



BOROUGH OF AKRON

BOROUGH OF AKRON, LANCASTER COUNTY, PENNSYLVANIA

EVALUATION OF REHABILITATION OF THE 80,000-GALLON STANDPIPE TANK VS. NEW ELEVATED PEDESPHERE TANK

Prepared by:



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BOROUGH OF AKRON

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of the 80,000-Gallon Standpipe Tank vs. New Elevated Pedesphere Tank**

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I. Executive Summary

The Akron Borough owns and operates a Public Water Supply system which serves the water needs for the entire population of the Borough, approximately 4169 people. In May 2024, the Borough authorized Entech Engineering, Inc (Entech) to conduct an evaluation of their existing water standpipe which provides storage of approximately 80,000 gallons and provides system pressure when the high service pumps are not operating. The standpipe, built in circa 1910, needs repair and recoating at this time. The purpose of this letter report is to evaluate the costs and impacts of building a new replacement tank in lieu of repairing the existing tank.

Based on: a) the advanced age of the existing standpipe; b) increased volume considerations; c) enhanced fire suppression capabilities; and d) cost per gallon consideration; our recommendation is to replace the standpipe with a new 250,000-gallon elevated pedesphere tank.

The table below shows the options that were explored in this report:

| Option | Estimated Cost | Cost Per Gallon |
|---|-----------------------|------------------------|
| Rehabilitate Existing 80,000 Gallon Standpipe | \$656,000 | \$8.20 |
| | | |
| New 250,000 Gallon Pedesphere @ 120 feet Height | \$2,000,000 | \$8.00 |
| New 250,000 Gallon Pedesphere @ 150 feet Height | \$2,145,000 | \$8.58 |
| | | |
| Demolition of Standpipe | \$100,000 | |

Our findings and details of these options are further discussed in the report.

II. Rehabilitation of Existing 80,000 Gallon Standpipe

On October 31, 2023 Mumford-Bjorkman Associates, Inc. (MBA) at the direction of Akron Borough, conducted an inspection of the existing standpipe located between 10th and 11th Streets. Subsequently, an evaluation report was provided to the Borough detailing their findings and is attached as Appendix A. In summary, the MBA report detailed the following deficiencies that need to be addressed: interior and exterior protective coatings need to be abrasively blasted and recoated; the roof needs to be replaced with an upgraded hatch and an upgraded vent; the manway in the sidewall needs to be replaced and enlarged; safety ladder and handrails need to be upgraded; and other miscellaneous metal repairs.

The MBA report conducted laboratory analysis of the interior and exterior paint coatings. The results concluded that the tank paint is lead-based and must be removed, contained, and disposed of in accordance with all applicable regulations. See Page 3 of the MBA report.

Location

The location of the existing standpipe is shown on the exhibit contained in Appendix B. The photograph below, sourced from the Lancaster County GIS, shows the parcel on which the tank is located. The tank is located in the midst of a residential neighborhood. There is only approximately 10 feet of clearance between the tank wall and the corner of the church building. The tank stands on a parcel owned by the United Zion Church and is directly behind a residential property. The residence is approximately 32 feet from the tank and other outbuildings are within 18 feet. The lack of sufficient workspace around the base of the tank will be a complicating factor for any contractor tasked with the rehabilitation work required for this tank. The chemical analysis of the exterior coating indicates there will be a need to tent the tank to contain the coating debris during the abrasive blasting process. There is a large pine tree in the church yard that will almost certainly need to be removed for work to take place. Rehabilitation work will require work trucks, scaffolding, temporary water service equipment, and an area for temporary cell antennae equipment relocation. Permission from the church and local residents will need to be obtained for temporary construction easements.



Investigation with a reputable contractor revealed the square foot cost for the exterior work will increase significantly due to the space restrictions.

Operational Considerations

Rehabilitation of the tank will necessitate the standpipe to be emptied and taken out of service for the duration of the project. The rehabilitation work is expected to take approximately eight (8) weeks and the Borough should expect to add another two (2) weeks to empty, fill, disinfect, and conduct bacteriological tests. Since the standpipe provides the pressure to the system when pumps are off and provides the telemetry and controls through water level to turn the pumps on and off, an alternative operating procedure will need to be implemented. There are two ways to accomplish temporary operations. First, a pneumatic tank trailer can be placed in the system, connected to a fire hydrant in close proximity to the standpipe base and telemetry controls. The existing pressure switch and telemetry can be utilized. Location and space requirements for a temporary pneumatic tanker plus security fencing will need to be addressed for this operating scenario. Tanks are brought in by tractor trailer, the cab drops the trailer which stays on site for the duration of the project. An example is pictured below. Typically, there is a mobilization/demobilization and set-up fee plus a weekly rental fee for the tanker.



Alternately, Variable Frequency Drives (VFD's) could be rented or purchased and placed into operation on the high service pumps to maintain system pressure. Temporary control programming will be necessary. For the purposes of this cost estimate, we are using the hydro-pneumatic tank option which will be equal to or slightly higher in cost to VFD's and will be conservative for budgetary planning.

Cell Carrier Antennas

The standpipe has cell communication antenna arrays on the roof of the existing standpipe. To accomplish the rehabilitation, the communications' providers will need to remove and relocate the equipment temporarily to enable the replacement of the roof. Research of the lease agreement between the Borough and the communications' lease holders indicates the lessees will be responsible for the costs associated with temporary removal of the equipment. A temporary mono-pole will need to be located close to the tank for the cell carriers to be able to move their equipment onto during the rehabilitation period, which will add to the already limited space constraints.

Permits

A Public Water Supply (PWS) permit amendment from the Pennsylvania Department of Environmental Protection (PADEP) (Safe Drinking Water Program) will be required to temporarily take the tank out of service and conduct modifications to the structure.

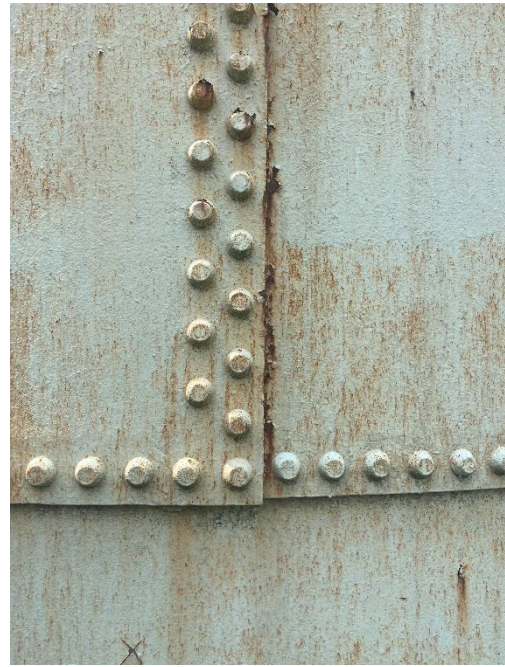
Cost Opinion

An opinion of probable project costs to rehabilitate the existing standpipe is presented in Table 1, see Appendix C. In total the opinion of probable project cost for this option is approximately \$656,000.

The life expectancy of a steel tank is typically less than 100 years. At almost 115 years old, the Akron standpipe is among one of the oldest steel tanks in the United States. Tanks of similar age are being dismantled and replaced. There has been no metallurgical tests done on the tank to determine the integrity of the sidewall steel. Abrasive blasting may uncover further issues that have not been discovered to date. The Borough should also be prepared for the two-to-three-month rehabilitation period which will expose the nearby residents and church congregation to excessive noise, dirt, and logistical disruption. The current tank condition is shown in the pictures below.



Standpipe with antenna and tree that will need removal.



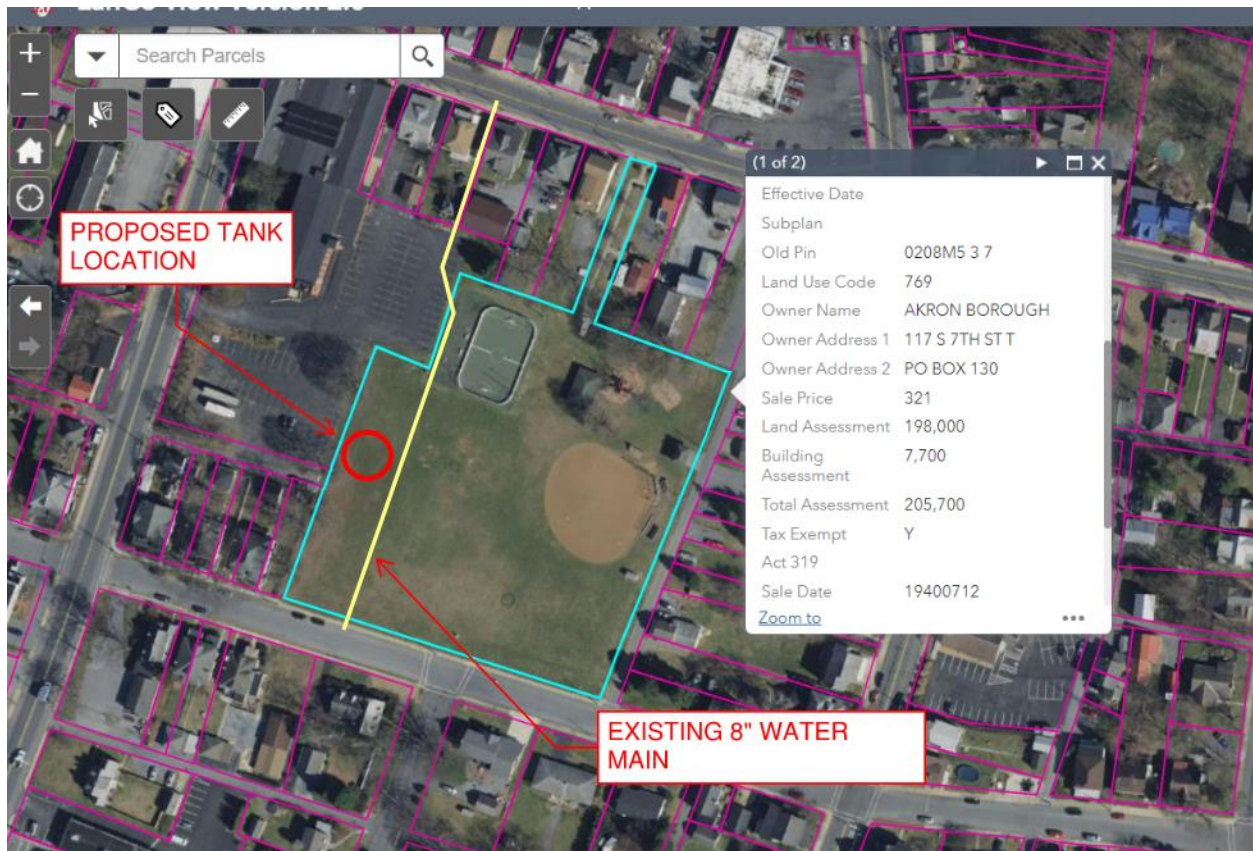
Sidewall plates and rivets showing corrosion.

There are significant costs associated with bringing the existing tank into current AWWA tank standard compliance as well as the recoating costs to protect the steel from further corrosion and degradation. Since the structure itself is at the end of its reasonable life cycle, we present a new elevated tank alternative for the Borough's consideration.

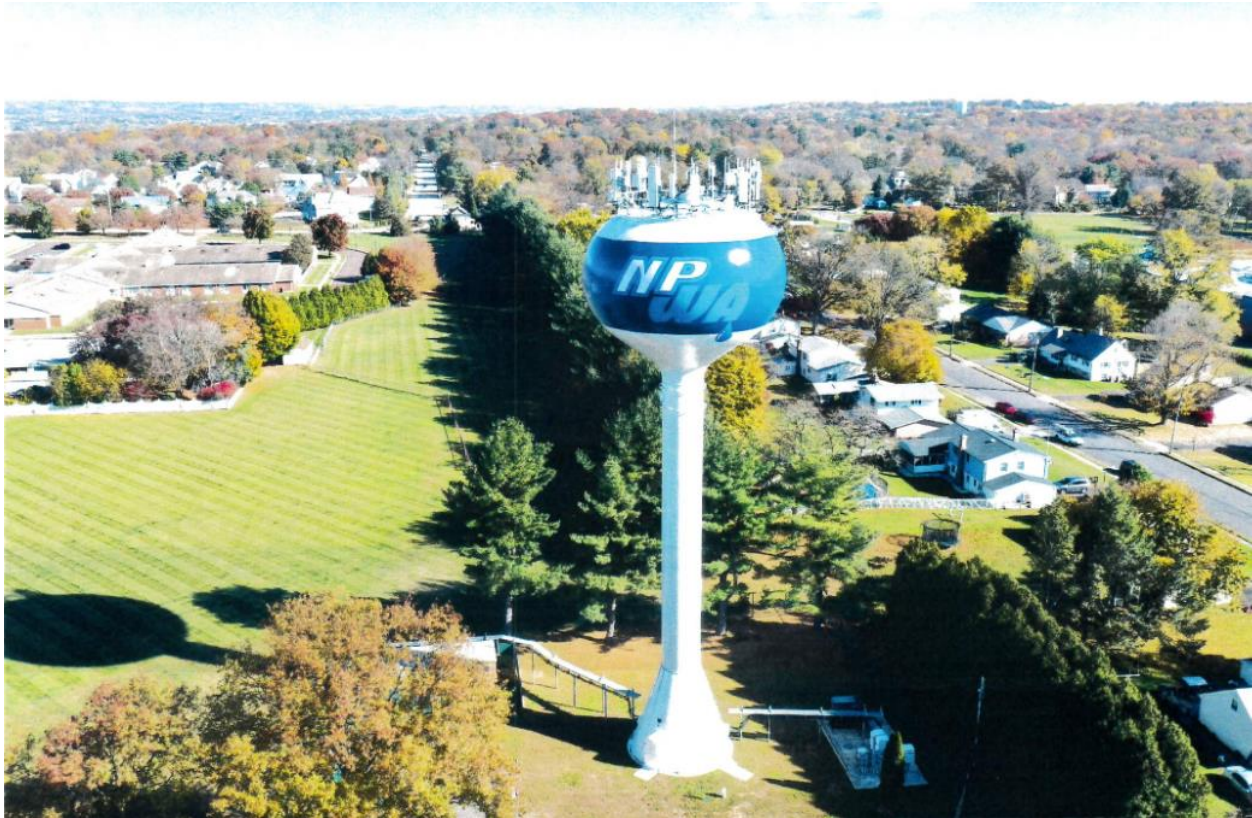
III. New Elevated Pedesphere Tank

Location

Location of a new tank has been identified and is shown on the exhibit contained in Appendix B. Borough personnel have indicated a location in the southwest corner of Broad Street park, as shown in the parcel photo below.



The Borough owns the land, and an existing 8-inch diameter distribution line is in close proximity making connection to the system very easy. The ground elevation at the new tank location is approximately 20 feet lower than the existing standpipe, therefore the total structure height of the proposed new tank will need to be approximately 20 feet taller so that water height elevation will match the existing tank for system pressure. A preliminary size used to obtain estimated costs for this evaluation is 250,000-gallon capacity with 120 feet maximum water height. A typical pedisphere type tank is pictured below.



Typical example of a pedesphere type tank.

Operational Improvements

A replacement tank option offers the Borough the ability to provide some upgrades to the water system, such as increasing water storage height which will increase service pressure and increasing water storage volume for fire suppression.

Water Pressure

The Borough has an opportunity to increase the service pressure to residents by increasing the water height by making the tank taller. We offer this not as a recommendation, but as an option the Borough and its operations personnel can consider during the design phase if a new tank is preferred. Currently water pressure at the base of the tank is approximately 42 psi when the tank is full (pump off elevation or 97 feet). A new tank could reasonably add another 13 psi to the system working pressure by increasing the tank height another 30 feet for a total tank height of 150 feet. This would be beneficial for the system connections that are at the higher elevations. Maximum system pressure located at the lowest part of the system is reported at 120 psi at the Heritage development. That location would also increase. We would recommend a pressure regulating valve be placed on the system main to decrease system pressure at this location. A working pressure of 120 psi in the system and being delivered to residences is certainly high and we would recommend a pressure regulating valve be considered, regardless of the Borough's decision on tank rehabilitation or constructing a new

tank. The high service pump curves will need to be evaluated to see if the existing pumps could supply the additional head required to increase the water height.

Water Volume and Fire Protection

The operation of the water system consists of multiple groundwater well sources pumping water into a 1.5 million gallon concrete water storage reservoir where the water receives chlorine disinfection. Average daily water usage is reported to be approximately 240,000 gallons per day (gpd) with peak day demand approximately 300,000 gpd. At full capacity, the concrete tank can store up to five days of water usage. High service pumps in a triplex configuration pump water into the distribution system from the concrete finished water storage tank. Excess water not used by the distribution system fills the 80,000 gallon standpipe. The water level in the standpipe provides water pressure to the system when the high service pumps are off. The water level in the standpipe serves as the control for the high service pump(s) on and off cycles via a pressure switch and telemetry located at the base of the existing tank. Current operating levels in the standpipe span five (5) feet between on and off. The diameter of the standpipe is very small at 12 feet. Only the top half of the tank is available for fire flow protection, or approximately 40,000 gallons. System pressure will drop to below 20 psi when the standpipe is half empty. Fire protection is supplied primarily from the three high service pumps that are located at the 1.5-million gallon concrete reservoir. There is nothing wrong with this operating setup. It should just be recognized that the fire suppression water is reliant on mechanical and telemetry systems.

A new elevated tank with a pedesphere configuration will allow the Borough to store more water at a higher elevation. Fire suppression water will be available on demand without mechanical pumping and telemetry control. The upper limit for residential (1-2 story family dwellings) needed fire flow is 1,500 gpm as published by the ISO "Guide for Determination of Needed Fire Flow". A two-hour fire flow duration at 1,500 gpm corresponds to 180,000 gallons. The Borough recently went through its ISO evaluation for Public Protection Classification (PPC). The summary report identified the Borough's Basic Fire Flow to be 2,250 gpm which is defined as the fifth largest Needed Fire Flow for selected buildings in the community. A two-hour fire flow duration at 2,250 gpm corresponds to 270,000 gallons.

Typically, storage tanks are sized on fire suppression needs plus one day of peak day water demand. The Borough already has sufficient peak day storage in its 1.5 million gallon finished water storage tank. We are recommending a tank size of 250,000 gallons which would correspond to approximately one day's water usage and be sufficient for fire suppression needs. This is a common and economical size for a pedesphere type tank. It also balances the need to keep water quality considerations in mind. Water quality age is a consideration. We would not recommend pushing water storage past the current 5 day supply.

Additional water storage at high elevation will provide additional operational flexibility in the system. Water level in the 1.5-million-gallon storage facility could be lowered to account for the additional day of storage without impacting the need to keep at least 10 feet of water in the ground tank for 4-Log treatment. Depending on where the operational levels in the pedosphere tank are set, the pumping times of the high service pumps could be increased and number of cycles per day decreased. Electrical savings could be realized depending on peak and non-peak operational hours.

Operationally the Borough will see a benefit to fire suppression for longer durations than the current system can provide. The location of the new tank two blocks to the west will extend the reach of fire flow and the ability of the system to maintain pressure for a longer period of time. Fire flow water will be available from the new elevated tank and the high service pumps simultaneously, as opposed to only being available from the high service pumps. Having water available from two sources is a significant advantage for this water system because the existing distribution system is primarily 6-inch diameter mains. The small diameter network compromises the amount of water that can be transported from the high service pumps located on the east side of the system. The ISO evaluation gave a credit of 8.62 points out of 30 points for the Borough's supply system which is a reflection of the water main capacity. A new tank with additional fire storage, higher water height, and located farther to the west should enhance the current fire flow capabilities of the Borough. Although we cannot guarantee the amount of improvement, it may be enough to bring the ISO score up to a PPC grade of 6/6X as the Borough was only 3 points shy. An increased diameter water main loop is recommended in conjunction with the new tank to significantly increase the fire suppression capabilities of the Borough.

New Tank – No Temporary Operations

Operations during construction will be easier for the new tank option. No temporary operating procedure will be needed for this option. The new tank can be constructed, disinfected, connected to the system, and brought into service. Following the new tank coming on-line, the old standpipe can then be decommissioned. The Borough could isolate the existing standpipe, empty it, then leave it in position until the term of the communications leases expire. Demolition of the standpipe can be accomplished at any time after the new tank goes into operation, in weeks, months, or even years. But certainly not indefinitely due to the degradation of the roof connection to the side wall.

The Borough may want to investigate renegotiating the terms of the lease agreement with the communications entities. They may want to move onto the new proposed tank if the Borough chooses that option.

Potential Funding

Due to the extreme old age of the existing tank, the Borough may want to investigate obtaining funds from the PENNVEST program in the form of low interest loans or a combination of a loan/grant for a new tank. The monies from the federal Water Infrastructure Finance and Innovation Act are available to governmental bodies through PENNVEST and may be a viable resource for the Borough.

Permits

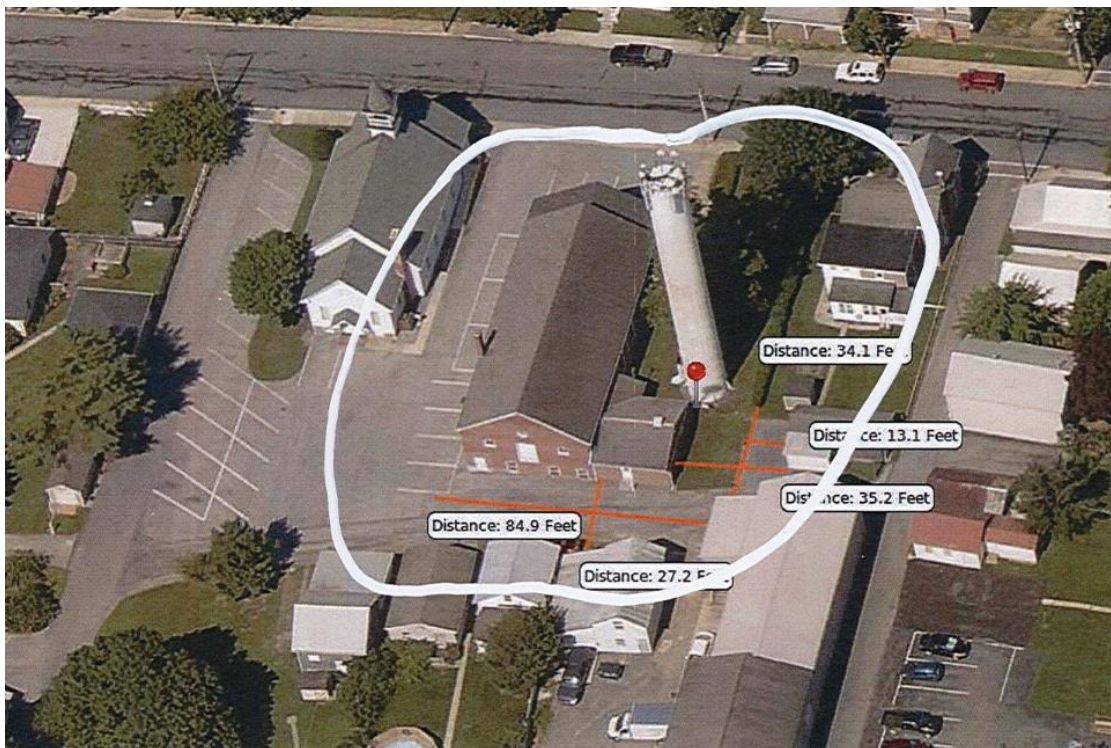
In addition to a PADEP PWS permit, a new tank will require a Federal Aviation Agency (FAA) evaluation due to the tank height to determine if marking/lighting will be required; an Erosion & Sedimentation Control Permit from the Lancaster County Conservation District; a Land Development Plan to be reviewed by the Akron Borough Planning Commission and approved by the Borough Council; and a Building Permit from the Akron Borough. The Borough may choose to waive the planning requirements.

Table 2 presents an opinion of probable project cost, see Appendix D. In total the opinion of probable project cost for a new elevated tank 120 feet tall with 250,000 gallon capacity is approximately \$2,000,000. Adding another 30 feet of tank height to increase water height to 150 feet will increase the cost of the tank by approximately \$145,000, or an additional \$0.58 per gallon. The additional 30 feet of water height will add approximately 13 psi to the system pressure.

IV. Demolition of Existing Standpipe

If the Borough chooses to construct a new tank, the existing standpipe will need to be demolished at some future time. A budgetary quote was received from Iseler Demolition, Inc. The quote is based on the following terms or conditions for plasma cutting, disassembly, and removal of the tank:

- The contractor will receive and dispose of the scrap steel.
- Demolition is for the steel shell only and does not include the foundation or capping of water lines.
- Fire blankets will need to be placed on the roofs of all structures shown in the white circle in the picture below.
- Access to a fire hydrant within 300 feet of the tank is needed.
- Any permitting fees are not included.



White circle indicates area where fire blankets will need to be placed on the rooftops.

Table 3 presents an opinion of probable project cost for demolition, see Appendix E. In total the opinion of probable project cost is approximately \$100,000.

V. Conclusion

Although the opinion of probable cost for the new tank option is significantly higher than the standpipe rehabilitation option, we recommend the Borough build a new tank for the following reasons:

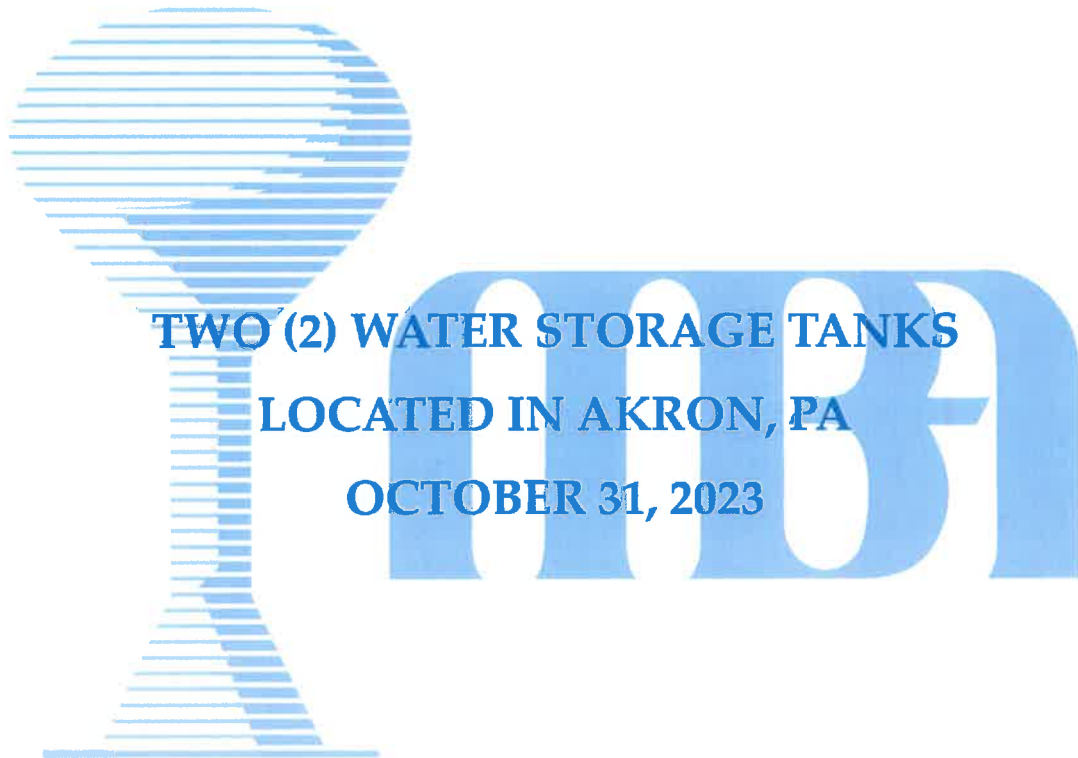
- 1) The existing standpipe is at the end of its useful life cycle. Spending the money to rehabilitate the tank with no guarantee on how much longer the sidewalls will hold up over time may not be wise.
- 2) A new tank will offer the Borough the opportunity to increase the overall water height thus increasing the system working pressure.
- 3) A new tank will offer the Borough the ability to increase storage capacity at higher elevation enabling increased fire storage and fire suppression capabilities.
- 4) The proposed location of a new tank two blocks to the west of the existing standpipe will enhance fire suppression capabilities.
- 5) Cost per gallon for the standpipe rehabilitation will be approximately \$8.20/gallon. ($\$656,000/80,000 \text{ gallons} = \8.20 per gallon)

- 6) Cost per gallon for a new 250,000-gallon pedesphere tank at 120 feet height will be approximately \$8.00/gallon. ($\$2,000,000/250,000$ gallons = \$8.00 per gallon)
The 120 feet height will match the existing standpipe water height.
- 7) If the Borough would wish to increase system pressure, an additional 30 feet of tank height would correspond to an additional 13 psi working pressure. Cost per gallon for the new 250,000-gallon pedesphere tank at 150 feet height will be approximately \$8.58/gallon. ($\$2,145,000/250,000$ gallons = \$8.58 per gallon)
- 8) There may be some electrical cost savings that could be realized by additional operational flexibility of running the high service pumps at the existing service pressure.
- 9) There may be funding available for a new tank through PENNVEST.

ATTACHMENT A

MBA STANDPIPE EVALUATION AND PHOTOS

TANK EVALUATIONS:



**TWO (2) WATER STORAGE TANKS
LOCATED IN AKRON, PA
OCTOBER 31, 2023**

**PREPARED FOR:
BOROUGH OF AKRON, PA**

Mumford-Bjorkman Associates, Inc.
P.O. Box 733
New Castle, DE 19720
1-800-486-4841
www.mbatanks.com

Subject

The subject of this report is the external and internal evaluation of the following:

| | |
|-------------|---|
| Owner: | Borough of Akron, PA |
| Location: | Between 10th and 11th Streets, Akron, PA |
| Tank Name: | Standpipe |
| Capacity: | 80,000 gal. |
| Size: | Approx. 12' Diameter x 108' High |
| Erected By: | Unknown |
| Year Built: | Circa 1910 |

The exterior was evaluated visually and digital photographs were taken. The digital photographs accompany this report.

The interior was evaluated utilizing our Remotely Operated Vehicle (ROV). Prior to the ROV entering the water, it was disinfected in accordance with AWWA C652. The internal evaluation was recorded and a USB thumb drive of this inspection accompanies this report.

This evaluation was performed on October 31, 2023, under MBA Contract No. 235261R.

Objectives

The purpose of this inspection was to determine the condition of the tank's interior, exterior, foundation, and accessories. We will make recommendations for the painting, repair, corrosion protection, and maintenance. However, our inspection for this structure is made visually, using only a PosiTest gauge for film thickness. Dimensions

of the structure and it's appurtenances were retrieved during this evaluation; prior to receiving quotes for maintenance and repairs, all dimensions should be verified. Our recommendation for a paint system on the interior and exterior are for convenience, using a system we feel is satisfactory, having limited knowledge of the environment and water content. Structural repairs listed in this report are given for consideration by the Owner's Engineers.

Summary

A. Heavy Metal Testing

MBA was authorized to remove coating samples which were analyzed for eight (8) regulated heavy metals in accordance with EPA Method 6020A. The eight following regulated heavy metals tested for: *Silver, Arsenic, Barium, Cadmium, Chromium, Mercury, Lead, and Selenium*. Identification of the metals is necessary for labeling of waste manifests and for Toxicity Characteristic Leachate Potential (TCLP) tests prior to disposal of any waste generated during surface preparation or painting operations. See attached laboratory reports and following table showing results:

| Metal Element | Metal Element Symbol | Exterior Sample Results (mg/kg) | Interior Sample Results (mg/kg) |
|----------------------|-----------------------------|--|--|
| Silver | Ag | < 25 | < 25 |
| Arsenic | As | 9.0 | < 2.5 |
| Barium | Ba | < 250 | 30000 |
| Cadmium | Cd | < 13 | < 13 |
| Chromium | Cr | 150 | 40 |
| Mercury | Hg | < 2.5 | < 2.5 |
| Lead | Pb | < 63 | 300 |
| Selenium | Se | < 5.0 | < 5.0 |

We believe the paint on this tank can be declared lead based with no further testing required. Any paint disturbing activities would then have to be performed in accordance with applicable OSHA and PA DEP regulations.

OSHA regards any recordable levels of lead in a coating as a lead based paint. Therefore, any paint disturbing activities performed shall be conducted in accordance with OSHA's Lead in Construction Standard, 29 CFR 1926.62 and Lead in General Industry Standard, 29 CFR 1910.1025.

Any dust or debris generated during paint disturbing activities or painting, shall not exceed the National Ambient Air Quality Standards as set forth in 40 CFR Part 50. If emissions are generated, then containment provisions as set forth in SSPC's Guide 6, and environmental monitoring as stated in SSPC's TU7 should be implemented.

B. Security

The tank is located in a residential area adjacent to a church and private residences, in Akron, PA. No site fence is present. The shell ladder begins 8' above grade, and lacks a ladder guard. The roof access manhole was bolted shut. See photographs #1-#8, #38, #62, and #63.

C. Exterior

1. Site - The tank site is confined. The site is generally flat and grassy, with asphalt present around the tank foundation. Hedges, private residences, a church, cell carrier buildings, the cabinet above the valve vault, and small trees occupy the area further out from the tank. There is limited laydown area for the Contractor's equipment during the tank rehabilitation, it is likely that easements and temporary fencing will be required. See photographs #1-#8.

2. Foundation - The exterior foundation is buried and has been capped with asphalt. Its condition is unknown. Minor vegetative growth was present at the shell to asphalt interface. See photographs #18-#21.

3. Protective Coating - The exterior coating appears to be an epoxy / urethane system. The coating was found to be in poor condition and measured 8-10 mils dry film thickness.

Generalized pinhole corrosion was present on 90% the shell. Isolated areas of coating breakdown with corrosion and stone bruising were noted on the lower shell plates, as well as on irregular surfaces such as along the riveted seams, shell ladder, shell manhole, name plate, and anchor bolt wing plates. See photographs #1, #9, and #18-#47.

The coating on the roof was heavily weathered and exhibiting sporadic areas of pinhole corrosion, affecting nearly 30% of the roof. Isolated coating breakdown with corrosion was also noted on the roof manhole. Heavy debris and fallout staining were present on the roof. Open holes were present at the shell to roof junction. See photographs #48-#63.

It is our recommendation that the exterior surfaces are abrasive blasted in one (1) to two (2) years. It will be necessary to maintain a Class 1A Containment system in accordance with SSPC Guide 6 during abrasive blasting and coating operations to prevent fugitive dust and emissions from escaping the work area. We have attached our Cost Estimate Sheet, as well as our Cleaning and Painting Recommendation Sheet, for your review and consideration.

4. Structural - This tank appeared to be in good structural condition.

5. Components -

a. Valve Vault - Access to the valve vault is provided by the locked cabinet on site. The piping in the vault was exhibiting 100% surface corrosion. Pitting was present on one (1) of the ductile iron spans. We recommend that the pipe span exhibiting heavy corrosion and pitting is replaced. The existing pipes in the pump house should be cleaned to an SSPC-SP6, "Commercial Blast" and recoated during the tank rehabilitation. See photographs #10-#17.

b. Base Plate - The base plate was buried with asphalt and could not be evaluated. See photographs #18-#21.

c. Anchor Bolts - There are a total of six (6) 1-3/4" diameter anchor bolts. Only the tops of the anchor bolts were exposed. The coating on the anchor bolt nuts were found to be in good condition with only minor pinhole corrosion noted. See photographs #19-#21.

d. Shell Manhole - This tank is equipped with a single 14" x 20" shell manhole located 24" above grade. The manhole is equipped with a single clamp. Coating breakdown with corrosion was present on the manhole bolt and minor pinhole corrosion was present on the lid. Currently, AWWA recommends that standpipes are equipped with two (2) shell manholes, and that at least one shell manhole measure 30" diameter to aid in entry and egress. See photographs #36 and #37.

e. Shell Ladder - The 12" clear rung width (CRW) shell ladder is equipped with a 7" standoff and begins 8' above grade. A galvanized flexible cable safety climb device was present. Pinhole corrosion was present on the shell ladder. The dimensions of the shell ladder do not conform with OSHA's 29 CFR 1910.27, which requires that ladders measure no less than 16" CRW. See photographs #38-#40.

f. Roof Vent - A 4" diameter carbon steel to PVC roof vent is present at the center roof. Drilled holes are present at the top of the PVC but no screen was present. See photographs #59-#61.

g. Roof Manhole - This tank is equipped with one (1) 18" x 18" roof manhole penetration that is flush with the roof plates. No rain lip was present. There was no lock present on the roof manhole. PA DEP requires a 4" minimum rain lip height requirement. See photographs #62 and #63.

h. Antennas - T-Mobile occupies space on this tank at the top of the shell. There are two (2) sectors of two (2) T-Mobile antennas mounted on stud welded brackets. An antenna array made up of 2" diameter galvanized pipe is fillet welded to the roof. There are five (5) dish antennas and three (3) sectors of two (2) internet panel antennas mounted on the array. See photographs #8, #9, #19, #38, #39, #41-#47, #49-#52, and #54-#58.

6. Repairs and Modifications -

a. This tank is not currently equipped with an overflow. Install an external overflow pipe with a flap gate and splash pad. See attached drawing.

b. Install a second 30" diameter bolted shell manhole with external hinge or davit arm, located 180 degrees from existing manhole. See attached drawing.

c. Replace existing shell manhole with a new bolted 30" diameter shell manhole, with external hinge or davit arm. See attached drawing.

d. Replace existing shell ladder with an OSHA compliant ladder. See attached drawing.

e. Install a galvanized flexible cable safety climb device on the new shell ladder. See attached drawing.

f. Install an 8' aluminum ladder guard at the base of the new shell ladder. See attached drawing.

g. Replace existing roof manhole with a 30" x 30" roof manhole with minimum 4" rain lip with 2" overlap per PA DEP requirements. See attached drawing.

h. Install OSHA compliant handrails with self-closing swing gate. This is currently not feasible due to the antenna layout. We recommend that the antenna framework on the roof is replaced with a perimeter corral, which should be designed as OSHA compliant handrails and engineered for the extra loads of the antennas. See attached drawing.

i. Remove existing roof vent and install a 24" diameter flanged neck and a 24" diameter aluminum pressure vacuum (APV) vent. See attached drawing.

j. Replace entire exterior roof with new dome of cone shaped roof plates, and seal the shell to roof interface entirely.

D. Interior

1. Protective Coating - The interior coating is an epoxy system that was found to be in poor condition.

Generalized pinhole corrosion and isolated areas of coating breakdown with corrosion were present on shell plates. Coating breakdown with corrosion was observed on irregular surfaces such as roof rafters, lap seams, and shell fasteners. A gap was present between the shell and the roof. See photographs #64-#75, and ROV footage.

The coating below the waterline exhibited generalized staining, sporadic pinhole corrosion, and generalized coating cracking on the shell. Isolated corrosion cells were also present on the shell. Coating breakdown with corrosion was observed on irregular surfaces such as the inlet/ discharge pipe silt stop and on the manhole lid. See ROV video footage.

We recommend that the interior surfaces are abrasive blasted to an SSPC-SP10, "Near White Metal Blast," and recoated within one (1) to two (2) years. We have attached our Cost Estimate Sheet, as well as our Cleaning and Painting Recommendation Sheet, for your review and consideration.

2. Components -

a. Roof Rafters - The I-beam cross brace roof rafters were found to be in poor condition with generalized coating breakdown with corrosion present on the flanges. Visible metal loss was observed on the rafter flanges and bolted connections. See photographs #64-#66 and #69.

b. Inlet/Discharge Line - The inlet/ distribution pipe is equipped with a silt stop. Coating breakdown with corrosion was present on the silt stop. See thumb drive containing ROV video footage.

c. Shell Manhole - The shell manhole and its gaskets were intact with no evidence of leakage detected. Corrosion was occurring on the cover. See thumb drive containing ROV video footage.

3. Structural - This tank appeared to be in good structural condition.

4. Sediment - Less than 1" of sediment was present on the floor. See thumb drive containing ROV footage.

5. Repairs and Modifications -

a. Total replacement of the roof, including the rafters, should be anticipated during the next rehabilitation.

b. Perform metal repairs as necessary. Non-structural areas of metal loss exhibiting greater than 25% but less than 50% metal loss can be pit filled. Areas of metal loss on critical items, riveted plate seams, or areas exhibiting 50% or greater metal loss should be pit welded or patch plated.

Conclusion

We recommend that the exterior and interior surfaces are abrasive blasted and recoated within one (1) to two (2) years. All repairs listed in this report shall be performed during the tank rehabilitation. We have attached our Cleaning and Painting Recommendation Sheet, as well as our Cost Estimate Sheet, for your review and consideration.

Given the age of the vessel, the owner may also wish to consider reaching out to Iseler Demolition, to inquire about a price for tank demolition.

MBA'S TANK DATA SHEET

| | |
|--|--|
| Customer <u>Borough of Akron</u> | Inspection Date <u>10/31/2023</u> |
| Location <u>Between 10th & 11th Streets</u> | Contract No. <u>235261R</u> |
| City <u>Akron</u> State <u>PA</u> | Builder <u>Unknown</u> |
| Tank Name <u>Standpipe</u> | Year <u>1910</u> |

Type of Tank Standpipe **Capacity** 80,000 Gallons **Size** 12' Diameter x 108' High

Type of Roof Flat **No. of Shell Rings** 20 **Weld / Rivet** Bolted

| | | | |
|-----------------------|-----------------------|--------------------------|-----------------------|
| Shell Manhole | Roof Manhole | Vent | Overflow |
| Quantity <u>1</u> | Quantity <u>1</u> | Locked <u>None</u> | Size <u>None</u> |
| Size <u>14" x 20"</u> | Size <u>18" x 18"</u> | Rain Lip <u>None</u> | Screen <u>N/A</u> |
| | | Screen <u>None</u> | Splash Pad <u>N/A</u> |
| | | Vent Size <u>4" Dia.</u> | |
| | | Vent Type <u>PVC</u> | |

| | | |
|--------------------|------------------------|---------------------------------------|
| Riser | Piping | Accessories |
| Size <u>N/A</u> | Inlet Size <u>Unk.</u> | Painter's Attachment <u>None</u> |
| Manhole Size _____ | Dist. Size <u>Unk.</u> | CP System <u>None</u> Type <u>N/A</u> |
| | No. of Pipes <u>1</u> | |

| Ladders | Exterior | | Ladder | Roof | Dry | Access Tube | Wet | Riser |
|----------------|--------------------|-------------------------|---------------|-------------|------------|--------------------|-------------|--------------|
| Ladder | <u>Yes</u> | | | <u>None</u> | <u>N/A</u> | <u>N/A</u> | <u>None</u> | <u>N/A</u> |
| Safety Climb | <u>Flex. Cable</u> | Locked <u>None</u> | Safety Climb | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |
| Cage | <u>None</u> | Off Grade <u>8'</u> | Cage | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |
| Width | <u>12"</u> | Ladder Gate <u>None</u> | Width | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |
| Standoff | <u>7"</u> | | Standoff | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |

Legs Number of Legs N/A Type of Legs N/A Number of Tiers N/A Leg Anchor Bolts N/A
Riser Anchor Bolts N/A

Coating

| | |
|--------------|----------------|
| Int. Coating | Mils |
| <u>Epoxy</u> | <u>Unk.</u> |
| Dry Coating | <u>N/A</u> |
| Ext. Coating | <u>8-10</u> |
| Last Painted | <u>Unknown</u> |
| Contractor | <u>Unknown</u> |

Total Lead Content

| | | |
|-------------------|-------------------|-------------|
| | mg/kg | Year |
| Int. Wet Total Pb | <u>See Report</u> | <u>2023</u> |
| Int. Dry Total Pb | <u>N/A</u> | <u>N/A</u> |
| Exterior Total Pb | <u>See Report</u> | <u>2023</u> |

Estimated Area (sq.ft.)

| | |
|--------------|--------------|
| Interior Wet | <u>4,500</u> |
| Interior Dry | <u>N/A</u> |
| Exterior | <u>4,200</u> |

Repairs

- Install an external overflow pipe with a flap gate and splash pad.
- Install 30" diameter shell manhole with external hinge or davit arm.
- Replace shell manhole with 30" diameter shell manhole.
- Replace existing shell ladder with an OSHA compliant ladder.
- Install a galvanized flexible cable safety climb device on the new shell ladder.
- Install an 8' aluminum ladder guard on the new shell ladder.
- Install a 30" x 30" roof manhole with 4" rainlip.
- Install OSHA compliant handrail corral, engineered to accomodate antennas.
- Remove existing roof vent and install a 24" diameter flanged neck and a 24" diameter aluminum pressure vacuum (APV) vent.
- Perform metal repairs as necessary.
- Replace all roof plates and rafters.

Dedicated to a cleaner environment since 1982



NY ELAP# 11993
PCM, PLM, TEM & LEAD

batta
LABORATORIES

Delaware Industrial Park, 6 Garfield Way
Newark, DE 19713-5817
Tel. (302)737-3376 Fax (302) 737-5764
Newark, DE - Columbia, MD - Philadelphia, PA
Web: <http://www.battaenv.com> E-mail: battaenv@battaenv.com



NVLAP
Lab Code: 101032-0

REPORT OF ANALYSIS

Page 1 of 2

Report Revision#: ORIGINAL
Project Number: L431105
Project Name: MUMFORD-BJORKMAN ASSOCIATES, INC.
Project Location: 10TH AND 11TH STREETS, AKRON, PA
Date Received: 11/1/2023 **Date Sampled:** 10/31/2023
Date Analyzed: 11/2-11/6/23 **Sampled By:** CLIENT
Analyte Requested: PAINT-RCRA8 **Date Report Issued:** 11/6/2023

| Lab Sample # | Field Sample # | Sample Description | Parameters | Results in Weight % | Result (mg/kg) | Method | RDL (mg/kg) |
|--------------|----------------|--------------------|------------|---------------------|----------------|-------------|-------------|
| 1066923 | 01 | EXTERIOR | Ag | <0.0025 | <25 | SW846 7000B | 25 |
| | | | As | 0.00090 | 9.0 | SW846 7060 | 2.5 |
| | | | Ba | <0.025 | <250 | SW846 7000B | 250 |
| | | | Cd | <0.0013 | <13 | SW846 7000B | 13 |
| | | | Cr | 0.015 | 150 | SW846 7000B | 25 |
| | | | Hg | <0.00025 | <2.5 | SW846 7470A | 2.5 |
| | | | Pb | <0.0063 | <63 | SW846 7000B | 63 |
| | | | Se | <0.00050 | <5.0 | SW846 7740 | 5.0 |

*ND-Parameter was not detected at or above the reporting limit

QA Package ID: 11/02-06/2023P(Ag, As, Ba, Cd, Cr, Hg, Pb, Se)-SHAA500/900/FIMS

Note: 1. EPA guidelines require identification of paint samples as "lead based paint" when concentrations are found to be greater than 0.5% by weight (5000 mg/kg); 2. Quality control results in this report are acceptable; 3. Results relate only to the items tested; Batta Laboratories, Inc. is not responsible for sample collection, nor interpretations made by others; 4. This report does not constitute endorsement by AIHA LAP, LLC., NVLAP and/or any other U.S. governmental agencies; and 5. Lab results/calculations are reported in 2 significant figures. Clients data/measurements are reported as they were submitted. 6. Samples received in acceptable condition unless otherwise noted. 7. The designation of "CL" as the Analyst on this report denotes that there are samples listed above which were submitted to an accredited partner lab for analysis.

Batta Lab strives on customer feedback to improve the quality of our services. Please e-mail your feedback to feedback@battaenv.com.

Analyst: Sarah Hopkins
S. Hopkins

QA/QC By: N.C. Batta/Al Yehia
N.C. Batta/Al Yehia (QA/QC Officer)

Dedicated to a cleaner environment since 1982



NY ELAP # 11993
PCM, PLM, TEM & LEAD

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LABORATORIES

Delaware Industrial Park, 6 Garfield Way
Newark, DE 19713-5817
Tel. (302) 737-3376 Fax (302) 737-5764
Newark, DE - Columbia, MD - Philadelphia, PA
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NVLAP
Lab Code: 101032-0

REPORT OF ANALYSIS

Page 2 of 2

Report Revision#: ORIGINAL
Project Number: L431105
Project Name: MUMFORD-BJORKMAN ASSOCIATES, INC.
Project Location: 10TH AND 11TH STREETS, AKRON, PA
Date Received: 11/1/2023 **Date Sampled:** 10/31/2023
Date Analyzed: 11/2-11/6/23 **Sampled By:** CLIENT
Analyte Requested: PAINT-RCRA8 **Date Report Issued:** 11/6/2023

| Lab Sample # | Field Sample # | Sample Description | Parameters | Results in Weight % | Result (mg/kg) | Method | RDL (mg/kg) |
|--------------|----------------|--------------------|------------|---------------------|----------------|-------------|-------------|
| 1066924 | 02 | INTERIOR | Ag | <0.0025 | <25 | SW846 7000B | 25 |
| | | | As | <0.00025 | <2.5 | SW846 7060 | 2.5 |
| | | | Ba | 3.0 | 30000 | SW846 7000B | 250 |
| | | | Cd | <0.0013 | <13 | SW846 7000B | 13 |
| | | | Cr | 0.0040 | 40 | SW846 7000B | 25 |
| | | | Hg | <0.00025 | <2.5 | SW846 7470A | 2.5 |
| | | | Pb | 0.03 | 300 | SW846 7000B | 63 |
| | | | Se | <0.00050 | <5.0 | SW846 7740 | 5.0 |

*ND-Parameter was not detected at or above the reporting limit

QA Package ID: 11/02-06/2023P(Ag, As, Ba, Cd, Cr, Hg, Pb, Se)-SHAA500/900/FIMS

Note: 1. EPA guidelines require identification of paint samples as "lead based paint" when concentrations are found to be greater than 0.5% by weight (5000 mg/kg); 2. Quality control results in this report are acceptable; 3. Results relate only to the items tested; Batta Laboratories, Inc. is not responsible for sample collection, nor interpretations made by others; 4. This report does not constitute endorsement by AIHA LAP, LLC., NVLAP and/or any other U.S. governmental agencies; and 5. Lab results/calculations are reported in 2 significant figures. Clients data/measurements are reported as they were submitted. 6. Samples received in acceptable condition unless otherwise noted. 7. The designation of "CL" as the Analyst on this report denotes that there are samples listed above which were submitted to an accredited partner lab for analysis.

Batta Lab strives on customer feedback to improve the quality of our services. Please e-mail your feedback to feedback@battaenv.com

Analyst: Sarah Hopkins
S. Hopkins

QA/QC By: 
N.C. Batta (QA/QC Officer)

MBA's

Cleaning and Painting Recommendations

For recommendation purposes only, consult with Coating Manufacturer, and/or MBA prior to specifying.

Owner **Borough of Akron**

Tank **Standpipe**

Interior Wet

Cleaning Full SSPC-SP10, "Near White Metal Blast."

Prime Full Induron Ceramaprime @ 3.0 - 5.0 mils DFT

Intermediate Stripe Induron PE-70 @ 3.0-5.0 mils DFT

Finish Full Induron Permaclean 100 @ 20.0-25.0 mils DFT

Interior Dry

Cleaning _____

Primer _____

Intermediate _____

Finish _____

Exterior

Cleaning Full SSPC-SP6 "Commercial Blast," w/ Class 2A Containment

Prime Full Induron Ceramaprime @ 3.0 - 5.0 mils DFT

Intermediate Stripe Induron PE-70 @ 4.0-5.0 mils DFT

Finish Full Induron Indurethane 6600 Plus @ 2.0 - 4.0 mils DFT

Second Finish Full Induron Permagloss Fluourourethane applied at 2.0-4.0 mils DFT

Valve Vault

Cleaning Full SSPC-SP6 "Commercial Blast."

Prime Full Induron Ceramaprime @ 3.0 - 5.0 mils DFT

Intermediate Stripe + Full Induron PE-70 @ 4.0-6.0 mils DFT

Finish Full Induron PE-70 @ 4.0-6.0 mils DFT

Special Testing

Perform high voltage holiday testing on all interior surfaces below the high waterline.

Remarks



Rehab Estimate Sheet

By Qualified Tank Painter*

P.O. Box 733
New Castle, DE 19720
Phone: (800) 486-4841
Fax: (302) 655-8260
www.mbatanks.com

| | | | | | |
|---------------------|-------------------------|------------------------|--------------|-------------------|-------------------|
| Customer | Borough of Akron | Location | Akron | State | PA |
| Tank Name | Standpipe | Total Lead Test | | Int. Wet | Int. Dry |
| Type of Tank | Standpipe | | | See Report | N/A |
| Capacity | 80,000 Gallons | | | See Report | See Report |

Estimated Coating Repair Cost

| | Square Foot | \$ / sq.ft. | Coating Repairs | Int. Wet Cost | Int. Dry Cost | Exterior Cost |
|---------------------------|-------------|-------------|-----------------------|---------------------|---------------|---------------|
| Int. Wet | 4,500 | 22 | Full SP-10 and Recoat | \$99,000.00 | | |
| Int. Dry | N/A | N/A | | | \$0.00 | |
| Exterior | 4,200 | 28 | Full SP-6 and Recoat | | | \$117,600.00 |
| Total Coating Cost | | | | \$216,600.00 | | |

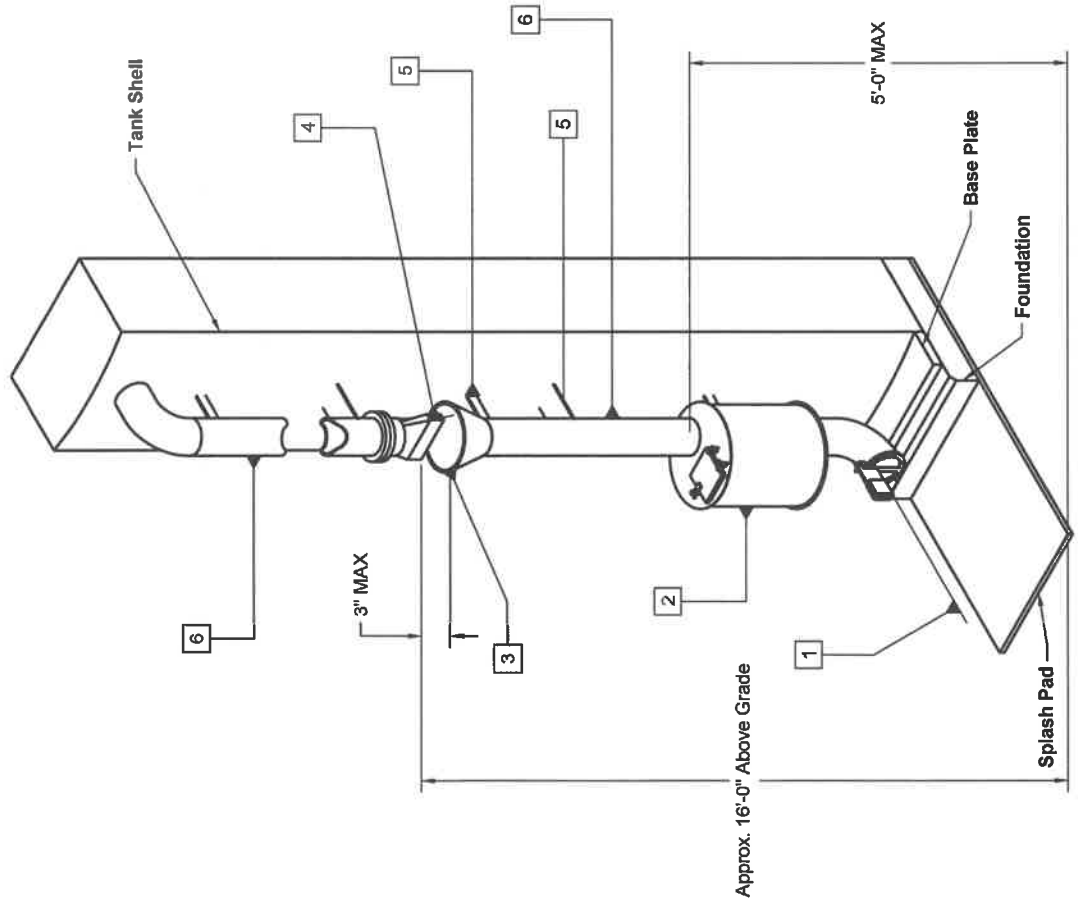
Estimated Metal Repair Cost

| | |
|---|---------------------|
| -Install an external overflow pipe with a flap gate and splash pad | \$6,500.00 |
| -Install 30" diameter shell manhole with external hinge or davit arm | \$10,000.00 |
| -Replace shell manhole with 30" diameter shell manhole | \$10,000.00 |
| -Replace existing shell ladder with an OSHA compliant ladder | \$12,000.00 |
| -Install a galvanized flexible cable safety climb device on the new shell ladder | \$2,000.00 |
| -Install an 8' aluminum ladder guard on the new shell ladder | \$2,000.00 |
| -Install a 30" x 30" roof manhole with 4" rainlip | \$10,000.00 |
| -Install OSHA compliant handrail corral engineered to accomodate antennas | \$25,000.00 |
| -Remove existing roof vent and install a 24" diameter flanged neck and a 24" diameter aluminum pressure vacuum (APV) vent | \$10,000.00 |
| -Perform metal repairs as necessary | \$25,000.00 |
| -Replace all roof plates and rafters | \$40,000.00 |
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| Total Metal Repairs Cost | \$152,500.00 |

TOTAL BUDGET \$369,100.00

Costs are based on past bid results. Contractor's actual bid could be higher or lower.
 *MBA can assist with Project Specifications and list of qualified Tank Painters.

This drawing is not to scale and is NOT to be used for fabrication. It is intended for illustration purposes only.



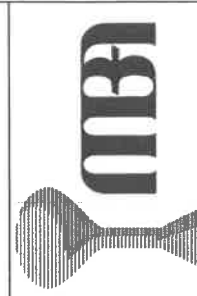
| BILL OF MATERIALS | | | |
|-------------------|-----|---------------------------------|----------|
| ITEM | QTY | DESCRIPTION | MATERIAL |
| 1 | 1 | FLAP GATE | A36 |
| 2 | 1 | DECHLORINATION DRUM | SS |
| 3 | 1 | CONCENTRIC REDUCER | A36 |
| 4 | 1 | DUCK BILLED FLANGED CHECK VALVE | RUBBER |
| 5 | TBD | ALTERNATING SUPPORT BRACKETS | A36 |
| 6 | 1 | OVERFLOW PIPE | A36 |

Notes:

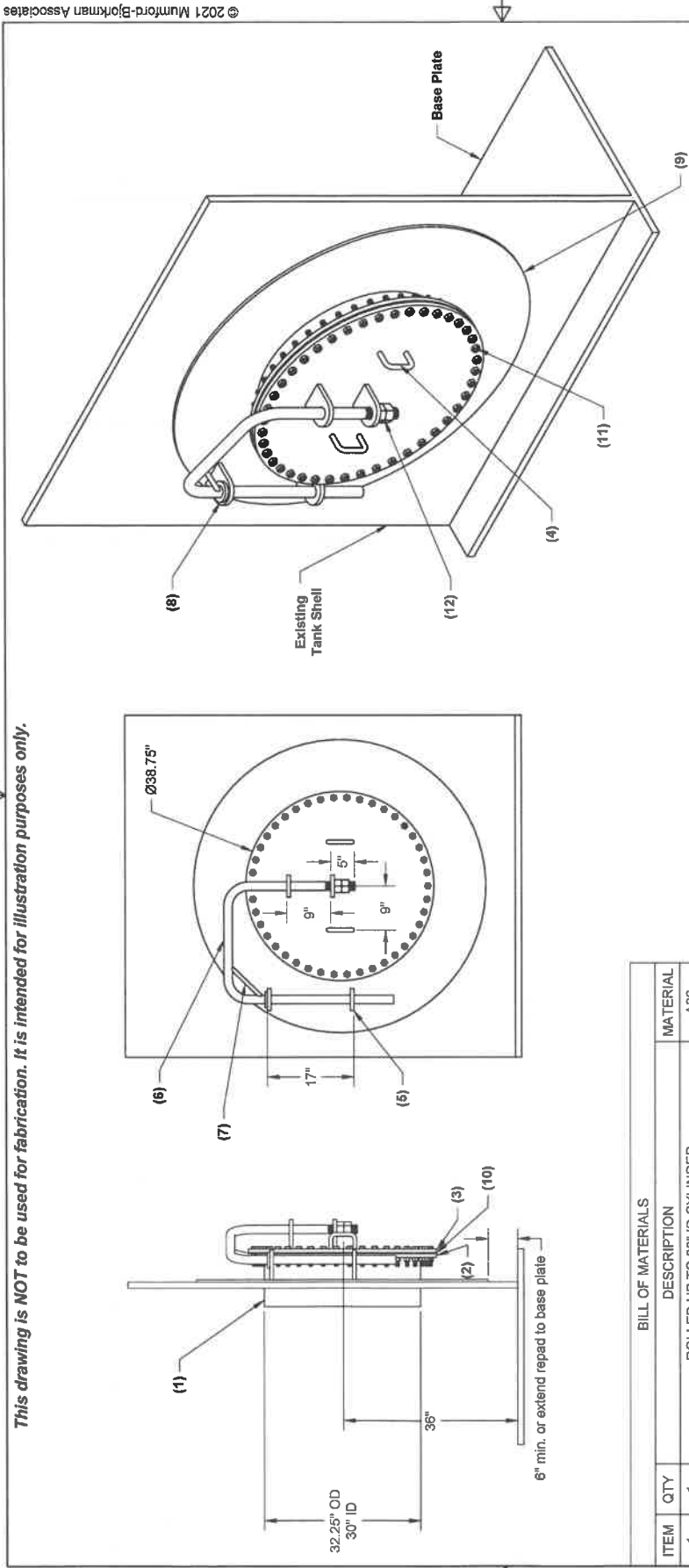
1. 3" air gap between check valve and concentric reducer, located approximately 16' above grade.
2. Top of dechlorination drum at 5'-0" maximum above grade.
3. Concentric reducer shall be 2x the nominal diameter of overflow pipe.

DRAWING TITLE:
OVERFLOW PIPE
ASSEMBLY

955 South Chapel Street
Newark, DE 19713



This drawing is NOT to be used for fabrication. It is intended for illustration purposes only.




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| BILL OF MATERIALS | | | |
|-------------------|-----|--|----------|
| ITEM | QTY | DESCRIPTION | MATERIAL |
| 1 | 1 | ROLLED UP TO 30" ID CYLINDER | A36 |
| 2 | 1 | 7/8" X 38.75 OD X 30.75 ID W/ 42 3/8" HOLES ON 36.25 BOLT CIRCLE | A36 |
| 3 | 1 | 1 X 38.75 OD W/ 42 3/8" HOLES ON 36.25 BOLT CIRCE | A36 |
| 4 | 2 | 3/4" ROD X 12.00 BEND TO 5.00 HANDLE | A36 |
| 5 | 4 | 1/2" X 4.5 X 5.25 | A36 |
| 6 | 1 | 1.5 ROD X 77.00 | A36 |
| 7 | 1 | 3/4" ROD X 12.00 (WELDED TO #6 AS GUSSET) | A36 |
| 8 | 1 | 1/2" X 4.00 OD X 1.625 ID | A36 |
| 9 | 1 | REPAD ROLLED TO MATCH TANK RADIUS | A36 |
| 10 | 1 | 1/4" X 38.75 OD X 31 ID W/ 42 3/8" HOLES ON 36.25 BOLT CIRCLE | SBR |
| 11 | 42 | 3/8" X 3.00 HH NUTS & BOLTS - GALVANIZED W/ ANTI-SEIZE | A325 |
| 12 | 2 | 1-3/4" HH NUTS | A36 |

Notes:

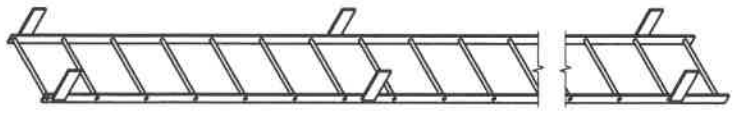
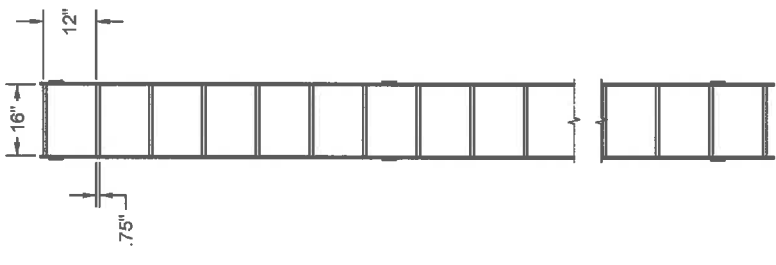
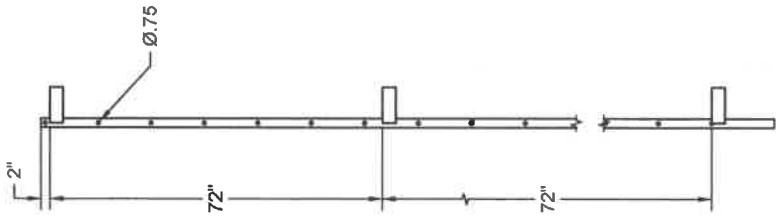
- Design, fabrication, and installation in accordance with AWWA D100-11 Sec. 3.13.
- Repad shall be rolled to fit curvature of the shell.
- Welds for repad shall be spaced a minimum of 10" from the existing vertical and horizontal shell seams.



DRAWING TITLE: 30" SHELL MANHOLE

955 South Chapel Street
Newark, DE 19713

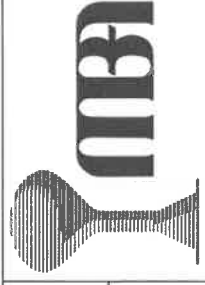
This drawing is NOT to be used for fabrication. It is intended for illustration purposes only.



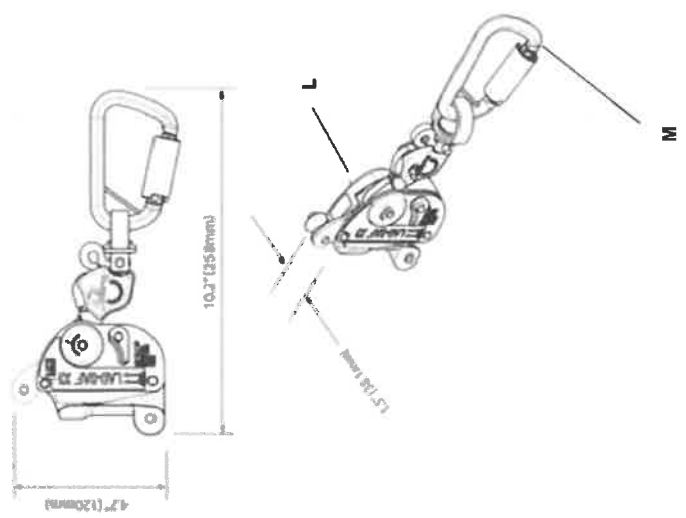
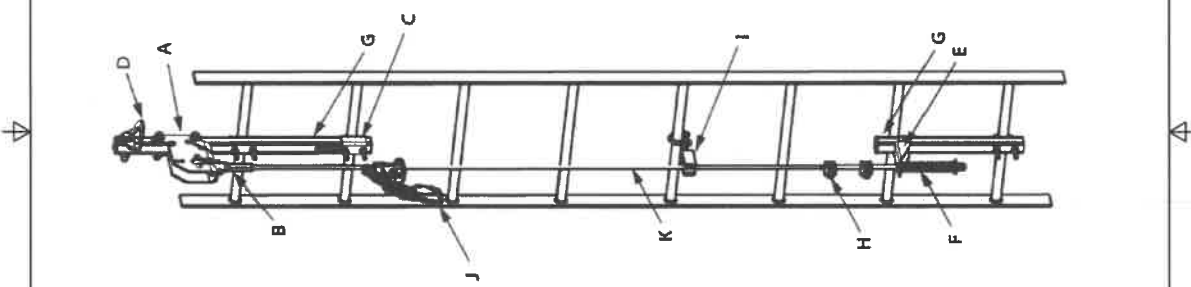
| BILL OF MATERIALS | | | |
|-------------------|-----|--------------------------------------|----------|
| ITEM | QTY | DESCRIPTION | MATERIAL |
| 1 | 2 | 2- 1/2" X 3/8" FLAT BAR - LENGTH TBD | A36 |
| 2 | TBD | 3/4" X 16- 1/2" WELD-GRADE REBAR | A36 |
| 3 | TBD | 3" X 8" X 3/8" FLAT BAR | A36 |

DRAWING TITLE:
Ladder Detail

955 South Chapel Street
Newark, DE 19713



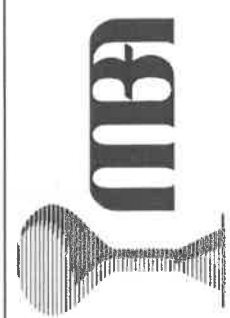
| BILL OF MATERIALS | | |
|-------------------|--------------------------|---------------------|
| ITEM | DESCRIPTION | FINISH |
| A | TOP PLATE | 304 STAINLESS STEEL |
| B | SWAGE CONNECTOR | 304 STAINLESS STEEL |
| C | HARDWARE | STEEL |
| D | SINGLE POINT ANCHOR | 316 STAINLESS STEEL |
| E | BOTTOM PLATE | STEEL |
| F | TENSION ASSEMBLY | 304 STAINLESS STEEL |
| G | TUBES | STEEL |
| H | TENSION ROD | STEEL |
| I | CABLE GUIDE | STEEL/RUBBER |
| J | DETACHABLE CABLE SLEEVE | 304 STAINLESS STEEL |
| K | CABLE | GALVANIZED |
| L | LAD-SAF X3 SLEEVE | 304 STAINLESS STEEL |
| M | CARIBINER, 1 1/8" THROAT | STEEL |



- NOTES:**
- Galvanized cable for atmospheric exposure.
 - 1.1. 3/8" diameter cable 1X7 strand extra st. 15,400 lb. min. tensile
 - OSHA 29 CFR 1910.23 requires a safety climb system on all ladders over 20' in height. The manufacturer is 3M Capital Safety. The distributor is First State Distributors, Wilmington, DE 302-655-8266.

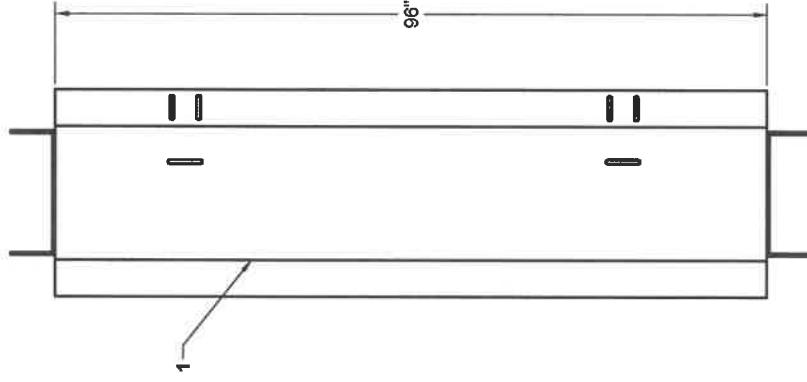
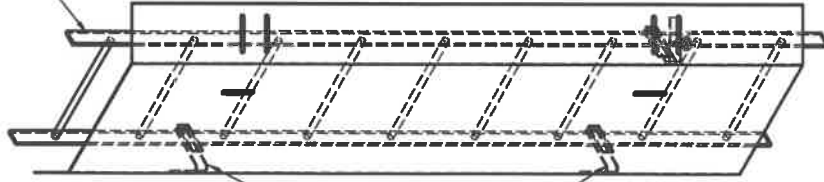
Drawing Title: Flexible Cable Safety Climb System (Galvanized)

955 South Chapel Street
Newark, DE 19713



This drawing is NOT to be used for fabrication. It is intended for illustration purposes only.

Existing tank ladder



Notes:

1. All braces and hardware are fabricated from rust-resistant, hot-dip galvanized, heavy gauge steel.
2. No welding, cutting, or alterations necessary.
3. Use of heavy duty, high quality padlock recommended.
4. Front lock option to be used if shield is turned to open to the right.

BILL OF MATERIALS

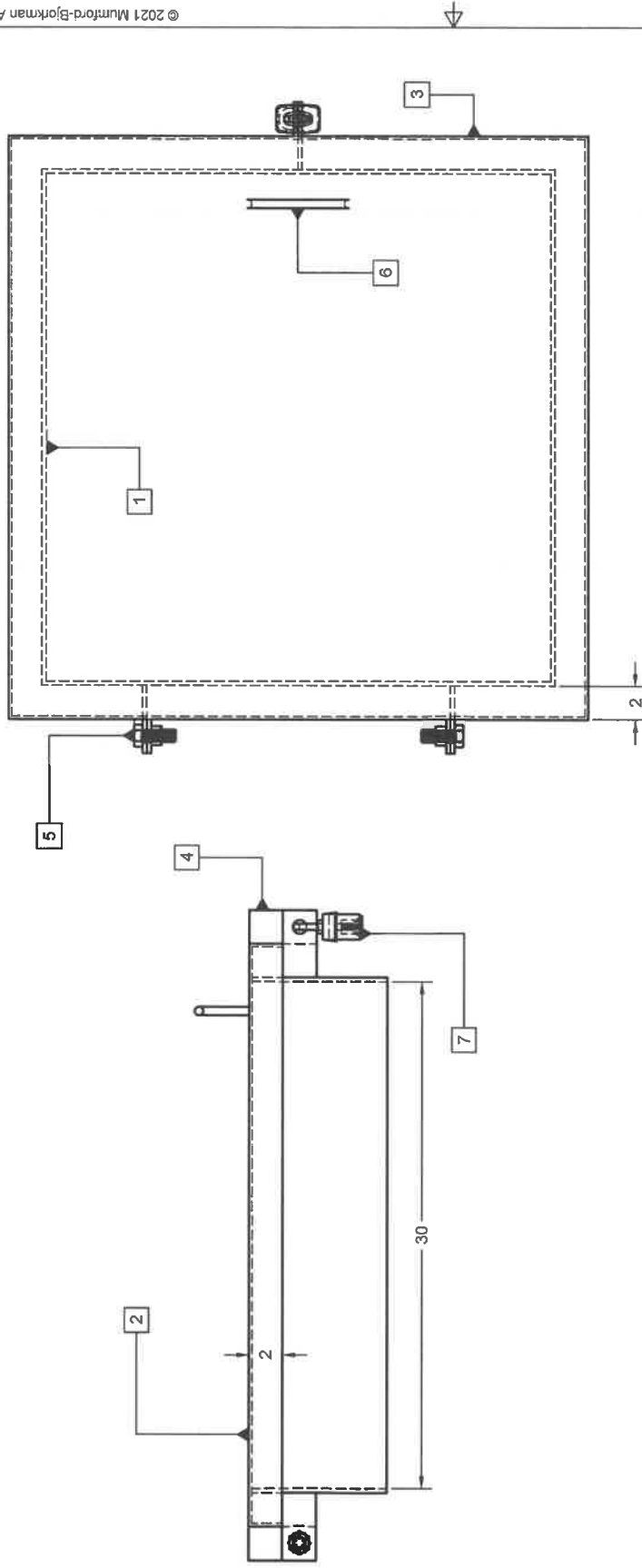
| ITEM | QTY | DESCRIPTION | MATERIAL |
|------|-----|------------------|----------|
| 1 | 1 | LADDER GATE | ALUMINUM |
| 2 | TBD | BOLT-ON BRACKETS | STEEL |

DRAWING TITLE:
ALUMINUM LADDER
GUARD



955 South Chapel Street
Newark, DE 19713

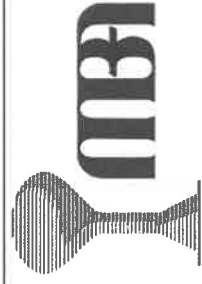
This drawing is NOT to be used for fabrication. It is intended for illustration purposes only.



| BILL OF MATERIALS | | | |
|-------------------|-----|------------------------------------|----------|
| ITEM | QTY | DESCRIPTION | MATERIAL |
| 1 | 4 | FB 1/2" x 8" x 30" | A36 |
| 2 | 1 | PL 3/16" x 34 1/2" | A36 |
| 3 | 4 | FB 1/2" x 2" x 34 1/2" | A36 |
| 4 | 6 | FB 1/2" x 2" x 4" w/ 13/16" Ø HOLE | A36 |
| 5 | 2 | BOLT 3/8" x 2" w/ HH NUT | A36 |
| 6 | 1 | RB 1/2" x 12" BEND AS SHOWN | A36 |
| 7 | 1 | PADLOCK | A36 |

Notes:

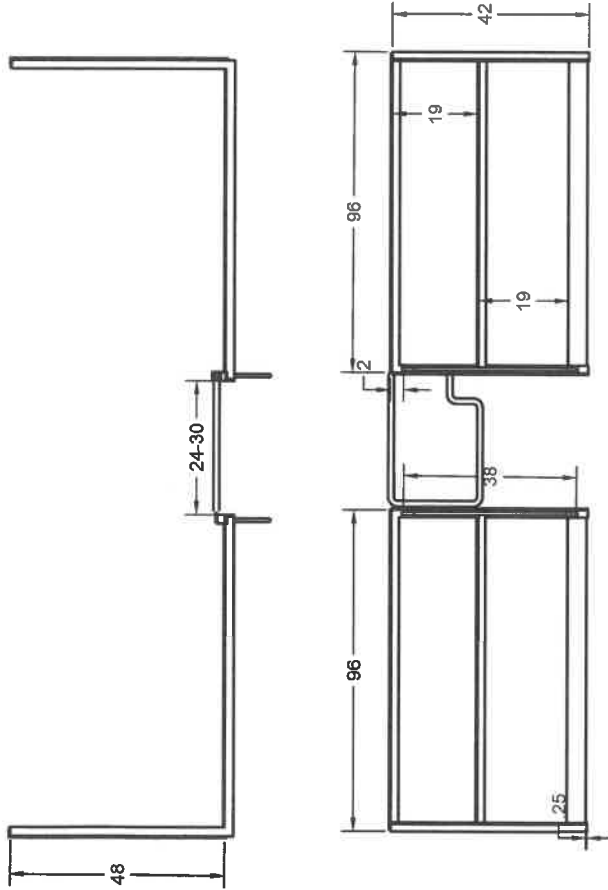
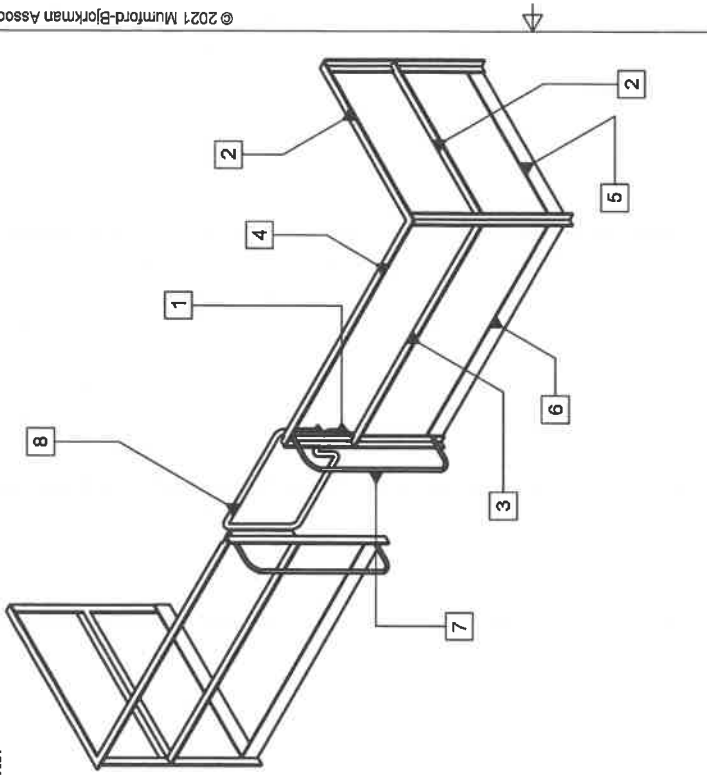
1. Top of the rain lip must be framed between 4" and 6" from top of tank roof, depending on state requirements.



DRAWING TITLE: 30"
SQUARE ROOF HATCH

955 South Chapel Street
Newark, DE 19713

This drawing is NOT to be used for fabrication. Its only intent is to provide information for OSHA requirements.



Notes:

1. Trim such that the top rail is 42" nominal height from roof surface.
2. Toe board to be installed $\frac{1}{4}$ " nominal height above roof surface.
3. Handrails shall comply with OSHA standards 29 CFR 1910.29 (Protection of open-sided floors, platforms, and runways).
4. A standard handrail shall consist of a top rail, intermediate rail, and post, and shall have a vertical height of 42" (+/-1 3") nominal from upper surface of top rail to floor. A standard toe board shall be 4" nominal in vertical height. All structural steel railings, post and top, and intermediate rails shall be of 2" by 2" by $\frac{3}{8}$ " angles or other metal shapes of equivalent bending strength with posts spaced not more than 8' (96") on centers.

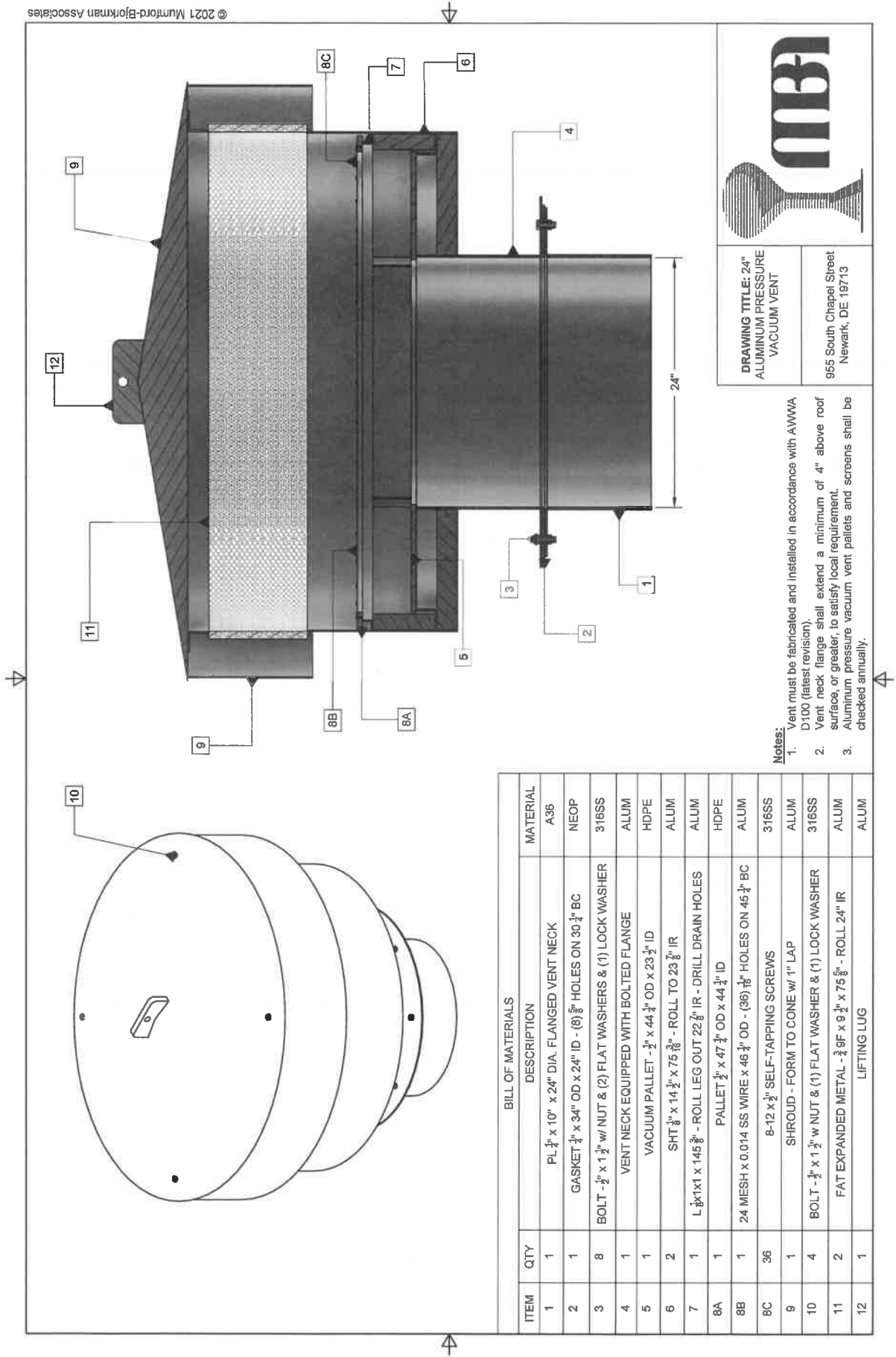

BILL OF MATERIALS

| ITEM | QTY | DESCRIPTION | MATERIAL |
|------|-----|---------------------------------------|----------|
| 1 | 6 | 2x2 $\frac{3}{8}$ " - 42" | A36 |
| 2 | 4 | 2x2 $\frac{3}{8}$ " - 48" | A36 |
| 3 | 2 | 2x2 $\frac{3}{8}$ " - 94" | A36 |
| 4 | 2 | 2x2 $\frac{3}{8}$ " - 96" | A36 |
| 5 | 2 | 4x4 - 48" | A36 |
| 6 | 2 | 4x4 - 96" | A36 |
| 7 | 2 | $\frac{3}{4}$ " ROD BENT TO 38" X 10" | A36 |
| 8 | 1 | SELF-CLOSING SWING GATE | |



DRAWING TITLE:
HANDRAILS AT
SHELL TO ROOF
TRANSITION

955 South Chapel
Street Newark, DE
19713

DRAWING TITLE: 24" ALUMINUM PRESSURE VACUUM VENT

965 South Chapel Street
Newark, DE 19713

- Notes:**
- Vent must be fabricated and installed in accordance with AWWA D100 (latest revision).
 - Vent neck flange shall extend a minimum of 4" above roof surface, or greater, to satisfy local requirement.
 - Aluminum pressure vacuum vent pallets and screens shall be checked annually.

| BILL OF MATERIALS | | | MATERIAL |
|-------------------|-----|--|----------|
| ITEM | QTY | DESCRIPTION | |
| 1 | 1 | PL 3/4" x 10" x 24" DIA. FLANGED VENT NECK | A36 |
| 2 | 1 | GASKET 3/4" x 34" OD x 24" ID - (8) 5/8" HOLES ON 30 3/4" BC | NEOP |
| 3 | 8 | BOLT - 3/8" x 1 1/2" w/ NUT & (2) FLAT WASHERS & (1) LOCK WASHER | 316SS |
| 4 | 1 | VENT NECK EQUIPPED WITH BOLTED FLANGE | ALUM |
| 5 | 1 | VACUUM PALLET - 3/8" x 44 3/4" OD x 23 1/2" ID | HDPE |
| 6 | 2 | SHT 3/8" x 14 1/2" x 75 3/8" - ROLL TO 23 7/8" IR | ALUM |
| 7 | 1 | L 1/2"x1 x 145 3/8" - ROLL LEG OUT 22 7/8" IR - DRILL DRAIN HOLES | ALUM |
| 8A | 1 | PALLET 3/8" x 47 3/4" OD x 44 3/4" ID | HDPE |
| 8B | 1 | 24 MESH x 0.014 SS WIRE x 46 3/4" OD - (36) 1/8" HOLES ON 46 3/4" BC | ALUM |
| 8C | 36 | 8-12 x 3/8" SELF-TAPPING SCREWS | 316SS |
| 9 | 1 | SHROUD - FORM TO CONE w/ 1" LAP | ALUM |
| 10 | 4 | BOLT - 3/8" x 1 1/2" w/ NUT & (1) FLAT WASHER & (1) LOCK WASHER | 316SS |
| 11 | 2 | FAT EXPANDED METAL - 3/8" x 9 1/2" x 75 5/8" - ROLL 24" IR | ALUM |
| 12 | 1 | LIFTING LUG | ALUM |



Photo # 1

Date

10/31/2023

Location

Exterior

Notes

Overall of tank.



Photo # 2

Date

10/31/2023

Location

Exterior

Notes

Grounds around tank.



Photo # 3

Date

10/31/2023

Location

Exterior

Notes

Grounds around tank.



Photo # 4

Date

10/31/2023

Location

Exterior

Notes

Grounds around tank.



Photo # 5

Date

10/31/2023

Location

Exterior

Notes

Grounds around tank.



Photo # 6

Date

10/31/2023

Location

Exterior

Notes

Grounds around tank.



Photo # 7

Date

10/31/2023

Location

Exterior

Notes

Grounds around tank.



Photo # 8

Date

10/31/2023

Location

Exterior

Notes

Grounds around tank.



Photo # 9

Date

10/31/2023

Location

Exterior

Notes

T-Mobile site: 2LA6005B and Posted signage.



Photo # 10

Date

10/31/2023

Location

Exterior

Notes

Cabinet covering valve vault.



Photo # 11

Date

10/31/2023

Location

Valve Vault

Notes

Valve Vault inside cabinet.



Photo # 12

Date

10/31/2023

Location

Valve Vault

Notes

Piping in vault.



Photo # 13

Date

10/31/2023

Location

Valve Vault

Notes

Piping in vault.



Photo # 14

Date

10/31/2023

Location

Valve Vault

Notes

Piping in vault.



Photo # 15

Date

10/31/2023

Location

Valve Vault

Notes

Piping in vault.



Photo # 16

Date

10/31/2023

Location

Valve Vault

Notes

Piping in vault.



Photo # 17

Date

10/31/2023

Location

Valve Vault

Notes

Piping in vault.



Photo # 18

Date

10/31/2023

Location

Exterior

Notes

Foundation, wing plates, anchor bolts, and coating on shell.



Photo # 19

Date

10/31/2023

Location

Exterior

Notes

Foundation, wing plate, and anchor bolt.



Photo # 20

Date

10/31/2023

Location

Exterior

Notes

Foundation, wing plates, and anchor bolts.



Photo # 21

Date

10/31/2023

Location

Exterior

Notes

Foundation, wing plate, and anchor bolts.



Photo # 22

Date

10/31/2023

Location

Exterior

Notes

Wing plate attached to shell.



Photo # 23

Date

10/31/2023

Location

Exterior

Notes

Wing plate attached to shell.



Photo # 24

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 25

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 26

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 27

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.

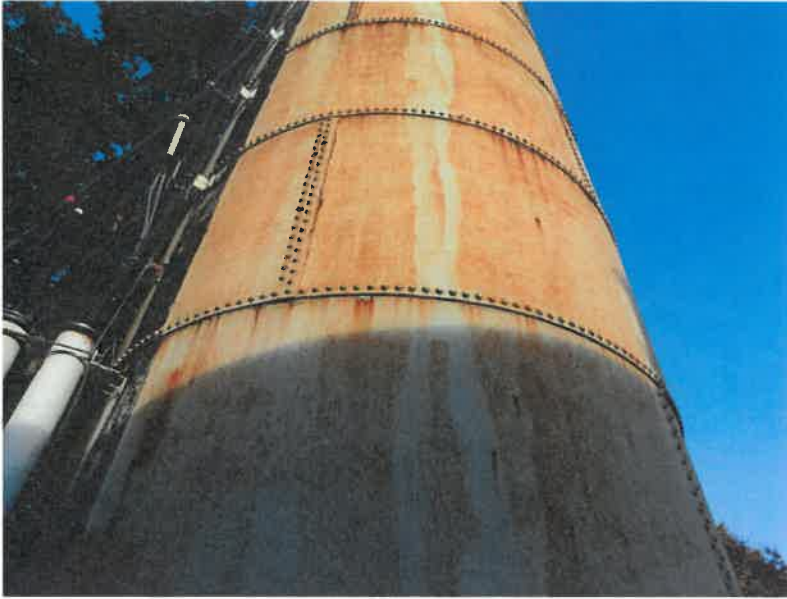


Photo # 28

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.

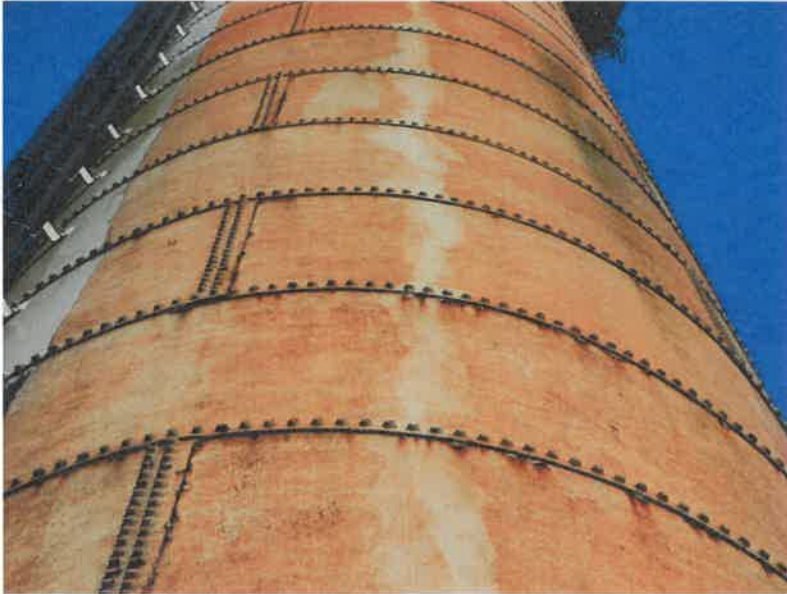


Photo # 29

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.

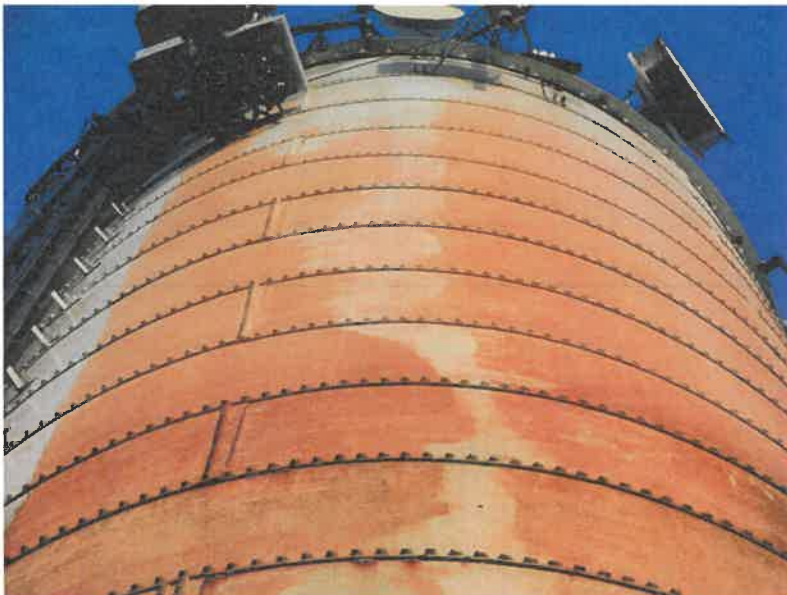


Photo # 30

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 31

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 32

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 33

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 34

Date

10/31/2023

Location

Exterior

Notes

Coating on shell.



Photo # 35

Date

10/31/2023

Location

Exterior

Notes

Name plate.



Photo # 36

Date

10/31/2023

Location

Exterior

Notes

14" x 20" shell manhole with cross clamp.



Photo # 37

Date

10/31/2023

Location

Exterior

Notes

Corrosion on bolt connecting 14" x 20" shell manhole to cross clamp.



Photo # 38

Date

10/31/2023

Location

Exterior

Notes

12" CRW shell ladder with flexible cable safety climb, and posted signage.



Photo # 39

Date

10/31/2023

Location

Exterior

Notes

12" CRW shell ladder with flexible cable safety climb, and T-Mobile coaxial cable run.



Photo # 40

Date

10/31/2023

Location

Exterior

Notes

12" CRW shell ladder with flexible cable safety climb.



Photo # 41

Date

10/31/2023

Location

Exterior

Notes

T-Mobile coaxial cables.



Photo # 42

Date

10/31/2023

Location

Exterior

Notes

T-Mobile coaxial cable rung up shell.



Photo #43

Date

10/31/2023

Location

Exterior

Notes

T-Mobile coaxial cable rung up shell.



Photo #44

Date

10/31/2023

Location

Exterior

Notes

T-Mobile coaxial cable rung up shell.

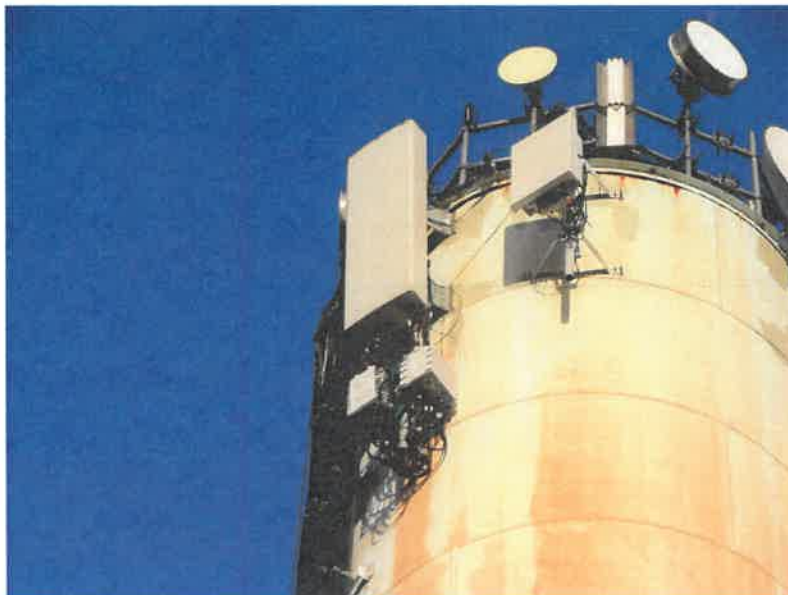


Photo #45

Date

10/31/2023

Location

Exterior

Notes

T-Mobile antennas on shell, internet dishes on roof.



Photo # 46

Date

10/31/2023

Location

Exterior

Notes

T-Mobile antennas on shell, internet dishes on roof.



Photo # 47

Date

10/31/2023

Location

Exterior

Notes

T-Mobile antennas on shell, internet dishes on roof.



Photo # 48

Date

10/31/2023

Location

Exterior

Notes

Shell ladder transition to roof.

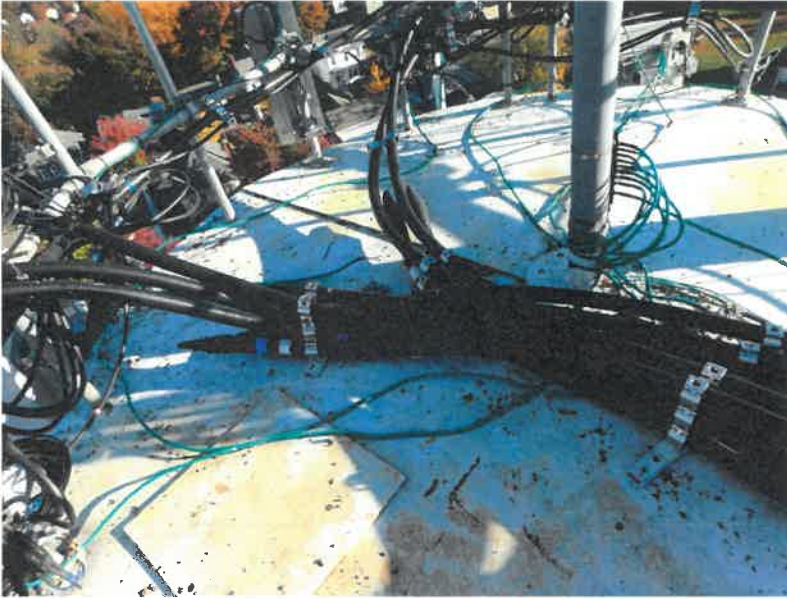


Photo # 49

Date

10/31/2023

Location

Exterior

Notes

Coaxial cables and coating on roof.



Photo # 50

Date

10/31/2023

Location

Exterior

Notes

Coaxial cables and coating on roof.



Photo # 51

Date

10/31/2023

Location

Exterior

Notes

Coaxial cables at roof transition.



Photo # 52

Date

10/31/2023

Location

Exterior

Notes

Coaxial cables and coating on roof.



Photo # 53

Date

10/31/2023

Location

Exterior

Notes

Coating on roof.



Photo # 54

Date

10/31/2023

Location

Exterior

Notes

Internet provider dishes, panel antenna, and supporting pipe array on roof.



Photo # 55

Date

10/31/2023

Location

Exterior

Notes

Internet provider dishes, panel antenna, and supporting pipe array on roof.



Photo # 56

Date

10/31/2023

Location

Exterior

Notes

Internet provider panel antenna and supporting pipe array on roof.



Photo # 57

Date

10/31/2023

Location

Exterior

Notes

Internet provider dishes, panel antenna, and supporting pipe array on roof.



Photo # 58

Date

10/31/2023

Location

Exterior

Notes

Internet provider dishes, panel antenna, and supporting pipe array on roof.

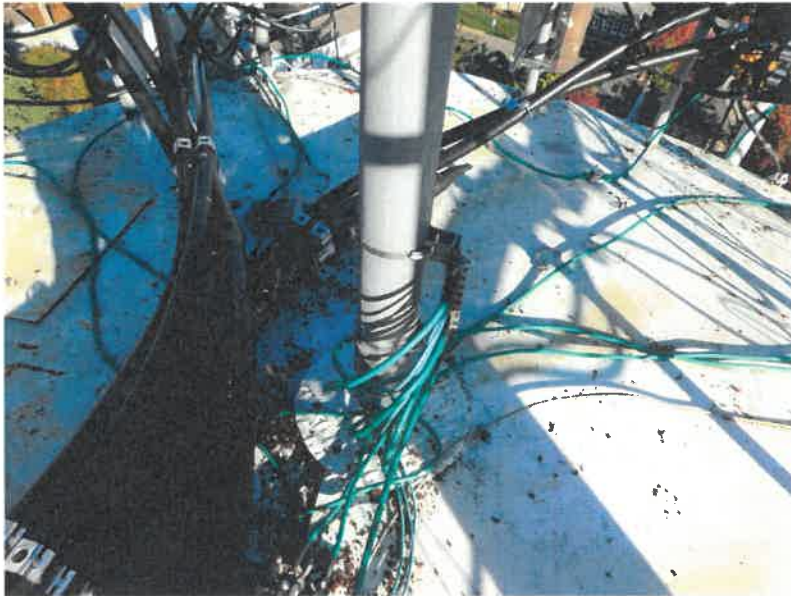


Photo # 59

Date

10/31/2023

Location

Exterior

Notes

4" diameter center roof vent transitions from steel of PVC pipe.



Photo # 60

Date

10/31/2023

Location

Exterior

Notes

4" diameter center roof vent transitioned from steel of PVC pipe.



Photo # 61

Date

10/31/2023

Location

Exterior

Notes

4" diameter center roof vent with drilled penetrations.



Photo # 62

Date

10/31/2023

Location

Exterior

Notes

18" x 18" roof manhole cover is bolted in place.

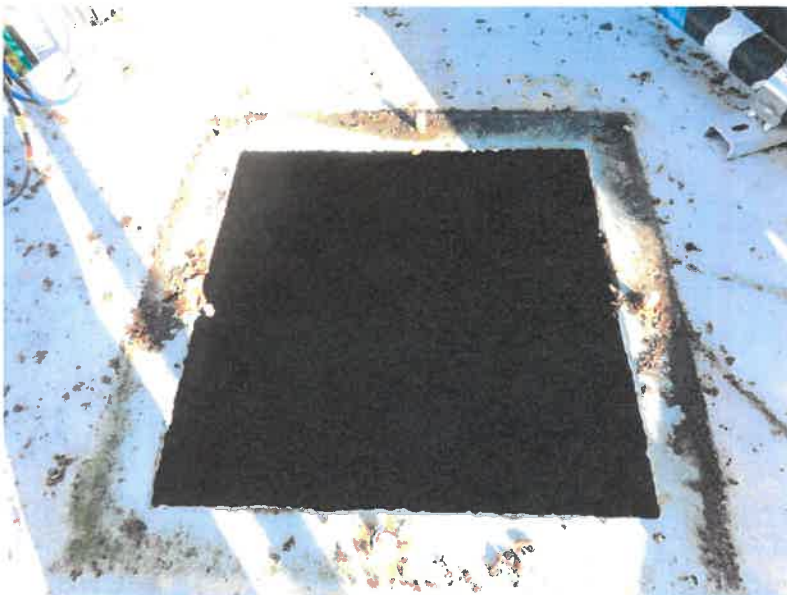


Photo # 63

Date

10/31/2023

Location

Exterior

Notes

18" x 18" roof manhole opening. No hinges, rain lip, or lock present.



Photo # 64

Date

10/31/2023

Location

Interior

Notes

Coating on interior roof, shell, and rafter.

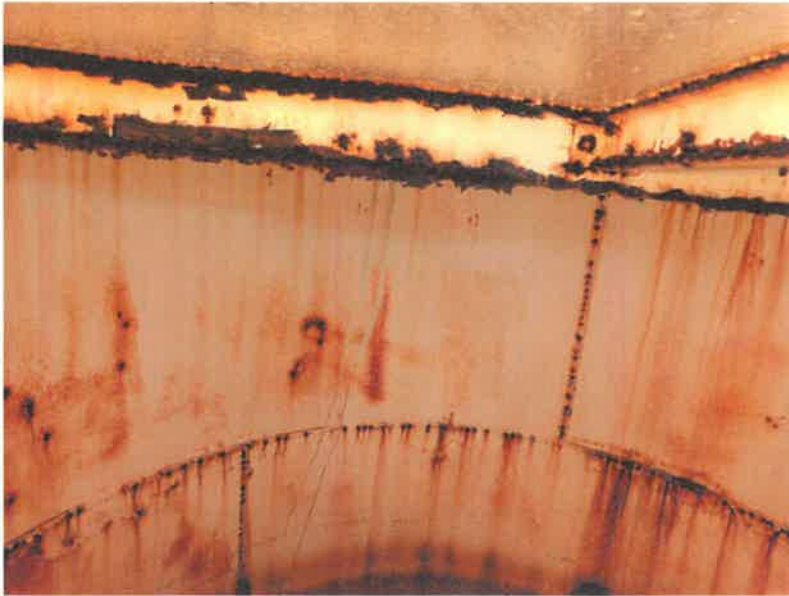


Photo # 65

Date

10/31/2023

Location

Interior

Notes

Coating on interior roof, shell, and rafters.

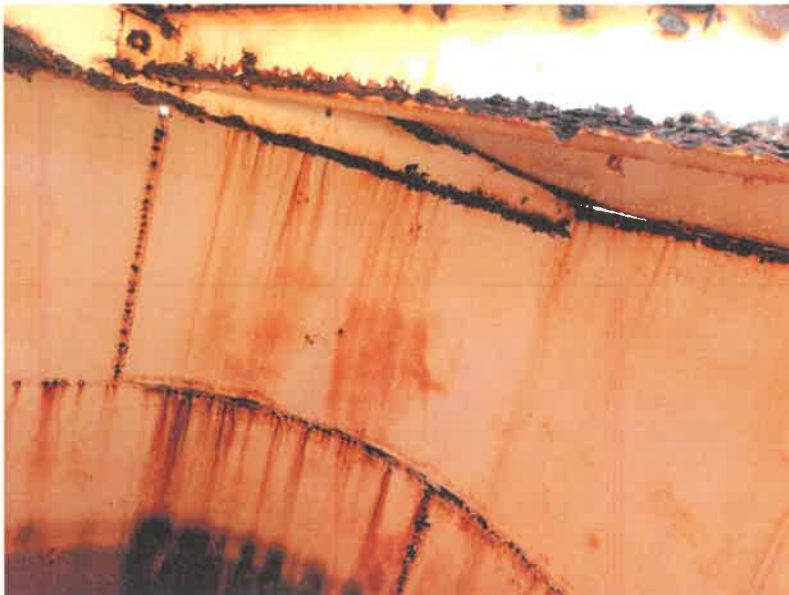


Photo # 66

Date

10/31/2023

Location

Interior

Notes

Coating on interior roof, shell, and rafters.



Photo # 67

Date

10/31/2023

Location

Interior

Notes

Coating on interior shell and roof. Note: Gap at interface.

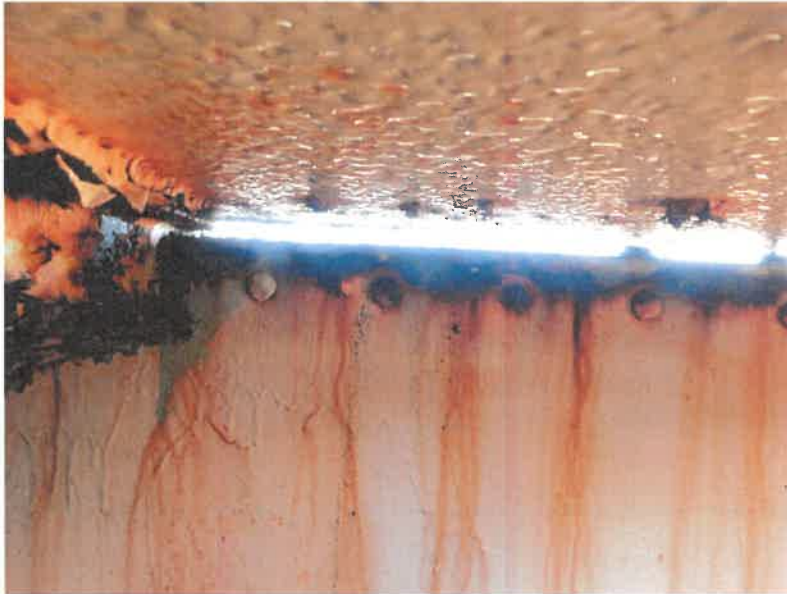


Photo # 68

Date

10/31/2023

Location

Interior

Notes

Coating on interior shell and roof. Note: Gap at interface.



Photo # 69

Date

10/31/2023

Location

Interior

Notes

Coating on interior shell, rafter, and roof. Note: Gap at interface.



Photo # 70

Date

10/31/2023

Location

Interior

Notes

Coating on interior shell and roof. Note: Gap at interface.



Photo # 71

Date

10/31/2023

Location

Interior

Notes

Coating on shell.



Photo # 72

Date

10/31/2023

Location

Interior

Notes

Coating on shell.

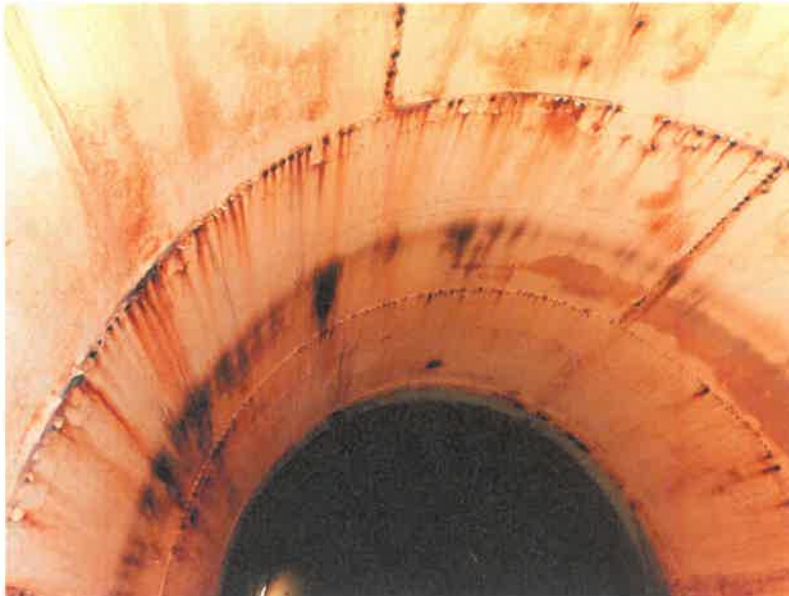


Photo #73

Date

10/31/2023

Location

Interior

Notes

Coating on shell.

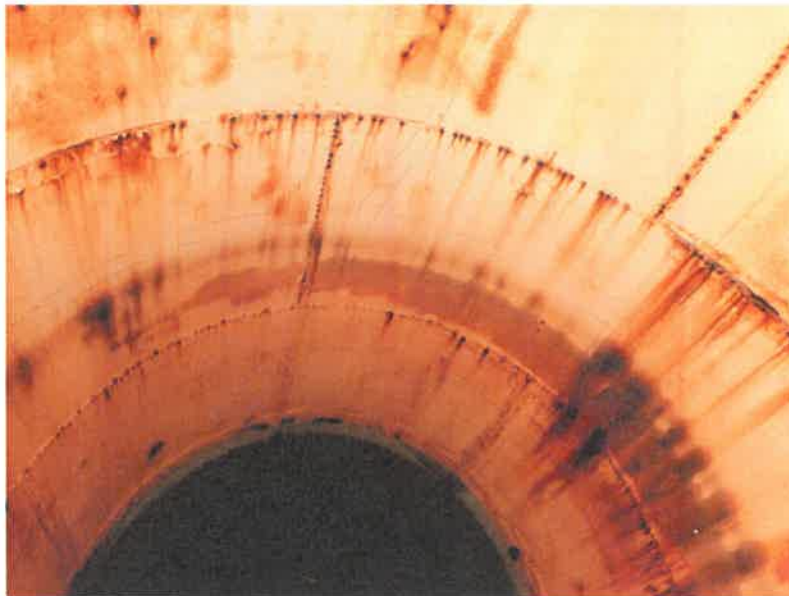


Photo #74

Date

10/31/2023

Location

Interior

Notes

Coating on shell.

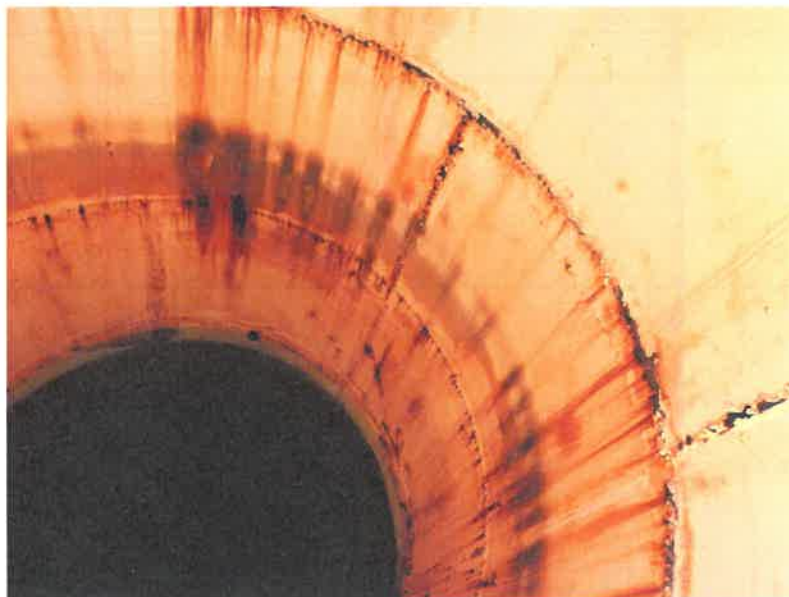


Photo #75

Date

10/31/2023

Location

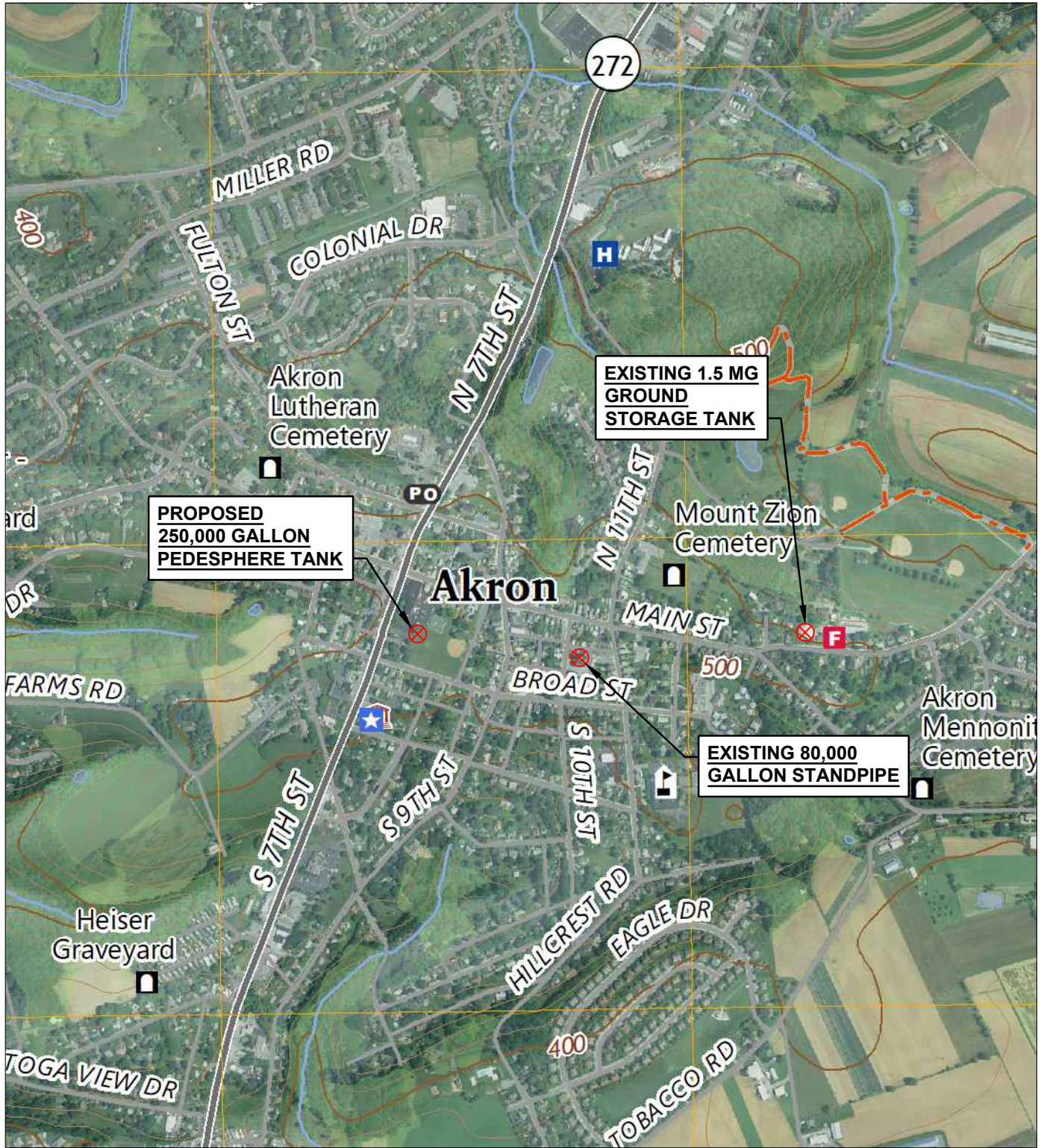
Interior

Notes

Coating on shell.

ATTACHMENT B

EXISTING AND PROPOSED WATER STORAGE TANKS LOCATION MAP

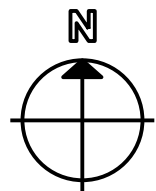
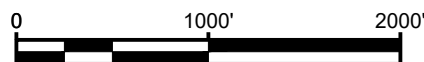


REFERENCE: USGS 7.5 MINUTE SERIES (TOPOGRAPHIC MAPS) EPHRATA PENNSYLVANIA

1

LOCATION / TOPOGRAPHICAL MAP

Scale: 1" = 1000'



1.800.825.1372
www.ventecheng.com

AKRON BOROUGH
LANCASTER COUNTY, PENNSYLVANIA

EXISTING AND PROPOSED WATER STORAGE TANKS LOCATION MAP

DATE: 07/01/2024

PREPARED BY: ARA

CHECKED BY: KCP

APPROVED BY: KCP

SCALE: AS NOTED

PROJECT NO. 4699.001

DRAWING NO.

EXH-3

ATTACHMENT C

TABLE 1 EXISTING TANK REHABILITATION – OPINION OF PROBABLE PROJECT COST

TABLE 1 - REHABILITATION OF EXISTING STANDPIPE
OPINION OF PROBABLE PROJECT COST

| No. | Description | Estimated Cost |
|------------|---|-----------------------|
| 1 | Mobilization / Bonds / Insurance | \$ 15,000 |
| 2 | Exterior Abrasive Blasting & Recoating ¹ | \$ 190,000 |
| 3 | Interior Abrasive Blasting & Recoating ¹ | \$ 121,250 |
| 4 | Metal Repair ² | \$ 152,500 |
| 5 | Site Work (Grass Restoration, fencing) | \$ 25,000 |
| 6 | Temporary Water Service ³ | \$ 47,800 |
| 7 | Demobilization | \$ 10,000 |
| | Subtotal | \$ 561,550 |
| | Contingency - 10% | \$ 56,155 |
| | PWS Permitting | \$ 5,000 |
| | Preparation of Bid Documents | \$ 5,000 |
| | Bidding & Services During Rehabilitation | \$ 28,000 |
| | GRAND TOTAL | \$ 655,705 |
| | SAY | \$ 656,000 |
| | COST PER GALLON | \$ 8.20 |

Notes:

- 1 Number based on SF price given by I.K. Stoltzfus Service Corp. and calculations by Entech
- 2 Number based on estimate from MBA's Tank Evaluation
- 3 Number based on estimate from I.K. Stoltzfus Service Corp.

ATTACHMENT D

TABLE 2 REPLACEMENT PEDESPHERE TANK – OPINION OF PROBABLE PROJECT COST

**TABLE 2 - NEW 250,000 GALLON PEDESPHERE TANK
OPINION OF PROBABLE PROJECT COST**

| No. | Description | Estimated Cost |
|------------|--|-----------------------|
| 1 | Mobilization / Bonds / Insurance | \$ 15,000 |
| 2 | New 250,000-Gallon Pedesphere (120 ft Ht) ¹ | \$ 1,550,000 |
| 3 | Yard Piping | \$ 28,000 |
| 4 | Site Work (E&S, Grass Restoration, Fencing) | \$ 50,000 |
| 5 | Instrumentation / Electrical / SCADA ² | \$ 25,000 |
| 6 | Geotechnical Report | \$ 21,350 |
| 7 | Demobilization | \$ 10,000 |
| | Subtotal | \$ 1,699,350 |
| | Contingency - 10% | \$ 169,935 |
| | Site Work Design incl survey | \$ 40,000 |
| | Permitting - FAA evaluation, PWS, E&S | \$ 15,000 |
| | Permitting - Land Development Plan | \$ 0 |
| | Preparation of Bid Documents | \$ 5,000 |
| | Bidding & Services During Construction | \$ 68,000 |
| | TOTAL | \$ 1,997,285 |
| | SAY | \$ 2,000,000 |
| | COST PER GALLON | \$ 8.00 |

| | | |
|--|--|---------------------|
| | Adder for 150 ft total height ¹ | \$ 145,000 |
| | TOTAL | \$ 2,145,000 |
| | COST PER GALLON | \$ 8.58 |

Notes:

1 Number based on budgetary opinion from Caldwell Tanks, Inc.

2 Number based on estimate from The Meter Guy, LLC.

ATTACHMENT E

TABLE 3 DEMOLITION OF STANDPIPE – OPINION OF PROBABLE PROJECT COST

TABLE 3 - DEMOLITION OF STANDPIPE
OPINION OF PROBABLE PROJECT COST

| No. | Description | Estimated Cost | |
|-----|--|----------------|----------------|
| 1 | Mobilization & Demob / Bonds / Insurance | \$ | 7,500 |
| 2 | Demolition of Tank (does not incl foundation) ¹ | \$ | 70,000 |
| 3 | Tree Removal | \$ | 2,500 |
| | Subtotal | \$ | 80,000 |
| | Contingency - 10% | \$ | 8,000 |
| | Preparation of Bid Documents | \$ | 5,000 |
| | Bidding & Services During Construction | \$ | 4,000 |
| | TOTAL | \$ | 97,000 |
| | SAY | \$ | 100,000 |

Notes:

1 Number based on budgetary opinion from Iseler Demolition, Inc. with terms.