

ADDENDUM NO. 2

BID NO. 18-15

**REHABILITATION OF THE 250,000 GALLON, RIVETED STEEL, KROUSE
ELEVATED WATER TANK, ABERDEEN, MARYLAND**

To all holders of the specifications, the following corrections are hereby made. All other items shall remain unchanged.

BID DUE DATE

The due date to receive all sealed bids at the Owner's address is hereby revised to: no later than **1:00 PM EDST ON APRIL 20, 2018.**

SECTION 05500 - MISCELLANEOUS METALS AND TANK REPAIRS

PART 1: GENERAL

Subpart 1.1 Scope, Paragraph A states: "This work is described in the Southern Corrosion report, created in December, 2017 and included as an appendix."

As part of the bid documentation, the City of Aberdeen is providing the Southern Corrosion Inspection Report to bidders attached hereto. The inspection report performed by Southern Corrosion is not to be considered the final paint specifications required for the project. Refer to the paint specifications in Addendum No. 1 for the required specifications.

SECTION 09900 - WATER STORAGE TANK PAINTING

PART 3: EXECUTION

Subpart 3.12 Logo Painting, Paragraph A shall be **DELETED** and not considered for this project. The OWNER does not require a logo to be painted on the water tower.

Acknowledgement of Addendum

Name: _____

Company: _____

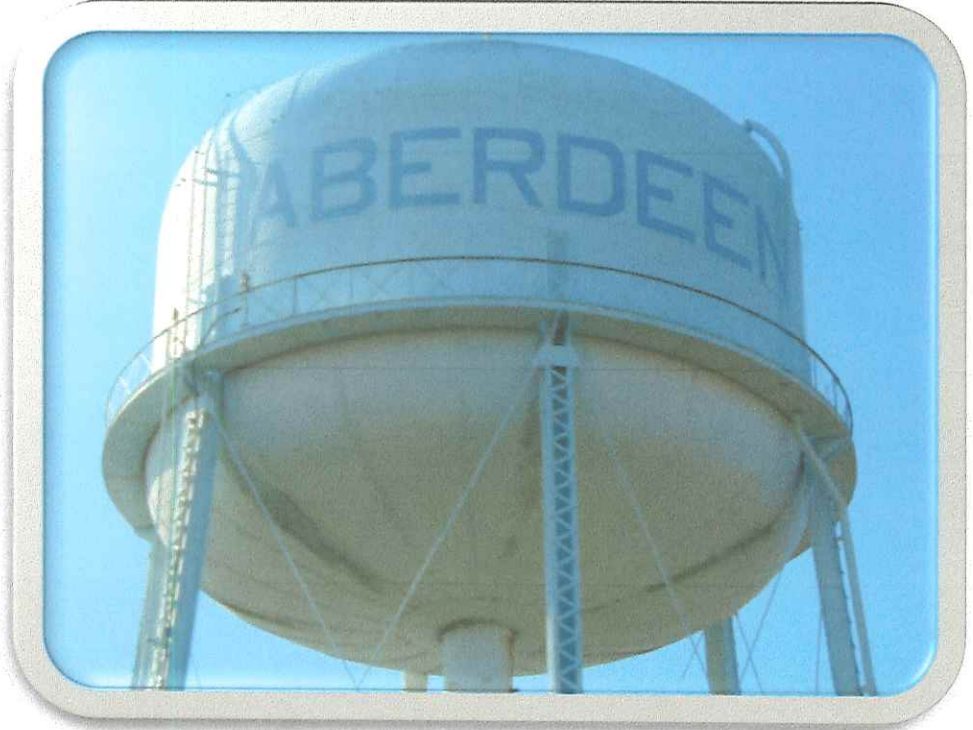
Date: _____

Signature: _____



INSPECTION REPORT

**250,000 GALLON RIVETED ELEVATED
KROUSE WATER TANK
ABERDEEN, MARYLAND**

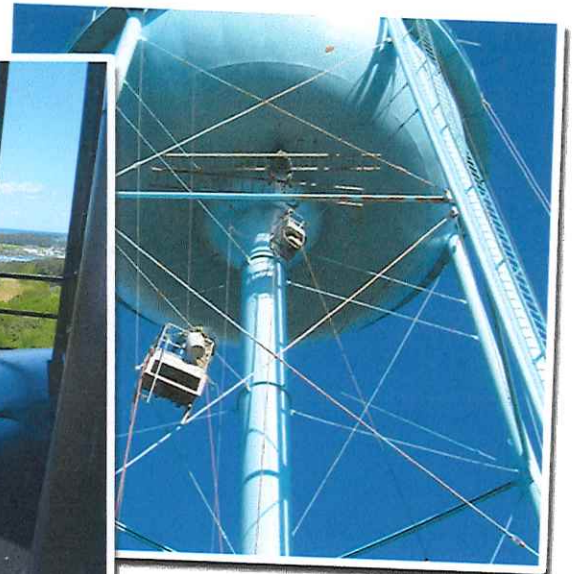


Inspected by:
SOUTHERN CORROSION INC.
738 Thelma Road
Roanoke Rapids, NC 27870
1-800-828-0876
Fax: 252-535-3215

W.A. Skilton PE # 7972
exp. date 7-21-2019

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SOUTHERN CORROSION INC. INSPECTION REPORT

Customer: City of Aberdeen, Maryland

Inspection Date: November 30, 2017

Inspector: Ryan Lucy NACE Coatings Inspector Level 1 - Certified, Cert. No. 071603

Tank Information:

Tank Name: Krouse Elevated Water Tank

Capacity: 250,000 gallons

Tank Erector: Unknown

Date Erected: Unknown

Tank Style: Riveted Elevated Tank

Roof: Ellipsoidal

Bowl: Ellipsoidal

Height to Low Water Level: 70'

No. of Legs: 6, single laced

Leg Width: 15"

No. of Strut Levels: 1

Security and Sanitary

The tank site is enclosed by a fence equipped with three strands of barbed wire angled outward, serving as a trespass preventative. The access ladder is not equipped with a climb prevention device (ladder guard), although the leg on which the ladder is mounted is equipped with a steel plate over the lower portion of the laced leg, which is intended to serve as a climb prevention device. The other legs are not equipped with climb prevention devices.

The tank is equipped with a standard-style vent. There is a steel shroud antenna mount attached to the vent. There is observed rust exceeding 95% of shroud surfaces.

The tank is equipped with an overflow pipe that extends through the knuckle (the area where the roof and shell wall meet), curves downward, extends through an opening in the catwalk floor, and extends outward where it attaches to the column leg. The overflow pipe continues adjacent to the column leg to grade. The discharge end of the overflow pipe is covered with a screen and a flapper. Both the screen and flapper are securely attached.

Exterior

The exterior coating system is in fair condition. The coating is generally fading, heavily chalking, and is past the end of its expected service life. Observed localized corrosion is present on the riser column and on irregular surfaces throughout the tank exterior. Dry film readings conducted on various exterior locations were recorded as follows: 7.2-13.2 mils on the column legs/riser column; 11.2-12.6 mils on catwalk, shell wall, and roof surfaces.

Foundations:

The concrete foundations appear to be in fair to poor condition. There is visible cracking on

many of the concrete foundations. Water and ice penetrating these areas will cause this situation to become more pronounced. At this time we do not believe the cracks to be structurally significant. Additionally, several of the foundations are covered by surrounding earth.

Base Plates:

The base plates are in good condition and are securely fastened to the concrete foundations. There is surface rust occurring on less than 5% of observable base plate surfaces. Debris was present on the inner portions of the base plates near the anchor bolt.

Anchor Bolts:

Each column leg is equipped with one 1 3/4-inch anchor bolt. There is corrosion present on less than 5% of anchor nut and bolt surfaces.

Column Legs:

The tank is equipped with six single-laced 15 inch column legs. Observed corrosion was present on less than 5% of surfaces, although staining is present where back to back steel exists (leg laces). The overflow pipe is attached to a column leg via a series of welded stand off support brackets. Heavy localized corrosion is present on the welded areas.

Rods & Struts:

The tank is not missing any rods. The rods measure 1 3/4-inch in diameter and are securely attached to the column legs. Light surface rust was observed on the irregular surfaces of the rods (threads) not exceeding 5% of total rod surfaces. The laced struts are in good condition with no corrosion observed.

Riser Pipe:

The riser column measures 4 feet in diameter and is in poor condition. Observed localized corrosion is present on approximately 15-20% of riser column surfaces. Pin point rust is evident, as is loss of steel.

The riser column is equipped with an oval-shaped manway measuring 18 inches in width and 12 inches in height. A new gasket was installed after the wash out of the tank interior.

Prior to the inspection, a leak was reported where the riser column meets the tank bowl. Welders observed an area on the tank interior that could be the source of the leak and attempted a repair at the time of inspection.

Tower Ladder:

The tower ladder is securely attached to the column leg via bolted stand off supports. The ladder measures 17 inches in width, with rungs that are spaced 12 inches apart. The toe space measures 6 inches. The rungs are square and turned on end to form an diamond shape. There were no missing, bent, or otherwise severely deteriorated rungs on the tower ladder. The ladder is equipped with a cable-style fall prevention system as required by OSHA fall prevention regulations. The ladder is equipped with standoffs mounted on the ladder rungs approximately

25 feet apart designed to hold the safety cable in place. One of these standoffs has a piece of steel wire holding the fall prevention cable in place. This standoff prevents the climber from proceeding without detaching from the cable and reattaching on the other side of the obstruction.

The access ladder is not equipped with a climb prevention device. Overall, corrosion exists on less than 5% of the ladder surfaces.

Tank Bowl:

The tank bowl is in good condition with mildew observed on approximately 15-20% of bowl surfaces. Corrosion was observed on irregular surfaces (seams/overlapping sheets). Loss of adhesion was observed on rivets on the tank bowl.

The tank bowl is in good condition. There were no leaks evident at the time of inspection. The coatings appear to be in fair condition with light observed corrosion present, primarily on the ring securing the riser column to the tank bowl.

Underside of Catwalk:

The underside of the catwalk is in good condition. Corrosion was observed on approximately 20% of surfaces.

Topside of Catwalk:

The catwalk balcony is equipped with a toe plate, supports and a hand rail that are fastened to the catwalk. The catwalk balcony measures 27 inches in width; the toe plate measure 7 inches in height; the hand rail measures 36 inches in height, and its support rails intersect 19 inches from the catwalk floor. Although current OSHA safety regulations state that the hand rail height must be 42 inches, it is our understanding based on the referenced interpretation, structures existing 60 days prior to the 42" regulation will not be cited by OSHA¹. Effectively, no remediation is necessary for the handrail structure.

The catwalk floor is in fair condition with localized corrosion on approximately 15% of surfaces. The catwalk floor is equipped with weep holes to prevent pooling.

Tank Shell:

The tank features a ladder that provides access from the catwalk to the roof. The shell ladder is attached to the shell wall and tank roof by welded stand off supports. The shell ladder is equipped with a cable-style fall prevention system as required by OSHA fall prevention regulations. The ladder is in good condition with no missing, bent or deteriorated rungs or railings.

The exterior shell wall appears to be in fair condition with no leaks observed. Mildew was observed on irregular surfaces (seams/rivets). No corrosion was observed on the shell wall.

Tank Roof:

The tank roof is in fair condition with observed corrosion observed on less than 5% of surfaces.

¹ https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27295.

The tank roof is equipped with a "church window" style access hatch that measures 26 inches in height and 18 inches in width. The access hatch has a lip/curb between the top and side portions of the lid and the roof, but not on the bottom portion. The existing curb measures approximately 2 inches in height. The American Water Works Association (AWWA) recommends that the primary roof opening be square or round and measure 24 inches or 30 inches. Additionally, the AWWA recommends a curb height of 4 inches, with 2 inch downward cover overlap on the hatch, to prevent the entry of foreign debris. The hinges are functioning properly.

The tank is equipped with a standard roof vent. Proper ventilation is inhibited by a steel shroud that appears to function as an antenna mount. Corrosion is present on over 95% of shroud surfaces. The existing vent and its surrounding structure should be removed and replaced with a frost free aluminum vent.

Interior

The tank interior is in fair condition with observed staining consistent with elements in the water. Remnants of spider rods that were once mounted to the interior of the tank, are still attached in one area along the interior wall painter's ring. These spider rods were used when the tank was initially built to hold the shape of the bowl but are no longer necessary. They are usually removed, as they are an obstruction when doing interior maintenance and are a source of rusting. All have been removed except for this small section.

A washout procedure was performed to remove debris and sediment from the tank interior. Repairs were executed to remedy a leak in the bowl of the tank where the riser connects. After repairs were executed, the bare substrate was touched up with Aquatapoxy.

The tank is equipped with a cathodic protection system that is no longer in use.

Ladders:

The tank is not equipped with an interior ladder. We recommend that an OSHA compliant interior ladder be installed to permit access to the interior wet areas of the tank. Additionally, the interior ladder should be equipped with a fall prevention cable.

Ceiling:

The interior ceiling appears to be in good condition with less than 5% visible surface corrosion.

Shell:

The observed interior shell wall has apparent staining and discoloration, which is generally caused by the elements in the water.

Bowl:

A significant amount of sediment was removed during the washout procedure. There is localized corrosion present on less than 5% of bowl surfaces.



Analytics Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 365-3000 Fax: (804) 365-3002
AIHA Accreditation # 176, ID 100531

December 13, 2017

EDWARD SOLTIS
SOUTHERN CORROSION INC
738 THELMA ROAD
ROANOKE RAPIDS, NC 27870

Laboratory Workorder ID: V342007

Client Project ID: ABERDEEN MD
Received: December 8, 2017
Reported: December 13, 2017

Attached are the results we obtained on the analysis of your samples submitted to Analytics. Any Chains-of-Custody associated by this sample group are enclosed. Air concentrations are calculated as a convenience to the client and the overall accuracy of this result depends on both the accuracy of the air volume and the amount found by analysis. Theoretical air volumes for passive monitors are calculated using the sampling time submitted and the manufacture's listed sampling rate for each compound. Results provided in this report relate only to the items tested.

For blanks and non-detects the results indicated with a '<' value represents the reporting limit for the analysis. Unless otherwise noted results are not corrected for blank values.

Unless the signature of the appropriate manager(s) appears on this report, this report should be considered PRELIMINARY and is subject to change.

We appreciate your confidence in allowing Analytics to be your testing laboratory. Any questions regarding this report can be addressed by calling our customer services department at (800) 888-8061.

A handwritten signature in black ink, appearing to read "Andrew L. Teague". The signature is written in a cursive, flowing style.

Andrew L. Teague, CIH
Technical Director

Enclosures



Analytics Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 365-3000 Fax: (804) 365-3002
AIRA Accreditation # 176, ID 100531

Final Report

Work Order V342007

SOUTHERN CORROSION INC
738 THELMA ROAD
ROANOKE RAPIDS, NC 27870

Customer: 32509555
Attention: EDWARD SOLTIS
PO Number EDWARD SOLTIS

Date Received: 12/08/17
Client Project ID ABERDEEN MD

Order	V342007001	Sample	INTERIOR	Media	Paint Chip	Sample Date	11/23/2017	Sample ID	
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Lead	NIOSH 7092M	12/12/17	-	9.79 ug/g			--	< 9.79 ug/g < 0.000979 %



Analytics Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 365-3000 Fax: (804) 365-3002
AIHA Accreditation # 176, ID 100531

Final Report

Work Order V342007

General Laboratory Comments

Abbreviations:

ug = micrograms; mg=milligrams; g = grams, ppm=parts per million (volume), ppb = parts per billion (volume), mg/M3=milligrams per cubic meter of air, ug/M3=micrograms per cubic meter of air; Min=minutes, Qual=Qualifiers



Analytics Corporation
10328 Stony Run Lane
Ashland, Va 23005
Phone: (804) 365-3000 Fax: (804) 365-3002
AIHA Accreditation # 176, ID 100531

December 13, 2017

EDWARD SOLTIS
SOUTHERN CORROSION INC
738 THELMA ROAD
ROANOKE RAPIDS, NC 27870

Laboratory Workorder ID: V342006

Client Project ID: ABERDEEN MD

Received: December 8, 2017

Reported: December 13, 2017

Attached are the results we obtained on the analysis of your samples submitted to Analytics. Any Chains-of-Custody associated by this sample group are enclosed. Air concentrations are calculated as a convenience to the client and the overall accuracy of this result depends on both the accuracy of the air volume and the amount found by analysis. Theoretical air volumes for passive monitors are calculated using the sampling time submitted and the manufacture's listed sampling rate for each compound. Results provided in this report relate only to the items tested.

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Unless the signature of the appropriate manager(s) appears on this report, this report should be considered PRELIMINARY and is subject to change.

We appreciate your confidence in allowing Analytics to be your testing laboratory. Any questions regarding this report can be addressed by calling our customer services department at (800) 888-3061.

A handwritten signature in black ink, appearing to read "Andrew L. Teague". The signature is fluid and cursive.

Andrew L. Teague, CIH
Technical Director

Enclosures



Analytics Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 366-3000 Fax: (804) 366-3002
AIHA Accreditation # 176, ID 100531

Final Report

Work Order V342006

SOUTHERN CORROSION INC
738 THELMA ROAD
ROANOKE RAPIDS, NC 27870

Customer: 32509555
Attention: EDWARD SOLTIS
PO Number EDWARD SOLTIS

Date Received: 12/08/17

Client Project ID: ABERDEEN MD

V342006001	EXTERIOR	Media	Paint Chip	Sample Date	11/23/2017	Sample ID	AS-1110-0104
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Lead	NIOSH 7082M	12/12/17	--	9.85 ug/g			--	74600 ug/g 7.46 %



Analytcs Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 365-3000 Fax: (804) 365-3002
A/IHA Accreditation # 178, ID 100531

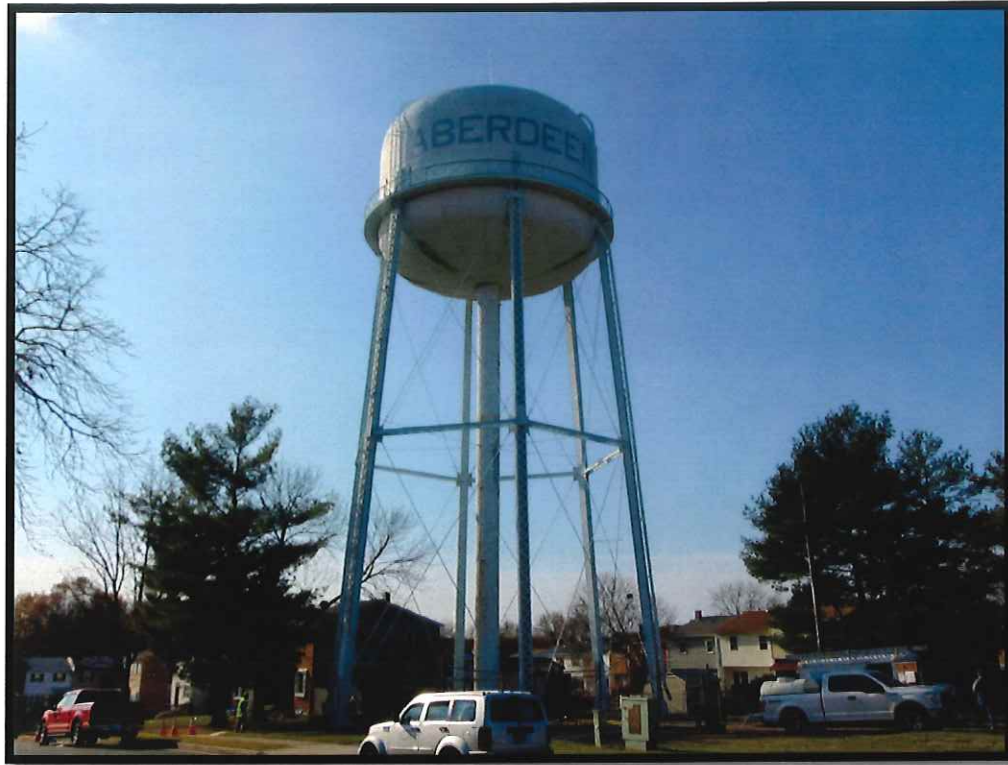
Final Report

Work Order V342006

General Laboratory Comments

Abbreviations:
ug = micrograms; mg=milligrams; g = grams, ppm=parts per million (volume), ppb = parts per billion (volume), mg/M3=milligrams per cubic meter of air, ug/M3=micrograms per cubic meter of air; Min=minutes, Qual=Qualifiers

View of the tank and column legs.



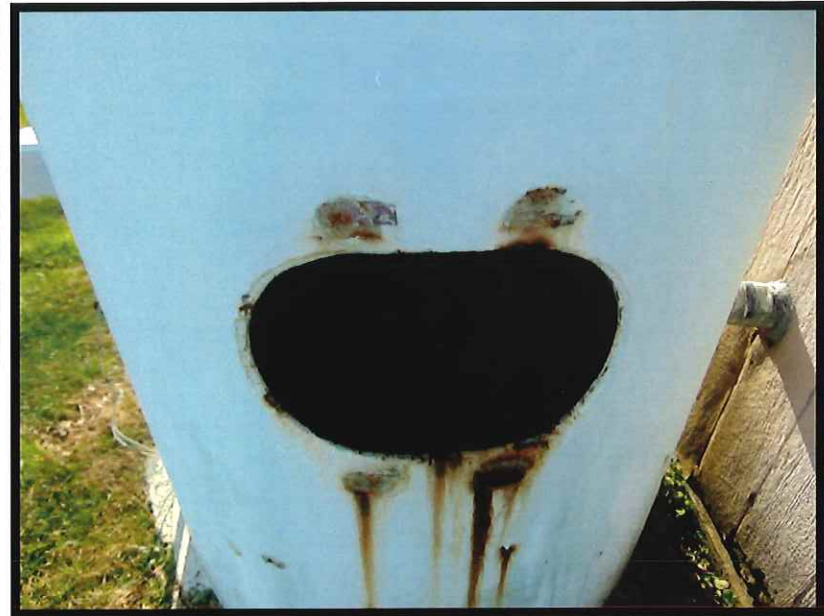
View of the concrete foundations, base plates, and anchor bolts.



View of the base plates, and anchor bolts.



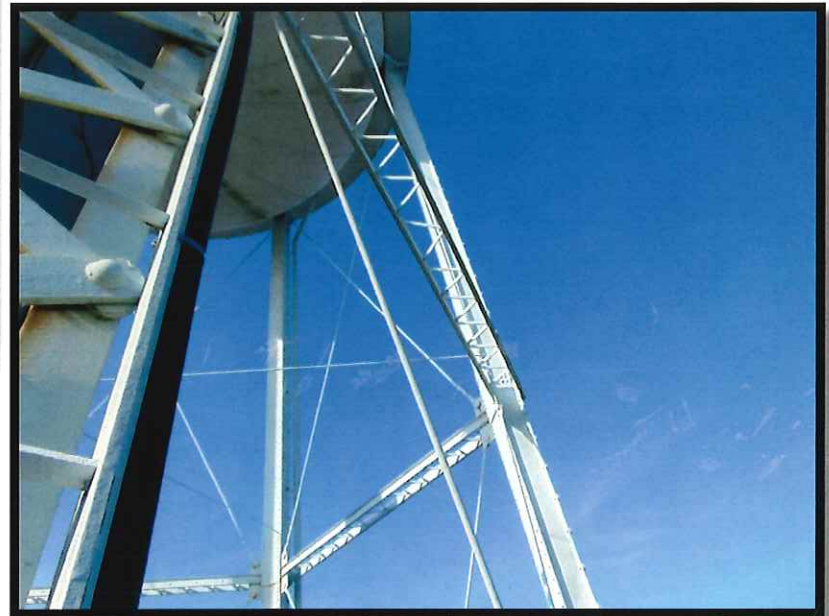
View of the riser column and riser manway.



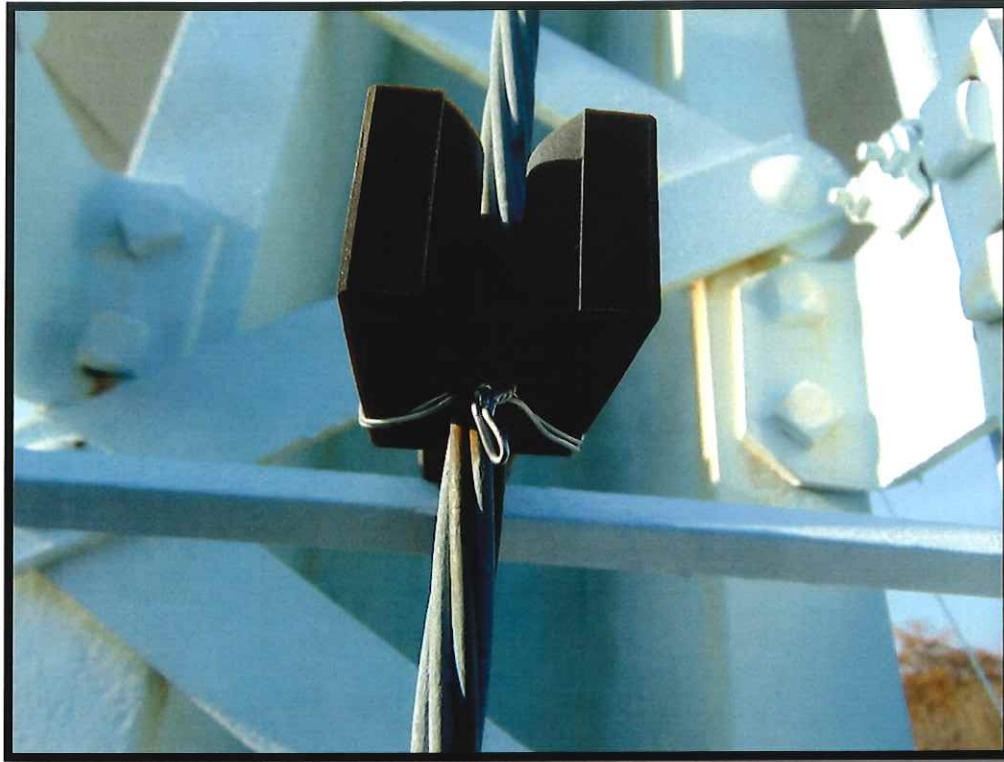
View of the wind rods and turnbuckles.



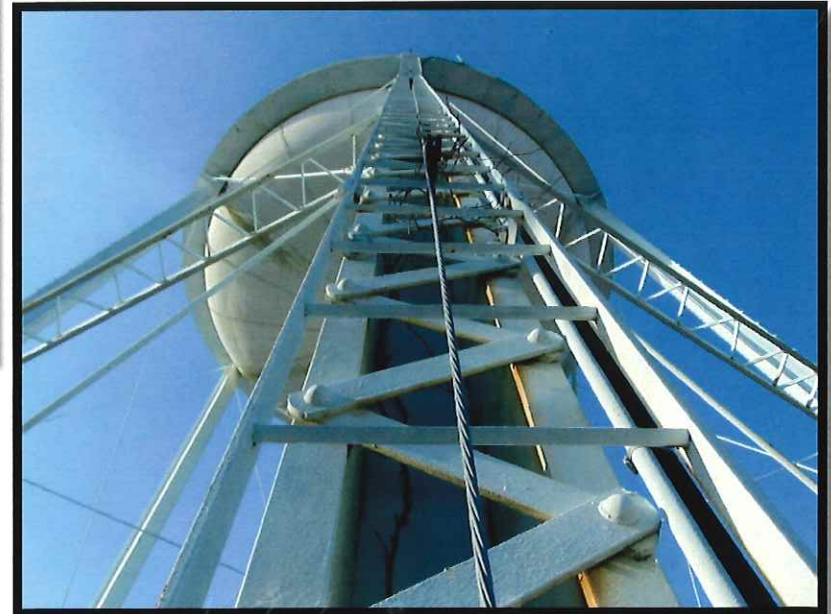
View of the struts.



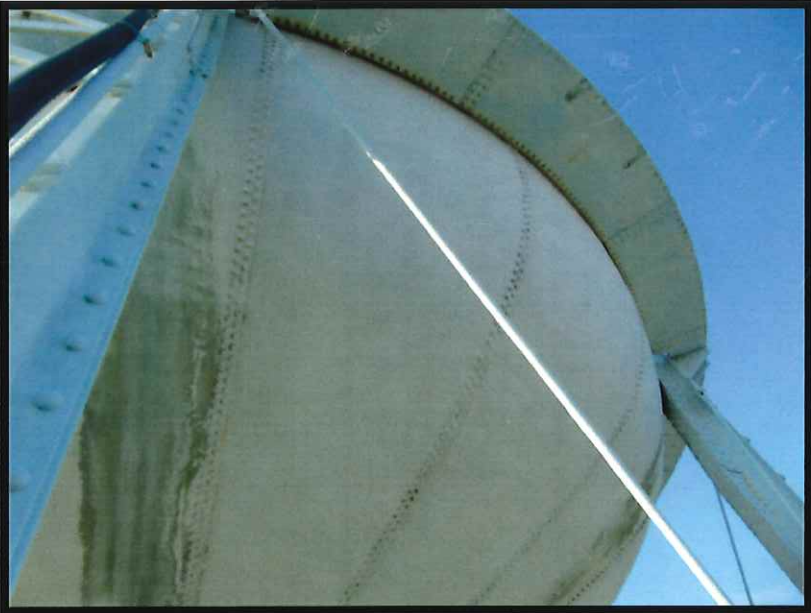
View of the access ladder, climb prevention plate, fall prevention cable, and cable stay.



Pictured above is the cable stay where a wire has been implemented in order to prevent the fall prevention cable from pulling out.



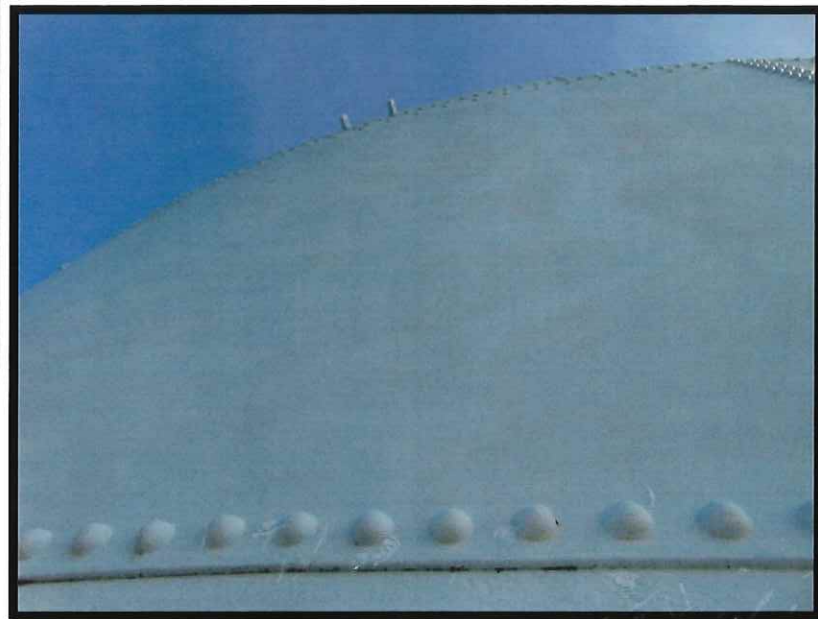
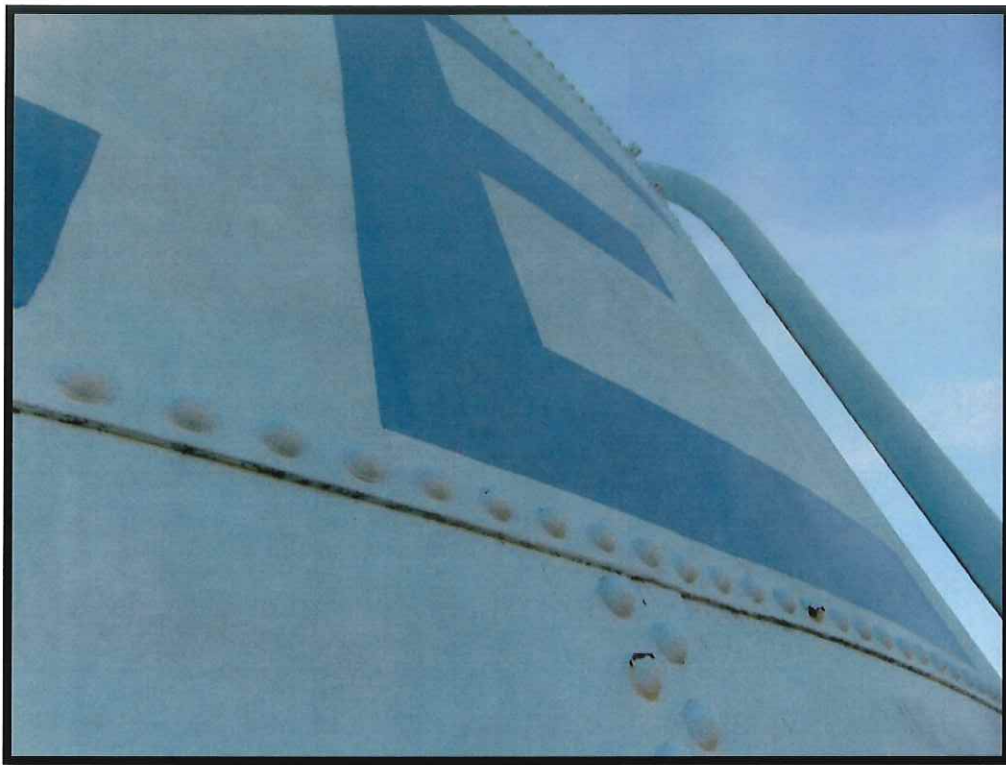
View of the tank belly and underside of the catwalk.



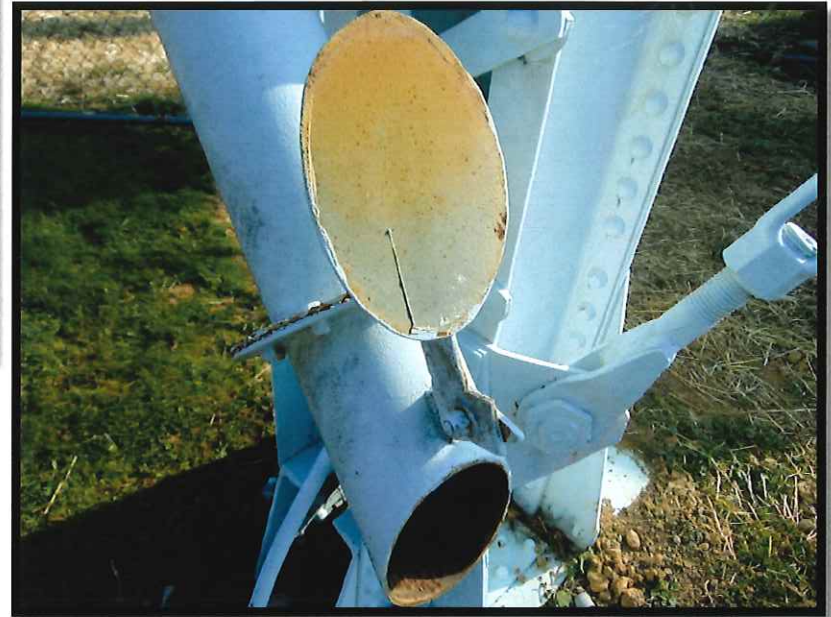
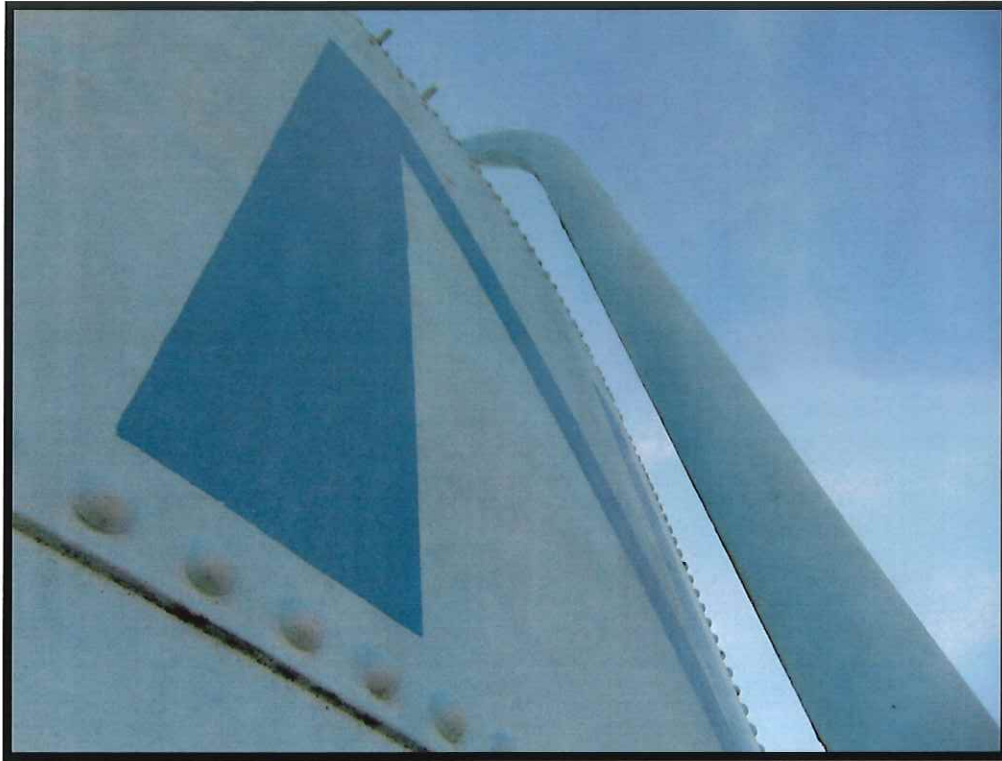
View of the catwalk and handrail.



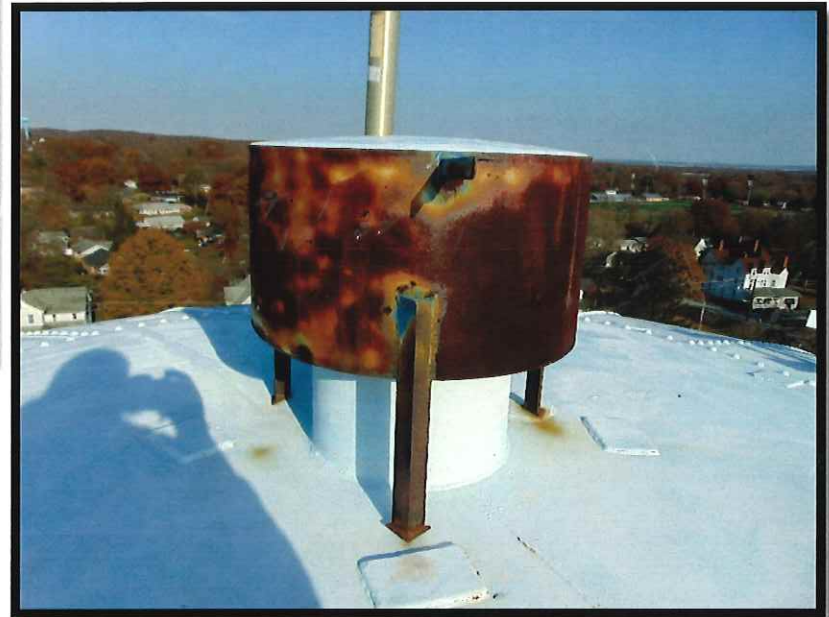
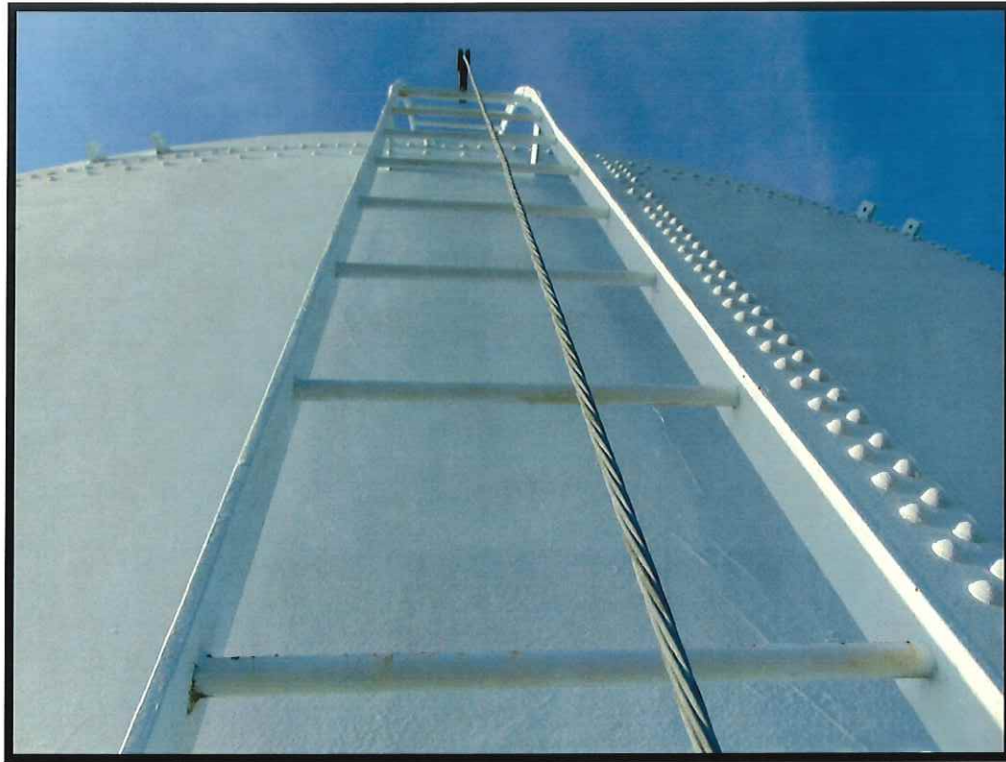
View of the shell wall and shell wall manway.



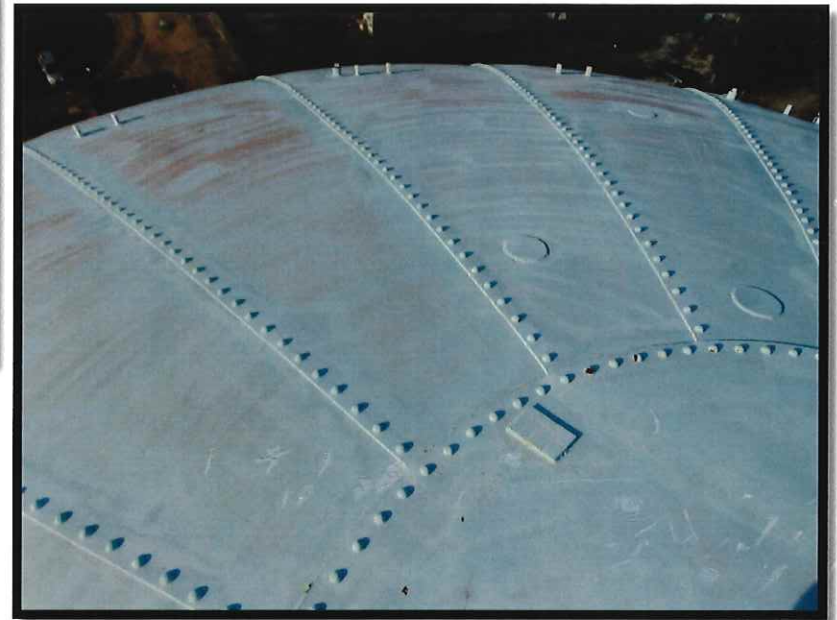
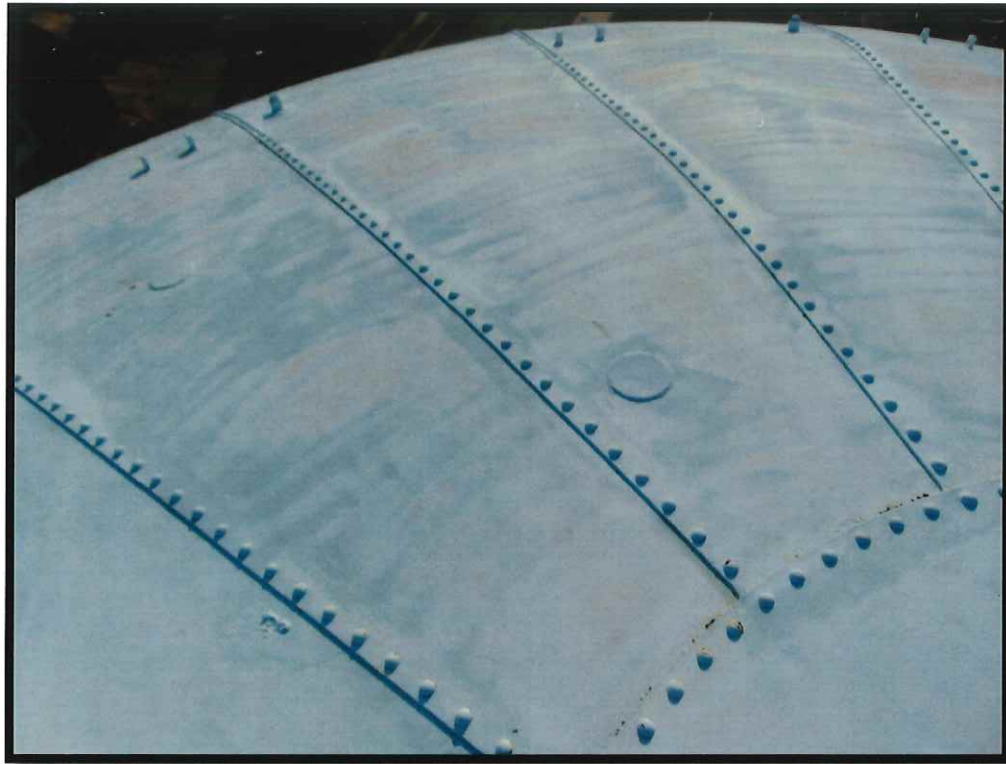
View of the overflow pipe and discharge end.



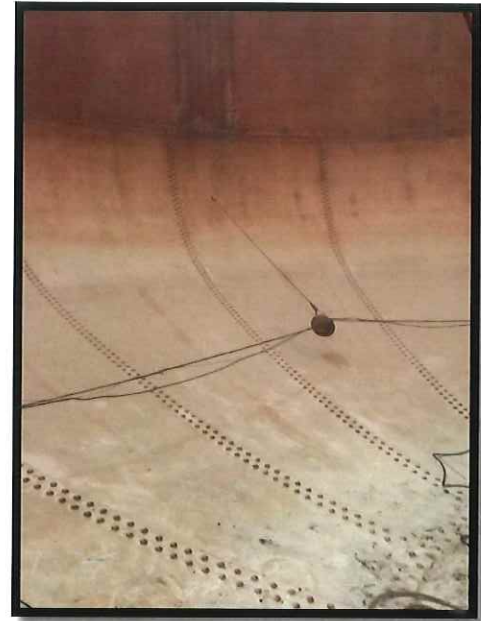
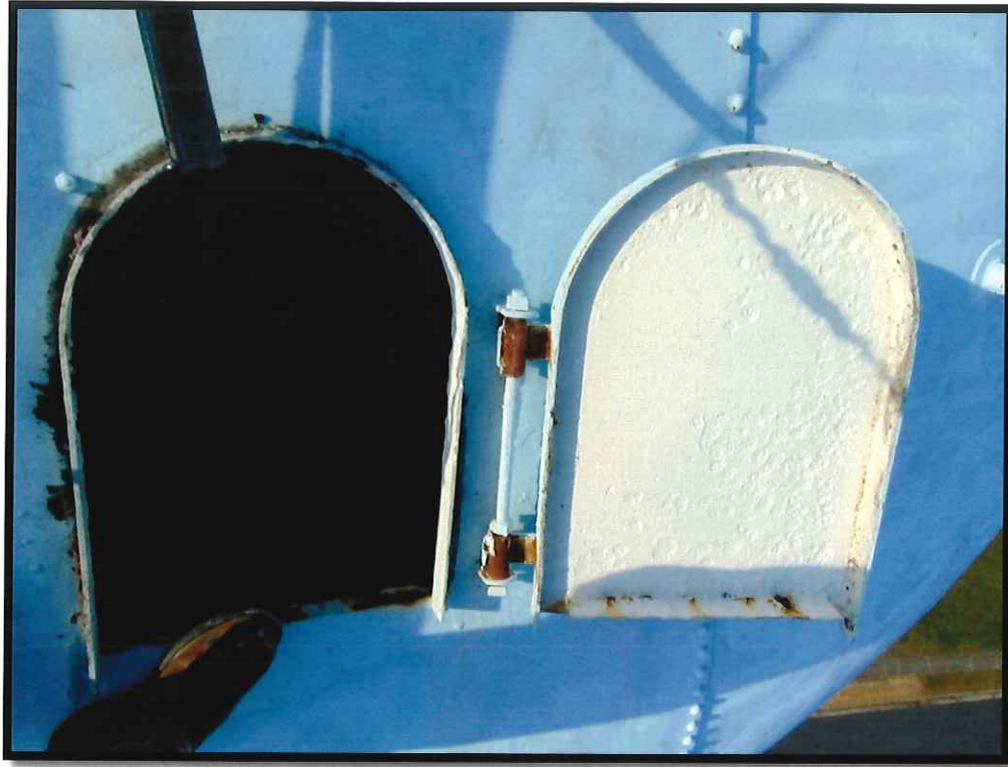
View of the shell/roof ladder and roof vent/vent shroud.



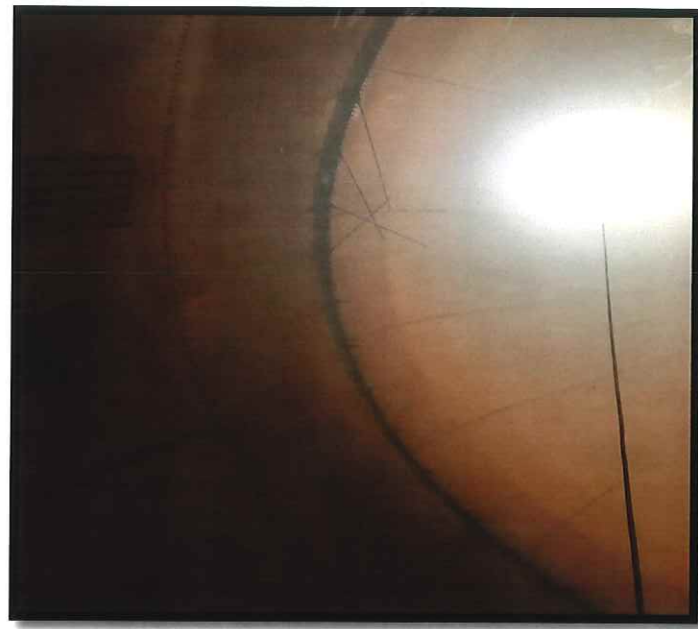
View of the roof.



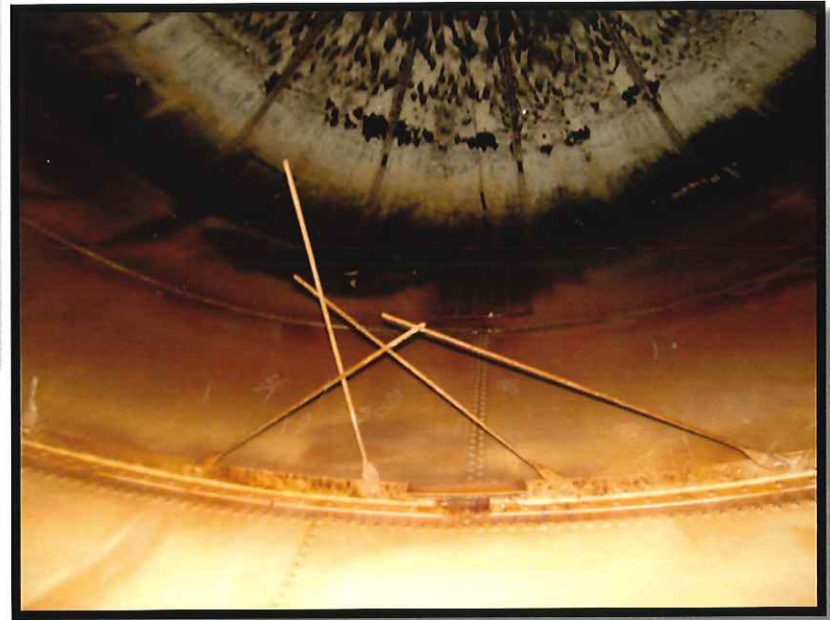
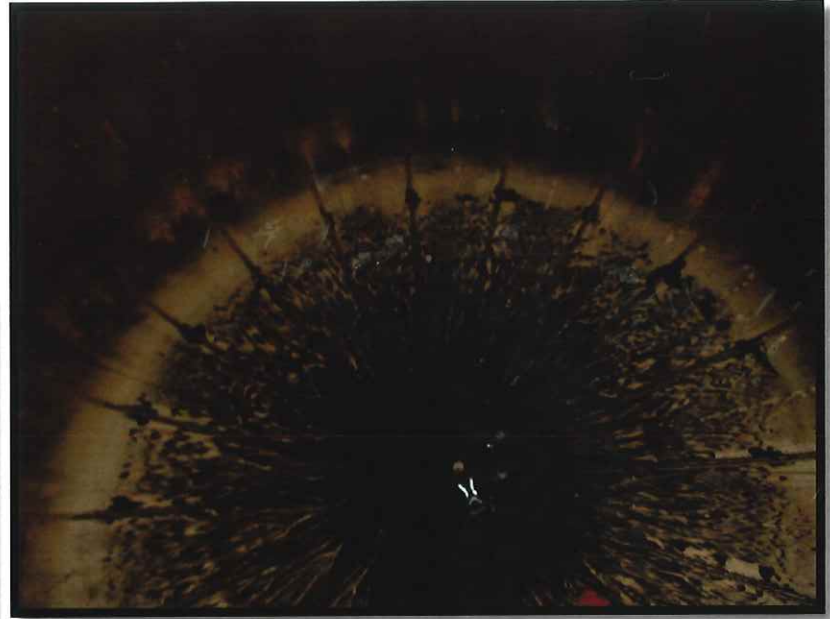
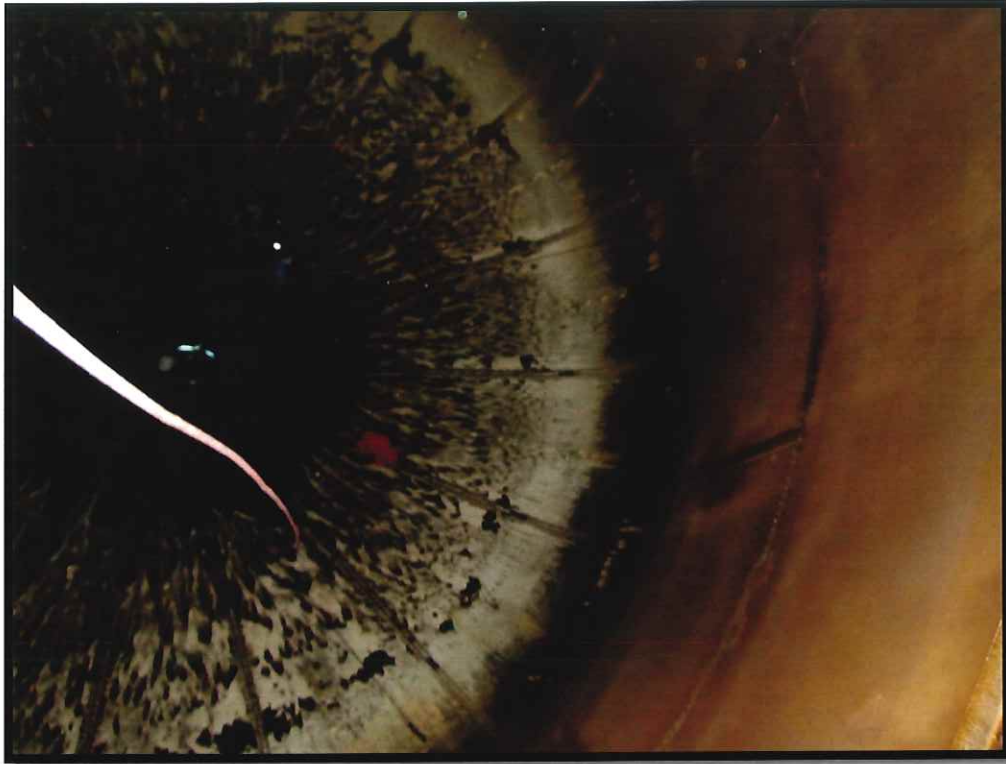
View of access hatch and tank interior.



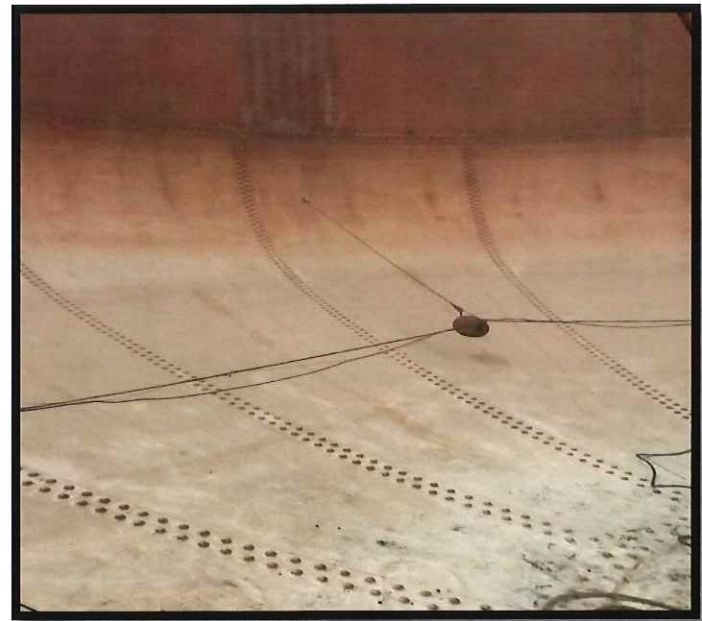
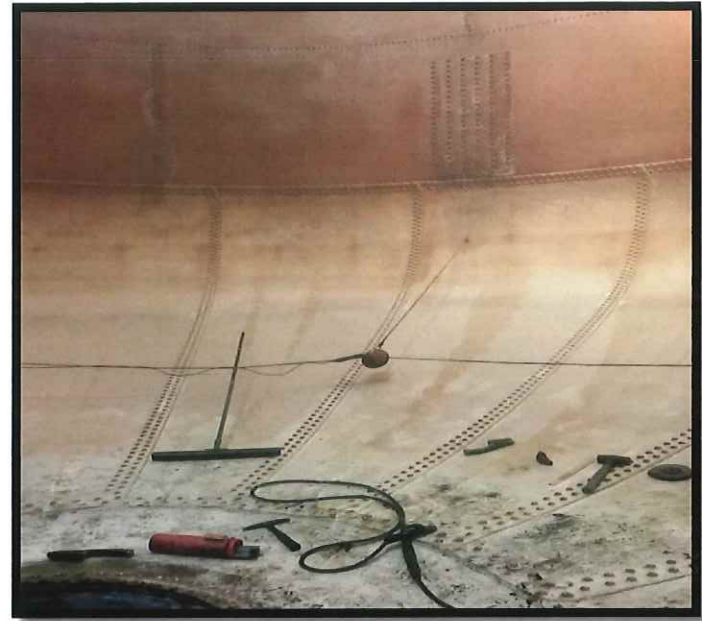
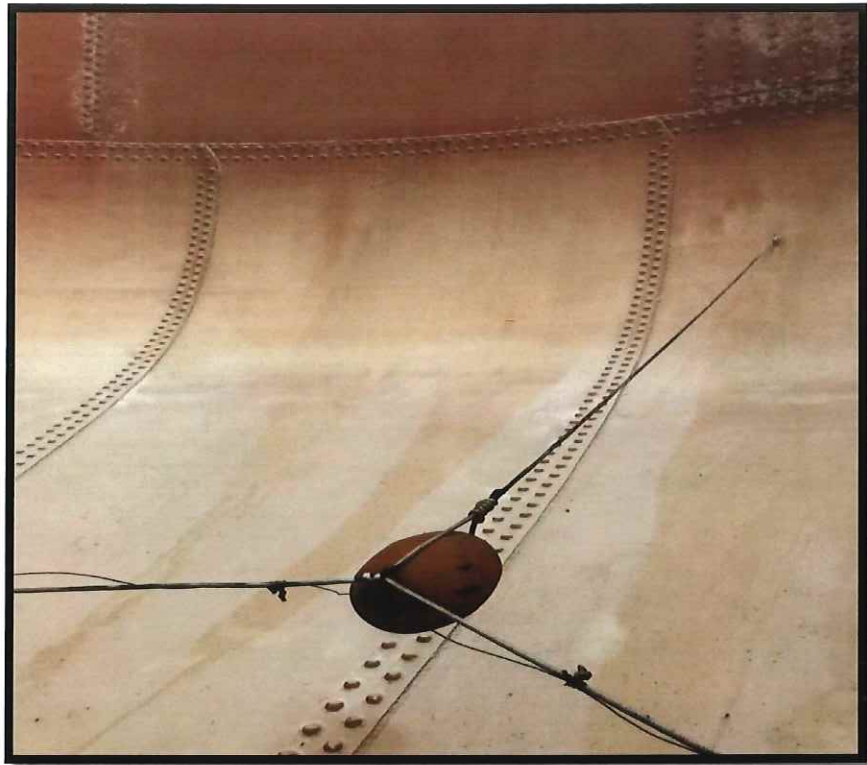
View of the interior roof and left behind spider rods.



View of interior pictures pre-washout
and left behind spider rods.



View of interior pictures post-washout showing remnants of cathodic protection system.



Assessed Deficiencies & Recommendations

1. Power wash the foundations. The stress cracks in the concrete foundations should be filled with Sikaflex 1a polyurethane caulk. The entire foundation should then be painted with an Epoxy Mastic Paint such as Sherwin Williams Macropoxy 646 Epoxy. [REDACTED]
2. The structure adjacent to the riser column prevents full 360-degree access to the riser column. We recommend that when the structure is replaced it be moved further away from the riser column.
3. The design of the column legs (single-laced) potentially enables access. The column legs should have climb prevention devices installed to prevent trespassers from climbing the laced legs. One such device is currently installed on the column to which the access ladder is mounted. [REDACTED]
4. The bottom of the column access ladder does not have a ladder guard installed. We recommend installing a ladder guard equipped with a locking mechanism to prevent trespassing. [REDACTED]
5. The ladder is equipped with a series of guides that are designed to hold the fall prevention cable in place. One of these guides fails to hold the cable; on the guide is a piece of wire that holds the cable permanently in place. At this juncture, the climber is required to detach from the fall prevention cable to bypass the guide. We recommend that this cable guide be replaced by one designed with a 90-degree angle at the location holding the cable. This will prevent the cable from becoming loose while also allowing the climber sufficient access without detaching from the safety cable. [REDACTED]
6. The roof vent and its shroud should be removed and replaced with an aluminum, frost-free roof vent. [REDACTED]
7. The "church window" style access hatch and its inadequate curbing should be replaced with an access hatch that meets AWWA recommendations. Since the existing hatch measures 26 inches in length, we recommend that a 30-inch square hatch with a curb of at least 4 inches in height be installed as a replacement. Additionally, the new hatch lid should have a downward overlap around the outside of the perimeter of the curb measuring at least 2 inches. We recommend that the new hatch be equipped with a hasp and locking mechanism. [REDACTED]
8. The interior of the tank is not equipped with a ladder. We recommend that a ladder be installed from the roof access hatch to the bottom of the tank bowl, and that said ladder meet the current OSHA standard. Additionally, the interior ladder must be equipped with a fall prevention cable. [REDACTED]
9. The tank is equipped with a cathodic protection system that is not currently in use. We recommend that the cathodic protection components be removed. [REDACTED]
10. At some point, spider rods were removed from the interior of the tank. Remnants from some of the spider rods remain in the tank and are still attached around the painter's ring on the tank interior. We recommend that these be removed. [REDACTED]
11. The exterior coating is generally fading, heavily chalking, and is past the end of its expected service life. The interior coating appears to be in fair condition, however, the current age of the coating system is unknown. We would recommend that an exterior and interior renovation be done as soon as possible.

Recommended Exterior Specifications

Repaint Exterior:

- a) Pressure wash all exterior surfaces using 4,000 psi pressure washers or higher.
- b) Clean all rusted and paint failed areas using scrapers, hand & power wire brushes in accordance with SSPC surface preparation methods #2 & #3, hand & power tool clean.
- c) Apply a spot prime coat of an epoxy-mastic primer to all bare metal surfaces at 2.5 to 3.5 mils dry film thickness.
- d) Apply two(2) full finish coats of acrylic paint to all exterior surfaces at 1.5 to 2.5 mils dry film thickness per coat.
- e) Replace the tank sign as existing.

Recommended Interior Specifications

Repaint Interior

- a) Abrasive blast all interior surfaces to bare metal in accordance with SSPC surface preparation method #10, near white grade.
 - b) Apply a full prime coat of epoxy that is NSF approved for contact with potable water to all interior surfaces at 4 to 6 mils dry film thickness.
 - c) Apply a "stripe coat" of epoxy that is NSF approved for contact with potable water to all ladders and weld seams at 2 to 3 mils dry film thickness, applied using paint brushes and rollers.
 - d) Apply a full finish coat of epoxy that is NSF approved for contact with potable water to all interior surfaces at 4 to 6 mils dry film thickness.
 - e) Caulk all unwelded roof lap seams using Sikaflex 1a polyurethane caulk.
 - f) Test abrasive blast debris for the 8 RCRA heavy metals using the TCLP method.
 - g) Dispose of abrasive blast debris in accordance with Federal, State, and Local regulations.
 - h) Sterilize tank interior using AWWA Disinfection Method #2, spray method.
- 