SMITHS FALLS
RISE AT THE FALLS

# Report # 2026-053

To: Mayor and Council
From: Paul McMunn, Director of Public Works and Utilities
Date: April 21, 2026,
Committee of the Whole Date: April 27, 2026
Title: Old Water Tower

☐ For Direction
☐ For Information
☒ For Adoption
☒ Attachment (72 pages)

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**Recommendation: THAT Council of the Corporation of the Town of Smiths Falls pass a resolution to direct staff to develop the scope of work for the removal of the old water tower located in Centennial Park;**

**AND FURTHER THAT Council authorize a 2026 out of budget approval of $375,000 for the removal of the old water tower; as presented in Committee of the Whole Report 2026-053.**

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**Purpose:** The purpose of this report is to seek Council's endorsement to proceed with the removal of the old water tower in 2026, and to obtain authorization for staff to issue a procurement document to solicit bids for contractors to facilitate the removal of the water tower as soon as reasonably possible.

**Background:** The existing water tower is a multi legged structure, is approximately 102 years old, and has reached the end of its service life. Due to its age, structural condition, and limited capacity, a new, modern elevated water storage facility was constructed and commissioned in January 2026.

The new tower provides approximately six times the storage capacity of the former structure and has been designed to meet current standards and service the community well into the future. As a result, the old tower has been decommissioned and is no longer in service.

While the old water tower has been a longstanding visual landmark within the community, it no longer serves an operational purpose.

**Analysis and Options:** Industry standards recognize an expected lifecycle of approximately 80–100 years for multi-legged water towers. The subject structure has exceeded this range.

Engineering inspections completed in 2022 and again in 2024 (ATTACHMENT 1 and ATTACHMENT 2) identified significant and ongoing deterioration, including:

- Severe coating failure, including weathering, cracking, and delamination across structural members

- Active and ongoing corrosion, particularly at riveted connections, leading to metal loss and weakening of structural components
- Evidence of crevice corrosion between steel plates, which cannot be effectively mitigated due to the original riveted design
- Potential structural failure due to age-related fatigue and material degradation

The inspection reports further note that even with significant investment, hidden corrosion, material loss, and age-related stress deficiencies would remain and cannot be fully addressed through rehabilitation.

In addition, the structure would require substantial upgrades to meet current safety standards (e.g., fall arrest systems, ladder compliance, confined space access), further increasing costs.

**Option 1 – Demolish and Remove the Structure (Recommended)**
Although the water tower is a recognizable and historic feature within the community, it presents an increasing liability risk in its current condition. The combination of structural deterioration, corrosion, and non-compliance with modern safety standards makes continued retention impractical.

**Option 2 – Retain as a Landmark Feature**
Retaining the structure solely for aesthetic or historical purposes would require ongoing maintenance, structural stabilization, and significant safety upgrades. Based on the findings of the inspection reports, these costs would be substantial and ongoing, with no guarantee of long-term structural reliability. As such, this option is not recommended.

**Budget/Financial Implications:** A preliminary cost estimate for removal has been obtained for budgetary planning purposes and includes:

- Structural demolition and removal: $250,000
- Lead abatement (if required): $75,000
- Removal of concrete footings (if required): $50,000

**Total Estimated Cost:** $375,000

The estimated costs of $375,000 can be funded from Water and Wastewater reserves.

**Link to Strategic Plan (2023-2026):**
Vision – Item 3 – Investing in our infrastructure to keep pace with needs

**Existing Policy:**

**Consultation:** Geoff Quan Landmark Structures Inc., Manager of Water and Wastewater, Glenview Iron and Metal

**Attachment:** Attachment 1 – Multi-Legged Tank Clean, Inspection and Report – May 17, 2022
Attachment 2 – Multi-Legged Tank Clean, Inspection and Report / Leak repairs – May 13, 2024

**Notes/Action (space for Council Member's notes):**

Respectfully Submitted:

Original Copy Signed
Paul McMunn, C.E.T.
Director of Public Works and Utilities

Approved for agenda by:

Original Copy Signed
Malcolm Morris, CMO
CAO

ATTACHMENT 1

LANDMARK
Elevating Expectations


# Smiths Falls—Multi-Legged Tank
# Clean, Inspection and Report
# May 17, 2022

Landmark Municipal Services

3091 Harrison Court
Burlington, ON CAN L7M 0W4
905.319.7700 Phone
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www.teamlandmark.com

September 22, 2022

**Corporation of the Town of Smiths Falls**
77 Beckwith St. N.
Smiths Falls ON.
K7A 416

**Attn:** **Jason Barlow**
jbarlow@smithsfalls.ca

**Tel:** 613 283-4124

**Re:** **Job # LM22077**
**Smiths Falls Multi-Leg - Water Storage Facility – Cleaning, Inspection and Report (CIR)**

Mr. Barlow,

A comprehensive inspection was performed at the above-mentioned process water storage facility on May 17th, 2022. The tank was drained before crew arrival to allow internal cleaning and inspection.

Please find a comprehensive report enclosed as follows:

| | | |
|---|---|---|
| 1) | Multi-leg Inspection Report | Pages 1 – 5 |
| 2) | Photographic Record of Report<br>*Photographs are numbered in accordance with the corresponding numbers throughout the report.* | Pages 6 – 16 |
| 3) | Coatings and Linings / Condition Assessment Letter | |
| 4) | Summary of Recommendations – Quote #Q19163 REV 1 | |

Should you have any questions or comments regarding the content of this report, please contact us at 905-319-7700.

Yours sincerely,

**LANDMARK MUNICIPAL SERVICES**


**David Baker - NACE Certified Coating Inspector - Level 2, CIP #329173**
dbaker@teamlandmark.com
905-319-5462

**Fall Arrest Update**

Effective December 1st, 2016, the CSA Group updated its standards relating to fall arresters and rigid rail systems. The update has resulted in the previous standard, Z259.2.1-98 (2011) (the "2011 CSA Standard"), being separated into two new standards: (a) CSA-Z259.2.4-15 (R2020) – Fall Arresters and Vertical Rigid Rails; and (b) CAN/CSA-Z259.2.5-12(2016) – Fall Arresters and Vertical Lifelines.

The impetus for the changes to the 2011 CSA Standard was driven by an incident in which a worker was critically injured while using a rigid rail type of fall protection system in 2014 – a copy of this notice is included at the end of this report. The Ontario Ministry of Labour's investigation into the matter revealed a weakness in the design of some Class Frontal-Fixed Rail Ladder Fall Protection Systems, which may not adequately protect workers who fall backwards or who squat and roll backwards into a fall while connected by a body harness to the trolley which slides along the vertical rail.

Particular to our review of the subject potable water storage facility is CSA-Z259.2.4-15 (R2020)– Fall Arresters and Vertical Rigid Rails ("2016 CSA Standard"). Generally, the revisions included in the 2016 Standard fall into 3 categories: (i) increased compatibility requirements between fall arresters, harnesses, and vertical rigid rail systems. These changes can primarily be found in sections 4.3.5, 4.4, and 4.5; (ii) the addition of 4 new mandatory testing requirements for rigid rail systems, which can be found in sections 5.3 through 6.4; and (iii) new marking requirements in sections 7.1, 7.2, and 7.3.

As per section 5.3.1, all new testing requirements must be met in order for the rigid rail system to be certified as compliant under the 2016 CSA Standard.

Landmark has followed up with the CSA Group in an attempt to determine the status of the exiting FRL's system compliance. In the case of fall arresters and vertical rigid rails, it appears that the current system has not been certified by the CSA Group with respect to the new 2016 Standard.

Please refer to quotation #Q19163 REV 1 for pricing to remove and replace the existing fall arrest system with Honeywell Safety Products – "Soll GlideLoc" which is compliant with the new 2016 Standard.

This report has been prepared by Landmark Municipal Services for the Town of Smiths Falls in order to provide the facility owner with a detailed description of the following:

The present condition of interior and exterior coatings, any pitting and/or corrosion on the interior of the water retaining vessel, the apparent condition of exposed foundations and the status of and recommendations for upgrades on safety equipment and other facility appurtenances.

Landmark Municipal Services has not performed a design review, an ultrasonic, x-ray, or destructive and/or non-destructive testing unless stated in the report. Comments and recommendations are based on visual inspection only and represent Landmark's professional judgement in reference to industry standards and best practices. This report may be based on information provided to Landmark which has not been independently verified. Its accuracy is limited to the time period and circumstances in which it was made. It was prepared for the specific purposes described in the report.

Any estimates regarding construction costs represent Landmark's judgement in light of our experience. Since Landmark has no control over market conditions, we do not make any representations or guarantees whatsoever with respect to such estimates or their potential variance from actual construction costs or schedules. Landmark accepts no responsibility for any potential losses.

In the case of subsurface, environmental or geotechnical conditions, the report may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time. Landmark makes no other representations or warranties whatsoever and accepts no responsibility for any events that may have occurred since the report was prepared.

***Note***
The Ontario Building Code and National Building Code (OBC / NBC) has undergone significant changes in the past few decades, specifically with an increase in snow loading, as a result of changing weather patterns as well as some catastrophic roof failures of structures built to the applicable building codes at the time.

Because of this, some structures that were built in the areas that experienced major changes in these environmental loads may not have the same acceptable safety margins for structural strength compared to when originally designed.

If there are no changes in the application, or no additions to the structure (everything is as originally designed and built) then the structures may be 'grandfathered in' and do not require redesign or reinforcement to meet the new code requirements.

If, however, any structural modifications or improvements need to be made to the original roof design (i.e., addition of telecommunication equipment), a design review must be performed, and structural reinforcement added as required. This is required to maintain acceptable levels of structural capacity.

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# MULTI - LEGGED TANK INSPECTION REPORT

| Landmark Contract No. | Inspection Date | Last Known Inspection Date |
|---|---|---|
| LM22077 | 17-May-22 | 26-Sep-19 |
| **Inspector** | **Report Date** | **Inspected By** |
| W. Clune | 13-Jul-22 | Landmark Municipal Services |

## OWNER / CONTACT

| | | | |
|---|---|---|---|
| **Owner** | Town of Smiths Falls | **Contact** | **Mr. Jason Barlow** |
| **Project Location** | **Smiths Falls Multi-Legged Tank** | **Title** | Manager Water / Wastewater Treatment |
| | | **Phone** | 613.283.4124 ext. 5501 |
| **Address** | 30 Old Mill Rd.,<br>Smiths Falls, ON | **Cell** | -- |
| | | **Email** | jbarlow@smithsfalls.ca |

## TANK DESCRIPTION

| | | | |
|---|---|---|---|
| **Engineer** | CBI / Horton | **Tank Capacity** | 230,000 Imp. Gallons / 1045 m3 |
| **Year Built** | 1924 | **Roof Type** | Self Supporting Welded Steel Dome |
| **Tank Type** | Multi-Legged (Rivetted, Double Ellipsoidal) | **Tank Diameter** | 57 ft. / 17.37 m |
| **Dwg's Available** | No | **Riser Diameter** | 52 in. / 1.32 m |
| **Dwg's Reviewed** | No | **Grade to Bottom of Tank** | 128 ft. / 39 m |
| **Coating System** | Epoxy / Urethane overcoat above catwalk | **Tank Height** | 180 ft. / 54.86 m |
| **Lining System** | 100% solids polyurethane | **HWL Elevation** | 176 ft. / 53.64 m |
| **Age of Paint** | Unknown | **No. of Columns / Size** | 6 / 15" Trellis Channel |

# REPORT SUMMARY

| Repairs Made During Inspection | Photo No. | | Photo No. |
|---|---|---|---|
| Riser leak repaired | 10-13 | | -- |
| | -- | | -- |
| | -- | | -- |

**Recommended Repairs**

| | | | |
|---|---|---|---|
| **Siteworks** | | **Accessories** | |
| Extend overflow away from foundation | 20 | Replace all non-compliant ladders c/w tie-offs | 27, 55, 76 |
| | -- | Design, fabricate and install roof handrail | 59 |
| **Security** | | Design, fabricate and install wet riser guardrail | 79 |
| Move antenna cables to tank leg | 33-34 | | -- |
| | -- | | -- |
| | -- | | -- |
| | -- | | -- |
| **Valve Chamber / Pit** | | **Fall Arrest System** | |
| | -- | Install new fall arrest system on new ladders | -- |
| | -- | Install Transfer 'D' rings on new roof handrail | -- |
| | -- | | -- |
| **Support Leg Foundations & Anchorage** | | | -- |
| *See Separate Coatings and Linings Report | -- | | -- |
| | -- | | -- |
| | -- | | -- |
| **Support Structure** | | **Confined Space & Rescue System** | |
| | -- | Install rescue port base at catwalk ladder | 45 |
| | -- | Install rescue port base at roof access hatch | 60 |
| | -- | | |
| | -- | | |
| **Exterior Balcony (Catwalk)** | | **Coating & Lining Condition** | |
| Extend balcony handrail to 42" (Currently 36") | 53 | *See Separate Coatings and Linings Report | -- |
| | -- | | -- |
| | -- | | -- |

Thank you for allowing Landmark Municipal Services to assist you in the maintenance of your elevated water storage facility. To maintain the integrity of your facility we recommend that you schedule your next:

| | | |
|---|---|---|
| **Safety inspection and report** | **2023** | |
| **Clean, inspect and report (CIR)** | **2028** | |
| **Remote inspection & report (RIR)** | **2025** | *** 3 yrs. after CIR*** |

| SITEWORKS | | | Photo No. |
|---|---|---|---|
| EXTERIOR VALVE PIT / BUILDING | | Pit - Good / Building - Good | 1-9 |
| DRIVEWAY / WALKWAY | | Good | 1 |
| OVERFLOW SPILLWAY | | Fair - extend overflow away from foundation | 20 |

**REPAIRS OR MAINTENANCE REQUIRED**

Extend overflow away from foundation

| SECURITY | | | Photo No. |
|---|---|---|---|
| FENCE & GATES | | Good | 14-17 |
| VERTICAL LADDER | | Good - Ladder gate present | 27-28 |
| HATCH LOCKS | | Good | 71 |

**REPAIRS OR MAINTENANCE REQUIRED**

| VALVE CHAMBER / PIT | | | Photo No. |
|---|---|---|---|
| CONDITION OF VALVE CHAMBER / PIT | | Good | 7-9 |
| CONDITION OF PIPING | | *Fair | 7-9 |
| CONDITION OF VALVES | | *Fair | 7-9 |
| VALVE PIT HATCH | *Size | 24" x 24" Steel hatch | 6 |
| | *Condition | *Fair | 6 |
| ARE THERE ANY INDICATIONS OF SETTLEMENT (EXTERIOR)? | | No | -- |
| IS THE CONCRETE IN THE PIT CRACKED, SPALLED OR LEAKING? | | No | -- |
| IS THERE ANY INDICATION OF PIPE MOVEMENT? | | No | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

*See Separate Coatings and Linings Report

| SUPPORT LEG FOUNDATIONS | | Photo No. |
|---|---|---|
| HOW FAR DO THE FOUNDATIONS EXTEND OUT OF THE GROUND? (Support Legs) | 0" - 48" | 20-26 |
| ARE THERE ANY INDICATIONS OF FOUNDATION SETTLEMENT? | No | -- |
| IS CONCRETE OR GROUT CHIPPED OR CRACKED | Minor chipping | 20-26 |
| IS THE SOIL AT THE BASE SATURATED OR IS THERE PONDED WATER? | No | -- |
| IS THERE ANY INDICATION OF UNDERGROUND PIPE LEAKAGE? | No | -- |
| IS THE SOIL AT THE BASE SATURATED OR ERODED? | No | -- |
| IS THE FOUNDATION UNDERMINED OR EXPOSED? | No | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

| SUPPORT STRUCTURE | | Photo No. |
|---|---|---|
| STRUCTURAL CONDITION OF WET RISER? | *Poor - Corroded internally /Guardrail recommended | 14-17 |
| STRUCTURAL CONDITION OF SUPPORT LEGS? | *Poor | 21-28 |
| STRUCTURAL CONDITION OF STRUTS AND COLUMNS? | *Poor | 14-17 |
| STRUCTURAL CONDITION EXTERIOR TANK SURFACES | *Fair | 40-41 |
| STRUCTURAL CONDITION INTERIOR TANK SURFACES | *Poor | 77-83 |

**REPAIRS OR MAINTENANCE REQUIRED**

*See Separate Coatings and Linings Report

Wet riser guardrail recommended

| BALCONY / CATWALK | | Photo No. |
|---|---|---|
| CONDITION OF BALCONY FLOOR? | *Poor | 45-52 |
| CONDITION OF BALCONY HANDRAIL? | *Poor - Only 36" tall | 53 |
| CONDITION OF SPLICES, SUPPORTS AND SHAFT CONNECTIONS? | *Poor - Corroded | 45-52 |
| DOES THE BALCONY FLOOR DRAIN? | Yes | 45-52 |

**REPAIRS OR MAINTENANCE REQUIRED**

Extend balcony handrail to 42" (Currently 36")

*See Separate Coatings and Linings Report

| ANCHORAGE | | Photo No. |
|---|---|---|
| ARE BASE PLATES DETERIORATED OR IN POOR CONDITION? | *Yes | 21-26 |
| ARE ANCHORS, NUTS & BOLTS DETERIORATED OR IN POOR CONDITION? | No | -- |
| ARE ANCHOR BOLT CHAIRS DETERIORATED OR IN POOR CONDITION? | *Yes | 21-26 |
| ARE ANCHOR BOLTS TIGHT? | Yes | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

*See Separate Coatings and Linings Report

| ACCESSORIES | | | Photo No. |
|---|---|---|---|
| **LADDERS** | * Ladder into valve pit | None | -- |
| | * Ladder to catwalk | Poor - Only 13" wide & 5/8" rungs (code is 16" & 3/4") | 27-44 |
| | * Ladder to roof | Poor - Only 13" wide & 5/8" rungs (code is 16" & 3/4") | 55 |
| | * Ladder on roof | Poor - Only 13" wide & 5/8" rungs (code is 16" & 3/4") | 56-57 |
| | * Ladder into tank from roof | N/A | -- |
| | * Ladder into tank from balcony | Poor - No side rails | 76 |
| **REST SEAT(S)** | | Good - 2 pcs | 32-36 |
| **ROOF HATCH** | * Size | 36" x 36" Aluminum hatch | 70 |
| | * Condition | Good | 70 |
| **VENT** | * Type | 16" S.S. Frostproof vent / vacuum relief unit | 72-73 |
| | * Condition | Good | 72-73 |
| **VACUUM RELIEF** | * Type | 16" S.S. Frostproof vent / vacuum relief unit | 72-73 |
| | * Condition | Good | 72-73 |
| **PAINT RAIL / ROOF COUPLINGS** | | None | -- |
| **ROOF HANDRAIL** | | None - Recommended | 59 |
| **WET RISER ACCESS FROM GROUND** | | 30" Bolted manway and 18" x 24" Sub hatch | 18-19 |
| **TANK ACCESS FROM CATWALK** | | 36" Bolted manway | 74-75 |
| **OVERFLOW PIPE (3" dia.)** | | Fair - Extend away from foundation | 20 |
| **CATHODIC PROTECTION** | | None | -- |
| **AIRCRAFT WARNING LIGHTS** | | None | -- |
| **ANTENNAE** | * Anchorage / Mounting | Good | 35, 45-46, |
| | * Cable Routing | Poor- Cables attached to ladder side rails | 33-34 |
| | * Surveys / Warning Signage as per Safety Code 6: Health Canada | None | -- |
| **LIGHTNING PROTECTION** | | Good | 68 |
| **TANK GROUNDING** | | Good | 21-26 |
| **MIXING SYSTEM** | | *Yes - Hydrodynamic system | 82 |

**REPAIRS OR MAINTENANCE REQUIRED**

Replace all non-compliant ladders c/w tie-offs

Design, fabricate and install roof handrail

Design, fabricate and install wet riser handrail

Extend overflow pipe to driveway / spillway

Move antenna cables to tank leg

*See Separate Coatings and Linings Report

Photo No.

## FALL ARREST SYSTEM

| LOCATION | SYSTEM TYPE | COMMENTS | |
|---|---|---|---|
| * TO VALVE PIT | N/A | -- | -- |
| * TO CATWALK | Aluminum TS rail | Install new fall arrest system | 27-42 |
| * TO ROOF | Aluminum TS rail | Install new fall arrest system | 55 |
| * ON ROOF | Aluminum TS rail | Install 'D' Rings on new roof handrail | -- |
| * TO TANK INTERIOR | N/A | -- | -- |

**REPAIRS / UPGRADES OR MAINTENANCE REQUIRED**

Install new fall arrest system on new ladders

Photo No.

## TRANSFER STATION 'D' RINGS

| LOCATION | YES / NO | CONDITION | |
|---|---|---|---|
| * AT VALVE PIT | N/A | -- | -- |
| * AT BOTTOM OF VERTICAL LADDER | Yes | Fair - Replace with S.S. | 27 |
| * AT TOP OF LADDER TO BALCONY | Yes | Fair - Replace with S.S. | 44 |
| * AT TOP OF LADDER TO ROOF | Yes | Poor - Replace with S.S. | 57 |
| * AT ROOF HATCH | Yes | Poor - Replace with S.S. | 62 |
| * AT CENTRE OF TANK ROOF | Yes - Dismount post | Poor - Replace with S.S. | 61 |

**REPAIRS OR MAINTENANCE REQUIRED**

Install 8 pcs S.S. 'D' rings on new ladder and on roof handrail

Photo No.

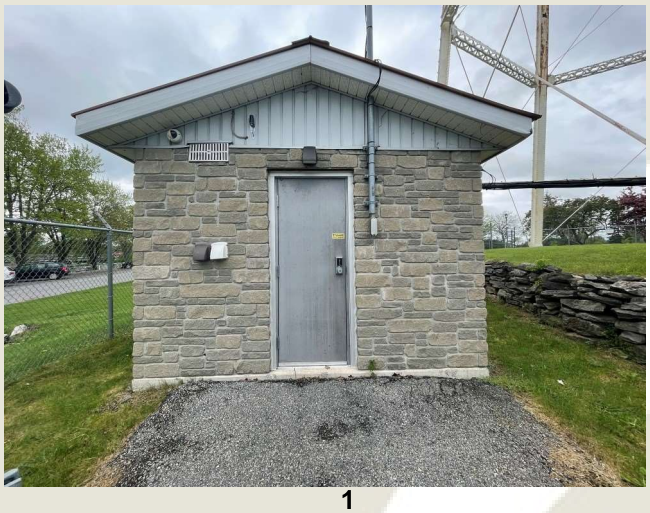
## RESCUE PORT BASES

| LOCATION | YES / NO | CONDITION | |
|---|---|---|---|
| * AT VALVE PIT | N/A | -- | -- |
| * AT TOP OF LADDER (CATWALK) | No | Required | 45 |
| * AT SHELL MANWAY | Yes | *Fair | 54 |
| * AT ROOF HATCH | No | Required | 60 |
| * AT CENTRE OF TANK ROOF | N/A | -- | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

Install rescue port base at catwalk ladder

Install rescue port base at roof hatch



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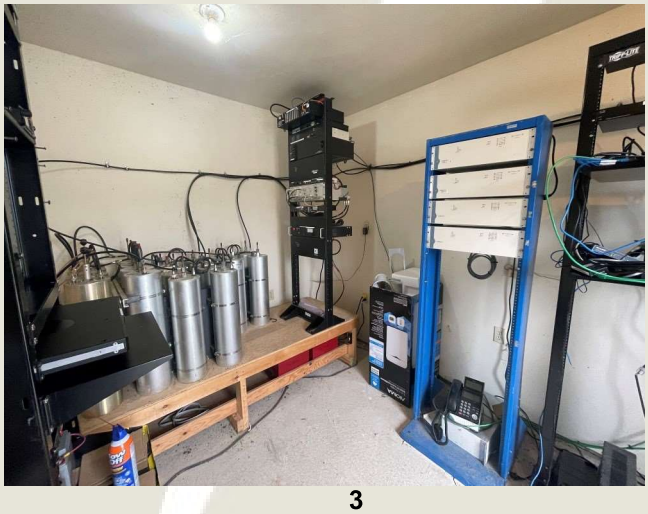

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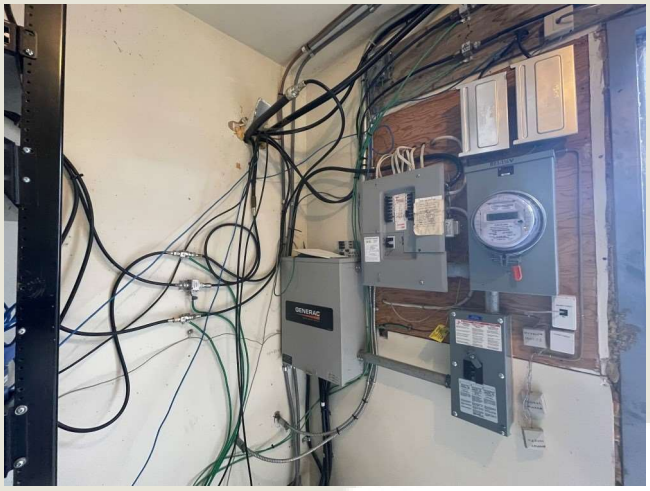

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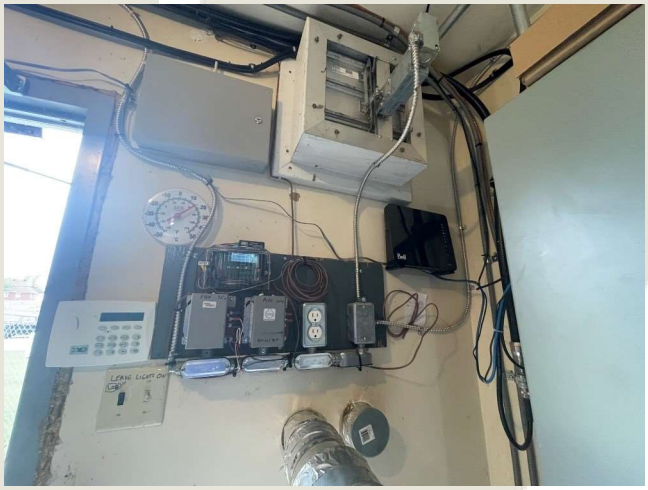

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*Refer to Protective Coatings & Linings Report for recommendations*

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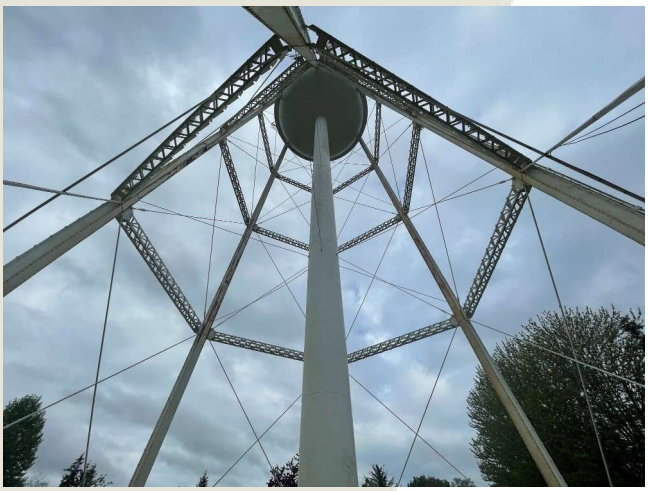

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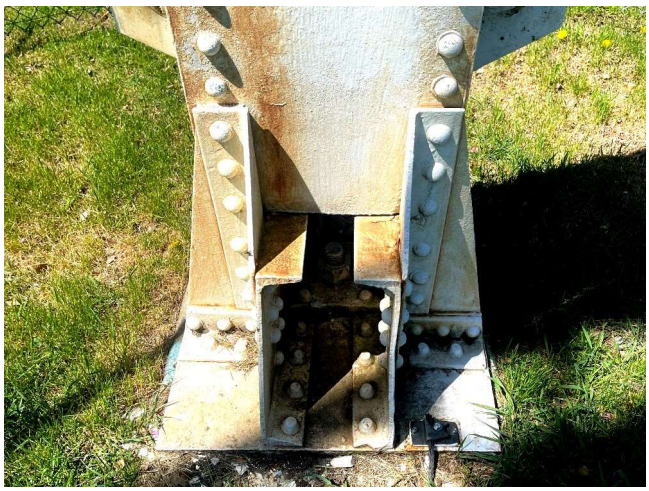

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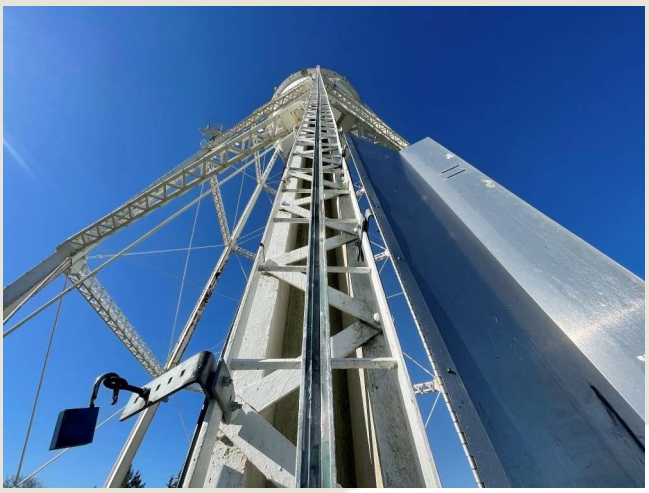

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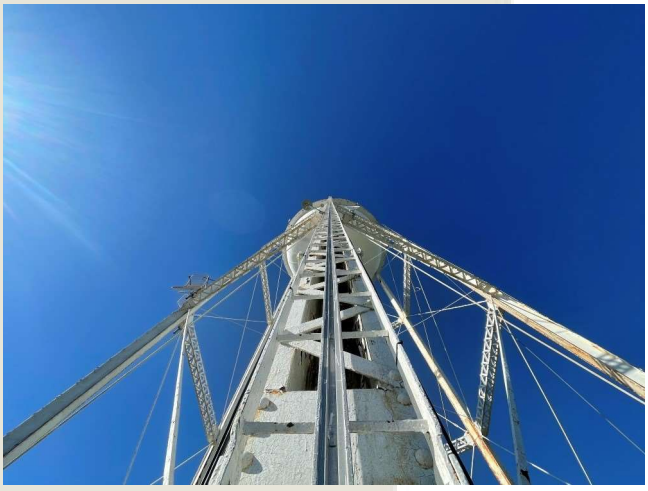

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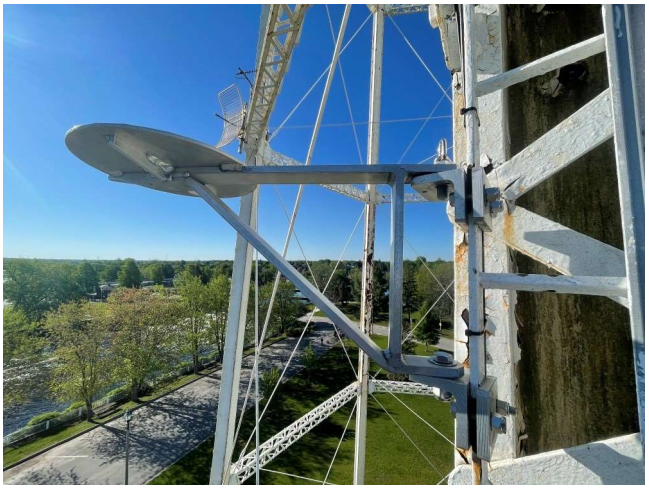

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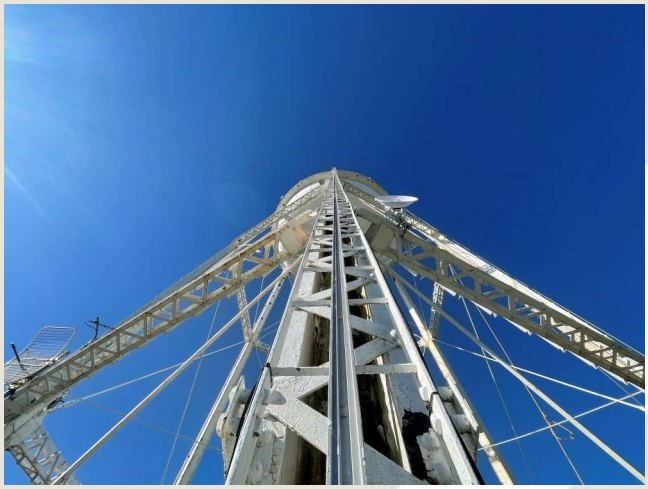

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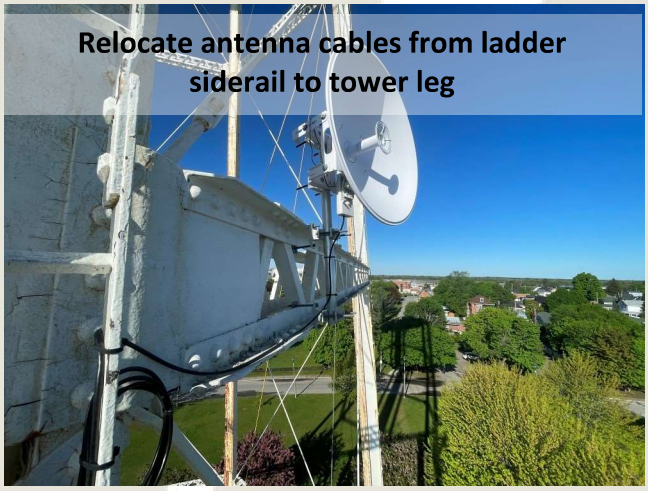


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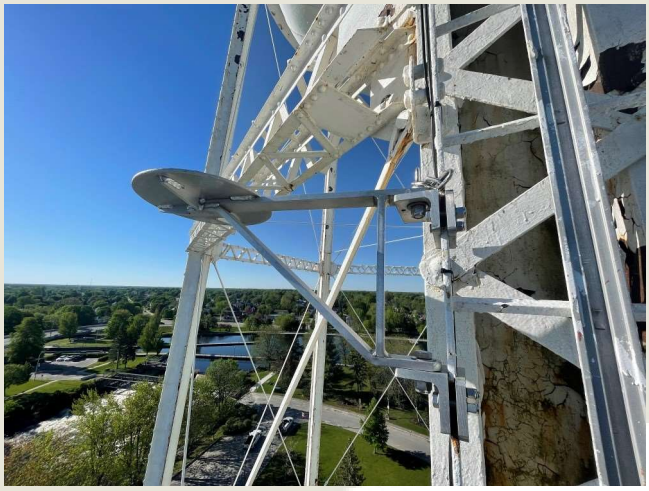

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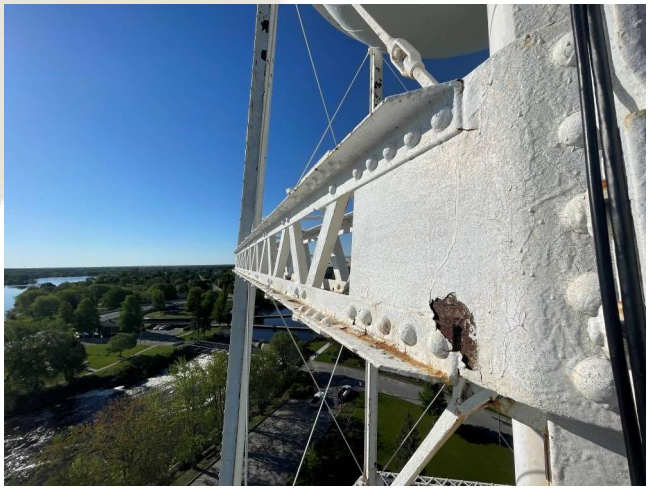

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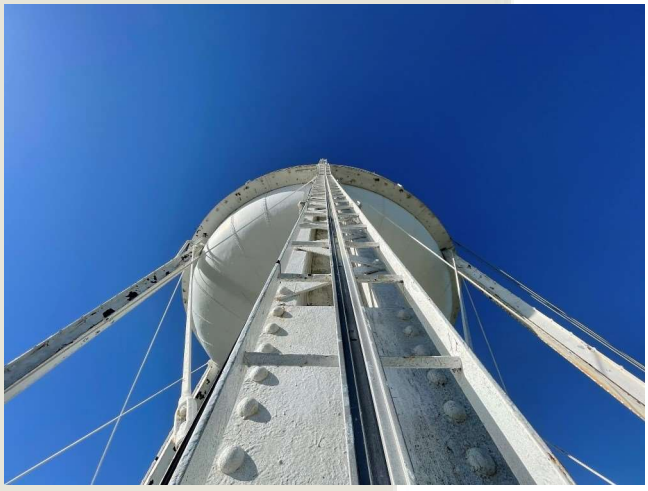

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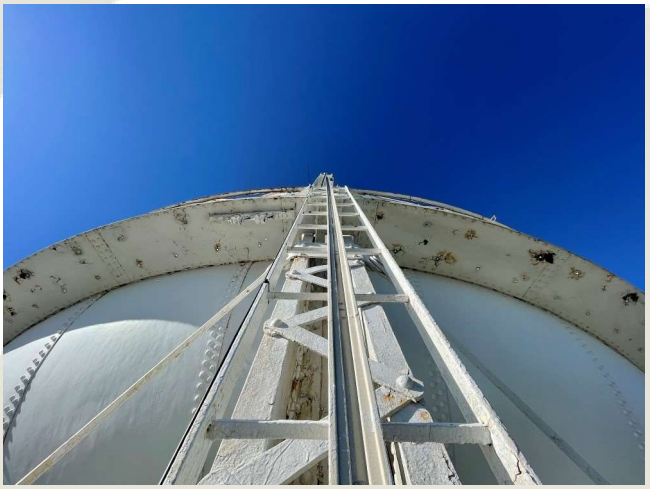

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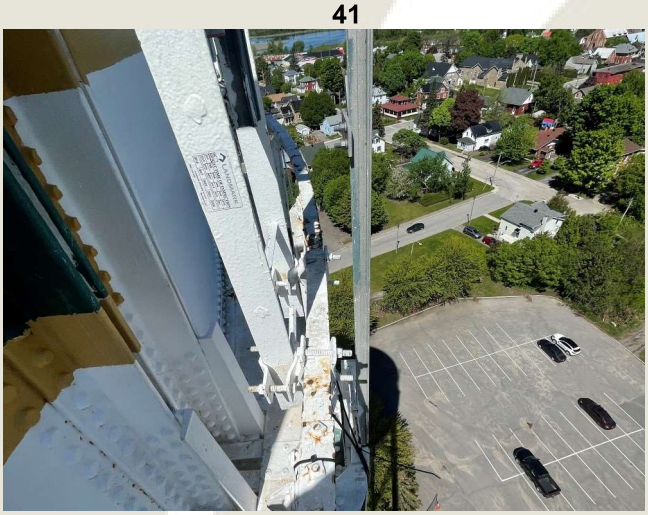

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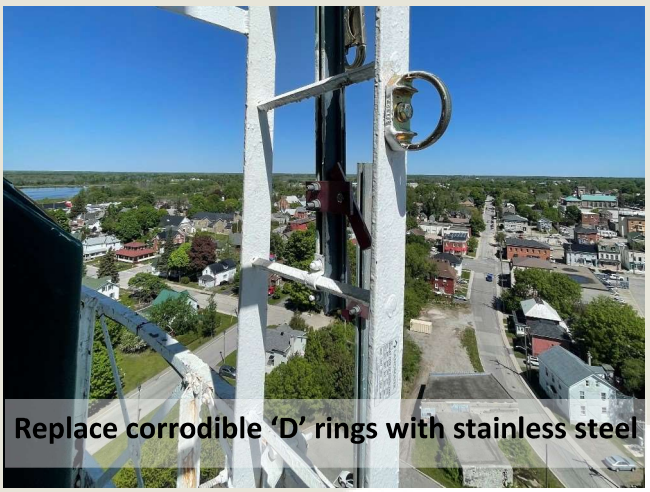


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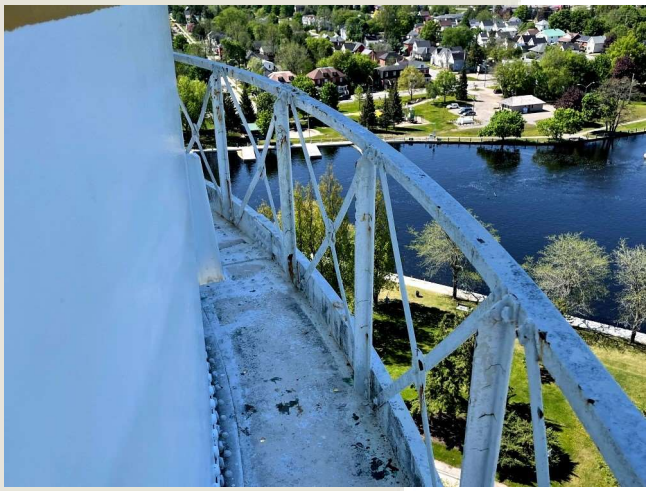

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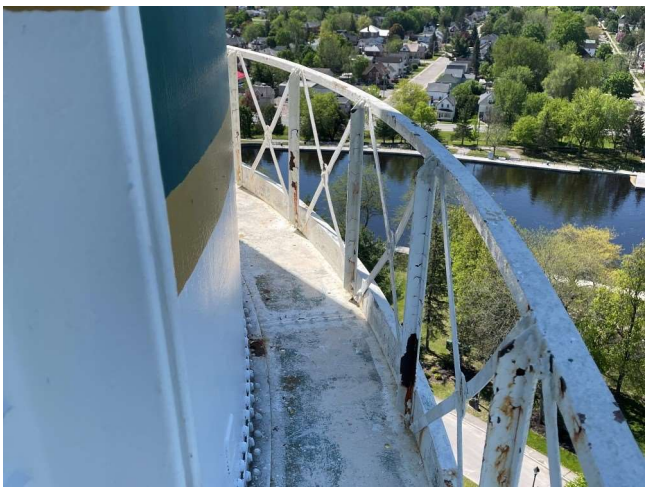

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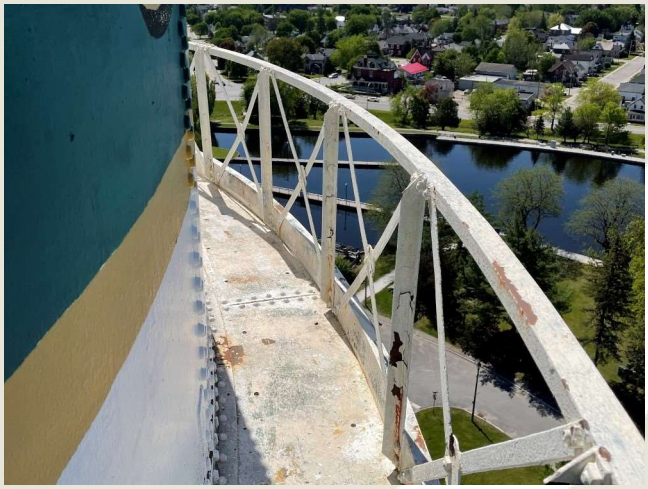

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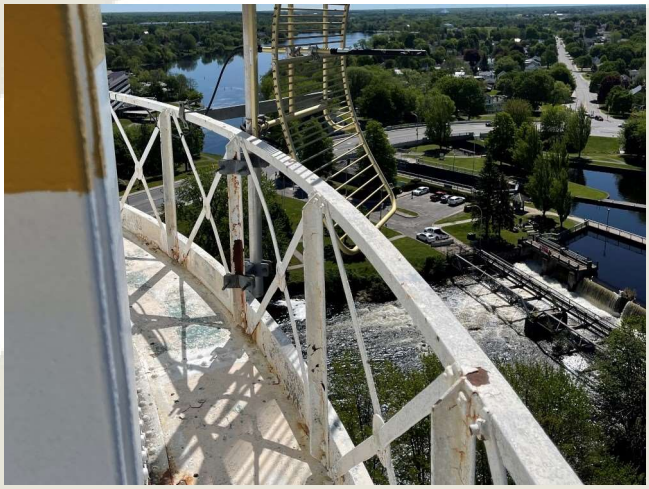

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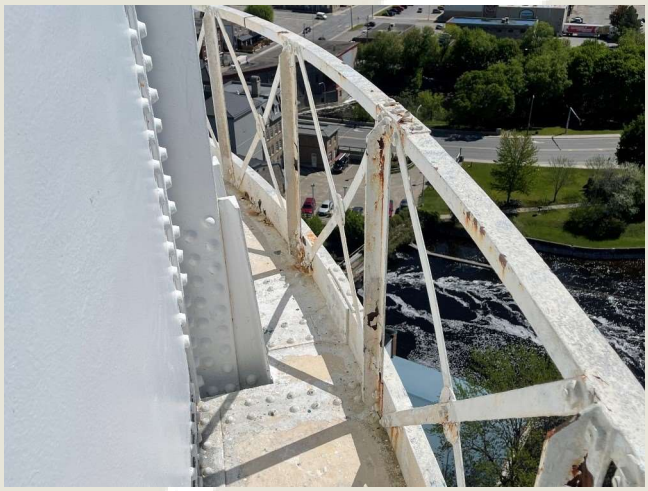

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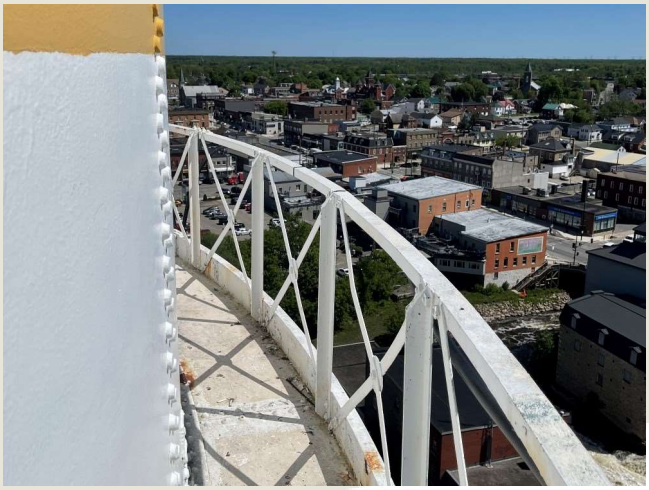

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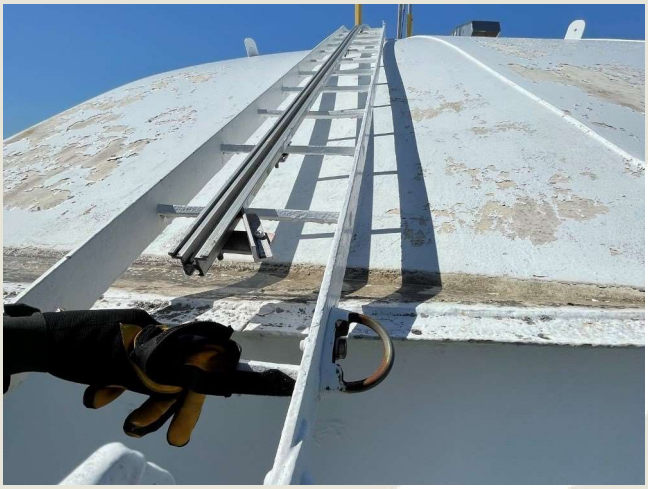

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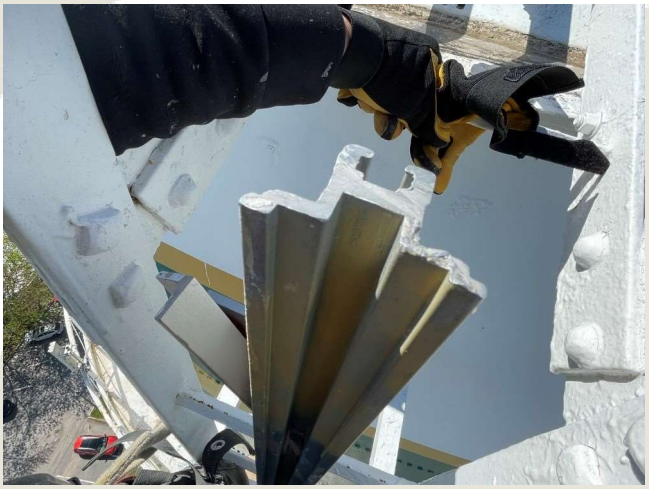

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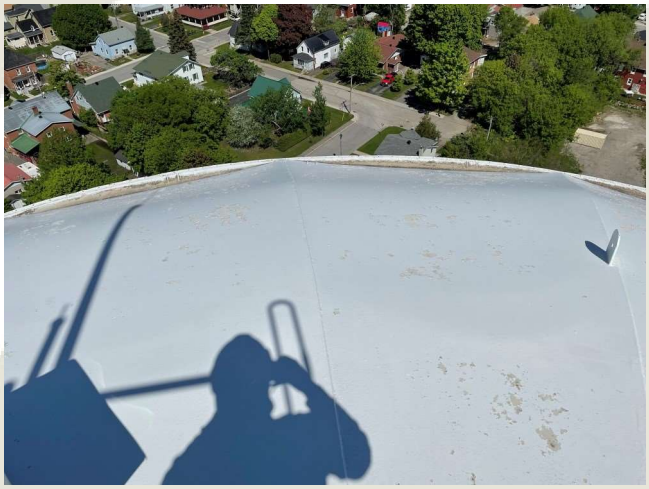

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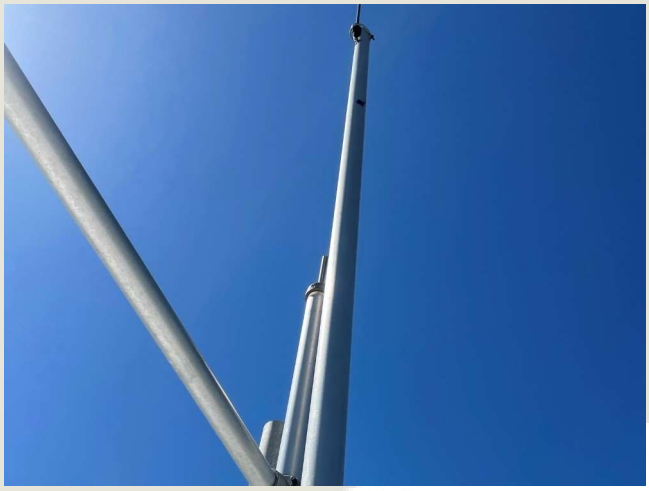

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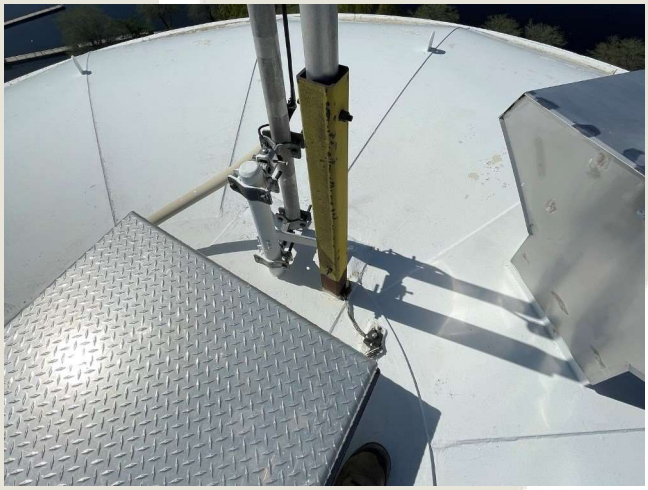

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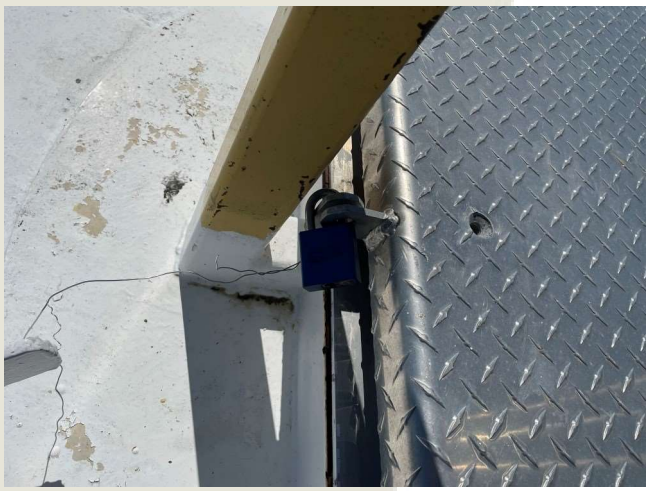

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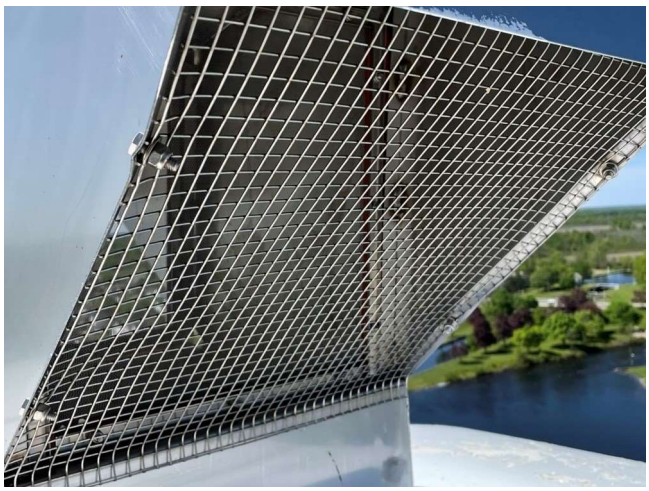

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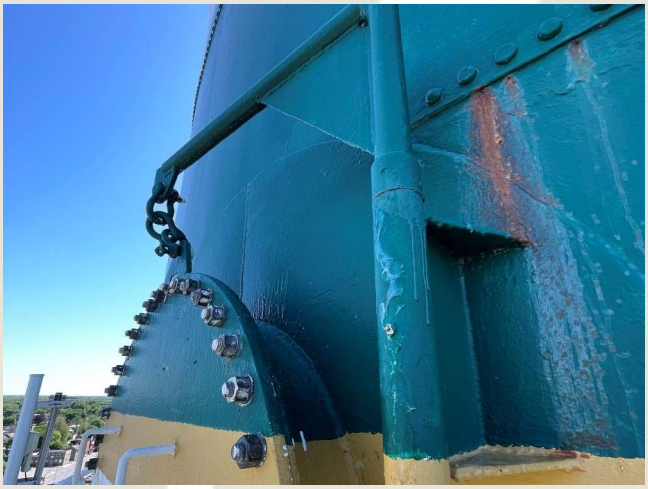

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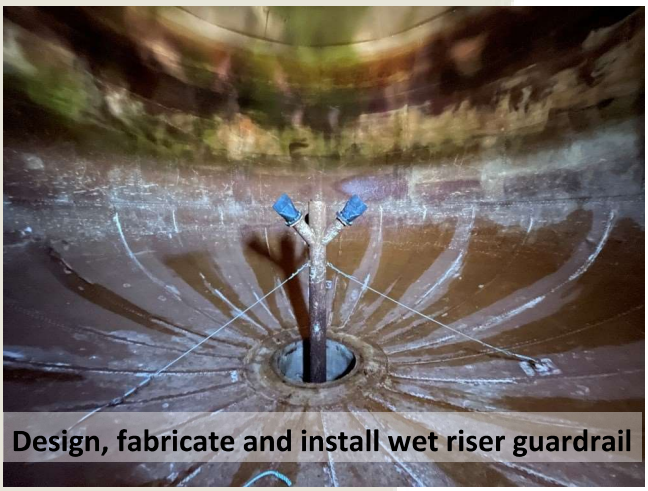


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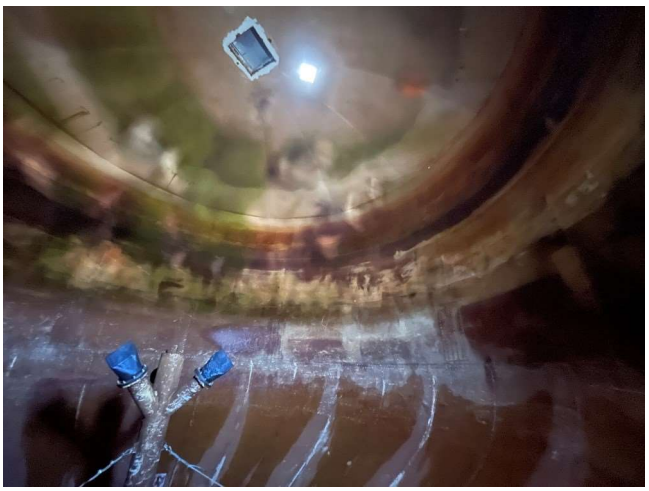

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Landmark Municipal Services

3091 Harrison Court
Burlington, ON CAN L7M 0W4
905.319.5451 Phone
905.319.7706 Fax

www.teamlandmark.com

September 22, 2022

**Corporation of the Town of Smiths Falls**
77 Beckwith St. N.
Smiths Falls ON.
K7A 416

**Attn:** **Jason Barlow**
jbarlow@smithsfalls.ca

**Tel:** 613 283-4124

**Re:** **Job # LM22077**
**Smiths Falls Multi-Leg - Water Storage Facility – Protective Coatings and Linings Report**

Mr. Barlow,

A comprehensive inspection was performed at the above-mentioned potable water storage facility on October 27th, 2021. Interior surfaces were disinfected in accordance with AWWA C652-19 Method #2.

This letter is a summary of our findings and recommendations for the above-noted water storage tank regarding the general condition of the structure.

## Exterior

This tank is painted with what appears to be an alkyd coating system, although the tank above the balcony was overcoated a number of years ago with an epoxy / urethane system for cosmetic reasons.

The coating system is in very poor condition, with severe weathering, alligator cracking and de-lamination on all structural members such as the anchorage bases, support legs and cross supports, balcony components, as well as on the tank body itself.

All of this paint has not prevented crevise corrosion from occurring between the riveted surfaces, which forces the steel plates to separate and then allows more moisture and subsequent corrosion to form. This corrosion also causes metal loss on the rivets themselves, which can lead to unexpected structural failures.

This is one of the main reasons why riveted construction methods are no longer used, as these structures have a finite lifespan limited to the effectiveness of coatings maintenance, and the faying surfaces between the steel plates cannot be surface prepared and re-painted to prevent further metal loss. Today's better engineering and construction practices eliminate any of these unreachable 'dead zones' between structural steel members which, along with regular maintenance, can afford a much longer lifespan.

It can be assumed, because of its age of nearly 100 years, that there would be some lead components in any of the finishes applied before the 1980's.

## Interior

The interior of this tank is lined with what appears to be a 100% solids epoxy which is in fair to poor condition. The rivetted construction of this tank provides many potential areas for corrosion to form as areas between the plates only require a pinhole for crevice corrosion to occur.

There are many corrosion cells below the water line, largely where Stress-Induced Plastic Deformation (SIPD) has caused the lining to thin out and then break over the edges formed by ionic displacement within the cold formed steel plates. Because of the cold forming used to create the double ellipsoidal shape of the bowl petals and the riser tube, there are large areas of SIPD, which appears as vertical and horizontal striations that might look to be painted-over corrosion pitting but isn't. The relaxing of the crystalline structure of the formed steel and the designed-in diaphragmatic movement of the tank bowl weakens the structure and increases the possibility of plate perforation and leaks, as have been prevalent in the last few years on this tank.
In addition to the effects of SIPD on the plates themselves, the normal flexing of these surfaces also puts shear strain on the plate rivets, which although not observable or measurable, can lead to catastrophic seam failure.

**Replacement Consideration:**

The industry recognized lifecycle for an AWWA D100 (Multi-Legged) is 80-100 years. This *riveted* tank, which was likely not built to any such strict standard, is 98 years old and is showing signs of structural deterioration and severe coating failure. Several leaks have occurred over the last few years and that is expected to continue.

It is not practical or economically feasible to repair an antiquated asset at a cost close to replacing it with a significantly better, state of the art asset that is less expensive to maintain. Even after a complete refurbishment, this tank will still have areas of hidden corrosion, metal loss and age-related stress faults that cannot be addressed. These defects will affect its structural integrity and its estimated remaining lifespan could not be guaranteed.

This tank should be replaced as soon as possible with a new AWWA D107 Composite Elevated tank. Our sales team welcome the opportunity to discuss tank replacement options, budgetary pricing, and life cycle cost analysis

Should you have any questions or comments regarding the content of this report, please contact us at 905.319.7700.

**Landmark Municipal Services**


**David Baker**
**NACE Certified Coating Inspector – Level 2, CIP #329173**
**dbaker@teamlandmark.com**
**905-319-5462**

Landmark Municipal Services
3091 Harrison Court
Burlington, ON CAN L7M 0W4
905.319.7700 Phone
905.319.7706 Fax

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September 22, 2022
(Original: December 18th, 2019)

**Corporation of the Town of Smiths Falls**
43 Abbott Street North
Smith Falls, ON K7A 4T6

**Attn:** **Mr. Jason Barlow**
jbarlow@smithsfalls.ca

**Tel:** 613.283.4124 ext. 5501

**Re:** **LMS Job #LM22077**
**Clean, Inspection and Report (CIR)**
**– Smiths Falls Multi-Legged Tank (ML)**
**– Recommended Upgrades #Q19163 REV 1**

Mr. Barlow,

Landmark Municipal Services is pleased to provide budgetary pricing for the following repairs & upgrades at the above-mentioned potable water storage facility.

*Please note that HST is not included.*

**Siteworks**

1) Extend Overflow pipe away from tank foundation and walkway **$ 3,800**

**Valve Chamber**

2) Surface prep and paint valves and pipes as required **$ 3,200**

3) Surface prep and paint underside of valve pit hatch **$ 600**

**Exterior Balcony (Catwalk)**

4) Increase height of balcony handrail to 42” min. (Currently 36”) **$ 9,800**
   - Includes shop blast and prime of new material as well as field coatings

**Accessories**

5) Ladder Upgrades:

Fixed access ladders are non-compliant to current standards whereas the rung lengths (inside to inside of side rails) are 13". The minimum required rung length by current standards is 16". In addition, rung diameters are 5/8" dia. (code requirement is ¾" dia. minimum) and the existing fall arrest system is over-coated in many areas and should be replaced as this prevents the fall arrest trolley from freely gliding along the track.

Ladder to Catwalk upgrades: **$ 95,000**

- Remove and dispose of existing ladder system
- Supply and Install (S&I) new 16" wide galvanized ladder system & support brackets
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops
- Remove and replace 'D' rings with S.S.

Ladder to tank roof upgrades:

- Remove and dispose of existing ladder system
- S&I new 16" wide galvanized ladder system & support brackets
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops
- Remove and replace 'D' rings with S.S.

Ladder on Tank Roof upgrades:

- Remove and dispose of existing ladder system
- S&I new 16" wide galvanized ladder system & support brackets
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops
- Remove and replace 'D' rings with S.S.

6) Design, fabrication and installation of a complete roof handrail system: **$ 22,500**

- Includes shop blast and prime of new materials as well as field coatings
- Top rail, mid rail and kickplate
- 'D' rings will be provided at each vertical post

7) Design, fabrication and installation of interior handrail system around wet riser **$ 7,200**

- Includes shop blast and prime of new materials as well as field coatings
- Top rail, mid rail and kickplate

**Fall Arrest System**

| | | |
|---|---|---|
| 8) | Remove and replace fall arrest system on all ladders (3) | **$ Incl. in #5** |
| 9) | Replace 'D' rings at the following locations: top of ladder to catwalk, top of ladder on tank roof (typ. 2), dismount mast, bottom of vertical ladder | **$ Incl. in #5** |

**Confined Space and Rescue**

| | | |
|---|---|---|
| 10) | Rescue port base required at hatch to valve pit (or use tripod) | **$ 3,500** |
| 11) | Rescue port base required at top of ladder at catwalk | **$ 4,500** |
| 12) | Rescue port base required at tank roof hatch | **$ 3,500** |

**H.S.T. not included in above pricing*

*Quotation is confidential and shall not be distributed without Landmark's knowledge and written approval.

Landmark inspections, reporting format and qualifications are in accordance with AWWA manual M42, chapters 8 and 9. All employees of Landmark Municipal Services have been trained and certified in Working At Heights, Fall Arrest and High Level Rescue, Confined Space Work and Rescue, WHMIS Worker Training, St. John Ambulance Safety Oriented First Aid and Cardiopulmonary Resuscitation. In addition, all activities conducted at heights by staff of LMS are fulfilled under strict guidelines based on involvement with the Ontario Ministry of Labour requirements outlined in the current Ontario Occupation Health & Safety Act, R.R.O. 1990, Regulation 851 amended to O.Reg. 629/05, and Section 26, O. Reg. 213/91

# Landmark Coatings

## Specialty Mobile Operations

Uncompromising commitment to safety. World class technical skill. Go-anywhere mobility. Landmark delivers factory applied quality to your site.

LANDMARK
Elevating Expectations

Developed and refined throughout 25 years of storage tank coatings and lining work, Landmark's specialty crews work wherever you need them…on projects that we design, fabricate and build, or on existing infrastructure requiring repair and recoating. The Society for Protective Coatings (SSPC) has recognized our technical skills and processes with their prestigious QP-1 certification, so you can rely on thoroughly tested multi-craft services on the most demanding jobs, with the added benefits of uncompromising safety and nationwide mobility.

## We work in a wide range of applications for the private sector, the military and municipal authorities:

- Industrial facilities
- Terminals
- Petrochemical plants
- Water and wastewater
- Oil and gas exploration and production
- Aircraft fueling facilities
- Lead abatement

## Safety

Safety is the Key

Landmark's uncompromising commitment to safety protects people, property and the environment. We apply equally rigorous standards for all locations, require ongoing training and testing for all crews, and utilize site evaluations, Hazard Identification and Risk Assessments (HIRA) and root cause analysis to continually drive performance improvement. Landmark employs the best available safeguards for the job, such as advanced, self-contained respiratory equipment on many applications. And we stay at the forefront of best practices and efficient reporting with our membership in ISNetworld. Core values and comprehensive safety and health programs, along with SSPC C-3 accreditation for de-leading steel structures, safeguards against environmental impact.

## Skill

Landmark's technical capabilities start with specification assistance, based on in-depth knowledge of industry suppliers and their latest products, and insights from our own operations. Our crews are fully equipped to perform surface preparation and coatings work on virtually any type of steel structure, utilizing a broad array of coatings including polyurethanes, 100% solids and fiberglass reinforced systems. Our crews perform all coatings work in accordance with the Landmark Quality Assurance Manual for Surface Preparation and Coating. They are trained to implement all of the required process controls and conduct workmanship inspections to meet or exceed all applicable standards and client expectations.


Routine quality evaluations include but are not limited to:

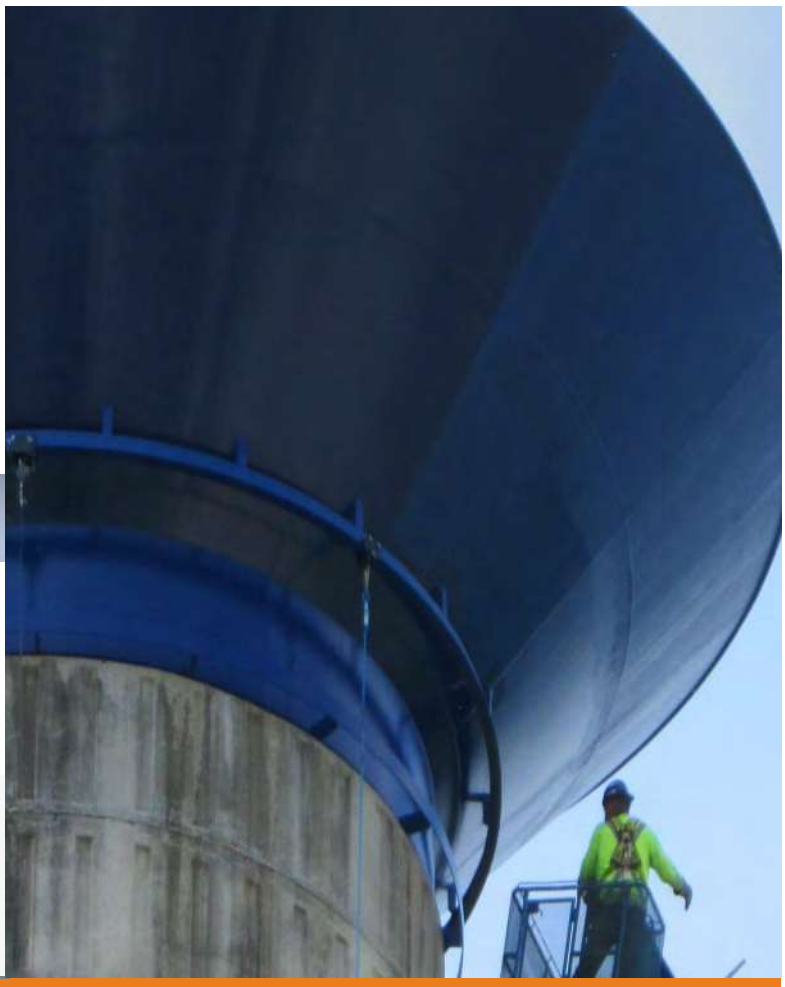
- Measurement of environmental conditions
- Verification of surface cleanliness prior to coating or lining
- Wet and dry film thickness measurement
- Holiday testing (low or high voltage, depending on lining thickness)

*Daily logs track all inspection activity, and are available upon request.*

Specialized equipment enables Landmark to manage dehumidification on work in enclosed spaces such as tank lining and recoating, and to protect the environment with blast media recycling and a full or partial containment on exterior surface preparation and coating. In addition, site specific plans for environmental monitoring, hazardous material management, and disposal of wastes are developed for all tank rehabilitations where existng coatings contain toxic metals. And for high-profile projects with community impact, Landmark has perfected the art of translating even the most intricate graphics to the public stage with precise reproduction. The utilization of dust collection systems ensures complete extraction of dusts for not only a cleaner surface prior to paint application, but as well as containment of dusts generated. This provides necessary air exchanges for confined space work.

## Mobility

Landmark capabilities are completely mobile for deployment nationwide or beyond, without limitations. Specially outfitted trailers move containerized equipment to the project site, and then serve as mobile command centers for the crews. All required assets are at hand, coordinated with local supply lines as appropriate.




You can count on Landmark Mobile Specialty Coatings to reliably protect your investment and extend the life of critical infrastructure. Contact us today to discuss the best solution and a quote on your next project.

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Landmark Municipal Services ULC
3091 Harrison Court
Burlington, Ontario L7M 0W4
Phone 905.319.7700 Fax 905.319.1373

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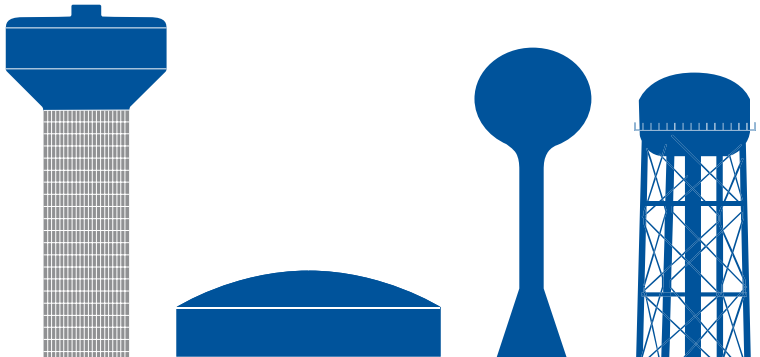
# Municipal Services

**Storage Tank Maintenance**
**Extend Service Life**
**Single Source Responsibility**

Expert Inspection, Maintenance And Repairs
For All Types Of Water Storage Tanks



# Expert inspection, maintenance, and repairs for all types of water storage tanks

- Safe, efficient, issue-free operation of your water storage infrastructure
- Full compliance with all applicable regulations across Canada

Landmark Municipal Services (LMS) brings more than 30 years of insight and innovation in water storage to owners and operators of tanks and systems of all types. Our complete range of services and packages provide predictability, continuity and flexibility for this essential function of municipal governments.

## Inspections

Regular, scheduled inspections are critical for long-term efficiency. LMS conducts various types of inspections, all with comprehensive reports detailing repairs performed or recommended and upgrade requirements, with photo documentation and related cost estimates.

CIR: **Clean, Inspect & Report:** AWWA (American Water Works Association) recommends that water storage tanks be washed out and inspected on a minimum three-year cycle.

SIR: **Safety Inspection & Report:** A thorough interior and exterior review of structure and operations for compliance with applicable government regulations.

ROV: **Remotely Operated Vehicle:** ROV inspections eliminate the inconvenience and expense of taking your tank out of service. LMS provides real-time, in-water evaluations with a remotely operated vehicle.

LMS inspections provide a complete review of all critical factors:

- Site works
- Foundations
- Support structure
- Ladders/landings
- Accessories
- Valves and piping
- Metal conditions
- Exterior coatings
- Interior linings
- Antenna and communications equipment
- Safety and rescue equipment

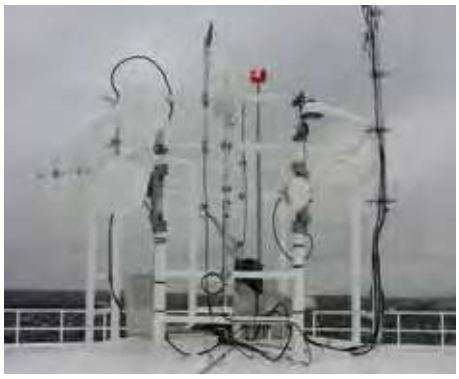
## Safety Upgrades and Training

LMS can provide safe access and rescue systems that meet or exceed the requirements of the Occupational Health & Safety Act for "vessel entry and rescue" as well as "fall arrest."



## Tank Modifications

Skilled LMS professionals provide practical, proven and fully engineered modifications for all types of storage tanks, leveraging experience as one of the leading tank builders in North America. Our vertical integration adds design, fabrication and coatings expertise when needed, with single source management and responsibility.


## Coatings and Linings

LMS services include all surface preparation and recoating of all interior and exterior areas. Options range from spot preparation to total blast cleaning with full containment for environmental protection. All lining materials applied to interior surfaces are ANSI and NSF 61 approved.



Safety is the Key




## Inspections:

- Clean, Inspect & Report (CIR)
- Safety Inspection & Report (SIR)
- Remotely Operated Vehicle (ROV)

## Safety:

- Confined space
- Fall arrest
- Training

## Maintenance:

- Tank Asset Management Program (TAMP)
- Annual programs
- Coatings/linings

## Lightning Protection:

- Design
- Installation
- Inspection

## Antenna and Communications Systems

- Design
- Structural fabrication & installation
- Inspection

## Demolition

- Partial
- Total

## Modifications

- Engineering
- Tank hydrodynamic mixing systems
- Site works
- Balconies/handrails
- Manholes
- Hatches
- Venting and vacuum relief
- Welding and fabrication
- Electrical/instrumentation
- Heat trace
- Insulation and cladding
- Security systems

Landmark delivers consistent, high quality results.

Contact us today to discuss the best solution for your next project.

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SMITHS FALLS - MULTI-LEGGED TANK - CLEAN, INSPECTION & REPORT - MAY 17, 2022

ATTACHMENT 2

LANDMARK
Elevating Expectations


# Town of Smiths Falls
# Smiths Falls Multi-legged Tank
# Clean, Inspection and Report / Leak Repairs
# May 13, 2024

Landmark Municipal Services

3091 Harrison Court
Burlington, ON CAN L7M 0W4
905.319.7700 Phone
905.319.7706 Fax

www.teamlandmark.com

June 19th, 2024

**Town of Smiths Falls**
**Public Works & Utilities**
43 Abbott Street North
Smiths Falls, ON K7A 1W4

**Attn:** Jason Barlow – Manager Water / Wastewater Treatment
jbarlow@smithsfalls.ca

**Tel:** 613-283-4124 ext. 5501

**Re:** **Job # 40-24-0014**
**Cleaning, Inspection and Report (CIR) & Leak Repairs - Smiths Falls Multi-Legged Tank**

Dear Jason,

A comprehensive inspection was performed at the above-mentioned process water storage facility on May 13th, 2024. The tank was drained before crew arrival to allow internal cleaning and inspection as well as active leak repairs of the wet riser.

Please find a comprehensive report enclosed as follows:

1) Multi-legged Tank Inspection Report Pages 1 – 5

2) Photographic Record of Report Pages 6 – 22
*Photographs are numbered in accordance with the corresponding numbers throughout the report.*

3) Coatings and Linings / Structural Condition Assessment Observations and Recommendations

4) Summary of Recommendations – Quote #**19163**

Should you have any questions or comments regarding the content of this report, please contact us at 905-319-7700.

Yours sincerely,

**LANDMARK MUNICIPAL SERVICES**


**David Baker** - AMPP Certified Coating Inspector – Level 2, CIP #36124
dbaker@teamlandmark.com
905-319-5462

**Fall Arrest Update**

Effective December 1st, 2016, the CSA Group updated its standards relating to fall arresters and rigid rail systems. The update has resulted in the previous standard, Z259.2.1-98 (2011) (the "2011 CSA Standard"), being separated into two new standards: (a) CSA-Z259.2.4-15 (R2020) – Fall Arresters and Vertical Rigid Rails; and (b) CAN/CSA-Z259.2.5-12(2016) – Fall Arresters and Vertical Lifelines.

The impetus for the changes to the 2011 CSA Standard was driven by an incident in which a worker was critically injured while using a rigid rail type of fall protection system in 2014 – a copy of this notice is included at the end of this report. The Ontario Ministry of Labour's investigation into the matter revealed a weakness in the design of some Class Frontal-Fixed Rail Ladder Fall Protection Systems, which may not adequately protect workers who fall backwards or who squat and roll backwards into a fall while connected by a body harness to the trolley which slides along the vertical rail.

Particular to our review of the subject potable water storage facility is CSA-Z259.2.4-15 (R2020)– Fall Arresters and Vertical Rigid Rails ("2016 CSA Standard"). Generally, the revisions included in the 2016 Standard fall into 3 categories: (i) increased compatibility requirements between fall arresters, harnesses, and vertical rigid rail systems. These changes can primarily be found in sections 4.3.5, 4.4, and 4.5; (ii) the addition of 4 new mandatory testing requirements for rigid rail systems, which can be found in sections 5.3 through 6.4; and (iii) new marking requirements in sections 7.1, 7.2, and 7.3.

As per section 5.3.1, all new testing requirements must be met in order for the rigid rail system to be certified as compliant under the latest CSA Standard.

Landmark has followed up with the CSA Group in an attempt to determine the status of the existing FRL's system compliance. In the case of fall arresters and vertical rigid rails, it appears that the current system has not been certified by the CSA Group with respect to the latest Standard.

Please refer to Quotation #**19163 REV 2** for pricing to remove and replace the existing fall arrest system with Honeywell Safety Products – "Soll GlideLoc" which is compliant with the latest Standard.

.

This report has been prepared by Landmark Municipal Services for the Town of Smiths Falls in order to provide the facility owner with a detailed description of the following:

The present condition of interior and exterior coatings, any pitting and/or corrosion on the interior of the water retaining vessel, the apparent condition of exposed foundations and the status of and recommendations for upgrades on safety equipment and other facility appurtenances.

Landmark Municipal Services has not performed a design review, an ultrasonic, x-ray, or destructive and/or non-destructive testing unless stated in the report. Comments and recommendations are based on visual inspection only and represent Landmark's professional judgement in reference to industry standards and best practices. This report may be based on information provided to Landmark which has not been independently verified. Its accuracy is limited to the time period and circumstances in which it was made. It was prepared for the specific purposes described in the report.

Any estimates regarding construction costs represent Landmark's judgement in light of our experience. Since Landmark has no control over market conditions, we do not make any representations or guarantees whatsoever with respect to such estimates or their potential variance from actual construction costs or schedules. Landmark accepts no responsibility for any potential losses.

In the case of subsurface, environmental or geotechnical conditions, the report may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time. Landmark makes no other representations or warranties whatsoever and accepts no responsibility for any events that may have occurred since the report was prepared.

*3091 Harrison Court, Burlington ON L7M 0W4*
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LANDMARK
Elevating Expectations

# MULTI-LEGGED TANK INSPECTION REPORT

| Landmark Contract No. | Inspection Date | Last Known Inspection Date |
|---|---|---|
| 40-24-0014 | 13-May-24 | 17-May-22 |
| **Inspector** | **Report Date** | **Inspected By** |
| W. Clune | 19-Jun-24 | Landmark Municipal Services |

## OWNER / CONTACT

| | | | |
|---|---|---|---|
| **Owner** | Town of Smiths Falls | **Contact** | **Jason Barlow** |
| **Project Location** | **Smiths Falls Multi-Legged Tank** | **Title** | Manager Water / Wastewater Treatment |
| | | **Phone** | 613-283-4124 Ext. 5501 |
| **Address** | 30 Old Mill Rd.,<br>Smiths Falls, ON | **Cell** | -- |
| | | **Email** | jbarlow@smithsfalls.ca |

## TANK DESCRIPTION

| | | | |
|---|---|---|---|
| **Engineer** | CBI / Horton | **Tank Capacity** | 230,000 Imp. Gallons / 1045 m3 |
| **Year Built** | 1924 | **Roof Type** | Self Supporting Welded Steel Dome |
| **Tank Type** | Multi-Legged (Rivetted, Double Ellipsoidal) | **Tank Diameter** | 57 ft. / 17.37 m |
| **Dwg's Available** | No | **Riser Diameter** | 52 in. / 1.32 m |
| **Dwg's Reviewed** | No | **Grade to Bottom of Tank** | 128 ft. / 39 m |
| **Coating System** | Epoxy / Urethane overcoat above catwalk | **Tank Height** | 180 ft. / 54.86 m |
| **Lining System** | 100% solids polyurethane | **HWL Elevation** | 176 ft. / 53.64 m |
| **Age of Paint** | Unknown | **No. of Columns / Size** | 6 / 15" Trellis Channel |

# REPORT SUMMARY

| Repairs Made During Inspection | Photo No. | Photo No. |
|---|---|---|
| Inspection and repair of noticeable wet riser leaks | 128-133 | -- |
| | -- | -- |
| | -- | -- |

**Recommended Repairs**

| Siteworks | | Accessories | |
|---|---|---|---|
| Extend overflow away from foundation c/w spillway | 22 | Remove and replace all ladders | 30, 70, 72 |
| | -- | Design, fabricate and install roof handrail | 72, 78 |
| | -- | Design, fabricate and install wet riser guardrail | 104 |
| **Security** | | **Fall Arrest System** | |
| Relocate antenna cables to tank leg | 29, 38 | Install new fall arrest system on new ladders | 29, 70, 72 |
| | -- | Install Transfer 'D' rings on new roof handrail | 78 |
| | -- | | -- |
| **Valve Chamber / Pit** | | **Confined Space & Rescue System** | |
| Surface prep and repaint valves and piping | 9-20 | Install rescue port base at valve pit or use tripod | 6 |
| | -- | Install rescue port base at catwalk ladder | 55 |
| | -- | Install rescue port base at roof access hatch | 88 |
| **Support Leg Foundations & Anchorage** | | **Exterior Balcony (Catwalk)** | |
| *See Separate Coatings and Linings Report | -- | Extend balcony handrail to 42" (Currently 36") | 54-68 |
| | -- | | -- |
| | -- | | -- |
| **Support Structure** | | **Coating & Lining Condition** | |
| | -- | *See Separate Coatings and Linings Report | -- |
| | -- | | -- |
| | -- | | -- |

Thank you for allowing Landmark Municipal Services to assist you in the maintenance of your elevated water storage facility.
To maintain the integrity of your facility we recommend that you schedule your next:

| | | |
|---|---|---|
| **Safety Inspection and Report (SIR)** | **2025** | |
| **Clean, Inspect and Report (CIR)** | **2030** | |
| **Remote Inspection & Report (RIR/ROV)** | **2027** | *** 3 yrs. after CIR** |

| SITEWORKS | | Photo No. |
|---|---|---|
| EXTERIOR VALVE PIT / BUILDING | Pit - Good | 6-20 |
| DRIVEWAY / WALKWAY | Grass - Good | 1-4 |
| OVERFLOW SPILLWAY | Fair - extend overflow away from foundation | 20 |

**REPAIRS OR MAINTENANCE REQUIRED**

Extend overflow away from foundation c/w spillway

| SECURITY | | Photo No. |
|---|---|---|
| FENCE & GATES | Good | 1-5 |
| VERTICAL LADDER SECURITY | Good - Ladder gate present | 27-29 |
| HATCH LOCKS | Good | 88 |

**REPAIRS OR MAINTENANCE REQUIRED**

| VALVE CHAMBER / PIT | | | Photo No. |
|---|---|---|---|
| CONDITION OF VALVE CHAMBER / PIT | | Good | 6-20 |
| CONDITION OF PIPING | | *Fair | 6-20 |
| CONDITION OF VALVES | | *Fair | 6-20 |
| VALVE PIT HATCH | *Size | 24" x 24" Steel hatch | 6-7 |
| | *Condition | *Fair | 6-7 |
| ARE THERE ANY INDICATIONS OF SETTLEMENT (EXTERIOR)? | | No | -- |
| IS THE CONCRETE IN THE PIT CRACKED, SPALLED OR LEAKING? | | No | -- |
| IS THERE ANY INDICATION OF PIPE MOVEMENT? | | No | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

*See Separate Coatings and Linings Report

| SUPPORT LEG FOUNDATIONS | | Photo No. |
|---|---|---|
| HOW FAR DO THE FOUNDATIONS EXTEND OUT OF THE GROUND? (Support Legs) | 0" - 48" | 1-4 |
| ARE THERE ANY INDICATIONS OF FOUNDATION SETTLEMENT? | No | -- |
| IS CONCRETE OR GROUT CHIPPED OR CRACKED | Minor chipping | 1-4 |
| IS THE SOIL AT THE BASE SATURATED OR IS THERE PONDED WATER? | No | -- |
| IS THERE ANY INDICATION OF UNDERGROUND PIPE LEAKAGE? | No | -- |
| IS THE SOIL AT THE BASE SATURATED OR ERODED? | No | -- |
| IS THE FOUNDATION UNDERMINED OR EXPOSED? | No | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

| SUPPORT STRUCTURE | | Photo No. |
|---|---|---|
| STRUCTURAL CONDITION OF WET RISER? | *Poor - Corroded internally /Guardrail recommended | 122-124 |
| STRUCTURAL CONDITION OF SUPPORT LEGS? | *Poor | 35-36 |
| STRUCTURAL CONDITION OF STRUTS AND COLUMNS? | *Poor | 32-33 |
| STRUCTURAL CONDITION EXTERIOR TANK SURFACES | *Fair | 44-49 |
| STRUCTURAL CONDITION INTERIOR TANK SURFACES | *Poor | 92-107 |

**REPAIRS OR MAINTENANCE REQUIRED**

*See Separate Coatings and Linings Report

Wet riser guardrail recommended

| BALCONY / CATWALK | | Photo No. |
|---|---|---|
| CONDITION OF BALCONY FLOOR? | *Poor - Corroded | 54-68 |
| CONDITION OF BALCONY HANDRAIL? | *Poor - Only 36" tall | 54-68 |
| CONDITION OF SPLICES, SUPPORTS AND SHAFT CONNECTIONS? | *Poor - Corroded | 54-68 |
| DOES THE BALCONY FLOOR DRAIN? | Yes | 54-68 |

**REPAIRS OR MAINTENANCE REQUIRED**

Extend balcony handrail to 42" (Currently 36")

*See Separate Coatings and Linings Report

| ANCHORAGE | | Photo No. |
|---|---|---|
| ARE BASE PLATES DETERIORATED OR IN POOR CONDITION? | *Yes | 1-4, 22 |
| ARE ANCHORS, NUTS & BOLTS DETERIORATED OR IN POOR CONDITION? | No | -- |
| ARE ANCHOR BOLT CHAIRS DETERIORATED OR IN POOR CONDITION? | *Yes | 1-4, 22 |
| ARE ANCHOR BOLTS TIGHT? | Yes | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

*See Separate Coatings and Linings Report

| ACCESSORIES | | | Photo No. |
|---|---|---|---|
| **LADDERS** | * Ladder into valve pit | None | -- |
| | * Ladder to catwalk | Poor - Only 13" wide (code is 16") | 29-32 |
| | * Ladder to roof | Poor - Only 13" wide (code is 16") | 70-71 |
| | * Ladder on roof | Poor - Only 13" wide (code is 16") | 72, 78 |
| | * Ladder into tank from roof | N/A | -- |
| | * Ladder into tank from balcony | Poor - No side rails | 103 |
| **REST SEAT(S)** | | Good - 2 pcs | 34, 42 |
| **ROOF HATCH** | * Size | 36" x 36" Aluminum hatch | 88-91 |
| | * Condition | Good | 88-91 |
| **VENT** | * Type | 16" S.S. Frostproof vent / vacuum relief unit | 86-87 |
| | * Condition | Good | 86-87 |
| **VACUUM RELIEF** | * Type | 16" S.S. Frostproof vent / vacuum relief unit | 86-87 |
| | * Condition | Good | 86-87 |
| **PAINT RAIL / ROOF COUPLINGS** | | None | -- |
| **ROOF HANDRAIL** | | None - Recommended | 72, 78 |
| **WET RISER GUARDRAIL** | | None - Recommended | 104 |
| **WET RISER ACCESS FROM GROUND** | | 30" Bolted manway | 109-111 |
| **TANK ACCESS FROM CATWALK** | | 36" Bolted manway | 58 |
| **OVERFLOW PIPE (3" dia.)** | | Fair - Extend away from foundation | 22 |
| **CATHODIC PROTECTION** | | None | -- |
| **AIRCRAFT WARNING LIGHTS** | | None | -- |
| **ANTENNAE** | * Anchorage / Mounting | Good | 39,62,66,84 |
| | * Cable Routing | Poor- Cables attached to ladder side rails | 29, 38 |
| | * Surveys / Warning Signage as per Safety Code 6: Health Canada | None | -- |
| **LIGHTNING PROTECTION** | | Good | 85 |
| **TANK GROUNDING** | | Good | -- |
| **MIXING SYSTEM** | | *Yes - Hydrodynamic system | 104, 115 |

**REPAIRS OR MAINTENANCE REQUIRED**

Remove and replace all ladders

Design, fabricate and install roof handrail

Design, fabricate and install wet riser handrail

Extend overflow pipe to driveway / spillway

Relocate antenna cables to tank leg

*See Separate Coatings and Linings Report

| FALL ARREST SYSTEM | | | Photo No. |
|---|---|---|---|
| **LOCATION** | **SYSTEM TYPE** | **COMMENTS** | |
| * TO VALVE PIT | N/A | -- | -- |
| * TO CATWALK | Aluminum TS rail | Install new CSA certified fall arrest system | 29 |
| * TO ROOF | Aluminum TS rail | Install new CSA certified fall arrest system | 70-71 |
| * ON ROOF | Aluminum TS rail | Install 'D' Rings on new roof handrail | 72 |
| * TO TANK INTERIOR | N/A | -- | -- |

**REPAIRS / UPGRADES OR MAINTENANCE REQUIRED**

Install new fall arrest system on new ladders

| TRANSFER STATION 'D' RINGS | | | Photo No. |
|---|---|---|---|
| **LOCATION** | **YES / NO** | **CONDITION** | |
| * AT VALVE PIT | N/A | -- | -- |
| * AT BOTTOM OF VERTICAL LADDER | Yes | Fair - Replace with S.S. | 25 |
| * AT TOP OF LADDER TO BALCONY | Yes | Fair - Replace with S.S. | 53 |
| * AT TOP OF LADDER TO ROOF | Yes | Poor - Replace with S.S. | 72 |
| * AT ROOF HATCH | Yes - Dismount post | Poor - Replace with S.S. | 88-89 |
| * AT CENTRE OF TANK ROOF | Same as above | -- | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

Install 8 pcs S.S. 'D' rings on new ladder and on roof handrail

| RESCUE PORT BASES | | | Photo No. |
|---|---|---|---|
| **LOCATION** | **YES / NO** | **CONDITION** | |
| * AT VALVE PIT | N/A | Required / Use tripod | -- |
| * AT TOP OF LADDER (CATWALK) | No | Required | 55 |
| * AT SHELL MANWAY | Yes | *Fair | 57 |
| * AT ROOF HATCH | No | Required | 88 |
| * AT CENTRE OF TANK ROOF | N/A | -- | -- |

**REPAIRS OR MAINTENANCE REQUIRED**

Install rescue port base at valve pit or use tripod

Install rescue port base at catwalk ladder

Install rescue port base at roof hatch

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Prepare and re-paint piping inside valve pit

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Move antenna cables to tank leg

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Replace non-compliant ladder c/w new fall arrest system and ‘D’ rings

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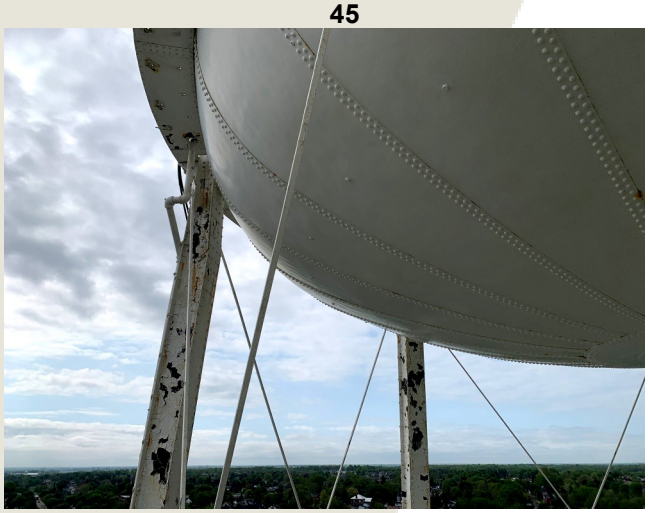

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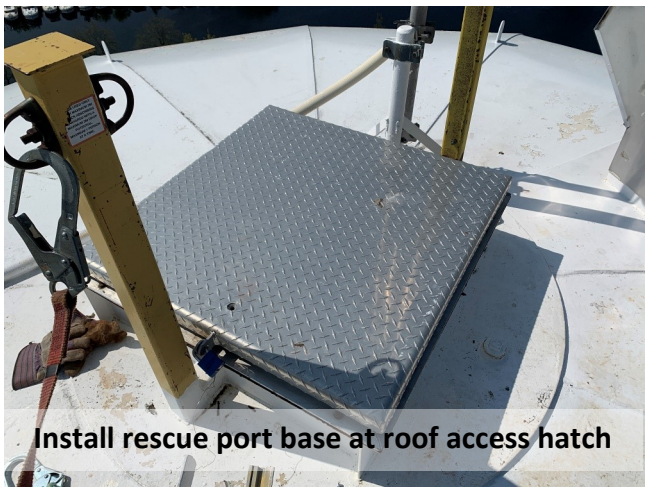

Install rescue port base at roof access hatch

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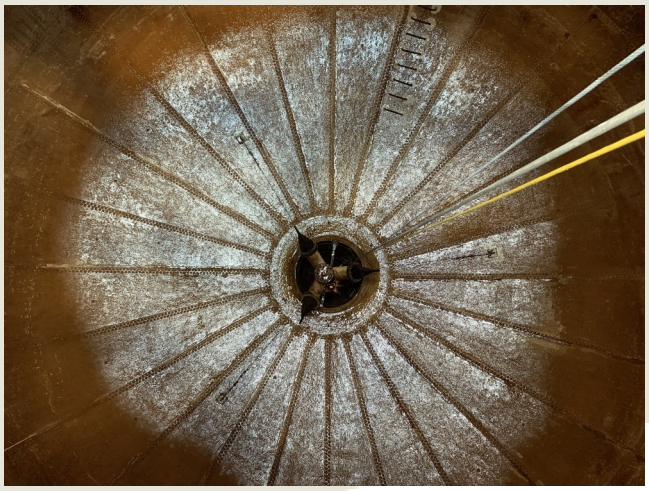

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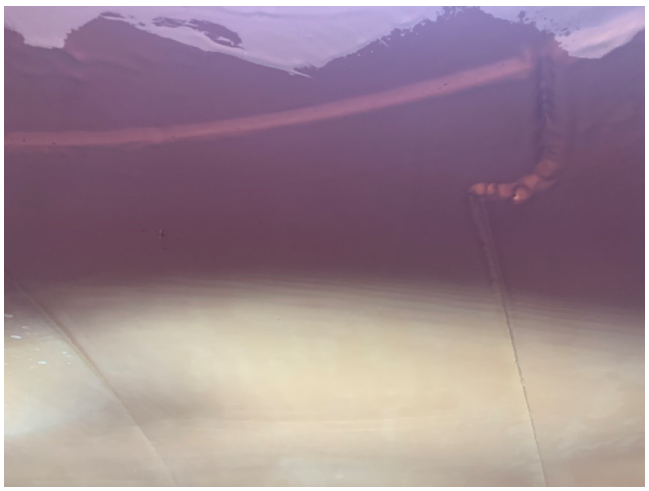

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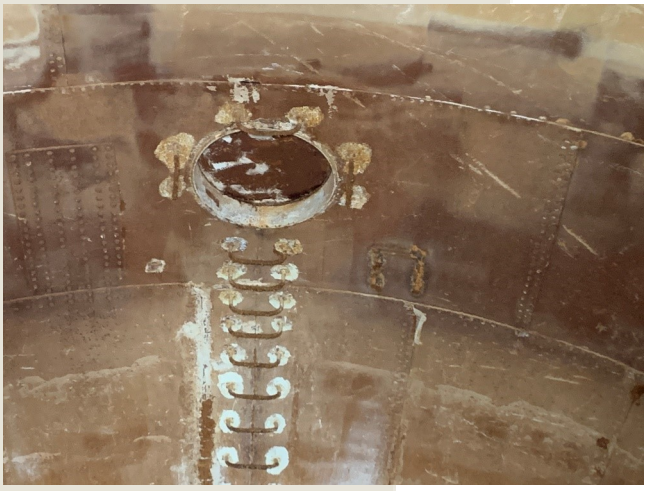

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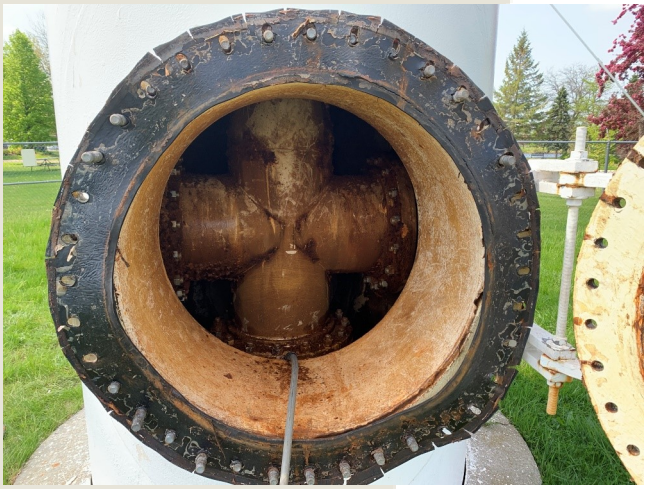

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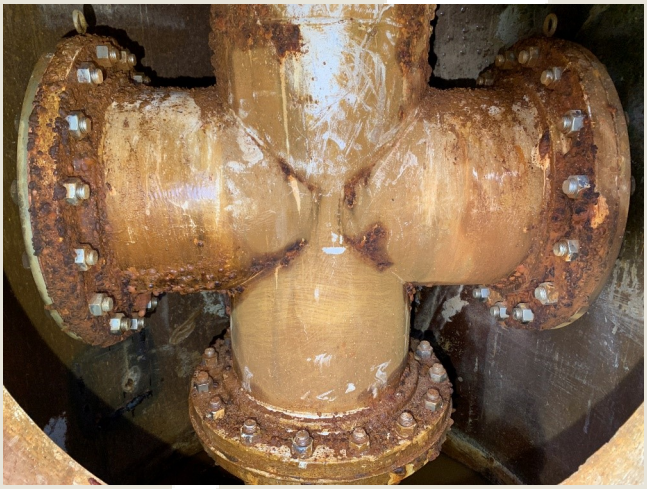

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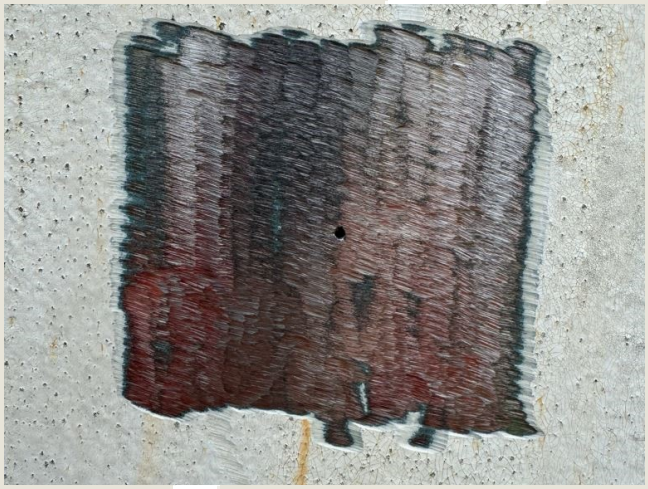

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Landmark Municipal Services

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June 19th, 2024

**Town of Smiths Falls**
**Public Works & Utilities**
43 Abbott Street North
Smiths Falls, ON K7A 1W4

**Attn:** Jason Barlow – Manager Water / Wastewater Treatment
jbarlow@smithsfalls.ca

**Tel:** 613-283-4124 ext. 5501

**Re:** **Job # 40-24-0014**
**Cleaning, Inspection and Report (CIR) - Smiths Falls Multi-Legged Tank**
**Protective Coatings and Linings Report**

Dear Jason,

A comprehensive inspection was performed at the above-mentioned potable water storage facility on May 13th, 2024. Interior surfaces were disinfected in accordance with AWWA C652-19 Method #2.

This letter is a summary of our findings and recommendations for the above-noted water storage tank regarding the general condition of the structure.

## Exterior

This tank is painted with what appears to be an alkyd coating system, although the tank above the balcony was overcoated a number of years ago with an epoxy / urethane system.

The coating system is in very poor condition, with severe weathering, alligator cracking and de-lamination on all structural members such as the anchorage bases, support legs and cross supports, balcony components, as well as on the tank body itself.

All of this paint has not prevented crevice corrosion from occurring between the riveted surfaces, which forces the steel plates to separate and then allows more moisture and subsequent corrosion to form. This corrosion also causes metal loss on the rivets themselves, which can lead to unexpected structural failures.

This is one of the main reasons why riveted construction methods are no longer used, as these structures have a finite lifespan limited to the effectiveness of coatings maintenance, and the faying surfaces between the steel plates cannot be surface prepared and re-painted to prevent further metal loss. Today's engineering and construction practices eliminate any of these unreachable 'dead areas' between structural steel members which, along with regular maintenance, can afford a much longer lifespan.

It can be assumed, because of its age of nearly 100 years, that there would be lead components in any of the finishes applied before the late 1980's.

The piping and valves in the below-grade valve pit are moderately corroded as is the valve pit hatch rim. The pit appears to flood occasionally and is stained with dirt and rust.

## Interior

The interior of this tank is lined with what appears to be a 100% solids polyurethane type of system which is in fair to poor condition. The rivetted construction of this tank provides many potential areas for corrosion to form as areas between the plates only require a pinhole for crevice corrosion to occur.

There are many corrosion cells below the water line, largely where Stress-Induced Plastic Deformation (SIPD) has caused the lining to thin out and then break over the edges formed by ionic displacement within the cold formed steel plates. Because of the cold forming used to create the double ellipsoidal shape of the bowl petals and the riser tube, there are large areas of SIPD, which appears as vertical and horizontal striations that appear to be painted-over corrosion pitting but are not. The relaxing of the crystalline structure of the formed steel and the designed-in diaphragmatic movement of the tank bowl weakens the structure and increases the possibility of plate perforation and leaks, as have been prevalent in the last number of years on this tank. In addition to the effects of SIPD on the plates themselves, the normal flexing of these surfaces also puts shear strain on the plate rivets, which although not observable or measurable, can lead to catastrophic seam failure.

**Next Steps:**

The industry recognized lifecycle for an AWWA D100 (Welded Multi-Legged) is 80-100 years. This *riveted* tank, which was likely not built to any such strict standard, is 100 years old and continues to show signs of structural deterioration and severe coating failure. Several leaks have occurred over the last number of years and that is expected to continue as corrosion cells proliferate, especially on the wet riser interior. Additionally, the tank is undersized and does not provide sufficient fire flow or system capacity to serve the area.

It is not practical or economically feasible to repair an antiquated asset at a cost close to replacing it with a significantly better, larger capacity, state of the art-asset that is less expensive to maintain. Even after a complete refurbishment, this tank will still have areas of hidden corrosion, metal loss and age-related stress faults that cannot be addressed. These defects will affect its structural integrity and its estimated remaining lifespan could not be guaranteed. Rehabilitation could be considered cost prohibitive, as the refurbishment costs would be >$2.0M.

This tank should be de-commissioned and replaced as soon as possible with a new AWWA D107 Composite Elevated tank. Construction is set to commence on the new tank in June /24, with anticipated completion and commissioning in the fall of '25. Until this time, we recommend inspecting the tank every 3-4 months (exterior visual inspection, interior ROV). The next inspection should take place prior to the Winter Season (September or October, 2024). Once the new Elevated Tank is in place, the older one should be demolished.

Yours sincerely,
**LANDMARK MUNICIPAL SERVICES**


**David Baker** - AMPP Certified Coating Inspector – Level 2, CIP #36124
dbaker@teamlandmark.com
905-319-5462

Landmark Municipal Services

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June 19th, 2024
(Revised: September 22nd, 2022)
(Original: December 18th, 2019)

**Town of Smiths Falls**
**Public Works & Utilities**
43 Abbott Street North
Smiths Falls, ON K7A 1W4

**Attn:** Jason Barlow – Manager Water / Wastewater Treatment
jbarlow@smithsfalls.ca

**Tel:** 613-283-4124 ext. 5501

**Re:** **Job # 40-24-0014**
**Cleaning, Inspection and Report (CIR) - Smiths Falls Multi-Legged Tank**
**Recommended Upgrades – Quote #19163 REV 2**

Dear Jason,

Landmark Municipal Services is pleased to provide budgetary pricing for the following repairs & upgrades at the above-mentioned potable water storage facility.

*Please note that HST is not included.*

**Siteworks**

1) Extend Overflow pipe away from footing c/w spillway **$ 2,500**

**Valve Pit / Chamber**

2) Clean pit, Surface prep and paint valves and pipes as required **$ 7,500**

3) Re-paint valve pit hatch cover **$ 600**

4) Install fixed access ladder system for safe entry into valve pit **$ 3,000**

**Exterior Balcony (Catwalk)**

5) Increase height of balcony handrail to 42” min. (Currently 36”) **$ 18,600**
   - Includes shop blast and prime of new material as well as field coatings
   - Includes reinforcement of existing vertical posts

**Accessories**

6) Ladder & Fall Arrest System Upgrades:

   Fixed access ladders are non-compliant to current standards whereas the rung lengths (inside to inside of side rails) are 13”. The minimum required rung length by current

standards is 16". In addition, rung diameters are 5/8" dia. (code requirement is ¾" dia. minimum) and the existing fall arrest system is over-coated in many areas and should be replaced as this prevents the fall arrest trolley from freely gliding along the track.

Ladder to Catwalk upgrades: **$ 102,500**

- Remove and dispose of existing ladder system
- Supply and Install (S&I) new 16" wide galvanized ladder system & support brackets
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops (Honeywell Soll GlideLoc)
- Remove and replace 'D' rings with S.S.

Ladder to tank roof upgrades:

- Remove and dispose of existing ladder system
- S&I new 16" wide galvanized ladder system & support brackets
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops (Honeywell Soll GlideLoc)
- Remove and replace 'D' rings with S.S.

Ladder on Tank Roof upgrades:

- Remove and dispose of existing ladder system
- S&I new 16" wide galvanized ladder system & support brackets
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops (Honeywell Soll GlideLoc)
- Remove and replace 'D' rings with S.S.

7) Design, fabrication and installation of a complete roof handrail system: **$ 25,000**
   - Includes shop blast and prime of new materials as well as field coatings
   - Top rail, mid rail and kickplate
   - 'D' rings will be provided at each vertical post

8) Design, fabrication and installation of interior handrail system around wet riser **$ 7,200**
   - Includes shop blast and prime of new materials as well as field coatings
   - Top rail, mid rail and kickplate

**Confined Space and Rescue**

9) Rescue port base required at hatch to valve pit (or use tripod) **$ 3,500**

10) Rescue port base required at top of ladder at catwalk **$ 4,500**

11) Rescue port base required at tank roof hatch **$ 3,500**

**Periodic Inspection**

12) To provide remote inspection and report (ROV) **$ 2,500**

**Structural Rehabilitation, Coatings and Linings**

13) Scaffold and Hoarding **$ 600,000**

14) Lead abatement, full removal and replacement of existing coatings and linings **$ 1,200,000**

15) ***Budget*** **Allowance for Structural Repairs and Rehabilitation** **$ 200,000**

16) Geotechnical Investigation and potential foundation upgrades **$ 100–250,000**

# Landmark Coatings

## Specialty Mobile Operations

Uncompromising commitment to safety. World class technical skill. Go-anywhere mobility. Landmark delivers factory applied quality to your site.

LANDMARK
Elevating Expectations

Developed and refined throughout 25 years of storage tank coatings and lining work, Landmark's specialty crews work wherever you need them…on projects that we design, fabricate and build, or on existing infrastructure requiring repair and recoating. The Society for Protective Coatings (SSPC) has recognized our technical skills and processes with their prestigious QP-1 certification, so you can rely on thoroughly tested multi-craft services on the most demanding jobs, with the added benefits of uncompromising safety and nationwide mobility.

## We work in a wide range of applications for the private sector, the military and municipal authorities:

- Industrial facilities
- Terminals
- Petrochemical plants
- Water and wastewater
- Oil and gas exploration and production
- Aircraft fueling facilities
- Lead abatement

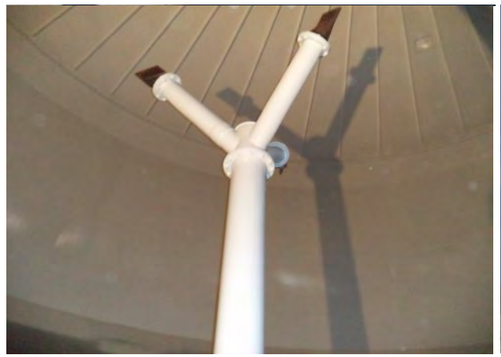
## Safety

Safety is the Key

Landmark's uncompromising commitment to safety protects people, property and the environment. We apply equally rigorous standards for all locations, require ongoing training and testing for all crews, and utilize site evaluations, Hazard Identification and Risk Assessments (HIRA) and root cause analysis to continually drive performance improvement. Landmark employs the best available safeguards for the job, such as advanced, self-contained respiratory equipment on many applications. And we stay at the forefront of best practices and efficient reporting with our membership in ISNetworld. Core values and comprehensive safety and health programs, along with SSPC C-3 accredidation for de-leading steel structures, safeguards against environmental impact.

## Skill

Landmark's technical capabilities start with specification assistance, based on in-depth knowledge of industry suppliers and their latest products, and insights from our own operations. Our crews are fully equipped to perform surface preparation and coatings work on virtually any type of steel structure, utilizing a broad array of coatings including polyurethanes, 100% solids and fiberglass reinforced systems. Our crews perform all coatings work in accordance with the Landmark Quality Assurance Manual for Surface Preparation and Coating. They are trained to implement all of the required process controls and conduct workmanship inspections to meet or exceed all applicable standards and client expectations.


Routine quality evaluations include but are not limited to:

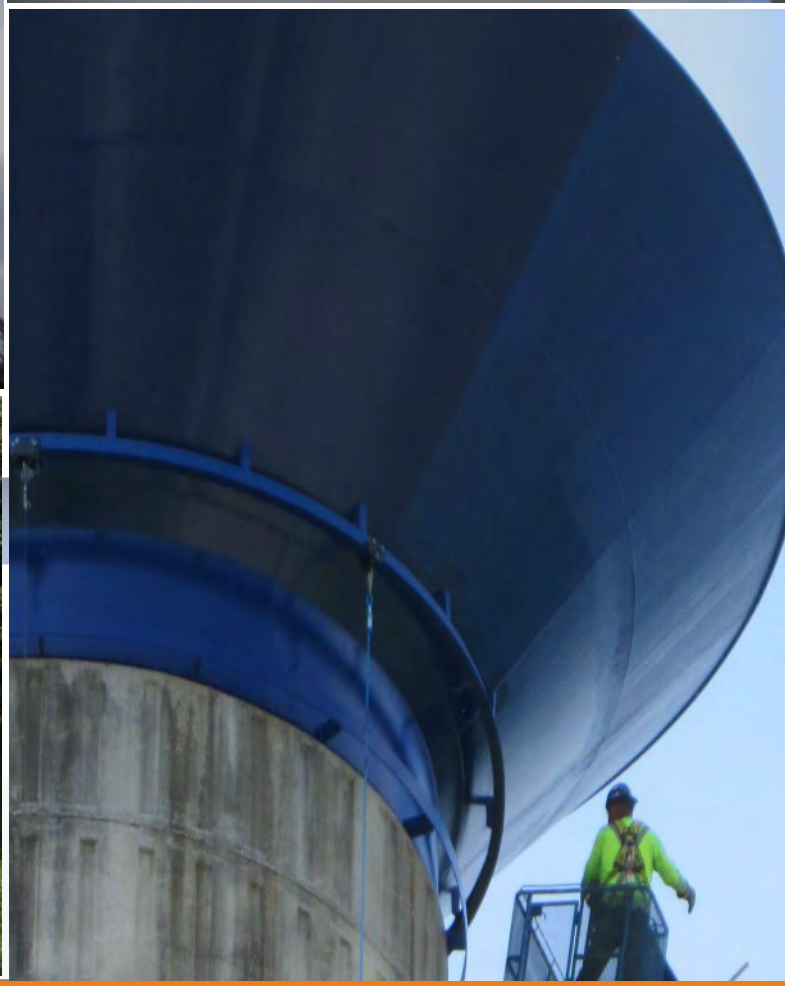
- Measurement of environmental conditions
- Verification of surface cleanliness prior to coating or lining
- Wet and dry film thickness measurement
- Holiday testing (low or high voltage, depending on lining thickness)

*Daily logs track all inspection activity, and are available upon request.*

Specialized equipment enables Landmark to manage dehumidification on work in enclosed spaces such as tank lining and recoating, and to protect the environment with blast media recycling and a full or partial containment on exterior surface preparation and coating. In addition, site specific plans for environmental monitoring, hazardous material management, and disposal of wastes are developed for all tank rehabilitations where existng coatings contain toxic metals. And for high-profile projects with community impact, Landmark has perfected the art of translating even the most intricate graphics to the public stage with precise reproduction. The utilization of dust collection systems ensures complete extraction of dusts for not only a cleaner surface prior to paint application, but as well as containment of dusts generated. This provides necessary air exchanges for confined space work.

## Mobility

Landmark capabilities are completely mobile for deployment nationwide or beyond, without limitations. Specially outfitted trailers move containerized equipment to the project site, and then serve as mobile command centers for the crews. All required assets are at hand, coordinated with local supply lines as appropriate.

You can count on Landmark Mobile Specialty Coatings to reliably protect your investment and extend the life of critical infrastructure. Contact us today to discuss the best solution and a quote on your next project.

LANDMARK
Elevating Expectations

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LANDMARK
Elevating Expectations

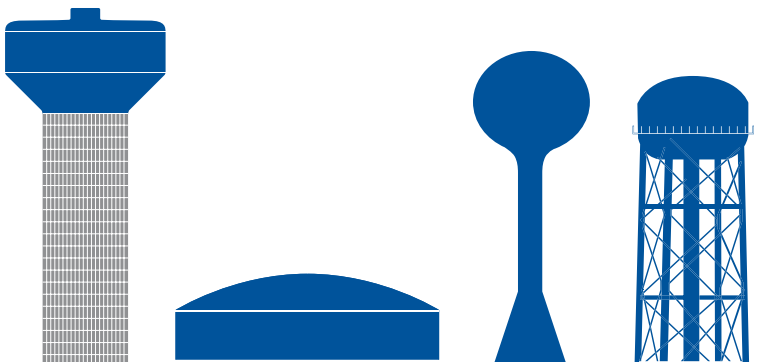
# Municipal Services

**Storage Tank Maintenance**

**Extend Service Life**

**Single Source Responsibility**

Expert Inspection, Maintenance And Repairs
For All Types Of Water Storage Tanks



# Expert inspection, maintenance, and repairs for all types of water storage tanks

- Safe, efficient, issue-free operation of your water storage infrastructure
- Full compliance with all applicable regulations across Canada

Landmark Municipal Services (LMS) brings more than 30 years of insight and innovation in water storage to owners and operators of tanks and systems of all types. Our complete range of services and packages provide predictability, continuity and flexibility for this essential function of municipal governments.

## Inspections

Regular, scheduled inspections are critical for long-term efficiency. LMS conducts various types of inspections, all with comprehensive reports detailing repairs performed or recommended and upgrade requirements, with photo documentation and related cost estimates.

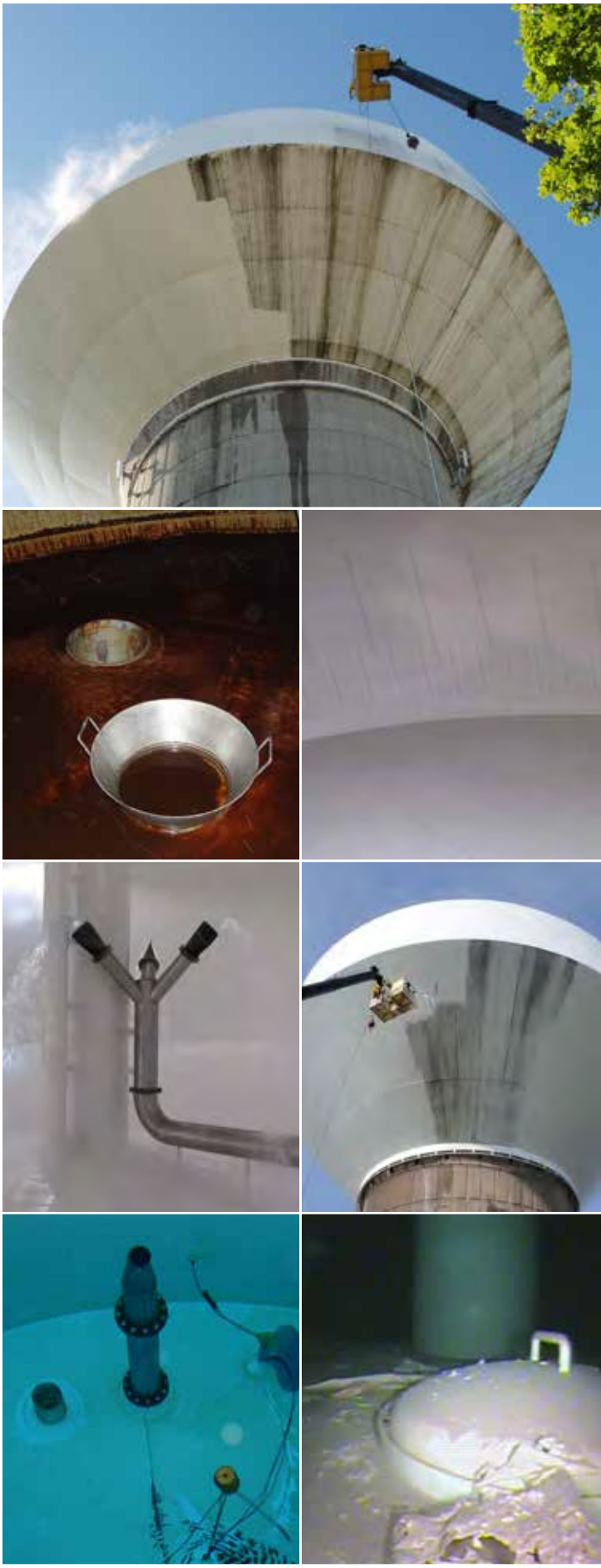
CIR: **Clean, Inspect & Report:** AWWA (American Water Works Association) recommends that water storage tanks be washed out and inspected on a minimum three-year cycle.

SIR: **Safety Inspection & Report:** A thorough interior and exterior review of structure and operations for compliance with applicable government regulations.

ROV: **Remotely Operated Vehicle:** ROV inspections eliminate the inconvenience and expense of taking your tank out of service. LMS provides real-time, in-water evaluations with a remotely operated vehicle.

LMS inspections provide a complete review of all critical factors:

- Site works
- Foundations
- Support structure
- Ladders/landings
- Accessories
- Valves and piping
- Metal conditions
- Exterior coatings
- Interior linings
- Antenna and communications equipment
- Safety and rescue equipment



## Safety Upgrades and Training

LMS can provide safe access and rescue systems that meet or exceed the requirements of the Occupational Health & Safety Act for “vessel entry and rescue” as well as “fall arrest.”



## Tank Modifications

Skilled LMS professionals provide practical, proven and fully engineered modifications for all types of storage tanks, leveraging experience as one of the leading tank builders in North America.  Our vertical integration adds design, fabrication and coatings expertise when needed, with single source management and responsibility.



## Coatings and Linings

LMS services include all surface preparation and recoating of all interior and exterior areas.  Options range from spot preparation to total blast cleaning with full containment for environmental protection.  All lining materials applied to interior surfaces are ANSI and NSF 61 approved.



Safety is the Key




## Inspections:

- Clean, Inspect & Report (CIR)
- Safety Inspection & Report (SIR)
- Remotely Operated Vehicle (ROV)

## Safety:

- Confined space
- Fall arrest
- Training

## Maintenance:

- Tank Asset Management Program (TAMP)
- Annual programs
- Coatings/linings

## Lightning Protection:

- Design
- Installation
- Inspection

## Antenna and Communications Systems

- Design
- Structural fabrication & installation
- Inspection

## Demolition

- Partial
- Total

## Modifications

- Engineering
- Tank hydrodynamic mixing systems
- Site works
- Balconies/handrails
- Manholes
- Hatches
- Venting and vacuum relief
- Welding and fabrication
- Electrical/instrumentation
- Heat trace
- Insulation and cladding
- Security systems

Landmark delivers consistent, high quality results.

Contact us today to discuss the best solution for your next project.

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