units, exposed roof deck and multiple buildings/covered walks, the addition of sprinklers is not recommended. This will allow use of funds in other areas of need.

There is a Simplex fire alarm panel located in the main office. The panel appears dated and the number of detection heads in the school is limited. In lieu of wet sprinklers, alarm system upgrades are recommended to provide full coverage and ADA compliant coverage.

**Plumbing:**

The piping system is galvanized below grade into the school. Most of the above grade distribution piping remains galvanized. There is one existing water meters serving the campus. The below grade service is extensive between buildings. Because of the age of the piping system, it is recommended that the water piping be upgraded to PEX and/or copper. Due to the building construction (and cost savings) exposed piping is recommended.

New gas-fired, natural draft water heaters have been installed throughout the campus at each building.

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**Plumbing:** *(continued)*

In general, the plumbing fixtures are dated but in serviceable shape. Throughout the school fixture trim is dated and a mixture of various types and manufacture. ADA accessibility is lacking and needs to be addressed. Due to the uneven terrain and number of stairs on this campus, ADA fixtures (and programs) may need to be located in a specific area.

The kitchen is dated although still performing satisfactorily.

**HVAC:**

The campus is served by an American Standard boiler that has reached end of life and become a maintenance headache. The District has begun migrating away from this system and has installed packaged rooftop units at Building B and split system heat pumps or electric baseboard at the Modular Buildings. There is natural gas available to the site.

It is the intent of the District to replace two hot water unit heaters in the Gym (F) with gas-fired type. One of the unit heaters is ducted with outside air. Currently there appears to be limited ventilation capacity.

The Classroom wings (C and E) are served by hot water unit ventilators. The District is intending to use split system heat pumps to serve those buildings and abandon the boiler entirely. Ventilation will need to be addressed as there is not sufficient operable window area for natural ventilation.

In general, the HVAC systems have reached the end of useful life and should be updated. The pneumatic controls are inefficient/leaking/non-functioning and it is reported that the building is being operated without time schedule, optimum start or reset. This is a huge waste of energy and a high priority for upgrade.

**Electrical:**

The main distribution panel and associated panelboards are Coast Electric panelboards that are 40+ years old and need replacement. In addition, recommendation is to provide feeders with 100% ground.

Classrooms have old yellowed acrylic wrap-around luminaires that need to be replaced. We recommend LED luminaires. In addition, the lighting will require automatic lighting control to meet State of Oregon requirements.

Recommendation is to revise exterior lighting to LED and provide emergency backup power to select luminaires to allow safe exit from site.

The buildings are not equipped with an American with Disabilities (ADA) compliant fire alarm system. Recommendation is to add an ADA compliant system.

The addition of security cameras, lockdown devices, etc. may be items that the school district should budget. In particular, added cameras would be effective to monitor/record activity at outer buildings.

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**Estimated Construction Costs:** *(All Items Considered Immediate Needs)*

ADA Fire Alarm Upgrades:	\$65,000
ADA Plumbing Fixtures:	\$50,000
New Plumbing Piping:	\$175,000
New HVAC Controls:	\$50,000
Heating HVAC/Ventilation (C,E,F):	\$270,000
Security:	\$20,000
Power Distribution:	\$60,000
Lighting:	\$102,000
<b>Total:</b>	<b>\$792,000</b>

**WEST ELEMENTARY SCHOOL**

This elementary school was constructed in about 1952 and serves students in the 4-6<sup>th</sup> grade. The total area of the school is nearly 42,000 SF. Like the Middle School and High School, West was constructed as a campus of separate buildings with connecting breezeways. The main building (Building A) houses the Office, Gym/Cafeteria, Library and abandoned Boiler Room. Behind Building A is the Music building (Building B). To the west are four classroom buildings (Buildings C, D, E and F). This composes the original campus. In 1998 was the addition of four modular (Buildings G, H, J and K) each about 1850 SF.

**Fire Protection:**

The existing buildings are not sprinkled. The construction of the elementary school is primarily wood. Due to the number of separated buildings, the cost of fire sprinkling would be high. Sprinklers would be predominantly exposed within the occupied spaces due to the exposed ceiling/roof structure.

The detection heads and horns/strobes in the school are limited or omitted in some areas. It is recommended that ADA compliant upgrades be done.

**Plumbing:**

The existing water piping has failed and been replaced with an overhead 2-inch PEX piping main in the breezeways. This piping is not well insulated and is likely not sized per code. There does not appear to be heat tracing for freeze protection. This should be addressed.

Drainage from the Kitchen is slow and affects all waste drainage upstream of that point. A failure in the sanitary line in the area of the Kitchen is suspected. This needs to be investigated and replaced as needed. Kitchen disposals should no longer be used; composting is recommended.

In general, the plumbing fixtures are dated but in serviceable shape. ADA accessibility is lacking and needs to be addressed. Plumbing trim is dated and a mixture of manufacturers. New trim is recommended.

**HVAC:**

The existing heating system is steam and has been abandoned. For the Classroom wings (C, D, E and F) new split systems heat pumps have been installed. Operable windows are limited to about 20 SF so there is not code ventilation in the classrooms. The modular buildings (G, H, J and K) have wall pack HVAC (Bard) that are sufficient. Classroom ventilators are recommended.

The Music Building (B) is served by a packaged roof unit that is beyond useful life and needs replacement.

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**HVAC:** *(continued)*

Building A (Office) has a newer 10-ton roof unit but lacks adequate thermostatic control. Updated controls are recommended to improve zoning.

**Electrical:**

The main distribution panel and various older branch panels are original. Equipment needs to be replaced. In addition, the electrical grounding for all feeders needs to be confirmed and upgraded.

Lighting control throughout should be completed to meet current State of Oregon Energy Cost.

Current lighting is sufficient and not as in need of replacement as the High School and Middle School. Replacement to LED would reduce energy costs and improve lamp life.

The addition of security cameras, lockdown devices, etc. may be items that the school district should budget. In particular, added cameras would be effective to monitor/record activity at outer buildings.

**Estimated Construction Costs** *(All Items Considered Immediate Needs)*

Fire Alarm Upgrades:	\$55,000
ADA Plumbing Fixtures:	\$120,000
New Water Piping:	\$90,000
New Sanitary Piping:	\$65,000
Add Classroom Ventilation:	\$84,000
Upgrade "A" HVAC Controls:	\$25,000
Security:	\$20,000
Power Distribution/Feeders:	\$75,000
Lighting Control:	\$25,000
Lighting Fixture Replacement:	<u>\$ 65,000</u>
<b>Total:</b>	<b>\$484,000</b>

Fire Sprinkler Addition: **\$180,000**

**EAST ELEMENTARY SCHOOL**

East elementary serves the K-3 population of students and was constructed in 2000. It is a modern school and holding up well. The Gym/Cafeteria is part of the original building and has been incorporated into the new school construction. No mechanical or plumbing upgrades are recommended.

The main portion of the school is in good condition from an electrical standpoint. However, there are issues with the electrical in Building B/Cafeteria B.

The old main distribution panel is located in a mechanical room on the lower level. The MDP is old and needs replacement. In addition, the MDP does not have the sufficient code clearance as outlined by The National Electrical Code.

Recommendation is to upgrade Building B/Cafeteria B to ADA fire alarm compliance to match the newer remodel.

The addition of security cameras, lockdown devices, etc. may be items that the school district should budget. In particular, added cameras would be effective to monitor/record activity at outer buildings.

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**Estimated Construction Costs** (*All Items Considered Immediate Needs*)

Replace MDP/Bldg. B:	\$40,000
ADA Fire Alarm Upgrades:	\$7,000
Security:	<u>\$20,000</u>
<b>Total:</b>	<b>\$67,000</b>

*End of Mechanical and Electrical Systems Report*

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