Cody-Kilgore Unified Schools

Cherry County, Nebraska

General Facility, Mechanical and Electrical Facilities Assessment

High School – Cody, NE

Elementary – Kilgore, NE

May 2017

CG·ID
Innovative Design in Architecture

SES Specialized Engineering Solutions

Scope of Assessment

CG-ID Architecture is an architectural planning and design firm located in North Platte, Nebraska. SES is a Mechanical and Electrical Engineering Firm with locations in Omaha, Ogallala, and Sidney, Nebraska, with additional locations across the country. The scope of our assessment is to address major issues with general building conditions, mechanical, electrical, plumbing, fire protection, and life safety infrastructure. The data for this report was obtained through visual observation of the various systems, components, and elements within the building. In addition to site reviews, onsite interviews with maintenance and management personnel were conducted. Every effort was made to perform a thorough observation of the facilities and the various components and elements. However, some components and elements could not be physically observed without destruction of walls, floors, etc.

In April of 2017, the team consisting of CG-ID Architecture and Specialized Engineering Solutions (SES) began working with the Cody-Kilgore Unified School District to assist with assessing their existing facilities in Cody and Kilgore, Nebraska. The assessment was conducted to aid the Cody-Kilgore Unified School District with Master Planning decisions for their district. The major goals for this assessment and planning session were to identify short comings within the buildings, improve efficiency for staff, assist with forecasting major system replacements before equipment reaches end of life, and provide the district with the right information to properly plan for the future of their district.

The assessment team recorded the location and condition of major systems' components related to the general construction of the building as well as the mechanical and electrical systems of the facilities. Conditions reported were the condition of the building, component, or element at the time of the observation. Since all of the systems may not have been operating during the survey, judgments were made concerning the condition and application of the system (e.g., emergency battery lighting). Obvious signs of deterioration or malfunction were noted.

The survey of the general buildings gave emphasis to the functionality of the classrooms, activities areas and office spaces along with looking at the code compliances of each facility.

The survey of mechanical equipment gave emphasis to primary heating and air conditioning components, plumbing piping and water heating equipment, major air handling and ventilation equipment, fire protection systems, and temperature controls.

The survey of electrical systems gave emphasis to the main electrical service, electrical distribution components, life safety components, and communication systems.

Problems may have been observed without being able to verify the actual cause. In such cases, a more detailed investigation should be conducted in order to determine the cause of the problem or deficiency.

Cody-Kilgore Unified Schools Campus

Cody-Kilgore Unified Schools High School, Middle School and Administrative Office are located at 360 W 4th St., NE. A major single level addition to the High School was completed in 1980. The existing shop portion of the existing structure was retained while the existing older classroom portion was replaced with the 1980 addition. A two classroom portable building has been added to this campus.

The Elementary school is located in Kilgore at 100 E Burlington St. The Elementary main school building and gymnasium was design in 1925 and constructed shortly after making this building roughly 90 years old. Its primary structure has changed little since the original construction. Two portable building have been added the campus.

Campus Plans

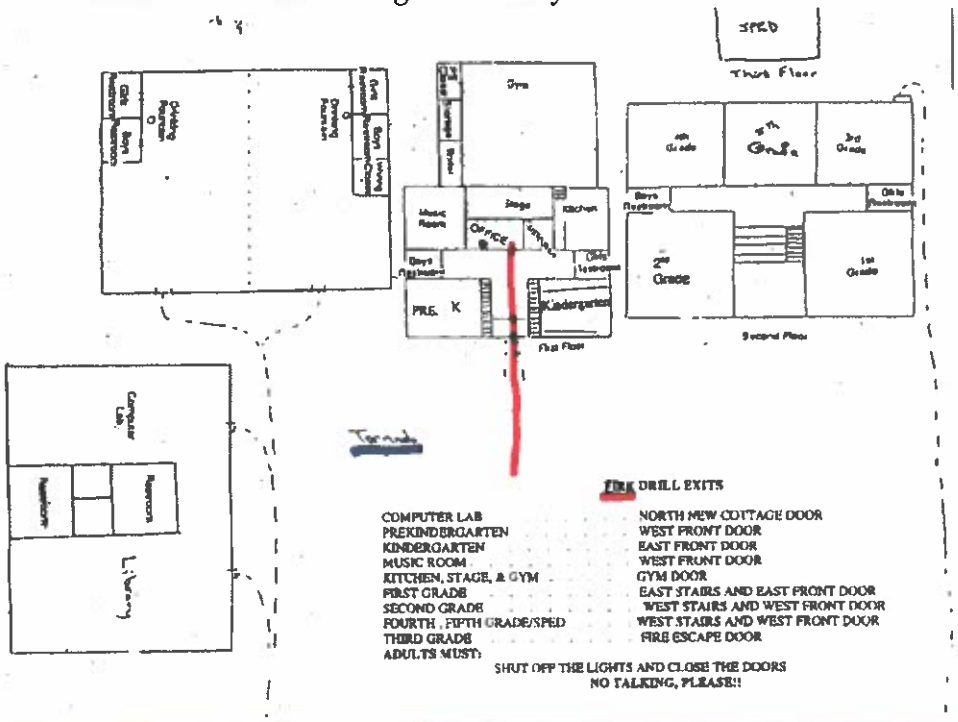
The following floor plans for each campus are provided for reference purposes during project planning discussions in relation to this assessment report

High School view from Google Earth. North on this plan is up.

Existing High School Floor Plan

Existing Elementary view from Google Earth. North is up

Existing Elementary Plans



Executive Summary

The following is provided as an overview of this assessment and brief summary for systems/items included within this assessment and their current condition.

High School Facility:

HVAC

The school is primarily served by two large air handling units with zone reheat coils and no means of mechanical cooling. The units are in marginal condition and it is recommended that the units are upgraded and mechanical cooling is added.

Plumbing

The plumbing systems are in generally good condition. However, it is recommended that the water heaters are replaced and restrooms and locker rooms are renovated to meet current ADA standards.

Fire Sprinkler

The building does not have a fire protection system. A complete fire sprinkler system retrofit is recommended for the entire facility.

Electrical Service

The electrical service equipment is outdated and requires being replaced.

Electrical Distribution

Much of the existing distribution is past its useful life and requires being replaced.

Lighting and Controls

Most lighting has been updated to energy efficient LEDs. Lighting controls are generally utilizing manual means.

Fire Alarm

The fire alarm system is currently operating well. Adjustments would all depend on the project pursued.

Special Systems

The bell schedule system is working well.

Public address is currently provided through the phone system and is working well.

The clock system has been abandoned.

The building has secured entry at the main entrance and cameras throughout most public spaces.

Elementary School Facility:

HVAC

The existing steam boiler system is in poor condition. An entirely new HVAC system with mechanical cooling is recommended.

Plumbing

The plumbing systems are in poor condition. A complete replacement of all plumbing systems is recommended.

Fire Sprinkler

The building does not have a fire protection system. A complete fire sprinkler system retrofit is recommended for the entire facility.

Electrical Service

The electrical service is a high leg delta service. It is recommended to add more labeling for personal protection and replace if a large project were to take place.

Electrical Distribution

Much of the existing distribution is past its useful life and requires being replaced.

Lighting and Controls

The building currently has mostly incandescent, high pressure sodium, and T12 fluorescent lighting. LED lighting with the use of occupancy sensors could provide lots of energy savings.

Fire Alarm

The fire alarm system is currently operating well. Adjustments would all depend on the project pursued.

Special Systems

The building does not currently have a bell scheduling system or need one.

Public address is currently provided through the phone system and is working well.

The building does not currently utilize a centralized clock system.

The building has secured entry at the main entrance and cameras throughout most public spaces.

High School General Build Assessment

Means of Egress

In general, the overall building has good access and means of egress (existing). There are two hallways that are in violation of Chapter 15, Existing Education Facility, of the 2000 Edition, Life Safety Code and 2006 International Building Code.

1. The hallway the leads to the library is considered a dead-end corridor. A dead end is where the corridor in a non-sprinklered building that is longer than 20 feet and does not lead to a compliant exit, and you would have to turn around to get out of the building. Exiting into another room at the end of the corridor does not constitute a "Means of Egress" exit.

2. The hallway the leads to the Music Classroom has two violations. At 47'-8" long, it is also a dead-end corridor. The second violation is the width is only 4'-3" inches. Exit access corridors are required to have a width of not less than 6'-0"

Another area that violated the exiting width is the cafeteria when the tables are in the area. When the tables are pushed up against the wall as shown in the first picture below, the created aisle is to be 6'-0" wide. With the current tables used the aisle is just under 6'-0" (easy solve – shorter tables). The second picture shows where the cafeteria gets narrower, the tables running with the aisles. In this scenario, both aisles are required to be 6'-0" wide. Both aisles do not meet this requirement.

The two interior classrooms on either side of the concessions storage room are required to have an automatic supervised fire suppression sprinkler system or the following:

1. Per section 15.2.5.4 of the 2000 Edition of the Life Safety Code; every room that is normally subject to student occupancy shall have an exit success door leading directly to an exit corridor or exit that is not less than 6'-0" in width and the doors shall swing towards the direction of exiting. Per 15.2.5.5 the doors that swing into an exit access corridor shall be arraigned to prevent interference with corridor travel. Simply put, the doors need to be set back into the room so the swing of the opened door does not go into the required 6'-0" width of the corridor.

2. Per section 15.2.11.1 of the 2000 Edition of the Life Safety Code, Windows for Rescue; every room or space greater than 250 square feet used for classroom or other educational purpose or normally subject to student occupancy and does not have an automatic supervised fire suppression sprinkler system shall have not less than one outside window for emergency rescues.

One solution to resolve all the exiting problems in this cafeteria/central area of the school, including the dead-end corridor leading to the library, would be to remove the two interior classrooms and convert the space into a larger cafeteria. This would require replacing the two classrooms in another location. Another solution would be to add a sprinkler system.

Bend Pipe Leak

Existing Roof(s) Condition

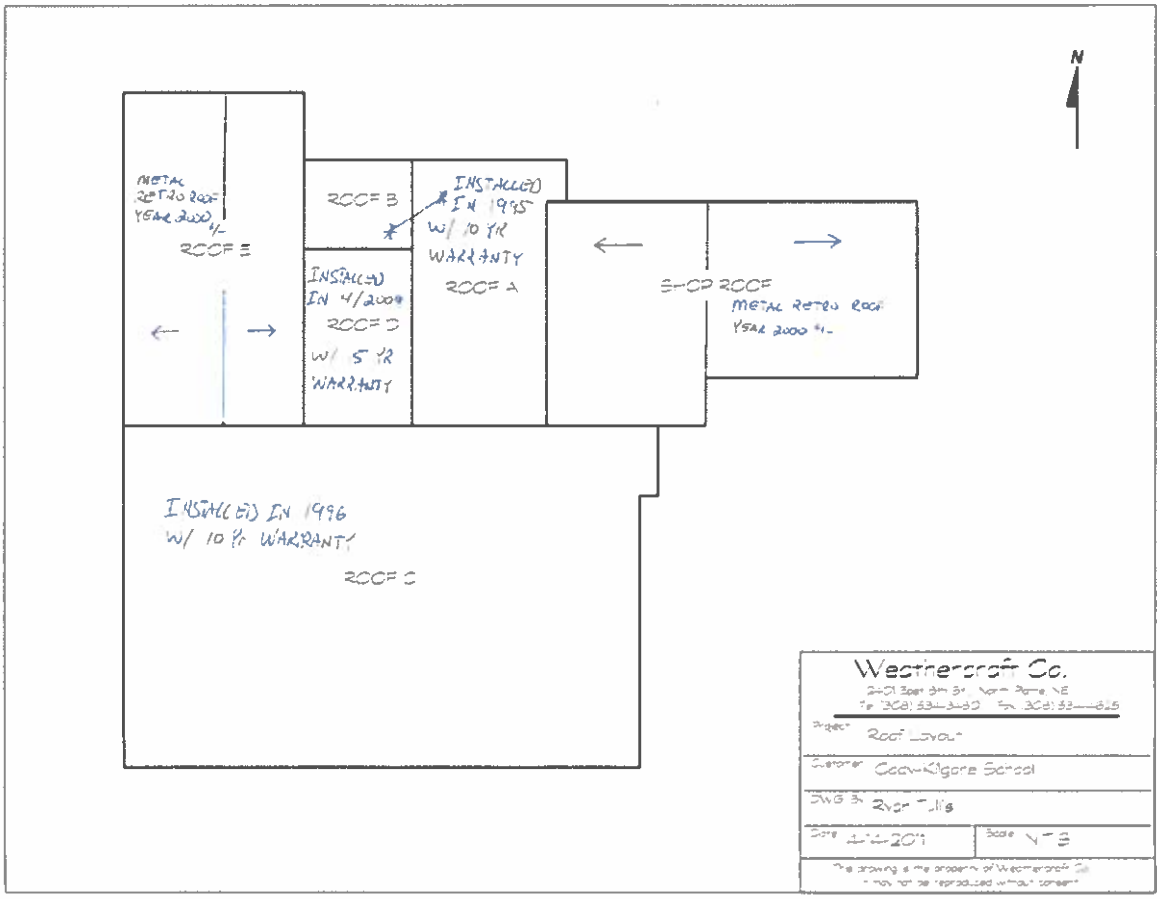
The roof at the high school are in varying degrees of condition and amount of remaining warranty:

Roof A & B are a built-up roofing systems that are 12 years over its warranty. The interior roof drains located in these areas are at capacity for typical rainfall amounts for the collection area of this roof. Part of the capacity issue is the roof area collects ½ the drainage area of the shop roof and ½ of the gymnasium's Roof E.

Roof C is a built-up roofing system that is 11 years over its warranty. This area is in the most need of repair and has had recent work completed along the west side.

Roof D is also a build-up system and still has 7 years of warranty remaining. This roof area appears to be in good condition.

Roof E & the Shop Roof are Alert "retro-fit" metal roof that appear to be in good shape. The extent of the warranty for these two areas is unknown.



The low end of each of the three entrance canopies is at or less than 7'-0" above the adjacent ground. Code requires a minimum of 7'-6" clear head room at all public accessible areas. All three will have to be reconstructed.

High School Mechanical Systems Assessment

HVAC Systems

Air Handling Equipment

The building is served by 2 Trane horizontal air handling units (AHUs) located in a mezzanine mechanical room (photo 1). One (1) of the AHUs is dedicated to the gymnasium and the other serves the remainder of the school. Each unit has an electric resistance heating coil and no means of mechanical cooling. The units are original to the building and appear to be in marginal condition.

In recent years a Mitsubishi variable refrigerant flow (VRF) system with an air-to-air heat pump has been retrofit to the facility to provide cooling to four separate zones. The heat pump is installed on the roof and the indoor units consist of ceiling cassette (photo 2) and wall mount style units (photo 3). This system appears to be in good

Terminal Equipment

Zone heating coils (electric resistance) are provided in the ductwork and controlled by thermostats in the rooms. The coils generally appear to be in acceptable condition but the controls were not reliable.

Electric baseboard heaters (photo 4) are also tied to the thermostats in the rooms to provide supplemental heating. The baseboard heaters appear to be in marginal condition and the controls were not reliable.

Electric unit heaters are installed in the gym and shop to provide supplemental heating. The unit heaters in the gym appear to be in acceptable condition (photo 5). The unit heaters in the shop appear to be in marginal condition.

Electric cabinet heaters are installed in the vestibules to provide heating. These heaters appear to be in marginal condition.

Window air conditioners (photo 6) have been installed in some rooms around the perimeter of the facility. These units are noisy, inefficient, and can overload existing electrical circuits.

Photo 1

Photo 2

Photo 3

Photo 4

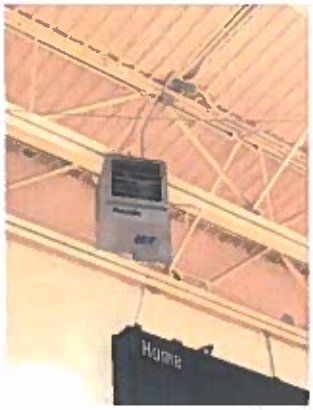


Photo 5

Photo 6

Distribution Systems

Generally, the ductwork for the facility appears to be in acceptable condition but it is original to the building. However, it is likely that the ductwork has a moderate amount of internal dust buildup due to the age of the system.

Temperature Controls

The facility has a pneumatic control system (photo 7) to control the HVAC system. Pneumatic control systems are an obsolete technology and difficult to maintain and repair. The existing control system is in poor condition and is not reliable.

It is recommended that a new direct digital control (DDC) building management system (BMS) is installed to serve the entire school. All existing equipment to remain would be retrofit with new controls.

Photo 7

Plumbing Systems

Water Service

A 3" domestic water service (photo 8) enters the building in the north mechanical room. The service is metered but does not have a backflow prevention device. The main isolation valve appears to be corroded and in poor condition. The other valves appear to be in acceptable condition.

Domestic Hot Water

Domestic hot water is generated by a pair of A.O. Smith electric tank style water heaters (photo 9). Each water heater is rated at 45 kW and has 120 gallons of storage capacity. The water heaters are in poor condition and are showing significant signs of corrosion (photo 10) on the outer tank shells.

A hot water circulation loop is installed to improve hot water distribution time and provide uniform temperature throughout the system. The pump appears to be in acceptable condition.

Piping Systems

Generally, the plumbing piping for the facility appears to be in acceptable condition but it is original to the building.

Plumbing Fixtures

Plumbing fixtures throughout the building are generally aged and in marginal to poor condition. A complete remodel of all restrooms and locker rooms including new plumbing fixtures and updates to meet current ADA standards is recommended.

Photo 8

Photo 9

Photo 10

Fire Protection Systems

The building does not have a fire protection system. A complete fire sprinkler system retrofit is recommended for the entire facility.

Additional Items

Based on the age and condition of the building, there is a possibility that excessive radon gas levels exist in certain areas of the building. Radon is a colorless, odorless, tasteless gas that increases the risk of lung cancer after prolonged inhalation of high concentrations. Further investigation by professionals trained in the detection and mitigation of radon gas is recommended.

High School Electrical Systems Assessment

Electrical Service Components

The building is currently serviced from a pad mount transformer (photo 17) located on the north side of the building. The building has 2 service laterals (photo 18) that are metered on the north face of the facility. The 2 service laterals entering the building appear to be (1) at 1200A, 480Y277v 3p 4w and (1) at 400A, 480Y/277v 3p 4w.

Photo 17

Photo 18

Electrical Distribution and Systems

Service Equipment 1

The electrical services enter the building within the main electrical room located just off of the shop area. The 1200A service terminates in a multi-section switchboard (photo 19). This switchboard appeared to feed most components in the building. A board of this size is required to have ground fault protection and it did appear this was present. The overall condition of this board was average. The board is definitely aged and it appears new parts are no longer available in the industry. In addition to parts not being available, the main service disconnect within this board is a 1200A bolted pressure switch (photo 20). Bolted pressure switches are a type of disconnect that require regular maintenance and where regular maintenance has not been provided the switch can be problematic if required to be moved to the off position. In many cases once turned off, the switch will not reengage to restore power.

Service Equipment 2

The second electrical service (photo 21) enters the building within the same electrical room within a 400A 2 section distribution panel. This board appears to be of the same vintage as the other service. The condition is again average and parts are likely no longer available.

Building Distribution Equipment

Other building distribution (photo 22) was reviewed as a part of this assessment and generally most equipment are aged beyond their useful life and parts are no longer available. There are cases where new panels have been added such as the kitchen but generally most areas within the school are operating off of outdated equipment unable to be expanded or modified.

Photo 19

Photo 20

Photo 21

Photo 22

Building Lighting and Lighting Controls

Interior Lighting

Most lighting fixtures within the building have been updated with LED retrofit lamping. LED sources have proven to be nearly 30% more energy efficient that T12 fluorescent lamps and 10% more efficient than T8 and T5 fluorescent light fixtures. Typically fluorescent lighting installed after 1995 utilizes either T8 or T5 technology. Fluorescent lighting installed prior to 1995 in many cases utilized the lesser efficient T12 lighting.

Interior Egress Lighting

Interior egress lighting appeared to consist of a central battery inverter connected to remote lighting units throughout the building. Generally the remote lighitng units were visible within most egress paths. Overall the central battery inverter did appear aged and it would be recommended to test the system to ensure proper operation.

Exterior Egress Lighting

NFPA 101 now requires that egress lighting served from a backup source be provided to public way once you exit the building. It did not appear that a battery source was included within any of the exterior lights. Exterior Egress lighting did not appear to be in place and would be required moving forward.

Exit Signage

Exit signage appeared to be working and properly visible when entering the egress path for the building.

Lighting Controls

Interior lighting controls appeared to utilize mostly manual controls. The State Energy Code requires that automatic lighting controls be provided. Renovations or building additions would need to be designed in compliance with associated requirements.

Fire Alarm Systems

The building does currently have a Spectronics SA400 zoned fire alarm system (photo 23) in place. Areas were reviewed for general device coverage and it appeared that in most cases the necessary smoke detection was in place but egress paths could utilize more visual device coverage. The system did appear to be in good condition and has some expansion capabilities. If a large construction or expansion project were to take place within the facility it would be recommended to update the fire alarm system to a fully addressable system with devices provided in compliance with today's standards.

In addition to standard building fire alarm components, the State of Nebraska requires that competition gymnasiums be provided with a mic handset and speaker evacuation system to provide announcements to a large crowd in an emergency situation. It did not appear that this voice evacuation system was in place currently. If a construction project were to take place in the area, this system would be required to be added.

Special Systems

Bell Scheduling

The building currently has an aged but working 120v bell class scheduling system (photo 24). It has been working okay for the facility in its current state though the noise of the bells has posed come concerns at times. If an elementary were to be integrated into this facility in some form, we would want to discuss how the bell scheduling system would want to operate to support elementary and high school functions.

Public Address

The facility currently utilizes the phone system for announcements and public communication. The phone system has been working well. It was identified that in an emergency situation it would be desired to have more speaker coverage within spaces outside of the classrooms.

Central Clock

The central clock system currently serving the school has been abandoned in place. In interviewing office personnel, they did not believe the system was currently operating.

Security

The building does currently have a secured main entrance with video visibility and push to enter station. It would be recommended to review other entrances for the building to determine if some sort of security would be beneficial.

The building also has a central surveillance camera system. Most public spaces and entrances appeared to be covered.

Photo 23

Photo 24

- Some tuck pointing

Elementary School General Building Assessment

The exterior of the building is in good repair. Maintenance and upkeep of sealants are required of the windows and penetrations. Some tuck-pointing is required at the masonry. The two roof areas are in good condition and have 8 years remaining on the gymnasium portion and 10 years on the main school building portion.

Means of Egress & ADA (Americans with Disabilities Act)

In general, there are not a lot of areas within the elementary main building and gymnasium that meets the regulatory codes (Chapter 15, Existing Education Facility, of the 2000 Edition, Life Safety Code; 2006 International Building Code and 2004 Edition of the Americans with Disabilities Act and Architectural Barriers Act Accessible Guidelines) that governs educational facilities in the State of Nebraska.

The entrances into all the building on this campus do not comply with ADA. The door at the main building are too narrow in the current configuration meet the required exiting width for Life Safety or clear passage width for ADA. Once in the building, all toilet rooms do not meet ADA. The access to the dining area at the stage or in the gymnasium area do not meet ADA passage requirements.

Entrance into Main School Building

Stair access only to both portable buildings

Access into toilet rooms

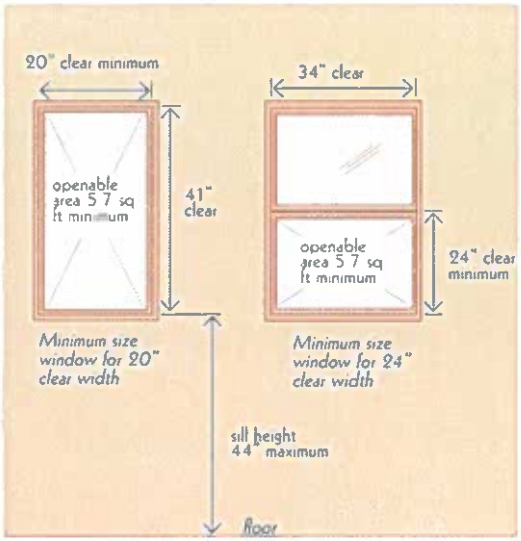
Passage in toilet Rooms

Sq. ft. ÷ 20 to figure occupancy

ADA toilet stalls do not meet space requirements

Egress Windows

The Windows for Rescue required in each classroom Per section 15.2.11.1 of the 2000 Edition of the Life Safety Code, is to be unobstructed in front of the designated rescue window, have a maximum height of 44" from the floor to the window sill and have no more than 54" from the floor to any latch device. The window opening requirements are 41.2" in clear opening height and greater than 20" in clear opening width. This is not the case in most of the classrooms. There is space within the old window opening to place a tall enough window unit to meet code.



Exiting Stairs

At least one stairway is to be no-communicating (meaning the stairway needs to exit directly to the outside and not open up to the level below. In addition, this stairway is to be protected by the weather (covered at a minimum and preferred to be enclosed in the fire rated structure). If one of the exits in an upper level is required to go through an occupied room, then this room is required to be large enough to hold ½ of the "code certified" occupancy load of the entire level. In this building, the required occupancy (including the upper level Sped Room) for this room would be would be 70 (½ of the code allowance occupancy of 141 - per table 1004.1.1 of the 2006 International Building Code). The existing 2nd stairs and route to the stairs do not meet code.

TABLE 1004.1.1
MAXIMUM FLOOR AREA ALLOWANCE PER OCCUPANT

USE	AREA PER OCCUPANT[2, 3] (sq ft)
Assembly without fixed seats	
Concentrated (includes among others, auditoriums, churches, dance floors, lodge rooms, reviewing stands, stadiums)	7 net
Waiting Space	3 net
Kitchens	100 gross
Unconcentrated (includes among others conference rooms, exhibit rooms, gymnasiums, lounges, stages, platforms)	15 net
Swimming pool water surface	50 gross
Swimming pool deck	30 gross
Exercise rooms with equipment	50 gross
Exercise rooms without equipment	15 gross
Lighting and access catwalks, galleries, and gridirons	100 net
Skating rinks	50 gross
Assembly with fixed seats	Note 1
Bowling alleys, allow 5 persons for each alley, including 15 ft of runway, and other spaces in accordance with the appropriate listing herein	7 net
Business areas	100 gross
Courtrooms without fixed seats	40 net
Courtrooms with fixed seats	Note 1
Day-care	35 net
Educational (including Educational Uses Above the 12th Grade)	
Classroom areas	20 net
Shops and other vocational areas	50 net
Industrial areas	100 gross
Institutional	
Sleeping areas	120 gross
Inpatient treatment and ancillary areas	240 gross
Outpatient area	100 gross
Resident housing areas	120 gross
Library	
Reading rooms	50 net
Stack area	100 gross
Malls	Section 413
Mercantile	
Basement and grade floor areas open to public	30 gross
Areas on other floors open to public	60 gross
Multiple street floors - each[4]	40 gross
Storage, stock, shipping area not open to public	300 gross
Parking garage	200 gross
Residential	200 gross
Restaurants (without fixed seats)	15 net
Restaurants (with fixed seats)	Note 1
Storage area, mechanical	300 gross

The building is heated Elementary School Mechanical Systems Assessment

HVAC Systems

Central Utility Plant

The building is heated by a fuel-oil fired American Standard steam boiler (photo 11) rated at 1,376 MBH output. The boiler appears to be poor condition. An underground fuel-oil storage tank is installed just west of the school adjacent to the main boiler room. Fuel-oil supply and return piping is routed below grade into the boiler room.

Terminal Equipment

Cast iron steam radiators (photo 12) and steam fintube heaters are located throughout the building to heat the individual spaces. All of this equipment is aged and in poor condition.

A fan coil unit (photo 13) was installed in the fifth-grade classroom to replace the original heating equipment. This unit appeared to be in acceptable condition.

Steam and electric unit heaters are installed in the gym/cafeteria (photo 14) and appear to be in acceptable condition.

Photo 11

Photo 12

Photo 13

Photo 14

Distribution Systems

Steam and steam condensate piping throughout the facility is threaded steel pipe. Generally, the piping in the building is in marginal condition. However, piping in the main boiler room is in very poor condition. Insulation is not installed on any of the piping through the building.

Temperature Controls

Terminal equipment is primarily controlled by manual control valves at each piece of equipment. These controls are generally ineffective at properly modulating equipment output to promote occupant comfort.

Plumbing Systems

Water Service

A 1" (approximate) domestic water service (photo 15) enters the building in the main boiler room. The service is metered but does not have a backflow prevention device. The main valves and piping appear to be corroded and in poor condition.

Domestic Hot Water

Domestic hot water (photo 16) is generated by a pair of electric tank style water heaters. Each water heater is rated at 4.5 kW and appears to be in acceptable condition.

Photo 15

Photo 16

Piping Systems

Generally, the plumbing piping for the facility appears to be in poor condition.

Plumbing Fixtures

Plumbing fixtures throughout the building are aged and in poor condition. A complete remodel of all restrooms including new plumbing fixtures and updates to meet current ADA standards is recommended.

Fire Protection Systems

The building does not have a fire protection system. A complete fire sprinkler system retrofit is recommended for the entire facility.

Additional Items

Based on the age and condition of the building, there is a possibility that excessive radon gas levels exist in certain areas of the building. Radon is a colorless, odorless, tasteless gas that increases the risk of lung cancer after prolonged inhalation of high concentrations. Further investigation by professionals trained in the detection and mitigation of radon gas is recommended.

Based on the age and condition of the building, it is possible that piping in the building has been wrapped with asbestos insulation. Asbestos is a silicate mineral that can cause serious and fatal illnesses such as lung cancer and mesothelioma after prolonged inhalation. Further investigation by professionals trained in the detection and abatement of asbestos is recommended.

Elementary School Electrical Systems Assessment

Electrical Service Components

The electrical service serving the Elementary School enters the building from overhead distribution located on the NW corner of the school (photo 25). The lateral is provided overhead and enters the school through a series of weatherheads. The transformer configuration is a High Leg Delta service meaning only the A and C phase can be utilized for secondary voltage connections. On several occasions in the industry we have seen the B phase be incorrectly connected causing damage to building components and even injury to workers. If the High Leg Delta service is to remain in the school we would recommend improving the labeling of the "High Leg" to ensure the protection of persons and property.

Photo 25

Electrical Distribution and Systems

Service Equipment

The electrical service enters the building within a main 1000A 3 phase 4 wire 240/120v (Delta) electrical panel (photo 26) located within a combination electrical/mechanical room just off the cafeteria. The panel appears to have been installed in 1995. The panel is in good condition and has approximately 10 years of useful life remaining in the current condition of the school. If a major renovation were to take place in the school, the recommendation would be to replace the service and main panel with an electrical service that would eliminate the High Leg.

Building Distribution Equipment

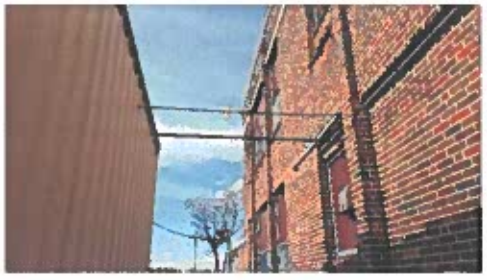
Other building distribution was reviewed as a part of this assessment and generally most boards are aged beyond their useful life and parts are no longer available. It was discussed that the school has looked into adding cooling to the building but the existing electrical panels do not have capacity or parts available to accommodate.

Some additional safety items identified within the electrical distribution systems include an electrical panel mounted to the ceiling (photo 27) within the main electrical/mechanical room and some Edison base fused panels (photo 28) located throughout the building. The Edison base fused panel pose a risk due to when fuses are removed, live bussing is exposed in the panel.

Photo 26

Photo 27

Photo 28



Conduits not Supported – Photo 29 – Not in Main Text

Building Lighting and Lighting Controls

Interior Lighting

The existing lighting within the building is comprised of a mix of incandescent, high pressure sodiuk, and T12 fluorescent technologies. As a whole, the majority of the lighting within the building is beyond its useful life and should be replaced. In addition to the light fixtures being beyond their useful life, generally most of the lighting within the building is 30% or more, less energy efficient than todays LED light fixtures and far more glary which was evident with some classrooms where sheilding has been provided over the lights (photo 30).

Interior Egress Lighting

The building did appear to be provided with egress lighting within most public spaces. We would recommend testing all egress lighting to ensure it is in working order.

Exterior Egress Lighting

NFPA 101 now requires that egress lighting served from a backup source be provided to public way once you exit the building. Exterior Egress lighting did not appear to be in place and would be required moving forward.

Exit Signage

The building appeared to have exit signage visible within most paths of egress. It would be recommended to test all exit light batteries to ensure they are in working order.

Lighting Controls

Interior lighting controls appeared to utilize mostly manual controls. The State Energy Code requires that automatic lighting controls be provided. Renovations or building additions would be designed in compliance with associated requirements.

Photo 30

Fire Alarm Systems

The building does currently have a Notifier SFP-400B zoned fire alarm system in place. Areas were reviewed for general device coverage and it appeared that in most cases the necessary smoke detection was in place but egress paths could utilize more visual device coverage. The system did appear to be in good condition and has some expansion capabilities. If a large construction project were to take place within the facility or a building addition added, it would be recommended to update the fire alarm system to a fully addressable system with devices provided in compliance with today's standards.

Main Fire Alarm
Control Panel

Special Systems

Bell Scheduling

The building currently does not have a scheduling system and it was identified that it was not necessary at this time.

Public Address

The facility currently utilizes the phone system for announcements and public communication. The phone system has been working well. It was identified that in an emergency situation it would be desired to have more coverage within spaces outside of the classrooms.

Central Clock

The building currently does not have a central clock system that is being utilized.

Security

The building does currently have a secured main entrance with video visibility and push to enter station. It would be recommended to review other entrances for the building to determine if some sort of security would be beneficial.

The building also has a central surveillance camera system. Most public spaces and entrances appeared to be covered.

Mechanical & Electrical Systems Recommendations

The priority of the recommendations is categorized as high, medium, or low.

High: A priority rating of high is justification for immediate remedy and corrective action. Service life of these systems or components has been reached or exceeded and are broken, unsafe, obsolete, or do not meet current code. Implementing recommendations will increase the life safety aspects of the buildings, will reduce further deterioration of the building components, will enhance the energy efficiency of the facility, and will ensure that the building operates as designed.

Medium. A priority rating of medium suggests the system or components has a remaining life of 5 years and may have minor deficiencies that can be funded as part of a capital renewal program. This category includes conditions requiring appropriate attention to preclude predictable deterioration or potential downtime and the associated damage or higher costs if deferred further.

Low: A priority rating of low represents systems or components with remaining life cycle exceeding 5 years but have minor deficiencies. Implementing recommendations in this category will either improve use of the building and/or reduce long term maintenance.

High School Mechanical Systems

DESCRIPTION	PRIORITY
Provide a new direct digital control (DDC) building management system (BMS) to control all new and existing mechanical equipment.	High
Replace domestic water heaters.	High
Remodel restrooms and locker rooms and provide new plumbing fixtures and layout to meet current ADA standards.	High
Provide a fire sprinkler system to protect the entire facility.	High
Replace air handling units. New units should include electric heating coil and DX cooling coil with remote air cooled condensing unit. Verify all ductwork is insulated to accommodate the new mechanical cooling system. Remove window air conditioners.	Medium
Replace zone heating coils, electric baseboard heaters, and cabinet and unit heaters on an as needed basis.	Low
Provide domestic water service backflow preventer and replace corroded valve/fittings.	Low
Provide radon gas survey	Low

Elementary School Mechanical Systems

DESCRIPTION	PRIORITY
Remove all existing HVAC equipment and distribution and provide new HVAC system.	High
Remove all existing plumbing equipment and distribution and provide new plumbing system.	High
Provide a fire sprinkler system to protect the entire facility	High
Provide asbestos containing material survey	High
Provide radon gas survey	Low

High School Electrical Systems

DESCRIPTION	PRIORITY
Replace existing electrical services and main equipment to add capacity and allow for modifications.	High
Replace outdated downstream electrical distribution equipment.	High
Review fire alarm system against facility planning and expand/replace as required.	High
Provide testing for existing egress and exit light battery equipment to ensure proper operation.	High
Provide exterior egress lighting.	Medium
Provide a public space paging zone.	Medium
Review all exterior doors for keying/access control.	Medium
Provide fire alarm voice evacuation system to the gymnasium.	Low
Upgrade remaining non-LED lighting to LED.	Low
Provide occupancy sensor lighting controls within the building.	Low

Elementary School Electrical Systems

DESCRIPTION	PRIORITY
Provide additional labeling of high leg delta service. Replace existing electrical services and main equipment to add capacity and allow for parts to be available.	High
Replace outdated downstream electrical distribution equipment.	High
Review fire alarm system against facility planning and expand/replace as required.	High
Provide testing for existing egress and exit light battery equipment to ensure proper operation.	High
Provide exterior egress lighting.	Medium
Provide a public space paging zone.	Medium
Review all exterior doors for keying/access control.	Medium
Upgrade lighting to LED fixtures.	Low
Provide occupancy sensor lighting controls within the building.	Low

End of Report

CG·ID
Innovative Design in Architecture

SES SPECIALIZED ENGINEERING SOLUTIONS

Kilgore Renovation Cost to bring the Facility up to Code Compliance:

Revisions: $2,108,750 (Code item cost are highlighted below $1,653,000)

- New 950 SF Administration Area at lower level new addition to create a new secure and handicapped accessible main entrance for the entire school. $270,750
- New ADA accessible toilet rooms at both levels with connecting corridor 1,240 SF for both levels. $434,000
- Provide elevator and required rated elevator equipment/electrical room. $225,000
- 1000 SF stair and elevator lobby that exit directly to the outside. The current main stairway is known as a communicating stairway (open to all levels with the ability to stop a fire or smoke from spreading from one level to another. $185,000
- Demolition and renovation of east end of both levels (at existing toilet rooms locations) $85,000
  - This includes opening up of the east exterior walls at both levels and to provide new structural components at these openings.
- New ADA ramp connecting the stage/kitchen to the east gym entrance and gymnasium floor. $14,000
- The following mechanical, plumbing and electrical items have been included within the recommended upgrades for this facility (provided by Specialized Engineering Solutions -SES). $710,000
  - Provide a sprinkler system to serve the building.
  - Provide complete replacement of HVAC system including cooling and controls.
  - Replace existing plumbing systems within the building in their entirety.
  - Replace existing electrical services and associated distribution.
  - Provide new exterior egress lighting.
- Architectural & Structural fixes and repairs to the existing floors, walls and ceilings for the listed mechanical, electrical work above. The demolition to accommodate these items will be significant and will potentially jeopardize the structural integrity of the building in some of the areas of demolition. There will be a need for repair in these areas. $185,000 (this may be on the light side)

The cost listed above are primarily for code compliance and security. There will be standard ongoing maintenance costs that are common and expected with 100-year-old buildings. After the costs are completed for the items listed above, these maintenance cost will still exist and the majority of the building (excluding the new entrance, administration, toilet room, stairway and elevator addition) will still look, sound and fill like a 100-year-old building. These costs do not address the continuous water issues and the gymnasium level. They also do not account for replacing the existing inefficient lights oar and power/outlets to any area of the facility. The cost listed above were provided on 10-5-2017. The school district should anticipate a 5% to 7% inflationary factor for the cost of construction each year after this date.

Submitted by Grant Creager
For CG·ID Architecture

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