

To: All Plan Holders of Record

From: CT Consultants, Inc.
For the Owner

Re: *Addendum No. 1*
High Service Area Water Tower Rehabilitation
City of Germantown, Ohio

Date: November 4, 2024

This Addendum forms a part of the contract documents and modifies the original bidding documents dated October 2024 and all previous addenda, if any. Acknowledge receipt of this addendum in the space provided in the bid forms. Failure to do so may subject the bidder to disqualification.

PRE BID MEETING MINUTES

A copy of the pre-bid meeting minutes and sign-in sheet are attached to this addendum

QUESTIONS AND ANSWERS

- Q. Is there a clear coat on the exterior?
A. Dixon took a sample of the exterior system back in June, and the topcoat was determined to be a fluoropolymer.
- Q. What is the anticipated start date?
A. February 1, 2025
- Q. How many days can the tank be out of service?
A. It is anticipated the tank will be out of service for two months.
- Q. How much are the liquidated damages?
A. Liquidated damages are \$1,000 per day as listed on page BF.9.
- Q. Please provide the most recent inspection report.
A. Two inspection reports are attached.
- Q. Is any type of containment system required?
A. Environmental regulations may be met with different available technologies. It is the Contractor's sole responsibility to comply with these and all applicable environmental regulations.
- Q. Who will the inspector be?
A. Dixon Engineering

Addendum No. 1

Date: November 4, 2024

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- Q. Are there any antennas on the tank and if so, who is responsible for removing/protecting them?
- A. The inspection report, which will be included in the addendum, does not indicate antennas.
- Q. Reference Technical Specification 00 54 00. Is the Schedule of Values to be submitted with the bid?
- A. At this time, the schedule of values will be required by the low bidder, post bid, but may be submitted with the bid.
- Q. Reference Technical Specification 09 97 13.10 3.03 J. How much of the exterior surface area contains clear coat?
- A. Dixon took a sample of the exterior system back in June, and the topcoat was determined to be a fluoropolymer. It is reasonable to assume the entire painted exterior is the same.

SPECIFICATIONS

In Specification Section 099713 – Steel Coating, Delete Subparagraph 1.06.A in its entirety.

Add the following inspection reports to the bid book as Appendices.

- Pittsburg Tank & Tower Group - Inspection Report dated June 18, 2019.
- Dixon Engineering - Maintenance Inspection 750,000 Gallon Composite (Route 4) Report dated January 16, 2023.

NLD:nld

Enclosures

H:\2024\241050\SPEC\Addenda\Addendum 01.Docx

Pre-Bid Meeting Minutes

To: ATTENDEES

Subject: 241050 - HIGH SERVICE AREA WATER TOWER REHABILITATION

Date: OCTOBER 28, 2024 AT 11:00 A.M.

The agenda for the Pre-bid Conference scheduled for October 28, 2024 at 11:00 a.m. at the Germantown Municipal Building, 1 N. Plum Street, Germantown, Ohio 45327 is as follows:

- Sign-In Sheet & Introductions
- Introduction of the Project
- Funding:
 - WSRLA (OEPA / OWDA)
- Schedule
 - Bid Date - 11:00 a.m. on November 8, 2024
 - Loan Approval – January 2025
 - Contract and NTP – February 2025
 - Project Completion – October 31, 2025
- Review of Bid Form/Schedule of Values
- Question and Answers – Note all answers to question are only made final when documented by addendum.
- Site Visit

MEETING SIGN-IN: 241050 - HIGH SERVICE AREA WATER TOWER
REHABILITATION

DATE: October 28, 2024 at 11:00 a.m.



NAME	COMPANY (REPRESENTING)	ADDRESS	CITY	ZIP	PHONE#	EMAIL ADDRESS
Kent Bryan	CT Consultants	4420 Cooper Rd Suite 200	Cincinnati	45242	419-733-4115	kbryan@ctconsultants.com
Nicole Diak	CT Consultants (Via Teleconference)	4420 Cooper Rd Suite 200	Cincinnati	45242	937-707-8863	ndiak@ctconsultants.com
JONATHAN MOORE	GERMANTOWN	1 N. Plum St.	GERMANTOWN	45329	937-313-1843	jmoore@germantown,oh.us



City of Germantown
75 N. Walnut Street
Germantown, OH 45327
RE: Germantown, OH
750,000 Gallon Composite Tank
June 18, 2019
Mr. Jonathan Moore
Public Services Director
(937) 855-7255
Job No. 319262

If you would like to speak with Patrick Heltsley concerning this report, call (270) 826-9000, Ext. 4601

For additional copies of this report, call (270) 826-9000 Ext. 4601

Paint • Repair • Dismantle • Inspect • Reinsulate • Tanks Raised, Lowered, and Moved
New and Used Tanks



Photo shows the tank is secured with fencing. We recommend posting a **Warning, Tampering With This Facility is a Federal Offense (US code title 42, section 300i-1)** sign and a **No Trespassing** sign.

**City of Germantown
RE: Germantown, OH
750,000 Gallon Composite Tank
Job No. 319262**



Photo shows the tank has no grounding system. We recommend electrically grounding the tank for lightning protection as required by **OSH Act of 1970 Section 5**, and **AWWA 0107-16; 8.8 Lightning Protection**.



Photo shows the condition of the personnel door. The personnel door requires
Photo shows the condition of the personnel door. The personnel door requires
the following to be in compliance with **AWWA 0107-16; 8.4.1.1 Personnel doors**
and **OSHA 1910.146(c)(2) Confined spaces**.

We recommend:

Post **Confined Space Entry** sign



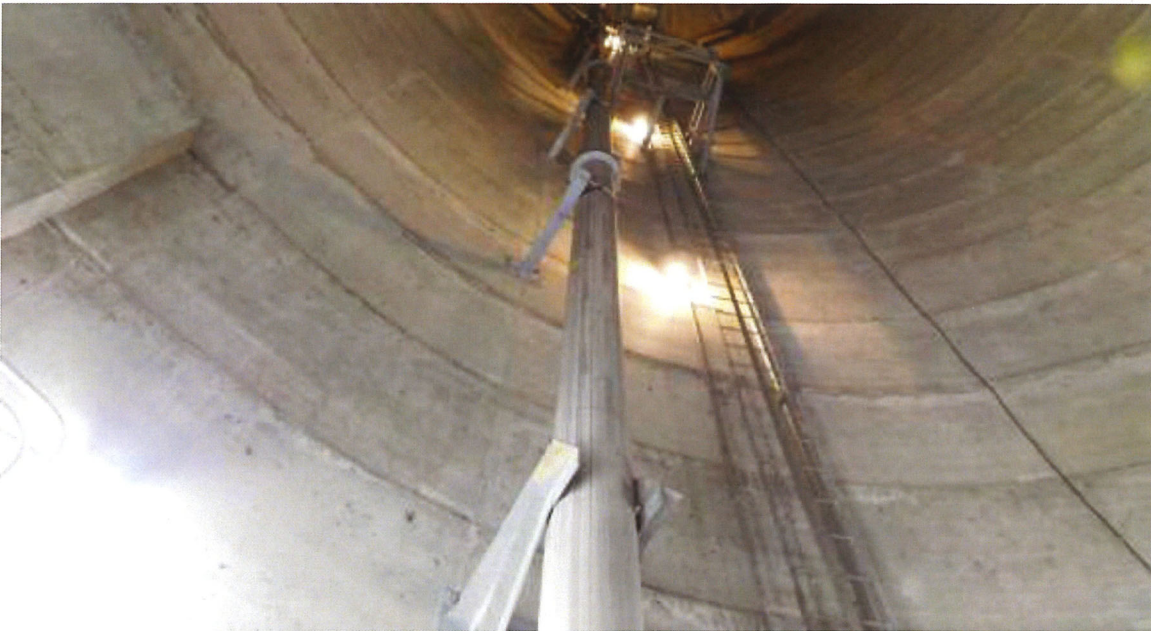
Photo shows the condition of the vehicle door. The vehicle door requires the following to be in compliance with [AWWA D107-16; 8.4.1.2 Vehicle doors](#) and [OSHA 1910.146\(c\)\(2\) Confined spaces](#).

We recommend:

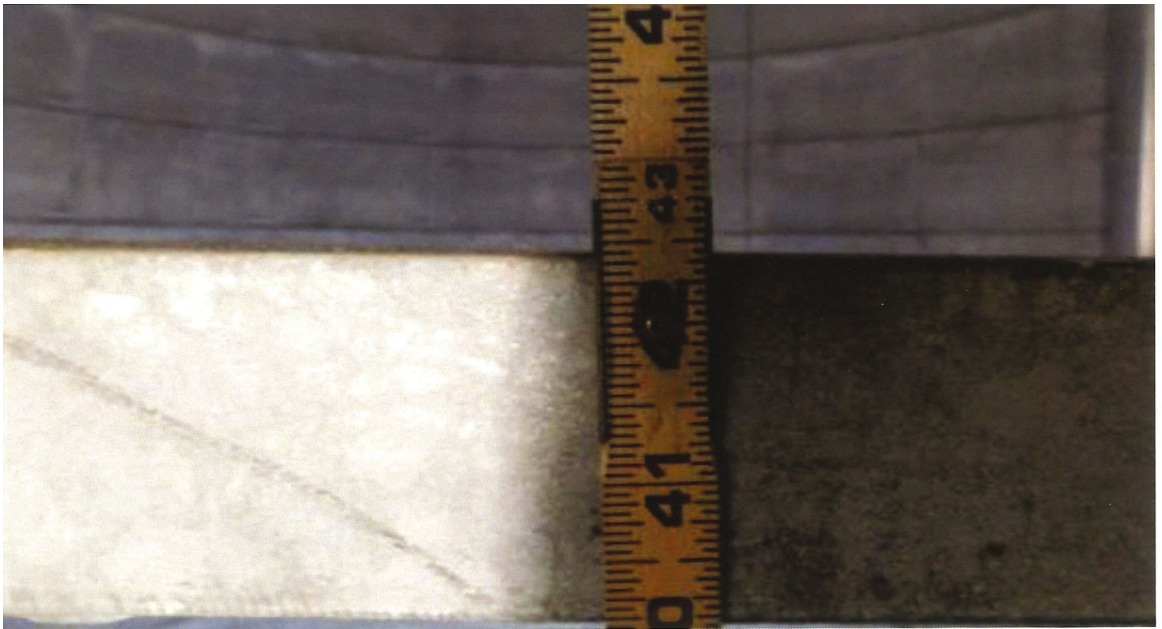
Post **Confined Space Entry** sign



Photos show the 12" overflow pipe system, which is not equipped with a flapper valve as required by [AWWA D107-16; 8.7.5 Overflow piping](#). We recommend installing a flapper valve and new screen on the existing overflow pipe elbow.



Pillar access ladders in above photos are 16" wide in compliance with [OSHA 1910.23 Ladders](#) and [AWWA 0107-16; 8.2 Ladders](#). We recommend posting a **Fall Protection Required** sign at the base of the ladder.



Photos show the pillar access ladder resting platforms, which appear to be in good condition.



Photo shows the transfer walkway, from the access ladder to the access tube, which is equipped with 42" high OSHA compliant handrail system, and appears to be in good condition.

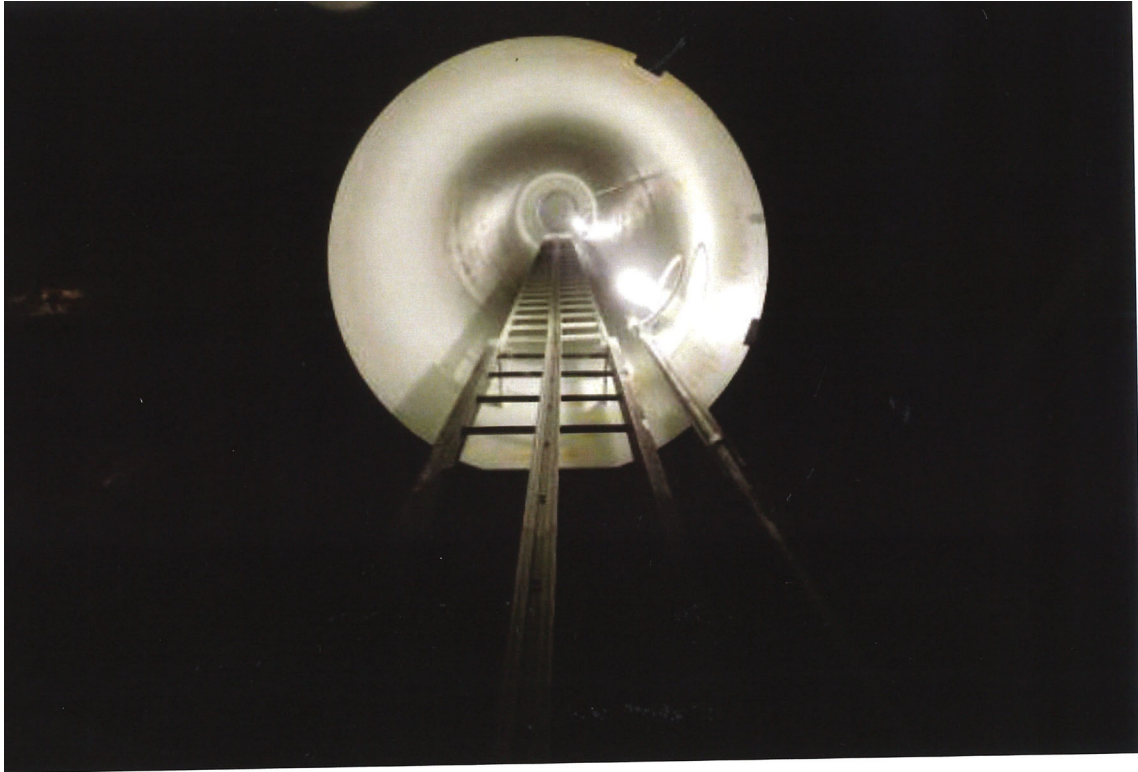


Photo shows the tank floor manhole, which is in compliance with **AWWA D107-16; 8.4.5 Tank floor manhole** and appears to be in good condition.

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RE: Germantown, OH
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Photo shows one of the pedestal vents, which appears to be in good condition.



Access tube ladder in above photo is 17" wide, in compliance with **OSHA 1910.23 Ladders** and **AWWA D107-16; 8.2 Ladders**.



Photo shows the tank interior dry area coating system. The overall tank interior dry area coating system appears to be in good condition. We recommend re-evaluating the tank interior dry area at next inspection cycle.

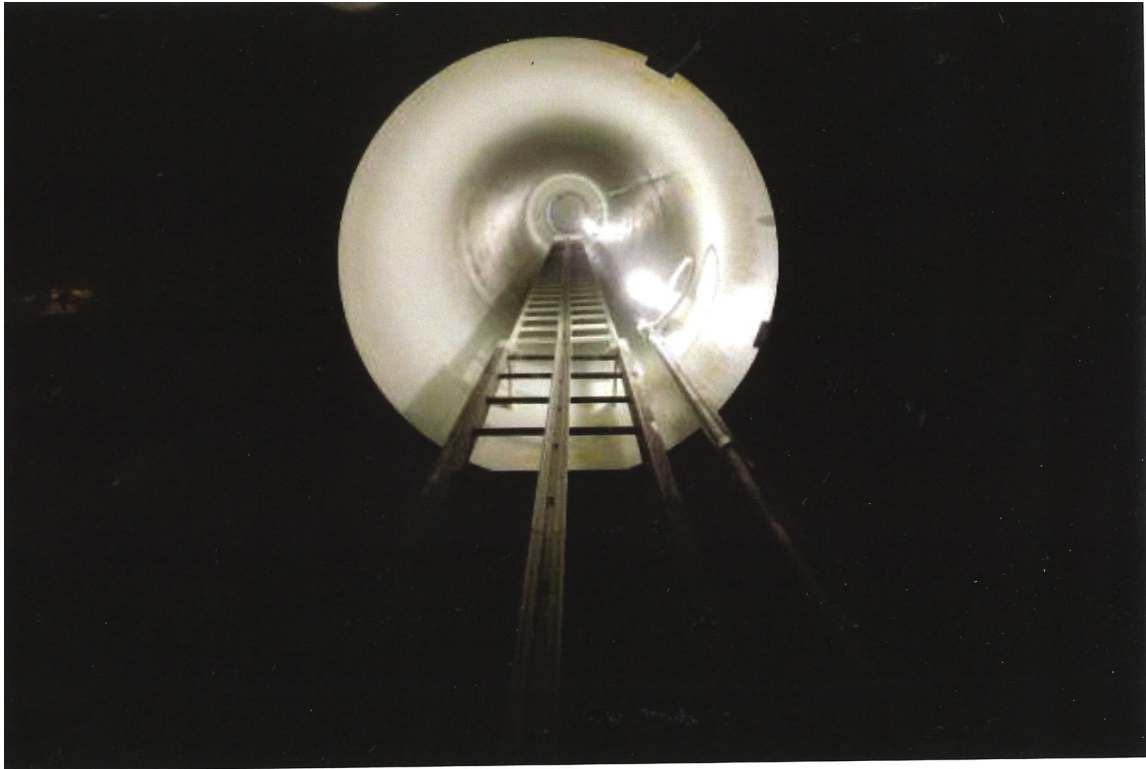


Photo shows the access tube hatch, which appears to be in good condition.

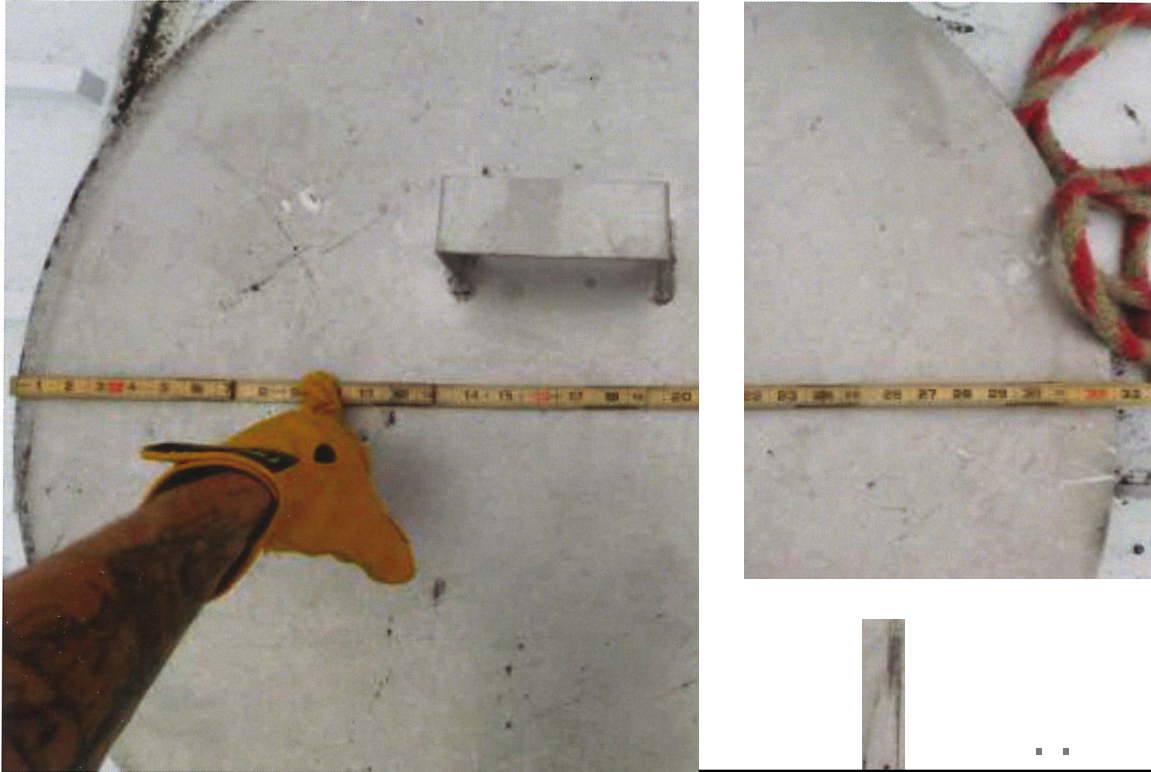
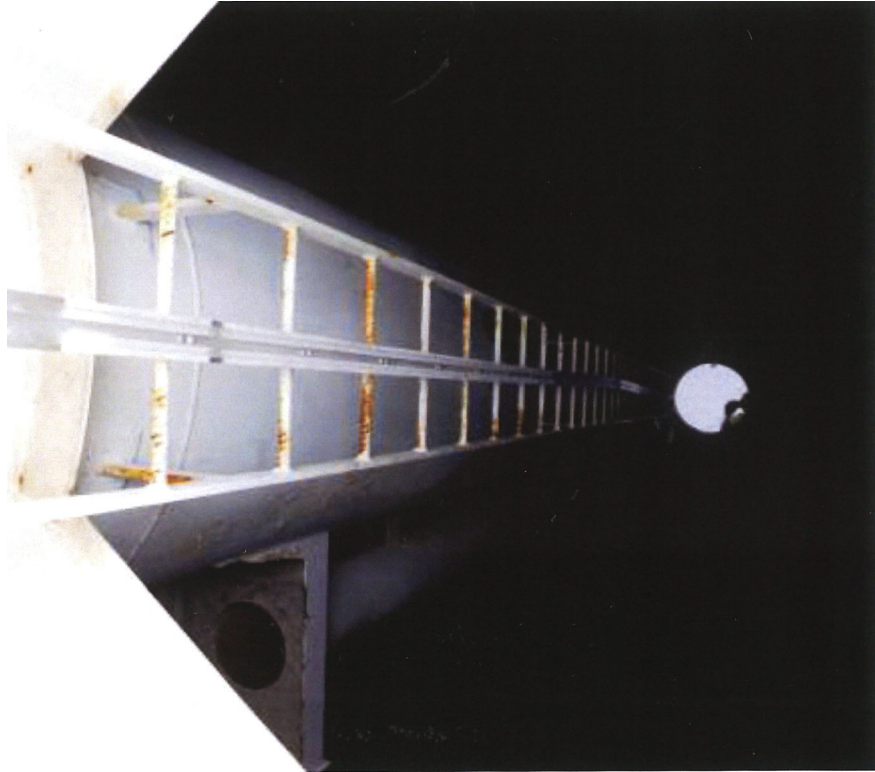


Photo shows the condition of the 30" primary roof hatch. Roof openings on this tank require the following to be in compliance with **AWWA D100-11; 5.4.3 Roof openings** and **OSHA 1910.146(c)(2) Confined spaces** .

We recommend:

Post Confined Space Entry sign

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Primary interior access ladder in above photo is 16" wide, in compliance with **OSHA 1910.23 Ladders** and **AWWA 10107-16; 8.2 Ladders**.

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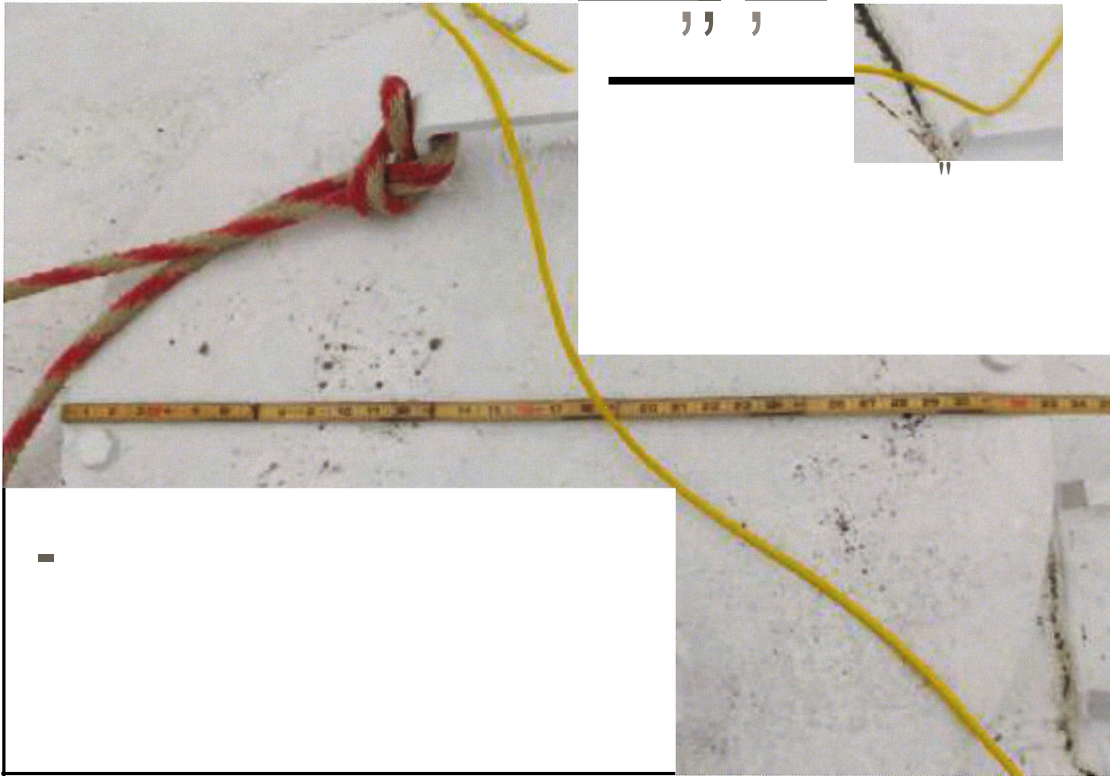
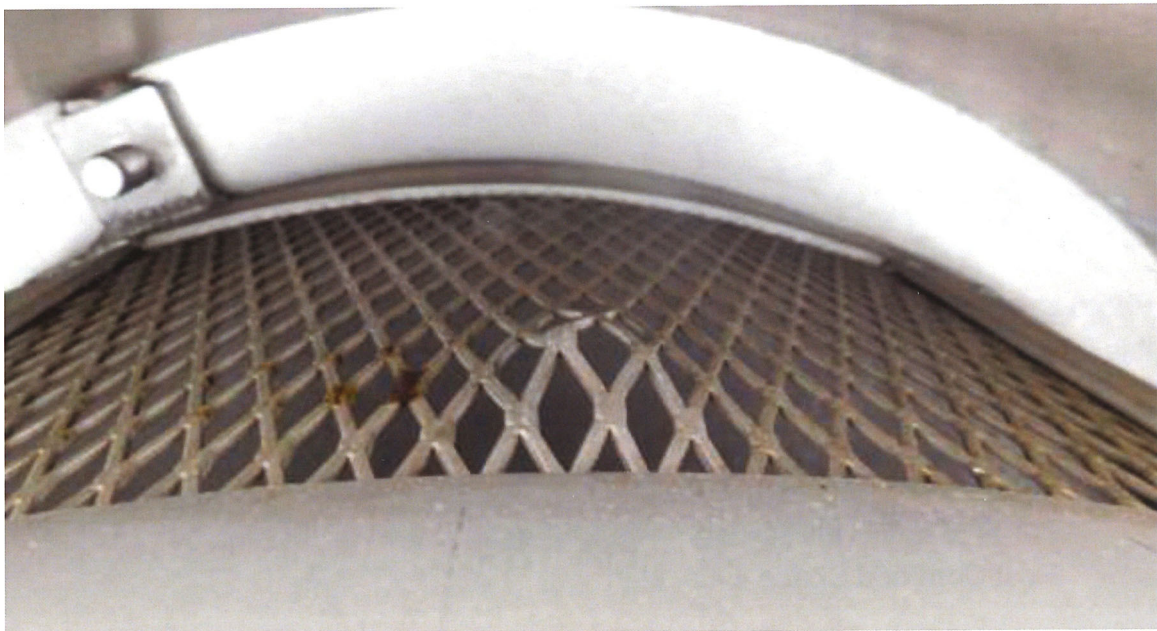


Photo shows the condition of the 30" secondary roof hatch. Roof openings on this tank require the following to be in compliance with [AWWA D100-11; 5.4.3 Roof openings](#) and [OSHA 1910.146\(c\)\(2\) Confined spaces](#).

We recommend:

Post **Confined Space Entry** sign



Photos show the existing 24" roof vent, which appears to be in good condition.



Photos show the tank roof edge is equipped with a 42" high compliant handrail system for fall protection as required by [OSHA 1910.28\(b\)\(1\)](#) . The handrail system is equipped with an intermediate rail and toeboard, and appears to be in good condition.



Photos show the tank exterior. The overall tank exterior appears to be in good condition. We recommend re-evaluating the tank exterior at next inspection cycle.



Photo shows the condition of the interior roof-to-rim angle connection. Notice the rust forming in the crevice between the roof and rim angle. We recommend seam sealing using Sikaflex® 1a around the circumference of this connection to prevent failure of a new interior liner. This work is to be performed in conjunction with application of new interior liner.

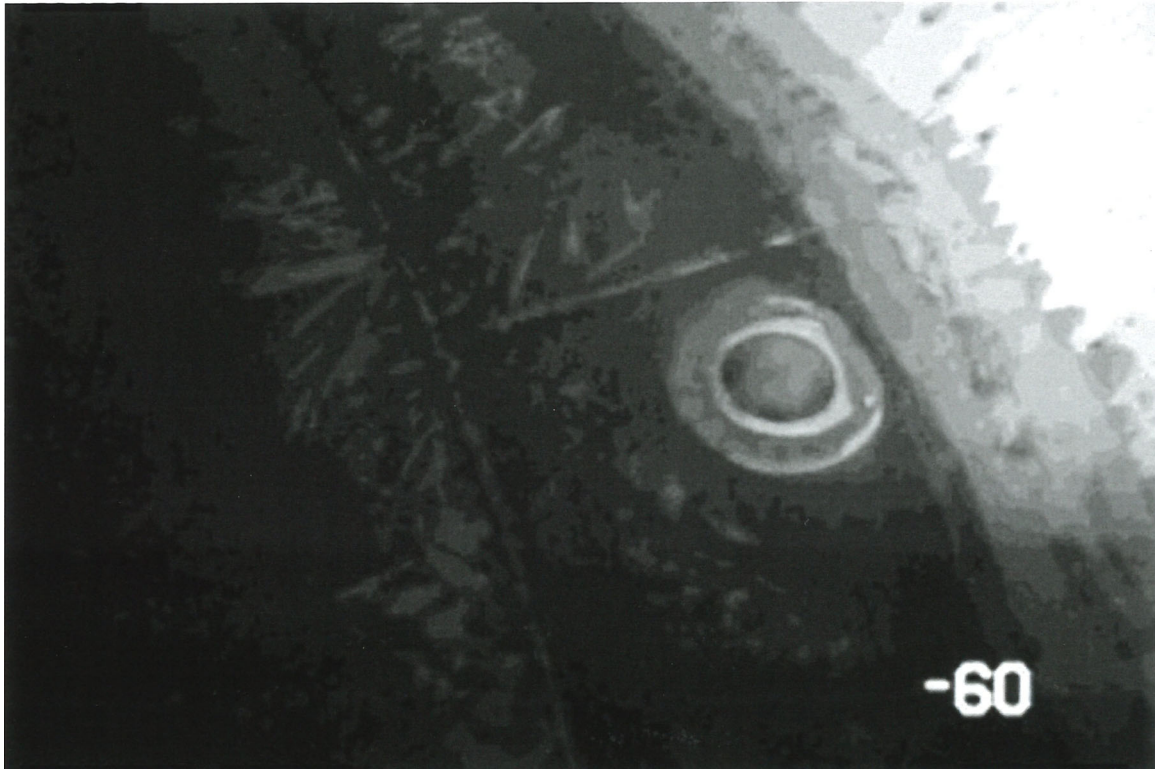


Photo shows a fill pipe on the tank interior. A temperature difference between the water in the top and bottom of a tank, even as little as 1-2 degrees Fahrenheit, is an indication of thermal stratification and the tank water not being completely mixed. Incomplete mixing would result in short-circuiting, and localized increase in water age would develop inside the tank. This typically leads to water quality problems, such as loss of residual, DBP spikes, HPC spikes, bacteria regrowth, formation of bio-film, changes in pH and dissolved oxygen. We recommend installing a mixing system. Electrical work to be done by others if required.



Photo shows sediment in the tank. We recommend performing a dry interior cleanout in order to prevent contamination issues associated with excessive sediment buildup.

This work should be performed on an emergency basis.

**Please note price for interior cleanout is based on removing 1" - 3" of sediment. Any additional accumulation discovered will be removed in the amount of \$300 per hour. In the event the tank has to be drained, tank will need to be drained by the owner, prior to our arrival.*

We further recommend installing a passive cathodic protection system.



Photos show the condition of the interior coating system. We recommend sandblasting all rusted and abraded interior areas to SSPC-SP10 (near white), and brush blasting all remaining interior areas to SSPC-SP?; then applying one (1) spot coat of epoxy primer to all areas sandblasted to #10, stripe coating all weld seams, and applying epoxy to the entire tank, to achieve 8 to 10 mils of total dry film thickness. Total mil thickness will include a combination of the existing and new coating.

COMPOSITE TANK INSPECTION REPORT

JOB NO: 319262 INSPECTOR: James Funk (LJ)
TANK OWNER: City of Germantown
OWNER'S REPRESENTATIVE: Mr. Jonathan Moore
TITLE: Public Services Director
MAILING ADDRESS: 75 N. Walnut Street, Germantown, OH 45327
PHYSICAL ADDRESS: 75 N. Walnut Street, Germantown, OH 45327
E-MAIL: mjayne@germantown.oh.us
CITY, STATE: Germantown, OH ZIP: 45327 COUNTY: Montgomery County
TELEPHONE: (937) 855-7255 FAX: Not Provided
LOCATION OF TANK: 1934 Dayton Pike, Germantown, OH 45327

**City of Germantown.
75 N. Walnut Street
Germantown, OH 45327
June 18, 2019
Mr. Jonathan Moore
Public Services Director
(937) 855-7255**

ORIGINAL CONTRACT NO: Not Provided YEAR BUILT: Not Provided
ORIGINAL MANUFACTURER: Not Provided CAPACITY: 750,000 Gallon
DATE OF LAST INSPECTION: Not Provided TYPE: Potable
HIGH WATER LEVEL: Not Provided LOW WATER LEVEL: Not Provided
DIAMETER: 64'-0" HEAD RANGE: 40'-0"
TYPE CONSTRUCTION: WELDED: --- X RIVETED: --- CONCRETE: --- X
ACCOUNT EXECUTIVE: Brandi Skaggs

Testing	Exterior	Interior
Lead	Negative	Negative
Adhesion	9.3 mils	11.2 mil's

Mil Thickness Testing								
Roof	14.4	10.6	11.3	12.1	14.3	15.3	14.6	10.9
	11.6	12.3	11.7					
Shell 11	10.6	13.4						
Shell 10	16.3	15.2						
Shell 9	14.3	15.1						
Shell 8	11.3	11.9						
Shell 7	9.8	10.6						
Shell 6	9.3	9.7						
Shell 5	8.9	10.7						
Shell 4	10.8	11.3						
Shell 3	9.5	8.7						
Shell 2	11.4	10.3						
Shell 1	6.8	10.3						

Ultrasonic Thickness Testing								
Roof	.311	.371	.331	.317	.401	.391	.377	.316
	.317	.377	.318					
Shell 11	.261	.251						
Shell 10	.291	.273						
Shell 9	.317	.288						
Shell 8	.273	.311						
Shell 7	.231	.271						
Shell 6	.271	.276						
Shell 5	.254	.259						
Shell 4	.293	.271						
Shell 3	.281	.293						
Shell 2	.271	.277						
Shell 1	.271	.218						

PITTSBURGH TANK TOWER GROUP



MAINTENANCE DIVISION Since 1919

1 Water Tank Place
 PO Box 1849
 Henderson, KY 42419
 P: (270) 826-9000
 F: (270) 767-6912
 www.pttg.com

Page#	Work Proposed	Warning Signs	No Trespassing	Grounding	Confined Space	Fall Protection	Other
2	Post a Warning, Tampering With This Facility is a Federal Offense (US code title 42, section 300i-1) sign.		X				
	Post a No Trespassing sign.		X				
3	Electrically ground the tank.		X	X			
4	Post Confined Space Entry sign on personnel door.				X		
5	Post Confined Space Entry sign on vehicle door.				X		
6	Install a flapper valve and new screen on the overflow pipe elbow.		X				
7	Post Fall Protection Required sign at base of pillar access ladder.					X	
13	Re-evaluate the tank interior dry area at next inspection cycle.						X
15	Post Confined Space Entry sign on primary roof hatch.				X		
17	Post Confined Space Entry sign on the secondary roof hatch.				X		
20	Re-evaluate the tank exterior at next inspection cycle.						X
21	Seal the circumference of the interior roof-to-rim angle connection using Sikaflex® Ia.						X
22	Install a mixing system. Electrical work to be done by others if required.		X				
23	Perform a dry interior cleanout, up to 3" of sediment. This work should be performed on an emergency basis. Addition of accumulation will be \$300 per hour to remove. In the event the tank has to be drained, it should be drained by the owner prior to our arrival.	X					
	Install a passive cathodic protection system.						X
24	Sandblast all rusted and abraded interior areas to SSPC-SP10 (near white), and brush blast all remaining interior areas to SSPC-SP7; then apply one (1) spot coat of epoxy primer to all areas sandblasted to #10, stripe coat all weld seams, and apply one (1) full coat of epoxy to the entire tank, to achieve 8 to 10 mils of total dry film thickness. Total mil thickness will include a combination of the existing and new coating.						X

Dixon Engineering, Inc.

Maintenance Inspection
750,000 Gallon Composite
(Route 4)

Germantown, Ohio

Inspection Performed: November 21, 2022
Reviewed by: Joseph T. Hoban, P.E.: January 16, 2023

Dixon Engineering Inc.
1104 Third Ave. Lake Odessa, MI 48849

Phone (800) 327-1578
Fax (616) 374-7116
<http://www.dixonengineering.net>
dixon@dixonengineering.net

CONCLUSIONS:

1. The exterior coating is presumed to be a urethane system. The coating is in good condition overall. Coating deterioration includes topcoat delamination. There are only a few coating failures on the roof.
2. The dry interior coating is presumed to be an epoxy system. The coating is in good condition overall. Coating deterioration includes rust bleedthrough. The failures are in the access tube.
3. The wet interior coating is presumed to be an epoxy system. The coating is in fair to poor condition overall. Below the high-water level coating deterioration includes spot failures to the substrate, topcoat delamination, and rust bleedthrough on the access tube and sidewall. There is coating deterioration above the high-water level at the roof panels and roof stiffeners.

RECOMMENDATIONS (GENERAL):

Annually inspect the roof vent, hatches, and any other health or security items on the structure. The work could be performed by in-house personnel or contracted as part of a regular maintenance program.

Schedule regular cleanings and inspections of the tank by an independent third party once every five years as recommended by AWWA.

RECOMMENDATIONS (WITH THE NEXT PAINT PROJECT):

Complete the recommended work in three years. The repairs and upgrades should be completed during the next major tank rehabilitation project when coating repairs are made.

1. High pressure water clean and overcoat the exterior with a urethane system. The estimated cost is \$100,000.
2. Spot power tool clean the coating failures in the dry interior. Spot repaint all prepared surfaces with an epoxy coating system. The estimated cost is \$3,000.
3. Spot abrasive blast clean the wet interior roof and access tube and spot repaint with an epoxy system. The estimated cost is \$30,000.
4. Install a suspended ring, impressed current cathodic protection system in the wet interior. The estimated cost is \$25,000.
5. Install a painter's railing outside the existing roof handrail. The estimated cost is \$6,000.
6. Install additional rigging couplings on the roof for temporary fall prevention of workers in the wet interior. The cost would be incidental to the next painting project.

7. Install a screened flap gate at the overflow pipe discharge. The estimated cost is \$3,000.
8. Install a handhold at the wet interior roof hatch and access tube roof hatch. The handhold would assist the climber while entering and exiting the openings. The cost would be incidental to the next painting project.
9. Install a mechanical mixer in the wet interior. The estimated cost is \$20,000.
10. Replace the mud valve in the bottom of the tank. The estimated cost is \$5,000.

A DISCUSSION ON RESCUE AND RETRIEVAL OPERATIONS FROM ELEVATED STORAGE TANKS

Working on elevated water storage tanks is inherently dangerous. OSHA regulations give guidelines for the climbing on elevated structures. Contractors and Engineers/Consultants are responsible for their own employees, but even with safety training and proper equipment, accidents can occur. Most rescue squads are local or neighboring fire departments, with some departments having more experience than others. Water storage tanks are designed to store water and are not suited for rescue or retrieval convenience. We recommend that you meet with your local rescue personnel and draft a rescue plan. A copy of the plan should be kept at the tank and with the rescue crew.

OSHA does not require 30 inch manways or hatches, but for rescue purposes 30 inch openings would allow enough room for a rescue basket with an injured person on it to pass through. Smaller openings may not be sufficient for retrieval.

Rescue personnel would gain access to the injured person using the existing ladders while attached to fall prevention devices. If possible, the basket would be lowered through the riser and out the opening in the bottom. If needed, the rescue crew would work from the roof inside a handrail. A tripod would be used to attach a winch to the basket. If the basket cannot fit through the riser then it would need to be raised to the roof.

From the roof it is possible to lower the basket over the side to ground level, but that would require a very large winch and increased loading on the attachment point. On a rainy, windy, or snowy day, the objective would be to get rescue personnel off the roof as soon as possible, so lowering through the dry interior is preferred. A helicopter rescue would need to be performed if it is not possible to lower the rescue basket down the dry interior.

Upgrades intended to make a rescue easier are included in this report. Dixon recommends 30 inch manways or hatches where possible and fall prevention devices on all ladders.

COST SUMMARY:

Exterior overcoat	\$100,000
Dry interior spot repaint	3,000
Wet interior spot repaint	30,000
Cathodic protection system	25,000
Roof painter's railing	6,000
Overflow flap gate	3,000
Mixer	20,000
Mud valve	<u>5,000</u>
Sub Total	\$192,000
Engineering and Contingencies	<u>\$39,000</u>
Total	\$231,000

INSPECTION:

On November 21, 2022, Dixon Engineering Inc. performed a maintenance inspection on the 750,000 gallon composite (Route 4) elevated water storage tank owned by the City of Germantown, Ohio. Purposes of the inspection were to evaluate the interior and exterior coating's performance and life expectancy, assess the condition of metal surfaces and appurtenances, review safety and health aspects, and make budgetary recommendations for continued maintenance of the tank. All recommendations with budgeting estimates for repairs are incorporated in this report.

The inspection was performed by Ryan Szczepaniak, Engineering Technician. The inspector was assisted by Jake Kramer, ROV Operator, and Austin Willette, Staff Technician.

The wet interior inspection was completed with a remotely operated vehicle (ROV). Video of the inspection and still photos are included with this report. No cleaning was performed in the wet interior during the ROV inspection.

GENERAL INFORMATION:

The tank was built in 2010 by Caldwell with a height to high-water level of 134 feet 10 inches.

CONDITIONS AND RECOMMENDATIONS:

EXTERIOR COATING CONDITIONS:

It is presumed that the exterior was abrasive blast cleaned to a SSPC-SP6 commercial condition and last painted in 2010 with a urethane system.

The coating is in good condition overall. The coating is beginning to chalk and fade and there is loss of gloss. Surfaces have faded due to exposure to ultraviolet light which is a normal occurrence for an exterior coating system.

The bowl and sidewall coating is in good condition with no significant deterioration. The bowl is covered with light mildew growth.

There is lettering on the sidewall that states "Welcome to Historic GERMANTOWN OHIO 1804" in two locations.

The roof coating is in good condition with a few failures. Primary method of deterioration is delaminated topcoat.

Adhesion testing was not performed due to cold temperatures. Testing in cold temperatures could cause inaccurate results. Adhesion testing should be performed before overcoating.

EXTERIOR COATING RECOMMENDATIONS:

Take no immediate action on the exterior coating. Budget for overcoating in three years. The typical overcoat frequency for modern urethane systems is fifteen years. There is always a risk in overcoating the exterior, but we have had several successful projects when performed in the timeframe noted. The risk of poor adhesion of the overcoat system gets higher as the existing system gets older. If not overcoated in the timeframe noted, it is possible total abrasive blast cleaning with containment may be required which will cost over twice that of overcoating.

The recommended procedure is to high pressure water clean (5,000-10,000 psi) the exterior to remove any poorly adhered coating and any contaminants. Coating failures to the substrate would be spot power tool cleaned to a bare metal (SSPC-SP11) condition. All sharp edges would be feathered into the surrounding coating.

The coating system would consist of a spot prime coat on the bare metal, a full coat of epoxy, and followed by two full coats of urethane. The urethane system offers excellent abrasion resistance with high gloss and sheen retention. The expected life of this system is fifteen years. The tank would be removed from service during the coating project. This is necessary to reduce condensation on the tank's surface. Urethane coatings have a minimum temperature requirement for application and are sensitive to moisture during the curing process. If moisture is present during the curing process, the appearance will become cloudy with little or no gloss. The estimated cost is \$100,000.

DRY INTERIOR COATING CONDITIONS:

The dry interior on this structure is defined as the non-water contact surfaces consisting of the column, domed bottom, and access tube.

It is presumed that the dry interior was abrasive blast cleaned to a SSPC-SP6 commercial condition and last painted in 2010 with an epoxy system. The coating is presumed to be an epoxy system based on the appearance. Determining exact coating type is not essential because we do not recommend overcoating in the dry interior.

The access tube coating is in good condition with a few failures. Primary method of deterioration is rust bleedthrough.

DRY INTERIOR COATING RECOMMENDATIONS:

Spot power tool clean the coating failures to a (SSPC-SP11) condition and spot repaint with an epoxy system. The work should be performed with an exterior/wet interior painting project. The estimated cost is \$3,000.

WET INTERIOR COATING CONDITIONS:

It is presumed that the wet interior was abrasive blast cleaned to a SSPC-SP10 near-white condition and last painted in 2010 with an epoxy system. The coating is presumed to be an epoxy system based on the color and condition.

The roof coating is fair condition with a few failures. Primary methods of deterioration are spot failures to the substrate, delaminated coating, and rust bleedthrough.

The sidewall coating is in fair condition with numerous failures. Primary methods of deterioration are spot failures to the substrate, delaminated topcoat, and rust bleedthrough.

The access tube coating is in poor condition with numerous failures. Primary methods of deterioration are spot failures to the substrate, delaminated topcoat, rust bleedthrough, and abrasion. There is significant damage at the high-water level.

The domed bottom was covered with approximately 3 inches of sediment that limited the amount of surface visible with the ROV.

The surfaces below the normal operating water level are covered with mineral staining which does not affect the integrity of the coating system.

WET INTERIOR COATING RECOMMENDATIONS:

Spot abrasive blast clean the wet interior roof and access tube to a near-white metal (SSPC-SP10) condition and spot repaint with an epoxy system. The estimated cost is \$30,000.

CATHODIC PROTECTION CONDITIONS:

There is no cathodic protection system in the wet interior. The tank does not have attachment clips or a pressure fitting installed for a future cathodic protection installation.

CATHODIC PROTECTION RECOMMENDATIONS:

Install an impressed current cathodic protection system with the next paint project. The system is designed with a horizontal ring configuration suspended into the lower one third of the tank connected to the sidewall or access tube. This design is considered ice-free as formation of ice normally occurs at the high-water level and some along the sidewall. When the tank is operated in the upper one half of its capacity, the probability of ice damage is very low. The anode used is a platinized niobium or titanium wire with a design life of approximately ten years. The system also incorporates copper/copper sulfate reference anodes.

The system is automatically controlled by monitoring the water-to-tank potential. It provides protection to the exposed steel surfaces. Cathodic protection operates by inhibiting galvanic cell corrosion where steel is exposed. The system creates an equipotential across the tank and drives the tank potential down to a point (-850 millivolts) where corrosion is essentially nonexistent. Only surfaces that are in contact with water are protected because water acts as the electrolyte for the circuit. Therefore, areas of the roof and upper sidewall are not protected by the system. The estimated cost is \$25,000.

COLUMN CONDITIONS:

The concrete column and concrete dome at the bottom of the tank are in good condition. There are no significant cracks or spalls. The concrete is not coated.

ROOF HANDRAIL, PAINTER'S RAILING, AND ROOF RIGGING CONDITIONS:

There is a handrail on the roof surrounding the roof hatches and the vent. The handrail is in good condition. There is not a painter's railing on the roof.

There are not enough roof rigging couplings for safety and staging lines during wet interior coating work.

ROOF HANDRAIL, PAINTER'S RAILING, AND ROOF RIGGING RECOMMENDATIONS:

Install a painter's railing outside the existing roof handrail. The railing gives the contractor a rigging point for staging. The estimated cost is \$6,000.

Install additional rigging couplings on the roof under the new painter's railing for fall prevention of workers in the wet interior. The cost would be incidental to the next painting project.

LIGHTING/ELECTRIC COMPONENTS CONDITIONS:

The tank has a double aviation light on the roof that is in good condition. The light is operating properly.

There are light fixtures located in the dry interior. The lights are in good condition and were functioning during the inspection.

OVERFLOW PIPE CONDITIONS:

The overflow pipe extends along the access tube in the wet interior down through the dry interior and exits near the bottom of the column. The overflow pipe discharge is vertical. The discharge end of the overflow pipe is screened. The screen is in good condition. The pipe discharges to a splash pad. The air gap meets the required 12-24 inches. The discharge area is in good condition.

OVERFLOW PIPE RECOMMENDATIONS:

Install a screened flap gate at the overflow pipe discharge. The flap gate would allow water to discharge even if the screen becomes covered with debris or frosted over. The gate is designed to stay closed to prevent rodents or birds from entering the pipe. The estimated cost is \$3,000.

HATCH AND MANWAY CONDITIONS:

There is a 30 inch diameter roof hatch to the wet interior that is in good condition. The hinged cover is in good condition. There is no handhold next to the hatch to aid the climber while entering and exiting the opening. The hatch was secured with a bolt. The hatch neck curb height meets the minimum height requirement of 4 inches. The hatch cover lip meets the minimum height requirement of 2 inches. There is a gasket on the hatch that is in good condition.

There is a secondary 24 inch diameter roof hatch to the wet interior that is in good condition. The hinged cover is in good condition. There is no handhold next to the hatch. The hatch was not secured. The hatch neck curb height meets the minimum height requirement of 4 inches. The hatch cover lip meets the minimum height requirement of 2 inches. It could not be determined if there is a gasket on the hatch. Since the primary hatch has a gasket it is presumed the secondary hatch has a gasket.

There is a 30 inch diameter roof hatch into the dry interior that is in good condition. The hinged cover is in good condition. There is no handhold next to the hatch to aid the climber while entering and exiting the opening.

There is a bolted painter's hatch on the roof that is in good condition. The hatch can be used for ventilation and lighting during maintenance work. There is a gasket on the hatch that is in good condition.

There is a 30 inch diameter manway in the domed bottom to the wet interior that is in good condition. The manway gasket showed no signs of leakage and the bolt is in good condition. There is a ladder to the manway that is in good condition. The ladder is equipped with a fall prevention device.

There is a service door in the column that is in good condition. The door operated properly during the inspection.

There is a retractable overhead door in the column that is in good condition. The door operated properly during the inspection.

There is a louvered vent at the top of the column that can serve as access to the exterior. The vent is in good condition.

The dry interior platform ladder openings are 30 inch square. The openings are equipped with hinged covers. There are safety handholds next to the openings.

There is a rigging attachment point on the domed bottom for rescue retrieval line attachment.

HATCH AND MANWAY RECOMMENDATIONS:

Install a handhold at the wet interior roof hatch and access tube roof hatch. The handhold would assist the climber while entering and exiting the openings. The cost would be incidental to the next painting project.

VENT CONDITIONS:

The roof vent is a pressure vacuum design that is in good condition. The pressure vacuum plate was properly aligned. There is a large external screen intended to keep birds out and a smaller mesh screen on the interior intended to keep insects out. The screens are in good condition. There is a rain shield over the outer screen.

LADDER CONDITIONS:

The dry interior ladders located in the column and access tube are in good condition. The ladders meet current OSHA size requirements. The ladders are equipped with T-rail type fall prevention devices that are in good condition.

There is a wet interior ladder from the roof to the domed bottom that appears to be in good condition. The rungs above the high-water level are corroded with minor steel loss. The ladder meets OSHA size requirements. The ladder is equipped with a T-rail type fall prevention device that was not used during the ROV inspection.

FILL/DRAW PIPE CONDITIONS:

The tank fills and draws from a single pipe. The pipe routes through the dry interior into the domed bottom and extends approximately 16 inches into the wet interior. There are deflector bars over top of the pipe in the wet interior.

There is a sample tap on the fill/draw pipe located in the column. The tap has a smooth end and faces downward. There is a threaded coupling on the fill/draw pipe for future attachment of a chemical feed line.

MIXING CONDITIONS:

There is ice abrasion coating damage on the access tube. The cause is a short circuiting of mixing during inflow and draw allowing ice to form. Tanks with the same pipe for influent and draw are especially susceptible. Many factors are involved such as daily turnover, rate of turnover, and pump turn on and turn off level settings. Using most of

the capacity of the tank during a pump down helps with mixing. If operational changes to improve water turnover are not possible, consider installation of a mixing system.

MIXING RECOMMENDATIONS:

There are a few options available to limit ice formation and the short-circuiting effect. A static system would consist of a draft tube over the fill pipe or dispersal tree with check valves. Static systems are expensive and can cost upwards of \$60,000. A mechanical mixing system can be installed to assist in situations where turnover is low but will eventually require maintenance since there are moving parts. We recommend a mechanical mixing system because the device is easily removed during repainting, and many can be removed for maintenance or replaced while the tank is in service. The estimated cost is \$20,000.

EXPANSION JOINT CONDITIONS:

The fill/draw pipe is equipped with an expansion joint located in the column. The expansion joint was covered with insulation and was not visible for inspection.

INSULATION CONDITIONS:

The fill/draw pipe is covered with rigid foam insulation. The insulation is covered with an aluminum jacket. The insulation and cover are in good condition.

MUD VALVE CONDITIONS:

There is a mud valve located in the bottom of the tank to aid in removal of sediment during inspections and routine maintenance. The mud valve was not operated during the inspection. The type of mud valve in this tank has a history of failures, however this valve appears to be in good condition.

MUD VALVE RECOMMENDATIONS:

Replace the existing mud valve with a model that is not prone to failure. The existing style of valve could operate with no issues for several more years. The recommendation for replacement is as a preventative measure. The estimated cost is \$5,000.

WET INTERIOR METAL CONDITIONS:

The steel structure is in good condition overall. No pitting was observed at the coating failures on the sidewall and access tube.

The interior roof is supported by radial stiffeners that are in good condition.

DIXON ENGINEERING, INC.
STEEL TANK FIELD INSPECTION REPORT
PEDESTAL TANK

DATE: November 21, 2022

OWNER: City of Germantown

CLIENT CODE: 35-57-11-03

TANK NAME: Route 4

LOCATION: Address: 1934 Dayton Germantown Pike

City: Germantown

State: Ohio

TANK SIZE: Capacity: 750,000 gallons

Bottom (LWL): 99 feet 10 inches (from nameplate)

Overflow (HWL): 134 feet 10 inches (from nameplate)

CONSTRUCTION:

Type: Composite

YEAR CONSTRUCTED: 2010

MANUFACTURER: Caldwell

CONTRACT NUMBER: E-6910

USE: Potable water and fire protection

COATING HISTORY	EXTERIOR	WET INTERIOR	DRY INTERIOR
YEAR COATED	<u>2010</u>	<u>2010</u>	<u>2010</u>
CONTRACTOR	<u>Caldwell</u>	<u>Caldwell</u>	<u>Caldwell</u>
SYSTEM	<u>Unknown</u>	<u>Presumed Epoxy</u>	<u>Presumed Epoxy</u>
SURFACE PREPARATION	<u>Presumed SSPC-SP6</u>	<u>Presumed SSPC-SP10</u>	<u>Presumed SSPC-SP6</u>
MANUFACTURER	<u>Unknown</u>	<u>Unknown</u>	<u>Unknown</u>
HEAVY METAL COATING SAMPLES	<u>No</u>	<u>No</u>	<u>No</u>
HEAVY METAL BEARING	<u>No</u>	<u>No</u>	<u>No</u>

PERSONNEL: Lead inspector Ryan Szczepaniak, ROV operator Jake Kramer, Crew member Austin Willette

METHOD OF INSPECTION: ROV

SITE CONDITIONS

Fenced: Yes

Site large enough for contractor's equipment: Yes

Control building: No
Antenna control site: No
Power lines within 50 feet: No
Site drainage: Away from the tank
Indications of underground leakage: No
Shrub, tree, etc. encroachment: No

EXPOSED PIPING

N/A

FOUNDATION

Foundation exposed: No

EXTERIOR COATING

Column:

Topcoat condition: Not coated
Concrete condition: Good

Bowl:

Topcoat condition: Good
Previous coat/system condition: Good
Describe coating: No significant coating deterioration
Mildew growth: Yes
Metal condition: Good

Sidewall:

Lettering: Yes
Number: 2
Lettering content: Welcome to Historic GERMANTOWN OHIO
1804
Logo: No
Topcoat condition: Good
Previous coat/system condition: Good
Describe coating: No significant coating deterioration
Metal condition: Good

Roof:

Topcoat condition: Fair
Previous coat/system condition: Fair
Describe coating: Fading, delaminating
Dry film thickness: 7-12 mils
Adhesion: Not taken

EXTERIOR COATING

Reason not taken: **Cold**

Metal condition: **Good**

Roof comments: **Approximately five small areas of delamination randomly and fading throughout**

EXTERIOR APPURTENANCES

Column Door:

Size: **36 x 80 inches**

Metal condition: **Good**

Overhead Door:

Size: **10 x 10 feet**

Metal condition: **Good**

Overflow Pipe:

Diameter: **12 inches**

Metal condition: **Good**

Discharge orientation: **Vertical**

Screen condition: **Good**

Percent of screen open: **100**

Mesh size: **4**

Flap gate/duck bill check valve: **No**

Air gap: **Yes**

Lowest part of discharge to the ground distance: **22 inches**

Height to column penetration: **31 inches**

Overflow discharges to: **Concrete pad**

Condition: **Good**

Roof Handrail:

Diameter: **15 feet**

Height: **42 inches**

Midrail height: **21 inches**

Kick plate height: **4 inches**

Vertical post type: **Angle**

Size: **3 x 3 inches**

Top rail type: **Angle**

Size: **2.5 x 2.5 inches**

Midrail type: **Plate**

Size: **3 inches**

Metal condition: **Good**

EXTERIOR APPURTENANCES

Painter's Rail:

N/A

Roof Rigging Points:

Number: 3

Couplings covered: Yes

Covered with: Plugs

Metal condition: Good

Wet Interior Roof Hatch:

Neck size: 30 inches

Distance from center of the tank (to outer edge): 5½ feet

Shape: Round

Handhold at opening: No

Curb height: 2½ inches

Cover overlap: 2½ inches

Gasket on cover/neck curb: Yes

Hatch security: Bolt

Metal condition: Good

Secondary Wet Interior Roof Hatch:

Number: 1

Neck size: 24 inches

Shape: Round

Handhold at opening: No

Curb height: 4 inches

Cover overlap: 2 inches

Gasket on cover/neck curb: Presumed yes

Hatch security: None

Metal condition: Good

Dry Interior Roof Hatch:

Neck size: 30 inches

Shape: Round

Handhold at opening: No

Hatch security: Chain

Metal condition: Good

Bolted Ventilation Hatch:

Neck diameter: 30 inches

Curb height: 2-4 inches

EXTERIOR APPURTENANCES

Gasket: **Yes**

Metal condition: **Good**

Roof Vent:

Number: **1**

Distance from center of the tank (to outer edge): **6 feet**

Type: **Pressure-vacuum**

Neck diameter: **24 inches**

Flange opening diameter: **24 inches**

Vertical expanded metal condition: **Good**

Interior screen condition: **Good**

Mesh size: **24**

Rain shield: **Yes**

Pressure plate condition: **Good**

Plate free to move: **Yes**

Plate screened: **Yes**

Mesh size: **24**

Height of the lowest opening above the roof: **21 inches**

Metal condition: **Good**

Aviation Lights:

Design: **Double red**

Location: **Handrail**

Functioning: **Yes**

Globe condition: **Good**

Photoelectric cell: **No**

Antennas:

N/A

Electrical Conduit:

Electrical conduit condition: **Good**

Exposed wiring: **No**

DRY INTERIOR COATING

Column:

Concrete condition: **Good**

Floor: **Concrete**

Drain line present: **No**

DRY INTERIOR COATING

Bottom/Condensate Platform:

N/A

Intermediate Platform:

Number: 1

Platform design: Partial

Material: Grating

Coating condition: Not coated

Metal condition: Good

Ladder opening size: 30 inches

Shape: Square

Opening covered: Yes

Handhold at opening: Yes

Top Platform:

Platform design: Catwalk

Material: Grating

Coating condition: Not coated

Describe coating: No significant coating deterioration

Metal condition: Good

Ladder opening size: 30 inches

Shape: Square

Opening covered: Yes

Handhold at opening: Yes

Handrail at platform

Height: 43 inches

Midrail height: 24 inches

Kick plate height: 4 inches

Domed Bottom:

Concrete condition: Good

Domed bottom comments: There is a painter's railing at the top of the column

Access Tube:

Diameter: 48 inches

Coating condition: Good

Describe coating: Rust bleedthrough

Dry film thickness: 5-7 mils

Metal condition: Good

DRY INTERIOR COATING

Access tube comments: **Approximately ten areas of rust bleedthrough near the bottom of the access tube**

DRY INTERIOR APPURTENANCES

Electrical Components:

Lights functioning: **Yes**

Missing covers (globes and cages): **No**

Additional lights needed: **No**

Electrical outlet/conduit condition: **Good**

Used during inspection: **Yes**

Sample Tap:

Location: **In the column**

Pipe diameter greater than ¼ inch: **Yes**

12 inches or more above the floor: **Yes**

Down turned: **Yes**

Smooth end: **Yes**

In heated box/room: **No**

Condition: **Good**

Threaded Coupling (for chemical feed on the fill/draw pipe):

Location: **In the column**

Condition: **Good**

Expansion Joint on Fill/Draw Pipe:

Location: **Bottom of pipe and top of pipe**

Type: **Rubber**

Fill/Draw Pipe Insulation:

Insulation cover: **Yes**

Type: **Aluminum**

Condition: **Good**

Seams loose: **No**

Column Ladder:

Toe clearance: **7 inches or greater**

Width of rungs: **16+ inches**

Thickness of rungs: **¾ inch**

Shape of rungs: **Rebar**

Metal condition: **Good**

Fall prevention device: **Yes**

DRY INTERIOR APPURTENANCES

Type: **T-rail**

Function properly: **Yes**

Cage: **No**

Ladder comments: **One single ladder from the ground up to the top platform**

Louvered Access Vent:

Metal condition: **Good**

Manway to Wet Interior:

Size: **30 inches**

Location: **In the domed bottom**

Metal condition: **Good**

Manway Ladder:

Metal condition: **Good**

Fall prevention device: **Yes**

Type: **T-rail**

Function properly: **Yes**

Mud Valve:

Number: **1**

Type: **Shand & Jurs**

Discharge material: **Hose**

Discharge slope: **Downward**

Functioning properly: **Not used during inspection**

Metal condition: **Good**

Access Tube Ladder:

Toe clearance: **7 inches or greater**

Width of rungs: **16+ inches**

Thickness of rungs: **3/4 inch**

Shape of rungs: **Rebar**

Metal condition: **Good**

Fall prevention device: **Yes**

Type: **T-rail**

Function properly: **Yes**

WET INTERIOR COATING

Roof:

Topcoat condition: **Fair**

WET INTERIOR COATING

Primer coating condition: **Good**

Describe coating: **Spot coating failures to substrate, rust bleedthrough, delaminated coating**

Metal condition: **Good**

Lap seams: **Welded**

Condition of lap seams: **Good**

Roof comments: **Approximately 5 spot coating failures, three of them are 12 inches in diameter**

Sidewall:

Topcoat condition: **Fair**

Primer coating condition: **Good**

Describe coating: **Delaminating, spot coating failures to substrate, rust bleedthrough**

Mineral deposits: **Light**

Metal condition: **Good**

Active pitting: **No**

Previous pitting: **No**

Sidewall comments: **Several spot coating failures approximately 3/4ths of the way up the wall. Coating is delaminating**

Access Tube:

Topcoat condition: **Poor**

Primer coating condition: **Fair**

Describe coating: **Delaminating, spot coating failures to substrate, rust bleedthrough, abrasion**

Mineral deposits: **Light**

Metal condition: **Good**

Active pitting: **No**

Previous pitting: **No**

Access tube comments: **Approximately 3/4ths of the way up there is substantial delamination and spot coating failures. Appears to be from ice movement**

Tank Bottom:

Completely covered in sediment, not completely inspected with the ROV

Sediment depth: **3 inches (estimated)**

Bottom comments: **Could not see the bottom to inspect the coating**

WET INTERIOR APPURTENANCES

Ladder:

Toe clearance: 7 inches or greater

Width of rungs: 16+ inches

Thickness of rungs: 3/4 inch

Shape of rungs: Rebar

Shape of side rails: Flat

Metal condition: Minor loss from corrosion on the top 3 rungs

Fall prevention device: Yes

Type: T-rail

Function properly: Unknown, not used during the inspection

Cathodic Protection:

N/A

Roof Stiffeners/Painters Railing:

Radial:

Number: 50 (estimated)

Dimensions: 6 x 1/2 inches

Shape: Plate

Connections: Welded

Painter's Railings Number: 2

Sidewall Stiffeners:

N/A

Overflow Pipe Inlet:

Type: Weir box

Metal condition: Good

Fill/Draw Pipe:

Diameter: 12 inches

Height above the tank bottom: 16 inches (estimated)

Deflector over end: Yes

Type: Bars

Metal condition: Good

Mixer:

N/A

Field Inspection Report is prepared from the contractor's viewpoint. It contains information the contractor needs to prepare his bid for any repair or recoating. The engineer uses it to prepare the engineering report. Cost estimates are more accurate if the contractor's problems can be anticipated. While prepared from the contractor's viewpoint, the only intended beneficiary is the owner. These reports are completed with diligence, but the accuracy is not guaranteed. The contractor is still advised to visit the site.



750,000 gallon composite (Route 4) elevated water storage tank owned by the City of Germantown, Ohio.



1) The column service door operated properly.

2) The overhead door is in good condition.

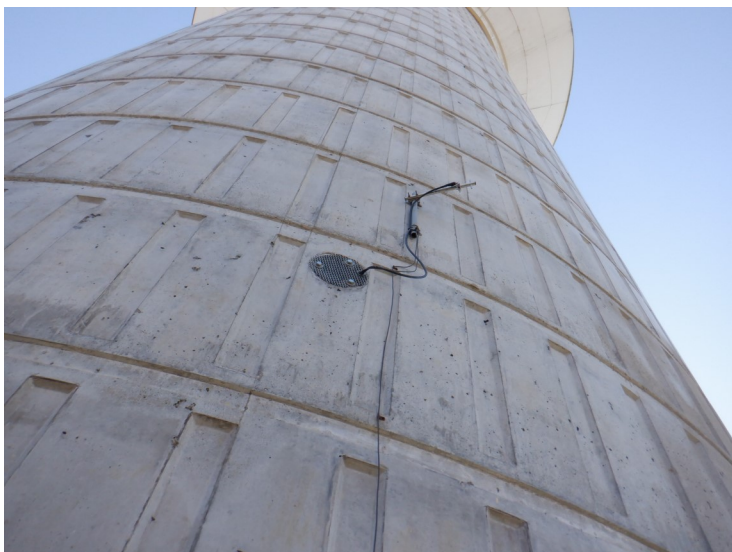


3) The overflow pipe discharges to a concrete splash pad.



4) The screen at the overflow discharge is intact.

5) The concrete column is in good condition with no deterioration.



6) Same.



7) There is light mildew growth on the bowl but no significant coating deterioration.

8) Same.



9) Same.



10) The sidewall coating is in good condition with no failures.

11) Same.

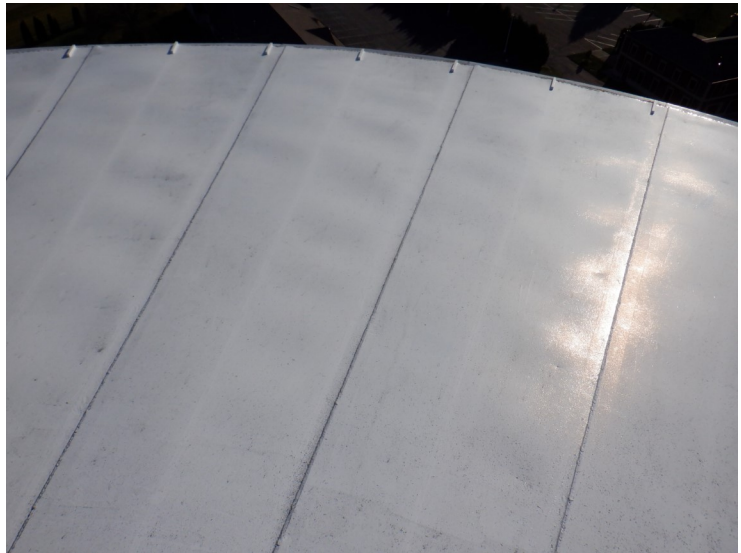


12) Same.



13) There are a few minor coating failures on the roof.

14) The roof coating is in fair condition overall.



15) Same.

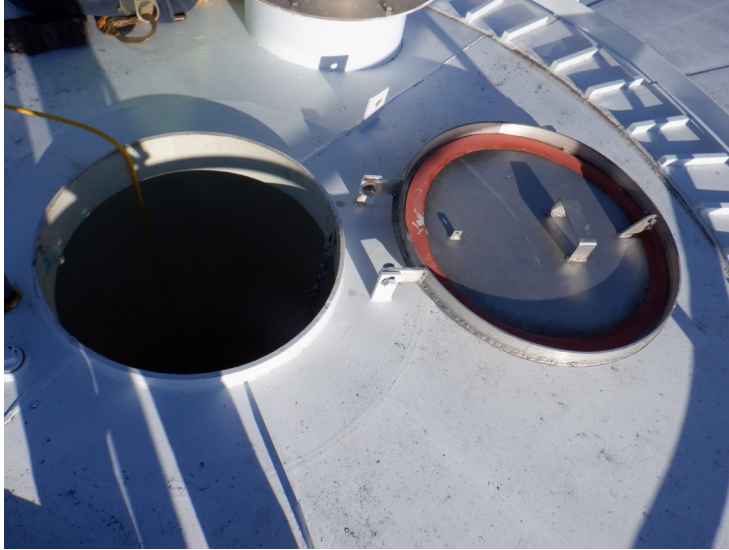


16) Same.

17) The roof rigging couplings are capped.



18) The roof handrail is in good condition.



19) There is a gasket on the wet interior roof hatch.

20) The secondary wet interior roof hatch is in good condition.

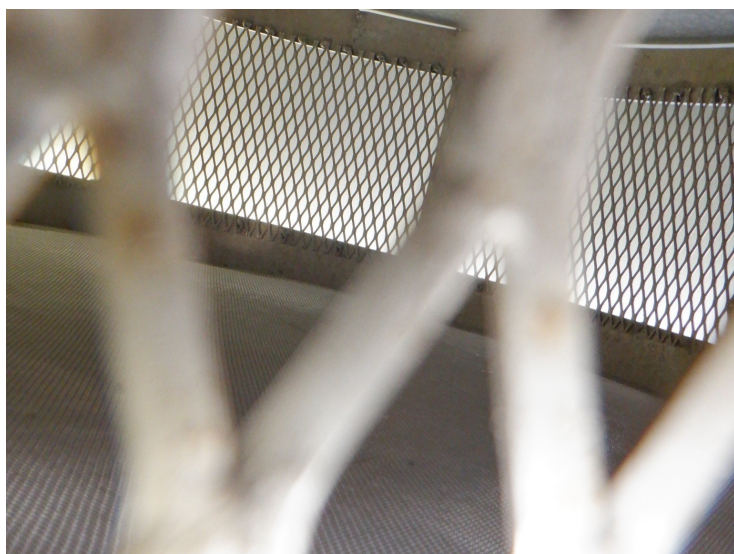


21) There is corrosion at the edges of the bolted ventilation hatch.



22) There is a gasket on the bolted ventilation hatch.

23) The roof vent is in good condition.



24) The external roof vent screen is intact.



25) The roof vent screened pressure plate is was found to be properly aligned.

26) The interior roof vent screen is in good condition.



27) The double aviation light is functioning.



28) The concrete column in the dry interior is in good condition with no deterioration.

29) Same.



30) The expansion joint at the bottom of the fill/draw pipe is covered with insulation and not accessible for inspection.



31) The sample tap on the fill/draw pipe is in good condition.

32) The dry interior ladder is in good condition. The ladder is equipped with a fall prevention device.



33) The ladder openings at the interior platforms are equipped with hinged covers.



34) The fill/draw pipe insulation and aluminum jacket are in good condition. The painter's railing at the top of the column is in good condition.

35) The interior platforms are galvanized and in good condition.



36) The wet interior manway in the domed bottom is in good condition.



37) The mud valve was not operated during the ROV inspection.

38) The louvered vent at the top of the column is in good condition.



39) There is no concrete deterioration on the domed bottom.



40) Same.

41) There are a few areas of rust bleedthrough in the access tube.



42) Same.



43) Same.

44) The access tube coating is in good condition overall.



45) The access tube ladder is in good condition. The ladder is equipped with a fall prevention device.



46) There are coating failures on the wet interior roof.

47) Same.



48) Same.



49) The wet interior roof coating is in fair condition overall.

50) Same.



51) There are numerous coating failures on the wet interior sidewall.



52) Same.



53) Same.



54) Same.



55) The wet interior sidewall coating is in fair condition overall.

56) The access tube coating is in poor condition with multiple failures.



57) Same.



58) There is minor steel loss from corrosion on the top three ladder rungs in the wet interior.

59) The wet interior ladder appears to be in good condition. The ladder is equipped with a fall prevention device.



60) The domed bottom was covered in sediment the limited the amount of surface visible with the ROV.



61) Same.

62) The mud valve was not operated during the ROV inspection.



63) There are deflector bars over the fill/draw pipe in the wet interior.