

CENTRAL VALLEY SCHOOL DISTRICT



Facility Assessment Reports DRAFT

Mechanical Electrical

8/20/2015



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Architects**

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TOWER
ENGINEERING

Center Grange Primary School
Facility Assessment Reports DRAFT
Mechanical Electrical

8/20/2015

Tower Project Name: Central Valley School District Facility Assessment – Center Grange Primary
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: James N. Kosinski, PE
Date: August 14, 2015

Discipline: Mechanical
Date of Site Visit: July 23, 2015

HVAC:

General Comments and Recommendations:

- Overall System Type: Water Source Heat Pump
- Construction and Renovation History: Original Construction in 2007
- Comparison to Current Standards:
 - The water-source heat pump system design is consistent with modern HVAC design for K-12 facilities.
- Overall Recommendation:
 - The existing HVAC system appears to be in very good condition.
 - See specific recommendations below.

Central Heating Plant:

- Description of Existing System:
 - Plant Type: hot water
 - Plant Age: 8
 - Fuel: natural gas
 - Boiler: Two Fulton Pulse Condensing Boilers
 - Pump Configuration: 2 pumps in parallel, primary and backup
 - Variable Speed Drive: Yes
 - Valve Configuration: 2-way
 - Glycol: No
- Recommendations:
 - None

Central Cooling Plant:

- Description of Existing System:
 - Condenser loop cooling is provided by a single fluid cooler installed on the roof. The cooler has electric resistance immersion heaters and heat trace for freeze protection.
 - The individual water-source heat pumps have integral refrigeration systems.
- Recommendations:
 - None.

Classrooms:

- Description of Existing System:
 - System Type: water-source heat pumps, installed in attic mezzanine
 - Age: original
 - Cooling Source: condenser water
 - Heating Source: condenser water
 - Ventilation Source: Ducted from rooftop energy recovery units
- Recommendations:
 - None.

Automatic Temperature Controls:

- Description of Existing System:
 - System Type: DDC
 - Manufacturer: Andover
 - Age: original
- Recommendations:
 - None.

Plumbing and Fire Protection:Plumbing Fixtures:

- Water Closets:
 - Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: floor mounted
 - ADA compliant: Yes
- Urinals:
 - Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: Wall-hung.
 - ADA compliant: Yes
- Lavatories:
 - Wall-hung, Drop-in, Undermount, Integral: Wall-hung.
 - Single or Double handle faucet, type: Single
 - ADA compliant: Yes
- Recommendations:
 - None

Domestic Water System:

- Public Water
- Size:
- Insulated: Yes
- Booster Pump: No

- Recommendations:
 - None

Domestic Hot Water System:

- Water Heaters:
 - # of: 1
 - Manufacturer/Model #: Barkay Genesis
 - Year: Original
 - Condition/Comments: Good condition
 - Circulator Pumps: Yes
- Recommendations
 - None

Sanitary Sewer System:

- Public Sewer System
- Size:
- No reported problems with the sanitary system
- Recommendations:
 - None

Rainwater System:

- Roof drains or gutters/downspouts: Roof drains and gutters/downspouts
- Comments: No reported problems with the storm system
- Recommendations:
 - None

Natural Gas:

- Size:
- Pressure: Unknown
- Gas fired Kitchen cooking equipment
- Recommendations:
 - None

Sprinkler System:

- Is Building Sprinkled: Yes
- Recommendations:
 - None

END OF EXISTING FACILITY ASSESSMENT

Tower Project Name: Central Valley School District Facility Assessment – Center Grange Primary
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: John C. West Jr., PE
Date: August 14, 2015

Discipline: Electrical
Date of Site Visit: July 23, 2015

Power Distribution:

- Description of Existing System
 - Utility Connection: Duquesne Light Company pad mount transformer (500KVA). Secondary feeders routed below grade from utility transformer to switchboard inside main electric room in building.
 - Equipment Manufacturer: Square D
 - Main Building Service: 480Y/277 volt, three phase, four wire switchboard.
 - Main building disconnecting means: 2000 amp (original 2007) main circuit breaker.
 - Switchboard section is circuit breaker type distribution.
 - Code Violations and Safety Concerns: The clearance in front of the 2000 amp main circuit breaker meets the requirements of the National Electric Code requirement of 48". There are tables and chairs stored in this room that infringe on that clearance.
 - Expected Life: This switchboard equipment is less than 10 years old and has another 20 – 30 years of useful life.
 - Sub-Distribution:
 - In the main electric room, there is a 225KVA transformer adjacent to the main switchboard, fed from the main switchboard, that powers a there is an 800 amp rated, 208Y/120 volt, three phase, four wire panelboard (Square D). This distribution panelboard powers all branch panelboards in the building.
 - Code Violations and Safety Concerns: All clearances around the sub-distribution equipment meet the requirements of the National Electric Code (NEC).
 - Expected Life: The sub-distribution panelboard is less than 10 years old and has another 20 – 30 years of useful life.
 - Branch Distribution
 - 480 volt feeders originating from the switchboard are routed around the building to the 480Y/277 volt, three phase, four wire branch panelboards located in dedicated electrical rooms.
 - The 208Y/120 volt, three phase, four wire branch panelboards located in dedicated electric rooms. Branch circuit loads in classrooms, offices, and common areas originate at these branch panelboards.
 - Code Violations and Safety Concerns: All clearances around the branch panelboard equipment meet the requirements of the National Electric Code (NEC).
 - Expected Life: The branch panelboards are less than 10 years old and have another 20 – 30 years of useful life.
- Recommendations:
 - Due to the recent construction of this building, there are no recommendations to improve or upgrade the electrical distribution system.

Emergency Lighting and Power System:

- Description of Existing System

- Existing generator: In a dedicated room for the emergency generator accessed from the outside of the building, there is a 125KW, 480Y/277V, three phase, four wire, natural gas fueled generator with two automatic transfer switches served by the main switchboard. All components are manufactured by Cummins. This generator was installed in 2007 as part of the building construction project.
- Adjacent to each automatic transfer switch (ATS) are an emergency panelboard that serve emergency life safety equipment (fed from the life safety ATS) and emergency equipment (fed from the equipment ATS). The life safety ATS powers the emergency egress lighting and the equipment ATS powers miscellaneous equipment such as the boilers, hot water pumps, cooler, freezers, etc.
- Adjacent to the automatic transfer switches is the area zone protection panel (loss of phase protection in building) and emergency panelboards that serve emergency lighting and power needs throughout the building.
- Emergency Loads:
 - Exit signs along paths of egress are powered from the normal emergency power source.
 - Corridor light fixtures on a normal emergency power are controlled through the low voltage lighting control panel to operate under normal conditions, then re-energize when power is lost. Gymnasium and stage utilize separate light fixtures that operate when the generator is running.
 - The heating plant (boilers and pumps) are connected to the emergency generator.
- Code Violations and Safety Concerns: There are no code violations with this installation.
- Expected Life: The emergency generator is less than 10 years old and should last another 20 – 25 years as long as it is properly maintained.
- Recommendations
 - Due to the recent construction of this building, there are no recommendations to improve or upgrade the emergency distribution system.

Lighting Systems:

- Description of Existing Systems
 - All 4'-0" fluorescent lamps in the building are T8 type. The light fixtures were installed in 2007 as part of the building construction project.
 - The offices and main lobby utilize 2' x 4' perforated basket type light fixtures.
 - The classrooms utilize linear direct/indirect pendant light fixtures.
 - Building mounted exterior lighting consists of a mix of surface mounted light fixtures equipped with metal halide lamps and recessed downlights in canopies with compact fluorescent lamps. Parking area utilizes shoebox type high pressure sodium light fixtures on 20'-0" poles.
 - All spaces in the building utilize a lighting control device to provide automatic shut off of the light fixtures. The classrooms utilize a corner mounted occupancy sensor and a daylight harvest sensor to control the row of light fixtures along the window.
 - A low voltage lighting relay control panel operates the corridor light fixtures and exterior light fixtures.
 - Code Violations and Safety Concerns: At this time, there are no apparent code violations pertaining to the lighting systems in the building.
 - Expected Life: Most light fixtures have a life expectancy of 20 years or more, so the light fixtures have another 15 – 20 years of useful life.
- Recommendations
 - Due to the recent construction of this building, there are no recommendations to improve or upgrade the lighting system, other than to replace compact fluorescent lamped light fixtures with LED lamped light fixtures.
 - The exterior drives and parking area pole mounted light fixtures could be upgraded to a more efficient lighting solution. This could include the use of LED (light emitting diode) light fixtures mounted on the existing poles to minimize the need to re-circuit these light fixtures.

Fire Alarm and Security Systems:

- Description of Existing Systems
 - The existing fire alarm system is a Simplex 4010 system panel. This system was installed in 2007 as part of the building construction project.
 - There are several perimeter doors equipped with card access. These systems are tied to a card access system that is utilized throughout the school district. This system was installed in 2007 as part of the building construction project.
 - There are surveillance cameras around the perimeter of the building and in the public areas of the building.
 - Code Violations and Safety Concerns: All areas are equipped with adequate fire alarm devices that meet with current codes.
 - Expected Life: The fire alarm system has a life expectancy of 10 to 15 years. The card access systems and surveillance camera systems have a life expectancy of 10 years.
- Recommendations
 - Due to the recent construction of this building, there are no recommendations to improve or upgrade these systems.

Building Intercom, Clock, and Cable Television System (CATV):

- Description of Existing Systems
 - The building paging/intercom system is a Rauland Telecenter system. This system was installed in 2007 as part of the building construction project. The clock system is a Primex wireless clock system. This system is used for all pages throughout the entire building and does not include a call-in button in the classrooms. The main cabinet housing all equipment is located in the main telecommunication room. The classrooms have a speaker in the ceiling and separate clock on the wall. There are several local sound systems (gym in a free-standing cabinet) that provide additional sound amplification in the larger spaces.
 - The cable television distribution system operates through the building local area network and utilizes the data cabling in the building to the ceiling mounted projectors.
 - Code Violations and Safety Concerns: None.
 - Expected Life: The public address systems has a life expectancy of 10 to 15 years.
- Recommendations
 - Due to the recent construction of this building, there are no recommendations to improve or upgrade these systems.

Telephone and Data Network System:

- Description of Existing Systems
 - Each classroom is equipped with a telephone mounted on the wall at the entry to each classroom. The cabling from this jack is routed back to data racks that are located at each end of the building in dedicated telecommunication closets. The telephone system is manufactured by Alcatel Lucent.
 - The data cabling in the building is cat 6 cabling. The data racks are connected together using fiber optic cabling.
 - Code Violations and Safety Concerns: None.
 - Expected Life: The data cabling and fiber optic cabling throughout the building is less than 10 years old and has at least another 10 years before needing to be retested.
- Recommendations
 - Due to the recent construction of this building, there are no recommendations to improve or upgrade these systems.

END OF EXISTING FACILITY ASSESSMENT

Todd Lane Elementary School
Facility Assessment Reports DRAFT
Mechanical Electrical

8/20/2015

Tower Project Name: Central Valley School District Facility Assessment – Todd Lane School
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: James N. Kosinski, PE
Date: August 14, 2015

Discipline: Mechanical
Date of Site Visit: July 23, 2015

HVAC:

General Comments and Recommendations:

- Overall System Type: Multizone Rooftop Units (heating only)
- Construction and Renovation History: Original Construction in 1971, Addition in 1995
- Comparison to Current Standards:
 - The rooftop multizone units are similar to the equipment installed in numerous primary/secondary schools that were designed/constructed in the 1970's.
 - Modern HVAC design for K-12 facilities has moved away from multizone units towards more efficient vertical (ducted) unit ventilator, water-source heat pump, geothermal, variable air volume (VAV), and fan-coil designs. These systems have numerous advantages including indoor air quality, acoustics, maintenance requirements and energy efficiency
- Overall Recommendation:
 - The HVAC system serving the original 1971 portion of the building is well beyond its expected longevity.
 - The HVAC system serving the 1995 addition is approaching its expected longevity.
 - Consideration should be given to replacing all components of the existing HVAC system (piping, controls, rooftop units, boilers, etc.) with new equipment.
 - See specific recommendations below.

Central Heating Plant:

- Description of Existing System:
 - Plant Type: hot water
 - Fuel: natural gas
 - Boiler: One original HB Smith cast iron sectional boiler dedicated to the original building and a second 8 year old Fulton condensing boiler that is dedicated to the 1995 addition.
 - Pump Configuration: 2 pumps in parallel, primary and backup plus a single standalone pump
 - Variable Speed Drive: No
 - HW Valve Configuration: 3-way valves
 - Glycol: No

- Recommendations:
 - Consider replacement of the original HB Smith cast iron boiler with a new condensing boiler and connecting the two hot water systems so that the building has redundant heating capability.

Central Cooling Plant.

- Description of Existing System:
 - The building lacks a central cooling plant.
 - Cooling is provided in only a few rooms via ductless splits or air handling units with condensing units.
- Recommendations:
 - If the building is renovated, install an HVAC system that is capable of providing cooling in all educational spaces.

Classrooms:

- Description of Existing System:
 - System Type: Ducted heating and ventilation via rooftop multizone units
 - Age: original
 - Cooling Source: not provided
 - Heating Source: gas heat within multizone units
 - Ventilation Source: Direct via dedicated outside air louver
- Recommendations:
 - Consider changing HVAC system for classrooms to alternative system such as upright unit ventilators, fan-coil units, VAV, water-source heat pump, etc.

Automatic Temperature Controls:

- Description of Existing System:
 - System Type: mix of DDC and DDC with pneumatic actuators
 - The library HVAC system and the heating plant for the new addition have an Andover DDC system.
 - Most of the building has an old Barber Coleman Network 8000 system that is from the 1980's
- Recommendations:
 - If building HVAC system is replaced, reuse the existing Andover system as much as possible and replace the dated Barber Coleman system in its entirety.

Miscellaneous:

- The drain pan for the Auditorium air handling unit is rusting.
- Corridors are currently being utilized for classroom return/relief air, which is currently a code violation. Modify the building's return/relief air system to eliminate this problem.
- The multizone system ductwork is made of fiberglass ductboard. Carefully inspect ductboard to insure that the seams are intact.

Plumbing and Fire Protection:**Plumbing Fixtures:**

- Water Closets:
 - Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: floor mounted
 - ADA compliant: No
- Urinals:
 - Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: Wall-hung.
 - ADA compliant: Yes in most areas
- Lavatories:
 - Wall-hung, Drop-in, Undermount, Integral: Wall-hung.
 - Single or Double handle faucet, type: Double
 - ADA compliant: No
- Recommendations:
 - If building is renovated, upgrade all bathrooms to ADA requirements and replace fixtures.

Domestic Water System:

- Public Water
- Size:
- Booster Pump: No
- Recommendations:
 - All of the piping, valves, specialties, etc. are original and should be replaced if the building is renovated.

Domestic Hot Water System:

- Water Heaters:
 - # of: 1
 - Manufacturer/Model #: Two AO Smith Genesis
 - Year: approximately 2006
 - Condition/Comments: ok condition
 - Circulator Pumps: Yes
- Recommendations
 - If the building is renovated, replace domestic hot water piping.

Sanitary Sewer System:

- Public Sewer System
- Size:

- Some of the exterior sanitary piping has roots, otherwise no reported problems with the sanitary system.
- Recommendations:
 - If the building is renovated, replace accessible sanitary piping.

Rainwater System:

- Flat roof over most of building.
- Roof drains or gutters/downspouts: Roof drains
- Comments: No reported problems with the storm system
- Recommendations:
 - If the building is renovated, replace accessible storm water piping.

Natural Gas:

- Size:
- Pressure: Unknown
- Gas fired Kitchen cooking equipment
- Recommendations:
 - Most of the gas piping is original and should be tested for leaks

Sprinkler System:

- Is Building Sprinkled: No
- Recommendations:
 - If building is renovated, consider installation of a full wet sprinkler system

END OF EXISTING FACILITY ASSESSMENT

Tower Project Name: Central Valley School District Facility Assessment – Todd Lane Elementary
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: John C. West Jr., PE
Date: August 14, 2015

Discipline: Electrical
Date of Site Visit: July 23, 2015

Power Distribution:

- Description of Existing System
 - Utility Connection: Duquesne Light Company vault style transformer. Secondary feeders routed through wall from vault and into main electrical room located on lower level.
 - Equipment Manufacturer: Square D
 - Main Building Service: 480Y/277 volt, three phase, four wire switchboard.
 - Main building disconnecting means: 1200 amp (original 1971) bolted pressure switch (repaired in 2014).
 - Switchboard section is circuit breaker type distribution.
 - Code Violations and Safety Concerns: The clearance in front of the 1200 amp bolted pressure switch meets the requirements of the National Electric Code requirement of 48".
 - Expected Life: This switchboard equipment has surpassed its useful life and should be replaced.
 - Sub-Distribution in the 1995 Addition:
 - In the electric room in the addition, there is a 400 amp rated, 480Y/277 volt, three phase, four wire panelboard (Cutler-Hammer) to serve the addition. A 112.5KVA transformer is fed from this panelboard and this transformer feeds a trough with several disconnect switches fed from the trough. Each disconnect switch feeds a 208Y/120 volt, three phase, four wire panelboard in addition.
 - Code Violations and Safety Concerns: All clearances around the sub-distribution equipment meet the requirements of the National Electric Code (NEC).
 - Expected Life: The sub-distribution panelboard from 1995 has another 15 – 20 years of useful life.
 - Branch Distribution
 - 480 volt feeders originating from the original switchboard are routed around the building to the 480Y/277 volt, three phase, four wire branch panelboards located in corridor walls, electric closets and kitchen.
 - The 208Y/120 volt, three phase, four wire branch panelboards located in corridor walls, electric closets, etc. are mostly powered from step-down transformers located near the panelboards. Branch circuit loads in classrooms, offices, and common areas originate at these branch panelboards.
 - Code Violations and Safety Concerns: All clearances around the branch panelboard equipment meet the requirements of the National Electric Code (NEC). Where transformers are located above ceilings, the NEC requires the rating of the transformer to not exceed 45KVA. These ratings would need to be verified.
 - Expected Life: The branch panelboards from the 1971 original construction have surpassed their useful life and should be replaced. The Cutler Hammer equipment installed in 1995 has another 15 – 20 years of useful life.
- Recommendations:
 - The existing Duquesne Light Co. vault mounted transformer should be removed and replaced by the utility with a pad mounted transformer outside the building. The open vault design in use today creates a hazardous working condition.

- At this time, all of the original electrical distribution equipment, including the switchboards and the branch panelboards, should be considered to be replaced based upon the age of the equipment. The equipment that has been added within the last 20 years can remain but the layout of the equipment may not work with architectural layouts that would be part of a major renovation.
- Because the building is not fully air-conditioned, the service is not sized to accommodate the electrical consumption load that a typical elementary building would typically use. If the building was air conditioned as part of a renovation project, then the electric service size would need to be increased.
- Where additional receptacles would need to be added in existing classroom spaces, the use of surface metal raceway would be employed to provide the pathway into these spaces.

Emergency Lighting and Power System:

- Description of Existing System
 - Existing generator: In the main electric room, there is a 30KW, 208Y/120V, three phase, four wire, natural gas fueled generator with one automatic transfer switch served by the main switchboard. All components are manufactured by Kohler Power Systems. This generator replaced the original equipment in 2000.
 - Adjacent to the automatic transfer switch is the emergency panelboard that serves emergency lighting and power needs throughout the building.
 - Emergency Loads:
 - Exit signs along paths of egress are powered from the normal emergency power source.
 - Corridors and gymnasium utilize separate downlight fixtures that operate when the generator is running.
 - The heating plant (boilers and pumps) are connected to the emergency generator.
 - Code Violations and Safety Concerns: Per current codes, the emergency generator should be located in a separate room with one-hour rated walls OR mounted outside the building. The present location of the emergency generator does not comply with current codes because it is in the same room as the normal power source.
 - Expected Life: The emergency generator is approximately 15 years old and should last another 15 – 20 years as long as it is properly maintained.
- Recommendations
 - The emergency generator should be relocated from the main electric room to a dedicated space or to the exterior of the building. The generator could be installed in a weatherproof housing.
 - If the emergency distribution system is replaced, then additional load can be considered to be added to the emergency system (coolers, freezers, IT equipment).

Lighting Systems:

- Description of Existing Systems
 - All 4'-0" fluorescent lamps in the building are T8 type. The light fixtures installed in the 1995 addition were equipped with this type of lamping and the existing light fixtures were retrofitted from T12 to T8 lamps during that project.
 - The office and classrooms utilize parabolic louvered light fixtures with T8 fluorescent lamps.
 - Building mounted exterior lighting consists of a mix of surface mounted light fixtures equipped with either metal halide or high pressure sodium lamps. Parking area utilizes shoebox type high pressure sodium light fixtures on 20'-0" poles.
 - Code Violations and Safety Concerns: At this time, there are no apparent code violations pertaining to the lighting systems in the building.
 - Expected Life: Most light fixtures have a life expectancy of 20 years or more, so the light fixtures original to the building should be replaced.
- Recommendations

- All incandescent and fluorescent exit signs should be replaced with light emitting diode (LED) lamp exit signs to reduce energy consumption. In renovated areas, this has already been done.
- The existing classroom, office, and corridor light fixtures should be replaced with a more efficient style of light fixture. This would reduce energy consumption by allowing greater spacing of the light fixtures in these spaces.
- If alterations to the building are planned in the near future, then to comply with the current energy codes, lighting control devices (timer switches, occupancy sensors) will be required to provide automatic shut-off of light fixtures during unoccupied times. To provide overall control of the building lighting systems in common areas, a low voltage lighting relay control panel could be installed to control more of the lighting in the building.
- If alterations to the building are planned that would vary floor plans, the light fixtures could be replaced with more efficient light fixtures and provide greater spacing, which would reduce the amount energy consumed.
- The exterior drives and parking area pole mounted light fixtures should be upgraded to a more efficient lighting solution. This could include the use of LED (light emitting diode) light fixtures mounted on the existing poles to minimize the need to re-circuit these light fixtures.

Fire Alarm and Security Systems:

- Description of Existing Systems
 - The existing fire alarm system is a Gamewell system panel. This system was installed as part of the addition project in 1995.
 - There are several perimeter doors equipped with card access. These systems are tied to a card access system that is utilized throughout the school district. These systems were installed within the last 10 years.
 - There are surveillance cameras around the perimeter of the building and in the public areas of the building.
 - Code Violations and Safety Concerns: Most public areas are equipped with adequate fire alarm devices that meet with current codes. There are no strobe only devices in the classrooms and library, which is now a code requirement.
 - Expected Life: The fire alarm system is 20 years old and is near the end of its useful life.
- Recommendations
 - A new fire alarm system should be considered for this building to completely replace the existing system. Additional devices can be added to comply with current codes.

Building Intercom, Clock, and Cable Television System (CATV):

- Description of Existing Systems
 - The building paging/intercom system is a Rauland Telecenter 21 systems that was installed in the 1995 addition project. The clock system is a National Time system. This system is used for all pages throughout the entire building and does not include a call-in button in the classrooms. The main cabinet housing all equipment is located in the administration office area. The original building has a combination speaker/clock unit mounted on the wall in the classrooms. The addition classrooms have a speaker in the ceiling and separate clock on the wall. There are several local sound systems (gym and cafeteria in a free-standing cabinet) that provide additional sound amplification in the larger spaces.
 - The cable television distribution system originates in the main electric room and is a channel one type system with televisions in each classroom. The distribution of the coaxial cabling consists of several trunk lines routed into the classroom areas that are then routed into each classroom using splitters.
 - Code Violations and Safety Concerns: None.
 - Expected Life: The public address systems has reached the end of its useful life and should be replaced.
- Recommendations
 - Each classroom and instructional space should be upgraded to include an audio/visual system that would include an LCD projector, voice amplification, interactive marker board and small head-end for the classroom system.

- The cable television system may be completely replaced with newer technology that utilizes the building data network rather than upgrading the current equipment in the central rack.

Telephone and Data Network System:

- Description of Existing Systems
 - Each classroom is equipped with a telephone mounted on the wall at the entry to each classroom. The cabling from this jack is routed back to a data rack that are located throughout the building in closets and storage rooms. The telephone system is manufactured by Alcatel Lucent.
 - The data cabling in the building is a mix of cat 5 and cat 6 cabling. The data racks are connected together using fiber optic cabling.
 - Code Violations and Safety Concerns: None.
 - Expected Life: The data cabling throughout the building is approaching the typical 15 year warranty period and could be retested and certified to ensure the cabling system can accommodate present and future technologies that will operate at gigabit Ethernet speeds. Also, fiber optic cabling from the MDF to each satellite closets could be retested for signal loss due to dust at connection points, etc.
- Recommendations
 - The existing data closet locations are not always secured and dedicated for the sole use of the data network. As part of any renovation, it would be advisable to provide separate spaces to accommodate this equipment and dedicated cooling systems would be provided to cool these rooms.

END OF EXISTING FACILITY ASSESSMENT

Central Valley Middle School
Facility Assessment Reports DRAFT
Mechanical Electrical

8/20/2015

Tower Project Name: Central Valley School District Facility Assessment – Central Valley Middle School
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: James N. Kosinski, PE
Date: August 14, 2015

Discipline: Mechanical
Date of Site Visit: July 23, 2015

HVAC:

General Comments and Recommendations:

- Overall System Type: 2-pipe unit ventilator, floor mounted
- Construction and Renovation History: Original Construction in 1964
- Comparison to Current Standards:
 - The floor mounted unit ventilators are similar to the equipment installed in numerous primary/secondary schools that were designed/constructed prior to the 1990's.
 - Modern HVAC design for K-12 facilities has moved away from floor mounted unit ventilator design towards vertical (ducted) unit ventilator, water-source heat pump, geothermal, variable air volume (VAV), and fan-coil designs. These systems have numerous advantages including indoor air quality, acoustics, maintenance requirements and energy efficiency
- Overall Recommendation:
 - The existing HVAC system is well beyond its expected longevity.
 - Consideration should be given to replacing all components of the existing HVAC system (piping, controls, unit ventilators, boilers, etc.) with new equipment.
 - See specific recommendations below.

Central Heating Plant:

- Description of Existing System:
 - Plant Type: hot water
 - Plant Age: approximately 15 years
 - Fuel: natural gas
 - Boiler: Two Lochinvar Copper Fin boilers.
 - Pump Configuration: 2 pumps in parallel, primary and backup
 - Variable Speed Drive: No
 - HW Valve Configuration: 3-way valves
 - Glycol: No
- Recommendations:
 - None

Central Cooling Plant.

- Description of Existing System:
 - The building lacks a central cooling plant.
 - Cooling is provided in only a few rooms with self-contained equipment, typically window air conditioners.
 - Dated rooftop units provide cooling for the Art Room and Library
 - The Band room air handling unit has cooling via a dated remote air cooled condensing unit.
- Recommendations:
 - If the building is renovated, install an HVAC system that is capable of providing cooling in all educational spaces.

Classrooms:

- Description of Existing System:
 - System Type: Floor-mounted unit ventilators, one per classroom
 - Age: original
 - Cooling Source: not provided
 - Heating Source: Hot water
 - Ventilation Source: Direct via dedicated outside air louver
- Recommendations:
 - Consider changing HVAC system for classrooms from floor mounted unit ventilators to alternative system such as upright unit ventilators, fan-coil units, VAV, water-source heat pump, etc.

Automatic Temperature Controls:

- Description of Existing System:
 - System Type: pneumatic/electric, no DDC
 - Age: original
- Recommendations:
 - If building HVAC system is replaced, install new building-wide DDC system.

Miscellaneous:

- Art Room and Library are provided with HVAC via two non-interlocked units that fight each other at times.
- The Band Room air handling unit is not capable of meeting the room's HVAC requirements and must operate continuously.
- The Auditorium air handling units are original and are very noisy due to their location on catwalk above stage.
- The makeup air unit serving the kitchen is not operational
- The Cafeteria air handling unit is not operational

Plumbing and Fire Protection:**Plumbing Fixtures:**

- Water Closets:
 - Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: floor mounted
 - ADA compliant: No
- Urinals:
 - Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: Wall-hung.
 - ADA compliant: Yes in most areas
- Lavatories:
 - Wall-hung, Drop-in, Undermount, Integral: Wall-hung.
 - Single or Double handle faucet, type: Single
 - ADA compliant: Only in some locations Trap wrap installed below
- Recommendations:
 - If building is renovated, upgrade all bathrooms to ADA requirements and replace fixtures.

Domestic Water System:

- Public Water
- Size:
- Insulated: Yes
- Booster Pump: No
- Recommendations:
 - All of the piping, valves, specialties, etc. are original and should be replaced if the building is renovated.

Domestic Hot Water System:

- Water Heaters:
 - # of: 1
 - Manufacturer/Model #: RBI 8900 series
 - Year: approximately 2010
 - Condition/Comments: Good condition
 - Circulator Pumps: Yes
- Recommendations
 - If the building is renovated, replace domestic hot water piping.

Sanitary Sewer System:

- Public Sewer System
- Size:
- No reported problems with the sanitary system
- Recommendations:
 - If the building is renovated, replace accessible sanitary piping.

Rainwater System:

- Flat roof over most of building.
- Roof drains or gutters/downspouts: Roof drains
- Comments: No reported problems with the storm system
- Recommendations:
 - If the building is renovated, replace accessible stormwater piping.

Natural Gas:

- Size:
- Pressure: Unknown
- Gas fired Kitchen cooking equipment
- Recommendations:
 - Most of the gas piping is original and should be tested for leaks

Sprinkler System:

- Is Building Sprinkled: No
- Recommendations:
 - If building is renovated, consider installation of a full wet sprinkler system

END OF EXISTING FACILITY ASSESSMENT

Tower Project Name: Central Valley School District Facility Assessment – Central Valley Middle School
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: John C. West Jr., PE
Date: August 14, 2015

Discipline: Electrical
Date of Site Visit: July 23, 2015

Power Distribution:

- Description of Existing System
 - Utility Connection: Duquesne Light Company vault style transformer. Secondary feeders routed through wall from vault and into main electrical room located in lower level.
 - Equipment Manufacturer: Westinghouse and General Electric
 - Main Building Service: 480Y/277 volt, three phase, four wire switchboard using multiple main disconnects in one section.
 - Main building disconnecting means: (1) 1600 amp and (1) 1200 amp (original 1964) bolted pressure switches in single section. This section is manufactured by Westinghouse. A separate 1200 amp bolted pressure switch section is connected to the distribution section and feeds what was an addition to the building in the late 1960's. This section is manufactured by General Electric. This bolted pressure switch is not considered one of the building main service disconnect switches.
 - The switchboard distribution section is circuit breaker type distribution.
 - Code Violations and Safety Concerns: The clearance in front of the switchboard meets the requirements of the National Electric Code requirement of 48".
 - Expected Life: The original switchboard equipment has surpassed its useful life and should be replaced. The General Electric section has also surpassed its useful life and should be replaced.
 - Sub-Distribution in first floor main electrical room:
 - A sub-distribution panelboard is located in a storage room adjacent to a locker room that is powered by the 1200 amp bolted pressure switch in main electric room. This sub-distribution panelboard powers branch panelboards in this part of the building.
 - Code Violations and Safety Concerns: All clearances around the sub-distribution equipment meet the requirements of the National Electric Code (NEC).
 - Expected Life: The sub-distribution panelboard from the mid 1960's has surpassed its useful life and should be replaced.
 - Branch Distribution
 - 480 volt feeders originating from switchboards are routed around the building to the 480Y/277 volt, three phase, four wire branch panelboards located in corridor walls, electric closets and kitchen.
 - The 208Y/120 volt, three phase, four wire branch panelboards located in corridor walls, electric closets, etc. are mostly powered from step-down transformers located near the panelboards. Branch circuit loads in classrooms, offices, and common areas originate at these branch panelboards.
 - Code Violations and Safety Concerns: All clearances around the branch panelboard equipment meet the requirements of the National Electric Code (NEC), except for a panelboard in the kitchen that is mounted above a sink. Where transformers are located above ceilings, the NEC requires the rating of the transformer to not exceed 45KVA. These ratings would need to be verified.

- Expected Life: The branch panelboards from the mid 1960's have surpassed their useful life and should be replaced.
- Recommendations:
 - The existing Duquesne Light Co. vault mounted transformer should be removed and replaced by the utility with a pad mounted transformer outside the building. The open vault design in use today creates a hazardous working condition.
 - At this time, all of the electrical distribution equipment, including the switchboards and the branch panelboards, should be considered to be replaced based upon the age of the equipment. There appeared to be very little equipment that has been added recently to the building. Therefore, completely replacing the electrical distribution system would be prudent.
 - Because the building is not fully air-conditioned, the service is not sized to accommodate the electrical consumption load that a typical middle school building would typically use. If the building was air conditioned as part of a renovation project, then the electric service size would need to be increased.
 - Where additional receptacles would need to be added in existing classroom spaces, the use of surface metal raceway would be employed to provide the pathway into these spaces.

Emergency Lighting and Power System:

- Description of Existing System
 - Existing generator: In the main electric room, there is a 50KW, 208Y/120V, three phase, four wire, natural gas fueled generator with one automatic transfer switch served by the main switchboard. All components are manufactured by Onan (Cummins). This generator is original to the building (1964).
 - Adjacent to the automatic transfer switch are the emergency panelboards that serve emergency lighting and power needs throughout the building. These panelboards were replaced within the last 10 years.
 - Emergency Loads:
 - Exit signs along paths of egress are powered from the normal emergency power source.
 - Corridors utilize 2' x 4' prismatic light fixtures with a separate third lamp connected to the emergency generator.
 - Gymnasiums, auditorium spaces utilize separate downlight fixtures that operate when the generator is running.
 - The heating plant (boilers and pumps) are connected to the emergency generator.
 - Code Violations and Safety Concerns: Per current codes, the emergency generator should be located in a separate room with one-hour rated walls OR mounted outside the building. The present location of the emergency generator does not comply with current codes because it is in the same room as the normal power source.
 - Expected Life: The emergency generator has surpassed its useful life and should be replaced.
- Recommendations
 - The emergency generator should be replaced due to its age and location with a new generator mounted outside the building.
 - If the emergency distribution system is replaced, then additional load can be considered to be added to the emergency system (coolers, freezers, IT equipment).

Lighting Systems:

- Description of Existing Systems
 - Most of all 4'-0" fluorescent lamps in the building are T8 type. The light fixtures are mostly original to the 1960's construction of the building, but were retrofitted from T12 to T8 lamps at some point in the last 15 years. The mechanical rooms utilize incandescent based light fixtures.
 - With the exception of the areas that have been renovated (very limited), all light fixtures appeared to be original to the building.

- The Auditorium house seating area consists of surface mounted 2' x 4' fluorescent light fixtures with dimmable ballasts. The stage has the original dimmer rack to control the stage lighting. There are electricians over the stage and front of house lights attached to the ceiling in the house.
- Building mounted exterior lighting consists of a mix of surface mounted light fixtures equipped with either metal halide or high pressure sodium lamps. Parking area utilizes shoebox type high pressure sodium or metal halide light fixtures on 20'-0" poles.
- Code Violations and Safety Concerns: Several of the pole mounted light fixtures are leaning and the poles are rusting at the bases.
- Expected Life: Most light fixtures have a life expectancy of 20 years or more, so the light fixtures original to the building should be replaced.
- Recommendations
 - All incandescent and fluorescent exit signs should be replaced with light emitting diode (LED) lamp exit signs to reduce energy consumption.
 - The existing classroom, office, and corridor light fixtures should be replaced with a more efficient style of light fixture. This would reduce energy consumption by allowing greater spacing of the light fixtures in these spaces. Also, the current light fixtures produce glare and new light fixture styles would help to eliminate this problem.
 - If alterations to the building are planned in the near future, then to comply with the current energy codes, lighting control devices (timer switches, occupancy sensors) will be required to provide automatic shut-off of light fixtures during unoccupied times. To provide overall control of the building lighting systems in common areas, a low voltage lighting relay control panel could be installed to control more of the lighting in the building.
 - If alterations to the building are planned that would vary floor plans, the light fixtures could be replaced with more efficient light fixtures and provide greater spacing, which would reduce the amount of energy consumed.
 - The exterior drives and parking area pole mounted light fixtures should be upgraded to a more efficient lighting solution. This could include the use of LED (light emitting diode) light fixtures mounted on new poles.

Fire Alarm and Security Systems:

- Description of Existing Systems
 - The existing fire alarm system is a Simplex 4100U system panel. This system was installed within the last 5 years.
 - There are several perimeter doors equipped with card access. These systems are tied to a card access system that is utilized throughout the school district. These systems were installed within the last 10 years.
 - There are surveillance cameras around the perimeter of the building and in the public areas of the building.
 - Code Violations and Safety Concerns: All areas are equipped with adequate fire alarm devices that meet with current codes.
 - Expected Life: The fire alarm system has a life expectancy of 10 to 15 years. The card access systems and surveillance camera systems have a life expectancy of 10 years.
- Recommendations
 - If alterations to the building are planned that would vary the floor plans, then revisions may need to be made to the fire alarm system device layout and camera layouts.

Building Intercom, Clock, and Cable Television System (CATV):

- Description of Existing Systems
 - The building paging/intercom system was not determined. The clock system was also not determined. This system is used for all pages throughout the entire building and does not include a call-in button in the classrooms. There are speakers in the classrooms and corridors. There are several local sound systems (gym and cafeteria in a free-standing cabinet, auditorium in a free-standing cabinet on the stage) that provide additional sound amplification in the larger spaces.

- The cable television distribution system originates in the main electric room and is a channel one type system with televisions in each classroom. The distribution of the coaxial cabling consists of several trunk lines routed into the classroom areas that are then routed into each classroom using splitters.
- Code Violations and Safety Concerns: None.
- Expected Life: The public address system has reached the end of its useful life and should be replaced.
- Recommendations
 - Each classroom and instructional space should be upgraded to include an audio/visual system that would include an LCD projector, voice amplification, interactive marker board and small head-end for the classroom system.
 - The cable television system may be completely replaced with newer technology that utilizes the building data network rather than upgrading the current equipment in the central rack.

Telephone and Data Network System:

- Description of Existing Systems
 - Each classroom is equipped with a telephone mounted on the wall at the entry to each classroom. The cabling from this jack is routed back to a data rack that are located throughout the building in closets and storage rooms. The telephone system is manufactured by Alcatel Lucent.
 - The data cabling in the building is a mix of cat 5 and cat 6 cabling. The data racks are connected together using fiber optic cabling.
 - Code Violations and Safety Concerns: None.
 - Expected Life: The data cabling throughout the building is approaching the typical 15 year warranty period and could be retested and certified to ensure the cabling system can accommodate present and future technologies that will operate at gigabit Ethernet speeds. Also, fiber optic cabling from the MDF to each satellite closets could be retested for signal loss due to dust at connection points, etc.
- Recommendations
 - The existing data closet locations are not always secured and dedicated for the sole use of the data network. As part of any renovation, it would be advisable to provide separate spaces to accommodate this equipment and dedicated cooling systems would be provided to cool these rooms.

END OF EXISTING FACILITY ASSESSMENT

Tower Project Name: Central Valley School District Facility Assessment – Central Valley High School
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: James N. Kosinski, PE
Date: August 14, 2015

Discipline: Mechanical
Date of Site Visit: July 23, 2015

HVAC:

General Comments and Recommendations:

- Overall System Type: 2-pipe unit ventilator, floor mounted
- Construction and Renovation History: Original Construction in 1960, Renovated in 1980's, Addition approximately 2007
- Comparison to Current Standards:
 - The floor mounted unit ventilators are similar to the equipment installed in numerous primary/secondary schools that were designed/constructed prior to the 1990's.
 - Modern HVAC design for K-12 facilities has moved away from floor mounted unit ventilator design towards vertical (ducted) unit ventilator, water-source heat pump, geothermal, variable air volume (VAV), and fan-coil designs. These systems have numerous advantages including indoor air quality, acoustics, maintenance requirements and energy efficiency
- Overall Recommendation:
 - Outside of the Cafeteria and Wellness Center additions, the existing HVAC system is well beyond its expected longevity.
 - Consideration should be given to replacing all components of the existing HVAC system (piping, controls, unit ventilators, boilers, etc.) with new equipment.
 - See specific recommendations below.

Central Heating Plant:

- Description of Existing System:
 - Plant Type: hot water
 - Fuel: natural gas
 - Boiler: Four HB Smith cast iron sectional boilers, two are approximately 8 years old and two are at least 25 years old
 - Pump Configuration: 2 pumps in parallel, primary and backup plus a single standalone pump
 - Variable Speed Drive: No
 - HW Valve Configuration: 3-way valves
 - Glycol: No
- Recommendations:
 - Consider replacing the two older cast-iron sectional boilers with high efficiency condensing boilers that would be sized to meet the building's heating requirements on a part-load day.

Central Cooling Plant.

- Description of Existing System:
 - The building lacks a central cooling plant.
 - Cooling is provided in only a few rooms via ductless splits or air handling units with condensing units.
- Recommendations:
 - If the building is renovated, install an HVAC system that is capable of providing cooling in all educational spaces.

Classrooms:

- Description of Existing System:
 - System Type: Floor-mounted unit ventilators, one per classroom
 - Age: original
 - Cooling Source: not provided
 - Heating Source: Hot water
 - Ventilation Source: Direct via dedicated outside air louver
- Recommendations:
 - Consider changing HVAC system for classrooms from floor mounted unit ventilators to alternative system such as upright unit ventilators, fan-coil units, VAV, water-source heat pump, etc.

Automatic Temperature Controls:

- Description of Existing System:
 - System Type: mix of DDC and DDC with pneumatic actuators
 - Approximately half of the building has an Andover DDC system that is 8 years old.
 - Approximately half of the building has an old Barber Coleman Network 8000 system that is from the 1980's
- Recommendations:
 - If building HVAC system is replaced, reuse the existing Andover system as much as possible and replace the dated Barber Coleman system in its entirety.

Miscellaneous:

- The drain pan for the Auditorium air handling unit is rusting.
- Corridors are currently being utilized for classroom relief air, which is currently a code violation. Modify the building's relief air system to eliminate this problem.

Plumbing and Fire Protection:Plumbing Fixtures:

- Water Closets:

- Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: floor mounted
 - ADA compliant: No
- Urinals:
 - Flush valve or tank: Manual Flush valve.
 - Floor mounted or wall-hung: Wall-hung.
 - ADA compliant: Yes in most areas
- Lavatories:
 - Wall-hung, Drop-in, Undermount, Integral: Wall-hung.
 - Single or Double handle faucet, type: Double
 - ADA compliant: No
- Recommendations:
 - If building is renovated, upgrade all bathrooms to ADA requirements and replace fixtures.

Domestic Water System:

- Public Water
- Size:
- Booster Pump: No
- Recommendations:
 - All of the piping, valves, specialties, etc. are original and should be replaced if the building is renovated.

Domestic Hot Water System:

- Water Heaters:
 - # of: 1
 - Manufacturer/Model #: Two AO Smith Genesis
 - Year: approximately 2006
 - Condition/Comments: ok condition
 - Circulator Pumps: Yes
- Recommendations
 - If the building is renovated, replace accessible domestic hot water piping.

Sanitary Sewer System:

- Public Sewer System
- Size:
- Some of the exterior sanitary piping has roots, otherwise no reported problems with the sanitary system.
- Recommendations:
 - If the building is renovated, replace accessible sanitary piping.

Rainwater System:

- Flat roof over most of building.
- Roof drains or gutters/downspouts: Roof drains

- Comments: No reported problems with the storm system
- Recommendations:
 - If the building is renovated, replace original storm water piping that is accessible.

Natural Gas:

- Size:
- Pressure: Unknown
- Gas fired Kitchen cooking equipment
- Recommendations:
 - Most of the gas piping is original and should be tested for leaks

Sprinkler System:

- Is Building Sprinkled: No
- Recommendations:
 - If building is renovated, consider installation of a full wet sprinkler system

END OF EXISTING FACILITY ASSESSMENT

Tower Project Name: Central Valley School District Facility Assessment – Central Valley High School
Tower Project Number: 2015080
Client: Crabtree, Rohrbaugh & Associates - Architects
Prepared By: John C. West Jr., PE
Date: August 14, 2015

Discipline: Electrical
Date of Site Visit: July 23, 2015

Power Distribution:

- Description of Existing System
 - Utility Connection: Duquesne Light Company vault style transformer. Secondary feeders routed through wall from vault and into main electrical room located in first floor.
 - Equipment Manufacturer: Westinghouse and Cutler-Hammer
 - Main Building Service: 480Y/277 volt, three phase, four wire switchboard using multiple main disconnects.
 - Main building disconnecting means: (1) 1200 amp (original 1962) and (1) 800 amp (Junior High Addition mid 1960's) bolted pressure switches and one 2000A/3P main circuit breaker added within last fifteen years. The newer 2000A/3P main circuit breaker section and associated distribution section are set directly beside the original switchboard.
 - All switchboard sections are circuit breaker type distribution.
 - Code Violations and Safety Concerns: The clearance in front of the 1200 amp bolted pressure switch and the circuit breaker distribution section fed from the 800 amp bolted pressure switch does not meet the National Electric Code requirement of 48". Also, a second means of egress from this room is required due to the size of the equipment in this space.
 - Expected Life: The original switchboard equipment has surpassed its useful life and should be replaced. The Cutler Hammer equipment installed within the last 15 years has another 20 – 30 years of useful life.
 - Sub-Distribution in first floor main electrical room:
 - When the Junior High Building was added in the mid 1960's, an 800 sub-distribution switchboard was added in the basement and was fed from a 500KVA transformer to derive the neutral. This distribution was fed from the main electric room with an 800 amp, three phase, three wire bus duct. When the 2000 amp switchboard was added, several sub-distribution panelboards were installed throughout the building.
 - Code Violations and Safety Concerns: All clearances around the sub-distribution equipment meet the requirements of the National Electric Code (NEC).
 - Expected Life: The sub-distribution switchboard from the mid 1960's has surpassed its useful life and should be replaced. The Cutler Hammer equipment installed within the last 15 years has another 20 – 30 years of useful life.
 - Branch Distribution
 - 480 volt feeders originating from switchboards are routed around the building to the 480Y/277 volt, three phase, four wire branch panelboards located in corridor walls, electric closets and kitchen.
 - The 208Y/120 volt, three phase, four wire branch panelboards located in corridor walls, electric closets, etc. are mostly powered from step-down transformers located near the panelboards. Branch circuit loads in classrooms, offices, and common areas originate at these branch panelboards.

- Code Violations and Safety Concerns: All clearances around the branch panelboard equipment meet the requirements of the National Electric Code (NEC). Where transformers are located above ceilings, the NEC requires the rating of the transformer to not exceed 45KVA. These ratings would need to be verified.
- Expected Life: The branch panelboards from the mid 1960's have surpassed their useful life and should be replaced. The Cutler Hammer equipment installed within the last 15 years has another 20 – 30 years of useful life.
- Recommendations:
 - The existing Duquesne Light Co. vault mounted transformer should be removed and replaced by the utility with a pad mounted transformer outside the building. The open vault design in use today creates a hazardous working condition.
 - At this time, all of the original electrical distribution equipment, including the switchboards and the branch panelboards, should be considered to be replaced based upon the age of the equipment. The equipment that has been added within the last 15 years can remain but the layout of the equipment may not work with architectural layouts that would be part of a major renovation.
 - Because the building is not fully air-conditioned, the service is not sized to accommodate the electrical consumption load that a typical high school building would typically use. If the building was air conditioned as part of a renovation project, then the electric service size would need to be increased.
 - Where additional receptacles would need to be added in existing classroom spaces, the use of surface metal raceway would be employed to provide the pathway into these spaces.

Emergency Lighting and Power System:

- Description of Existing System
 - Existing generators: In the main electric room, there is a 40KW, 480Y/277V, three phase, four wire, natural gas fueled generator with one automatic transfer switch served by the main switchboard. All components are manufactured by Kohler Power Systems. This generator is original to the building (1962). This generator serves the loads in the high school building. A second generator mounted outside the building in a weatherproof enclosure was installed within the last 10 years and replaced a 25KW, 208Y/120V, three phase, four wire, natural gas fueled generator with automatic transfer switch. All components are manufactured by Cummins. This generator served the loads in the junior high section of the building.
 - Adjacent to the automatic transfer switches is the area zone protection panel (loss of phase protection in building) and emergency panelboards that serve emergency lighting and power needs throughout the building.
 - Emergency Loads:
 - Exit signs along paths of egress are powered from the normal emergency power source. Some tritium gas exit signs are used in the building and will require proper disposal if removed.
 - Corridors, gymnasiums, auditorium spaces utilize separate downlight fixtures that operate when the generator is running.
 - The heating plant (boilers and pumps) are connected to the emergency generator.
 - Code Violations and Safety Concerns: Per current codes, the original emergency generator should be located in a separate room with one-hour rated walls OR mounted outside the building. The present location of the emergency generator does not comply with current codes because it is in the same room as the normal power source. The newer generator mounted outside the building does comply with newer codes.
 - Expected Life: The original emergency generator has surpassed its useful life and should be replaced. As long as the newer emergency generator is properly maintained, it should be able to operate another 20 years.
- Recommendations
 - The original emergency generator should be replaced due to its age and location with a new generator mounted outside the building. At that time, the newer outdoor emergency generator could be eliminated to consolidate all the emergency loads onto one generator.

- If the emergency distribution system is replaced, then additional load can be considered to be added to the emergency system (coolers, freezers, IT equipment).

Lighting Systems:

- Description of Existing Systems
 - Most of all 4'-0" fluorescent lamps in the building are T12 type, with the exception of spaces renovated in the last 15 – 20 years. These spaces would include the cafeteria, technical education rooms, and surrounding corridors. The fitness room that was added to the building also utilizes light fixtures with T8 lamping. The mechanical rooms utilize incandescent based light fixtures.
 - With the exception of the areas that have been added on or renovated, all light fixtures appeared to be original to the building.
 - The Auditorium house seating area consists of incandescent downlights. The stage has a 96 circuit dimmer rack located in a room behind the stage. There are three electrics over the stage and front of house lights attached to the catwalk structure.
 - Building mounted exterior lighting consists of a mix of surface mounted light fixtures equipped with either metal halide or high pressure sodium lamps. Parking area utilizes shoebox type high pressure sodium light fixtures on 20'-0" poles.
 - Code Violations and Safety Concerns: At this time, there are no apparent code violations pertaining to the lighting systems in the building.
 - Expected Life: Most light fixtures have a life expectancy of 20 years or more, so the light fixtures original to the building should be replaced.
- Recommendations
 - Because the T12 lamp has been phased out of production by a Federal Law in 2012, the bulk of the existing light fixtures need to be retrofitted with T8 lamps and electronic ballasts at a minimum. The physical condition of the light fixtures would suggest the entire light fixture be replaced rather than retrofitted.
 - All incandescent and fluorescent exit signs should be replaced with light emitting diode (LED) lamp exit signs to reduce energy consumption. In renovated areas, this has already been done.
 - The existing classroom, office, and corridor light fixtures should be replaced with a more efficient style of light fixture. This would reduce energy consumption by allowing greater spacing of the light fixtures in these spaces. Also, the current light fixtures produce glare and new light fixture styles would help to eliminate this problem.
 - If alterations to the building are planned in the near future, then to comply with the current energy codes, lighting control devices (timer switches, occupancy sensors) will be required to provide automatic shut-off of light fixtures during unoccupied times. To provide overall control of the building lighting systems in common areas, a low voltage lighting relay control panel could be installed to control more of the lighting in the building.
 - If alterations to the building are planned that would vary floor plans, the light fixtures could be replaced with more efficient light fixtures and provide greater spacing, which would reduce the amount energy consumed.
 - The exterior drives and parking area pole mounted light fixtures should be upgraded to a more efficient lighting solution. This could include the use of LED (light emitting diode) light fixtures mounted on the existing poles to minimize the need to re-circuit these light fixtures.

Fire Alarm and Security Systems:

- Description of Existing Systems
 - The existing fire alarm system is a Simplex 4010 system panel. This system was installed as part of the renovation project approximately 8 years ago.
 - There are several perimeter doors equipped with card access. These systems are tied to a card access system that is utilized throughout the school district. These systems were installed within the last 10 years.
 - There are surveillance cameras around the perimeter of the building and in the public areas of the building.

- Code Violations and Safety Concerns: All areas are equipped with adequate fire alarm devices that meet with current codes.
- Expected Life: The fire alarm system has a life expectancy of 10 to 15 years. The card access systems and surveillance camera systems have a life expectancy of 10 years.
- Recommendations
 - If alterations to the building are planned that would vary the floor plans, then revisions may need to be made to the fire alarm system device layout and camera layouts.

Building Intercom, Clock, and Cable Television System (CATV):

- Description of Existing Systems
 - The building paging/intercom system in both the high school and junior high portions of the building are Rauland Telecenter V systems that are not original to the building but appeared to be at least 20 years old. The clock system is a Simplex system in the high school portion of the building. This system is used for all pages throughout the entire building and does not include a call-in button in the classrooms. The main cabinet housing all equipment is located in the administration office area in both sections of the building. There are speakers in the classrooms but not in the corridors. The two systems are not connected so a page from one system does not communicate to the other side of the building. There are several local sound systems (gym and cafeteria in a free-standing cabinet, auditorium in a free-standing cabinet in the projection booth) that provide additional sound amplification in the larger spaces. The auditorium sound system has had some upgrades since the building opened, but still has some deficiencies.
 - The cable television distribution system originates in the main electric room and is a channel one type system with televisions in each classroom. The distribution of the coaxial cabling consists of several trunk lines routed into the classroom areas that are then routed into each classroom using splitters.
 - Code Violations and Safety Concerns: None.
 - Expected Life: The public address systems in both schools have reached the end of their useful life and should be replaced.
- Recommendations
 - If both public address systems are replaced, they could be combined into one system.
 - Each classroom and instructional space should be upgraded to include an audio/visual system that would include an LCD projector, voice amplification, interactive marker board and small head-end for the classroom system.
 - The cable television system may be completely replaced with newer technology that utilizes the building data network rather than upgrading the current equipment in the central rack.

Telephone and Data Network System:

- Description of Existing Systems
 - Each classroom is equipped with a telephone mounted on the wall at the entry to each classroom. The cabling from this jack is routed back to a data rack that are located throughout the building in closets and storage rooms. The telephone system is manufactured by Alcatel Lucent.
 - The data cabling in the building is a mix of cat 5 and cat 6 cabling. The data racks are connected together using fiber optic cabling.
 - Code Violations and Safety Concerns: None.
 - Expected Life: The data cabling throughout the building is approaching the typical 15 year warranty period and could be retested and certified to ensure the cabling system can accommodate present and future technologies that will operate at gigabit Ethernet speeds. Also, fiber optic cabling from the MDF to each satellite closets could be retested for signal loss due to dust at connection points, etc.
- Recommendations

- The existing data closet locations are not always secured and dedicated for the sole use of the data network. As part of any renovation, it would be advisable to provide separate spaces to accommodate this equipment and dedicated cooling systems would be provided to cool these rooms.

END OF EXISTING FACILITY ASSESSMENT