City of Cordova
Multi-Building Condition Assessment:
City Maintenance Shop

Prepared For:

CITY OF CORDOVA
INCORPORATED 1909

Prepared By:

COFFMAN ENGINEERS

800 F Street
Anchorage, AK 99501

Nicholas Krysinski, PE, Mechanical
Dave Booker, PE, SE, Structural
Mark Graham, Electrical
Derek Tannahill, PE, Civil
Dave Dreher, AIA NCARB,
Architect Kent Gamble, Estimator

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1. INTRODUCTION

The City of Cordova engaged Coffman Engineers and Burkhart Croft Architects to assess and report on the condition of City-owned buildings and structures to establish a baseline of their current assets, and better forecast future needs.

The team performed a multi-discipline condition assessment of thirteen facilities including:

1. Bob Korn Memorial Swimming Pool
2. Bidarki Recreation Center
3. Eyak Skaters Cabin
4. Cordova Jr/Sr High School
5. Odiak Pond Gazebo and Boardwalk
6. Odiak Camper Park Restroom
7. Parks and Recreation Maintenance Shop
8. City Maintenance Shop
9. Ballfield Restroom / Concession Stand
10. Cordova Chamber of Commerce
11. Hollis Heinrichs Park Restroom
12. Flemning Spit Restroom
13. Fire Department Sub Station

The team also visited the City Maintenance Shop and evaluated the feasibility of relocating the building to a new site.

The team consisted of an architect, civil, structural, mechanical, electrical engineers, and a cost estimator.

Due to the amount of information and quantity of sites, a separate report has been developed for each facility. This condition assessment report is for the City Maintenance Shop.

2. EXECUTIVE SUMMARY

The City Maintenance Shop was evaluated by the team on November 17, 2022. This report provides:

- A description and assessment of the various building components.
- A list of deficiencies, ordered by urgency for repair or correction.
- Rough order of magnitude cost estimate for the listed deficiencies, as well as building replacement.
- A routine and preventative maintenance plan.

The City Maintenance Shop was in fair condition, especially given its history of phased construction and additions. The shop is operated by skilled employees and has some purpose-built modifications such as a vehicle exhaust system. As a whole, the shop is functional but has numerous code deficiencies. The shop has a third set of bays that are used for dry storage but are not heated of fully built out yet.

3. PARKS AND RECREATION MAINTENANCE SHOP

3.1. Description and Summary

Original construction of the city maintenance shop is believed to have been built in the early 1980s. The shop has three sets of bays, each with two overhead doors. There is an office, mezzanine storage, and workspace in the back portion of each bay. The shop is used for equipment maintenance, repairs, and warm storage. The third bay, on the west end, is under construction. It is closed in but not heated or finished. It was used as dry storage for equipment during the time of the site visit.

3.2. Building Component Assessments

3.2.1. Architectural

3.2.1.1 IBC Code Summary

Model Code Application

This building appears to have been added onto as the city required additional space. Most likely the main building was constructed before 2000 and would have been under the *Uniform Building Code* in effect prior to 2000. Since 2000, the *Uniform Building Code* has been replaced by the *International Building Code (IBC)* family as the acting model building code in Alaska. The assessment below is based on the 2021 IBC (current version adopted by the State). While the original building may have been permitted through the state, the current user group did not provide information regarding permitting for the additions to the building.

The IBC restricts the size of buildings depending on what they are built out of and what life safety components they are equipped with. The facility is approximately 7,497 square feet, with an additional 1,891 square feet of mezzanine space. The walls are constructed out of combustible framing. While the structural members are steel, they are unprotected from fire. This will classify the building as Type V-B construction. This is the most restrictive assembly for allowable square footage as noted above. The facility is compliant for construction type and area, but code deficient for use. See below.

Occupancy Groups

This facility is split into 3 distinct bays. They are separated with wood framed walls. Sheathing is typically gypsum wall board on each side, with some having plywood sheathing installed, and others with no sheathing at all, just exposed studs. For reporting purposes, we are designating the bays 1 through 3 in this portion of the report.

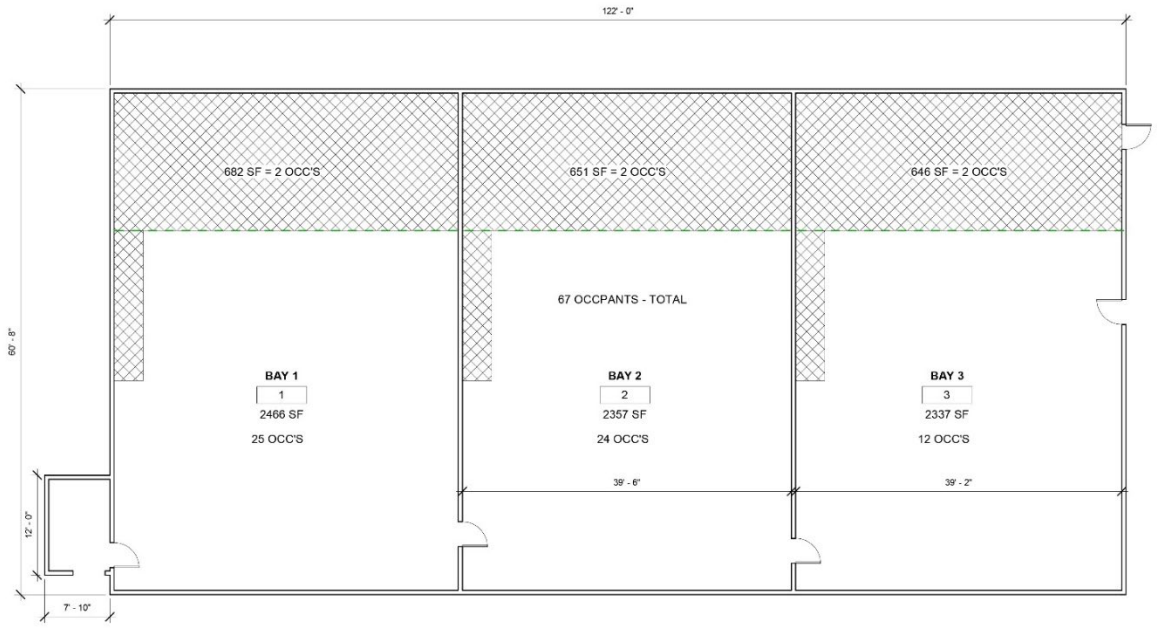

Fig. 1. Floor Plan

Vehicular Maintenance Bay: Bays 1 & 2, with the use observed during the inspection would qualify the occupancy as "S-1" Vehicular Repair Garage.

Vehicular and Equipment Storage Bay: Bay 2, with the use observed during the inspection would qualify the occupancy as "S-2" Moderate Hazard Storage.

Mezzanines: All Mezzanines would be classified as "S-2" Moderate Hazard Storage.

3.2.1.2 Egress System

There is a significant deficiency with the existing exit path of the facility. See floor plan above. Code dictates maximum travel distances until the occupant is presented with two means of egress or is at an exterior exit. For this type of construction, without a fire suppression system that distance is 75-feet. In almost all areas of the building, the length is exceeded. What is required is an additional exiting study to design a new compliant exiting path. Most likely 3-4 additional exit doors will be required. Their location is critical as well with more than likely 2 being located under the mezzanines. Overhead doors do not qualify as exiting doors per the code. For cost estimating we are assuming the following:

- *Provide 4 additional steel exit doors. All equipped with standard hardware, no panic devices are required. Doors are to be insulated hollow metal, with hollow metal frames. Exist signage will be provided at all locations. Doors will be installed in walls where no doors existed, provide headers as required.*
- *Door out of the upper mezzanine is a life safety concern. Door is neither signed nor blocked off. Exterior landing has metal guards, but stair has neither guards or handrails. Stairs also stop short of existing grade by about 4-feet. Sign door at minimum, mechanically blocking it would be preferred.*

- *Complete construction of the stair exiting out of the upper mezzanine in Bay 3. Work includes 42-inch-tall guard on one side, 34-inch handrails on both sides, and the stair construction to be extend to grade. Follow all current stair dimension requirements for grasp ability and extension and openness.*
- *Ensure door exiting out of Bay 3 is accessible, ensure code compliant exit signage is installed.*

3.2.1.3 Sprinkler System Protection

General

Fire Protection addresses overall description and condition of the fire suppression systems installed in the building.

Sprinkler System Requirements

Sprinkler system requirements are addressed in Chapter 9 of the IBC. In some cases, Chapter 9 specifically requires the building to be protected due to the type of use and code-defined occupancy group. In this case, all S-1 Occupancies are required to be sprinklered throughout if the fire area exceeds 5,000 square feet or occupant load is greater than 300. This facility is not in compliance with this requirement. With its current construction, fire suppression is required. fire area is defined by the unprotected cumulative area of the building. In the case of this facility, the entire building is unprotected. There is no fire rated construction, but the code also allows a fire barrier to be erected with an existing building. With the current room configuration, building it adjacent to the wall separating Bay 2 & 3 is the most logical location. Fire separation between S-1 and S-2 occupancies is 3-hours. The two options for correcting this code deficiency are as follows:

- *Option 1: Provide a NFPA13 fire suppression system throughout the facility.*
- *Option 2: Provide a 3-hour fire barrier. Barrier to be constructed in Bay 3. No 3-hour wood framed assembly exists. New wall will be steel framed, similar to USG Wall Assembly UL U419. Wall is allowed to terminate on the underside of the combustible roof deck.*

3.2.1.4 Accessibility / ADA / ANSI A117 Compliance

General

This facility is used by the City of Cordova Maintenance Staff. No accessibility recommendations are being made for this facility.

Fig. 2. Front Elevation

Fig. 3. Rear Elevation

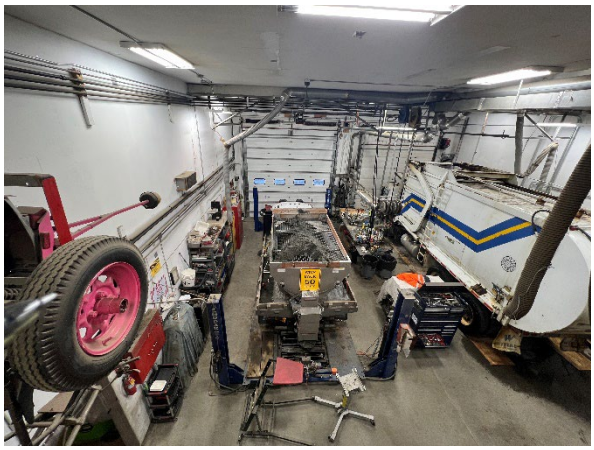

Fig. 4. Main Shop (Bay 1)

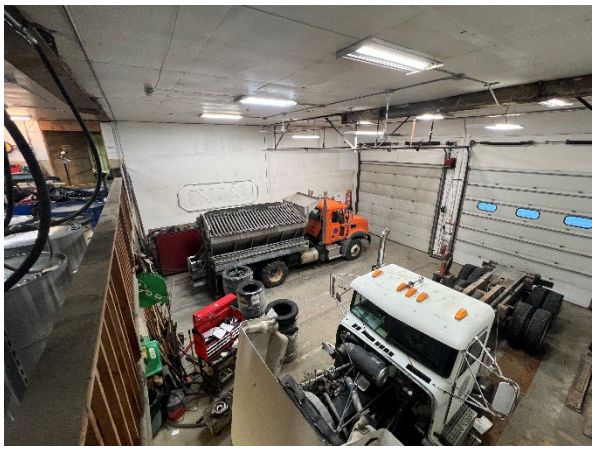

Fig. 5. Bay 2

Fig. 6. Bay 3

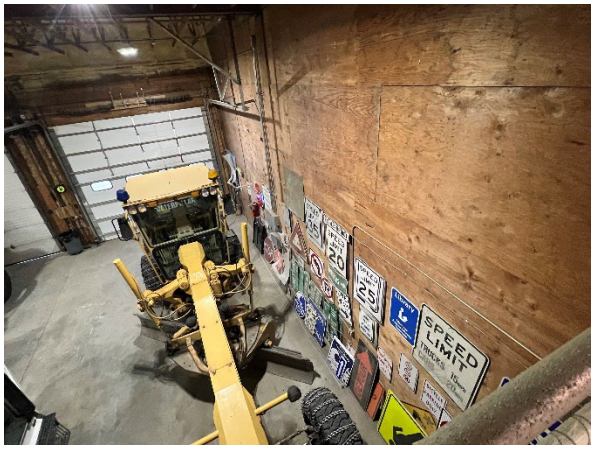

Fig. 7. Bay 3

Fig. 8. Exposed Foam

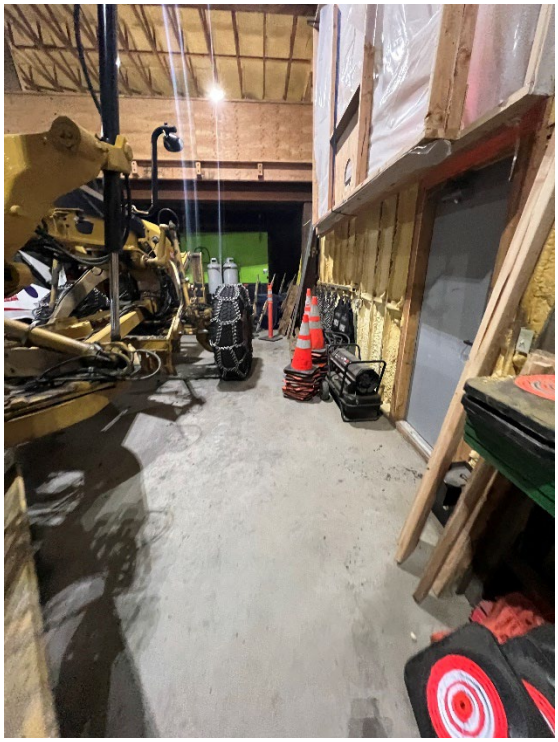

Fig. 9. Exit door requires signage

Fig. 10. Exit out of Bays 3 Mezzanine

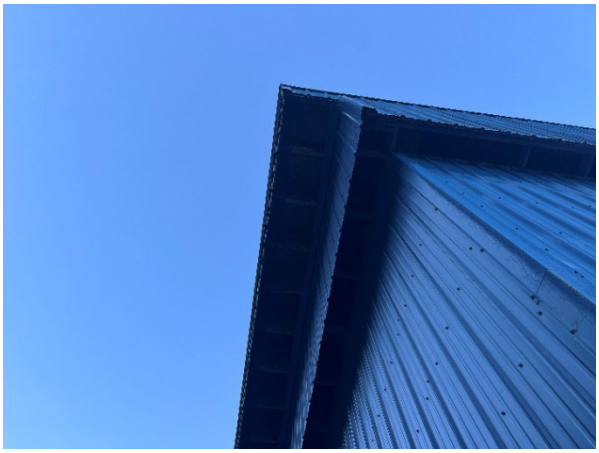

Fig. 11. Open soffits

3.2.1.5 Building Exterior

The building is clad with metal siding throughout. It all appears to be the same style and age. It would have been installed after the last addition was constructed. There were no visible issues with the siding.

Roof

The roof is a low slope metal roof. It was reported by the user that the roof leaks and should be replaced. There is a large cavity created by over framed wooden trusses where evidence of water damage is visible. While low slope metal roof systems are available, a more economical solution would be a membrane roof system.

- *Replace the existing metal roofing with a membrane system. Assume a 65-millimeter scrim reinforced EPDM over a new coverboard.*

The existing wood trusses overhang the existing facility by approximately 12-inches. No soffit panels or bird screening is present.

- *Install perforated soffit liner panels or bird screening along north and south elevations.*

3.2.1.6 Building Interior

General

The building interior appears to be in fair to poor condition overall. The facility is operating as a vehicular repair and storage facility serving the City of Cordova.

3.2.1.7 Code Deficiencies

Bays 3 is out of compliance with Chapter 26, Foam and Plastics. All foam and plastics are required to have a thermal separation between all occupied areas. There is exposed spray applied insulation throughout this bay.

- Cover the existing ceilings and wall with 5/8-inch gypsum wall board.

There are numerous areas in the facility where water damage was observed in the interior of the building. While the source of all the ceiling damage can be attributed to the failing roof, the walls present a question. It is unknown if the water infiltration is continuing after the last metal siding was installed. If water migration is still ongoing, then replacement of the water and thermal barrier on the exterior walls is recommended.

3.2.1.8 Facility Maintenance and Improvements

Considering the existing condition of the facility, code and exterior deficiencies are the only architectural improvements being recommended. See other disciplines for code or required work.

3.2.2. Structural

The Public Works Shop Building is a wood frame building constructed in three distinct phases, with a final installation of a second mono-slope roof over all three original flat roofs. The building's overall dimensions are approximately 122-feet wide by 60-feet deep with a 10-feet by 10-feet

lean-to entry vestibule on the east end. Each phase of the building construction is approximately 40-feet wide by 60-feet deep. Each phase has two overhead doors on the north side and a 15-feet to 20-feet deep mezzanine loft on the south end. The mezzanines are all at the same level, approximately11-feet-6-inches above the concrete shop floor. There are no record drawings available for this building and based on conversations with the users, no engineered designs were made.

The original roof framing for each of the three phases consists of 30-inch deep parallel chord pre-engineered wood trusses spanning 30-feet north-south from the exterior walls to a steel wide flange girder supported on W14x132 wide flanges or 12-inch square HSS posts. The steel girders are 30inches deep and 27-inches deep where the center 30-inches deep girder cantilevers over the interior posts and supports the interior ends of the 27-inch girders. The steel girders and posts were reported to be salvaged from a demolished bridge. The shop ceiling is approximately 21-feet above the shop floor. The new roof is built from pre-engineered wood trusses with a 1:12 pitch to the south. The over-framed roof trusses have an eave heel height of 24-inches and are spaced at 24-inch on centers.

Interior and exterior wall framing for all three phases is 2x6 studs at 16-inch on centers.

Since there were no original designs for this facility, we recommend a full structural evaluation be performed to identify structural deficiencies and make recommendations. Two concerns from our observations are as follows.

1. The height of exterior walls is too tall for 2x6 wood studs.
2. The lateral load resistance of the north wall is suspect. The north wall, with six overhead doors, leaves only seven narrow shear walls with high height to width aspect ratios and no hold down anchors to resist the over-turning forces.

Fig. 12. Public Workd Shop North Elevation

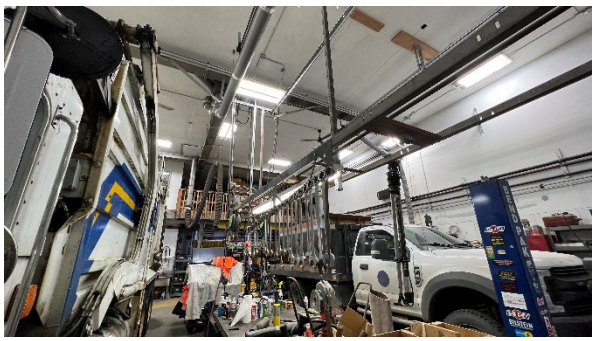

Fig. 13. Phase 1 – East Double Bays

Fig. 14. Phase 2 – Middle Double Bays

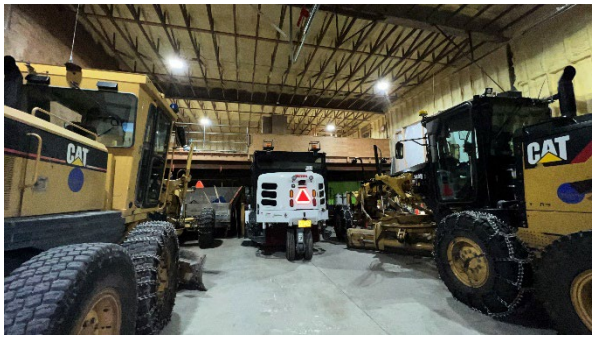

Fig. 15. Phase 3- West Double Bays

Fig. 16. Original Roof Trusses on Interior Girder

Fig. 17. Overframed Roof Truss Eave End

3.2.3. Civil

The City Maintenance Shop is located on a parcel owned by the City of Cordova, at 311 Orca Inlet Drive. The site consists of gravel pad with drives and shares a common area with the Parks and Recreation Maintenance Shop. An auxiliary structure is located directly east of the main shop, used for heated sand storage. Sand storage is also located to the east of the facility in uncovered stockpiles. A shed is present to the west of the shop for the waste oil system.

The Owner stated that the facility is on City water and sewer service and reported no issues with the services. Exterior utilities were not observed as part of this inspection.

Drainage around the building appeared to be adequate with no signs of ponding or runoff against the foundation. Runoff sheet flows away from the structure to surrounding areas for infiltration.

Concrete aprons extending from the bay access doors were observed to be deteriorated and damaged. Large cracks and chunks of concrete were seen during the inspection. See Figure 19.

The exterior exit stairs on the west side from Bay 3 appear to be damaged and removed, and do not connect to the concrete apron. See Figure 20. See architectural for more information.

Equipment fueling tanks with pumps are located directly east of the auxiliary shop in a secured fenced enclosure. The tanks are skid mounted to a metal pad.

The heating fuel tank is located on the east side of the building directly next to the east wall. The fuel tank appears to be in good condition with no evidence of leaks.

Fig. 18. Shop auxillary structure

Fig. 19. Concrete apron at bay entrances

Fig. 20. Stairs on west side

3.2.4. Mechanical

The City Maintenance Shop is heated with a combination of fuel oil and supplemental waste oil. There is a 300 gallon above ground fuel oil tank, as well as a 3,500-gallon oil tank on a trailer that accepts waste oil. The waste oil is run through a 500-gallon settling tank, filtered, and then stored in a 300-gallon day tank, which is mixed with fuel oil as needed depending on waste oil quality. The final mixture is run through a mixed-fuel oil boiler to heat water for the hydronic system. The hydronic system includes unit heaters and radiant floor tubing. There is a sand storage building adjacent to the shop that has a unit heater and radiant tubing that are supplied from the main shop. There is a small plate and frame heat exchanger to separate the water that goes to the sand storage building. The 400 MBH boiler is approximately six years old and appears in good condition. Components of the heating system vary in age; some may date back to original construction in the early 1980s. There are two unfinished bays in the building that have radiant tubing and insulation installed but are not connected to the hydronic system yet.

The sand storage building piping is buried but goes above grade and routes through the sand storage building. It was noted onsite that the system is run on water with no glycol. The piping would be subject to freezing if the system goes down during the winter, especially where the piping is uninsulated at the entrance to the building where it leaves the ground. This piping should be insulated, and it is recommended that glycol be added to this system as it is separated from the building by a heat exchanger.

It was noted onsite that the shop area takes 1-2 hours to reach 60 degrees after an overhead door is opened on a 20-degree day, and that the unit heaters in the shop are not adequate. There are two- or three-unit heaters per bay, depending on the bay, each is rated at 43,000 BTH/hr. This is in line with other successful hangar and shop designs in colder parts of the state. It was noted onsite that the supply temperature from the boiler felt cooler than the 180-degree water that the unit heaters are commonly designed for. A thermometer on the main supply piping was not located during the site visit, however, by touch the piping felt a similar temperature to the piping serving the sand storage building, which does have a thermometer and read 100 degrees. The boiler seems to be producing water in the 120-degree range, which is appropriate for radiant piping, but not unit heaters. Furthermore, the nameplate of the boiler indicates the design outlet water temperature is rated at 160–220-degree water. A heat exchanger for the shop radiant floor piping was not observed; one should be added, and controls set up so the boiler produces 180-190 degree water to the unit heaters and 120 degree water to the radiant piping and the heat exchanger to the sand storage building. The radiant slabs can be damaged by running high temperature water through the slab. It was also noted that some of the heating piping did not have insulation. Insulation should be added to ensure the water temperature is maintained to the unit heaters.

The boiler was observed to cycle approximately every ten minutes during the site visit. Outdoor temperature was about 25 degrees. This is detrimental to equipment life and efficiency. This was discussed onsite and the boiler goes directly to high fire, runs until the water setpoint (which is too low as discussed above) is met, and shuts down. The boiler operation should be reviewed and corrected by a qualified technician that is familiar with an Energy Logic multi-fuel boiler. This work should be in conjunction with adding a heat exchanger for the radiant and adjusting the boiler output temperature as noted in the paragraph above.

There is a purge exhaust fan that is reported to work well for fume removal, but an overhead door has to be open and the building has issues maintaining heating setpoint so its usage is minimal. It is operated by a manual wall switch.

There is a welding exhaust capture hood and fan located in the work space behind the middle bays.

There is a vehicle exhaust system in the main two bays of the shop. It was discussed onsite that it was designed and installed by the shop workers and it works well. Generally, vehicle exhaust systems are a specialty item made of purpose-built components that are rated for certain vehicles and usage. This system did not appear to be designed and constructed to that level. The International Mechanical Code (IMC) requires vehicle exhaust systems to be engineered by a registered design professional or be factory-built equipment designed and sized for the purpose. While this custom system is an impressive example of local ingenuity and handiness, it would have to be replaced with a Carmon, Nederman, or similar vehicle exhaust system sized for the needs of the shop if the city wants the building to be code compliant. Alternatively, if the vehicles are only running to pull into and out of the shop, vehicle exhaust is not required.

There was no building-wide ventilation system present in the shop. The IMC requires natural or mechanical ventilation for this building. There are two options to comply with the code required ventilation. Option one is natural ventilation, which requires operable openings to exceed 4% of the building floor area. Opening an overhead door would easily exceed this. However, in cold climates this approach is generally not reasonable and is not recommended in this case, as the overhead door would have to remain open while the building is occupied to meet the intent of the code. The second option is to install a ventilation system. In this case, a Heat Recovery Ventilator (HRV) with a hydronic heating coil, and ductwork sized for about 6,500 CFM (based on Maintenance shop area classification in the IMC) would be recommended to serve the entire building, including the last two bays that are not yet heated. If sized at this flow, the last two bays should be connected to the hydronic system heat before the ventilation system is connected to it. The existing boiler capacity would not be able to handle the added ventilation load, the boiler would have to be replaced with a larger unit, or a secondary boiler added.

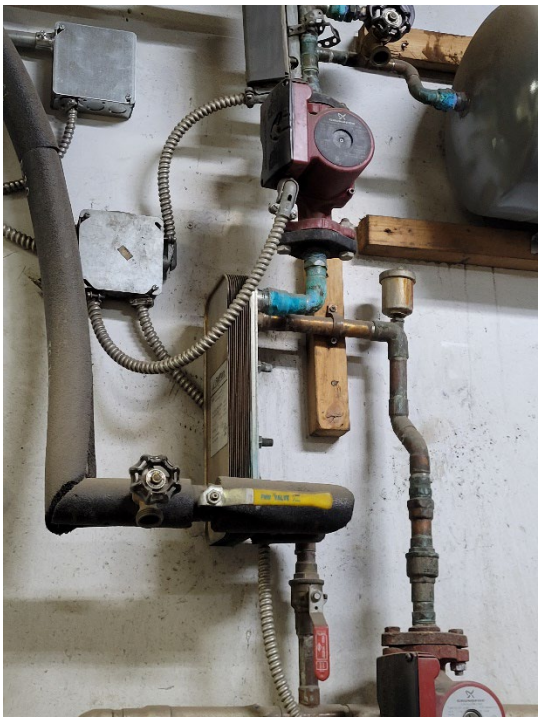

Fig. 21. Heat exchanger and pump for sand storage building

Fig. 22. Oil settling tank with day tank below, boiler in background

Fig. 23. Middle two bays

Fig. 24. Main two bays (east end), note vehicle exhaust system

Fig. 25. Multi fuel boiler

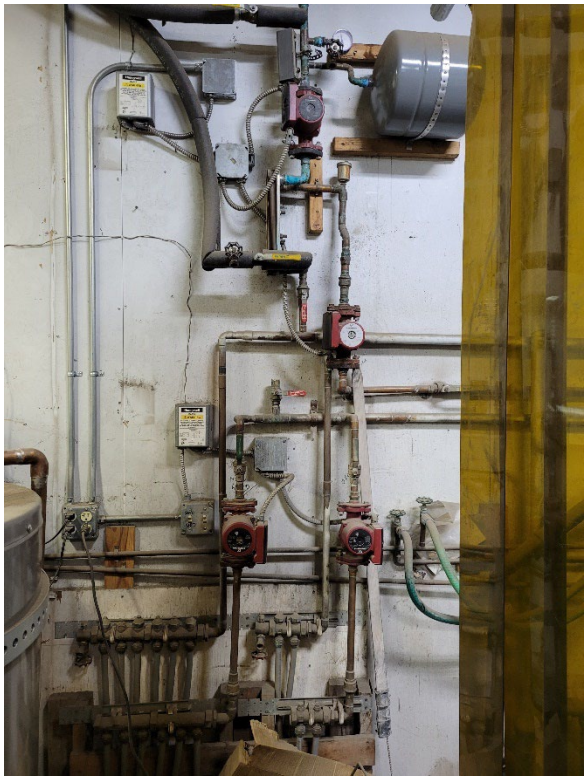

Fig. 26. Hydronic piping and pumps, and radiant manifold at bottom

Fig. 27. Purge fan and boiler stack

Fig. 28. Damage to vehicle exhasut ductwork

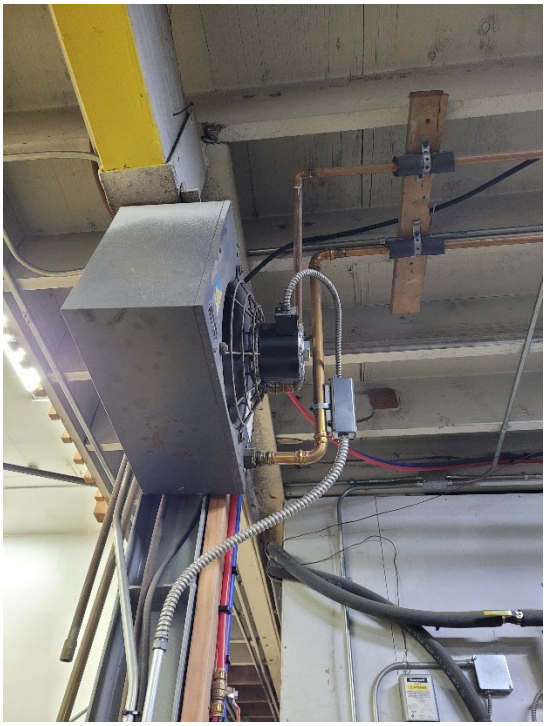

Fig. 29. Unit heater with uninsulated piping

Fig. 30. 300 gallon fuel oil tank

Fig. 31. Waste oil tank

Fig. 32. Waste oil tank and piping

Fig. 33. Sand storage building

Fig. 34. Sand storage building heating water entrance

3.2.5. Plumbing

Plumbing in this shop includes domestic hot and cold water and waste for a bathroom, floor drainage, compressed air, hose reels, and various pumped automotive fluids.

Domestic hot water is provided by an electric water heater. It was discussed onsite that there may be an accidental crossover connection in the domestic water piping somewhere; the bathroom sink gets hot water from the hot tap and warm water from the cold tap.

Supplementary hot water for a pressure washer is provided by a portable fuel-fired pressure washer that has the exhaust ducted out the exterior wall. The ducting is with single wall galvanized duct, and the clearances to combustibles through the wall should be checked with the local Fire Marshal.

Building drainage is to a buried holding tank that is approximately 15 feet deep, accessed by a manhole cover near the southwest end of the building. The tank has a broken sump pump and must be manually emptied by a vacuum truck about twice per year.

An oil water separator was not observed and should be present for the floor drain drainage from the shop.

Automotive fluids such as hydraulic oil are stored in 55-gallon drums and pumped by air-driven local pumps that attached to each drum and pump through permanently installed piping down to the maintenance bays. The equipment appeared to be in very good condition.

Fig. 35. Bathroom

Fig. 36. Eyewash and shop sink

Fig. 37. Electric hot water heater

Fig. 38. Fuel fired pressure washer

3.2.6. Fire Protection

As stated above in the *Architectural* section, this building is required to have a sprinkler system as the building area exceeds 5,000 square feet.

- *Provide a NFPA13 fire suppression system throughout the facility.*

Per Section 907.2.10 of the 2021 International Building Code, a fire alarm system is not required.

There are multiple 55-gallon drums located in the building such as AW-32 Hydraulic Oil, SAE 15W-40, and SAE 5W-30; however, none of these are hazardous materials according to their SDS.

Per the *2021 International Fire Code*, waste oil and other Class IIIB liquids shall be stored in approved tanks or containers, inside repair garages. These tanks are required to be located at, below, or above grade with proper and adequate drainage and containment. Above-ground tanks storing Class IIIB liquids are required to be UL 142 listed.

Tanks that are protected above-ground are required to be a minimum of 5 feet away from any building, 25 feet away from the nearest fuel dispenser, 15 feet from the lot line, 5 feet away from the nearest public way, and 3 feet away from other tanks. Above-ground tanks are required to be protected by guard posts or another approved method unless the tanks are listed as a protected above-ground tank. Above-ground tanks are required to be provided with drainage control / secondary containment.

The 300-gallon located on the exterior part of the building is not protected by an approved method, is within 5 feet of the building, and is not provided with secondary containment. The 3,500-gallon oil tank is 5 feet away from the building but does not have any secondary containment.

- *Provide code-compliant tanks for secondary containment of Class IIIB liquids.*
- *Provide code-compliant distances between above-grade outdoor storage tanks and fuel dispensers, buildings, lot lines, public way, and other tanks.*

Fig. 39. 55 gallon drum storage.

Fig. 40. 500 gallon settling tank and 300 gallon day tank.

3.2.7. Electrical

The facility is served by a 240/120V, single phase, 3-wire, 400A electrical service provided by Cordova Electric Co-Op. The incoming utility service equipment, including current transformer (CT) cabinet, disconnect switch, and meter socket are wall mounted on the exterior of the building. There are some miscellaneous items stored in front of the exterior electrical service equipment that should be removed to ensure adequate working clearance in front of the service equipment.

Distribution for the building is provided by a 400A, 240/120V, single phase, 3-wire main distribution panel (MDP) located in shop Bay 1. The MDP serves three 200A, 240/120V single

phase panelboards located in the Shop Bays. Panel A is located in Shop Bay 1, Panel B is located in Shop Bay 2 and Panel C is located in Shop Bay 3. The electrical distribution system was upgraded in 2014 with a new MDP, branch panels, feeders, and wiring and is in good condition.

There are no arc flash labels on the electrical panels and equipment. It is recommended that an Arc Flash Risk Assessment be performed on power systems for employee safety and compliance with The Occupational Safety and Health Administration (OSHA) regulations. OSHA requires that employers provide a place of employment which is free from recognized hazards that are likely to cause death or serious physical harm to employees. OSHA also requires that employers employ safety-related work practices to prevent electrical shock or other injuries resulting from direct or indirect electrical contact.

Receptacles are located throughout the Shop Bay areas, and at work benches. All receptacles are mounted above 36-inches and receptacle locations have been coordinated with shop equipment.

Facility staff said there is a desire to make the mezzanine area above Shop Bay 3 into a wood shop. Some of the shop equipment has already been located up there, but the power is not installed. A new branch panel is desired to the mezzanine to serve the wood shop equipment. An emergency stop pushbutton should be installed to shunt trip (cut power) to the shop equipment in an emergency.

Lighting within Shop Bays 1 and 2 are from 6 lamp, high bay fluorescent lights. The mezzanines and areas below the mezzanines have fluorescent strip lights mounted to the ceiling and above work benches. Some of the fixtures have been retrofit with TLED lamps. Lighting levels are adequate in Shop Bays 1 and 2. Occupancy sensors are installed in Shop Bays 1 and 2 and are effective in controlling the lights to save energy. There is minimal lighting in Shop Bay 3, and no lighting under the mezzanine. This area is currently used mainly for equipment storage, but staff is planning to use Shop Bay 3 for maintenance functions similar to Bays 1 and 2. The lighting in Bay 3 will require an upgrade if the function changes to maintenance in Bay 3. If the mezzanine in Shop Bay 3 is converted to a wood shop, the lighting will need to upgraded. Overall, the existing interior lighting throughout the facility is useable and in poor condition, but could be significantly improved with an upgrade. The staff is working with a variety of tools and performing a variety of tasks in these areas.

There are combination emergency light/exit signs located above the egress doors. The combo combination emergency light/exit sign located in Shop Bay 3 is covered up by a wall panel hanging from the wall and obstructs the view of the sign. A combination emergency light/exit sign is required for the mezzanine door leading to the exterior stairs. There is no emergency lighting at the exterior of the main egress doors, or on the exterior stairs. A couple of the combination emergency light/exit signs were damaged and had dead batteries. General condition of the combination emergency light/exit signs is poor, and they should be replaced if a lighting upgrade is done. Four new exit doors (refer to architectural) will require exit and emergency lights.

Exterior lighting is provided by LED lights mounted on the wall above the garage bay doors, one located over the main entrance door, and one over the door exiting Shop Bay 3. The lights are in good condition and provide adequate illumination for the front of the building. The lights are controlled by a photosensor for automatic dusk to dawn operation. There is no lighting for the exterior stair landing that accesses the Shop Bay 3 mezzanine.

Sand Storage Building

Power is fed to the Sand Storage Building underground from the Maintenance Shop MDP. It feeds a mini panel with four breakers that serves the building lights, overhead door, fuel shed, and a few receptacles. There is no disconnect at or within the panel which is required by NEC code.

The panel and associated electrical equipment are in fair to good condition The lights inside the Sand Storage Building are twin head flood lights. There is no exterior lighting on the building.

Fig. 41. Front elevation with lights above door

Fig. 42. Electrical serice equipment, remove stuff in front of electrical equipment

Fig. 43. Main distribution panel and panel A

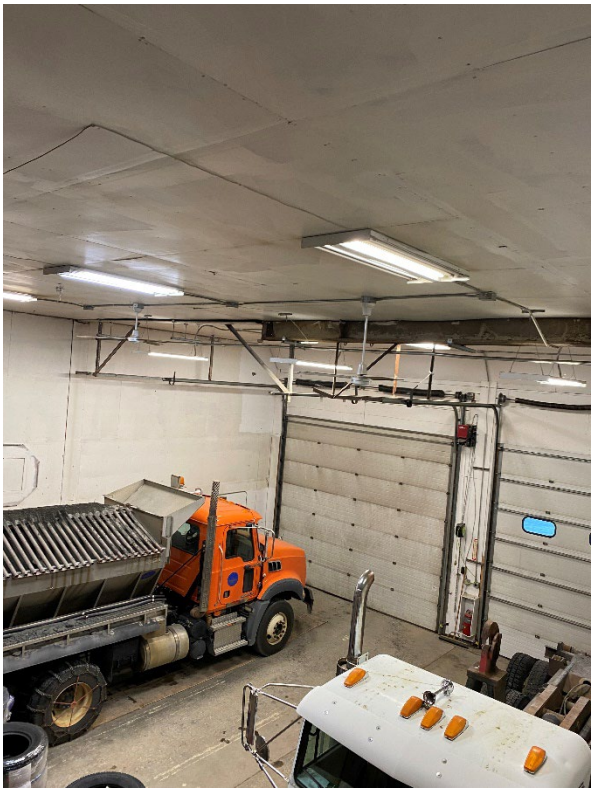

Fig. 44. Interior shop fluorescent lighting

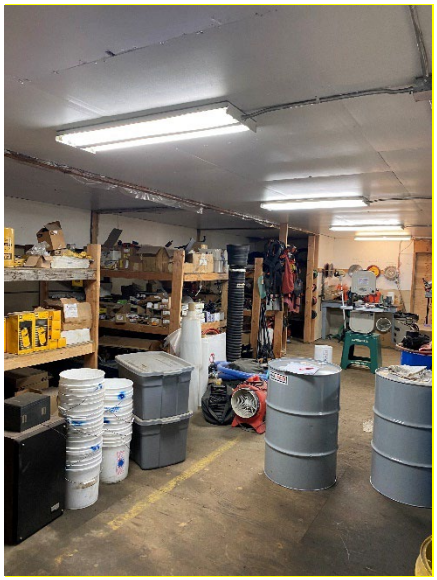

Fig. 45. Fluorescent lights below mezzanine missing lens

Fig. 46. Mezzanine above Shop Bay 3- future wood shop area

Fiq. 33 Combo emergency/exit sign in poor condition

3.2.8. Deficiencies and Recommendations

The following list of deficiencies and items requiring maintenance are grouped into four categories: Life Safety, Structural, Code Compliance, and Maintenance or Facility Improvements. A rough order of magnitude cost is included but does not factor into the order in this list. See Appendix C for detailed cost estimate information.

Total building replacement, including demolition of the existing facility is estimated to cost $16,587,667. The total cost of all recommendations below is $1,052,717.

There are serious deficiencies discussed in the body text above that are difficult to address via repairs and upgrades. A structural evaluation is needed to determine the full extent of repairs and is recommended below. Additional repair recommendations are expected to arise from that evaluation that are not yet accounted for here. It is our opinion that the level of repair needed to have a code compliant building is hard to justify. Major capital budget should be saved for building replacement.

3.2.9. Life Safety Recommendations

Some of the recommendations below relate to life safety, however, there are no specific deficiencies warranting immediate action.

3.2.10. Phase 1

1. **Structural Assessment.** Perform a full structural assessment of the building. This assessment would be significantly more involved that the structural component of this condition assessment and would investigate all structural members of the building and loading, and provide a report of the building construction, condition, and needs.

   Estimated Cost: $30,000

3.2.11. Phase 2

2. **Fuel Tank Location.** The fuel oil tank is currently located directly adjacent to the building wall. Move the fuel tank 5-feet east to get the required NFPA 30 setback from the structure.

   Estimated Cost: $22,133

3. **Oil water separator.** Design and install an oil/water separator for the maintenance bay drainage.

   Estimated Cost: $24,811

4. **Building ventilation.** Design and install a Heat Recovery Ventilator (HRV) with a hydronic heating coil, and ductwork sized for about 6,500 CFM would be recommended to serve the entire building, including the last two bays that are not yet heated. If sized at this flow, the last two bays should be connected to the hydronic system before the ventilation system is connected to it. This project would include connecting the existing radiant piping and installing two new 40 MBH unit heaters in these bays and connecting them to the hydronic system.

   This modification would require a boiler upgrade. Recommend adding a second 400 MBH multi-fuel boiler and associated piping and stand-alone controls.

   Estimated Cost: $318,098

5. **Heating System.** Design and install a heat exchanger to separate the radiant floor (120-degree system) from the unit heater loop (180-degree system). Adjust the boiler to provide a 180–190-degree output water temperature. Adjust the boiler to operate per the manufacturer's recommendations to minimize cycling. Install heating pipe insulation (assume 300 feet of 1-1/2” piping) where missing.

   Estimated Cost: $104,213

6. **Vehicle exhaust.** Demolish the existing vehicle exhaust system, design and replace with equipment rated for vehicle exhaust and sized for the equipment and usage that is needed.

   Alternatively, if vehicles do not require engine testing or operation in the building other than pulling into and out of the bays, no vehicle exhaust system is needed, and the existing one can remain in place for additional purge ventilation if desired.

   Estimated Cost: $33,084

7. **Exiting Deficiency.** Provide 4 additional steel exit doors. All equipped with standard hardware, no panic devices are required. Doors are to be insulated hollow metal, with hollow metal frames. Exit signage will be provided at all locations. Doors will be installed in walls where no doors existed, provide headers as required.

   Estimated Cost: $30,251

8. **Mezzanine Exit Prevention.** Door out of the upper mezzanine is a life safety concern. Door is neither signed nor blocked off. Exterior landing has metal guards, but stair has neither guards or handrails. Stairs also stop short of existing grade by about 4-feet.

Provide sign door at minimum, mechanically blocking it would be preferred. This could be performed by shop staff and does not have to be budgeted for.

Estimated Cost: By Owner

9. **Mezzanine Exit Repair.** Complete construction of the stair exiting out of the upper mezzanine in Bay 3. Work includes 42-inch-tall guard on one side, 34-inch handrails on both sides, and the stair construction to be extend to grade. Follow all current stair dimension requirements for grasp ability and extension and openness.

   Estimated Cost: $22,839

10. **Exiting Signage.** Ensure exit door out of Bay 3 is unblocked. Ensure code compliant exit signage is installed.

    Estimated Cost: $829

    Total Cost Phase 2: $556,300

3.2.12. Phase 3

11. **Code Deficiency.** Option 1: Provide a NFPA13 fire suppression system throughout the facility. Option 2: Provide a 3-hour fire barrier. Barrier to be constructed in Bay 3. No 3-hour wood framed assembly exists. New wall will be steel framed, similar to USG Wall Assembly UL U419. Wall is allowed to terminate on the underside of the combustible roof deck.

    Estimated Cost, Option 1: $204,920

    Estimated Cost, Option 2: $123,468

12. **Fuel fired pressure washer.** Verify with the Fire Marshal that wall penetration meets the required clearance to combustibles. If required, replace the exhaust penetration through the wall with double wall ductwork rated for the application, or a wall thimble assembly to maintain clearance to combustibles.

    Estimate cost: $4,985

    Total Cost Phase 3: $210,000 or 128,500 depending on option

3.2.13. Phase 4

13. **Emergency lighting upgrade.** Replace all combo emergency light/exit signs and add one in the mezzanine above Shop Bay 3. Add exit signs and emergency lights to the four new exit doors referenced in architectural. Extend emergency lighting to the exterior path of egress by adding remote emergency heads at exterior doors and the exterior stairs, powered from the combo battery unit. Relocate the wall panel blocking the view of the exit sign in Shop Bay 3.

    Estimated Cost: $16,840

14. **Add glycol to sand storage heating loop.** This is not a deficiency or code requirement, but is it recommended to add glycol to the sand storage system heating loop to protect the unit heater and piping against freezing if the door is left open or the system goes offline.

Estimated Cost: $1,960

15. **Domestic water piping.** Hire a plumber to trace the domestic water piping from the water heater to the restroom on the other side of the wall, determine the cause of the warm water from the cold water faucet, and repair it. Assume 8 hours of local plumber time.

    Estimated Cost: $4,799

16. **Sand Storage Building Electrical.** Install a 100A disconnect at the mini panel serving the Sand Storage Building. Install a new wall mounted LED light above the exterior garage door to illuminate the exterior ramp in front of the door. Remove the interior flood lights and install three high bay, exterior rated, wet location listed high bay lights with integrated occupancy sensors for lighting control. The lighting will reduce the glare and improve visibility at the Sand Storage building.

    Estimated Cost: $15,268

17. **Arc Flash Risk Assessment.** Recommend an Arc Flash Risk Assessment is performed on power systems for employee safety and compliance with OSHA regulations. Install arc flash hazard labels to all panels and equipment per NEC 110.16.

    Estimated Cost: $13,234

    Total Cost Phase 4: $52,100

3.2.14. Phase 5

18. **Interior lighting upgrade** Replace the high bay fluorescent lights in Shop Bays 1 and 2 and add new lights in Bay 3, with surface mounted, wet location listed lensed high bay LED light fixtures. Maintain connection to existing ceiling mounted occupancy sensors for lighting control. Replace all fluorescent strip lights with 1-foot x 4-foot surface mounted vaporlume style (dust light) LED light fixtures. Shops should be illuminated to a minimum of 50fc average. The lighting upgrade would improve lighting levels, reduce maintenance, and reduce energy consumption. It would also improve safety for the staff using tools.

    Estimated Cost: $76,623

    Total Cost Phase 5: $76,600

APPENDIX A – EQUIPMENT CONDITION AND LIFE EXPECTANCY

Major HVAC Equipment List				
Equipment	**Description**	**Age (yrs)**	**Life Expectancy (yrs)[1]**	**Notes**
Oil fired boiler	Energy Logic, model EL-500B	Unknown	20	Boiler cycles on high roughly every 10 minutes to maintain setpoint, which is detrimental to equipment life expectancy. Unit is only producing roughly 120°F heating water, which is appropriate for maintenance building and sand storage radiant heat, but not for the overheard unit heaters. Boiler design supply water temp is 160-220°F.
Hydronic Unit Heaters	Dayton, Model 5PV47, multiple units serve shop area	14	25	Unit heaters are rated for supply water temp of 160-200°F, but are receiving closer to 120°F water which leads to inefficient operation. After a garage door is opened, it takes close 1-2 hrs for the space to heat back up to the 60°F design setpoint.
Water Heater	Richmond, model unknown, electric water heater	5	15	Unit appears to be in fair condition.
Main building heating circ pumps, sand storage radiant heat circ pump	Grundfos, models unknown	14	10	Units appear to be in fair condition.
Sand storage radiant heat flat plate heat exchanger	FlatPlate FP5X12-12 heat exchanger, provides from the main building circ to the sand storage radiant system	11	10	Unit appears to be in fair condition, piping connections to both the circ pump and expansion tank are extremely corroded.
Ventilation Fan	Second floor louvered ventilation fan	14	25	Unit appears to be in good condition.

1. Life expectancy is based on the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) 2019 Applications Handbook, Chapter 38, Table 4: Comparison of Service Life Estimates. These values are based on historical survey data, and are heavily dependent on maintenance, usage, cycling, and application, but form a basis to accompany site observation notes.

APPENDIX B – ROUTINE MAINTENANCE TASKS

Fan Maintenance (Exhaust, Supply, Return)				
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**
	Mechanical			
a	Check fan-belt tension, check for belt wear, and check sheaves for evidence of improper alignment or evidence of wear.	Correct tension and sheave alignment	Semiannually	Replace belts and sheaves as needed to ensure proper operation.
b	Check variable-frequency drive for proper operation, if present.	Correct as needed. Clean housing and tighten connections as needed. Clean or replace air filter.	Semiannually	Repair, replace, or restore as needed to ensure proper operation.
c	Check control system and devices for evidence of improper operation.	Clean, lubricate, adjust	Semiannually	Repair or replace components as needed to ensure proper operation.
d	Check fan drive for problems due to poor alignment or poor bearing seating.	Adjust and lubricate as necessary	Annually	Repair or replace components as needed to ensure proper operation.
e	Check fan blades and fan housing.	Clean as needed.	Annually	Repair or replace components as needed to ensure proper operation.
f	Assess field-serviceable bearings.	Lubricate as necessary.	Annually	Replace as needed.
g	Check control box for dirt, debris, and/or loose terminations.	Clean and tighten electrical connections as needed.	Annually	Repair, replace, or restore as needed to ensure proper operation.
h	Check motor contractor for pitting or other signs of damage.	Clean and tighten electrical connections as needed.	Annually	Repair, replace, or restore as needed to ensure proper operation.
i	Check integrity of all panels on equipment.	Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually	Repair or replace damaged panels.
j	Inspect exposed ductwork and external piping for insulation and vapor barrier integrity.	Record location of damage.	Annually	Repair or replace as needed.
k	Check damper for condition, setting, and operation.	Adjust and lubricate as necessary	Annually	Repair or replace as needed to ensure proper operation.
l	Inspect flexible connections.	Clean as needed.	Annually	Repair, replace, or restore as needed to ensure proper operation.

Pumps Maintenance				
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**
	Mechanical			
a	Check variable frequency drive, if present.	Correct as needed. Clean housing, and tighten connection as needed. Clean or replace air filter.	Semiannually	Repair or replace.
b	Inspect pump and electrical components.	Clean and verify proper operation.	Semiannually	Repair or replace.
c	Check control system and devices for evidence of improper operation.	Clean, lubricate, adjust.	Semiannually	Repair or replace.
d	Check motor contractor for signs of damage.	Clean and tighten electrical connections as needed.	Annually	Repair or replace.
e	Check pump drive for wear or problems based on alignment or bearing seating.	Lubricate and adjust and record evidence of wear.	Annually	Repair or replace.
f	Check proper fluid flow.	Clean, adjust, as needed to restore proper flow.	Annually	Repair or replace.
g	Assess field serviceable bearings.	Lubricate as necessary.	Annually	Repair or replace.
h	Check insulation, vibration isolators, and flexible connections for integrity.	Clean as needed. Record location of damage.	Annually	Repair or replace.

Boiler Maintenance				
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**
	Mechanical			
a	Visually inspect fuel filter.	Clean and verify proper operation.	Monthly	Repair or replace.
b	Perform chemical testing of system water.	Verify water treatment target levels are being maintained.	Monthly	Repair equipment and treat water to proper water chemistry.
c	Check fuel pump for proper operation.	Clean and verify proper operation.	Quarterly	Repair or replace.
d	Inspect blowdown or drain valve.	Clean and verify proper operation.	Quarterly	Repair or replace.
e	Check for evidence of leakage of fuel supply, heat transfer fluid, and flue gas.	Record location of identified leaks.	Quarterly	Repair or replace.
f	Check control system and devices for evidence of improper operation.	Clean and verify proper operation.	Semiannually	Repair or replace.
g	Check control box for dirt, debris, and/or loose terminations.	Clean, lubricate, and verify proper operation.	Annually	Repair or replace.
h	Check motor contactor for pitting or other signs of damage.	Clean and tighten electrical connections as needed.	Annually	Repair or replace.
i	Check for evidence of buildup or fouling, corrosion, or degradation on heat exchange surfaces.	Clean and tighten electrical connections as needed.	Annually	Repair or replace.
j	Check for proper damper operation.	Clean and restore as needed to ensure acceptable condition.	Annually	Repair or replace.
k	Check combustion chamber, burner, and flue for deterioration, moisture problems, condensation, and combustion products.	Clean and adjust combustion process for operation.	Annually	Repair or replace.
l	Inspect refractory for damage or wear.	Clean combustion side. Record location of damage and wear.	Annually	Repair or replace.
m	Observe burner flame at high load for correct clearance from refractory	Clean and adjust.	Annually	Repair or replace.
n	Verify proper operation of safety devices per manufacturer's recommendations.	Clean, lubricate, and adjust.	Annually	Repair or replace.

Terminal Heating Units Maintenance				
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**
	Mechanical			
a	Check fans and wiring for damage.	Correct as needed. Clean housing, and tighten connection as needed. Clean or replace air filter.	Semiannually	Repair or replace.
d	Inspect that the motor shaft turns correctly and power connections.	Adjust as needed.	Annually	Repair or replace.
e	Examine thermostats for correct temperature settings and connectivity.	Verify that unit kicks on with temperature adjustment.	Annually	Repair or replace.
f	Inspect hydronic tubes.	Correct/clean as needed. Clean housing, and tighten connection as needed. Clean or replace air filter.	Annually	Repair or replace.
i	Check for signs of water stain or rusting.	Note any stains or rusting.	Annually	Repair or replace.

Heat Exchanger Maintenance				
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**
	Mechanical			
a	Check for physical and external leaks.	Inspect the physical damage or leaks on the unit.	Monthly	Repair or replace.
b	Check for signs of fouling or corrosion.	Inspect the physical damage or leaks on the unit.	Monthly	Repair or replace.
c	Check frame is tightened.	Verify and tighten frame.	Monthly	Repair or replace.
d	Check for pressure drop.	Verify and adjust for proper pressure.	Quarterly	Repair or replace.
e	Check for blowdown pressure.	Verify and adjust for proper pressure.	Quarterly	Repair or replace.
f	Check pressure gauges.	Verify and adjust for proper pressure.	Quarterly	Repair or replace.
g	Inspect thermometers.	Verify accurate temperature is showing.	Quarterly	Repair or replace.
h	Test the inlet and outlet temperatures.	Verify and adjust for propre temperatures in the inlet and outlet.	Quarterly	Repair or replace.
i	Check the tubes.	Inspect tubes for any signs of wear, damage, leaks, and corrosion.	Annually	Repair or replace.
j	Clean the heat transfer area.	Clean surrounding area around equipment.	Annually	Repair or replace.
k	Flush heat exchanger, eliminate and clean debris and build up.	Flush the system.	Annually	Repair equipment and treat water to proper water chemistry.
l	Inspect relief valves.	Verify and adjust relief valves.	Annually	Repair or replace.

Water Heater Maintenance				
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**
	Mechanical			
a	Check water pressure.	Verify and adjust for proper pressure.	Monthly	Repair or replace.
b	Check control water pressure.	Verify and adjust for proper pressure.	Monthly	Repair or replace.
c	Check thermal expansion tank.	Verify tank is working correctly, pressurized, and no damage.	Monthly	Repair or replace.
d	Inspect T&P relief valve.	Inspect and verify that valve is functioning properly.	Quarterly	Repair or replace.
e	Drain and flush tank.	Drain tank and verify water is clean. If milky, drain entire tank and refill.	Annually	Repair or replace.
f	Check anode rod.	Inspect and verify that anode rod is function and doesn't have significant damage/wear.	Annually	Repair or replace.

Site Maintenance				
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**
Civil				
a	Check sediment in storm drain manholes	Clean out sediment in manhole basins	Biannual	Pump out sediment with vac truck.

Electrical Equipment Maintenance					
Item No.	**Inspection Task**	**Maintenance Task**	**Frequency**	**Recommended Action**	**Reference**
Electrical					
a	Switchgear enclosure inspection	Infared scanning	Annually	Clean and verify proper operation. Repair or replace.	NFPA 70B: 11.17
b	Switchgear enclosure inspection	Visual inspection	Semiannually	Clean and verify proper operation. Repair or replace.	NFPA 70B:15.2.6 thru
c	Molded case circuit breaker inspection	Visual inspection	every 3 years	Repair or replace.	NFPA 70B:17.7 thru 17.11
d	Molded case circuit breaker inspection	electrical test	3-5 years	Repair or replace.	NFPA 70B: 11.10.5
e	Power and distribution dry type transformers	cleaning, inspection, testing	every 2 years	Repair or replace.	NFPA 70B: 11.9, 11.11.2
f	Rotating equipment	Visual mechanical and electrical inspection, cleaning and testing	Annually	Repair or replace.	NFPA 70B: 26.7, 8.7, 25.3,
g	Motor control center inspection	Infared scanning	Annually	Clean and verify proper operation. Repair or replace.	NFPA 70B: 11.17
h	Motor control center enclosure, contactors, relays, wiring inspection	Visual inspection	Annually	Clean and verify proper operation. Repair or replace.	NFPA 70B: 16.2.1 thru
i	Motor control center bus bar, wiring and ternminal connections inspection	Visual inspection, check connections for tightness	every 2 years	Clean and verify proper operation. Repair or replace.	NFPA 70B: 16.4.2
j	wiring devices, receptacles, snap switche, attachment plugs, connector bodies	inspection, operational check	monthly and when used	Repair or replace.	NFPA 70B: 24.2.1 thru
k	Power cables, inspection	Visual inspection	Annually	Repair or replace.	NFPA 70B: 19.2
l	Power cables, testing	electrical testing	every 3 years	Repair or replace.	NFPA 70B: 19.5, 11.9.2.4
m	Light fixtures, inspection and cleaning	cleaning, inspection, testing	Annually	clean fixture lenses, test lamps and ballasts, relamp	NFPA 70B: 23
n	Emergency lighting monthly test and inspection	test lighting, inspection, repair	monthly	30 second test emergency lighting every 30 days for required illumination, repar or replace. Maintain	NFPA 101
o	Emergency lighting yearly test and inspection	test lighting, inspection, repair	Annually	90 mimute test emergency lighting annually for required illumination to simulate long term	NFPA 101

APPENDIX C – COST ESTIMATE

HMS Project No. 22130-H

MULTI-BUILDING CONDITION ASSESSMENTS
CONSTRUCTION COST ESTIMATE

CITY OF CORDOVA
CITY MAINTENANCE SHOP
CORDOVA, ALASKA

PREPARED FOR:

Coffman Engineering
800 F Street
Anchorage, Alaska 99501

February 8, 2023

4103 Minnesota Drive • Anchorage, Alaska 99503 p: 907.561.1653 • f: 907.562.0420 • e: mail@hmsalaska.com

NOTES REGARDING THE PREPARATION OF THIS ESTIMATE

DRAWINGS AND DOCUMENTS

Level of Documents:	(30) condition assessment document, record drawings, and narratives
Date:	Undated
Provided By:	Coffman Engineers of Anchorage, Alaska

RATES

Pricing is based on current material, equipment and freight costs.

Labor Rates:	A.S. Title 36 working 60 hours per week
Premium Time:	16.70% (included with unit rates)
Subcontractor Mark-Up:	35.00%
Estimator's Contingency:	30.00%
Unique Market Risk:	5.00%
General Conditions, Overhead, and Profit:	45.00%
Escalation to Summer 2024 at 7.91% per Annum (16 Months):	10.55%
A/E Design Fee:	12.00%

BIDDING ASSUMPTIONS

Contract:	Standard construction contract without restrictive bidding clauses
Bidding Situation:	Competitive bid assumed
Start of Construction:	Summer 2024
Note:	Quantities, qualities, and conditions are assumed when not directly provided in narrative.

EXCLUDED COSTS

1. Administrative and management costs
2. Furniture, furnishings and equipment (except those specifically included)
3. Remediation of contaminated soils or abatement of any hazardous materials

NOTES REGARDING THE PREPARATION OF THIS ESTIMATE (Continued)

GENERAL

When included in HMS Inc.'s scope of services, opinions or estimates of probable construction costs are prepared on the basis of HMS Inc.'s experience and qualifications and represent HMS Inc.'s judgment as a professional generally familiar with the industry. However, since HMS Inc. has no control over the cost of labor, materials, equipment or services furnished by others, over contractor's methods of determining prices, or over competitive bidding or market conditions, HMS Inc. cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from HMS Inc.'s opinions or estimates of probable construction cost.

This estimate assumes escalation based on a 12-month rolling average of the U.S. Consumer Price Index. HMS Inc. will continue to monitor this, as well as other international, domestic and local events, and the resulting construction climate, and will adjust costs and contingencies as deemed appropriate.

Due to the lingering effects of the COVID-19 pandemic on the global supply chain and labor market, as well as ongoing geopolitical impacts to energy prices, HMS Inc. has included an additional contingency titled 'Unique Market Risk'. This amount provided for in the estimate will be adjusted as the situation continues to change and the effect on construction pricing becomes better understood.

GROSS FLOOR AREA

First Floor	7,494 SF
Mezzanine	1,979 SF
TOTAL GROSS FLOOR AREA:	**9,473 SF**

HMS Project No.: 22130-H

CONDITION ASSESSMENT GENERAL COST SUMMARY

TOTAL BUILDING REPLACEMENT	$ 16,587,667
DEFICIENCIES	1,491,417

HMS Project No.: 22130-H

TOTAL BUILDING REPLACEMENT	*QUANTITY*	*UNIT*	*UNIT RATE $*	*TOTAL $*
Demolish existing structure	151,600	CF	0.45	68,220
Hazmat abatement allowance	9,473	SF	3.00	28,419
Demolish building substructure	7,494	SF	1.10	8,243
New maintenance shop with mezzanine	9,473	SF	500.00	4,736,500
Load, haul, and dispose of debris	150	LDS	650.00	97,500
Site work as needed to support new recreation center	1	LOT	75000.00	75,000
SUBTOTAL:				*$ 5,013,882*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			1,754,859
SUBTOTAL:				*$ 6,768,741*
General Requirements, Overhead, and Profit	45.00%			3,045,933
Estimator's Contingency	30.00%			2,944,402
Unique Market Risk	5.00%			637,954
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			1,413,387
A/E Design Fee	12.00%			1,777,250

TOTAL ESTIMATED COST:	***$ 16,587,667***

HMS Project No.: 22130-H

CONDITION ASSESSMENT COST SUMMARY

	Total
PHASE 1	
Deficiency 1 - Fuel Tank Location	$ 22,133
Deficiency 2 - Oil/Water Separator	24,811
Deficiency 3 - Building Ventilation	318,098
Deficiency 4 - Vehicle Exhaust	33,084
Deficiency 5 - Exiting	30,251
Deficiency 6 - Mezzanine Door Exit Prevention	By Owner
Deficiency 7 - Mezzanine Exit Repair	22,839
Deficiency 8 - Exit Signage	829
Deficiency 9 - Code Deficiency Option 1	204,920
Deficiency 9 - Code Deficiency Option 2	123,468
Deficiency 10 - Fuel Fired Pressure Washer	4,985
PHASE 2	
Deficiency 1 - Structural Assessment	Price By Designer
Deficiency 2 - Heating System	104,213
Deficiency 3 - Emergency Lighting Upgrade	16,840
PHASE 3	
Deficiency 1 - Add Glycol to Sand Storage Loop	1,960
Deficiency 2 - Domestic Water Piping	4,799
Deficiency 3 - Interior Lighting Upgrade	76,623
Deficiency 4 - Arc Flash Assessment	13,234
Deficiency 5 - Mezzanine Wood Shop Electrical	473,062
Deficiency 6 - Sand Storage Building Electrical	15,268
TOTAL ESTIMATED CONSTRUCTION COST:	***$ 1,491,417***

HMS Project No.: 22130-H

PHASE 1 ***Deficiency 1 - Fuel Tank Location***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Remove existing fuel tank shelter assembly	1	EA	250.00	250
New concrete pad for fuel tank	70	SF	12.00	840
Drain and relocate existing 300 gallon tank	1	EA	1500.00	1,500
Extend fuel oil supply piping	20	LF	30.00	600
Install new weather shelter at tank	100	SF	35.00	3,500
SUBTOTAL:				*$ 6,690*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			2,342
SUBTOTAL:				*$ 9,032*
General Requirements, Overhead, and Profit	45.00%			4,064
Estimator's Contingency	30.00%			3,929
Unique Market Risk	5.00%			851
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			1,886
A/E Design Fee	12.00%			2,371

TOTAL ESTIMATED COST:	***$ 22,133***

HMS Project No.: 22130-H

PHASE 1 ***Deficiency 2 - Oil/Water Separator***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Budgetary allowance for oil/water separator installation	1	EA	7500.00	7,500
SUBTOTAL:				*$ 7,500*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			2,625
SUBTOTAL:				*$ 10,125*
General Requirements, Overhead, and Profit	45.00%			4,556
Estimator's Contingency	30.00%			4,404
Unique Market Risk	5.00%			954
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			2,114
A/E Design Fee	12.00%			2,658

TOTAL ESTIMATED COST:	***$ 24,811***

HMS Project No.: 22130-H

PHASE 1 ***Deficiency 3 - Building Ventilation***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
New 400 MBH, multi-fuel boiler, including controls and connection to existing system	1	EA	14000.00	14,000
40 MBH hydronic unit heater	2	EA	850.00	1,700
6,500 CFM heat recovery ventilator unit	1	EA	10000.00	10,000
Heating coil	1	EA	3000.00	3,000
Ductwork	4,900	LBS	9.00	44,100
Diffuser	10	EA	125.00	1,250
Glycol	200	GAL	16.00	3,200
Modify existing hydronic piping as required	1	LOT	7500.00	7,500
Upgrade building controls	1	LOT	5000.00	5,000
Test, balance, and commission	40	HRS	160.00	6,400
SUBTOTAL:				*$ 96,150*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			33,653
SUBTOTAL:				*$ 129,803*
General Requirements, Overhead, and Profit	45.00%			58,411
Estimator's Contingency	30.00%			56,464
Unique Market Risk	5.00%			12,234
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			27,104
A/E Design Fee	12.00%			34,082
TOTAL ESTIMATED COST:				***$ 318,098***

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PHASE 1 ***Deficiency 4 - Vehicle Exhaust***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Demolish existing vehicle exhaust system	2	BAY	500.00	1,000
New complete vehicle exhaust system	2	BAY	4500.00	9,000
SUBTOTAL:				*$ 10,000*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			3,500
SUBTOTAL:				*$ 13,500*
General Requirements, Overhead, and Profit	45.00%			6,075
Estimator's Contingency	30.00%			5,873
Unique Market Risk	5.00%			1,272
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			2,819
A/E Design Fee	12.00%			3,545

TOTAL ESTIMATED COST:	***$ 33,084***

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PHASE 1 ***Deficiency 5 - Exiting***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Demolish exterior wall assembly at new door locations	84	SF	6.00	504
Allowance for new header at door location	4	EA	150.00	600
New exterior 3'0"x7'0" hollow metal door assembly, complete	4	EA	2480.00	9,920
Exit signage	4	EA	250.00	1,000
Paint doors and frames	200	SF	1.60	320
SUBTOTAL:				*$ 12,344*
General Requirements, Overhead, and Profit	45.00%			5,555
Estimator's Contingency	30.00%			5,370
Unique Market Risk	5.00%			1,163
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			2,578
A/E Design Fee	12.00%			3,241

TOTAL ESTIMATED COST:	***$ 30,251***

PHASE 1 ***Deficiency 6 - Mezzanine Door Exit Prevention***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*

Note: Mezzanine door exit prevention by owner.

TOTAL ESTIMATED COST:

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PHASE 1 ***Deficiency 7 - Mezzanine Exit Repair***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Extend existing steel stair assembly to grade	20	SF	125.00	2,500
42" galvanized guardrail	22	LF	150.00	3,300
34" galvanized handrail	44	LF	80.00	3,520
SUBTOTAL:				*$ 9,320*
General Requirements, Overhead, and Profit	45.00%			4,194
Estimator's Contingency	30.00%			4,054
Unique Market Risk	5.00%			878
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			1,946
A/E Design Fee	12.00%			2,447

TOTAL ESTIMATED COST:	***$ 22,839***

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PHASE 1 ***Deficiency 8 - Exit Signage***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Install exit sign at Bay 3	1	EA	250.00	250
SUBTOTAL:				*$ 250*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			88
SUBTOTAL:				*$ 338*
General Requirements, Overhead, and Profit	45.00%			152
Estimator's Contingency	30.00%			147
Unique Market Risk	5.00%			32
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			71
A/E Design Fee	12.00%			89

TOTAL ESTIMATED COST: ***$ 829***

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PHASE 1 ***Deficiency 9 - Code Deficiency Option 1***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
4" fire protection riser	1	EA	7500.00	7,500
NFPA13 fire suppression system	9,388	SF	5.00	46,940
Upgrade existing water supply to building			Excluded (Assumed Adequate)	
Fire protection design	1	LOT	7500.00	7,500
SUBTOTAL:				*$ 61,940*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			21,679
SUBTOTAL:				*$ 83,619*
General Requirements, Overhead, and Profit	45.00%			37,629
Estimator's Contingency	30.00%			36,374
Unique Market Risk	5.00%			7,881
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			17,461
A/E Design Fee	12.00%			21,956

TOTAL ESTIMATED COST:	***$ 204,920***

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PHASE 1 ***Deficiency 9 - Code Deficiency Option 2***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Demolish existing wood framed wall assembly, complete	1,200	SF	3.50	4,200
New steel framed wall assembly	1,200	SF	24.00	28,800
Paint	2,400	SF	1.80	4,320
SUBTOTAL:				*$ 37,320*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			13,062
SUBTOTAL:				*$ 50,382*
General Requirements, Overhead, and Profit	45.00%			22,672
Estimator's Contingency	30.00%			21,916
Unique Market Risk	5.00%			4,749
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			10,520
A/E Design Fee	12.00%			13,229

TOTAL ESTIMATED COST:	***$ 123,468***

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PHASE 1 ***Deficiency 10 - Fuel Fired Pressure Washer***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Remove existing exhaust duct	12	LF	6.00	72
New 10" diameter double wall flue piping	12	LF	105.00	1,260
Wall thimble/cap assembly	1	EA	175.00	175
SUBTOTAL:				*$ 1,507*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			527
SUBTOTAL:				*$ 2,034*
General Requirements, Overhead, and Profit	45.00%			915
Estimator's Contingency	30.00%			885
Unique Market Risk	5.00%			192
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			425
A/E Design Fee	12.00%			534

TOTAL ESTIMATED COST:	***$ 4,985***

PHASE 2 ***Deficiency 1 - Structural Assessment***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*

Note: Full structural assessment of building price is by designer.

TOTAL ESTIMATED COST:

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PHASE 2 ***Deficiency 2 - Heating System***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
New heat exchanger installed into existing hydronic system	1	EA	25000.00	25,000
Adjust boiler operation, including testing and balancing	20	HRS	160.00	3,200
Insulate existing 1 1/2" diameter piping	300	LF	11.00	3,300
SUBTOTAL:				*$ 31,500*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			11,025
SUBTOTAL:				*$ 42,525*
General Requirements, Overhead, and Profit	45.00%			19,136
Estimator's Contingency	30.00%			18,498
Unique Market Risk	5.00%			4,008
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			8,880
A/E Design Fee	12.00%			11,166

TOTAL ESTIMATED COST:	***$ 104,213***

PHASE 2 ***Deficiency 3 - Emergency Lighting Upgrade***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Remove wall panel	1	EA	240.00	240
Remove emergency light/exit sign	3	EA	60.00	180
New emergency light/exit sign	8	EA	300.00	2,400
New remote head exterior exit light	7	EA	110.00	770
New conduit and conductor	100	LF	15.00	1,500
SUBTOTAL:				*$ 5,090*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			1,782
SUBTOTAL:				*$ 6,872*
General Requirements, Overhead, and Profit	45.00%			3,092
Estimator's Contingency	30.00%			2,989
Unique Market Risk	5.00%			648
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			1,435
A/E Design Fee	12.00%			1,804

TOTAL ESTIMATED COST:	***$ 16,840***

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PHASE 3 ***Deficiency 1 - Add Glycol to Sand Storage Loop***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Add glycol to sand storage loop	50	GAL	16.00	800
SUBTOTAL:				*$ 800*
General Requirements, Overhead, and Profit	45.00%			360
Estimator's Contingency	30.00%			348
Unique Market Risk	5.00%			75
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			167
A/E Design Fee	12.00%			210

TOTAL ESTIMATED COST:	***$ 1,960***

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PHASE 3 ***Deficiency 2 - Domestic Water Piping***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Resolve domestic water piping issue (labor)	8	MH	150.00	1,200
Material allowance	1	LOT	250.00	250
SUBTOTAL:				*$ 1,450*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			508
SUBTOTAL:				*$ 1,958*
General Requirements, Overhead, and Profit	45.00%			881
Estimator's Contingency	30.00%			852
Unique Market Risk	5.00%			185
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			409
A/E Design Fee	12.00%			514

TOTAL ESTIMATED COST:	***$ 4,799***

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PHASE 3 ***Deficiency 3 - Interior Lighting Upgrade***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Remove high bay lights in Bays 1 and 2	12	EA	250.00	3,000
Remove fluorescent strip light	16	EA	60.00	960
New high bay LED fixture	18	EA	650.00	11,700
New LED strip light	16	EA	300.00	4,800
New conduit and conductor	180	LF	15.00	2,700
SUBTOTAL:				*$ 23,160*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			8,106
SUBTOTAL:				*$ 31,266*
General Requirements, Overhead, and Profit	45.00%			14,070
Estimator's Contingency	30.00%			13,601
Unique Market Risk	5.00%			2,947
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			6,529
A/E Design Fee	12.00%			8,210

TOTAL ESTIMATED COST:	***$ 76,623***

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PHASE 3 ***Deficiency 4 - Arc Flash Assessment***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Perform arc flash assessment	1	LOT	3500.00	3,500
Install arc flash signage (allowance)	10	EA	50.00	500
SUBTOTAL:				*$ 4,000*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			1,400
SUBTOTAL:				*$ 5,400*
General Requirements, Overhead, and Profit	45.00%			2,430
Estimator's Contingency	30.00%			2,349
Unique Market Risk	5.00%			509
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			1,128
A/E Design Fee	12.00%			1,418

TOTAL ESTIMATED COST:	***$ 13,234***

PHASE 3 ***Deficiency 5 - Mezzanine Wood Shop Electrical***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
General renovation of mezzanine for wood shop	1,979	SF	60.00	118,740
New 100 amp, 240/120 volt, 32 circuit distribution panel	1	EA	2500.00	2,500
Miscellaneous receptacle and equipment connections	20	EA	175.00	3,500
Emergency stop shunt trip	1	EA	250.00	250
LED industrial fixture	20	EA	300.00	6,000
Conduit and conductor	800	LF	15.00	12,000
SUBTOTAL:				*$ 142,990*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			50,047
SUBTOTAL:				*$ 193,037*
General Requirements, Overhead, and Profit	45.00%			86,867
Estimator's Contingency	30.00%			83,971
Unique Market Risk	5.00%			18,194
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			40,308
A/E Design Fee	12.00%			50,685

TOTAL ESTIMATED COST:	***$ 473,062***

PHASE 3 ***Deficiency 6 - Sand Storage Building Electrical***	*QUANTITY*	*UNIT*	*UNIT RATE* *$*	*TOTAL* *$*
Disconnect switch	1	EA	560.00	560
Exterior wall mounted LED light	1	EA	470.00	470
Remove interior flood light	3	EA	75.00	225
New high bay wet location LED fixture	3	EA	720.00	2,160
New conduit and conductor	80	LF	15.00	1,200
SUBTOTAL:				*$ 4,615*
Subcontractor's Overhead and Profit on Material and Labor	35.00%			1,615
SUBTOTAL:				*$ 6,230*
General Requirements, Overhead, and Profit	45.00%			2,804
Estimator's Contingency	30.00%			2,710
Unique Market Risk	5.00%			587
Escalation to Summer 2024 at 7.91% per Annum (16 Months)	10.55%			1,301
A/E Design Fee	12.00%			1,636

TOTAL ESTIMATED COST:	***$ 15,268***