NORTH SLOPE
BOROUGH SCHOOL DISTRICT
Striving For Excellence

HAROLD KAVEOLOOK
SCHOOL
Striving For Excellence

KAKTOVIK
AREAWIDE MECHANICAL AND ELECTRICAL BUILDING ASSESSMENT AND INVENTORY SURVEY REPORT

August 19, 2024

Prepared by:

RSA Engineering, Inc.
MECHANICAL AND ELECTRICAL CONSULTING ENGINEERS
670 W Fireweed Lane Suite 200, Anchorage, AK 99503 / 907-276-0521

This page intentionally left blank.

TABLE OF CONTENTS

This page intentionally left blank.

SECTION 1. INTRODUCTION

A. OVERVIEW

The school was visited on April 15, 2024, to review the current conditions of the building with the conditions of the building identified in the report from 2017. The school was destroyed in a fire and the school district has constructed a temporary school. The temporary school is a modular building consisting of new modules and repurposed modules. The modular school is in relatively new and is in good condition.

This report provides an area wide condition survey of the mechanical and electrical systems in of the buildings owned by the North Slope Borough School District in Kaktovik. The assessment was performed by a survey team composed of representatives from RSA Engineering and the NSBSD. The survey included a walk-through of each building to evaluate condition of the existing mechanical and electrical systems. The survey was non-destructive, issues noted in this report were visible during the building walk-through or reported by NSBSD staff. During the walk-through the survey team met with NSBSD staff to discuss issues at the buildings and proceeded to assess the project area to develop recommended upgrades for the facility.

Team Member	Title
Ralph DeStefano, P.E.	Mechanical Principal, RSA Engineering
Pat Collins, P.E.	Electrical Senior Engineer, RSA Engineering

B. BUILDING SUMMARY

The below table includes a list of buildings inspected in this survey:

Table 1: Buildings Surveyed

Village	Building Name
Kaktovik	Interim School
Kaktovik	Old School Storage
Kaktovik	Maintenance Shop Storage
Kaktovik	Plumbing Parts Storage
Kaktovik	Skid Steer Storage
Kaktovik	Single Family Residence #321
Kaktovik	Single Family Residence #323
Kaktovik	Single Family Residence #325
Kaktovik	Single Family Residence #327

C. REFERENCED CODES AND STANDARDS

The buildings were inspected for conformance of the following adopted codes and standards:

International Existing Building Code 2021
International Mechanical Code 2021
International Fire Code 2021
International Fuel Code 2021
Uniform Plumbing Code 2021
National Electrical Code 2020
ASHRAE 62.1-2019 – Ventilation & Acceptable Indoor Air Quality.
National Fire Alarm Code (NFPA 72), 2019
ADA Standards for Accessible Design 2010
ANSI A117.1 2017: Accessible and Usable Buildings and Facilities
Illuminating Engineering Society (IES) Lighting Standards, latest published version

SECTION 2. SURVEY RESULTS

INTERIM SCHOOL

Mechanical Systems

Overview

The school site was visited on April 15, 2024, to inspect the mechanical systems. The interim school was recently completed and consists of various previously used and new building modules purchased by the NSBSD. In general, all the mechanical systems are fairly new and in good condition.

Plumbing

Domestic water service is provided to the school by the city utility. A single service enters the building at the back of the kitchen area (F112) and is split into a domestic water line and fire protection line. The domestic water service has electric heat trace, a meter, and check valve.

The water piping in the interim school is mostly concealed however the visible portion was in good condition.

Waste service is provided by local fixture lift stations and three larger lift stations located in the school. Each of the larger lift station pumps waste to a trailer located behind the kitchen. The trailer has multiple waste storage tanks that are emptied via a NSB waste pumper truck.

The waste piping appears to be all overhead. Waste is typically collected by small lift stations located behind the toilets or next to the associated plumbing fixtures. From the plumbing fixture lift station, the piping is routed over head to the larger lift stations. There are three larger lift stations that collect waste from the small fixture lift stations and pump the waste to the waste storage tanks. Two of the lift station are located in the mechanical rooms located between the associated girls' and boys' restrooms. The restroom lift stations control panels are remote mounted in the adjacent Janitor's room. The third lift station is in the mechanical space (F112) at the back of the kitchen. The control panel for the kitchen lift station is in the same room as the lift station. The lift stations are in good condition.

The waste piping in the school is typically concealed, however most of it appears to be PVC or ABS. PVC is used for the forced waste piping. A combination of ABS and PVC is used for the vent piping and the gravity drainage system. The waste piping is in good condition.

The plumbing fixtures are generally in good condition. The water closets are Sanivite toilets that have integral lift stations behind the toilet. The remain plumbing fixtures: lavatories, janitor's sinks, and kitchen equipment fixtures are standard fixtures that use either the adjacent toilet lift station or separate lift station.

Domestic hot water for the kitchen area is provided by an 54kw / 120-gallon electrical hot water heater. Domestic hot water for the boy's and girls' rooms in the classroom wing are provided by 2-gallon electric hot water heaters located in the adjacent janitor's room. Standalone lavatories and sinks hot water are provided with point of use under counter electric hot water heaters. All the hot water heaters are in good condition.

Photo M1 – Toilet and Lift Station

Photo M2 – Area Lift Station

Photo M3 – Icemaker and Lift station

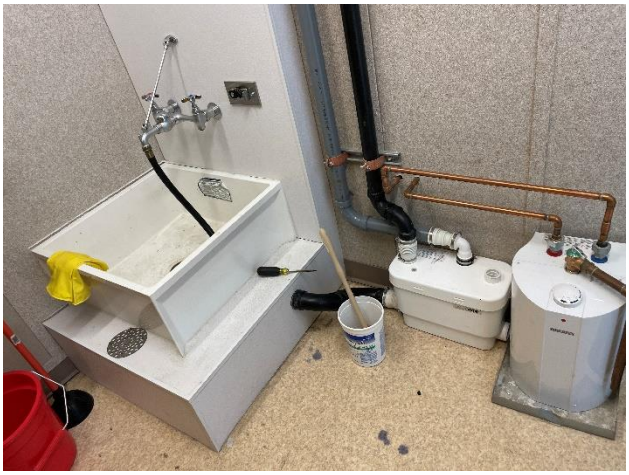

Photo M4 – Janitor's Sink Lift Station and Water Heater.

Heating and Ventilation

The school is heated and ventilated with a combination of electric air handling units (AHU), electric base board, electric unit heaters and heat recovery ventilation units (HRV).

The typical classroom module is heated and ventilated with a ceiling mounted AHU with integral electric heat coil. The AHUs are typically located in small mechanical rooms adjacent to the classrooms; one AHU serves each classroom. The AHU's supply air is ducted overhead to ceiling supply air diffusers. The AHUs have an outside air connection to provide fresh air into the space. Each classroom has a relief opening to relieve the fresh air back to the exterior. All intakes and relief air openings have arctic hoods to help prevent snow infiltration. The heating and ventilation system for the classrooms are in good condition.

The recreation and exercise modules are heated and ventilated in a similar fashion the classrooms, except the AHU's and ductwork are exposed in the spaces. The heating and ventilation system for the recreation and exercise modules are in good condition.

The office area modules are heated and ventilated with a floor mounted furnace with integral electric heat coil and an HRV. The furnace and HRV are located in a small mechanical closet where the HRV provides fresh air to the furnace. The furnace supply air is ducted inside wall soffits to the various office spaces. In addition to the furnace there are several wall mounted heaters used in the office space. The heating and ventilation system for the offices are in good condition.

The kitchen module is heated with ceiling hung electric unit heaters and electric base board in the office. The kitchen has two commercial kitchen hoods with roof mounted exhaust fans. Make up air is provided by a roof mounted electric make up unit. We did not observe the fans or make up air unit however they were reported to be in good working order.

Mechanical spaces, janitor's closets, restrooms, and corridors are heated using either baseboard heaters, small wall mounted electric heaters, or electric unit heaters. The baseboard, wall heaters, and unit heaters are in good condition.

Standalone ceiling or in line exhaust fans are installed for the restrooms, lift station rooms, and waste tank module. The exhaust fans are all in good condition.

Photo M5 – AHU w/Electric Coil

Photo M6 – Corridor Electric Baseboard

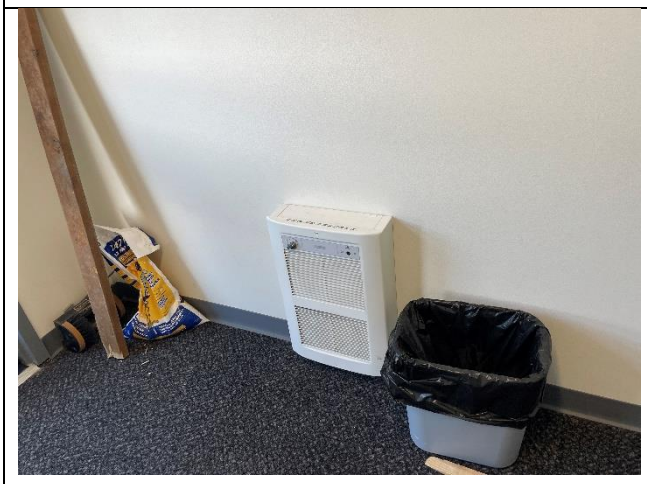

Photo M7 – Electric Wall Heater

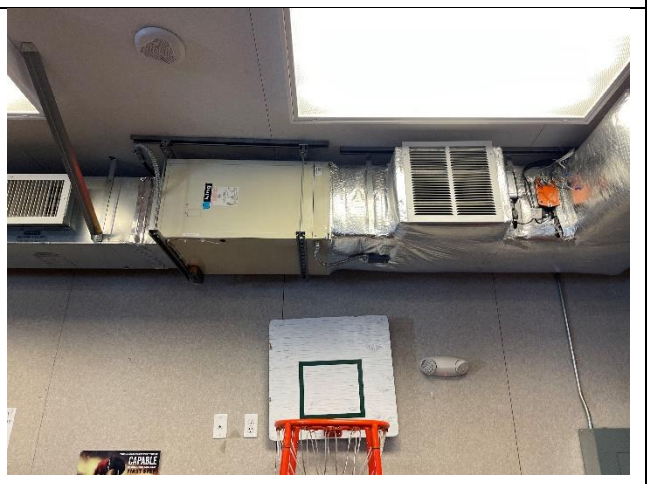

Photo M8 – AHU in Recreation Area

Air Conditioning

The electrical / MDP (F110) has two wall mounted AC units with associated condensing units located in the storage / loading dock area adjacent to the room. The units are in fair condition. The I.T. space has a small portable AC unit located on the floor. The heat discharge is ducted the exterior. The unit is in good condition.

Photo M9 – Electrical Room Condensing Units

Photo M10 – IT Room AC

HVAC Controls System

The HVAC system is controlled by standalone controls throughout the school. The electric air handlers are typically controlled by a stand-alone Honeywell controller. Baseboard, unit heaters, and wall heaters are typically controlled by a stand-alone thermostat.

Photo M11 – AHU Temperature Controller

Photo M12 – Typical Thermostat

Fire Protection

The fire protection system is a wet sprinkler system and is supplied from the city water utility. The sprinkler is separated from the domestic water system with isolation valves and a double check valve backflow preventor. The system is in good condition. No issues were reported with the system.

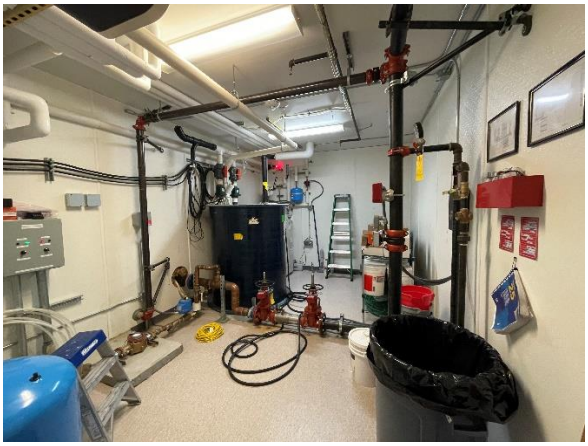

Photo M13 – Sprinkler Riser

Photo M14 – Water Service

Electrical Systems

Overview

The school was visited on April 15, 2024, to inspect the electrical systems. The building is made up of pre-existing conex with existing equipment which have been repurposed and connected with a constructed main entry and connecting corridor. The age of the electrical systems within the building are all relatively new. The oldest equipment was installed about 10 years ago and is in good to excellent condition. The offices, kitchen, dining room, recreation, student stores, mechanical spaces, and bathrooms use T8 fluorescent fixtures while all other areas use more modern LED type technology.

Power

The school electrical power service is supplied by the utility from a 300KVA pad-mounted transformer located at the south corner of the building. The building is then fed underground to a CT where the main feed is tapped to provide (3) feeders. One feed goes to a 600A fused disconnect which then feeds panel 'MDP1B'. 'MDP1B' is a 600A, 480V, 3-phase, 4-wire distribution panel. The second main tap feeds to a 600A, fused disconnect which then feeds panel 'MDP1A'. This distribution is rated the same as 'MDP1B'. The third tap goes to an 800A fused disconnect which feeds panel 'MDP2' which is 800A, 480V, 3-phase, 4-wire. All 480V distribution panels are Square D type I-line distribution panels. These feed 480V equipment and 480V branch circuit panels for the throughout the facility.

Panel ‘MDP1B’ feeds a 225KVA transformer then to an 800A, 208V, 3-phase, 4-wire distribution panel ‘LDP1’ with an 800A main circuit breaker. Panel ‘MDP2’ feeds a 300KVA transformer to a 1,200A, 208V, 3-phase, 4-wire distribution panel with 1,000A main breaker. These 208V distribution panels feed 208V load centers and equipment throughout the school modules. The load centers are all Square D type QO load centers.

All the 208V and 480V distribution panels have exterior connection boxes with plugs for external connection for alternate power source (see photo 4). There is a generator conex with ATS and portable cable connections available however we did not have access at the time of our inspection. From onsite discussions this generator has damaged windings and can no longer provide power in standby operation but the engine still functions. The generator is 750KW, 480V, 3-phase, 4-wire Detroit V12.

The built corridor section has (2) mechanical rooms which each have a 480V branch circuit panel which is connected to ‘MDP2’ panel. 480V branch circuit panels are Cutler-Hammer type Prl3a. The 480V branch circuit panel sub-feeds 30KVA transformer to a 208V, 3-phase ,4-wire panel, Cutler-Hammer type Prl1a. These sub-panels feed all 120V and 208V equipment throughout the corridor section.

There is a sewer conex located on the East corner of the school. It is fed with a single branch circuit panel which powers lights, receptacles, heaters, and fans in the conex. The electrical installation is typical of a NEMA 1 rated indoor installation but is feeding explosion rated mechanical equipment. Further code studies, in regard to the process and ventilation, complying with NFPA 820 will need to be performed to determine the rating of the room and if electrical equipment needs to be updated to meet a classified location per NEC.

Photo E1 – MDP1B

Photo E2 – MDP1B

Photo E3 – MDP2

Photo E4 – Exterior service and stanby connections

Wiring and Cabling Systems

The branch wiring system in the facility is non-metallic cable recessed load centers. ½" electrical metallic conduit with copper building wire is used for corridor panels. A separate insulated green equipment grounding conductor is run for every branch circuit. Surface routed conduit and surface raceway were used only for the fire alarm system and above counter receptacles in the office area. Feeders for module panels are run using a mixture of MC-HL in concealed cable trays or conduit and wire.

The wiring devices in the facility consist of NEMA 5-20R receptacles and 20A, 120V toggle light switches throughout. Faceplates are white thermoplastic in all areas except the kitchen where they use stainless steel.

The motor starters and switches used for mechanical equipment were noted to be in good to excellent condition. Replacement components are readily available for these devices for future maintenance needs. There are three electric furnaces used in the dining area. Currently only one is wired for service and it is currently inoperable. We would recommend connecting all the heaters so that they can serve as backups when one fails.

Lighting

The lighting consists of both newer LED and T8 technologies. In general, modules constructed around 2014 (kitchen, office, restrooms, and recreation) are using the old fluorescent fixtures and classroom modules and the corridor is using newer LED. The fluorescent fixtures are all in good condition with a few needing lamps replaced. All the LED fixtures are in excellent condition. Exterior fixtures are all LED type.

The exterior lighting includes LED wall packs at the entrances.

The emergency egress fixtures consist of mainly bugeye type fixtures in excellent condition. Exit signs are white thermoplastic with stenciled LED letters. There is a mix of both red and green signage within the facility, but all were in good working condition.

Lighting Controls

Single toggle switches are used throughout. There are some three-way switches where there are multiple entrances into the room there are no level control or automatic control within the building.

The exterior lighting is controlled by integral photocells.

Telecommunication Systems

The main telephone service runs underneath the building to a Telephone Terminal Board located in the IT room. There are two 7' telecommunication cabinet racks in the IT, one for the telecommunication system and the other for the video surveillance system. The telecommunications system consists of Category 6 cabling run in conduit to cable tray in the corridor then J-hooks where possible in the modules before transitioning to conduit down walls to outlets.

Fire Alarm System

The fire alarm system consists of an addressable Class 'B' fire alarm with voice evacuation system. The Fire Alarm Control Panel 'FACP' is in IT Room E106 and is a Notifier control panel *(Photo E5).* The fire alarm initiating devices include pull stations at the exits, heat detectors in the mechanical and kitchen areas, duct smoke detectors on the air handlers, kitchen hood suppression system, and sprinkler flow/tamper switches. The signaling devices consist of fire alarm speakers/strobes in the corridors, classrooms, and public spaces. There were smoke detectors in areas that have increased hazard potential such as bathrooms and the dining area.

Photo E5 – Main FACP

Master Clock

There is a master clock system in the corridors and classrooms however we could not get access to the IT cabinets to verify headend equipment. From on-site discussions the understanding is that this is connected to the fire alarm panel as well as the voice evacuation system being used as the facility PA system.

Photo E6 – Intercom Speakers and Wireless Clocks

End of Harold Kaveolook Interim School Survey results

STORAGE FACILITIES

Mechanical Systems

Overview

We visited these facilities on April 15, 2024, to inspect the mechanical systems. These facilities are made up of a remaining section of the old school, a maintenance shop, a vehicle storage, and equipment storage. These facilities are various ages and states of completion. The existing school section is the oldest and has been converted to storage space for the interim school while the other buildings are newer and used for equipment supporting school facilities.

Plumbing

Domestic water and sanitary sewer service serving the teacher housing adjacent to the school passes through the old school but does not serve the existing school. There are currently no water or sewer to the existing school and hence no functional plumbing systems. The existing plumbing piping and systems should be demolished when the building is converted to a storage building. The other storage facilities do not have any plumbing.

Heating

The old school building is heated by a single new residential oil-fired boiler and pump that are in good condition. Depending on how the building is remodeled the boiler may need to be relocated or replaced. Heat is distributed throughout the old school building using the existing piping baseboard fin tube, cabinet unit heaters, and unit heaters. The piping and terminal heating equipment are all in poor condition and will need to be replaced when the building is remodeled.

The maintenance shop is heated by an oil-fired unit heater that is in poor condition and needs to be replaced. A new fuel oil tank in good condition provides fuel oil for the heater.

The vehicle and equipment storage buildings are heated by a single electrical heater that is very new and in good condition.

Ventilation

There are currently no working ventilation systems in the old school building. The existing ductwork will need to be demolished when the building is remodeled into a storage building. The generator located in the old school building has an integral radiator that is ducted to the exterior of the building and discharges through an arctic hood. Outside air for the generator cooling and combustion air is brought in via a through the floor opening. The generator ventilation system was in good working condition. The other storage buildings do not have any ventilation.

Fuel Oil

A fuel oil tank for the old school building sits just outside the generator room and serves the generator and fuel oil boiler. The fuel tank is a single wall tank in poor condition. There is a new double walled tank on site that is schedule to be installed this year.

The maintenance building has a new exterior fuel tank that is in good condition.

HVAC Controls System

The existing school building controls are standalone controls consisting of thermostats. The Johnson Control Metasys system has been abandon. The controls will need to be demolished and replaced with a modern DDC system when the building is remodeled.

The other storage buildings all have standalone controls consisting of thermostats or built in controls.

Fire Protection

None of the storage facilities have fire protection. The old school building has some existing sprinkler piping, but it is not currently connected to a water source.

Photo M15 – Old School Boiler

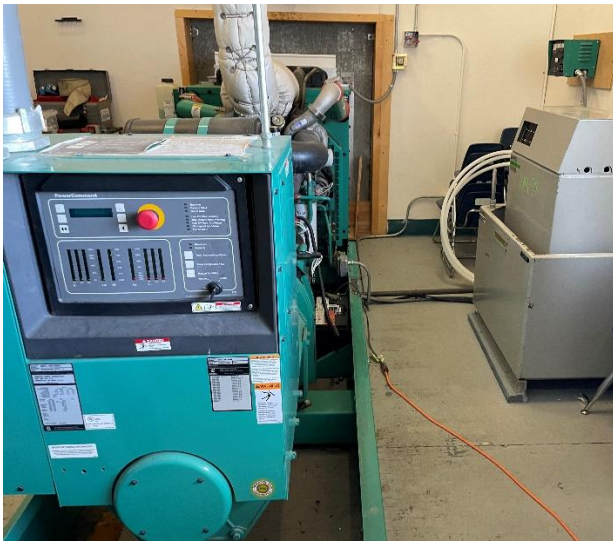

Photo M16– Old School Generator / Day Tank

Electrical Systems

Overview

We visited these facilities on April 15, 2024, to inspect the electrical systems. These facilities are made up of a remaining section of the old school, a garage, a vehicle storage, and equipment storage. These facilities are various ages and states of completion. The existing school section is the oldest and has been

converted to storage space for the interim school while the other buildings are newer and used for equipment supporting school facilities.

Power

The old school section has the main building service from before the rest of the building was destroyed to the main 800A main breaker. This main disconnect then feeds to the remaining ATS which is connected to a branch circuit panel adjacent to the main disconnect (Photo E1). This panel feeds the remaining building loads and the single-family residence, see below. The connection to the branch circuit and other sub-feeds are temporary connections using MC-HL to connect the loads that exist in the building, but the loads remain largely intact.

The garage is fed from the same utility pole-mount transformer which feeds the remaining school building but is fed overhead with a single-phase tap. The service to the building connects to a 100A, combination meterbase, disconnect with a 100A, 2-pole breaker which then feeds to a load center on the interior of the garage. There are various missing junction box covers but wiring and devices, although old, are still usable and fair condition. The load center has (2) breakers which feed the vehicle storage and equipment storage with dedicated 50A, 2-pole feeds.

The vehicle storage is fed with a single 50A circuit from the garage with (3) #8 and an equipment grounding conductor. This circuit is splice at the building and feeds lighting, receptacles, and electric unit heater from this single circuit. There is no separate over-current protection for the lighting or receptacles per NEC. It would also require a dedicated grounding electrode for multiple circuits.

The equipment storage is the same circuiting issue as the vehicle storage requiring dedicated over-current protection for the lighting, receptacles, and electric unit heater. It would also require a dedicated grounding electrode. The conductors are also undersized for the over-current protection as there is only #10 with is rated to maximum of 30A per NEC. These conductors would need to be upsized or the breaker rating reduced to meet code.

Photo E1 – Electrical Service Disconnect and ATS

Photo E2 – Generator

Photo E3 – Garage Loadcenter

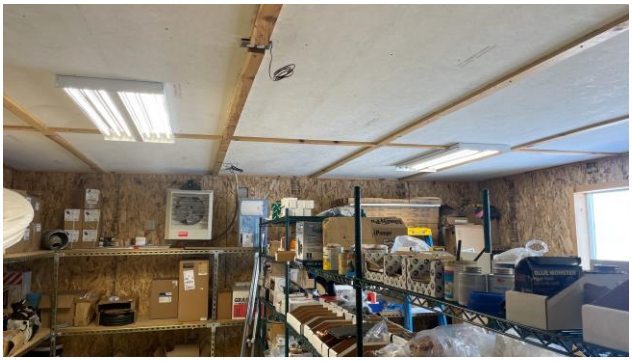

Photo E4 – Storage Lighting

Wiring and Cabling Systems

The branch wiring system in the facility is copper building wiring run in surface-mounted EMT cable. A separate insulated green equipment grounding conductor is run for every branch circuit. The feeders to the storage building are run overhead between the garage and each building.

The wiring devices in the facility consist of NEMA 5-20R receptacles and 20A, 120V toggle light switches. Faceplates are white thermoplastic in all areas except the kitchen where they use stainless steel. Receptacles are mounted 48” above finished floor and are in fair to excellent condition.

Lighting

Lighting is all linear fluorescent type in the existing school building, the garage, and storage buildings. For school building is surface or pendant-mounted type such as wrap arounds and strip lights. The garage and vehicle storage use a strip light type surface-mounted fixture. The equipment storage facility is using a surface-mounted T5H0 type fixture. The T8 type fixtures are all at end of light and there are some with missing lenses and a re-lamp would be recommended. The T5HO fixtures are in excellent condition but are over lighting the area giving the number of lamps and low mounting height.

Exterior lighting is only on the new school section and is LED type.

There are no emergency lights in the garage and storage buildings. The emergency lighting in the old school is left over and are not functioning. They are probably not required except in areas with electrical panels and we would recommend replacement only as required.

Lighting Controls

Single toggle switches are in all buildings. They are all in fair to excellent condition.

The exterior lighting is controlled by integral photocells.

Special Systems

There are no special systems in the garage and storage buildings.

The old school building has the remnants of a fire alarm, PA, clock, and telecommunications but all these devices and wiring have been abandoned in place. These systems could be demolished in their entirety if not required. If some of these systems are desired, we would recommend providing new that integrate with the new school and providing them in a limited area.

End of Interim School Survey results

SINGLE FAMILY RESIDENCE #321, #323, #325, #327

Mechanical Systems

Overview

The mechanical systems in units were all of a similar configuration. Some upgrades had been performed in each unit. The systems are described as typical for all unit with any variances in site conditions noted by system.

2024 Update

The residences froze up after the fire to main school and hence the plumbing systems were heavily damaged. The heating systems utilizes glycol and were mostly undamaged.

Plumbing

Domestic water and sanitary sewer service is provided to each residence by arctic piping routed to the school utilidor system. The arctic piping is in poor condition and requires routine repairs. The school utilidor where the utilities connect has experienced issues with waste back-up up and pipe freezing. The water/sewer services to each building should be upgraded to connect directly to the city system.

The condition of the plumbing piping is fair. The plumbing fixtures vary in condition from fair to poor. The plumbing piping and fixtures are at the end of their useful life expectancy. The plumbing fixtures utilize higher water usage than is required by the current plumbing code and should be replaced with lower usage fixtures when repairs are performed. The plumbing vents through roof in the building do not have heat trace for freeze protection. The on-site maintenance staff indicated that the vents are prone to freezing.

Domestic hot water is provided by a hot water generator in each residence. The hot water generators in #321, #323 and #325 are in poor condition and at the end of their useful life expectancy. The units should be scheduled for replacement. The hot water generator in unit #327 was recently replaced as is in good condition.

The fuel oil piping is original from the construction of the building and is in poor condition, there is visible corrosion on the fuel tank. The fuel oil tank is a 300-gallon single wall tank.

2024 Update

The domestic water plumbing piping burst during the freeze up and has been replaced with exposed pex piping. The water piping is somewhat unsightly but is functional.

Domestic hot water is provided by a hot water generator in each residence. The hot water generators where replace during the freeze up repairs and are in good condition.

Heating

The heating system consists of one fuel oil cast iron sectional boiler for each unit. The boilers in unit #321 and #325 are Burnham boilers rated at 119,000 BTU/hr output each. The boilers in #321 and #325 are at the end of their useful life expectancy and should be scheduled for replacement. The boilers in unit #323 and #327 are Weil McClain boilers rated at 115,000 BTU/hr output each. New burners had been recently installed on the boilers in unit #321 and #327. The boilers are in fair condition and estimated to 20 years old. The boilers are piped primary only with one circulation pump with zone valves for heating in the residence. There is no provision for minimum flow through boiler to prevent overheating of glycol. The piping in the boiler room consists of uninsulated copper piping. The rooms are heated by finned tube. There is no combustion air for the boilers. The piping, heating system pumps and fintube is in fair to poor condition in the units and is at the end of its useful life expectancy. The storage room added to each unit does not have adequate heat. Additional heating capacity should be added for the storage room as part of heating system upgrades.

The housing heating system is connected to each unit to provide back-up heating for the boilers. When the system operates the pressure exceeds the pressure relief valve setting on the boilers. The arctic piping serving the buildings is in poor condition. The system should be demolished or reconfigured with new arctic piping and piping arrangement to prevent overpressure on the boiler system.

2024 Update

There are no changes to the heating system.

Ventilation

Ventilation for each unit is provided by an HRVs, one Venmar HRV is installed to serve each unit. The HRVs do not have preheat coils and have limited capacity for operation in the winter. The HRVs were not operating when we were on-site.

The range hood for each unit was not ducted to the building exterior.

2024 Update

There are no changes to the ventilation system.

Fire Protection

There is no fire sprinkler system in the building.

2024 Update

There are no changes to the fire protection system.

Photo M17– Exposed Pex Piping

Photo M16– Hot Water Generator

Photo M18 – Boiler

Photo M19 – Boiler Room

Electrical Systems

Overview

We visited the single-family residences on April 15, 2024, which were connected to the old school and experienced freeze ups to verify the condition of the electrical systems. The electrical systems did not experience any issues due to the temporary disruption due to the destruction of the old school and remains in the same condition as the 2017 walkthrough.

The electrical systems are in average condition and mostly in need of updating to meet current safety codes.

Power

All single-family residences are provided power via a panel located in the Generator Room of the School *(Photo E1)*. The feeders to each residence consist of MC-HL and route to a 100A, 120/208V, 1-Phase, 3-Wire disconnect on the exterior of each unit. The residences should be provided with separate services from the utility and removed from the school service.

Each residence contains a 100A, 120/208V, 1-Phase, 3-Wire loadcenter. Units #321 and #325 have older Murray loadcenters (*Photo E2*) that are no longer manufactured and should be replaced with new. Units #323 and #327 contain Square D loadcenters and are in good condition with spare parts readily available.

2024 Update

There are no changes to the power system report.

Photo E1 – Panel that Feeds Residences (on left)

Photo E2– Murray Loadcenter

Devices and wiring

The majority of the building wiring was routed concealed within the walls with type NM cable. Receptacles in the dwelling units are standard 15A receptacles and in average condition. Minor faceplates and devices needing replacement only. GFI protection is provided in the bathrooms and kitchen meeting current code, with the exception of Residences #321 and #325 which were missing GFCI receptacles in the kitchens. No tamperproof receptacles or arc fault type breakers were noted which are current code requirements for dwelling units.

2024 Update

There are no changes to the power system report.

Lighting

The lighting throughout the facility consists primarily of incandescent fixtures with Compact Fluorescent Lamp (CFL) screw-in replacement lamps and surface mounted fluorescent T8 lamps. Most of the light fixtures are dated and in poor to average condition. The lighting is switched with local 15A, 120V line voltage switches.

The exterior fixtures were primarily HPS type wall pack fixtures (*Photo E3*) that should be replaced with newer energy efficient LED type fixtures.

2024 Update

There are no changes to the power system report.

Special Systems

The telephone service to each building is fed from an overhead line to individual exterior Network Interface Devices (NID) mounted on each building *(Photo E4).* Category 3 cable is routed inside to the RJ45 telephone jacks.

2024 Update

In many cases the homeowners are now using personal Starlink satellites.

Photo E3 – Typical Exterior Lighting

Photo E4– Typical Telephone Service NID

Photo E5 – Typical Satellite Dish

Photo E6 – Typical Missing Smoke Detector

Photo E7 – Carbon Monoxide Detector

Satellite TV service is provided from a roof-mounted dishes on with #327 and routed to each building with coaxial cable into the units *(Photo E5).* It is unclear if the two dishes provide all TV service to each building. In some cases, these satellites may be abandoned in place and replaced with resident's own Starlink satellites.

Fire alarm systems in the building consisted of battery powered smoke detectors in the bedrooms and the common area outside the bedrooms. Many of the smoke detectors were missing from their bases (*Photo E6*). A few carbon monoxide detectors were noted in some of the units (*Photo E7*); however, they should be provided in all bedrooms and within the areas outside of each bedroom per IFC requirements.

End of Single-Family Residence #321, #323, #325, #327 Survey results.

SECTION 3. DEFICIENCY CODES & FINDINGS

This section explains the codification system for categorizing facility deficiencies based upon field survey findings.

A. DEFICIENCY CODES

1 – Health/Life Safety: These deficiencies identify areas where the facility is not constructed or maintained in compliance with provisions of the state mandated life safety aspects of building codes including the codes adopted from the International Code Council (such as the International Building Code) or other standards organizations (such as the National Fire Prevention Association). Deficiencies could include inadequacies in fire barriers, smoke barriers, capacity and means of egress, door ratings, and fire protection equipment not covered in other deficiency codes.

2 – Operating Cost: These deficiencies address the efficiency of lighting, heating systems/fuel types and the thermal enclosures of buildings, processes, and are required for energy conservation and good energy management.

3 – Technical Upgrade: These are items that would upgrade obsolete equipment or systems to the current technology.

4 – Code Upgrade: These are deficiencies related to building code violations where there is no imminent threat to life safety.

5 – Protection of Structure: These are deficiencies that endanger the physical structure of the facility.

6 – Functional Upgrade: These are deficiencies in the plumbing, heating, ventilating, air conditioning, power, lighting, special systems, etc. requiring maintenance due to normal wear and tear that would result in system failure.

7 – Education Program Upgrade: These are items that would improve the ability of the educators to instruct the students.

The deficiencies are further categorized by design disciplines and priority as follows:

Code	Discipline
M	Mechanical
E	Electrical

Priority	Description
1	Highest priority – Life safety or imminent danger
2	Repair/remodel within 3 years
3	Repair/remodel within 3-10 years

See attached Deficiency Matrix for detailed information.

B. MASTER DEFICIENCY INDEX

Discipline /Record #	Deficiency Code	Priority	Building	Deficiency Title	*2024 Update*
M1	6	2	School Itinerant House	Upgrade Plumbing Fixtures and Plumbing piping.	***No change noted.***
M2	4	2	School Itinerant House	Upgrade Heating Equipment	***No change noted.***
M3	6	2	Single Family Residence #321, 323, 325, 327	Upgrade Fuel Tank to Double Wall	***No change noted.***
M4	6	2	Single Family Residence #321,325	Upgrade boilers	***No change noted.***
M5	6	3	Single Family Residence #321, 323, 325, 327	Upgrade Heating Equipment	***No change noted.***
M6	6	2	Single Family Residence #321, 323, 325, 327	Upgrade Water/Sewer	***No change noted.***
M7	6	2	Single Family Residence #321, 323, 325	Hot water generators end of life expectancy.	***The hot water heaters were replaced in 2020 when the facilities froze up.***
M8	6	2	Single Family Residence #321, 323, 325, 327	Upgrade Plumbing Fixtures and Plumbing piping.	***No change noted.***
M9	6	2	Single Family Residence #321, 323, 325, 327	Upgrade Ventilation	***No change noted.***
M10	6	2	Single Family Residence #321, 323, 325, 327	No exhaust on Range Hoods	***No change noted.***
M11	6	2	Single Family	Upgrade boilers	***No change noted.***

			Residence #323, 327		
M12	***6***	***6***	***Single Family Residence #321, 323, 325, 327***	***Replace water piping.***	***New item.***
E1	1	1	All Housing	Smoke/CO Detectors Missing	**No change noted.**
E2	4	3	All Housing	Receptacles in units not tamperproof	**No change noted.**
E3	4	3	All Housing	Missing arc fault protection in load centers	**No change noted.**
E4	6	3	Single Family Residence #321, 323, 325, 327	Separate building fed from school	**No change noted.**
E5	6	3	Single Family Residence #321	Discontinued panel type.	**No change noted.**
E6	4	1	Single Family Residence #321	Kitchen receptacles not GFCI.	**No change noted.**
E7	1	1	Single Family Residence #323	Receptacle missing faceplate.	**No change noted.**
E9	6	3	Single Family Residence #325	Discontinued panel type.	**No change noted.**
E10	4	1	Single Family Residence #325	Kitchen receptacles not GFCI.	**No change noted.**
E11	***6***	***2***	***Interim School***	***Dining Room Heaters***	***New item.***
E12	***3***	***2***	***Interim School***	***Generator***	***New item.***
E13	***4***	***2***	***Storage Facilities***	***Storage Service Disconnect***	***New item.***
E14	***4***	***2***	***Storage Facilities***	***Junction Box Covers***	***New item.***
E15	***6***	***2***	***Storage Facilities***	***Burned out fluorescent bulbs.***	***New item.***

E16	*4*	*1*	*Storage Facilities*	*Feeder sizes incorrect size.*	*New item.*
E17	*4*	*1*	*Storage Facilities*	*Overcurrent protection missing.*	*New item.*
E18	*3*	*3*	*Storage Facilities*	*Unused low voltage systems*	*New item.*