



www.svpa-architects.com  
Phone 515.327.5990

1466 28th Street, Suite 200  
West Des Moines, Iowa 50266

**Facilities Study for the City of Windsor Heights**  
**Public Works Maintenance Garage and Salt Storage Shed**



W I N D S O R  
H E I G H T S  
the heart of it all

**Completed by:**  
**SVPA Architects Inc.**  
**Tometich Engineering**  
**Twin Rivers Engineering Consultants**



www.svpa-architects.com  
Phone 515.327.5990

1466 28th Street, Suite 200  
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Project: #18037 Windsor Heights Public Works Facilities Assessment

July 24, 2018

SVPA Architects has been retained by the City of Windsor Heights to complete a facility study of the Public Works Maintenance Garage and Salt Storage Building. The purpose of this study is to provide the City with an accounting of the strengths and weaknesses of the facility that can be used as a resource to determine how funds should be spent on this building. This evaluation is the first step in the process by the City in development, alterations and updates to the existing facilities.

### **Facilities Study of Public Works Maintenance Garage and Salt Storage Shed.**

#### **Maintenance Garage:**

Original Building: Approx. 8,610 SF with garage(S-1) and office spaces(B).

Construction Type: Type-V, unsprinkled.

Condition: Average-Poor condition

Utilities: Natural gas, electric



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## **1. STRUCTURAL REVIEW**

The purpose of this investigation was to investigate the cause and assess the extent of damage to the building. The scope of our investigation included the following:

1. Obtained background information from Thad Long and Ron Paskach of SVPA.
2. Site review of the property on April 29, 2018, photographs were taken.
3. Reviewed plans prepared by Woodburn and O'Neil Architects dated September of 1980.
4. Preparation of a written report of our findings.



1. View from the northeast



2. View from the northwest



3. View from the southeast



4. View from the southwest

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5, 6. Views of block distress



7, 8. Views of block distress

**Results of Investigation:**

There are two buildings that are the subject of this report. The first building is the maintenance shed measuring 122'-8" x 70'-4" and the second building is the salt storage shed which measures 29'-8" x 40'-0". Both buildings were constructed at the same time with basically the same techniques. The footings are of poured concrete and the foundation wall is of reinforced concrete block that is 8' high. The structure is a premanufactured metal building with a steel moment frame with purlins and girts supporting the corrugated metal siding and roofing panels. There is a wood framed mezzanine that is identified in the drawings as capable of supporting 125#/sf (this needs to be posted for OSHA).

The concern with the building is that the salt has deteriorated the concrete block, the concrete floors and the metal in some portions of the buildings. The salt storage shed has severe deterioration, the maintenance building has many areas of deterioration.

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9, 10. Views of efflorescence



11, 12. Views of interior mezzanine



13, 14. Views of mezzanine

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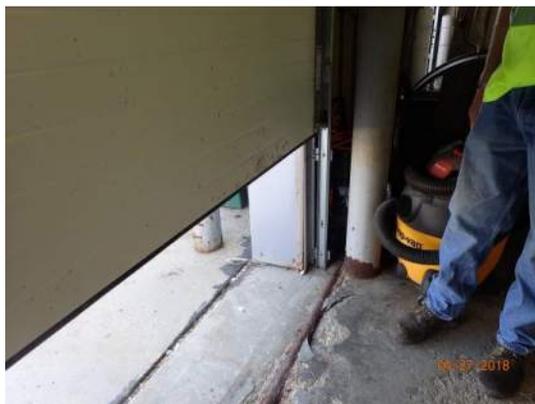
15, 16. View of second mezzanine



17, 18. Overview of shop



19, 20. View of concrete in need of repair



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21, 22. Views of salt storage building



23, 24. Views of salt storage building



25, 26. Views of masonry distress

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27, 28. Interior views of masonry distress and steel rusting



29. View of damage at base



30. Overview

**Evaluation and Assessment:**

The maintenance building has numerous areas of concern. Most of them are related to deterioration due to salt. The first is the concrete block. There is efflorescence (salts leaching through the block) in many areas. The potential concern is that the salts are also rusting the reinforcing steel inside of the block. There is “crazing” (numerous hairline fractures) of the block. At this point it does not appear that the block is failing, but the slow deterioration will eventually lead to more severe problems. The block could be cleaned and sealed to extend its life.

The balance of the side walls is corrugated steel siding. The steel siding and steel framework appear to be in good condition for their age. It does not appear the salt has affected it as much as the masonry. The steel columns in the center of the building have rust at the base. This will need to be sandblasted and re-painted. Consideration for a concrete protection bollard should be reviewed to protect both the structure and the finish.

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The wood framed mezzanines appear to be in good condition. The mezzanines did not appear to be load rated as required by OSHA, but the drawings indicate they have a 125#/sf capacity. The landing of the stair did not appear to have a 4" toe kick.

The floor of the building is in poor condition. The salts have eaten the surface of the concrete. There are many areas where the pitting of the concrete is present, especially at the overhead doors. The floors do slope to the middle and there is a trench drain that collects the salt-laden water. There are significant cracks radiating from these locations. An epoxy topping could be added to the floor or the floor could be removed and replaced.

In general, the maintenance building needs some improvements but can be economically salvaged. The salt storage building has significant deterioration in many areas. The roof framing has been compromised by rusting of the steel framing members. The roof will continue to rust and will eventually be close to collapse. The sidewalls also have significant signs of deterioration, especially on the north side. There are many cracks in the masonry block. The block will continue to deteriorate as it continues to be exposed to salt and weather. The building will most likely be more expensive to repair than to replace.

**Conclusions:**

Based on the results of our investigation, the following conclusions would appear to be warranted.

1. The maintenance building needs some improvements but is economically salvageable.
2. The salt storage building should be demolished and replaced.

Our conclusions are based upon the information made available to us at the time of our investigation. Should additional information be uncovered or made available, we retain the right to revise or supplement our report accordingly.

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## **2. MECHANICAL REVIEW**

### **Heating**

The building is heated with the use of gas-fired equipment. The maintenance bays are served by multiple Reznor gas-fired unit heaters. These unit heaters are original to the building that was constructed in 1983. The last time these units were serviced, the technician noted that some of the heaters are leaking flue gases, likely from the heat exchangers. At 35 years of age, these units are well past the average service life for this type of equipment and should be scheduled to be replaced. Stratification in the work bays is another observed issue in the summer and winter. Temperatures on the mezzanine are significantly higher than they are on the floor. Destratification or ceiling fans can be added to provide circulation and maintain more consistent temperatures in the bays. This will also circulate the warm air at the upper portions of the bays down to the floor where it can be beneficial for the occupants and reduce run time on the equipment.

The office is heated with a Goodman high efficiency, gas-fired furnace that is located up on the mezzanine. The furnace was installed in 2013 to replace the original. This unit has another 8 to 10 years of service with good maintenance and could continue to be utilized if no significant changes to the administrative areas are made that would affect heating loads. Duct is routed from the mezzanine down to the offices below. Exposed spiral ductwork is routed to the individual rooms. Return air is routed below the floor slab. It is common for underground ductwork to corrode over time. It would be recommended to camera the existing below slab ductwork to determine the continuity of the ductwork. If the ductwork has failed this is often a pathway for water to collect inside the ductwork.

A small electric unit heater is installed in the kennel area.

#### **Recommendation: Replace Unit Heaters in Maintenance Bays**

1. Remove and replace the existing gas-fired unit heaters in the maintenance bays with gas-fired infrared radiant heaters.
2. The estimated construction budget cost for new gas-fired infrared heaters is \$30,000 to \$40,000.

### **Cooling Plant:**

The office, break room, sign shop and locker room areas on the west side of the building are air conditioned utilizing a direct expansion (DX) coil installed on the furnace. Refrigerant piping is routed to a 3-ton Goodman air cooled condensing unit that is pad mounted at grade on the southwest corner of the building. The DX coil was installed when the furnace was replaced. The condensing unit was salvaged from another building. The condensing unit was manufactured in 2004. With 14 years of service between the public works building and its previous installation, it is nearly the end of its normal service life.

A through wall air conditioner is installed for conditioning of the kennel area.

#### **Recommendation: Destratification Fans and Controls in Maintenance Bays**

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1. Add destratification fans and automatic controls in the maintenance bays.
2. The estimated construction budget cost for destratification fans and controls is \$12,500 to \$15,000.
3. Replace air cooled condensing unit and refrigerant piping for the furnace system serving the office area.
4. The estimated construction budget cost for a new condensing unit and refrigerant piping is \$5,000 to \$7,500.

### **Ventilation Systems:**

No ventilation air is provided to the furnace system serving the offices. Providing ventilation air to meet current code requirements and ventilation standards will improve the indoor air quality for the office area. Providing some tempering through an energy recovery unit will allow ventilation air to be provided without adding any additional load to the existing furnace and maintain mixed air temperatures into the furnace above the manufacturer's requirements for the heat exchanger. Restroom and locker room exhaust can be ducted through the energy recovery unit to temper the incoming ventilation air.

Ventilation in the work bays is provided with exhaust fans located on the roof that are manually switched. With vehicles being moved in and out of the bays and the potential for vehicle exhaust emissions into the work bays, a carbon monoxide/nitrogen dioxide detection control panel and sensors should be provided to monitor CO and NO<sub>2</sub> levels and purge the work bays of any vehicle exhaust fumes.

The restrooms and sign shop are provided with exhaust fans and ductwork for exhausting these spaces with individual exhaust fans control with a wall switch. At the time of the walk through the exhaust appeared to be adequate.

A gas range is being used in the break room. A hood with fire suppression should be considered over the range to remove heat, cooking smoke and vapors. Fire suppression may be required by the local authority with this being used in a commercial building.

A ducted vehicle exhaust system is installed in the west work bays. The utility set fan no longer operates and the system has not been used in several years. Another utility set fan is mounted next to the vehicle exhaust fan. It appears this may have been used at one time for welding exhaust. For the extent the vehicle exhaust has been used, the best option may be to remove the system and use openings in the overhead doors if maintenance is necessary on running vehicles. A new welding exhaust fan and movable arm are recommended for any welding work.

### **Recommendations**

#### **Ventilation Improvements – Office**

1. Add minimum required ventilation air to the existing furnace system serving the offices with the use of an energy recovery unit. The energy recovery unit would also be used to exhaust the building to maintain the proper pressure relationship in the building. Exhaust would be taken from the building at the restrooms and locker rooms with a need for general exhaust. New

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ductwork is required to extend building exhaust to the energy recovery unit and fresh air to the return air duct on the furnace. The exhaust removed from the building would be utilized to temper the raw outside air by transferring energy through an energy recovery core. This approach is a very energy efficient method for providing ventilation for the building.

2. The estimated construction budget cost for adding an energy recovery ventilation system to the office furnace system is \$5,000 to \$7,500.

### **Ventilation Improvements – Maintenance Bays**

1. Provide new exhaust fans, make-up air louvers and ductwork, and CO/NO<sub>2</sub> controls and sensors for gas detection and ventilation controls in the maintenance bays.
2. The estimated construction budget cost for the ventilation system and controls is \$60,000 to \$80,000.

### **Return Air Duct Investigation and Replacement**

1. Investigate the condition of existing return ductwork below grade with camera and replace with ductwork above grade as necessary.
2. The estimated construction budget cost for investigation and duct replacement is \$7,500 to \$10,000.

### **Replace Condensing Unit**

1. Provide new air cooled condensing unit and refrigerant piping for the furnace system serving the office area.
2. The estimated construction budget cost for a new condensing unit and refrigerant piping is \$5,000 to \$7,500.

### **Range Hood with Fire Suppression**

1. Provide a range hood with fire suppression for the gas range in the break room.
2. The estimated construction budget cost for a range hood with integral fire suppression is \$12,000 to \$14,000.

### **Welding Exhaust**

1. Provide a new welding exhaust arm with integral fan in the maintenance bay.
2. The estimated construction budget cost for a new welding exhaust arm and fan is \$6,000 to \$8,000.

### **Temperature Controls:**

The building temperature controls are served by a stand-alone heat-cool thermostat for the office area and heat-only thermostats for the gas-fired unit heaters. The thermostats do not have any night setback capabilities. Replacing the existing thermostats with programmable thermostats will provide some operational cost savings.

### **Recommendation: Programmable Thermostat for Furnace Controls**

1. Provide programmable thermostat for the furnace system serving the offices.
2. The estimated construction budget cost for new programmable thermostat controls is \$200 to \$300.

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### **3. PLUMBING REVIEW**

#### **Domestic Water:**

There is a 2-inch water service that enters the far west side of the work bays, under the stairs to the mezzanine. The service is provided with what appears to be a 1-inch meter. There is no backflow preventer on the water service. The water service size is adequate for the current fixture demand in the building.

Domestic water piping material appears to be copper as visually observed where pipe insulation has been removed.

A surge tank was added on the 2-inch service to address issues with water surge into the building when the fire hydrant to the north of the building was used. After the hydrant was shut off there was a water pressure surge into the building that caused the water heater to discharge and flood the rooms below the mezzanine. The surge tank has addressed the issue.

The domestic hot water is generated by a Ruud, 38 MBH gas-fired water heater with 40 gallons of storage. The hot water system does not include a recirculated loop or pump. Pipe lengths for hot water are relatively short and recirculation isn't necessary unless there is a need for quicker delivery of the hot water at the fixtures. The gas-fired water heater appears to have been installed in 2012 or 2013 based on the manufactured date of the water heater. The water heater is a standard efficiency unit. The heater has another 5 to 10 years of useful life based on an average water heater useful life span.

#### **Sanitary Sewer:**

The existing sanitary sewer for the building does not have any known issues. Trench drains in the work bays are extended to a sand/oil interceptor which is pumped out on a regular maintenance schedule. The trench drain grates are showing signs of deterioration. Replacement grates could be provided if desired.

#### **Recommendation: Replace Trench Drain Grates**

1. Provide new trench drain grates at the existing trench drain locations.
2. The estimated construction budget cost new trench drain grates is \$5,000 to \$7,500.

#### **Plumbing Fixtures:**

The plumbing fixtures throughout the building appear original to the building construction. Water closets are flush valve type fixtures. The west work bays have an emergency eye wash station. To meet current standards, tempered water should be supplied to the eye wash station. ADA accessibility requirements are not being met for the restrooms, emergency eye wash, or water cooler.

#### **Recommendation: Plumbing Fixture Replacement for ADA**

1. Provide new ADA compliant plumbing fixtures for the locker rooms and maintenance bays.
2. Provide a tempered water mixing valve for the emergency eye wash.

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3. The estimated construction budget cost for new plumbing fixtures is \$15,000 to \$20,000.

**Pressure Washer:**

A Hotsy pressure washer is installed in the west service bay. The unit has its own internal gas-fired heater. Consider creating a dedicated wash bay so electrical and mechanical in the wash bay can be water resistant and withstand the harsh environment of the wash bay.

**Recommendation: Wash Bay Relocation**

1. Relocate pressure washer to the new dedicated wash bay. Add dedicated exhaust for the wash bay. Provide new trench drains as necessary. Infrared heater for wash bay will be stainless steel construction.
2. The estimated construction budget cost for the wash bay relocation is \$40,000 to \$50,000.
3. Wash bay would be best located at the east end of the existing building if plumbing and drainage can be located which would be determined with additional calculations during schematic design.

**Fluid Delivery System:**

Fluid tanks are located on the mezzanine for motor oil, transmission fluid, grease, diesel fuel and rear end grease. Pneumatic pumps and piping transfer the fluid from the tanks on the mezzanine to hose reel locations in the west maintenance bay. Water and air are also provided at the hose reel locations. The fluid delivery tank storage location needs to be reviewed as it relates to hazardous material storage and secondary containment.

**Compressed Air:**

Shop air is provided by a reciprocating compressor located up on the mezzanine. The nameplate on the tank is dated 1967. The belt drive 5 hp motor appears relatively new. A new compressor will operate more efficiently and quietly than the current compressor. The compressed air pipe distribution is with black iron pipe. A 1-inch main is extended from the air compressor to the maintenance bays.

**Recommendation: Replace Air Compressor**

1. Provide new air compressor for the maintenance bays.
2. The estimated construction budget cost for installation of a new air compressor is \$10,000 to \$12,500.

**Natural Gas Service:**

The gas service and meter are located on the south side of the building. The gas service serves the domestic hot water heater, furnace, unit heaters, emergency generator, pressure washer and range in the break room. The service size and pressure are adequate for the current building needs.



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#### **4. FIRE PROTECTION REVIEW**

##### **Fire Protection:**

The building does not have a fire protection sprinkler system.

##### **Recommendation**

1. Provide a fire protection sprinkler system for the building. There may be some limitations in available flow and pressure to support a fire sprinkler system due to the 4-inch main that serves the fire hydrant to the north of the building. More extensive site survey information and flow and pressure test data will be needed to determine feasibility.
2. The estimated construction budget cost for a fire protection sprinkler system and water service is \$40,000 to \$50,000.

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## **5. ELECTRICAL REVIEW**

### **Electric Service:**

Power to the building is fed from a 50 KVA MidAmerican Energy pole mounted transformer. Secondary conductors are fed overhead from the transformer to a manual transfer switch located behind a desk in the office. The transfer switch is not readily accessible. The transfer switch feeds a main distribution panel on the mezzanine and a generator on the south side of the building. The service voltage is 120/240 Volt, 1 Phase.

### **Power Distribution:**

The main distribution panel on the mezzanine level consists of 3 ITE panelboards mounted side by side. The first panel has a 225A-2P main circuit breaker and has sub-feed lugs to the second panel which has sub-feed lugs to the third panel. The panels feed all the lighting, receptacles and equipment within the building. There is physical space in the panels for additional circuits to be added. The equipment is original to the building and is in good condition for continued use.

### **Generator:**

An Onan natural gas generator is located on the south side of the building. Natural gas is connected to MidAmerican Energy service. The generator is set up to serve the entire building via the manual transfer switch and is rated for 13.3KW at 120/240 Volt, 1 Phase. The generator is a hand-me-down from the fire department and is undersized to adequately serve the all the equipment within the building.

### **Recommendation**

1. Reconfigure the electric service with replacement of the generator. The service would be fed overhead from the pole mounted transformer to a Service Entrance Rated automatic transfer switch located in a dedicated room on the northwest corner of the mezzanine level. The transfer switch normal power would be connected to the existing ITE main distribution panel described above. The transfer switch emergency power would be fed to a new 50 KW generator with sub-base fuel tank. The generator would be located on the front west side of the building to minimize the feeder circuit length and allow for easy refilling access. The size of the electric service and the generator would need to be revisited during design to assure they can accommodate mechanical improvements and any building additions.
2. The estimated construction budget cost for the reconfigured electric service with new generator is \$45,000 to \$55,000.

### **Lighting:**

Interior lighting consists primarily of fluorescent type fixtures. The fixtures in the shop areas were upgraded about 5 years ago. These fixtures utilize 5000k T8 fluorescent lamps. The shop fixtures provide good light levels and are in good condition. The fixtures in the other areas of the building are original to the building and vary in condition from fair to poor.

Automatic lighting control systems were not observed.

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Site lighting consists of LED building mounted lights and a MidAmerican Energy parking lot light mounted to the transformer pole. The building mounted LED lights were recently installed and are in good condition.

Emergency egress and exit lighting appears to be in good condition.

**Recommendation**

1. The fluorescent light fixtures in the shop are suitable for continued use, however, they should be considered for an upgrade to LED type lighting. The lights in the remainder of the building should be upgraded to LED type lights.
2. The estimated construction budget cost for shop lighting upgrades is \$25,000. The estimated construction budget cost for lighting upgrades in the rest of the building is \$10,000.
3. Automatic lighting controls should be added throughout the building. The estimated construction budget cost range for lighting controls is \$4,000 to \$5000.

**Fire Alarm System:**

There is no fire alarm system in this building.

**Recommendations**

1. A fire alarm system will need to be added if fire protection sprinkler is added. The extent of the system could vary from minimum requirements to full automatic detection throughout the building.
2. The estimated construction budget for a fire alarm system is \$5,000 to \$20,000.

**Intercom System:**

There are 2 intercom speakers, one in each shop, that are tied into the phone system. The speakers and system are reportedly functional. No recommendations.

**Voice/Data Cabling System:**

The voice/data cabling system consists of a switch on the wall in the mezzanine area and a couple of CAT 5e data drops to the office and into the shops. The equipment and cabling are in good condition, however, internet service to the building is reported to be slow. No recommendations to the existing internal system is needed, the quality and speed of the internet service should be evaluated and improved for better overall performance and productivity.

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## **6. ARCHITECTURAL REVIEW**

### **Maintenance Building:**

#### **Roof**

The roof is a single slope metal roof that drains from north to south. The original screw down metal roof is still in place and is experiencing leaks at several locations. The original batt insulation is also in place and shows signs of water damage in more than half of its area. Several of the roof penetrations and curbs show signs or leaks either active or previously active. The gutters at the back of the building appear to leak at each of the seams. The downspouts appear to be in place and working. The downspouts empty on to splash blocks and the water is surface drained.

#### **Critical Issues:**

1. New roof is required.
2. A flute-fill roofing system would work best for this facility. It would add insulation and provide an 60 or 80 mil TPO membrane above that would be much less likely to leak.
3. The deeper insulation would require taller curbs.
4. Replace gutters and downspouts.

#### **Exterior Walls:**



North elevation



North elevation

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North elevation



NE corner



East elevation



SE corner



South elevation door



South elevation generator

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South elevation missing mortar



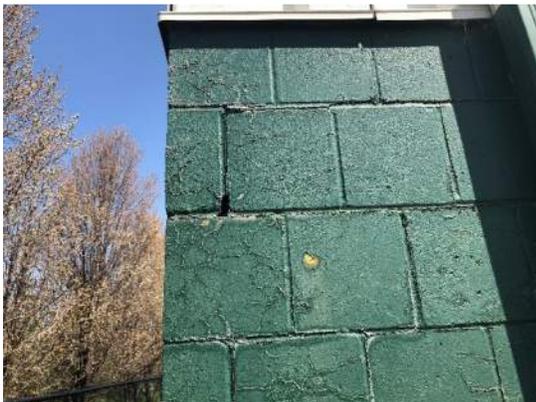
South elevation



SW corner condenser



SW corner



SW corner missing mortar



West elevation efflorescence

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West elevation efflorescence



West elevation efflorescence



West elevation efflorescence



West elevation efflorescence



West elevation rusted frame



NW corner efflorescence and missing mortar

The exterior walls consist of a lower painted concrete block section about 8 feet tall, and an upper pre-finished metal panels section. The lower concrete block section has several areas that are experiencing efflorescence. The building was constructed at a time when salt was added to mortar to allow masonry

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to be laid in cold conditions. The block itself also has salts present in the cement used to make the block. If water finds its way to the salts, the wall will experience efflorescence, which is water acting as a vehicle to carry the salts out of the block. This is then expressed as a white powder or haze on the face of the masonry materials. If water is present in the walls, several types of damage can occur and shorten the life of the building. The west walls especially are showing signs of water damage on the exterior of the building with failing mortar, cracks, efflorescence, rusted metal (window frames, lintels). The failed mortar joints will require tuck-pointing.

It may make sense to add brick or some other exterior to the CMU portion of the wall so that a more substantial weather barrier and insulation can be added between the brick and the existing block. This would make the building much easier to heat, cool and maintain.

Additionally, there are no expansion/contraction joints in the masonry or metal panels of the walls which can cause the walls to expand into the door and window openings when it gets hot. This can make it difficult to open and close doors, especially on the south facing walls.

The pre-finished metal panels above the concrete block appear to be in good to average condition. The problem is the flashing between the metal panels and the concrete block that was installed by the metal panel installer. The flashing wasn't installed to be water tight and is allowing water to leak into the concrete block. This is likely the cause of much of the efflorescence and rusted window and door frames. It is recommended to remove the existing flashing and install new flashing behind the metal panels with overlapping joints sealed with a butyl sealant that won't dry out. Additionally, a continuous layer of butyl sealant should be set below the flashing to make a continuous weather barrier that won't allow water to be wind-blown up behind. In addition to the water issues, it is likely that these walls will not meet the current energy code and if improvements are made to the building, the insulation value of the walls will need to be increased.

The overhead doors seem to be in good condition and the operators work well. If the exterior of the building is painted, it will probably make sense to paint these doors as well. Several of the hollow metal swing doors and frames are rusted and should be painted or replaced.

### **Critical Issues:**

1. Flashing needs to be removed and new flashing installed.
2. Insulation behind the panels needs to be increased to meet code.
3. Efflorescence needs to be removed, treated and the walls repainted.
4. Replace rusted doors and windows

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**Interior Ceilings:**



West bays water damage



West bays water damage



West bays water damage



West bays water damage



East bay's water damage



East bay's water damage

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East bay's water damage



East bays water damage



East bays water damage

The interior ceilings consist of exposed Kraft-faced insulation and painted steel beams and purlins. This is a very typical finish for a utility building. Several areas of the ceiling insulation and structure have signs of water infiltration and damage. Some areas are much worse than others, but much of the insulation is damaged beyond the ability to just paint over it. If it is decided to add the flute-fill TPO roof system mentioned earlier, the insulation inside of the building could be removed and the metal panels above could be painted white. New white paint on the ceilings will spread light around the building better and reduce the number of fixtures needed.

Animal control room ceiling is a drywall ceiling and has water damage that will need to be repaired and painted.

The ceilings of the offices and locker room are drywall but only require small repairs and paint.

The ceilings of the shower/restroom are ACT and are in desperate need of replacement.

**Critical Issues:**

1. After roof leaks are addressed, upgrade and paint underside of roof.

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- 2. Repair and paint drywall ceilings.
- 3. Replace ACT ceilings in shower/restroom.

**Interior Walls:**



Dog cage rooms



dog cage room



Rusted frame in dog cage room



Wall cracks at SE corner



East wall efflorescence



South wall efflorescence

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South wall efflorescence



South wall efflorescence



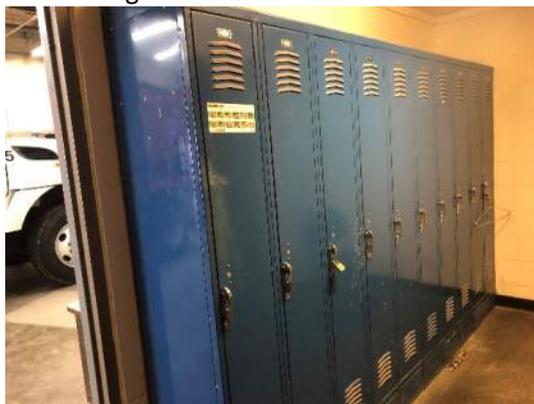
South wall efflorescence and water damage



Interior sign room wall



Locker room / restroom/ shower room



Locker room

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Sign room



Break room



Break room



wall of breakroom



South end of mezzanine



Furnace room on mezzanine

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Furnace room on mezzanine



Mezzanine



Mezzanine



Mezzanine



Break room



Break room

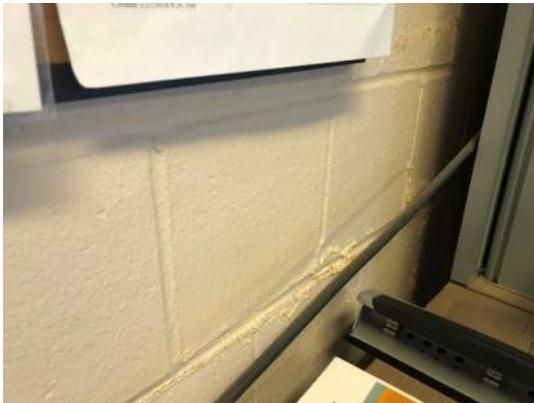
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Office



Office



Efflorescence on West office wall

The interior walls are painted concrete block for the most part (mezzanine has a few framed walls). Overall the condition of the concrete block walls is good. Almost all the exterior walls have efflorescence present that has caused the paint to discolor and fail. It is hoped that addressing the flashing issues on the building exterior will eliminate the water infiltration and end the efflorescence inside the building. The walls will need to be cleaned with a weak acid solution and wire brush. Once the area is cleaned, rinsed and dried, new primer and paint can be applied. If the water infiltration issue is properly addressed on the building exterior, the efflorescence should not return.

The upper portion of the exterior walls is a metal liner panel similar to the exterior. The original drawings for the building indicate that there is approximately 2" of batt insulation behind the liner panels. This is far less than is required by the current energy code even for a partially conditioned building. The liner panels can be removed and additional rigid or spray foam insulation installed, and the liner panel reinstalled. Depending on the type of insulation board/spray installed, a layer of drywall may be required as a thermal barrier to protect the insulation from fire.

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The concrete block walls separating the kitchen and breakroom are not structural, but they do contain electrical and plumbing lines which may present challenges if it is desired to move that wall.

**Critical Issues:**

1. Clean efflorescence off walls and paint.
2. Insulation behind the panels needs to be increased to meet code.

**Interior Floors:**



NE corner door



West bays



East bay's



NE corner at brine pump

The interior floors are sealed concrete for the most part (mezzanine has framed plywood floors). Overall the condition of the concrete floors is good. There are some areas in the maintenance bays where salt and heavy equipment has caused damage to the floors. At the sill of several of the overhead doors there is spalled concrete and rusted out steel pipe that was cast into the floor slab. The concrete slab near the brine pump is spalled as well as areas where the trucks park. The cast iron trench drain grate has oxidized from the salt but is still in good condition. The bottoms of the interior columns and base plates of the structure show signs of rust that will need to be repaired.

**Critical Issues:**

1. Clean/blast floors to remove loose material and paint.

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2. Repair/replace trench drain covers.

**Conclusions:**

Through the investigation it appears that the maintenance building would be economically feasible to repair and upgrade as long as the building meets current and future area needs.

**Salt Shed:**

Original Building: Approx. 1,200 SF (S-1).  
Construction Type: Type-IIB, unsprinkled.  
Condition: Poor condition

**Roof**



Salt building distressed materials



Salt building distressed roof structure



Salt building distressed steel supports

The roof is a single slope metal roof that drains from north to south. The original screw down metal roof is still in place and is experiencing leaks at several locations. The original batt insulation is also in place and shows signs of water damage in more than half of its area. Several of the roof penetrations and curbs

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show signs or leaks either active or previously active. The gutters at the back of the building appear to leak at each of the seams. The downspouts appear to be missing and need to be replaced. The downspouts empty out on to splash blocks and the water is surface drained.

**Critical Issues:**

1. New roof required.
2. New structure for roof that won't rust should be considered.
3. Insulation is not required.
4. Replace gutters and downspouts.
5. Replacement of building makes most sense - safety.

**Exterior Walls:**



NW corner



North elevation



Rusted opening steel



Interior

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Cracks in all corners



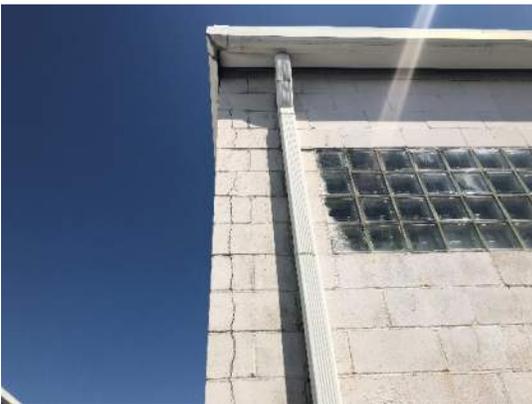
East elevation



South elevation



Cracks in all corners



Cracks in all corners

The exterior walls consist of painted concrete block. The concrete block has several areas that are experiencing efflorescence and major cracks. This building is subject to great lateral forces when salt is



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delivered to the building and when salt is removed with heavy equipment. The steel plate and bollards at the front openings are rusted badly.

**Critical Issues:**

1. Building is extensively damaged and should be considered for replacement.

**Conclusions:**

Building is extensively damaged and should be considered for replacement.

Our conclusions are based upon the information made available to us at the time of our investigation. Should additional information be uncovered or made available, we retain the right to revise or supplement our report accordingly.

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## **ADDITIONAL INFORMATION**

SVPA Architects (Thad Long, AIA and Ron Paskach, AIA) met on June 21, 2018 with the Windsor Heights Public Works maintenance staff to determine the future use/space needs for the maintenance building.

The issues reviewed Included:

1. Current operation
2. Current staffing
3. Current equipment space needs
4. Current deficiencies of the building
5. Equipment sales/purchases
6. Future operation
7. Future staffing
8. Future equipment space needs
9. Potential building additions, and site organization

The building currently houses a single office shared by the Public Works Director and Assistant Public Works Director, a break room, a kitchenette, toilet/shower/locker room, a sign shop, equipment maintenance room, equipment storage room, dog kennel, record storage room, furnace room, and storage mezzanine. A separate salt storage building is also on this site.

### **Current Operation:**

The staff operates this building as efficiently as possible but feel it would operate better if there was more space. Currently the facility only has one office that is shared between the Public Works Director and Assistant Public Works Director. The shared office space presents several difficulties in office productivity and effective management of the department. If privacy is needed, one of the occupants needs to vacate the office until invited back in which can interrupt phone calls and other operations. Evaluation of an additional office for the Public Works Director to have the ability to have private meetings with two to three additional people would be ideal.

The sub-standard condition of the shower room causes the showers and locker space to be almost unused. The facility could be better used with improvements to the locker area by providing a locker space for personal belongings and a separate private changing restroom facility with one shower. This would support the need for female and male privacy. Currently the facility has a total of 6 full time employees and additional summer time help. If space allowed, two uni-sex restrooms would be ideal with one equipped with a shower. A minimum of one restroom including the shower would be designed to meet ADA requirements. The locker area could be accessed separately from the each of the restrooms that would be utilized as private changing rooms.

The kitchenette and break room seem to be oversized/inefficient for the number of actual employees utilizing the space each day. Re-organization of the space by removing a wall or relocating some plumbing will allow for better use of the current square footage and allow better flow through the kitchenette. The

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kitchen space requires minimal appliances with microwave, sink, refrigerator and dishwasher. It was determined that laundry facilities are not used or needed in the foreseen future.

The equipment maintenance room (west bay) is fairly tight especially when vehicles are stored inside. When winter snow removal blades are attached to the trucks, the space gets even tighter. The current maintenance equipment fits in the current facility, but the addition of cold storage for varying seasonal storage would be ideal. It would allow for better use of the west bays for equipment storage. The far east portion of the space has a make-shift wash bay but the surrounding materials are not waterproof and the bay isn't well used because of the challenges with getting surrounding stored items wet and dirty with its use. Equipment cleaning is accomplished mostly outside, which is difficult during several months of the year and not ideal for the wash bay equipment or the exterior concrete apron, which can pose a slip hazard.

### **Current Staffing:**

No changes are anticipated for staffing of this facility at this time. The current building cannot accommodate additional staff as it is currently configured, if the City determined to hire more staff the space would be extremely tight. There was discussion about the difficulty of accommodating female staff in terms of lockers, showers, and toilet facilities. All of these amenities are in the same room, making it difficult to allow for concurrent male and female use. At the time of the interview there were no female staff in the building, but with summer help and other City Staff, providing private changing facilities while still allowing access to lockers will be an improvement.

### **Current equipment space needs:**

Based on information known at the time the public works staff did not see anticipate major changes for equipment storage requirements. While some equipment is being purchased, other pieces are being sold and the existing equipment storage space handles the current equipment needs. The addition of wing blades for each of the plows and a broom for the skip loader have been discussed as an additional equipment that would require storage space. It is important to note is the layout of storage space could be improved. When the time comes to change out between winter and summer seasonal equipment, all the vehicles must be taken out of the east bays of the building to provide access to stored items and equipment. It was noted additional storage would allow the process to go much more smoothly if stored items could be in a separate "cold storage shed" with overhead sectional doors. Additional storage would allow space for snow blades, road signs and barriers, and allow better access to equipment and vehicles. The additional storage would allow for the west bays as functional maintenance bays and not have to utilized for storage areas.

### **Current deficiencies of the building:**

A walk-thru lift in the maintenance area is needed for proper vehicle maintenance and is a need for the facility. This lift will need to be sized for the largest truck in the fleet. A walk-thru lift will allow staff to complete all standard vehicle maintenance and some repairs on fleet vehicles without having to lay on the ground.

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As discussed earlier, additional office space for the Assistant Public Works Director will allow for better management and minimize interruptions to work flow.

Improved locker room, changing, shower and restroom facilities will allow much needed privacy and the ability for female employees to comfortably use the facilities. An improved layout and upgraded finishes would encourage use of a currently underutilized facility.

Re-organized breakroom and kitchenette facilities can be organized for a more efficient use of square footage, allowing better utilization and full staff meetings when needed.

### **Equipment sales/purchases:**

It is understood that City Public Works staff currently plans to sell one backhoe and purchase a skid broom. It was discussed that the balance of equipment is not expected to increase or decrease by any appreciable amount in the foreseeable future. The equates to the current building space being adequate for equipment if the current items being stored had additional or separate space.

### **Future Operation:**

No future changes in operation were identified. Currently space is being utilized for the animal control and it was determined that this space demand will continue into the foreseeable future. No additional square footage is required at this time.

### **Future staffing:**

No future changes or additions to staffing were identified. The fluctuations in staffing were identified as hiring 3 people for summer help with the full-time count of 6 employees to remain.

### **Future equipment space needs:**

The future need for equipment storage was identified as a cold storage shed to house seasonal equipment and attachments to free up floor space in the maintenance building. The items in question include: snow blades, snow blowers, mower decks, road maintenance etc. It may also make sense to store Christmas lights and decorations in this shed with proper storage racks.

### **Potential building additions, and site organization:**

This report recommends removing the existing salt storage building and replacing it. The attached site plan shows a potential layout for replacing the salt building and adding a small cold storage addition between the salt and maintenance buildings. The salt building would rotate to align better with the drive and a cold storage shed can be added to the east side of the existing maintenance building. Separate office space for the Public Works Assistant Director is critical for ongoing operations and management. The addition of a small 400 sf office could be added to the west end of the north side of the building near the existing entrance, directly outside the current office space. This will allow for the current office to be converted to break room space or to be maintained as small office. The Public Works Assistant Directors space could be just a desk space, which could require a small overall footprint if actual office space is not available.

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### **PRIORITY LIST & COSTS (IN 2018 DOLLARS)**

1. Re-roof of existing building:
  - a. \$80,000 – 80 mill TPO membrane roof with Flute-fill insulation over existing roof.
2. New Salt Building:
  - a. \$220,000 – precast concrete structure with membrane roof.
3. Office addition:
  - a. \$56,000 – 440 sf addition to match existing building.
4. Replace unit heaters in maintenance bays:
  - a. \$40,000 – gas fired radiant heaters.
5. Cold Storage:
  - a. \$440,000 – Metal building to match existing building.
6. Office/Restroom remodel:
  - a. \$45,000 – Material upgrade for office, break room, kitchen and locker room.

Additional upgrades to systems that may not be priorities are listed separately within the body of the mechanical and electrical sections of this report.

### **EXECUTIVE SUMMARY**

Based on input from the Public Works staff and Assistant Public Works Director, the current equipment maintenance space is adequate until additional items are purchased. Currently it handles majority of its intended uses but requires shuffling of vehicles and equipment to get access and does not allow for the west bays to be used for regular maintenance. If additional storage is provided for seasonal items with the replacement of existing salt storage building, the existing space can be improved with a designated wash bay and a walk-thru lift for city vehicle maintenance. Storage space would allow for the west bays to be utilized for maintenance and service of the Public Works vehicles.

The current breakroom, restroom, locker space and office square footage on the west portion of the building can be organized to be more efficient with the addition of a Public Works Director's office as discussed directly to the north on the west end. This addition would allow direct access to the existing interior space and visual connection to the current operations with direct view of the overhead doors and parking lot. The remaining space could potentially house the remaining office space for the Public Works Assistant Director, the breakroom, kitchenette, a locker area, and changing/shower facilities. It is assumed the current plumbing is located within the wall that separates break room and kitchenette, removal of the interior walls and a portion of the floor which would require the relocation of plumbing but could provide a more effective and efficient layout.

In summary the existing building has served as valid Public Works facility for many years and will continue to work for its intended use. Several improvements could be made with the removal of the existing salt



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storage building which needs replacement. The attached site diagram indicates a possible solution to replace the salt storage and would allow the addition of cold storage. As described in the potential building additions relocated of the stored seasonal equipment would free up space within the building and allow for better access to all the equipment, the vehicles and allow space for a wash-bay and actual service bays. A small office would allow the remaining break, restroom and office space to be re-organized to better service the existing building.

Next steps would be to engage SVPA to provide programming and schematic design services for the facility. Once a conceptual site plan and building plans are produced and approved by the Public Works Staff and Director an estimated cost range for construction could be determined. Phasing of the proposed improvements could be determined and prioritized at once there is a better understanding of construction cost and available funding. The estimated cost of construction would include site improvements for the proposed building additions and interior renovated spaces. The schematic drawings and cost estimate created in the next phase of design that would allow for the City to plan and discuss if phasing the proposed improvement because of funding. The improvements could be broken in to two phases which would include site and east building and salt storage addition as one phase and the interior renovations as a separate phase. Breaking the proposed improvements into separate phases may add to the overall construction costs, the sequence of the two phases should not matter it could be determined by the Public Works Staff or funding availability.

The proposed east site addition is approximately 3,560 square feet based on a preliminary study of available space on site (see attached site concept). Average costs for a pre-engineered building can range between \$80 to \$105 per square foot depending on several factors site, floor finish, under slab drainage, lighting and mechanical requirements. The east addition construction budget could be in the range of \$300,000 to \$400,000 not including unknown site costs and owner soft costs. The office addition and remodel construction budget could range between \$150,000 to \$250,000 depending on amount of plumbing that needs to be relocated and office addition square footage.

In summary the existing Public Works facility has good life remaining and with a few proposed additions and improvements would serve the needs of Windsor Heights for several years.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to be 'J. Tometich', is written over a light blue horizontal line.

SVPA Architects Inc.  
Tometich Engineering, Inc.  
Twin Rivers Engineering, Inc.

# POTENTIAL SITE IMPROVEMENTS PLAN

