

**MASON COUNTY PUBLIC SERVICE DISTRICT
MASON COUNTY, WEST VIRGINIA**

CONTRACT #2 - J2Y35 WATER TANK REPLACEMENT

ADDENDUM #2

NOVEMBER 23, 2022

THRASHER PROJECT #010-10151

TO WHOM IT MAY CONCERN:

The following are clarifications and responses to questions posed by Contractors for the above reference project.

A. GENERAL

1. Bids will be received until 2:00 p.m. on Thursday, December 1, 2022, at the Mason County Public Service District's Office located at 101 Camden Avenue, Point Pleasant, Mason County, West Virginia. At that time, the Bids received will be publicly opened and read.

B. SPECIFICATIONS

1. **REMOVE** Specification Section 263200 – Transfer Switches.
2. **REPLACE** Specification Section 331613 – J2Y35 Water Storage Tank included with this Addendum #2.

C. DRAWINGS

1. **REPLACE** Sheet 2 included with this Addendum #2.
2. **REPLACE** Sheet 3 included with this Addendum #2.
3. **REPLACE** Sheet 5 included with this Addendum #2.
4. **REPLACE** Sheet 6 included with this Addendum #2.
5. **REPLACE** Sheet 9 included with this Addendum #2.

D. QUESTIONS AND RESPONSES

QUESTION

1. What is the amperage of the automatic transfer switch and are they using an existing generator?

RESPONSE

An automatic transfer switch is not proposed for this Contract. Specification Section 263200 – Transfer Switches has been removed.

QUESTION

2. What is the Freeboard amount required for the tank?

RESPONSE

Twelve inches. Refer to Sheet 3 and Sheet 5 included in this Addendum #2.

QUESTION

3. Can you provide a Silt Stop Detail for a Glass-Fused-to-Steel Tank?

RESPONSE

Yes, Refer to Sheet 6 included with this Addendum #2.

QUESTION

4. Does the entire foundation under the existing tank need to be removed along with tearing down the existing tank?

RESPONSE

No.

QUESTION

5. Does the new tank have to be in service before the existing tank can be taken down?

RESPONSE

Yes.

QUESTION

6. How do we access the existing tank site?

RESPONSE

The Contractor shall coordinate with Brent Clark, manager of Mason County Public Service District, to access the existing tank site.

QUESTION

7. Is there an inspection report for the existing tank?

RESPONSE

No.

QUESTION

8. Can the existing tank be tipped over?

RESPONSE

Yes. Coordination with the Mason County Public Service District is mandatory.

QUESTION

9. Do trees, stumps, etc. need to be hauled off site? If so, does the Owner have a place to take them?

RESPONSE

All debris must be hauled off site. The Owner does not have a designated area to haul debris except for dirt. Dirt may be hauled to the Camp Conley Wastewater Treatment Plant, however coordination with the Owner is required.

QUESTION

10. Is there a paint analysis for the existing tank?

RESPONSE

No.

QUESTION

11. Is the electrical as shown on the drawings to be installed, if so, where does the main power feed come from?

RESPONSE

The electrical shall be installed as shown on Sheet E1. The solar powered telemetry and appurtenances are to be included in Contract #1.

QUESTION

12. Can you provide the following information:

- a) Specific Gravity
- b) Design Freeboard
- c) Wind Velocity
 - i. Exposure Value
- d) Risk Category
- e) Allowable Soil Bearing
- f) Roof Snow Load
- g) Earthquake Seismic, AWWA D103
 - i. Importance Factor
 - ii. S_s
 - iii. S_1

RESPONSE

Yes. Specification Section 331613 – J2Y35 Water Storage Tank has been revised to include this information.

QUESTION

13. Who retains ownership of the existing steel tank after the tank is demolished?

RESPONSE

The Mason County Public Service District shall retain ownership of the steel after demolition. The Contractor shall coordinate with the Owner on a location to store the steel.


E. CLARIFICATIONS

1. Erosion and Sedimentation Controls have been included on Sheets 2 and 9 included with this Addendum #2.

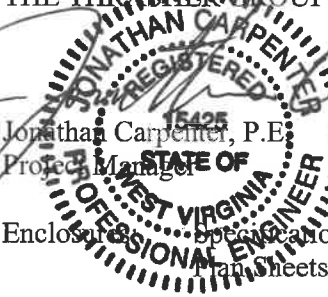
If you have any questions or comments, please feel free to contact me at your earliest convenience. As a reminder, bids will be received until 2:00 p.m. on Thursday, December 1, 2022, at the Mason County Public Service District Office located at 101 Camden Avenue, Point Pleasant, Mason County, WV. Good luck and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.



Jonathan Carpenter, P.E.
Project Manager



Enclosure

SECTION 331613 - J2Y35 WATER STORAGE TANK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract Documents, including General and Supplementary Conditions, Division 01, and all related Specification Sections, apply to this Section.

1.2 SCOPE OF WORK

- A. Furnish and erect a glass-coated, bolted steel water storage tank, including tank foundation, tank structure, and tank appurtenances as shown on the Drawings and described herein. All tanks supplied by this specification must meet AWWA Standard D103, latest version, and be approved by the West Virginia Bureau for Public Health.
- B. All required labor, materials and equipment shall be included.

1.3 QUALIFICATIONS OF TANK SUPPLIER

- A. The Engineer's selection of factory applied glass-fused-to-steel bolt together tank construction for this facility has been predicated upon the design criteria, construction methods specified, and optimum coating for resistance to internal and external tank surface corrosion. Deviations from the specified design, construction or coating details, will not be permitted.
- B. The bidder shall offer a new tank structure as supplied from a U.S.A. manufacturer specializing in the design, fabrication and erection of factory applied glass-fused-to-steel, bolt together tank systems. The manufacturer shall own and operate its production plant, fabricate and glass coat the tank at one U.S.A. location. Steel used for the tanks shall be smelted and produced in the U.S.A.
- C. The tank shown on the contract drawings and specified herein is a Model 2070 Aquastore Tank System as manufactured by CST Storage of DeKalb, Illinois.
- D. Alternate glass-fused-to-steel tank products, as provided by other manufacturers, will be considered for prior approval by the Engineer. Manufacturers lacking the experience requirement will not be considered. The Owner's decision or judgment on these matters will be final, conclusive and binding.
- E. Strict adherence to the standards of design; fabrication; erection; product quality; and long term performance, established in this Specification will be required by the Owner and Engineer.
 - 1. Tank or Dome substitutions which cause engineering and contract changes - the tank installation as shown on the plans and specified herein, is based on the equipment furnished by one manufacturer. A tank which is offered as a substitute to the specific

requirements of these Specifications and which differs in detail and arrangement from that shown may require changes in design and construction. All costs which result from such changes in design and construction are to be borne entirely and unconditionally by the Contractor; said costs to included but not be limited to structural, piping, mechanical and electrical changes and all engineering costs incurred as a result of the substitution, in the revision of Plans and Specifications, review of design changes by others, preparation of change orders, and any other costs directly resulting from said substitution.

- F. Tank suppliers/manufacturers wishing to pre-qualify shall submit the following to the Engineer/Owner for consideration 14 days prior to bid date.
1. Typical structure and foundation drawing(s).
 2. List of tank materials, appurtenances and tank coating specs.
 3. List of five (5) tanks presently in U.S.A. potable water service, of size and character specified herein, operating satisfactorily for a minimum of five (5) years, including the name and telephone number of Owner and Engineer. The tanks listed shall have been manufactured in the present production facility; not by a predecessor company in a different facility.
 4. Certification from tank manufacturer that the tank meets all of tank design standards listed in Section 2.0.
- G. Only bids from U.S.A. manufactured tank suppliers who have successfully pre-qualified will be considered.
- H. The Engineer reserves the right to evaluate all bids based on long term, 30 year minimum operation, coating, and maintenance costs. Values to be used in this evaluation will be at the discretion of the Engineer, as detailed in this specification and bid tabulation form. The Engineer will add such costs, dependent upon the type of tank offered, to the bidder's bid price to determine the effective low bid for purposes of making the award.

1.4 SUBMITTAL DRAWINGS AND SPECIFICATIONS

- A. Construction shall be governed by the Owner's drawings and specifications showing general dimensions and construction details, after written approval by the Engineer of detailed erection drawings prepared by the tank bidder. There shall be no deviation from the drawings and specifications, except upon written order from the Engineer.
- B. The bidder is required to furnish, for the approval of the Engineer and at no increase in contract price, five (5) sets of complete specifications and construction drawings for all work not shown in complete detail on the bidding drawings. A complete set of structural calculations shall be provided for the tank structure and foundation. All such submissions shall be stamped by a Registered Professional Engineer licensed in the state of project location, as well as, by a Registered Professional Engineer employed on the tank manufacturer's engineering staff.
- C. When approved, two sets of such prints and submittal information will be returned to the bidder marked "APPROVED FOR CONSTRUCTION" and these drawings will then govern for the work detailed thereon. The approval by the Engineer of the tank supplier's drawings shall be an approval relating only to their general conformity with the bidding drawings and specifications and shall not guarantee detail dimensions and quantities, which remains the bidder's responsibility.

1.5 WARRANTY

- A. The tank manufacturer shall include a warranty on tank materials and workmanship for a specified period. As a minimum, the warranty shall provide assurance against defects in material, coatings, workmanship, and tank interior lining for a period of five (5) years, starting at the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TANK SIZE

- A. The factory coated glass-fused-to-steel, bolt together tank shall have a nominal diameter of 20 feet, with a nominal sidewall height (to roof eave) of 70 feet.

2.2 TANK CAPACITY

- A. Tank capacity shall be 156,000 gallons (nominal, U.S. Gallons).

2.3 FLOOR ELEVATION

- A. Finished floor elevation shall be set at Elevation 864.50 feet.

2.4 TANK DESIGN STANDARDS

- A. The materials, design, fabrication and erection of the bolt together tank shall conform to the AWWA Standard for "Factory Coated Bolted Steel Tanks For Water Storage" - ANSI/AWWA D103, latest revision.
- B. The tank coating system shall conform solely to Section 12.4 of ANSI/AWWA D103. NOTE: Baked-on powder epoxy painted, galvanized, or stainless steel bolt-together tanks are not considered equal.
- C. The vitreous coating on the tank, bolt head encapsulation material, and joint sealant shall have been approved for listing under ANSI/NSF Standard 61 for Indirect Additives.
- D. The tank manufacturer shall be ISO-9001 certified to assure product quality.
- E. The tank manufacturer shall undergo an annual FM (Factory Mutual) inspection of their glass-coated, bolted-steel tank factory & provide written proof thereof to assure quality.

2.5 DESIGN LOADS

- A. Specific Gravity: 1.0
- B. Design Freeboard: 12 inches

- C. Wind velocity: 100 mph per AWWA D103
 - 1. Exposure Value: C
- D. Risk Category: 3
- E. Allowable Soil Bearing: 3,000 psf
- F. Roof Snow Load: 25 psf
- G. Earthquake Seismic, AWWA D103
 - 1. Site Class: C
 - 2. Importance Factor: 1.25
 - 3. S_s : 0.131
 - 4. S_1 : 0.066

2.6 MATERIALS

- A. Plates and Sheets: All steel shall be smelted and produced in the U.S.A.
 - 1. Plates and sheets used in the construction of the tank shell, tank floor (optional) or tank roof (optional), shall comply with the minimum standards of AWWA D103, Section 4.4.
 - 2. Design requirements for mild strength steel shall be ASTM A1011 Grade 30 with a maximum allowable tensile stress of 14,566 psi per AWWA D103.
 - 3. Design requirements for high strength steel shall be ASTM A1011 Grade 50 with a maximum allowable tensile stress of 26,000 psi per AWWA D103.
 - 4. The annealing effect created from the glass coated firing process shall be considered in determining ultimate steel strength detailed in AWWA D103, Sections 5.3.
 - 5. Multiple vertical bolt line sheets and plates of ASTM A1011 Grade 50 only shall be manufactured such that holes are staggered in the vertical bolt lines and that no two adjoining holes are in-line horizontally, except at the center of the sheet or plate.
 - a. Bolt seam design shall generally be in accordance with the requirements of AWWA D103 section 5.5.2; bolt spacing may be adjusted in the vertical bolt lines to increase the net section and improve joint efficiency to a maximum of 85%.
 - b. Double sheeting of tank panels shall not be permitted to achieve structural sidewall thickness requirements.
- B. Rolled Structural Shapes:
 - 1. Material shall conform to minimum standards of ASTM A36 or ASTM A992.
- C. Horizontal Wind Stiffeners
 - 1. Design requirements for intermediate horizontal wind stiffeners shall be of the "web truss" design with extended tail to create multiple layers of stiffener, permitting wind load to transfer around tank.
 - 2. Web truss stiffeners shall be of steel with hot dipped galvanized coating.
 - 3. Rolled steel angle stiffeners are not permitted for intermediate stiffeners.

D. Bolt Fasteners:

1. Bolts used in tank lap joints shall be 1/2" - 13 UNC- 2A rolled thread, and shall meet the minimum requirements of AWWA D103, Section 4.2.

E. Bolt Material:

1. SAE J429 (1" and 1-1/4" bolt length) heat treated to:
 - a. Tensile Strength - 120,000 psi Min.
 - b. Proof Load - 85,000 psi Min.
 - c. Allowable shear stress - 29,454 psi.
2. SAE J429 (>1-1/4" bolt length) heat treated to:
 - a. Tensile Strength - 150,000 psi Min.
 - b. Proof Load - 120,000 psi Min.
 - c. Allowable shear stress - 36,818 psi.
3. Bolt Finish - Zinc, mechanically deposited.
 - a. 2.0 mils minimum - under bolt head, on shank and threads
4. Bolt Head Encapsulation:
 - a. High impact polypropylene co-polymer encapsulation of entire bolt head up to the splines on the shank.
 - b. Natural resin with UV (ultraviolet) light inhibitor. Color to be black.
5. All tank shell bolts shall be installed such that the head portion is located inside the tank, and the washer and nut are on the exterior.
6. All lap joint bolts shall be properly selected such that threaded portions will not be exposed in the "shear plane" between tank sheets. Also, bolt lengths shall be sized as to achieve a neat and uniform appearance. Excessive threads extending beyond the nut after torquing will not be permitted.
7. All lap joint bolts shall include a minimum of four (4) splines on the underside of the bolt head at the shank in order to resist rotation during torquing.
8. All exterior nuts, washers, and bolt threads will be covered with a sealer-filled protective plastic cover. Color to match tank shell.

F. Sealants:

1. The lap joint sealant shall be a one component, moisture cured, polyurethane compound. The sealant shall be suitable for contact with potable water and meet ANSI/NSF Additives Standard 61.
2. The sealant shall be used to seal lap joints, bolt connections and sheet edges. The sealant shall cure to a rubber like consistency, have excellent adhesion to the glass coating, have low shrinkage, and be suitable for interior and exterior exposure.
3. Sealant curing rate at 73° F and 50% RH.
 - a. Tack-free time: 6 to 8 hours.

b. Final cure time: 10 to 12 days.

4. The sealant shall be ESPC System Sealer No. 98.
5. Neoprene gaskets and tape type sealer shall not be used.

2.7 GLASS COATING

A. Surface Preparation:

1. Following the de-coiling and shearing process, sheets shall be steel grit-blasted on both sides to the equivalent of SSPC-10. Sand blasting and chemical pickling of steel sheets is not acceptable.
2. The surface anchor pattern shall be not less than 1.0 mil.
3. These sheets shall be evenly oiled on both sides to protect them from corrosion during fabrication.

B. Cleaning:

1. Prior to initial preparation all four (4) exposed rectangular continuous sheet edges, including starter sheets, for each specific sheet radii shall be mechanically rounded in profile and adhere to The Porcelain Enameling Institute's Technical Manual PEI-101. All four (4) exposed sheet edges will then be coated with the same vitreous enamel as the glass coating of the sheets. Sheet edge encapsulation will have a minimum 5 mils thickness enamel coating. Rounded sheet edge encapsulation will have zero exposed uncoated steel. The process shall be equal to Edgecoat II by CST Storage. Sealer or glass overspray as edge coating shall not be acceptable.
2. After edge coating and prior to application of the coating system, all sheets shall be thoroughly cleaned by a caustic wash and hot rinse process followed immediately by hot air drying.
3. Inspection of the sheets shall be made for traces of foreign matter or rust. Any such sheets shall be re-cleaned or grit-blasted to an acceptable level of quality.

C. Coating:

1. All sheets shall receive one coat of a catalytic nickel-oxide glass precoat to both sides and then air dried.
2. Another coat of milled cobalt blue glass shall be applied to both sides of the sheets and then dried.
3. A third coat of milled titanium dioxide white glass shall be applied to all wetted surfaces which must be an 18 to 22 percent titanium dioxide reinforced mixture. The specified coating shall be Aquastore Vitrium. An acceptable alternate three coat two fire system must be submitted for approval prior to the bid.
4. The sheets shall then be fired at a minimum temperature of 1500° F in strict accordance with the manufacturer's ISO 9001 quality process control procedures, including firing time, furnace humidity, temperature control, etc.
5. The dry film interior coating thickness shall be 10.0 to 18.0 mils minimum. The finished inside color shall be white.
6. The dry film exterior coating thickness shall be 7.0 to 15.0 mils minimum. The finished exterior color shall be cobalt blue.

7. The same glass coating as applied to the sheet surfaces shall be applied to the ex-posed edges.

D. Factory Inspection:

1. The manufacturer's quality system shall be ISO 9001 certified.
2. Chemical Resistance of Glass Coating:
 - a. Every batch of component frits shall be individually tested in accordance with PEI Test T-21 (Citric Acid at Room Temperature).
3. Factory Holiday Test:
 - a. A dry volt test using a minimum of 1100 volts is required.
 - b. Frequency of the test shall be every sheet. Any sheet registering a discontinuity shall be rejected.
 - c. All inside sheet surfaces shall be holiday free.
4. Measurement of Glass Thickness:
 - a. Glass thickness shall be measured using an electronic dry film thickness gage (magnetic induction type) approved by CST Storage. The thickness gage shall have a valid calibration record.
 - b. Frequency of the test shall be every tenth sheet. The thickness of the glass shall be between 10.0 and 18.0 mils.
5. Measurement of Color
 - a. The exterior color of the sheets shall be measured using a colorimeter approved by CST Storage. The colorimeter shall have a valid calibration record.
 - b. Frequency of the test shall be every tenth sheet. The color must fall within the tolerance specified by CST Storage, else the panel shall be rejected.
6. Impact Adherence Test
 - a. The adherence of the glass coating to the steel shall be tested in accordance with ASTM B916-01. Any sheet that has poor adherence shall be rejected.
 - b. Frequency of this test shall be one sheet per gage lot run minimum.
7. Fish-Scale Test
 - a. The glass coating shall be tested for fish-scale by placing the full size production sheets in an oven at 400° F for one hour. The sheets will then be examined for signs of fish-scale. Any sheet exhibiting fish-scale shall be rejected and all sheets from that gage lot will be similarly tested.
 - b. Frequency of this test shall be one sheet per gage lot run minimum.

E. Packaging:

1. All approved sheets shall be protected from damage prior to packing for shipment.

2. Heavy paper or plastic foam sheets shall be placed between each panel to eliminate sheet-to-sheet abrasion during shipment.
3. Individual stacks of panels will be wrapped in heavy mil black plastic and steel banded to special wood pallets built to the roll-radius of the tank panels. This procedure eliminates contact or movement of finished panels during shipment.
4. Shipment from the factory to the job site will be by truck, hauling the tank components exclusively. No common carrier, drop, or transfer shipments.

PART 3 - EXECUTION

3.1 ERECTION

A. Foundation:

1. The tank foundation is a part of this contract.
2. The tank foundation shall be designed by the manufacturer to safely sustain the structure and its live loads.
3. Tank footing design shall not exceed 3,000 psf soil bearing capacity as determined by geotechnical analysis performed by a licensed soils engineer. The cost of this investigation and analysis is not to be included in the bid price. Copies of the soils report are to be provided to the bidder prior to bid date by the Owner or Engineer.
4. Footing designs for soil bearing strengths less than that specified, and those designs deviating from tank manufacturers standard shall be the responsibility of the Owner and his Engineer based on tank live and dead loading data provided by the tank manufacturer.

B. Tank Floor:

1. Concrete Floor (Standard)
 - a. The floor design is of reinforced concrete with an embedded glass coated steel starter sheet per AWWA D103-09 section 13.4.6 and the manufacturer's design, and is an integral element of the tank assembly; therefore, the tank foundation and floor slab (performed in two separate pours) with embedded starter sheet shall be constructed by the tank supplier using manufacturer trained personnel regularly engaged in this type of tank construction.
 - b. Leveling of the starter ring shall be required and the maximum differential elevation within the ring shall not exceed one-eighth (1/8) inch, nor exceed one-sixteenth (1/16) inch within any ten (10) feet of length.
 - c. A leveling plate assembly (per Harvestore Products, Inc. - U.S. Patent No. 4,483,607), consisting of two 18" anchor rods (3/4" dia.) and a slotted plate (3 1/2" X 11" X 3/8" thick) shall be used to secure the starter ring, prior to encasement in concrete. Installation of the starter ring on concrete blocks or bricks, using shims for adjustment, is not permitted. The foundation with anchor bolts/leveling plates shall be a separate pour from the concrete floor.
 - d. Two water stop seals made of a butyl rubber elastomer special for this application shall be placed on the inside surface of the starter ring below the concrete floor line. These materials shall be installed as specified by the tank manufacturer.

C. Sidewall Structure:

1. Field erection of the glass-coated, bolted-steel tank shall be in strict accordance with the procedures outlined in the manufacturer's erection manual, and performed by an authorized dealer of the tank manufacturer, regularly engaged in erection of these tanks.
2. Specialized erection jacks and building equipment developed and manufactured by the tank manufacturer shall be used to erect the tanks.
3. Particular care shall be taken in handling and bolting of the tank panels and members to avoid abrasion of the coating system. Prior to liquid test, all surface areas shall be visually inspected by the Engineer.
4. An electrical holiday test shall be performed during erection using a nine (9) volt leak detection device. All electrical leak points found on the inside surface shall be repaired in accordance with manufacturer's published touch up procedure using urethane sealer.
5. The placement of sealant on each panel may be inspected prior to placement of adjacent panels. However, the Engineer's inspection shall not relieve the bidder from his responsibility for liquid tightness.
6. No backfill shall be placed against the tank sidewall without prior written approval and design review of the tank manufacturer. Any backfill shall be placed according to the strict instructions of the tank manufacturer.

D. Roof:

1. Tanks with diameters of 14 to 31 ft. shall include a radially sectioned roof fabricated from glass-coated, bolted steel panels, as produced by the tank manufacturer, and shall be assembled in a similar manner as the sidewall panels utilizing the same sealant and bolting techniques, so as to assure a water/air tight assembly. The roof shall be clear span and self-supporting. Both live and dead loads shall be carried by the tank walls. The exterior coating finish shall be cobalt blue glass. The manufacturer shall furnish a roof opening which shall be placed near the outside tank ladder and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least twenty-four (24") inches in one direction and eighteen (18") inches in the other direction. The opening shall have a gasketed weather-tight cover.

E. Roof Vent:

1. A properly sized vent assembly in accordance with AWWA D103 shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum possible rate of water fill or withdrawal, the resulting interior pressure or vacuum will not exceed 0.5" water column.
2. The overflow pipe shall not be considered to be a tank vent.
3. The vent shall be constructed of aluminum.
4. The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including an expanded aluminum screen (1/2 inch) opening. An insect screen of 23 to 25 mesh polyester monofilament shall be provided and designed to open should the screen become plugged by ice formation.

F. Appurtenances (per AWWA D103, Section 7):

1. Pipe Connections:
 - a. Where pipe connections are shown to pass through tank panels, they shall be field located, saw cut, (acetylene torch cutting or welding is not permitted), and utilize

- an interior and exterior flange assembly. ESPC Sealer No. 98 shall be applied on any cut panel edges or bolt connections.
- b. Overflow piping shall be 6-inch diameter schedule 80 PVC and shall have a stainless steel mesh screened end.
2. Outside Tank Ladder:
 - a. An outside tank ladder shall be furnished and installed as shown on the contract drawings.
 - b. Ladders shall be fabricated of aluminum and utilize grooved, skid-resistant rungs.
 - c. The exterior ladder will be equipped w/ an OSHA approved safety rail/cable.
 3. Sidewall Access Manway
 - a. One sidewall access manway shall be provided as shown on the contract drawings in accordance with AWWA D-103.
 - b. Such manway shall be a minimum of 24 inches in diameter and shall include a properly designed reinforcing frame and cover plate. A davit to hold the cover plate, when opened, is required for tanks in excess of 38' tall.
 4. Identification Plate: A manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity. The nameplate shall be affixed to the tank exterior sidewall at a location approximately five (5') feet from grade elevation in a position of unobstructed view.
 5. Cathodic Protection
 - a. The Manufacturer will provide a cathodic protection system consisting of sacrificial magnesium anodes which provide corrosion protection for the portions of the structure immersed in liquid. The anodes are equally spaced (to the nearest vertical bolt line) around the structure, attached to the floor, and bolted through existing shell sheet bolt holes. In special cases where anodes may be spaced differently, a layout plan will be provided as part of the submittal package. Lead wires and buss bars are used to ensure continuity between anodes and structure shell sheets.
 - b. Electrical continuity between all tank sidewall panels shall be the responsibility of the tank manufacturer.
 - c. The design life shall be calculated at 10 years. The cathodic protection system shall be designed for protection of uncoated steel surfaces in the product zone, including rebar within an uncoated concrete tank floor.

3.2 FIELD TESTING

A. Hydrostatic Testing:

1. Following completion of erection and cleaning of the tank, the structure shall be tested for liquid tightness by filling tank to its overflow elevation.
2. Any leaks disclosed by this test shall be corrected by the erector in accordance with the manufacturer's recommendations.

3. Water required for testing shall be furnished by the owner at the time of tank erection completion, and at no charge to the tank erector. Disposal of test water shall be the responsibility of the owner.
4. Labor and equipment necessary for tank testing is to be included in the price of the tank.

3.3 DINFECTON

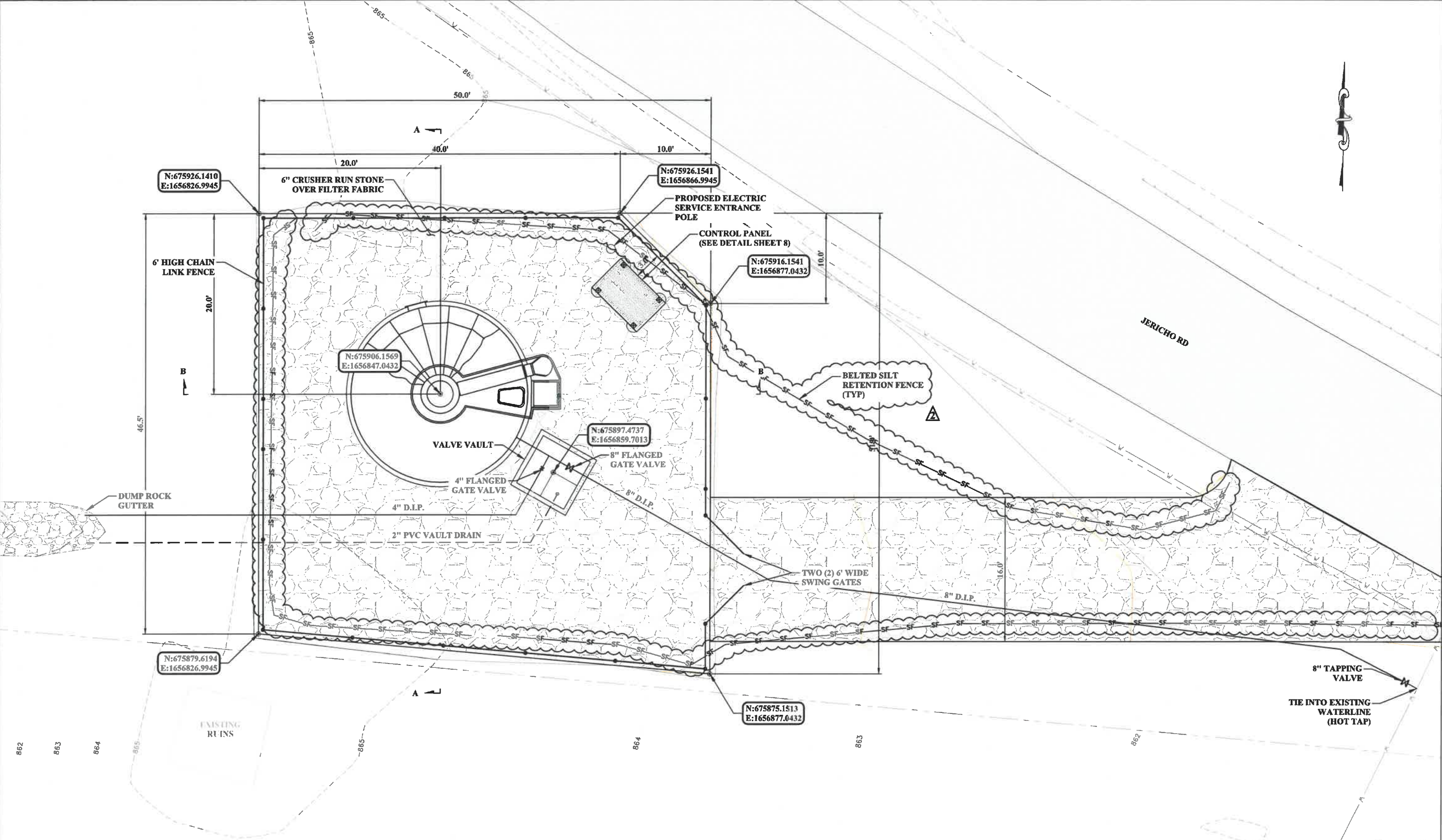
A. Standards:

1. The tank structure shall be disinfected at the time of testing by chlorination in accordance with AWWA Specification C652 "Disinfection of Water Storage Facilities" as modified by the tank manufacturer.
2. Disinfection shall not take place until tank sealant is fully cured (10 to 12 days at 73° F/50% relative humidity).
3. Acceptable forms of chlorine for disinfection shall be:
 - a. Liquid chlorine as specified in AWWA C652.
 - b. Sodium hypochlorite as specified in AWWA C652.
 - c. Calcium hypochlorite (HTH) is not acceptable.
4. Acceptable methods of chlorination per AWWA C652:
 - a. Section 4.1.1.
 - b. Section 4.1.2 - chemical feed pump only (4.1.2.1).
 - c. Section 4.3.
 - d. Section 4.2 is not acceptable.

END OF SECTION 331613

This page intentionally left blank.

CAD FILE: R:\010\010-10151.00- 4235 Waterline Extension - Mason County PSD\Drawings\Contract2 - Tank Project\002-C2-SHEET 2.dwg
 PLOT DATE/TIME: 11/22/2022 3:34 PM
 LAYOUT: Sheet 2
 USER: kevin phillips



ADDENDUM #2



THE INFORMATION CONTAINED HEREIN IS THE
 SOLE PROPERTY OF THE THRASHER GROUP INC.
 REPRODUCTION OF THESE DOCUMENTS IN WHOLE
 OR IN PART, FOR ANY REASON WITHOUT PRIOR
 WRITTEN PERMISSION, IS STRICTLY PROHIBITED.
 COPYRIGHT © 2022 THE THRASHER GROUP INC.

NO.	BY	DATE	DESCRIPTION
2	KMP	11/2022	ADDENDUM #2 - ADDED BELTED SILT RETENTION FENCE

SCALE: AS SHOWN
DRAWN: K. PHILLIPS DATE: 5/2022
CHECKED: E. ALLBRIGHT DATE: 5/2022
APPROVED: J. CARPENTER DATE: 5/2022
SURVEY DATE:
SURVEY BY:
FIELD BOOK No.:

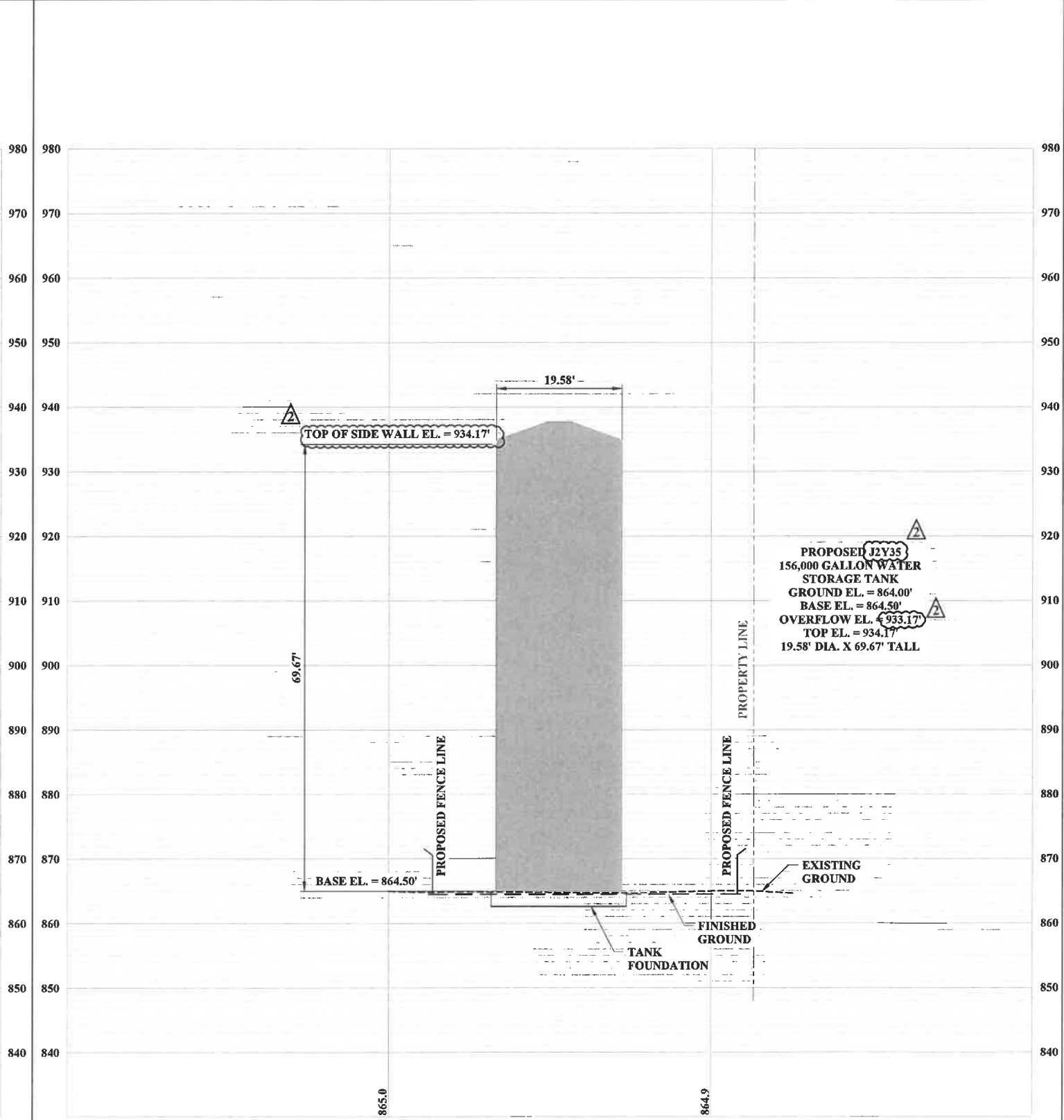
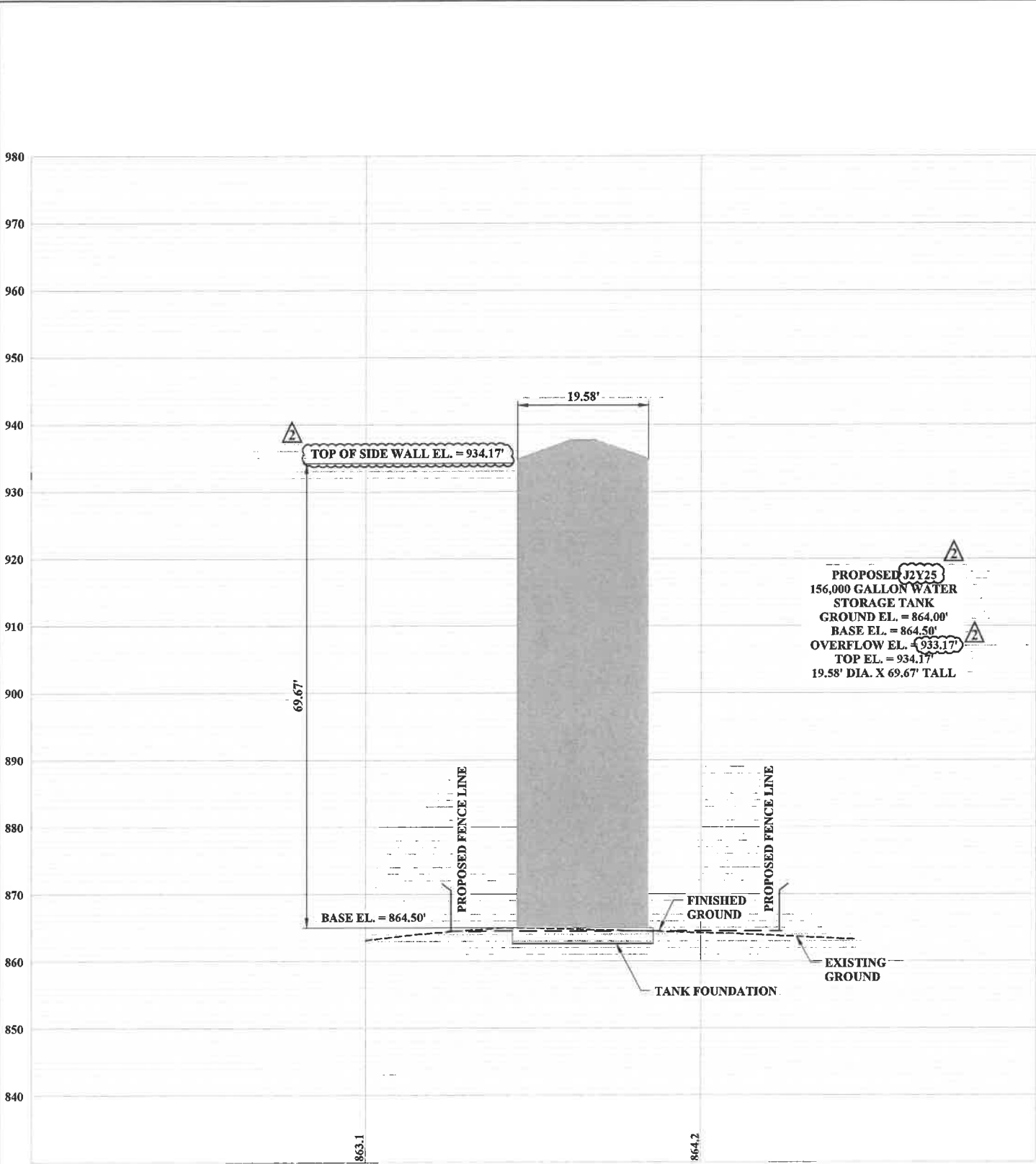
THRASHER
 300 ASSOCIATION DRIVE
 CHARLESTON, WV 25311
 www.thrashergroup.com
 PHONE (304)-343-7601 FAX (304)-343-7604

PHASE No.	
CONTRACT No.	2
PROJECT No.	010-10151

MASON COUNTY PUBLIC SERVE DISTRICT
 MASON COUNTY, WEST VIRGINIA
 PROPOSED WATERLINE EXTENSION
 LEWIS DISTRICT
 PROPOSED SITE PLAN

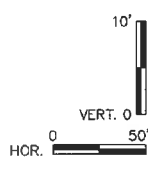
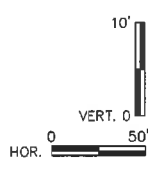
SHEET No.
2

CAD FILE: R:\010\010-10151\00-02\235 Waterline Extension - Mason County PSD\Drawings\Contract2 - Tank Project\003-C2-Sheet_3.dwg
 PLOT DATE/TIME: 11/22/2022 11:53 AM
 LAYOUT: Sheet 3
 USER: kevin_phillips



PROPOSED J2Y25
 156,000 GALLON WATER
 STORAGE TANK
 GROUND EL. = 864.00'
 BASE EL. = 864.50'
 OVERFLOW EL. = 933.17'
 TOP EL. = 934.17'
 19.58' DIA. X 69.67' TALL

PROPOSED J2Y35
 156,000 GALLON WATER
 STORAGE TANK
 GROUND EL. = 864.00'
 BASE EL. = 864.50'
 OVERFLOW EL. = 933.17'
 TOP EL. = 934.17'
 19.58' DIA. X 69.67' TALL



ADDENDUM #2

NO.	BY	DATE	DESCRIPTION
2	KMP	11/2022	ADDENDUM #2 - UPDATED SIDE WALL ELEV. OF TANK

SCALE: AS SHOWN
 DRAWN: K. PHILLIPS DATE: 5/2022
 CHECKED: E. ALLBRIGHT DATE: 5/2022
 APPROVED: J. CARPENTER DATE: 5/2022
 SURVEY DATE:
 SURVEY BY:
 FIELD BOOK No.:

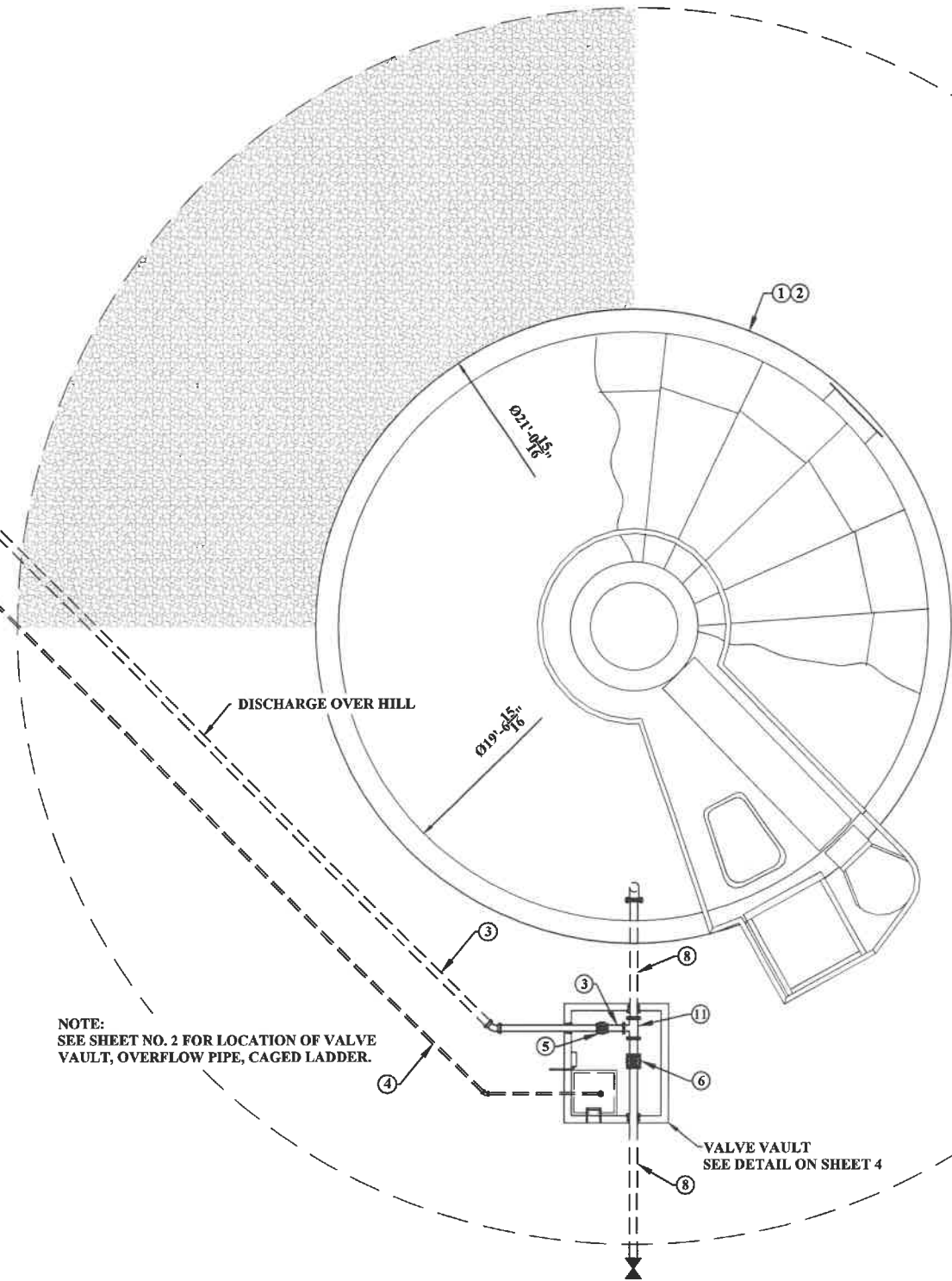
THRASHER
 300 ASSOCIATION DRIVE
 CHARLESTON, WV 25311
 www.thrashergroup.com
 PHONE (304)-343-7601 FAX (304)-343-7604

PHASE No.	
CONTRACT No.	2
PROJECT No.	010-10151

MASON COUNTY PUBLIC SERVE DISTRICT
 MASON COUNTY, WEST VIRGINIA
 PROPOSED WATERLINE EXTENSION
 LEWIS DISTRICT
 PROPOSED SITE CROSS SECTIONS

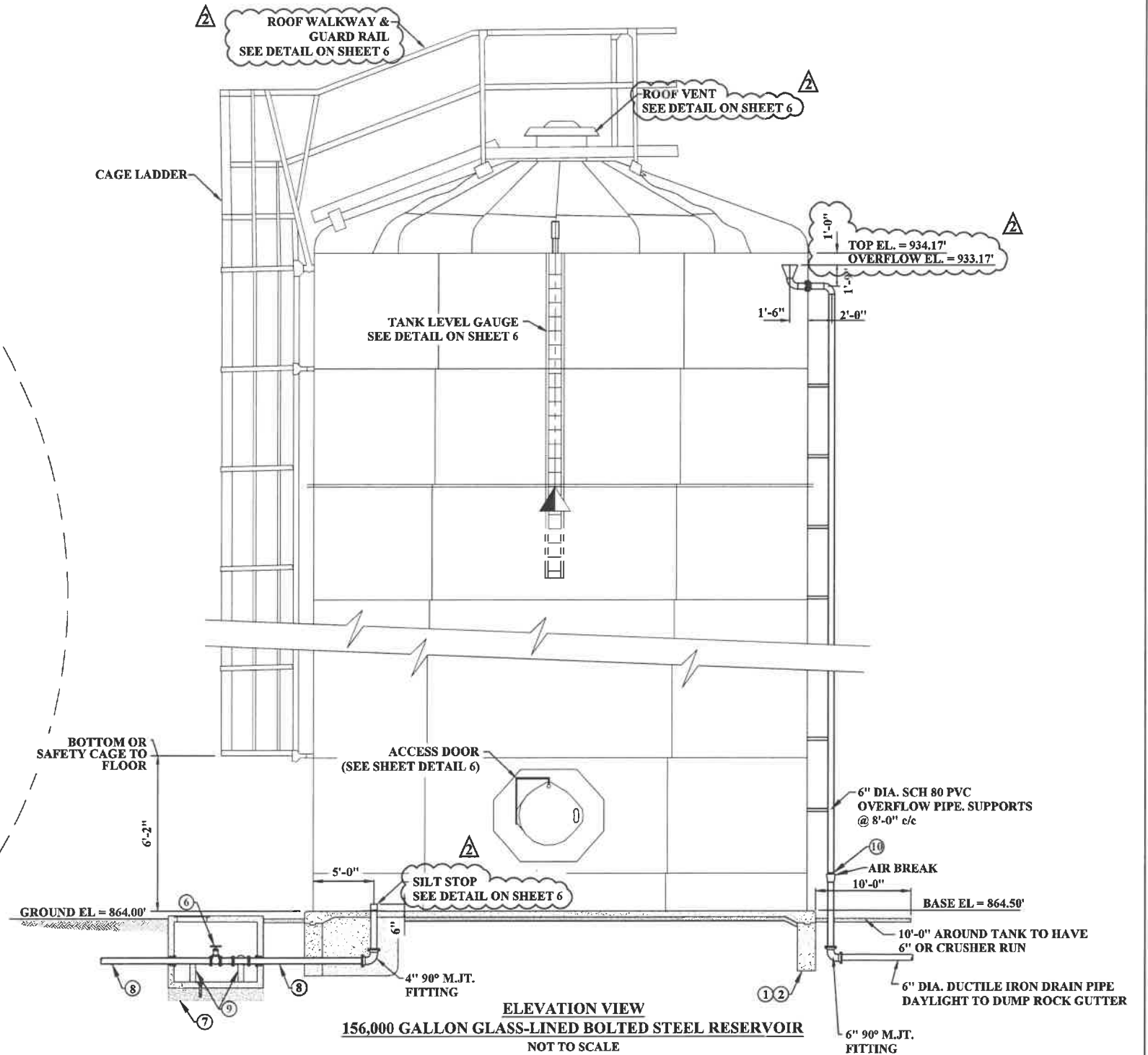
SHEET No.	3
-----------	----------

CAD FILE: R:\010\010-10151.D01- J2Y35 Waterline Extension - Mason County FSD\Drawings\Contract2 - Tank Project\004-C2-Sheet 4-7-Storage Tank Details.dwg
 PLOT DATE/TIME: 11/22/2022 11:31 AM
 LAYOUT: Sheet 5
 USER: kevin phillips



PLAN VIEW
156,000 GALLON GLASS-LINED BOLTED STEEL RESERVOIR
 NOT TO SCALE

NOTE:
 SEE SHEET NO. 2 FOR LOCATION OF VALVE VAULT, OVERFLOW PIPE, CAGED LADDER.



ELEVATION VIEW
156,000 GALLON GLASS-LINED BOLTED STEEL RESERVOIR
 NOT TO SCALE

NOTES:

- ① THE TANK FOUNDATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH AWWA STANDARD D-103, SEISMIC ZONE C, & 100 M.P.H. WIND VELOCITY. SEE DETAIL SHEET 6.
- ② THE BEARING CAPACITY USED FOR FOUNDATION DESIGN SHALL BE 3,000 P.S.F. RING WALL SHALL BE ON FIRM WEATHERED ROCK ON ALL SIDES AT AN ELEVATION OF 864.00'
- ③ 4" D.I.P.
- ④ 2" PVC VAULT DRAIN.
- ⑤ 4" GATE VALVE
- ⑥ 8" GATE VALVE.
- ⑦ 4" OF CRUSHED AGGREGATE BASE.
- ⑧ 8" D.I.P.
- ⑨ PIPE SUPPORTS.
- ⑩ INSTALL STAINLESS STEEL INSECT / BIRD SCREEN AT END OF PIPE AND FASTEN TO PIPE WITH TWO STAINLESS STEEL STRAPS.
- ⑪ 8" x 8" x 4" DI TEE

THE INFORMATION CONTAINED HEREIN IS THE SOLE PROPERTY OF THE THRASHER GROUP INC. REPRODUCTION OF THESE DOCUMENTS IN WHOLE OR IN PART, FOR ANY REASON WITHOUT PRIOR WRITTEN PERMISSION, IS STRICTLY PROHIBITED. COPYRIGHT © 2022 THE THRASHER GROUP INC.

NO.	BY	DATE	DESCRIPTION
2	KMP	11/2022	ADDENDUM #2 - UPDATED ELEV. & SHEET NUMBERS ON NOTES

SCALE: 1/2" = 1'-0"
 DRAWN: K. PHILLIPS DATE: 5/2022
 CHECKED: E. ALLBRIGHT DATE: 5/2022
 APPROVED: J. CARPENTER DATE: 5/2022
 SURVEY DATE:
 SURVEY BY:
 FIELD BOOK No.:

THRASHER
 300 ASSOCIATION DRIVE
 CHARLESTON, WV 25311
 www.thrashergroup.com
 PHONE (304)-343-7601 FAX (304)-343-7604

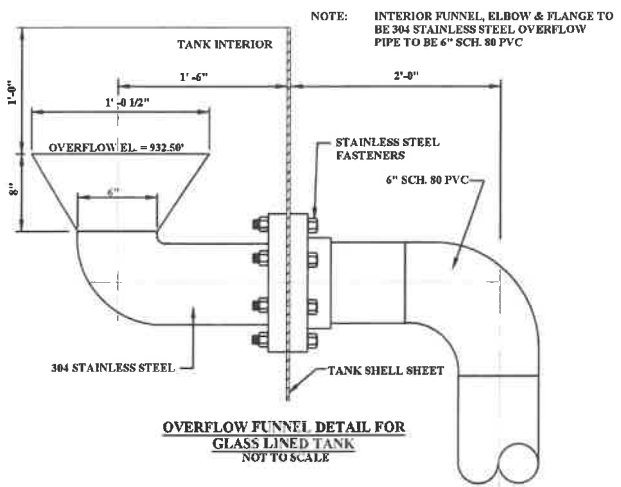
PHASE No.	
CONTRACT No.	2
PROJECT No.	010-10151

MASON COUNTY PUBLIC SERVICE DISTRICT
 MASON COUNTY, WEST VIRGINIA
 J2Y35 WATER TANK REPLACEMENT
 LEWIS DISTRICT
 BOLTED STEEL WATER STORAGE TANK DET.

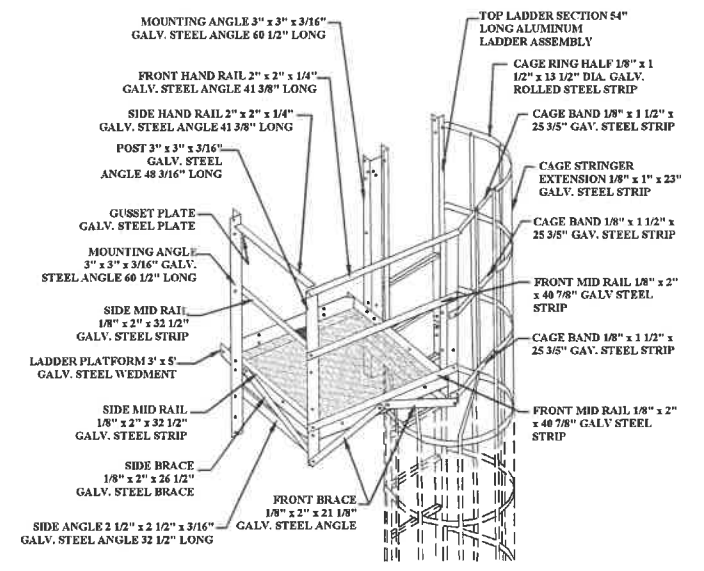
SHEET No.
5

ADDENDUM #2

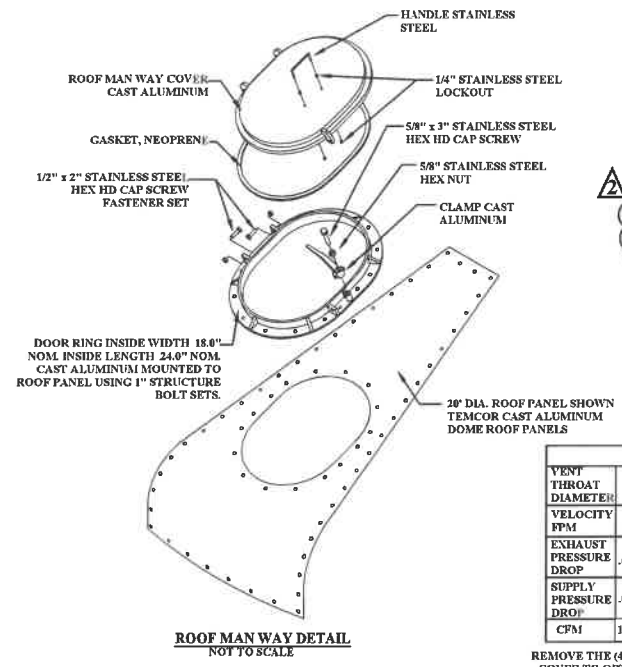
USER: kevin.phillips
 LAYOUT: Sheet 6
 PLOT DATE/TIME: 11/22/2022 11:24 AM
 CAD FILE: R:\010\010-10151-00- J2Y35 Waterline Extension - Mason County PSD\Drawings\Contract 2 - Tank Project\010-10151-00-Sheet 4-7-Storage Tank Details.dwg



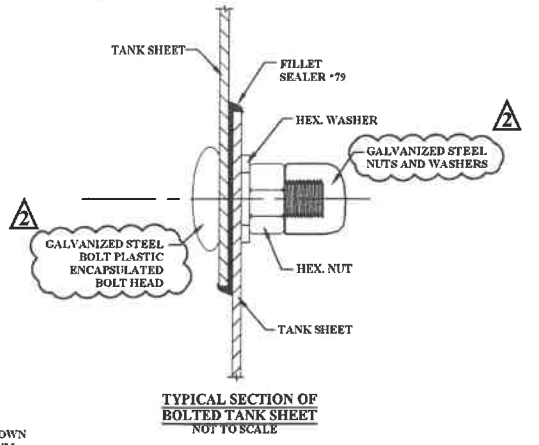
OVERFLOW FUNNEL DETAIL FOR GLASS LINED TANK
NOT TO SCALE



LADDER SECTION ABOVE STEP-OFF PLATFORM ASSEMBLY
NOTE: LADDER SECTION ABOVE STEP-OFF PLATFORM ASSEMBLY ARE DEPENDENT UPON TANK HEIGHT AND TANK REQUIREMENTS
MAN WAY PLATFORM
NOT TO SCALE



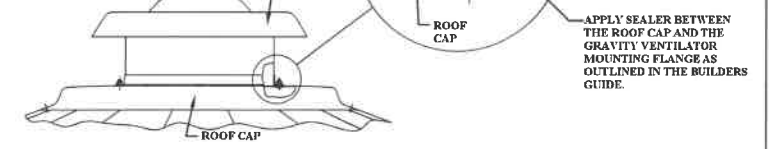
ROOF MAN WAY DETAIL
NOT TO SCALE



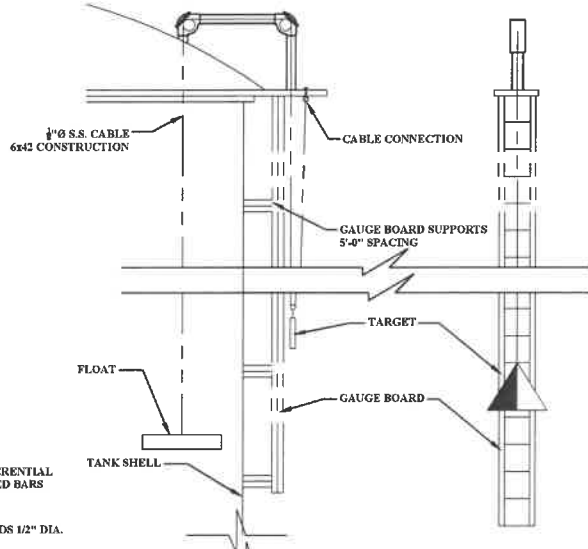
TYPICAL SECTION OF BOLTED TANK SHEET
NOT TO SCALE

VENT CAPACITY CHART	
3.14 SQUARE FEET	
VENT THROAT DIAMETER	
VELOCITY FPM	400 500 600 700 800 900 1000
EXHAUST PRESSURE DROP	.025 .035 .050 .070 .090 .120 .155
SUPPLY PRESSURE DROP	.060 .090 .130 .180 .240 .300 .380
CFM	1258 1511 1885 2200 2515 2830 3140

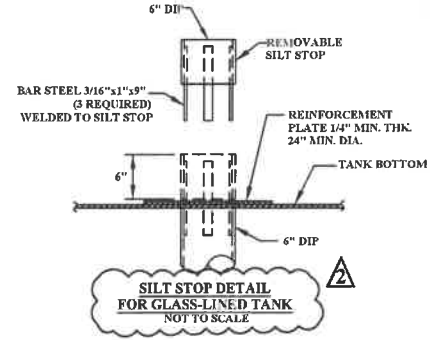
REMOVE THE (4) FASTENERS AND THE TOP COVER TO OBTAIN ACCESS TO THE TANK INTERIOR. RE-INSTALL AFTER MOUNTING THE VENTILATOR ONTO THE ROOF CAP.



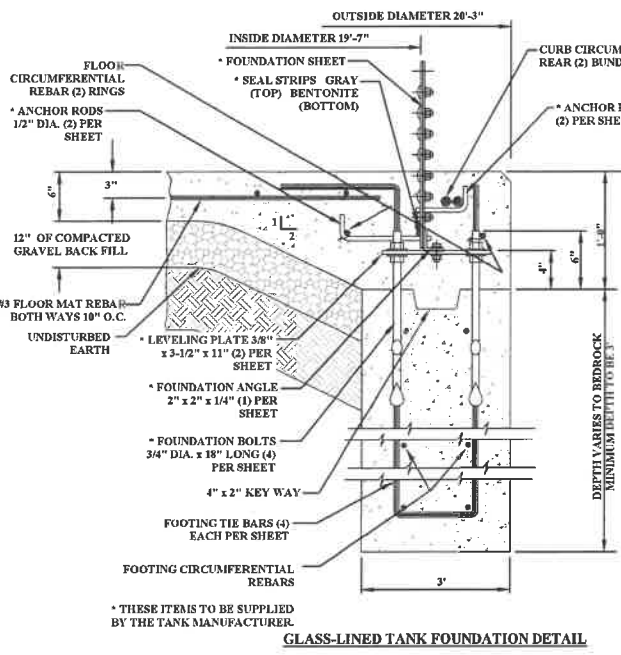
GRAVITY VENTILATOR GENERAL CONSTRUCTION
HOUSING COVER AND SUPPORT MEMBERS - ALUMINUM
INSECT SCREEN - 23 TO 25 MESH, .0133" x .0145" DIA. POLYESTER MONOFILAMENT WIRE
BIRD SCREEN - .63 THICK ALUMINUM, 5 x .75 EXPANDED MESH
VENT DETAIL
NOT TO SCALE



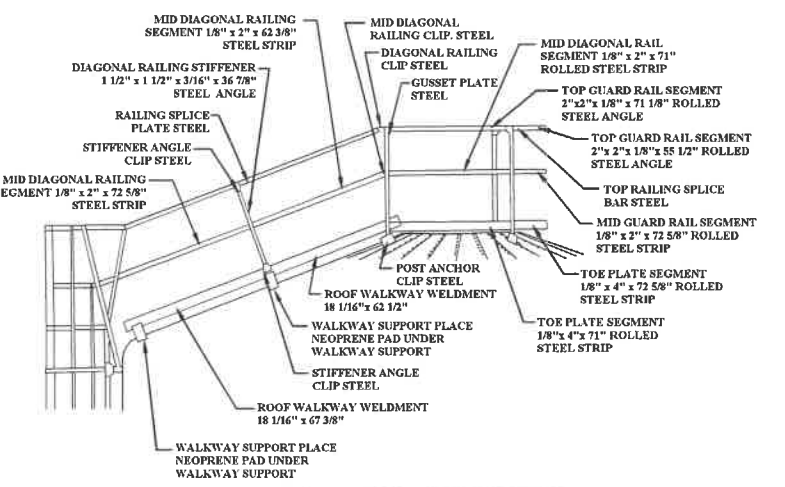
TANK SECTION WITH LEVEL INDICATOR
GLASS-LINED TANK
NOT TO SCALE



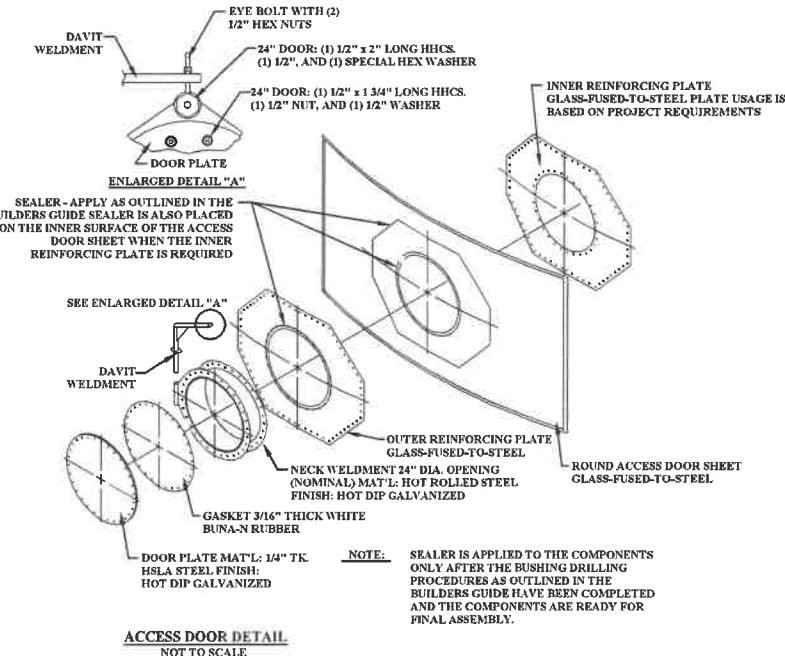
SILT STOP DETAIL FOR GLASS-LINED TANK
NOT TO SCALE



GLASS-LINED TANK FOUNDATION DETAIL



ROOF WALKWAY & GUARD RAIL DETAIL



ACCESS DOOR DETAIL
NOT TO SCALE

ADDENDUM #2

THE INFORMATION CONTAINED HEREIN IS THE SOLE PROPERTY OF THE THRASHER GROUP INC. REPRODUCTION OF THESE DOCUMENTS IN WHOLE OR IN PART, FOR ANY REASON WITHOUT PRIOR WRITTEN PERMISSION, IS STRICTLY PROHIBITED. COPYRIGHT © 2022 THE THRASHER GROUP INC.

NO.	BY	DATE	DESCRIPTION
2	KMP	11/2022	ADDENDUM #2 - UPDATED TANK MATERIAL ON NOTES

SCALE: 1/2" = 1'-0"
 DRAWN: K. PHILLIPS DATE: 5/2022
 CHECKED: E. ALLBRIGHT DATE: 5/2022
 APPROVED: J. CARPENTER DATE: 5/2022
 SURVEY DATE:
 SURVEY BY:
 FIELD BOOK No.:

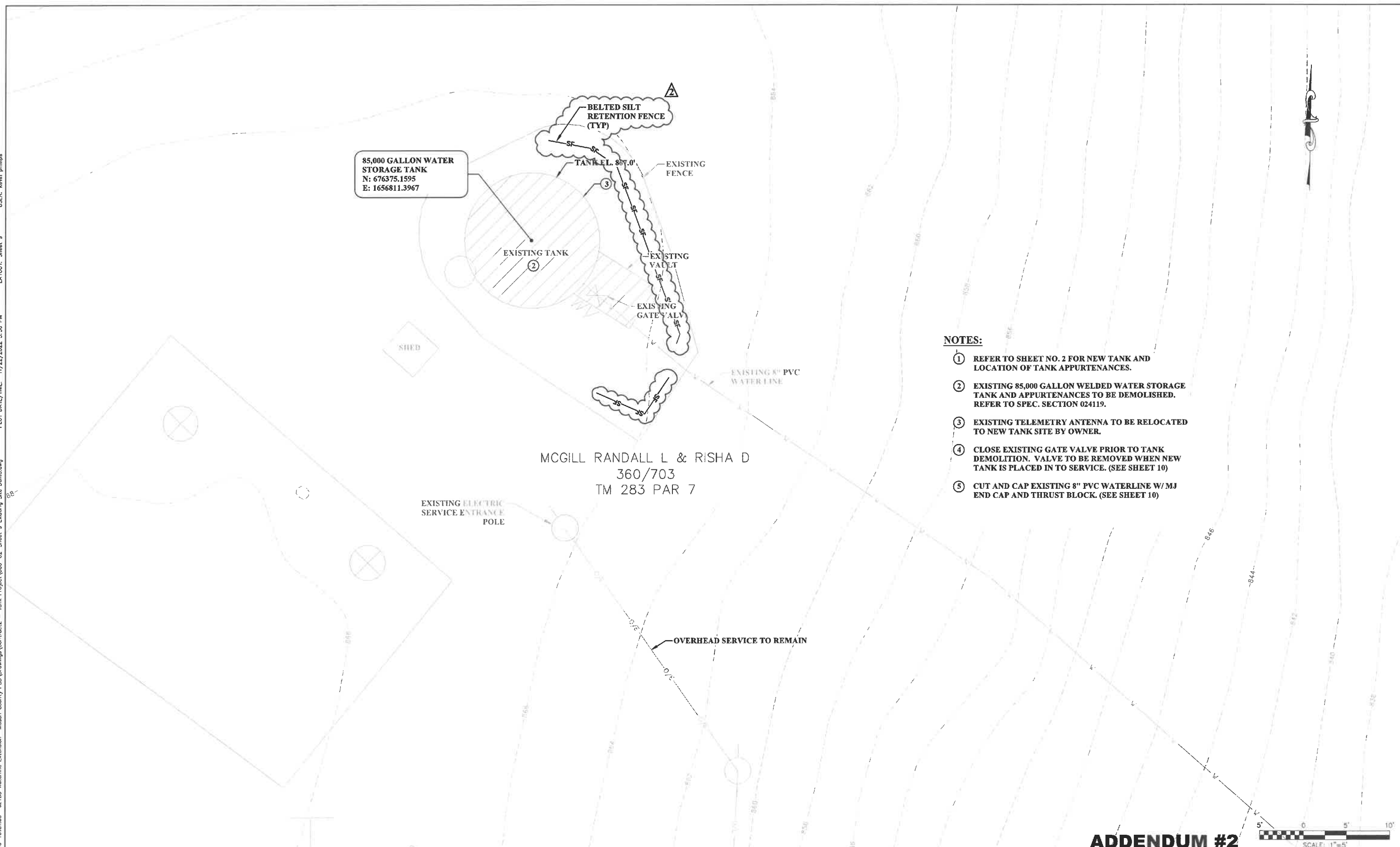
THRASHER
 300 ASSOCIATION DRIVE
 CHARLESTON, WV 25311
 www.thrashergruop.com
 PHONE (304)-343-7601 FAX (304)-343-7604

PHASE No.	
CONTRACT No.	2
PROJECT No.	010-10151

MASON COUNTY PUBLIC SERVICE DISTRICT
 MASON COUNTY, WEST VIRGINIA
 J2Y35 WATER TANK REPLACEMENT
 LEWIS DISTRICT
 BOLTED STEEL WATER STORAGE TANK DET.

SHEET No.
6

USER: kevin.phillips LAYOUT: Sheet 9 PLOT DATE/TIME: 11/22/2022 3:36 PM CAD FILE: R:\010\010-10151.DWG - J2Y05 Waterline Extension - Mason County PSD\Drawings\Contract12 - Tank Project\006-C2-Sheet 9 Existing Site Demo.dwg



85,000 GALLON WATER STORAGE TANK
N: 676375.1595
E: 1656811.3967

EXISTING TANK

BELTED SILT RETENTION FENCE (TYP)

TANK E.L. 807.0'

EXISTING FENCE

EXISTING VAULT

EXISTING GATE VALVE

EXISTING 8" PVC WATER LINE

SHED

EXISTING ELECTRIC SERVICE ENTRANCE POLE

MCGILL RANDALL L & RISHA D
360/703
TM 283 PAR 7

OVERHEAD SERVICE TO REMAIN

NOTES:

- ① REFER TO SHEET NO. 2 FOR NEW TANK AND LOCATION OF TANK APPURTENANCES.
- ② EXISTING 85,000 GALLON WELDED WATER STORAGE TANK AND APPURTENANCES TO BE DEMOLISHED. REFER TO SPEC. SECTION 024119.
- ③ EXISTING TELEMETRY ANTENNA TO BE RELOCATED TO NEW TANK SITE BY OWNER.
- ④ CLOSE EXISTING GATE VALVE PRIOR TO TANK DEMOLITION. VALVE TO BE REMOVED WHEN NEW TANK IS PLACED IN TO SERVICE. (SEE SHEET 10)
- ⑤ CUT AND CAP EXISTING 8" PVC WATERLINE W/ MJ END CAP AND THRUST BLOCK. (SEE SHEET 10)

ADDENDUM #2



THE INFORMATION CONTAINED HEREIN IS THE SOLE PROPERTY OF THE THRASHER GROUP INC. REPRODUCTION OF THESE DOCUMENTS IN WHOLE OR IN PART, FOR ANY REASON WITHOUT PRIOR WRITTEN PERMISSION, IS STRICTLY PROHIBITED. COPYRIGHT © 2022 THE THRASHER GROUP INC.

NO.	BY	DATE	DESCRIPTION
2	KMP	11/2022	ADDENDUM #2 -- ADDED BELTED SILT RETENTION FENCE

SCALE: AS SHOWN
DRAWN: K. PHILLIPS DATE: 5/2022
CHECKED: E. ALLBRIGHT DATE: 5/2022
APPROVED: J. CARPENTER DATE: 5/2022
SURVEY DATE:
SURVEY BY:
FIELD BOOK No.:

THRASHER
300 ASSOCIATION DRIVE
CHARLESTON, WV 25311
www.thrashergroup.com
PHONE (304)-343-7801 FAX (304)-343-7804

PHASE No.	
CONTRACT No.	2
PROJECT No.	010-10151

MASON COUNTY PUBLIC SERIVE DISTRICT
MASON COUNTY, WEST VIRGINIA
PROPOSED WATERLINE EXTENSION
LEWIS DISTRICT
PROPOSED EXISTING SITE DEMO PLAN

SHEET No.
9