

**OCEANO COMMUNITY SERVICES DISTRICT**  
**WATER STORAGE TANK REHABILITATION**  
**SPECIAL PROVISIONS AND/OR TECHNICAL SPECIFICATIONS**  
**PLANS AND DRAWINGS**  
**FOR**  
**OCEANO, CA**  
**CONTRACT NO. 2023-03**

**See bid document:**

**Advantage Technical Services, Inc – Project Manual for Oceano Community Services District’s  
0.3 Million Gallon Water Tank Recoating and Roof Replacement Project**

**PROJECT MANUAL FOR**  
**OCEANO COMMUNITY SERVICE DISTRICT'S**  
**0.3 MILLION GALLON WATER TANK RECOATING AND**  
**ROOF REPLACEMENT PROJECT**



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# **PART I**

## **NOTICE, PROPOSAL AND AGREEMENT FORMS**

## **PART II**

# **CONDITIONS OF THE CONTRACT**

## **PART III**

# **TECHNICAL SPECIFICATIONS**

Technical Specifications for:

OCEANO COMMUNITY SERVICES DISTRICT  
1655 Front St.  
Oceano, CA 93445

Prepared by:

ADVANTAGE TECHNICAL SERVICES, INC.  
6661 Fern Canyon Road  
San Luis Obispo, CA 93401  
805-595-2282

May 2023

### CERTIFICATION

In accordance with the provisions of Section 6735 of the Business and Professions Code of the State of California, these specifications have been prepared by or under the direction of the following Professional Engineers licensed in the State of California:



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William D. Bellis, PE  
55334, Exp. 12/31/2024



Approved by:



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Will Clemens  
District Manager

Section 01100

## SCOPE AND CONTROL OF THE WORK

### PART 1 - GENERAL

#### 1.01 SCOPE

The project generally includes upgrading appurtenances, replacing roof and roof structure and recoating the interior and exterior of one 0.3 million-gallon (approximately 40' diameter x 32' tall) welded water tank and other items specified herein and as shown on the Contract Documents. The following sections further define the scope of the Work as detailed within these specifications (planning and the actual order of work is the responsibility of the Contractor):

- A. The Contractor will provide any required sampling and testing of existing coatings. Coatings are known to contain lead and other heavy metals. Employee protections for disturbance of coatings containing lead and other heavy metals shall be included in all project planning and execution.
- B. The Contractor will complete engineering and planning and will provide submittals pursuant to these specifications.
- C. The Contractor will fabricate and shop coat replacement roof and appurtenances as specified.
- D. The District will provide access. The District provided work area is limited to the fenced unpaved tank site.
- E. The District will provide any applicable building permits.
- F. The Contractor will notify the District at least two weeks in advance of the start of demolition to allow the draw-down and use of the water in the existing tank.
- G. The District will draw-down the water in the existing tank and remove from service. The District will notify the Contractor when the tank has been removed from service and rehabilitation may be started. Some water and sediment will remain in the tank.
- H. The Contractor will remove the remaining water from the tank to allow for magnetic flux leakage (MFL) inspection of the bottom.
- I. If desired, the District will hire an MFL contractor and coordinate with the Contractor for up to five days for MFL inspection as the first order of work.
- J. The Contractor will provide safe access for the MFL inspection.
- K. The Contractor will mobilize to the site and will complete the specified work items including but not limited to demolition of tank roof, removal of CP system, repairs, new roof and structure, upgrades, preparation and coating on the tank.
- L. The Contractor will recycle steel that is removed as part of the replacement of the existing roof and other work.

- M. The Contractor will modify the existing compression ring as required for fit and drainage and provide a new roof and structure from the existing shell down to and including new base plates.
- N. The Contractor will prepare and install new exterior coatings including existing piping to 6" below grade.
- O. The Contractor will prepare interior, including removal of all interior coatings and install new interior coatings.
- P. The Contractor will provide containment of dust, mists and other transient materials during the work including but not limited to preparation and coating.
- Q. The interior coatings of the tank will be allowed to cure as recommended by the coating manufacturer.
- R. The Contractor will provide disinfection of interior surfaces as specified and seal the tank.
- S. The District will fill the newly painted tank and provide VOC and bacteriological testing and put the newly painted tank into service as appropriate. The Contractor will be held responsible for the cost of the water if the VOC testing results do not meet State standards.
- T. The Contractor will sample, test, provide transport and recycle spent abrasive.
- U. The Contractor will sample, test, provide transport and dispose of any coatings or materials not included with the spent abrasive.
- V. The Contractor will demobilize all construction equipment, construction materials, stabilize the site and return control of the site to the District.
- W. The Contractor will provide a one year warranty on the Work pursuant to these specifications.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01205, Measurement and Payment
- B. Section 09905, Protective Coatings
- C. Section 13020, Replace Water Tank Roof
- D. Section 13010, Tank Upgrades

#### 1.03 SUBMITTALS

- A. Submittals shall be provided in accordance with these Special Provisions. Submittals shall be provided electronically in "PDF" format. The Contractor shall maintain a full set of approved submittals on the job site.

The Contractor shall provide submittals before the pre-job conference. No work shall be done on items needing submittal approval until the material or plan is approved by the Owner.

Submittals shall be submitted to:

**Advantage Technical Services, Inc.**

Wbellis.ats@gmail.com

Attn: William D. Bellis, P.E.

Consulting Engineer

- B. The Contractor shall provide a Project Safety Plan prepared under the direction of and certified by a Certified Safety Professional (CSP) or other qualified independent consultant. The intent of the plan is to develop and document measures, appropriate to the Contractor's means and methods, which assure employee safety and regulatory compliance. The plan shall be submitted before the pre-construction conference. A copy of the Project Safety Plan shall be on site during the course of the project. Payment for providing and implementing the Safety Plan shall be considered as included in the various contract prices paid and no additional compensation will be allowed.

1.04 HEALTH, SAFETY AND ENVIRONMENTAL CONTROLS

- A. The project goals are to complete the work with no injuries, spills or other environmental incidents. The Contractor shall be responsible for conducting the work in a manner that protects project personnel, the public and the environment. The Contractor shall provide qualified persons and implement appropriate programs to control all aspects of the work including worker and public health, safety and environmental protection.
- B. The Contractor shall conduct regular safety meetings with continuous review potential hazards associated with the project. Steps shall be taken to mitigate hazards and maintain a safe workplace. Known project safety and environmental hazards include the following:
1. Falls
  2. Confined spaces
  3. Eye injury including arc burn
  4. Venomous snakes including rattle snakes
  5. Poisonous spiders including black widow and brown recluse
  6. Wild fire associated with grinding, welding and other equipment or ignition sources
  7. Fire or explosion associated with flammable fuels or solvents
  8. Vehicle accidents
  9. Spills from leaking equipment or storage containers
  10. Introduction of non-native species
  11. Work on and around existing lead based paints
  12. Work around paints including volatile organic compounds

1.05 NOISE

- A. Noise generated from equipment operating overnight including generators, pumps and dehumidification shall not exceed 75 dB at all property lines.
- B. Construction activities shall be restricted to the hours of 7:00AM to 5:00PM Monday through Friday. No construction shall occur on Saturday or Sunday. On-site equipment maintenance and servicing shall be confined to the same hours.
- C. All construction equipment utilizing internal combustion engines shall be required to have mufflers that are in good condition and tuned according to the manufacture's recommendations. Stationary noise sources shall utilize noise reducing engine housing enclosures or noise screens.

1.06 OSHA COMPLIANCE.

- A. Contractor shall comply with all applicable regulations including state and federal OSHA and these Special Provisions.
- B. Contractor is responsible for complying with Cal/OSHA regulations for lead in construction in accordance with California Code of Regulations, California Title 8, Section 1532.1.
- C. The costs for complying with all OSHA requirements shall be considered as included in the various contract prices paid and no additional compensation will be allowed. Contractors are encouraged to take lead samples in advance by arrangement with the owner.

1.07 LEAD

- A. The facilities included in this project were constructed after 1978. Cal/OSHA requires compliance with California Title 8, Section 1532.1 if the paint contains lead at any level. Interior and exterior coatings are known to contain lead and other heavy metals.
- B. The Owner assumes no responsibility for sampling or test results. Preliminary testing is included in the appendices of this document but they are for information only. All work involving the removal of lead containing coatings and the disposal of such removed material shall be in strict accordance with all applicable Local, State and Federal regulations and guidelines including notification, removal and containment techniques, proper transportation and disposal, and worker protection and monitoring.
- C. The Contractor is responsible to test the composite waste from the project to determine proper disposal. A copy of all test results shall be furnished to the Owner.
- D. For waste requiring the preparation of a hazardous waste manifest and waste shipment record, the Contractor shall prepare an accurate hazardous waste manifest and waste shipment record for signing by the Engineer. Neither the Contractor nor his employees shall sign the waste manifests or waste shipment records as the generator's representative. The Contractor shall provide the Owner with a certified weight ticket for each shipment of hazardous waste. If any waste is shipped to a disposal facility outside of California, the transporter and disposal facility shall complete and sign and distribute California's Hazardous Waste Manifest in the same manner as required by California law for the disposal facilities inside California.



- E. The Contractor will be responsible for any cleanup of areas where materials containing lead, heavy metals or other hazardous and non-hazardous materials have been released during the job. The Contractor shall assume all costs for such cleaning.

1.08 TEMPORARY FACILITIES.

- A. Power. The Contractor shall provide, at no additional cost to the Owner, all construction power used at the project sites.
- B. Sanitary Facilities. The Contractor shall make arrangements and provide for adequate portable toilet facilities at the site of work. The Contractor shall maintain the sanitary facilities in acceptable condition from the beginning of work until completion and shall remove the facilities and disinfect the premises.
- C. Water. The District will provide construction water used at the project site.

1.09 CONSTRUCTION DETAILS.

- A. The tank is located in Oceano, CA. The facilities serve a predominantly residential community.
- B. Tank Draining. Prior to the start of construction, Owner staff shall empty the Tank. The tank will be out of service and drained but some water will remain. The Contractor shall remove the remaining water as needed to facilitate the start of work.

1.010 ISOLATION OF EQUIPMENT

- A. The piping and equipment adjacent to the tank will be in service during the work. The Contractor shall work with plant operations personnel to assure safe working conditions and prevent damage to property and equipment.
- B. The Owner shall be responsible for lockout/tag out of all power on equipment. The Contractor shall confirm lockout/tag out before proceeding with work.

**PART 2 - PRODUCTS  
NOT APPLICABLE**

**PART 3 - EXECUTION**

3.01 HOUSEKEEPING AND CLEANUP

- A. At the end of each work day, dust and abrasive shall be removed from the surfaces and surrounding areas. Spent abrasive shall be stored in temporary storage containers on site pursuant to Best Management Practices and Best Pollution Prevention Practices listed under federal and state guidelines.
- B. The site shall be maintained free of unnecessary accumulations of tools, equipment, surplus materials, and debris. Equipment maintenance and spill prevention procedures shall be adequate to prevent spills and leaks.

- C. Upon completion of the work, the Contractor shall remove all excess materials, equipment, containers, and waste from the job site. Coating spots or stains shall be removed from adjacent surfaces and surfaces repaired if needed. As work proceeds, promptly remove all coating that is spilled, splashed, or splattered. Collect empty containers, rags, waste material, and debris and store or remove from the site as appropriate.

### 3.02 ACCESS, CONTAINMENT AND PROTECTION

- A. The Contractor shall provide scaffolding or other access and fall protection anchors to allow safe access for Contractor personnel, inspection personnel and others as appropriate
- B. The tank is situated near residences. Creeks and all surface drains and swales lead directly onto the adjacent land, or to creeks and the ocean. Contractor shall protect all work sites and all drainage inlets from pollutants and illegal discharges.
- C. The work will be conducted in and around operational equipment and adjacent to residences. The Contractor shall provide containment or mitigation of air-borne dust, overspray and other contaminants to protect the existing equipment, facilities and neighboring properties from dust, overspray pursuant to regulatory requirements.

END OF SECTION

Section 01205

## MEASUREMENT AND PAYMENT

### PART 1 - GENERAL

This Section describes the methods of measurement and payment for the specific bid items associated with Work on the existing welded steel water tank. All other provisions of the Contract Documents which relate to measurement and payment are applicable, except that where conflicts occur between this section and other provisions of the technical specifications or reference specifications, this measurement and payment section shall prevail.

### PART 2 - PRODUCTS NOT APPLICABLE

### PART 3 - EXECUTION

#### 3.01 METHOD OF PAYMENT

- A.** Payment will be made on the basis of the unit prices or lump sums bid for the various items as called for on the Bid Sheet(s) and included in the Contract as awarded. The quantities given in the Proposal and Contract forms are approximate only and are given as a basis for the comparison of bids, and the Owner does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of or any class or portion of the Work or to omit portions of the Work as may be deemed necessary or advisable by the Engineer.

#### 3.02 MEASUREMENT OF QUANTITIES

- A.** Materials paid for by the ton shall be weighed on public scales or other scales for which the State Bureau of Weights and Measures has issued a certificate of inspection which is available to the Engineer.
- B.** Full compensation for all expenses involved in conforming to the above requirements for weighing materials shall be included in the prices for the materials being weighed, and no additional allowance will be made therefore.
- C.** The quantity of materials paid for by the lineal foot, square foot or square yard shall be determined by horizontal measurement.

#### 3.03 SCOPE OF PAYMENT

- A.** The Contractor shall accept the compensation as herein provided as full payment for furnishing all materials, labor, tools, and equipment necessary to complete the Work, and for performing all work contemplated and embraced under the Contract; also, for loss or damage arising from the nature of the Work, or from the action of the elements, except as

heretofore provided, or from any unforeseen difficulties which may be encountered during the prosecution of the Work, until the final acceptance by the District, and for all risks of every description connected with the prosecution of the Work; also, for all expenses incurred in consequence of the suspension or discontinuance of the Work as herein specified; and for completing the Work according to the Plans and Specifications. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or materials.

### 3.04 BID ITEMS

#### **A. Mobilization and Construction Coordination**

##### 1. Description

This work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. The Contractor shall develop a construction plan for the Work with means and methods that allow completion of the work pursuant to these specifications using the District's limited space of the fenced tank site for the Work or shall, independently from the District, acquire any temporary easements from landowners that are necessary for stockpile of materials, or facilitation of completion of the Work. The construction plan shall include all work for both tanks.
- b. Planning, coordination (2 week notice) and access to allow access and up to 5 normal working days for District testing lab consultant to complete magnetic flux leakage (MFL) bottom scan and ultrasonic testing of the existing bottom plate.
- c. Portable restroom(s) shall be on site prior to, or at the time of, the start of mobilization and shall remain on site during all on-site Work.
- d. Mobilization – Contractor shall move in and set up all equipment, provision for power, materials, etc. as necessary to complete all aspects of this project. This item also includes the cost of all bonds, insurance, and Permits for the Project.
- e. Easements – The Contractor may determine the location, type, extent and value to the Contractor of any temporary easement(s), which may facilitate completion of the Work, which is beyond the District's access easement and fenced tank site shown in the Plans and Specifications.
- f. Construction Schedule – The Contractor is responsible for preparing, amending, implementing, and complying with a construction schedule for all Work on this project. The initial schedule shall be submitted to the Engineer at the time of the award of the contract. The schedule shall be amended, and submitted to the Engineer, as necessary if progress varies significantly from the schedule and at a minimum, every month.
- g. Construction Water – The District will provide access to construction water.

- h. Submittals – The Contractor shall provide the submittals and associated planning and engineering including, field verification, structural calculations, shop drawings, materials data sheets, MSDS, certificates of compliance and other submittals required by the Work and these specifications.
- i. Utility Coordination – The Contractor is responsible for all coordination effort with regards to utilities on the project including temporary service interruptions, tie-ins, etc. and scheduling the inspection of all Contractor Work. The Contractor shall be responsible for any financial claims associated with missed inspections, repeat inspections, or any costs associated with re-working portions of the project due to failed inspections or lack of inspections based on the Contractors failure to schedule and follow through with same.
- j. Project Controls- A Health and Safety Plan for worker protection developed under the direction and signed by a Certified Safety Professional or other qualified independent consultant shall be submitted and kept on site for the duration of the project. The plan shall be for all Work on this project. The plan shall address known hazards including excavation safety, confined space permit controls, heavy metals including lead, fall protection and fire prevention.
- k. An Environmental Health Protection plan (including storm water pollution prevention best management practices) for all Work on this project shall be developed under the direction of and signed by a licensed P.E. (or other qualified person) shall be submitted and kept on the site for the duration of the project.
- l. Public Safety – The Contractor shall concern himself with public safety at all times during the life of this contract. Work area shall be clearly identified. Public access through the project shall be by means of well-established and delineated corridors. Materials shall be stockpiled in such a manner as to assure no hazard to the public, District Facilities, District Operations or the environment. Tools and equipment shall be likewise kept locked and out of reach. Work area shall be kept free of garbage and other waste.
- m. Dust Control – The Contractor shall comply with all County and other regulatory requirements for dust control. Contractor shall provide adequate personnel and equipment as necessary to abate all dust, which results from either his operation or created by a portion of the Work of this project. Dust control measures shall be in effect during the entire length of this contract including weekends and holidays. Contractor shall designate a contact person responsible for responding to any calls regarding dust issues and implementing dust control measures.

2. Measurement

Measurement of Work associated with Bid Item **No. 1** will be based upon completion of such work as a lump sum.

3. Payment

Payment for this bid item will be made at the lump sum named in the Bid Schedule under Bid Item **No. 1**, which price shall made on a percent complete basis based on the lump sum amount for this item. No portion of payment for “Mobilization and

Construction Coordination” will be approved for payment under the Contract until all pre-job planning and product submittal items listed herein have been completed and approved as specified. The scope of the work included under this bid item shall include the obtaining of all bonds, insurance, permits, submittals, and moving tank construction equipment (including crane, power generation and welders) onto the site.

All submittals shall conform to the requirements of the General Conditions and Specifications and be approved by the Engineer.

The aforementioned amount will be retained by the Owner as the agreed, estimated value of completing all of the mobilization items listed. Any such retention of money for failure to complete all such mobilization items as a lump-sum item shall be in addition to the retention of any payments due to the Contractor.

**B. Replace Tank Roof**

1. Description

This Work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. Field verification of tank dimensions.
- b. Engineering of any required temporary supports, roof structure, tank connections and foundation, shop drawings, submittals and documentation of contract compliance.
- c. Shop fabrication.
- d. Shop coating.
- e. Temporarily support the roof, shell and other portions of the tank and appurtenances as required.
- f. Temporary door sheet if desired by the Contractor with radiographic testing.
- g. Demolition, removal and recycling of existing roof (includes roof plate and structure down to and including base plates) and all other appurtenances and materials necessary as part of this project.
- h. Adjustment of pitch of the existing compression ring to prevent ponding and facilitate fit-up and welding to the new roof panels.
- i. Erection of new roof structure and all associated elements for a complete roof.
- j. Quality control.
- k. Testing of welds.
- l. Complying with all applicable federal, state, and local regulations.

2. Measurement

Measurement of Work associated with Bid Item **No. 2** will be based upon completion of this work as a lump sum. The measurement shall be made by the contractor and verified by the Owner's representative.

3. Payment

Payment for this bid item will be made at the lump sum named in the Bid Schedule under Bid Item **No. 2**, which price shall be made on a percent complete basis based on the lump sum amount for this item. The lump sum cost shall constitute full compensation for furnishing all labor, materials, tools, and equipment associated with performing all Work involved in providing Work under this bid item in place, operational, and in conformance with the plans & specifications.

**C. Roof Appurtenances, Roof Hatch, Roof Vent, Level Gauge and Guardrail**

1. Description

This Work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. Field verification of related existing tank and appurtenance dimensions.
- b. Engineering of guardrail, roof hatch, vent, roof fall protection system and associated appurtenances, shop drawings, submittals and documentation of contract compliance.
- c. Demolition, removal and recycling of existing guardrail, roof hatch and all other materials removed as a portion of this work.
- d. Disconnect, remove and dispose of all existing cathodic protection components. Remove primary power wires to the first junction box and abandon buried conduit in-place.
- e. Fabrication and installation new guardrail with protection at all roof edges.
- f. Fabrication and installation of a new roof hatch.
- g. Install two new 1 1/4" Sch 40 spare couplings with plugs on the roof adjacent to the new roof hatch.
- h. Fabricate and install a new level gauge (w/ option to re-use existing gauge channel), attachment and stilling well.
- i. Remove from existing roof and re-attach high inlet piping to the new roof.
- j. Fabricate and install a new roof vent.
- k. Move existing inside ladder safety device extension rack to the new roof.

- l. Finish welds and other surfaces in preparation for coating.
- m. Preparation and coating of new appurtenances.
- n. Quality control.
- o. Complying with all applicable federal, state, and local regulations.

2. Measurement

Measurement of Work associated with Bid Item **No. 3** will be based upon completion of this work as a lump sum. The measurement shall be made by the contractor and verified by the Owner's representative.

3. Payment

Payment for this bid item will be made at the lump sum named in the Bid Schedule under Bid Item **No. 3**, which price shall be made on a percent complete basis based on the lump sum amount for this item. The lump sum cost shall constitute full compensation for furnishing all labor, materials, tools, and equipment associated with performing all Work involved in providing Work under this bid item in place, operational, and in conformance with the plans & specifications.

**D. Spiral Stairway Security Cage and Locking Door**

1. Description

This Work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. Field verification of related existing tank and appurtenance dimensions.
- b. Engineering of hot dip galvanized double stringer spiral stairway and associated appurtenances, shop drawings, submittals and documentation of contract compliance
- c. Finishing welds and other surfaces in preparation for coating
- d. Preparation and coating (HDG) of all stairway components (including security cage and gate).
- e. Quality control
- f. Complying with all applicable federal, state, and local regulations

2. Measurement

Measurement of Work associated with Bid Item **No. 4** will be based upon completion of this work as a lump sum. The measurement shall be made by the contractor and verified by the Owner's representative.



3. Payment

Payment for this bid item will be made at the lump sum named in the Bid Schedule under Bid Item **No. 4**, which price shall be made on a percent complete basis based on the lump sum amount for this item. The lump sum cost shall constitute full compensation for furnishing all labor, materials, tools, and equipment associated with performing all Work involved in providing Work under this bid item in place, operational, and in conformance with the plans & specifications.

**E. Interior Coatings**

1. Description

This Work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. Preparation of interior surfaces of the existing tank and appurtenances for coatings
- b. Containment of dusts, mists and other objectionable airborne materials
- c. Application of coatings on interior surfaces and appurtenances
- d. Preparation and application of coatings on interior surfaces of the underground and aboveground piping (first six inches from tank)
- e. Preliminary wash of all interior surfaces, piping and components prior to disinfection
- f. Disinfection of tank interior surfaces
- g. Disinfection of piping and any other surfaces, affected by the work that are within the potable water storage and distribution system
- h. Protecting and repairing coatings damaged during disinfection and other work
- i. Sealing the tank manways
- j. Quality control

2. Measurement

Measurement of Work associated with Bid Item **No. 5** will be based upon completion of this work as a lump sum. The measurement shall be made by the contractor and verified by the Owner's representative.

3. Payment

Payment for this bid item will be made at the lump sum named in the Bid Schedule under Bid Item **No. 5**, which price shall be made on a percent complete basis based on the lump sum amount for this item. The lump sum cost shall constitute full compensation for

furnishing all labor, materials, tools, and equipment associated with performing all Work involved in providing Work under this bid item in place, operational, and in conformance with the plans & specifications.

**F. Exterior Coatings**

1. Description

This Work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. Preparation and coating of exterior surfaces of the existing tank
- b. Protection of property
- c. Containment of dusts, mists and other objectionable airborne materials
- d. Quality control

2. Measurement

Measurement of Work associated with Bid Item **No. 6** will be based upon completion of this work as a lump sum. The measurement shall be made by the contractor and verified by the Owner's representative.

3. Payment

Payment for this bid item will be made at the lump sum named in the Bid Schedule under Bid Item **No. 6**, which price shall be made on a percent complete basis based on the lump sum amount for this item. The lump sum cost shall constitute full compensation for furnishing all labor, materials, tools, and equipment associated with performing all Work involved in providing Work under this bid item in place, operational, and in conformance with the plans & specifications.

**G. Welded Patches**

1. Description

This Work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. Provide submittals including welding procedures and welder qualifications.
- b. Fabricate 1/4" thick patch plates as required to repair the specified areas.
- c. Seal weld patch plates on tank to repair bottom corrosion or other miscellaneous locations as directed by the Engineer or Owner's Representative.

2. Measurement

Measurement for Bid Item **No. 7** Work will be based upon completion of these items on a unit cost basis for each sq. ft. as specified by the Engineer. The measurement shall be made by the contractor and verified by the Owner's Representative.

### 3. Payment

Payment for Bid Item **No. 7** shall be made on a unit cost basis. The unit cost shall constitute full compensation for furnishing all labor, materials, tools, and equipment associated with performing all Work involved in providing the Work associated with this Bid Item in place, operational, and in conformance with the plans & specifications.

## H. Demobilization

### 1. Description

This work includes the furnishing of all tools, equipment, labor and materials required to accomplish all of the following Work within the limits designated on the plans or as directed by the Engineer in accordance with the plans and specifications. The Work includes but is not limited to the following:

- a. Demobilization – Contractor shall move off all equipment, materials, etc. as necessary to complete all aspects of this project.
- b. Handle, sample, test, transport and recycle spent abrasive which will contain lead and other heavy metals from existing coatings
- c. Construction Clean-Up – The Contractor is responsible for leaving the project areas in suitable condition for operation. It is imperative that all contractor Work, stockpile, storage, and equipment areas be completely clean and free of foreign material, materials removed or replaced as part of this work, gravel, aggregate base, broken asphalt, pipe, hardware, packing material, welding debris, and concrete when the Work is complete. All said material shall be picked up and removed from the site and not scattered. All removals from the site shall be done so in a legal manner. Contractor is responsible for all costs associated with loading, hauling, and dumping including any required permits, fees, etc
- d. Daily housekeeping and site control.
- e. Maintenance of storm water pollution prevention plan controls.
- f. The Contractor shall provide slope stabilization and other measures required to prevent sedimentation or other contamination of water draining from the site as a result of construction activities and this project.
- g. Miscellaneous – All items which are shown on the plans or identified in the specification or implied thereby, or incidental to any of the described items, even though not specifically called out in a particular item shall be included as part of this bid item.

### 2. Measurement

Measurement for Bid Item **No. 8** "Demobilization" will be based upon completion of such work as a lump sum. The measurement shall be made by the contractor and verified by the Owner's representative.

3. Payment

Payment for Bid Item **No. 8** "Demobilization" shall be made in a lump sum amount for this item. **No payment shall be made until full completion of the Work within the bid item.** The lump sum cost shall constitute full compensation for furnishing all planning, acquisition, labor, materials, tools, and equipment associated with performing all Work involved in demobilizing, stabilizing and returning the site in a fully operable condition.

END OF SECTION

Section 09905

## PROTECTIVE COATINGS

### PART 1 - GENERAL

#### 1.01 SCOPE SUMMARY

- A. The work described in this section covers protective coatings for the project including the interior and exterior surfaces of one existing water tank, accessible portions of piping, appurtenances. The project goals are to achieve coating systems that provide long term service, good aesthetics and with low maintenance cost while using best safety and environmental practices.
- B. The contractor shall supply all coatings, solvents, abrasives, air compressors, hoses, paint guns, materials storage and any other tools, equipment and consumables necessary for the proper preparation and application of the coatings.
- C. The Contractor shall be familiar with the service conditions of the tank and shall submit preparation and coating applications as appropriate. The Contractor shall consult the Engineer prior to any coating activity where the coating of certain components or surfaces is in question.
- D. The Contractor shall provide containment for abrasives, dusts, mists and other objectionable materials to protect neighboring homes, adjacent equipment and other property.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01100, Scope and Control of the Work
- B. Section 1205, Measurement and Payment
- C. Section 13010, Upgrades to the Existing Tank
- D. Section 13020, Replace Water Tank Roof

#### 1.03 REFERENCES

- A. Without limiting the general aspects or other requirements of this specification, work and equipment shall conform to applicable requirements of County, State and Federal codes, laws and ordinances governing the work, American Water Works Association, SSPC: The Society of Protective Coatings, and the manufacturer's printed instructions.
- B. When conflict exists between any of the referenced codes, laws, ordinances, specifications and standards contained herein, the most conservative relative to the project goal of system longevity shall govern.
- C. The latest edition of the following standards and regulations form a part of this specification. Materials, preparation, application, repair methods, and all other aspects of the work and inspections shall conform to following codes and standards:

1. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
  - a. ASTM D1186, Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base
  - b. ASTM D3359, Standard Test Method for Measuring Adhesion by Tape Test
  - c. ASTM D4138, Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means
  - d. ASTM D4285, Standard Test Method for Indicating Oil or Water in Compressed Air
  - e. ASTM D4414, Standard Practice for Measurement of Wet Film Thickness by Notch Gages
  - f. ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
  - g. ASTM D5402, Standard Test Methods for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs
2. AMERICAN WATER WORKS ASSOCIATION (AWWA)
  - a. AWWA D102-19, AWWA Standard for Coating Steel Water-Storage Tanks
  - b. AWWA M42, AWWA Manual of Water Supply Practices, Steel Water Storage Tanks
  - c. AWWA C652-02, AWWA Disinfection of Water-Storage Facilities
3. SOCIETY OF PROTECTIVE COATINGS (SSPC)
  - a. SSPC-PA 1, Shop, Field, and Maintenance Painting of Steel
  - b. SSPC-PA 2, Measurement of Dry Coating Thickness with Magnetic Gages
  - c. SSPC-VIS 1, Visual Standard for Abrasive Blast Cleaned Steel
  - d. SSPC-VIS 3, Visual Standard for Hand and Power Tool Cleaned Steel
  - e. SSPC Publication No. 91-12, Coating and Lining Inspection Manual
  - f. SSPC Visual Comparison Manual
  - g. SSPC-SP 1, Solvent Cleaning
  - h. SSPC-SP 3, Power Tool Cleaning
  - i. SSPC-SP 7, Brush-off Blast Cleaning
  - j. SSPC-SP 10, Near-White Metal Blast Cleaning
  - k. SSPC-SP 11, Power Tool Cleaning to Bare Metal

- I. SSPC-SP 12, Surface Preparation and Cleaning of Metals
- 4. NACE INTERNATIONAL (NACE)
  - a. NACE SP0188-2006, Standard Practice for Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
  - b. NACE RP 0178-89, Standard Recommended Practice for Fabrication Details, Surface Finish Requirements, and Proper Design Considerations for Tanks and Vessels to be Lined for Immersion Service.
- D. NATIONAL SANITATION FOUNDATION (NSF)
  - 1. NSF 61, Drinking Water System Components - Health Effects
- E. EQUIPMENT AND COATING MANUFACTURER'S PUBLISHED INSTRUCTIONS

#### 1.04 SUBMITTALS

- A. Submittals shall be provided in accordance with these special provisions. **The Contractor shall provide submittals before the pre-job conference.** No work shall be done on items needing submittal approval until the material or plan is approved by the Owner.
- B. Required Submittals. Submittals shall be furnished by the contractor as called for in the various sections of these Special Provisions and for following items as a minimum:
  - 1. Coatings/Color (each coat)
  - 2. Solvents/Thinners
  - 3. Abrasives
  - 4. Magnetic Dry Film Thickness Gage
  - 5. Coating Conditions Verification Equipment (Temperatures/Humidity)
  - 6. Daily Report Form
  - 7. Caulking (See Coating Systems)
  - 8. Holiday detection equipment with voltage verification/calibration method
  - 9. Containment method for abrasives, dusts, mists and other objectionable materials to protect property
- C. Product Submittals. Approval of materials and products by the Owner does not waive the Contractor's responsibility to provide a material which will meet the project goals.
- D. Coating Submittals. The submittals for coating products shall, at a minimum, contain the following information:
  - 1. Material Name / Manufacturer
  - 2. Standards of which the product complies

3. Conditions for which the product was developed or can be used
4. Application guidelines including manufacturer approved field repair method of shop applied primers
5. Testing information / data on product
6. Any material guarantees
7. Expected life
8. Surface Preparation for coatings including any special requirements for this project
9. Recommended uses
10. Safety precautions - and MSDS sheets
11. Name and phone number of the area sales representative for the product
12. Any other information the contractor feels would be helpful in the Owner's review

#### 1.05 OSHA COMPLIANCE.

- A. Contractor shall comply with all applicable regulations including state and federal OSHA and these Special Provisions.
- B. Contractor is responsible for complying with Cal/OSHA regulations for lead in construction in accordance with California Code of Regulations, California Title 8, Section 1532.1. Lead. Some levels of lead are undoubtedly present and Cal/OSHA requires compliance with 1532.1 if the paint contains lead at any level.
- C. The costs for complying with all OSHA requirements shall be considered as included in the various contract prices paid and no additional compensation will be allowed. Contractors are welcome to take lead samples in advance by arrangement with the owner.

## **PART 2 - PRODUCTS**

### 2.01 ABRASIVES

- A. Abrasive used in blast cleaning operations shall be recyclable fused copper slag. Abrasives shall meet all requirements of the California Air Resources Board for content and emissions.
- B. Abrasives shall be certified for unconfined dry blasting pursuant to the California Administrative Code, Section 92520 of Subchapter 6, title 17, and shall appear on the current listing of approved abrasives.

### 2.02 CAULKING

- A. The caulking sealant shall be a premium-grade, high-performance, moisture-cured, 1-component, polyurethane-based, non-sag elastomeric sealant that meets ASTM C-920, Type S, Grade NS, Class 25 such as Sika 1a or equivalent. The material shall be capable of  $\pm 25\%$  joint movement and withstand submerged conditions. The material shall have



excellent resistance to aging, weathering and maintain elasticity during long term exposure in the given conditions.

## 2.03 COATING MATERIALS.

- A. Coating materials shall conform to the following requirements:
1. Only high-grade products of manufacturers having an established good reputation in the manufacture of quality protective coatings shall be used. All coatings on the interior surfaces of the tank or other areas that can contain potable water shall conform to NSF-61(including NSF-600).
  2. Coating materials shall be brought to the job site in the original sealed containers. Materials found to be damaged or out of date shall be removed from the site. Materials shall be stored in an enclosed structure out of the weather protecting them from excessive heat or cold.
  3. The Contractor may submit paint materials of manufacturer's other than those specified herein in accordance with these Special Provisions. The Contractor shall provide satisfactory documentation from the firm manufacturing the proposed material that the material meets the specified requirements and is equivalent to or better than the listed materials in the following properties:
    - a. Quality
    - b. Durability
    - c. Resistance to abrasion and physical damage
    - d. Life expectancy
    - e. Ability to recoat in future
    - f. Solids content by volume
    - g. Dry film thickness per coat
    - h. Compatibility with other coatings
    - i. Suitability for the intended service
    - j. Resistance to chemical attack
    - k. Temperature limitations in service and during application
    - l. Type and quality of recommended undercoats and topcoats
    - m. Ease of application
    - n. Ease of repairing damaged areas
    - o. Stability of color

## **PART 3 - EXECUTION**

### 3.01 HOUSEKEEPING AND CLEANUP

- A. At the end of each work day, dust, paint chips and abrasive shall be removed from the surfaces and surrounding areas. Spent abrasive shall be stored in temporary storage containers on site pursuant to Best Management Practices and Best Pollution Prevention Practices listed under federal and state guidelines.
- B. As work proceeds, promptly remove all coating that is spilled, splashed, or splattered. Collect empty containers, rags, waste material, and debris and store or remove from the site as appropriate.
- C. The site shall be maintained free of unnecessary accumulations of tools, equipment, surplus materials, and debris. Equipment maintenance and spill prevention procedures shall be adequate to prevent spills and leaks.
- D. Upon completion of the work, the Contractor shall remove all excess materials, equipment, containers, and waste from the job site. Coating spots or stains shall be removed from adjacent surfaces and surfaces repaired if needed.

### 3.02 PROTECTION OF PROPERTY

- A. The Contractor shall prevent any airborne materials including mists or dusts or abrasive blast residue or overspray from leaving the District's property.
- B. The Contractor shall provide, operate and maintain filtered ventilation on the tank during interior preparation and coating. The filtration shall contain and prevent the drifting of particulates including but not limited to abrasive blast residue and overspray preparation and coating.
- C. Open air abrasive blasting is prohibited except when containment is provided.
- D. Spray application of coatings is prohibited except when containment is provided.
- E. The Contractor shall protect the following surfaces from abrasive blasting, entry of sand, grit, dust and paint or other damage by wrapping, masking or other methods:
  - 1. PVC piping including high inlet on tank interior
  - 2. Sheet metal siding
  - 3. Any pump/motors
  - 4. Threaded portions of valve and gate stems
  - 5. Machined surfaces for sliding contact, bearings, sprockets or gears
  - 6. Surfaces to be assembled against gaskets
  - 7. Mechanical drives
  - 8. Stainless steel or aluminum surfaces not specifically designated for coating or painting
  - 9. Coated or plated items (including galvanized) not scheduled for painting or coating

- 10. Drains & relief valves
- 11. Concrete surfaces
- 12. All other surfaces not specifically designated for coating or painting.

- F. If required to prevent damage, protective coverings or drop cloths shall be used to protect floors, fixtures and equipment. The Contractor shall mask, cover and shield all gauges, instruments, stainless steel, aluminum, galvanized steel, glass, plastic, equipment and all other surfaces not intended for coating as specified. Surfaces, from which inadvertently applied materials cannot be removed satisfactorily, shall be recoated or repainted to produce a finish satisfactory to the Owner.
- G. Coating application to exterior surfaces shall be completed using roller and brush methods when containment is not provided. The Contractor shall prevent coating material to spatter, spray or otherwise transfer beyond 35' from the tank.

### 3.03 PRESSURE WASHING

- A. The Contractor shall complete low-pressure water cleaning of surfaces prior to other applicable surface preparations. Surfaces shall be cleaned in accordance with SSPC-SP12 LP WC. All oil, grease, salts, rust, loose materials or other contaminants that will adversely impact adhesion or cause coating failure shall be removed.
- B. Pressure washing can be destructive to nonmetallic surfaces. Hydraulic pressure of the washer shall be controlled so as to not cause damage to surfaces not designated for painting. The Contractor shall protect wood, insulation, caulking, electric installations and instrumentation from direct and indirect water streams. The Contractor shall cover and protect all instruments and equipment not intended for washing.

### 3.04 SURFACE PREPARATION

- A. Surface preparation shall be provided as detailed for the specific aspects of the work. Surface preparation shall conform to this specification and the applicable material manufacturer's recommendations. The contractor shall provide all necessary testing and **recycle the abrasive** through an approved recycling program. The Contractor shall provide documentation of receipt of the material by the recycler.
- B. All welding shall be completed prior to surface preparation and coating. Do not apply any part of a coating system before the Owner's Quality Assurance has reviewed the surface preparation. Coating applied without inspection shall be removed by abrasive blasting and reapplied in accordance with this specification.

### 3.05 APPLICATION.

- A. Coating application on exterior surfaces may be completed using roller or brush methods. Spray application is not allowed on the exterior unless containment is provided.
- B. Coatings applied to materials prior to forming (i.e., roof panels) shall be removed at least 5 inches away from any bends by abrasive blasting to a commercial blast. Edges shall be feathered.

- C. Thinning shall be permitted as recommended by the manufacturer for the conditions of application and allowed by applicable regulations.
- D. Each application of coating or paint shall be applied evenly, free of sags and runs, with no evidence of poor workmanship. Care shall be exercised to avoid lapping on glass or hardware. Coating and paint shall be sharply cut to lines. Finished surfaces shall be free from defects or blemishes.
- E. When two or more coats of coating or paint are specified, each coat shall be adequately contrasting in color to act as an indicator of coverage.
- F. All material shall be applied in accordance with the manufacturer's recommendations and these specifications. Maximum permissible level of soluble salts or chemicals shall be as recommended by the coating manufacturer and verification shall be the responsibility of the contractor.
- G. At least one brush stripe coat shall be applied, on the interior, to edges, corners, and irregular surfaces such as welds and fasteners. Minimum recoat times shall be observed between the stripe coat and the next coat. The stripe coat may be applied after the prime coat if appropriate.
- H. Where the number of coats or dry film thickness is specified, they shall be considered a minimum. The Contractor shall apply additional coats as necessary to achieve the specified dry film thickness.
- I. Coating procedures and recoat cycles are critical. It is imperative that the manufacturer's recommendations be strictly followed. Any deviation from printed literature must be approved in writing by the manufacturer's technical department and the owner prior to starting alternate procedures.

### 3.06 CONTRACTOR QUALITY CONTROL.

- A. The Contractor is responsible for quality control. The Contractor shall provide adequate equipment to monitor project quality. The Contractor shall document conditions, progress, project personnel and equipment on site, in a daily report. Environmental readings shall be recorded at the beginning and end of each painting sessions. Signed daily reports shall be provided to the Owner Representative on a weekly basis.
- B. No coating or paint shall be applied to wet or damp surfaces, in rain, snow, fog, or mist, when the steel temperature or surrounding air temperature is less than 5 degrees Fahrenheit (5°F) above the dew point, nor in conditions not recommended by the manufacturer. If unacceptable weather conditions are prevalent, coating or painting shall be delayed or postponed until conditions are favorable. The day's coating or painting shall be completed in time to permit the film sufficient drying time prior to damage by atmospheric conditions.
- C. The thickness of coatings shall be checked with a non-destructive, magnetic type thickness gauge. Coating thickness measurement procedures shall be pursuant to SSPC-PA-2. Additional measurements may be made when determined by the inspector to be in the best interest of the project. In cases of dispute concerning film thickness, measurements made with instruments shown to be in calibration with the National Bureau of Standards

calibration plates shall predominate. The contractor shall furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates to test accuracy of dry-film thickness gauge. All inspection devices shall be in good working order.

Dry film thickness that exceeds the coating manufacturer's recommendation is unacceptable and shall be removed by the Contractor at no extra cost to the Owner.

- D. The coating integrity of all interior coated metallic surfaces shall be tested with an approved high voltage spark testing detection device. Non-submersed roof and shell areas shall be included in the holiday testing. Holiday detection of interfaces between roof plate and rafters which are not seal welded is not required.

The contractor shall provide holiday detection devices in good working order.

All holiday detection devices shall be operated in the presence of a representative of the Owner. Testing shall be conducted pursuant the coating manufacturer's recommendations and NACE RP 0188 (latest edition). All rejected areas shall be marked and repaired in accordance with the manufacturer's printed recommendations and re-tested. No pinholes or other irregularities will be permitted in the final coating.

### 3.07 QUALITY ASSURANCE.

- A. The Owner may provide shop or field inspection of the work. The Contractor shall provide the Owner's Representative with a 3 day notice prior to any surface preparation or coating application. All work shall be performed with the presence of the Owner's Representative unless written prior approval has been granted. Coatings applied without inspection shall be removed by abrasive blasting and reapplied in accordance with this specification.

### 3.08 COATING SYSTEM – EXTERIOR OF EXISTING TANK & ABOVE GROUND FERROUS PIPING

- A. General. All exterior surfaces of the existing tank, above ground piping and appurtenances shall be coated unless noted herein. Level gage, vent screens and other "bolt on" hardware shall be removed prior to preparation and replaced after completion. Electrical conduit, enclosures and instruments shall be loosened from clamps and supported away from surfaces to be painted as appropriate for optimal corrosion protection of tank and appurtenances.
- B. Included Items: All exterior surfaces including above ground piping.
- C. Surface Preparation:
1. Tank exterior: SSPC-SP12 LP WC, hand sand to scarify surfaces and as specified by the coating manufacturer's recommendations.
  2. New materials: See below
  3. Ductile iron piping and fittings: NAPF 500-03-03 Power tool clean
  4. Romac expansion joints: SSPC – SP2 Power tool clean, protect rubber material

- D. Exterior Coating System: Spot prime any bare steel, full barrier/intermediate coat with epoxy followed by aliphatic polyurethane. All coatings shall meet applicable regulatory standards. Examples of coatings are as follows:
1. Devoe
    - a. Spot Prime: Devoe High Performance Coatings Bar-Rust 231 Multi-Purpose Epoxy Mastic, 3 - 5 mils
    - b. Barrier/Intermediate: Devoe High Performance Coatings Bar-Rust 231 Multi-Purpose Epoxy Mastic, 3 - 5 mils
    - c. Finish: Devoe High Performance Coatings Devthane 378H Aliphatic Urethane Semi-Gloss, 2 - 3 mils

or
  2. Carboline
    - a. Spot Prime: Carboguard 890 @ 4-6 mils DFT
    - b. Barrier/Intermediate: Carboguard 890 @ 4-6 mils DFT
    - c. Finish: Carbothane 134VOC @ 2-3 mils DFT

or
  3. Tnemec
    - a. Spot Prime: Tnemec L140F Pota-Pox, 3 - 5 mils
    - b. Intermediate: L140F Pota-Pox, 3 - 5 mils
    - c. Finish: Tnemec 1075 Endura-Shield, 2 - 3 mils
  4. Approved equal.
- E. Color: Submit color for Owner approval. Custom color matching may be required.

### 3.09 COATING SYSTEM – EXTERIOR SURFACES (NEW STEEL)

- A. All exterior surfaces shall be coated unless noted herein. Ladder safety climb rails, level gage board, vent screens and other “bolt on” hardware shall be removed during coating and replaced after completion.
- B. Included Items: All new steel exterior surfaces including, but not limited to, new roof, new appurtenances and new piping.
- C. Surface Preparation: Abrasive blast per SSPC-SP6 Commercial Blast Cleaning (containment required) and the coating manufacturer’s recommendations. Coatings applied to materials prior to forming (i.e., roof panels) shall be removed at least 5 inches away from any bends by abrasive blasting to a commercial blast. Edges shall be feathered.

- D. Exterior Coating System (AWWA D-102 Outside Coating System No. 5). Epoxy prime coat with an epoxy intermediate coat followed by aliphatic polyurethane. Examples of approved coatings are as follows:
1. Devoe
    - a. Primer: Devoe High Performance Coatings Bar-Rust 231 Multi-Purpose Epoxy Mastic, 3 - 5 mils
    - b. Intermediate: Devoe High Performance Coatings Bar-Rust 231 Multi-Purpose Epoxy Mastic, 3 - 5 mils
    - c. Finish: Devoe High Performance Coatings Devthane 378H Aliphatic Urethane Semi-Gloss, 2 - 3 milsor
  2. Tnemec
    - a. Primer: Tnemec L69 Epoxoline or V140F Pota-Pox, 3 - 5 mils
    - b. Intermediate: Tnemec L69 Epoxoline or V140F Pota-Pox, 3 - 5 mils
    - c. Finish: Tnemec 1075 Endura-Shield, 2 - 3 milsor
  3. Approved equal.
- E. Color: Submit color palette for Owner approval.
- F. Slip Resistant Areas: Provide slip-resistant surfaces by applying 30 mesh walnut shell to an epoxy "stripe coat".

3.010 COATING SYSTEM – INTERIOR SURFACES

- A. Included items: All Interior surfaces.
- B. Surface Preparation: Abrasive blast per SSPC-SP10 Near White Blast Cleaning and the coating manufacturer's recommendations.
- C. Interior Coating System (AWWA D-102 Inside Coating System No. 2): Three coat, two component epoxy coating system. A prime, intermediate and finish coat of two component epoxy. An example of approved coatings is as follows:
1. Tnemec
    - a. Primer: Tnemec L140 Pota-Pox, 3 mils
    - b. Intermediate: Tnemec L140 Pota-Pox, 4 mils
    - c. Finish: Tnemec L140 Pota-Pox, 5 mils

or

2. Sherwin Williams

- a. Primer: SherPlate 600 @ 3 mils DFT
- b. Intermediate: SherPlate 600 @ 4 mils DFT
- c. Finish: SherPlate 600 @ 5 mils DFT

or

3. Approved equal.

D. Color: Tank white

3.011 CURING AND VENTILATION

- A. Forced ventilation of the tank interior shall be conducted for a period equal or exceeding the coating manufacturer's recommended minimum recoat time for each coat and for at least 48 hours after the final coat. The ventilation shall be equal to or greater than specified in AWWA D102. Circulation through low areas of the tank, piping and other associated areas that will hold solvent vapors shall be assured.
- B. If heating or dehumidification are required for proper curing, the Contractor shall provide these as a part of the Base Bid and at no additional cost to the Owner.

3.012 CAULKING

- A. Caulk shall be applied to unsealed joints such as bolts, nuts, bolted flanges etc. to prevent moisture intrusion and rust staining ("bleeding"). Minimum recoat times for caulking shall be followed. Caulk shall be applied only to clean dry areas that are free of loose materials and dust. Follow manufacturer's installation instructions. Caulk shall be applied between the prime and finish coats.

3.013 LABELING

- A. Label inside of roof hatch "**FALL HAZARD PROTECT OPENING OR MONITOR WHEN OPEN – CONFINED SPACE ENTRY BY PERMIT ONLY**". Labeling shall be located on the inside of the hatch lid. The labeling shall be done with red or black colored NSF 61 approved epoxy. Letters shall be neatly stenciled and shall be 2" tall or larger.
- B. Label the shell adjacent to the level gauge or other location as directed by the Owner with the maximum operating level as follows: "**MAXIMUM OPERATING LEVEL: XX' - XX**" (actual value per the Contractor's Engineer). Letters shall be neatly stenciled and shall be 2" tall or larger.

3.014 CERTIFICATE OF COMPLIANCE

- A. The Contractor shall provide a Certificate of Compliance stating that "The Coating Work has been completed in conformance with the Specifications and Curing has been completed and confirmed pursuant to the Project Specifications and the coating



manufacturer's recommendations and the tank is ready to be filled." The Certificate of Compliance shall be provided to the Owner and Engineer prior to disinfection.

3.015 TANK DISINFECTION.

- A. After cure of the interior coating has been completed, the interior of the tank shall be thoroughly cleaned and disinfected. All work shall conform to the requirements of ANSI/AWWA C652, Standard for Disinfection of Water-Storage Facilities, Method 2. The Contractor shall test the disinfection solution for chlorine concentration during the observation of the Owner Representative and prior to start of disinfection. Upon completion of disinfection, the Owner's representative shall photograph the tank interior and the Contractor shall seal the tank.

3.016 SOAK TEST AND MONITORING

- A. The Owner will fill the tank and complete the five day soak test and VOC monitoring including organics listed on the coating manufacturer's MSDS. The reservoir must also be sampled for coliforms and have satisfactory results. The Owner shall submit the results of all monitoring and testing to the State Water Resources Control Board and receive approval prior to putting the reservoir into service.

3.017 WARRANTY INSPECTION.

- A. The Owner shall provide for inspection of any or all of the work completed under this contract. The date and method of the inspection shall be established and notification given at least 30 days in advance. If an inspection date has not been established within 13 months after completion of the coating work, the first anniversary inspection shall be considered waived. Waiver of the warranty inspection will not relieve the Contractor of the responsibility to repair defective work.

3.018 WARRANTY REPAIR.

- A. If any work is found to be defective, as determined by the Owner, its employees or consultants, the Contractor shall promptly correct the defective work with no cost to the Owner.
- B. The surfaces shall be prepared and re-coated as per the applicable original coating system. Preparation and application procedures for coating repairs shall conform to manufacturer's recommendations and be approved by the Owner with the intent of bringing the defective areas up to the quality level of the original work required by this specification.
- C. The Owner may require delay of repair where necessary for efficient operation of the water treatment facility. If the Contractor does not complete corrective work promptly, the Owner may complete the work itself or hire others to complete it. The original Contractor and its Surety will be liable to the Owner for all direct and indirect costs.

END OF SECTION

Section 13010

## UPGRADES OF THE EXISTING TANK

### PART 1 - GENERAL

#### 1.01 SUMMARY

The intent of the work described in this section is to provide a safe workplace and fully operational potable water tank system.

#### 1.02 SCOPE

- A. Demolish, remove and recycle the applicable existing components that are being replaced or upgraded.
- B. Design, fabricate, install, and coat upgrades on the existing tank in order to provide a safe workplace and assure compliance with applicable regulations. The Contractor's work will include verification of all dimensions (40FT. HEIGHT ON EXISTING NAMEPLATE IS KNOWN TO BE INCORRECT) and engineering by the Contractor's Engineer for all work.
- C. Remove all cathodic protection system components and primary power to first junction box.
- D. Upgrade the access, roof guardrail and other appurtenances to current regulations (including OSHA Standards and State Health Regulations) and these special provisions. The dimensions provided herein are intended to be general information. The Contractor shall field verify all dimensions prior to fabrication.
- E. The Contractor shall design, fabricate, and erect all aspects of the repairs pursuant to AWWA D100-21 (including Section 13 for seismic design), CBC 2022, California Department of Public Health Drinking Water Statutes, and all other applicable rules and regulations. NSF/ANSI 61 (including NSF 600), Standard for Drinking Water System Components shall apply. All contractor design calculations and drawings shall be stamped by a Registered Professional Civil or Structural Engineer with design experience on over 50 similar welded steel tanks.

#### 1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01100, Scope and Control of the Work
- B. Section 1205, Measurement and Payment
- C. Section 09800, Protective Coatings
- D. Section 13020, Replace Water Tank Roof

#### 1.04 REFERENCES

The latest edition of standards and regulations herein form a part of this specification. Design details, repair methods, fabrication, erection, and all other aspects of the work and inspections shall conform to following Codes and Standards:

- A. AMERICAN WATER WORKS ASSOCIATION (AWWA)
  - 1. AWWA D100-21, AWWA Standard- Welded Carbon Steel Tanks for Water Storage
- B. CALIFORNIA BUILDING STANDARDS COMMISSION (CBSC)
  - 1. CBC 2022, California Building Code (including electrical, mechanical, etc.)
- C. NATIONAL ASSOCIATION OF CORROSION ENGINEERS (NACE)
  - 1. NACE SP0178-2007, Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service.
- D. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
  - 1. ASCE/SEI 7, Minimum Design Loads For Buildings and Other Structures
- E. NATIONAL SANITATION FOUNDATION (NSF)
  - 1. NSF 61, Drinking Water System Components - Health Effects.
- F. AMERICAN PETROLEUM INSTITUTE (API)
  - 1. API 653, Tank Inspection, Repair, Alteration and Reconstruction, API Standard 653-2018 w/ Addendum 2 (2020)

#### 1.05 SUBMITTALS

Engineering calculations shall be provided to show the adequacy of structural items where loads are specified by applicable industry standards. The design calculations and detailed drawings shall be signed by a Civil or Structural Engineer licensed to practice in the state of California.

- A. Tank roof structure and accessory drawings and supplemental information will include the following:
  - 1. Dimensional drawings indicating size and thickness of all members
  - 2. Attachment details
  - 3. List of appurtenances
  - 4. Fabrication details
  - 5. All details of welded joints. Weld joint details shall include, size, joint preparation, identification of field welds, and indication of welds requiring low hydrogen procedures.
- B. Welding Procedures
- C. Welder Certifications
- D. Mill Test Reports

## PART 2 - PRODUCTS

### 2.01 PLATE AND SHEET

- A. Plate and sheet materials shall conform to the design requirements of AWWA D100.

### 2.02 TANK ACCESSORIES

#### A. ROOF VENT

Provide a 37-inch roof vent. The vent openings shall be concealed under the lid to reduce the number of air-borne particles allowed to enter the tank. The venting area shall be covered with an 8-mesh bronze insect screen. The vent covers shall be hinged and lockable to allow ease of opening for inspection and to help prevent unauthorized removal. The vent covers shall be made of fiberglass to allow installation and removal by two persons. With the lid off, the 37" diameter vent shall readily accept installation of common industrial fans for forced ventilation. To deter subversive damage, the screen clamping system is only accessible with the vent lid removed. All brackets, connection points, wear points, hinges and fasteners, shall be AISI 316 stainless steel. Stainless steel to carbon steel welds shall be completed with E309 stainless steel or another approved electrode.

#### B. ROOF GUARDRAIL

Roof guardrails shall be provided at the entire perimeter of the roof edge except the stairway platform opening. Size of posts and rails and the height of the guardrail assemblies shall comply with applicable state and federal regulations and AWWA D100. All guardrail and components shall be hot dip galvanized.

Guardrails shall be steel with a top rail, mid rail(s), and vertical posts. Spacing between vertical posts shall match existing and shall be spaced a maximum of 7'-0" apart. Guardrail shall include a 4" x 1/4" toeboard. The toeboards shall be provided with bolted attachment to allow removal for painting and maintenance. The Contractor shall notify the Owner's Representative for final inspection.

The guardrail opening at the stairway platform shall be protected with a self-closing safety gate such as Fabenco XL71-36 or equal. The gate shall provide a minimum of 22" of vertical coverage, be fabricated from A36 steel with stainless steel spring and shall be hot dip galvanized.

#### C. DOUBLE STRINGER STAIRWAY

Provide a spiral stairway that meets OSHA requirements. The double stringer stairway design shall eliminate unwelded inaccessible areas. The treads shall bolt to inner and outer stringers. Brackets and gussets shall clear all shell joints pursuant to AWWA D100 requirements. Treads shall be the bar grating type. Treads shall be 30" wide. Maximum riser per step shall be 8". Guardrailing and separate handrailing are required. All parts shall be hot dip galvanized for optimum corrosion resistance. The lower xx of the stairway shall have a climb resistant "cage". The entrance to the stairway shall include a lockable security gate.

D. LEVEL INDICATOR WITH STILLING WELL

The Contractor shall provide a target type liquid level indicator. The indicator board shall be a one-piece extruded 6" aluminum channel (existing aluminum channel may be re-used but w/ new indicator tape). A bolt together board will not be acceptable. The indicator tape shall be pre-printed solid vinyl. Painted markings are not acceptable. The level pointer "target" shall be made from 3/16" galvanized steel. The target shall be balanced to eliminate binding during target movement. The internal hollow float shall be made of heavy gauge stainless steel. The float shall be contained within a pvc stilling well that runs from 6" above the top of the overflow to 2" above the top of the tank bottom. The stilling well shall be attached at a minimum of two points to the tank shell using stainless steel clamps. The stainless clamps shall be painted and electrically isolated from the shell. Shell attachments shall be carbon steel flat bar or angle with a minimum size of 3/8" x 2". All parts, including cable conduits, tensioners, and bottom anchors, shall be made of corrosion resistant materials. The level gage shall be full length.

E. SQUARE ROOF HATCH

Provide a 39" square hinged roof hatch to comply with requirements of OSHA and AWWA D100 for fixed ladders. Stainless steel hinges and latches are required to protect inaccessible wear points. The internal ladder shall extend to, and be welded to, the inside of the roof hatch curb.

F. TANK NAME PLATE (REPLACEMENT ROOF)

The tank shall be provided with an additional new stainless steel name plate located over the manway designated by the owner's representative. At a minimum, the following information shall be engraved into the name plate in letters and numerals not less than 5/32 inch high:

1. Design Standard and date ref. "ROOF REPLACEMENT"
2. The year the tank roof was completed
3. Nominal height (feet and inches), EXISTING NAME PLATE SHOW 40' WHICH IS INCORRECT
4. Nominal diameter (feet and inches)
5. Design maximum operating level (feet and inches) for required freeboard.
6. Nominal capacity (gallons)
7. Fabricator and Erector

G. SPARE ROOF COUPLINGS

1. Install two extra heavy half couplings with plugs in the roof adjacent to the new roof hatch (location per owner representative).

H. WELDED PATCHES

### **PART 3 - EXECUTION**

#### **3.01 REMOVE EXISTING APPURTENANCES**

- A. Remove the existing exterior ladder.

#### **3.02 REMOVE EXISTING CATHODIC PROTECTION SYSTEM**

- A. Remove all cathodic protection system components including all on-tank items such as conduit, wiring and anodes
- B. Remove all CP related items including the post adjacent to the tank and the mounted rectifier cabinet.
- C. Trace primary power back to the nearest junction box and pull existing wires out of the conduit between the junction box and the tank.
- D. Cap and abandon underground conduit in place.
- E. All work shall be done by a qualified person with a minimum qualification of a California licensed electrician pursuant to regulatory requirements.

#### **3.03 GENERAL FABRICATION AND WELDING**

- A. All corners and edges that are exposed upon completion of fabrication shall be finished to a minimum radius of 1/16" to optimize coating application. Finishing with grinding wheels may produce "hard" corners which are not acceptable. Grinders equipped with "soft pads" or sanding discs on rubber backing are often necessary to produce acceptable finishes without corners and edges.

#### **3.04 WELD PROFILES AND FINISHING**

- A. All weld spatter shall be removed prior to coating. Abrasive blasting is not reliable for removal of all weld spatter, so all weld spatter shall be removed as part of tank erection and prior to the start of abrasive blasting.
- B. Removal of Temporary Attachments
  - 1. All temporary and unnecessary brackets, lugs, and clips (such as those used during erection) shall be removed from the tank. Pits created during removal shall be repaired with consideration of minimum weld length and accepted welding procedures. Welded repairs shall be ground flush. Removal of temporary attachments shall be by grinding followed by sanding to smooth course grinding marks (deeper than 4 mils as measured with profile tape) and radius any angular transitions.

#### **3.05 QUALITY**

- A. Shop and field welding quality control shall be the responsibility of the Contractor. Weld quality assurance inspection will be provided by the Owner's Representative. Safe access and lighting are an important aspect of producing a quality product for both the contractor personnel and quality assurance personnel. Safe access, lighting, and assistance shall be provided by the Contractor for the Owner's Representative(s) using the Contractor's rigging and equipment to allow inspection or observation of all work. This shall be provided by the Contractor at no additional cost.
  
- B. The intent of nondestructive testing on this project is to confirm that welds meet the specified minimum requirements. Testing will be done by sampling welds of the most questionable quality, those under higher stress, or by random selection.

END OF SECTION

Section 13020

## REPLACE WATER TANK ROOF

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Replace corroded existing roof with a new fully seal welded formed panel roof for an existing flat-bottom welded steel potable water storage tank.

#### 1.02 SCOPE

- A. The Contractor shall remove and recycle the existing roof and roof structure
- B. The Contractor shall provide a new roof and structure. The new roof shall be a formed structural roof panel system with exterior structure. The roof shall be fully seal welded on the interior and exterior. The tank roof and completed tank system shall be suitable to provide potable water storage and emergency (including post-earthquake fire suppression) service.
- C. The Contractor shall design, fabricate, coat and erect all aspects of the tank roof structure system, including the foundation (center column base plates), pursuant to AWWA D100-21 (including Section 13 for seismic design, CBC 2022, California Department of Public Health Drinking Water Statutes, and all other applicable rules and regulations). NSF/ANSI 61 (Standard for Drinking Water System Components) shall apply.
- D. All contractor design calculations and drawings shall be stamped by a registered Professional Civil or Structural Engineer with design experience on over 50 similar welded steel tanks.
- E. The Contractor may install a temporary shell opening “door sheet” (at their option) for improved access. The temporary door sheet shall conform to AWWA D100 and API 653 (latest). See Part 3, Execution-Quality for special radiographic testing requirements.

#### 1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01100, Scope and Control of the Work
- B. Section 01205, Measurement and Payment
- C. Section 13010, Upgrades to the Existing Tank
- D. Section 09800, Protective Coatings

#### 1.04 REFERENCES

The latest edition of standards and regulations herein form a part of this specification. Design details, repair methods, fabrication, erection, and all other aspects of the work and inspections shall conform to following codes and standards:

- A. AMERICAN WATER WORKS ASSOCIATION (AWWA)



1. AWWA D100-21, AWWA Standard- Welded Carbon Steel Tanks for Water Storage
2. AWWA C652-19, AWWA Disinfection of Water-Storage Facilities
- B. CALIFORNIA BUILDING STANDARDS COMMISSION (CBSC)
  1. CBC 2022, California Building Code
- C. NATIONAL ASSOCIATION OF CORROSION ENGINEERS (NACE)
  1. Standard RP0178-91, Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service
- D. ASTM INTERNATIONAL
  1. ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- E. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
  1. ASCE/SEI 7, Minimum Design Loads for Buildings and Other Structures
- F. AMERICAN PETROLEUM INSTITUTE (API)
  1. API 653-Latest, Tank Inspection, Repair, Alteration and Reconstruction
- G. AMERICAN WELDING SOCIETY (AWS)
  1. AWS D1.1:2010 Structural Welding Code - Steel
- H. NATIONAL SANITATION FOUNDATION (NSF)
  1. NSF 61, Drinking Water System Components - Health Effects

#### 1.05 DEFINITIONS

- A. Roof Structure: For the purposes of this project, roof structure includes all portions of the roof plate and roof support system between the existing shell and the tank bottom. This includes rafter attachments at the shell, roof plate with integral (formed) rafters, rafter bracing, center support, center column and base plate(s).

#### 1.06 SUBMITTALS

- A. Engineering calculations. These will show the structural adequacy of all significant design items on the roof structure including but not limited to support of the roof plate considering its existing thickness, "rafter" sizing, center support, column(s) and base plate(s). The Contractor shall provide additional design calculations to show structural adequacy of additional structural items where structural loads are specified by applicable regulations or industry standards. The design calculations and detailed drawings shall be signed and stamped by a Civil or Structural Engineer licensed to practice in the state.
- B. Drawings and supplemental information. These will include: dimensional drawings (indicating size and thickness of all members), attachment details, fabrication details, testing and inspection requirements and all details of welded joints. Weld joint details shall

include size, joint preparation, identification of field welds and indication of welds requiring low hydrogen procedures.

- C. Welding Procedures (including method for determining flare-groove weld size).
- D. Welder Certifications
- E. Mill Test Reports (including columns, roof plate/"rafters", base plates)
- F. Temporary door sheet design and details drawings (if Contractor selects to use door sheet(s)).

#### 1.07 DESIGN INFORMATION

- A. Diameter: Approximately 40'-0". Dimension shall be confirmed by the Contractor
- B. Shell Height: Approximately 32'-0". Dimensions shall be confirmed by the Contractor (40FT DIMENSION SHOWN ON EXISTING NAME PLATE IS KNOWN TO BE INCORRECT).
- C. The center base plates shall be designed pursuant to 900 psf net allowable soil bearing pressure (in addition to the weight of water).
- D. Roof Type: cone
- E. Roof Structure:
  - 1. The roof shall be a "single bay" design.
  - 2. Roof structure shall be integrally formed with roof plate. The structural sections shall be on the topside of the roof.
  - 3. The roof design shall use a center support that allows access to all areas of the structure for seal welding, coating and inspection.
  - 4. The minimum thickness of the roof shall be 1/4".
  - 5. The lowest column base plate shall be a minimum of 3/4 inch thick. The column shall have "end plates" that are retained laterally but shall be a "floating design" (not welded to the tank bottom).
  - 6. Lowest column base plate(s) shall be welded to the bottom but shall have a floating upper plate.
  - 7. All nuts and bolts in the roof structure shall be hot dip galvanized.
- F. Roof live load: 20 psf
- G. Roof plate minimum thickness: 1/4"
- H. Roof slope: 1" in 12"
- I. Seismic
  - 1. Per ASCE/SEI 7-22

2. Risk Category: IV
  3. Mechanically Anchored: Yes (existing)
  4. Calculate the required freeboard and new maximum operating level. See Paint section for labeling exterior shell at the level gauge and upgrades for new nameplate.
- J. Temporary door sheet: If used, door sheet design shall conform to API 653.

## **PART 2 - PRODUCTS**

### 2.01 BASE PLATES

- A. Plate shall conform to the design requirements of AWWA D100 and ASTM A36

### 2.02 STRUCTURAL SHAPES

A. COLUMN(S)

Columns shall be round tubular with minimum thickness of  $\frac{1}{4}$ ". Pipe shall conform to the design requirements of AWWA D100 and ASTM A53.

B. RAFTERS

Integral rafters – See plate and sheet.

### 2.03 PLATE AND SHEET

- A. Plate and sheet materials shall conform to the design requirements of AWWA D100.

## **PART 3 - EXECUTION**

### 3.01 NEW FORMED PANEL ROOF

A. Removal of Existing Roof and Structure

1. All connections between the existing roof plate and structure and the tank shall be removed with care to preserve and protect the compression ring, shell, and tank bottom. The roof plate connection weld at the compression ring (horizontally oriented flat bar at the top of the shell) shall be ground flush. The top corners of the compression ring shall be radiused ( $\frac{1}{16}$ " ) as specified in "General Fabrication and Welding - Finishing Corners and Edges".
2. The existing compression ring flat bar is known to not be sloped to match the roof pitch. The flat bar slope shall be adjusted using a procedure that preserves the roundness of the shell. An example procedure would be to cut the compression ring radially at an appropriate spacing (approximately 15'), form (bend) downward to match the roof slope and re-weld the butt joints. The finished condition shall eliminate ponding and provide an acceptable fit-up on the interior side of the shell to roof joint.
3. Existing rafter - shell connection brackets ("clips") shall be cut off and remaining welds shall be ground flush.
4. Existing base plates shall be cut off and remaining welds shall be ground flush.

5. Pits created during removal shall be repaired with consideration of minimum weld length and accepted welding procedures. Welded repairs shall be ground flush. Removal of temporary attachments shall be by grinding followed by sanding in order to smooth course grinding marks (deeper than 4 mils as measured with profile tape) and radius any angular transitions.
- B. The new roof and structure shall be installed pursuant to the Contractor's design drawings and all joints or inaccessible areas on the interior and exterior shall be fully seal welded.
- C. Flare bevel and other groove welds shall be completed pursuant to specific welding procedures that allow and assure completion and verification of the design weld size. Minimum parameters required for design weld sizes shall be specified.

### 3.02 QUALITY

- A. Shop and field welding quality control shall be the responsibility of the Contractor. Quality assurance inspection oversight and CBC required special inspection will be provided by the Owner's Representative. To help insure effective and efficient oversight, the Owner's quality assurance shall be conducted by or under the oversight of an experienced tank design engineer with minimum qualifications of a California PE Registration and AWS Certified Welding Inspector. Safe access and lighting are an important aspect of producing a quality product for both the contractor personnel and quality assurance personnel. Safe access, lighting, and assistance shall be provided by the Contractor for the Owner's Representative(s) using the Contractor's rigging and equipment to allow inspection or observation of all work. This shall be provided by the Contractor at no additional cost. The Contractor shall provide written notification to the Owner's Representative at least 48 hours in advance of the start or re-start of each work phase.
- B. Radiographic testing and other AWWA D100 required nondestructive testing shall be provided at the expense of the Contractor. The intent of nondestructive testing on this project is to confirm that welds meet the specified minimum requirements. Radiography shall be conducted pursuant to the requirements of AWWA D100 with the following changes: 100% of all the vertical and horizontal shell welds used to replace the door sheet shall be radiographed. The quantity of locations for radiography in other locations shall be increased by adding one additional location on each of the vertical joints in the lowest two shell rings; the locations for all radiographic testing shall be selected by the Owner's Representative. For each weld where quality is found to be unacceptable, the AWWA D100 procedure will be followed regarding additional locations and two supplementary radiographs shall be taken at locations selected by the owner's representative (in addition to the "tracer" locations required by AWWA D100). A copy of the radiographic inspection report shall be provided to the Owner's Representative.

### 3.03 GENERAL FABRICATION AND WELDING

- A. Finishing of Corners and Edges

All corners and edges that are exposed upon completion of fabrication shall be finished to a minimum radius of 1/16" to optimize coating application. Finishing with grinding wheels may produce "hard" corners which are not acceptable. The Contractor shall use grinders equipped with "soft pads" or sanding discs on rubber backing where required to produce acceptable finishes and rounding of corners and edges.

B. Weld Profiles and Finishing

The maximum weld reinforcement allowed by AWWA D100 shall be reduced by 1/32" for all butt joints on this project. Weld reinforcement shall transition to the base metal in a manner that minimizes the mechanical notch at the toe of the weld. The maximum angle between the weld reinforcement and the adjoining base metal shall be 45 degrees. Welds with a less gradual transition shall be repaired by grinding followed by sanding to smooth course grinding marks (deeper than 4 mils as measured with profile tape) and radius any angular transitions.

All weld spatter shall be removed prior to coating. Abrasive blasting is not reliable for removal of all weld spatter so all weld spatter shall be removed as a part of tank erection and prior to the start of abrasive blasting.

C. Removal of Temporary Attachments

All temporary and unnecessary brackets, lugs, and clips, such as those used during erection, shall be removed from the tank. Pits created during removal shall be repaired with consideration of minimum weld length and accepted welding procedures. Welded repairs shall be ground flush. Removal of temporary attachments shall be by grinding followed by sanding in order to smooth course grinding marks (deeper than 4 mils as measured with profile tape) and radius any angular transitions.

3.04 DOOR SHEET

A. If the Contractor chooses to use a door sheet (temporary shell opening), the removal and installation shall be pursuant to API 653 and the following:

1. All welding shall be with low hydrogen processes.
2. Plate edges shall be built up with low hydrogen electrode to replace material lost in the kerf of the cut during the removal of the door sheet. This must be done prior to beveling. The purpose is to help prevent a flat spot in the shell upon replacement.
3. See Quality section for special radiography requirements.

**END OF SECTION**

# **PART IV**

## **APPENDICES**

# **APPENDIX A**

## **COATINGS HEAVY METALS TESTING**



**Asbestos Inspections of SLO**

www.sloasbestos.com

### METALS IN COATING SURVEY REPORT



**Oceano Community Services District Tank Farm**

**1935 19<sup>th</sup> Street**

**Oceano, CA 93445**

**May 3, 2023**

Prepared by:

Mike Bruffey  
Asbestos Inspections SLO  
9517 Carmel Road  
Atascadero, CA 93422  
Phone: (805) 235-0582

Prepared for:

William Bellis  
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May 3, 2023

William Bellis  
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6661 Fern Canyon Road  
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(805) 748-6726 | wbellis.ats@gmail.com

Re: Metals in Small Water Tank Coating Report Summary  
1935 19<sup>th</sup> Street, Oceano, CA 93445

I have completed the requested coating sampling survey on the small water tank located in the Oceano Community Services District water tank farm. The smaller of the two water tanks are scheduled for maintenance to repair corroded portions prior to recoating. The paint/coating is in poor condition and several areas with severe corrosion were noted.

This survey on April 26, 2023, involved sampling, cataloging, and analyzing coatings collected from the number 1 tank ring and the top to test for the presence of lead, chromium, and cadmium by ICP (inductively coupled plasma) laboratory analysis. Two samples were obtained: one from the north side ring and one from the top section. Relatively low levels of all three metals were detected in both samples. Results can be found in the Summary of Lab Results section of this report.

AISLO appreciates the opportunity to perform these services for you and look forward to working with you on future projects. If you have any questions or comments regarding the information contained in this report or I can be of further assistance, please contact me by phone or email.

Sincerely,

Mike Bruffey  
Owner  
Asbestos Inspections SLO - AISLO  
CDPH Certified Lead Inspector Assessor – LRC-00003723

9517 Carmel Road, Atascadero, CA 93422 – (805) 235-0582 – bruffey@att.net

## PURPOSE AND SCOPE OF SERVICES

This survey and inspection involved collecting a limited number of paint/coating samples in various locations for lead, chromium, and cadmium content. The following is a detailed description of the work performed at this location.

1. For each sample, the following information was documented:
  - a) Sample Location
  - b) Sample Description
  - c) Condition of Material
  
2. Submission of samples to an EPA accredited lab for analysis that provides a report containing:
  - a) Sample identification number (AISLO)
  - b) Laboratory sample identification number
  - c) Analytical technique
  - d) Quality control procedures
  - e) The amount of Pb, Cr, and Cd in weight percent (mg/kg)
  
3. Analyze the laboratory sample results and produce a comprehensive written report that includes:
  - Applicable Definitions
  - Summary Report of Analysis
  - Conclusions and Recommendations
  - Limitations and Disclaimers
  - Metals Analysis of Paints – Laboratory Report
  - Analysis Request Form - Chain of Custody
  - Credentials – Inspector

## APPLICABLE DEFINITIONS

**Abatement** – any set of measures designed to reduce or eliminate lead hazards or lead-based paint for public and residential buildings but does not include containment or cleaning.

**Component** – a structural element or fixture, such as a wall, floor, ceiling, door, window, molding, trim, railing, cabinet, gutter, or downspout.

**Deteriorated Lead-Based Paint** – lead-based paint or presumed LBP that is cracking, chalking, flaking, chipping, peeling, non-intact, failed or otherwise separating from a component.

**Lead-Based Paint** – paint or other surface coatings that contain an amount of lead equal to or in excess of:

- (a) one milligram per square centimeter (1.0 mg/cm<sup>2</sup>)
- (b) half of one percent (.5%) by weight (5000 parts per million (ppm))

**Lead Hazard** – deteriorated lead-based paint, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or presumed lead-based paint without containment, or any other nuisance which may result in persistent and quantifiable lead exposure.

**Lead-Related Construction Work** – any construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation, and cleanup, that, by using or disturbing lead-containing material or soil, may result in significant exposure of adults or children to lead.

**Presumed Lead-Based Paint** – paint or surface coating affixed to a component in or on a structure constructed prior to January 1, 1978.

**Renovation, Repair and Painting Rule (RRP)** – requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in homes, child care facilities and pre-schools built before 1978 have their firm certified by EPA, use certified renovators who are trained by EPA-approved training providers and follow lead-safe work practices.

## SUMMARY OF LAB RESULTS – CADMIUM, CHROMIUM, AND LEAD

A total of 2 samples were collected, documented, and sent to SGS Forensic Laboratories in Carson, CA to be analyzed for metals content using Method Reference EPA 3050B/6010B.

Sample#	Location	Description	Metal Content PPM
OCSD-1	Ring #1	Multi-layer coating - CADMIUM	6
OCSD-1	Ring #1	Multi-layer coating - CHROMIUM	26
OCSD-1	Ring #1	Multi-layer coating - LEAD	46
OCSD-2	Top of Tank	Multi-layer coating - CADMIUM	60
OCSD-2	Top of Tank	Multi-layer coating - CHROMIUM	18
OCSD-2	Top of Tank	Multi-layer coating - LEAD	410

As a comparison (for lead only), the EPA and CDPH consider a material to be lead-based paint when it exceeds .5% or 5,000 ppm. In addition, the Consumer Product Safety Commission (CPSC) set a limit of .009% or 90 ppm of lead in paint for children’s toys and Cal/OSHA regulates workers who disturb lead coated surfaces at any detectable lead level.

## CONCLUSIONS AND RECOMMENDATIONS

**Low levels of cadmium, chromium, and lead were detected in both samples analyzed by the lab.** The paint/coating was in poor condition and no lead hazards were noted. I recommend any contractor conducting work which will disturb painted surfaces receive proper notification of the metals content of the paint/coating surfaces prior to demolition or any activity which will disturb the material. All lead related work should be conducted in compliance with the Cal/OSHA (Title 8, Section 1532.1) and EPA regulations.

Precautions should also be taken even though low levels of cadmium and chromium were detected in the coating. For contractors removing any coatings, the PEL for cadmium and chromium ( $5 \mu\text{g}/\text{m}^3$ ), calculated as an eight-hour time-weighted average exposure (TWA) should not be exceeded. All work should be conducted in compliance with the Cal/OSHA (Title 8, Section 1532 and 1532.2 and EPA regulations. These sections can be found at <https://www.dir.ca.gov/title8/1532.html> and [https://www.dir.ca.gov/title8/1532\\_2.html](https://www.dir.ca.gov/title8/1532_2.html) Additional information about chromium can be found at <https://www.osha.gov/hexavalent-chromium>

## **LIMITATIONS AND DISCLAIMERS**

The findings and conclusions rendered in this report are opinions based on the scope of work authorized by the client and laboratory analysis of the tank surface coatings during this inspection. This report does not reflect variations which may exist between sampling points. These variations cannot be anticipated, nor could they be entirely accounted for, despite exhaustive additional testing. My work has been performed in accordance with generally accepted practices in the field of lead consultation.

Enclosed with this report are the following documents:

**Metals Analysis of Paints (Laboratory Report)**  
**Analysis Request Form (Chain of Custody)**  
**Credentials – Inspector**

# Metals Analysis of Bulks - TTLC

(AIHA-LAP, LLC Accreditation, Lab ID #101629)

Asbestos Inspections of SLO  
Mike Bruffey  
9517 Carmel Road

Atascadero, CA 93422

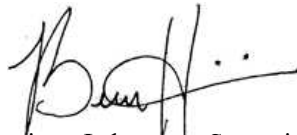
**Client ID:** L1985  
**Report Number:** M250250  
**Date Received:** 04/27/23  
**Date Analyzed:** 05/02/23  
**Date Printed:** 05/02/23  
**First Reported:** 05/02/23

**Job ID / Site:** Oceano Com. Service District Water Tank; 1935 19th Street, Oceano, Ca  
**Date(s) Collected:** 04/26/2023

**SGSFL Job ID:** L1985  
**Total Samples Submitted:** 2  
**Total Samples Analyzed:** 2

Sample Number	Lab Number	Analyte	Result	Result Units	Reporting Limit*	Method Reference
OCSD-1	LM248654	Cd	6	mg/kg	2	EPA 3050B/6010B
		Cr	26	mg/kg	2	EPA 3050B/6010B
		Pb	46	mg/kg	3	EPA 3050B/6010B
OCSD-2	LM248655	Cd	60	mg/kg	3	EPA 3050B/6010B
		Cr	18	mg/kg	2	EPA 3050B/6010B
		Pb	410	mg/kg	3	EPA 3050B/6010B

\* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.



Beatriz Hinojosa, Laboratory Supervisor, Carson Laboratory

Analytical results and reports are generated by SGS Forensic Laboratories at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by SGS Forensic Laboratories to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by SGS Forensic Laboratories. The client is solely responsible for the use and interpretation of test results and reports requested from SGS Forensic Laboratories. SGS Forensic Laboratories is not able to assess the degree of hazard resulting from materials analyzed. SGS Forensic Laboratories reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Any modifications that have been made to referenced test methods are documented in SGS Forensic Laboratories' Standard Operating Procedures Manual. Sample results have not been blank corrected. Quality control and sample receipt condition were acceptable unless otherwise noted.

Note\* Sampling data used in this report was provided by the client as noted on the associated chain of custody form.

Client Name & Address: Asbestos Inspections of SLO 9517 Carmel Road Atascadero, CA 93422		Client No.: L1985	PO / Job#:	Date: 4-26-23
Contact: Mike Bruffey		Phone: (805) 235-0582	Turn Around Time: Same Day / 1Day / 2Day / <del>3Day</del> / 4Day / 5Day	
E-mail: bruffey@att.net		<input type="checkbox"/> PCM: <input type="checkbox"/> NIOSH 7400A / <input type="checkbox"/> NIOSH 7400B <input type="checkbox"/> Rotometer <input type="checkbox"/> PLM: <input type="checkbox"/> Standard / <input type="checkbox"/> Point Count 400 - 1000 / <input type="checkbox"/> CARB 435		
Site Name: Oceano Com. Service District Water Tank		<input type="checkbox"/> TEM Air: <input type="checkbox"/> AHERA / <input type="checkbox"/> Yamate2 / <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> TEM Bulk: <input type="checkbox"/> Quantitative / <input type="checkbox"/> Qualitative / <input type="checkbox"/> Chatfield <input type="checkbox"/> TEM Water: <input type="checkbox"/> Potable / <input type="checkbox"/> Non-Potable / <input type="checkbox"/> Weight % <input type="checkbox"/> TEM Microvac: <input type="checkbox"/> Qual / <input type="checkbox"/> D5755(str/area) / <input type="checkbox"/> D5756(str/mass)		
Site Location: 1935 19th Street, Oceano, CA		<input type="checkbox"/> IAQ Particle Identification (PLM LAB) <input type="checkbox"/> PLM Opaques/Soot <input type="checkbox"/> Particle Identification (TEM LAB) <input type="checkbox"/> Special Project <input checked="" type="checkbox"/> Metals Analysis Matrix: Paint Method: ICP Analytes: LEAD & CHROMIUM & CADMIUM		
Comments: Email results to: bruffey@att.net			<input type="checkbox"/> Silica in Air <input type="checkbox"/> w/Gravimetry <input type="checkbox"/> Quartz Only	

Sample ID	Date / Time	Sample Location / Description	FOR AIR SAMPLES ONLY				Sample Area / Air Volume
			Type	Time On/Off	Avg LPM	Total Time	
OCSD-1	4-26-23 7:30	North side Ring 1/Blue/green/beige paint	A P C				
OCSD-2	↓	Tank Top/Blue/green paint	A P C				
			A P C				
			A P C				
			A P C				
			A P C				
			A P C				
			A P C				
			A P C				
			A P C				
			A P C				

Sampled By: Mike Bruffey	Date/Time: 4-26-23	Shipped Via: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> US Mail <input type="checkbox"/> Courier <input type="checkbox"/> Drop Off <input type="checkbox"/> Other:
Relinquished By: Mike Bruffey <i>MB</i>	Date / Time: 4-26-23 @ 2:30	Relinquished By:
Received By: <i>Jaime Contreras</i>	Date / Time: 4-27-23 / 9:25 AM	Received By:
Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No	Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No	Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No

SGS Forensic Laboratories may subcontract client samples to other SGSFL locations to meet client requests.  
 San Francisco Office: 3777 Depot Road, Suite 409, Hayward, CA 94545-2761 • Phone: 510/887-8828 • 800/827-3274  
 Los Angeles Office: 20535 South Belshaw Ave., Carson, CA 90746 • Phone: 310/763-2374 • 888/813-9417  
 Las Vegas Office: 6765 S. Eastern Avenue, Suite 3, Las Vegas, NV 89119 • Phone: 702/784-0040





# LEAD-RELATED CONSTRUCTION CERTIFICATE

**INDIVIDUAL:**



**Michael Bruffey**

**CERTIFICATE TYPE:**

Lead Inspector/Assessor

**NUMBER:**

LRC-00003723

**EXPIRATION DATE:**

12/19/2023

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at [www.cdph.ca.gov/programs/clppb](http://www.cdph.ca.gov/programs/clppb) or calling (800) 597-LEAD

## **APPENDIX B**

### **PROJECT DRAWINGS**

# OCEANO COMMUNITY SERVICES DISTRICT PLANS FOR THE CONSTRUCTION OF THE WATER STORAGE TANK REHABILITATION PROJECT



## DRAWING TABLE OF CONTENTS

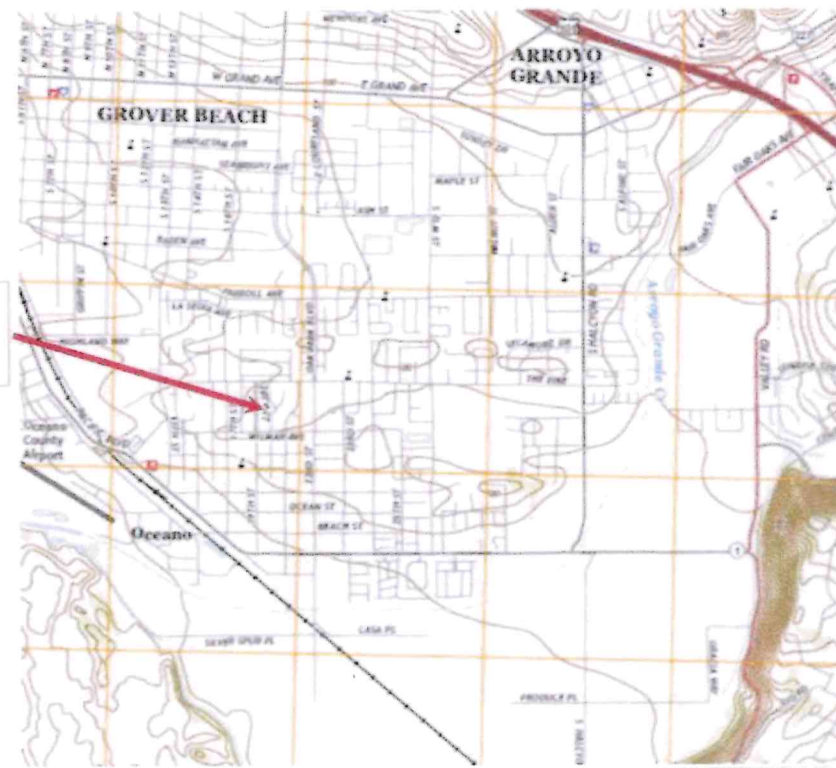
1. COVER SHEET
2. VICINITY AND LOCATION MAPS
3. NOTES
4. NOTES
5. TANK PLAN
6. ROOF STRUCTURE
7. ROOF VENT AND ROOF HATCH DETAILS
8. SPIRAL STAIRS
9. STAIR CAGE





ADVANTAGE TECHNICAL SERVICES, INC.  
805-595-2282  
ATS-SLO.COM



PROJECT SITE



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REVISIONS	DATE	 <b>ADVANTAGE TECHNICAL SERVICES, INC</b> 805-595-2282 ATS-SLO.COM	DESIGNED BY:	DRAWN BY:	CHECKED BY:	RECOMMENDED:		OCEANO COMMUNITY SERVICES DISTRICT WATER STORAGE TANK REHABILITATION	SHEET:
	00/00/00		WB	DC	JB	<i>Tony Marraccino</i> TONY MARRACCINO - UTILITY SYSTEMS MANAGER		VICINITY AND LOCATION MAPS	2 OF 9
			PREPARED UNDER THE DIRECTION OF:		7/28/2023	APPROVED:			SCALE:
			<i>William Bellis</i> WILLIAM BELLIS P.E.		DATE	<i>Will Clemens</i> WILL CLEMENS - GENERAL MANAGER			VARIES





# ASCE 7 Hazards Report

Address:  
Oceano  
California,

Standard: ASCE/SEI 7-22  
Risk Category: IV  
Soil Class: Default  
Latitude: 35.09884  
Longitude: -120.61248  
Elevation: 22.58911449253668 ft (NAVD 88)

Seismic Default

### Site Soil Class:

#### Results:

PGA <sub>M</sub> :	0.54	T <sub>L</sub> :	8
S <sub>MS</sub> :	1.37	S <sub>S</sub> :	1.15
S <sub>M1</sub> :	0.93	S <sub>1</sub> :	0.37
S <sub>DS</sub> :	0.92	V <sub>S30</sub> :	260
S <sub>D1</sub> :	0.62		

Seismic Design Category: D

### STATEMENT OF SPECIAL INSPECTIONS

THE OWNER SHALL EMPLOY THE SERVICES OF A REGISTERED PROFESSIONAL ENGINEER TO PROVIDE STRUCTURAL OBSERVATIONS AS DEFINED IN SECTION 1702 OF THE CALIFORNIA BUILDING CODE. THE STRUCTURAL OBSERVER SHALL PROVIDE OBSERVATION OF ERECTION PRACTICES DURING THE FOLLOWING PROCESSES:

- FIELD WELDING OF WELDING - TWO SITE VISITS MINIMUM

### SCHEDULE OF INSPECTION, TESTING AGENCIES AND INSPECTORS

THE FOLLOWING ARE THE TESTING AGENCIES AND SPECIAL INSPECTORS THAT WILL BE RETAINED TO CONDUCT TESTS AND INSPECTIONS ON THIS PROJECT:

SPECIAL INSPECTION FOR WELDING  
ADVANTAGE TECHNICAL SERVICES, INC  
6661 FERN CANYON RD.  
SAN LUIS OBISPO, CA



COUNTY OF SAN LUIS OBISPO  
DEPARTMENT OF PLANNING & BUILDING  
Statement Of Required Special Inspections

BLD-1032  
08/02/2019

The Statement Of Required Special Inspections *imprinted on the plan sheet shall be unique to the specific project identifying only the inspections as required.*

Project Address: 1935 Wilmar (physically on 19th st.) Permit No.:

Notation Used In Table:

Column headers:

- C Indicates continuous inspection is required.
- P Indicates periodic inspections are required. The notes and or contract documents should clarify.

Notes Applicable standards as referenced from the California Building Code

Box entries:

- X Is placed in the appropriate column to denote either "C" continuous or "P" periodic inspections.
- Denotes an activity that is either a one-time activity or one whose frequency is defined in some other manner.
- Selection box of required special inspections identified with an X by design professional.

Additional detail regarding inspections and tests are provided in the project specification or notes on the drawings.

Verification and Inspection	C	P	Notes
<input checked="" type="checkbox"/> 1704.2.5 - Inspect fabricator's fabrication and quality control procedures.			
<input type="checkbox"/> 1704.2.5.1 - Certificate of Compliance from Approved Fabricator			

### Statement Of Required Special Inspections

Verification and Inspection	C	P	Notes
<input type="checkbox"/> 1) Complete penetration groove welds 5/16" or greater in risk category III or IV.		---	UT on 100%, may reduce to 25% per AISC 360, N5e
<input type="checkbox"/> 2) Complete penetration groove welds 5/16" or greater in risk category II.		---	UT on 10%, may increase to 100% per AISC 360, N5f
<input type="checkbox"/> 3) Thermally cut surfaces of access holes when material t > 2".		---	
<input type="checkbox"/> 4) Welded joints subject to fatigue when required by AISC 360, Appendix 3, Table A-3.1.		---	
<input type="checkbox"/> 5) Fabricator's NDT reports when fabricator performs NDT.		---	AISC 360, N5d
<input type="checkbox"/> 5. Structural steel bolting:			
<input type="checkbox"/> a. Inspection tasks Prior to Bolting (Observe, or perform tasks for each bolted connection in accordance with QA tasks listed in AISC 360, Table N5.6-1.)		---	
<input type="checkbox"/> b. Inspection tasks During Bolting (Observe the QA tasks listed in AISC 360, Table N5.6-2.)		---	
<input type="checkbox"/> c. Inspection tasks After Bolting (Perform tasks for each bolted connection in accordance with QA tasks listed in AISC 360, Table N5.6-3.)		---	
<input type="checkbox"/> 6. Inspection of steel elements of composite construction prior to concrete placement in accordance with QA tasks listed in AISC 360, Table N6.1.		---	

### Statement Of Required Special Inspections

BLD-1032  
08/02/2019

Verification and Inspection	C	P	Notes
<input checked="" type="checkbox"/> Table 1705.2 - Structural Steel (AISC 360 and AISC 341)			
<input checked="" type="checkbox"/> 1. Fabricator and erector documents (Verify reports and certificates as listed in AISC, chapter N, paragraph N, paragraph 3.2 for compliance with construction documents.)			
<input checked="" type="checkbox"/> 2. Material verification of structural steel.		X	
<input checked="" type="checkbox"/> 3. Verify member locations, braces, stiffeners, and application of joint details at each connection comply with construction documents.		X	
<input checked="" type="checkbox"/> 4. Structural steel welding:			
<input type="checkbox"/> a. Inspection tasks Prior to Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-1.)		---	
<input checked="" type="checkbox"/> b. Inspection tasks During Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-2.)		---	
<input checked="" type="checkbox"/> c. Inspection tasks After Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-3.)		---	
<input type="checkbox"/> d. Nondestructive testing (NDT) of welded joints:			EXCEPTION: NDT of welds completed in an approved fabricator's shop. See AISC 360, N7

### Statement Of Required Special Inspections

Verification and Inspection	C	P	Notes
<input type="checkbox"/> Table 1705.2.2 - Verification of Steel Construction Other Than Structural Steel			
<input type="checkbox"/> 1. Material verification of cold-formed steel deck:			
<input type="checkbox"/> a. Identification markings to conform to ASTM standards specified in the approved construction documents.		X	Applicable ASTM material standards.
<input type="checkbox"/> b. Manufacturer's certified test reports.		X	
<input type="checkbox"/> 2. Inspection of welding:			
<input type="checkbox"/> a. Cold-formed steel deck:			
<input type="checkbox"/> 1) Floor and roof deck welds.		X	AWS D1.3
<input type="checkbox"/> b. Reinforcing steel:			
<input type="checkbox"/> 1) Verification of weldability of reinforcing steel other than ASTM A 706.		X	AWS D1.4, ACI 318: Section 3.5.2
<input type="checkbox"/> 2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.		X	AWS D1.4, ACI 318: Section 3.5.2
<input type="checkbox"/> 3) Shear reinforcement.		X	AWS D1.4, ACI 318: Section 3.5.2
<input type="checkbox"/> 4) Other reinforcing steel.		X	AWS D1.4, ACI 318: Section 3.5.2

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	00/00/00		WB	DC	JB				3 OF 9
ADVANTAGE TECHNICAL SERVICES, INC 805-595-2262 ATS-SLO.COM			PREPARED UNDER THE DIRECTION OF:	7/28/2023		APPROVED:		NOTES	SCALE:
			WILLIAM BELLIS P.E.	DATE		WILL CLEMENS - GENERAL MANAGER			VARIES



## SITE SAFETY AND ENVIRONMENTAL CONTROLS

## ABBREVIATIONS

### 1.01 Noise

- A. Noise generated from equipment operating overnight including generators, pumps and dehumidification shall not exceed 75 dB at all property lines.
- B. Construction activities shall be restricted to the hours of 7:00AM to 5:00PM Monday through Friday. No construction shall occur on Saturday or Sunday. On-site equipment maintenance and servicing shall be confined to the same hours.
- C. All construction equipment utilizing internal combustion engines shall be required to have mufflers that are in good condition and tuned according to the manufacture's recommendations. Stationary noise sources shall utilize noise reducing engine housing enclosures or noise screens.

### 1.02 OSHA Compliance.

- A. Contractor shall comply with all applicable regulations including state and federal OSHA and these Special Provisions.
- B. Contractor is responsible for complying with Cal/OSHA regulations for lead in construction in accordance with California Code of Regulations, California Title 8, Section 1532.1.
- C. The costs for complying with all OSHA requirements shall be considered as included in the various contract prices paid and no additional compensation will be allowed. Contractors are encouraged to take lead samples in advance by arrangement with the owner.

### 1.03 Housekeeping and Cleanup






- A. At the end of each work day, dust and abrasive shall be removed from the surfaces and surrounding areas. Spent abrasive shall be stored in temporary storage containers on site pursuant to Best Management Practices and Best Pollution Prevention Practices listed under federal and state guidelines.
- B. The site shall be maintained free of unnecessary accumulations of tools, equipment, surplus materials, and debris. Equipment maintenance and spill prevention procedures shall be adequate to prevent spills and leaks.
- C. Upon completion of the work, the Contractor shall remove all excess materials, equipment, containers, and waste from the job site. Coating spots or stains shall be removed from adjacent surfaces and surfaces repaired if needed. As work proceeds, promptly remove all coating that is spilled, splashed, or splattered. Collect empty containers, rags, waste material, and debris and store or remove from the site as appropriate.

### 1.04 Access, Containment and Protection

- A. The Contractor shall provide scaffolding or other access and fall protection anchors to allow safe access for Contractor personnel, inspection personnel and others as appropriate
- B. The tank is situated near residences. All surface drains and swales lead directly onto the adjacent land, or to creeks and the ocean. Contractor shall protect all work sites and all drainage inlets from pollutants and illegal discharges.
- C. The work will be conducted in and around operational equipment and adjacent to residences. The Contractor shall provide containment or mitigation of air-borne dust, overspray and other contaminants to protect the existing equipment, facilities and neighboring properties from dust, overspray pursuant to regulatory requirements.

AB	ANCHOR BOLT	FG	FINISHED GRADE	UD	UNDERDRAIN
AC	ASPHALTIC CONCRETE	FRP	FIBER REINFORCED PLASTIC	UG	UNDERGROUND
ACI	AMERICAN CONCRETE INSTITUTE	FTG	FOOTING	VAC	VACUU
AL	ALUMINUM	GPM	GALLONS PER MINUTE	VERT	VERTICAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	HDG	HOT DIP GALVINIZED	WS	WATERSTOP
AWS	AMERICAN WELDING SOCIETY	HORIZ	HORIZONTAL	WTR	WATER
BFV	BUTTERFLY VALVE	HSS	HOLLOW STRUCTURAL STEEL	WWF	WELDED WIRE FABRIC
BLDG	BUILDING	I.F.	INSIDE FACE		
BM	BEAM	I/O	INLET OUTLET		
BRG	BEARING	IN.	INCH		
CB	CATCH BASIN	INV	INVERT		
CFM	CUBIC FEET PER MINUTE	JT	JOINT		
CJ	CONSTRUCTION JOINT	LG	LEVEL GAGE		
CL	CENTER LINE	LONG.	LONGITUDINAL		
CLR	CLEARANCE	M	MALE		
CMLSP	CEMENT MORTAR LINED STEEL PIPE	MAX	MAXIMUM		
CMU	CONCRETE MASONRY UNIT	MFR	MANUFACTURER		
COL	COLUMN	MIN	MINIMUM		
CONC	CONCRETE	MISC	MISCELLANEOUS		
CONN	CONNECTION	MJ	MECHANICAL JOINT		
CONT	CONTINUOUS	MPH	MILES PER HOUR		
CORP	CORPORATION	MW	MANWAY		
CP	CATHODIC PROTECTION	N	NEW		
CTR	CENTER	NPT	NOMINAL PIPE THREAD		
CU FT	CUBIC FOOT	NTS	NOT TO SCALE		
CU IN	CUBIC INCH	OC	ON CENTER		
CU YD	CUBIC YARD	OD	OUTSIDE DIAMETER		
CV	CHECK VALVE	OF	OVERFLOW		
DIA	DIAMETER	PLYWD	PLYWOOD		
DR	DRAIN	PRCST	PRECAST		
DWG	DRAWING	PREFAB	PREFABRICATED		
E	EXISTING	PSF	POUNDS PER SQUARE FOOT		
EA	EACH	PSI	POUNDS PER SQUARE INCH		
EL	ELEVATION	PSIG	POUNDS PER SQUARE INCH GAUGE		
ELB, ELLELBOW		PT	POINT OF TANGENCY		
ENGR	ENGINEER	PVC	POLYVINYL CHLORIDE PLASTIC		
EQL SP	EQUALLY SPACED	RC	REINFORCED CONCRETE		
EXP JT	EXPANSION JOINT	RD	ROAD, ROOF DRAIN		
EXST	EXISTING	REINF	REINFORCED, REINFORCING		
F	FEMALE	RH	ROOF HATCH		
FB	FLAT BAR	RST	REINFORCING STEEL		
FCO	FLUSH CLEAN OUT	RV	ROOF VENT		
FD	FLOOR DRAIN	UBC	UNIFORM BUILDING CODE		

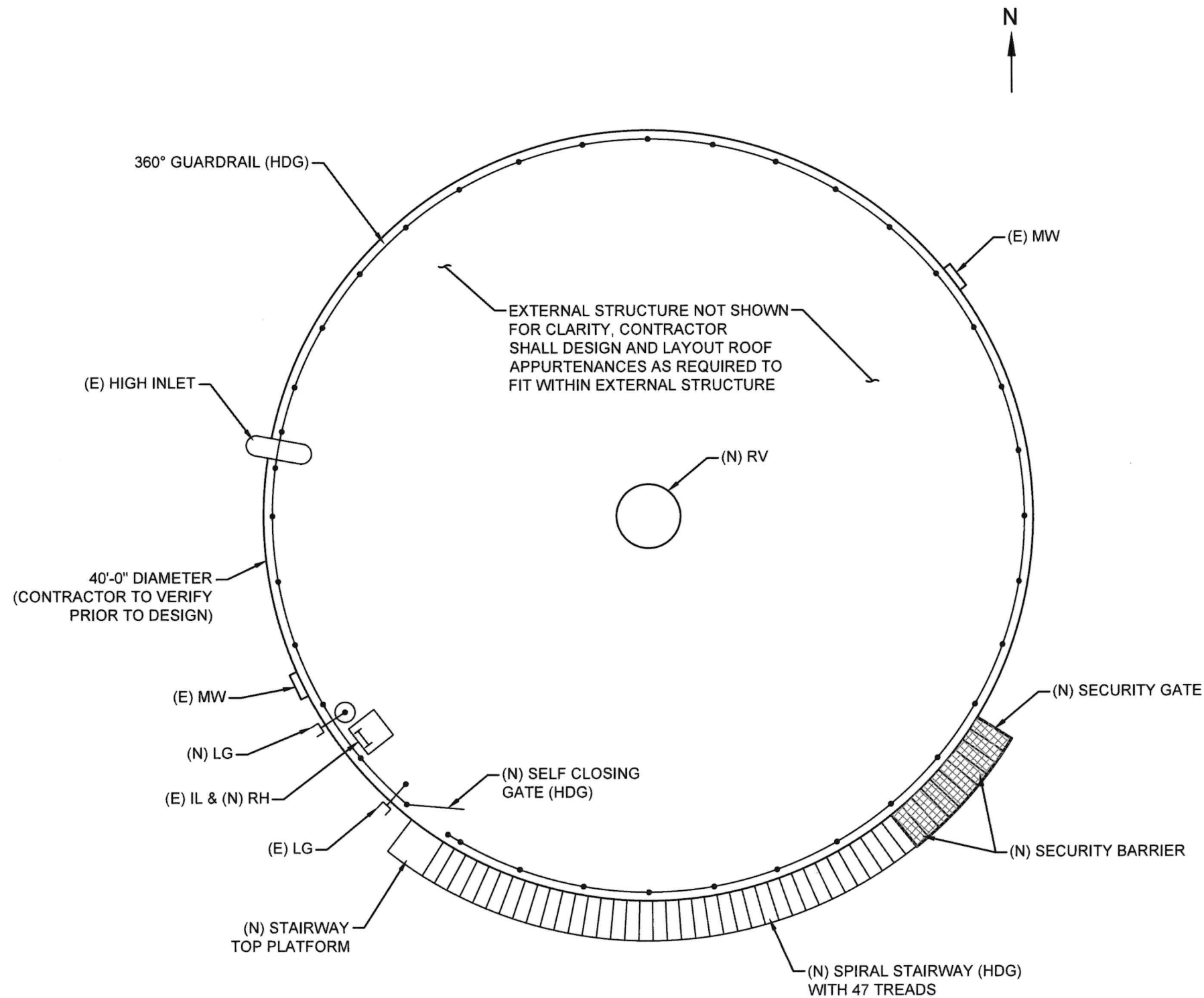
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REVISIONS	DATE	 ADVANTAGE TECHNICAL SERVICES, INC 805-595-2282 ATS-SLO.COM	DESIGNED BY: WB	DRAWN BY: DC	CHECKED BY: JB	RECOMMENDED:  TONY MARRACCINO - UTILITY SYSTEMS MANAGER	 OCEANO COMMUNITY SERVICES DISTRICT WATER STORAGE TANK REHABILITATION	SHEET: 4 OF 9
	00/00/00		PREPARED UNDER THE DIRECTION OF:  WILLIAM BELLIS P.E.	7/28/2023 DATE	APPROVED:  WILL CLEMENS - GENERAL MANAGER	NOTES		SCALE: VARIES



# DRAWING NOTES



1. PRIOR TO THE START OF CONSTRUCTION, OWNER STAFF SHALL EMPTY THE TANK. THE TANK WILL BE OUT OF SERVICE AND DRAINED BUT SOME WATER WILL REMAIN. THE CONTRACTOR SHALL REMOVE THE REMAINING WATER AS NEEDED TO FACILITATE THE START OF WORK.
2. PROVIDE NEW APPURTENANCES PURSUANT TO THE PROJECT DRAWINGS AND SPECIFICATIONS.
3. FINAL LOCATIONS FOR TANK ROOF APPURTENANCES SHALL BE COORDINATED W/ THE OWNER'S REPRESENTATIVE.
4. LEVEL GAUGE SHALL BE MOVED TO THE NEW LOCATION SHOWN. A PVC PIPE STILLING WELL SHALL BE PROVIDED TO GUIDE THE FLOAT AND PROTECT GAUGE CABLE FROM WAVE ACTION ASSOCIATED WITH THE HIGH INLET.
5. THE HIGH INLET SHALL BE DISCONNECTED FROM THE EXISTING ROOF AND RE-MOUNTED TO THE NEW ROOF.
6. NEW GUARDRAIL AND SELF CLOSING SWING GATE SHALL PROVIDE PROTECTION AT THE ENTIRE ROOF PERIMETER. GUARDRAIL SHALL HAVE TOEBOARD AND TWO INTERMEDIATE RAILS. GUARDRAIL AND SWING GATE SHALL BE HOT DIP GALVANIZED.
7. REMOVE AND DISPOSE OF CATHODIC PROTECTION SYSTEM INCLUDING POST AND RECTIFIER ENCLOSURE. DISCONNECT AT CIRCUIT BREAKER. CUT CONDUIT AND CAP AT 1'-0" UNDERGROUND. CONDUIT MAY BE ABANDONED IN PLACE.



## TANK PLAN



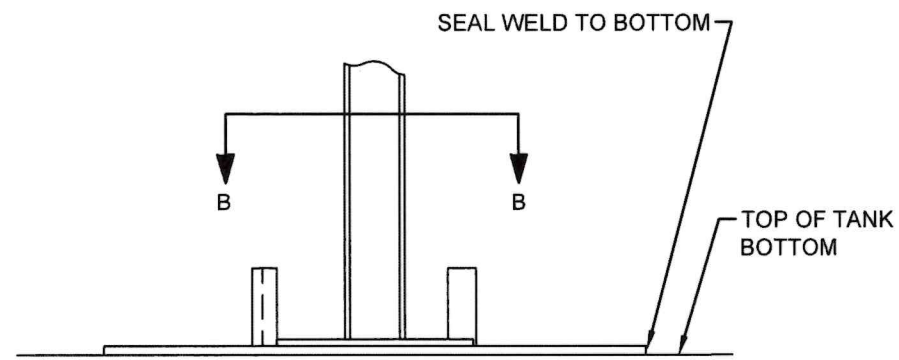
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	00/00/00		WB	DC	JB	<i>Tony Marraccino</i> TONY MARRACCINO - UTILITY SYSTEMS MANAGER		5 OF 9
			PREPARED UNDER THE DIRECTION OF:		7/28/2023	APPROVED:	TANK PLAN	SCALE:
			<i>William D. Bellis</i> WILLIAM BELLIS P.E.		DATE	<i>Will Clemens</i> WILL CLEMENS - GENERAL MANAGER		VARIES



# DRAWING NOTES

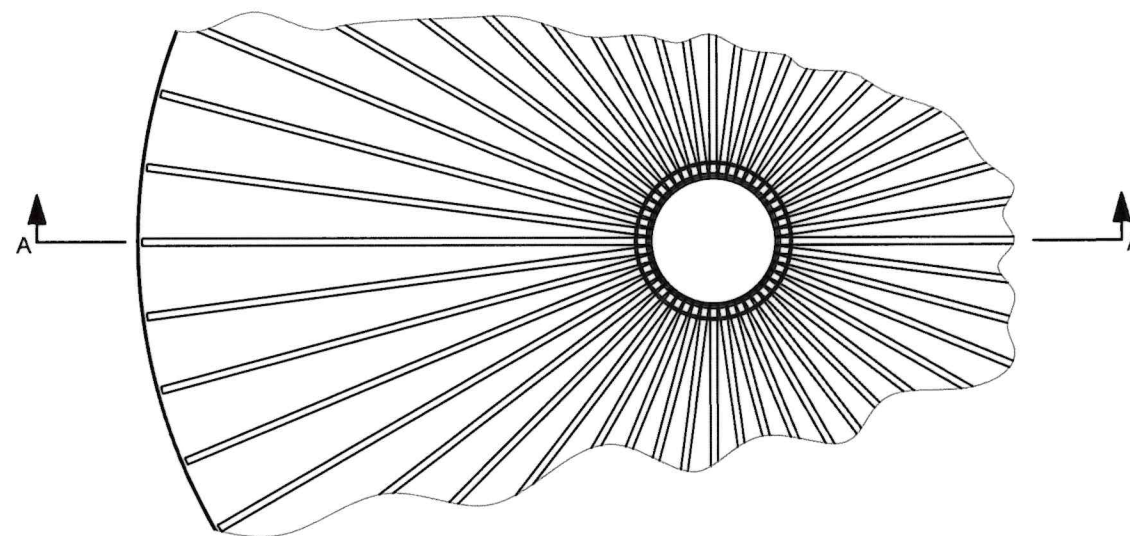
1. REMOVE AND RECYCLE EXISTING ROOF PLATE, RAFTERS, RAFTER CLIPS, CENTER SUPPORT AND BASE PLATES.
2. NEW ROOF SHALL BE DESIGNED AND CONSTRUCTED WITH INTEGRAL FORMED CHANNEL "RAFTERS" ON THE EXTERIOR.
3. ALL AREAS ON THE INTERIOR AND EXTERIOR, THAT ARE INACCESSIBLE FOR COATING SHALL BE SEAL WELDED.
4. THE ROOF DESIGN SHALL PROVIDE A SYSTEM FOR CONTROL OF SHELL ROUNDNESS DURING ERECTION SUCH AS ERECTION BOLTS OR OTHER METHOD USING POSITIVE STOPS.
5. ROOF SECTIONS SHALL NOT BE PRIME COATED UNTIL AFTER FORMING.
6. ALL PLATE EDGES SHALL BE FINISHED TO A MINIMUM OF 1/16" RADIUS PRIOR TO ABRASIVE PREPARATION.



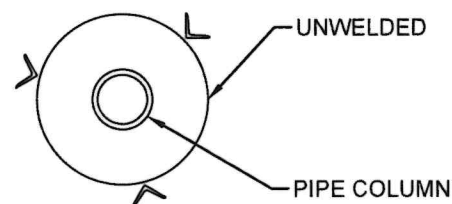
(BASE PLATE THICKNESS AND DIMENSIONS BY CONTRACTOR'S ENGINEER)

## FLOATING BASE PLATE DETAIL

SCALE: 1/2" = 1'-0"

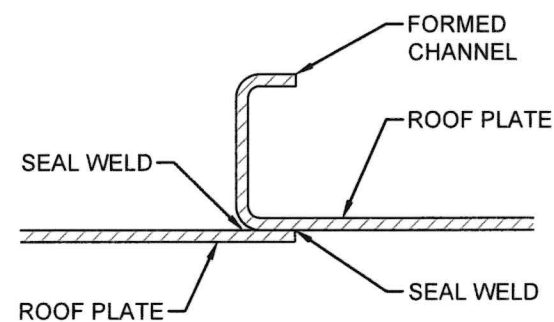


## TANK STRUCTURE PARTIAL PLAN



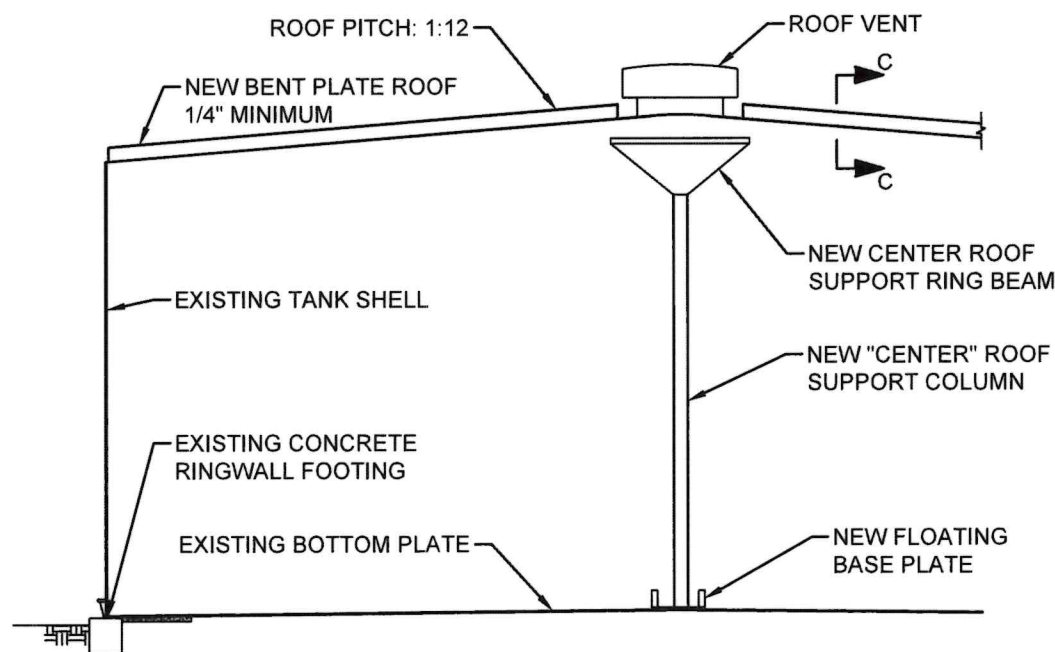
## SECTION VIEW B-B

SCALE: 1/2" = 1'-0"



## SECTION VIEW C-C


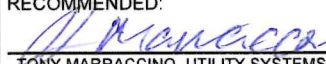


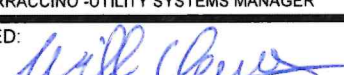
SCALE: 3" = 1'-0"



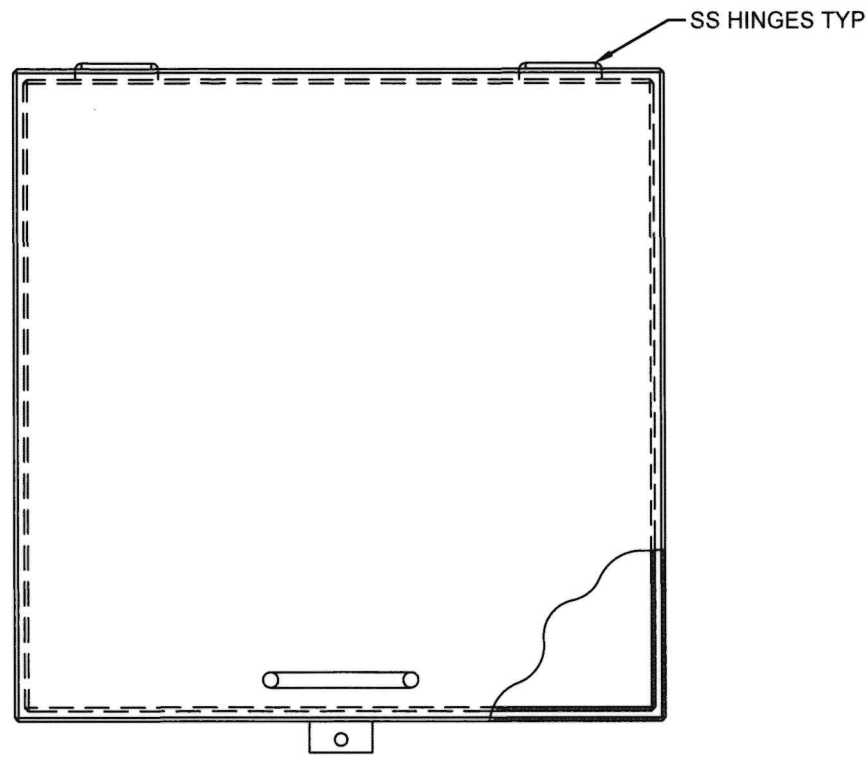
## PARTIAL SECTION VIEW A-A



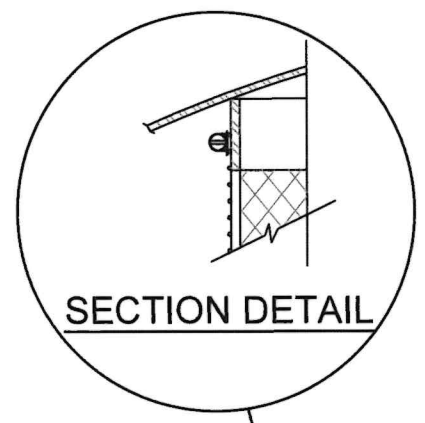
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	REVISIONS	DATE																
	00/00/00																	
PREPARED UNDER THE DIRECTION OF:  WILLIAM BELLIS P.E.	DATE: 7/28/2023	APPROVED:  WILL CLEMENS - GENERAL MANAGER	ROOF STRUCTURE	SCALE: VARIES														



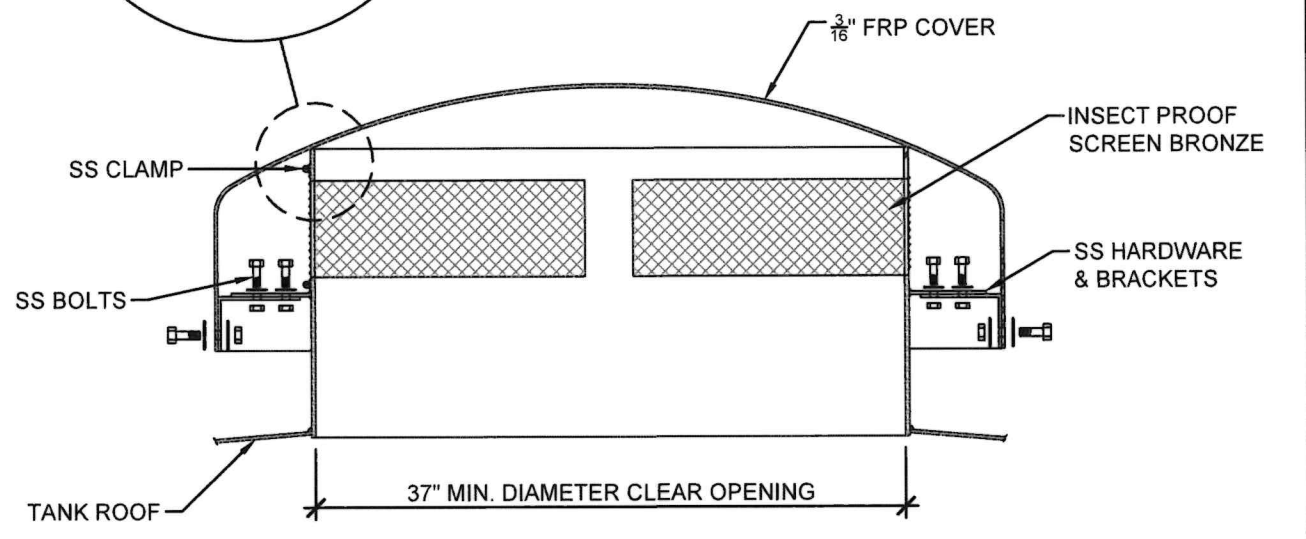


TOP VIEW

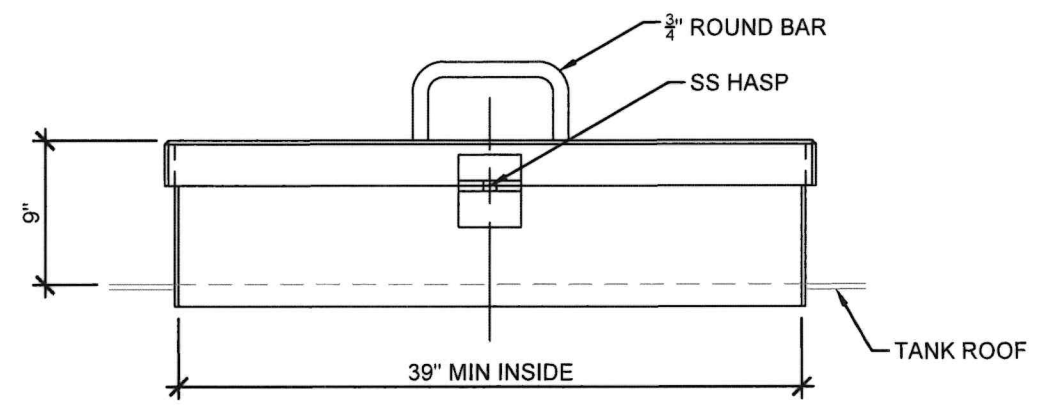


SECTION DETAIL

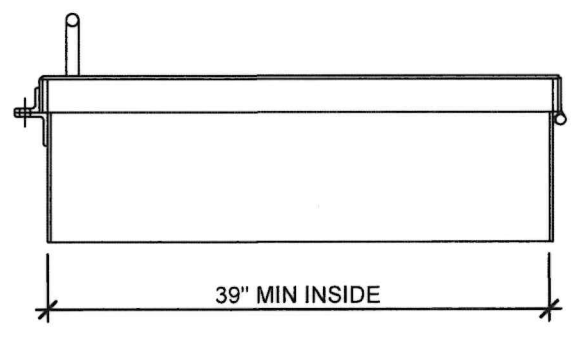
NOTE:  
INSTALL CLAMPING RINGS AFTER SCREEN IS IN PLACE. RINGS  
& SCREEN ARE TO BE INSTALLED AFTER ALL PAINT IS CURED.



ROOF VENT SECTION



FRONT VIEW





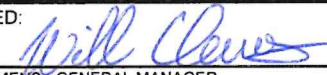


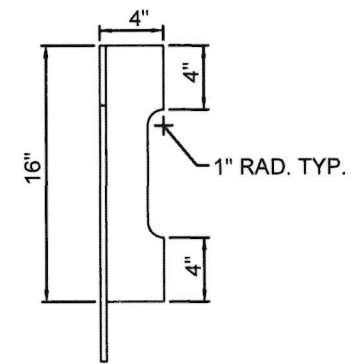
SIDE VIEW

ROOF HATCH

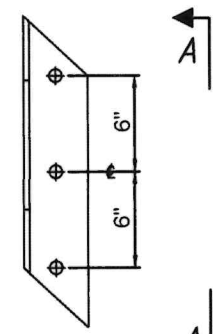


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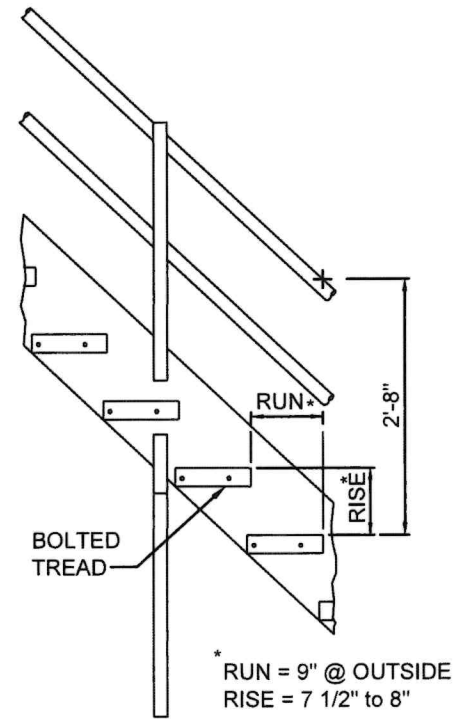
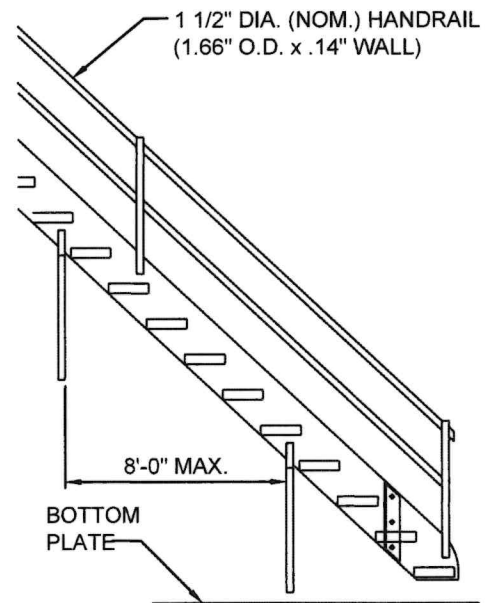
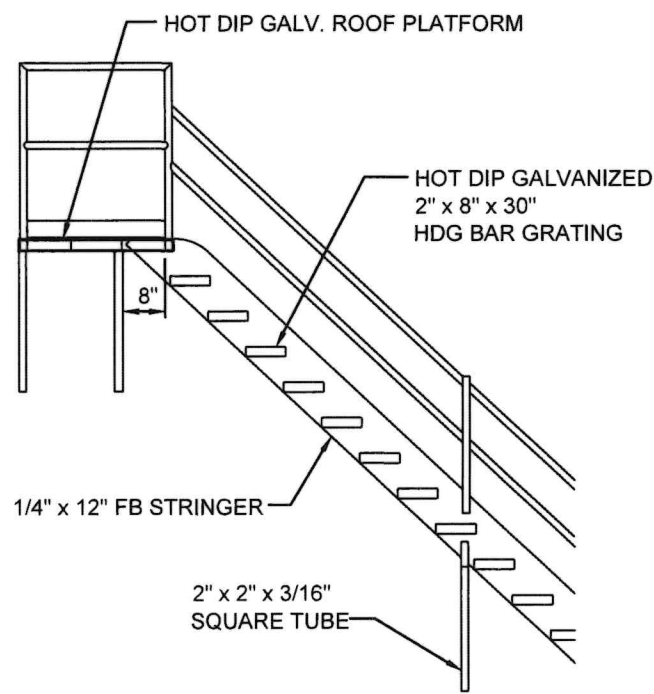
REVISIONS DATE 00/00/00	 ADVANTAGE TECHNICAL SERVICES, INC. 805-595-2282 ATS-SLO.COM	DESIGNED BY: WB	DRAWN BY: DC	CHECKED BY: JB	RECOMMENDED:  TONY MARRACCINO - UTILITY SYSTEMS MANAGER		OCEANO COMMUNITY SERVICES DISTRICT WATER STORAGE TANK REHABILITATION	SHEET: 7 OF 9
		PREPARED UNDER THE DIRECTION OF:  WILLIAM BELLIS P.E.		7/28/2023 DATE	APPROVED:  WILL CLEMENS - GENERAL MANAGER		ROOF VENT AND ROOF HATCH DETAILS	SCALE: VARIES



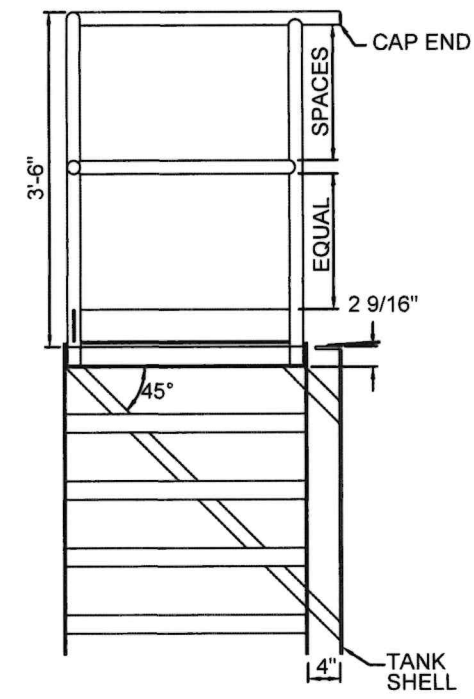
VIEW A-A



CLIP DETAIL



\* RUN = 9" @ OUTSIDE  
RISE = 7 1/2" to 8"




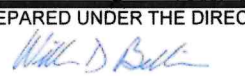



### SPIRAL STAIR ELEVATIONS

SCALE: 1/2" = 1'-0"



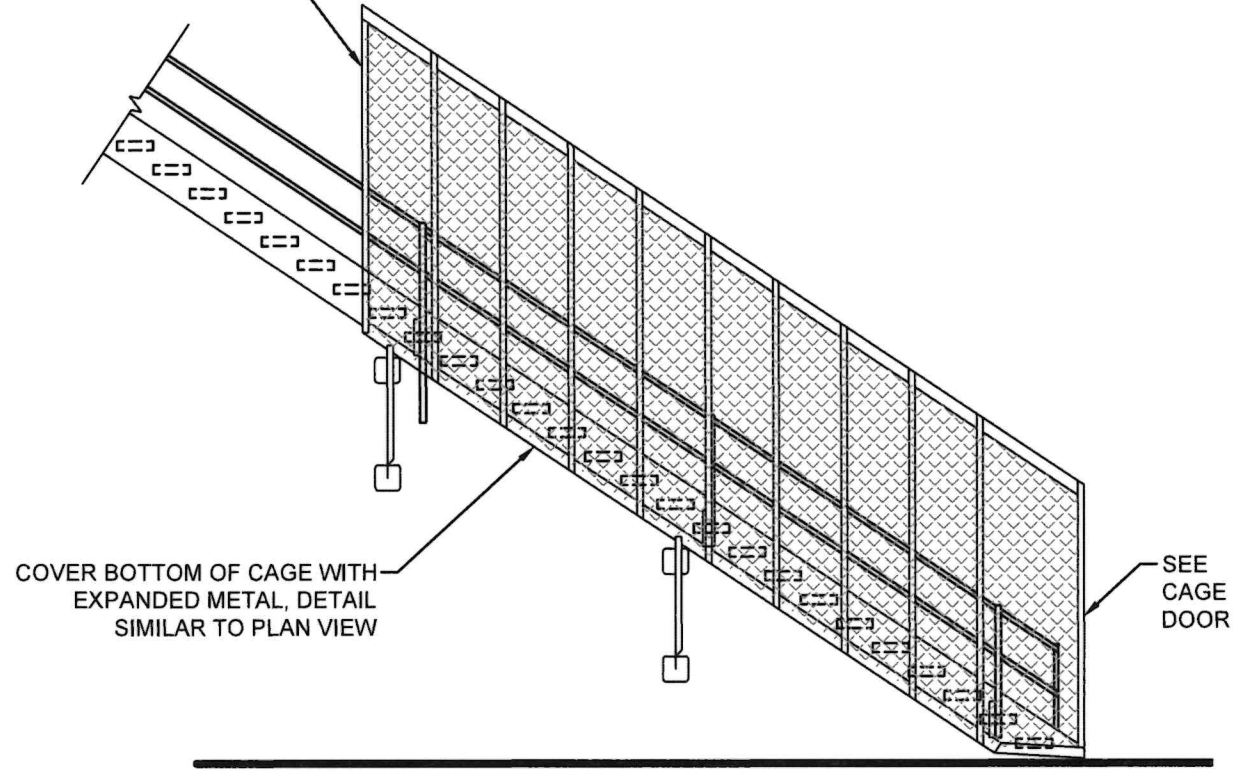
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REVISIONS DATE 00/00/00	 <b>ADVANTAGE TECHNICAL SERVICES, INC.</b> 805-595-2282 ATS-SLO.COM	DESIGNED BY: <b>WB</b>	DRAWN BY: <b>DC</b>	CHECKED BY: <b>JB</b>	RECOMMENDED:  TONY MARRACCINO - UTILITY SYSTEMS MANAGER		OCEANO COMMUNITY SERVICES DISTRICT WATER STORAGE TANK REHABILITATION	SHEET: 8 OF 9
		PREPARED UNDER THE DIRECTION OF:  WILLIAM BELLIS P.E.		7/28/2023 DATE	APPROVED:  WILL CLEMENS - GENERAL MANAGER			SCALE: VARIES



HOT DIP GALVANIZE  
ALL PARTS AFTER  
FABRICATION

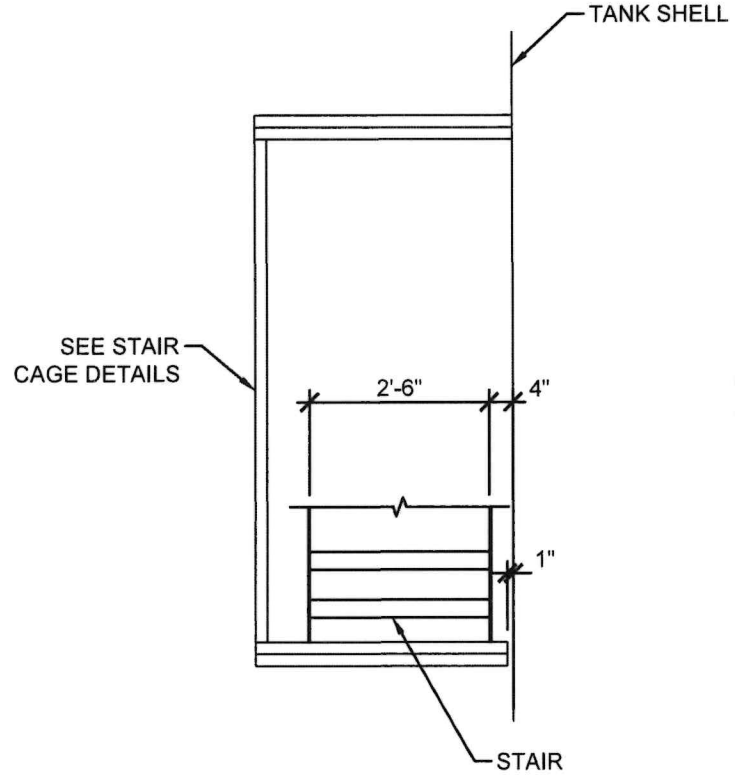
ATTACH EXPANDED METAL AND  
ANGLE TOP AND BOTTOM WITH  
FENDER WASHERS AND RIVETS  
(ITEMS 4 & 5) AT 2'-0" MAX SPACING



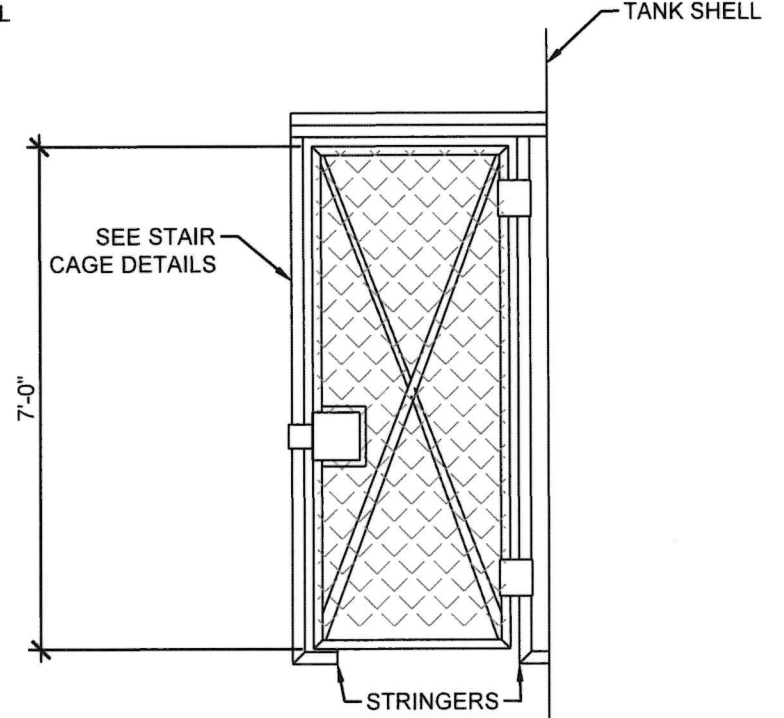
COVER BOTTOM OF CAGE WITH  
EXPANDED METAL, DETAIL  
SIMILAR TO PLAN VIEW

SEE  
CAGE  
DOOR

**STAIR CAGE**  
SCALE: 3/16" = 1'-0"



**SECTION A-A**  
SCALE: 3/8" = 1'-0"  
(SUPPORT BRACKET NOT SHOWN)



**CAGE DOOR**  
SCALE: 3/8" = 1'-0"



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REVISIONS	DATE
	00/00/00



ADVANTAGE TECHNICAL SERVICES, INC.  
805-595-2282  
ATS-SLO.COM

DESIGNED BY: WB	DRAWN BY: DC	CHECKED BY: JB
PREPARED UNDER THE DIRECTION OF: <i>William D. Bellis</i> WILLIAM BELLIS P.E.		
DATE 7/28/2023		DATE

RECOMMENDED: <i>Tony Marraccino</i> TONY MARRACCINO - UTILITY SYSTEMS MANAGER
APPROVED: <i>Will Clemens</i> WILL CLEMENS - GENERAL MANAGER



OCEANO COMMUNITY SERVICES DISTRICT  
WATER STORAGE TANK REHABILITATION

**STAIR CAGE**

SHEET: 9 OF 9
SCALE: VARIES

## **APPENDIX C**

### **DIVE INSPECTION REPORTS – EXISTING WELDED TANK**

**INSPECTION REPORT FOR THE  
OCEANO COMMUNITY SERVICES DISTRICT'S  
297,000 GALLON WATER STORAGE TANK  
JULY 22<sup>ND</sup>, 2020**



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**INSPECTION REPORT FOR  
OCEANO COMMUNITY SERVICE DISTRICT'S  
297,000 GALLON WATER TANK**

**JULY 22<sup>ND</sup>, 2020**

**REVISION DATE: N/A**

Pursuant to the American Water Works Association's Manual of Water Supply Practices, Steel Water-Storage Tanks, M42 and California Business and Professions Code section 6735, the engineering report contained herein has been prepared by or under the direction of the following Registered Engineer:

**ADVANTAGE TECHNICAL SERVICES, INC.  
6661 FERN CANYON LANE  
SAN LUIS OBISPO, CA 93401  
805-595-2282**

**UNDER THE SUPERVISION OF:  
WILLIAM D. BELLIS**

*William D. Bellis*

---

Registered Civil Engineer, CA C55334



## **EXECUTIVE SUMMARY**

Advantage Technical Services, Inc. (ATS) inspected the Oceano Community Services District's 297,000-gallon Storage tank on July 22<sup>nd</sup>, 2020. The tank interior was inspected above and below the water line using sanitary diving procedures. The following is a summary of what appear to be the most significant elements:

1. The roof is severely corroded. ATS provided temporary repair to seal 10 existing holes and prevent an unsanitary condition.
2. The roof at the base of the guardrails is severely corroded and the guardrails will not provide worker protection. This is a hazardous condition. Access should only be allowed with an engineered system and hazard mitigation plan.
3. Serious corrosion and metal loss are present on some of the roof support rafters. It is unlikely that the roof structure meets minimum safe design standards.
4. Serious corrosion has damaged the roof vent hood attachment brackets. The vent hood is not fastened as designed and could blow off of the roof in high winds.
5. The steel plate in the tank shell and bottom provide the containment portion of the tank and these are in good condition so rehabilitation is still a reasonable option.

## **SCOPE, OBJECTIVE, AND LIMITATIONS**

An inspection was completed on the interior and exterior of the steel potable water storage reservoir. Principle Inspector/Engineer, Will Bellis, P.E. and ATS associates provided the tank inspection.

ATS personnel completed a preliminary inspection for safe access with particular attention to work from the elevated location and the confined space. It was determined that the existing roof fall protection does not meet OSHA regulatory requirements. Our on-site Engineer determined the acceptability of temporary fall protection anchor points, temporary tie-backs and confirmed the applicability of our standard procedures for mitigating the risks. The temporary protection equipment is part of ATS tooling and is not appropriate for permanent installation so it was removed upon completion of this work.

ATS divers have experience and certifications that meet or exceed the requirements of the American Water Works Association Manual of Water Supply Practices, Steel Water-Storage Tanks, M42, AWWA C652 Standard for Disinfection of Water Storage Facilities and OSHA regulations for technical or commercial diving. Additionally, our team's certifications or licenses include a Registered Professional Engineer, API 653 Tank Inspector, AWS Certified Welding Inspector, National Association of Corrosion Engineers Level III Coating Inspector, and American Society of Nondestructive Testing Level III Engineer. With these applicable credentials and combined experience of over five hundred tank dive inspections our team leads the industry.

The diver's air supply is supplied by air hoses from the surface using either a dive compressor or bottled air. The diver's air supply system offers triple redundancy; including a self-contained system maintained in the diver's possession and control. A full-time

communication system supports documentation of findings and operational or emergency communications.

All disinfection procedures are in accordance with the American Water Works Association Standard for Disinfection of Water-Storage Facilities (ANSI/AWWA C652-11).

The photographs provided within this report display representative views and subsequent analysis. Digital video, also included, provides additional documentation of the conditions.

The observations made during the inspection, and included in this report, provide a reasonable evaluation of the tank conditions at the time of the inspection. Considerations of safe access and reasonable care were observed in making and reporting the observations. Latent defects or conditions found during subsequent cleaning, inspections, or other work at the tank must be brought to the Engineer's or Owner's attention.

## **OBSERVATIONS**

### **General Tank Data**

40 ft. Diameter x approx. 32' ht

Type: Ground supported welded steel reservoir

Media Stored: Potable water

~~Diameter: Approximately 31.75 ft. (40 ft. from name plate, not measured)~~

~~Height: 40 ft. (from name plate, not measured)~~

Water level during inspection: Approximately 39 ft.

Design liquid level: 32 ft. (shown on name plate, may be lower to match vol. on plate)

### **Foundation**

The concrete ring foundation is in good condition overall. Minor cracks are present but these appear to be normal and adequately tight to prevent associated damage or significant rebar corrosion. No significant settlement was noted. No spalling or visible deterioration of the concrete was noted.

### **Exterior Shell**

The exterior shell coating is in fair condition. Scattered general corrosion is present and some minor metal loss was noted in one area.

Serious corrosion is present on the chime which is the bottom extension at the base of the shell. The corrosion on the chime appears to have started from the inaccessible area on the underside of the bottom and progressed from there. If this corrosion continues to the shell weld, a new bottom may be required.

Coatings appear to be losing the ability to protect the steel from corrosion. Significant chalking was noted. Chalking is the formation of friable, or easily removed powder, on the surface of the coating. The "powder" is evolved from the coating itself. The level of



chalking helps define the amount of degradation and its presence affects the adhesion of top-coats. The ASTM D 4214 Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films was used.

Dry film thickness was measured on the shell at mid height and found to average about 8 mils. It appears that the only coating on this tank is from original construction.

## **Exterior Roof**

The exterior roof coating is in poor condition and has not been protecting the steel for an extended time. Serious corrosion is present in approximately 50 localized areas. 10 holes, caused by rusting, were sealed using fiber reinforced NSF approved epoxy resin in order to provide a temporary repair and help prevent rain water intrusion.

Corrosion at the base of the guardrails has severely damaged the structure and the guardrails will not provide the intended safety barrier. This is a hazardous condition.

Dry film thickness was measured on the roof and found to average about 5 mils. It appears that the only coating on this tank is from original construction.

## **Interior Bottom**

The bottom plate is in good condition with no significant pitting or other forms of metal loss. The coatings are in fair condition overall. The cathodic protection is protecting some scattered areas of coating failure. Many scattered areas of blistering are present. Blisters are densely patterned and are less than ½ in. diameter.

Dark brown sediment material was present over approximately 50% of the bottom area.

## **Interior Shell**

Interior shell plate is in fair condition. The epoxy coatings are in good condition overall. Some scattered blisters are present on the shell. The blisters were un-broken and no associated corrosion was present. The blisters were left intact by the diver inspector.

## **Interior Roof Plate**

The interior roof plate is in poor condition with significant metal loss that has penetrated from the exterior. Corrosion from the interior side is isolated to only a few areas with mostly general corrosion. Corrosion and staining are present at the un-seal welded lap joint.

## **Roof Structure**

The roof is supported by a round tubular center column with wide flange rafters. The base plate is welded to the bottom. Minor bowing is visible in the rafters. This may be caused by settlement at the center portion of the tank that is greater than at the shell.

The structural steel is in poor condition. Serious corrosion and metal loss are present on some rafter flanges. It is unlikely that the roof structure meets minimum safe design standards specified by the Building Code.

## **Cathodic Protection System**

The elements of the sacrificial anode cathodic protection system appeared to be intact and operating normally. The reference cell appeared to be in normal operating condition. The edges of the hand-holes have significant corrosion.

## **Appurtenances**

Level Gauge: The main cable was broken but was repaired by ATS. The float is located close to the inlet that enters the tank through the roof. The vibration cause by tank filling creates excessive movement at the level gauge float. This movement is causing excessive wear of the cable, cable attachment points and cable guides.

Exterior Ladder and Cage: These areas are in poor condition overall. Serious corrosion is present in scattered areas including ladder support legs. Metal loss is approximately 50% of the original thickness of the ladder stringer in one location.

Roof Fall Protection: No roof fall protection is present.

Roof Guardrail: The partial guardrail at the roof hatch is in poor/hazardous condition due to serious corrosion.

No guardrail is provided for other areas of the roof edge. The ladder opening is not protected by a swinging gate.

Roof Hatch: One lockable square roof hatch is located at the top of the interior ladder. The hatch is in fair condition. The appropriate curb or neck and downward overlap of the cover are present. Some minor areas of general corrosion are present.

Internal Ladder: The internal ladder is in fair condition.

Overflow: The visible exterior of the overflow steel appears to be in good condition with no significant corrosion. The internal areas of the overflow weir have some localized corrosion. The pipe appears to be free from obstructions.

Outlet: The outlet penetration in the tank shell appeared to be in normal condition.

Inlet: The inlet and riser pipe were in good overall condition with staining and minor corrosion.

Drain: The drain appears to be in fair condition with some minor corrosion.

Roof Vent: The roof vent screen appears to be bug proof. The hood attachment brackets are corroded to the point of losing all integrity. Significant corrosion is present on the hardware and band clamps.

Manways: Two mono-bolt manways are present. The manways were in good condition overall on the interior. Minor corrosion was present but no significant metal loss was noted.

## **ENVIRONMENT AND OPERATING CONDITIONS**

This tank is located in a water facility buildings and equipment.

The tank site conditions are typical for California coastal areas with regular fog, dew and salts which significantly increase corrosion rates on exterior surfaces and interior vapor space.

## **RECOMMENDATIONS**

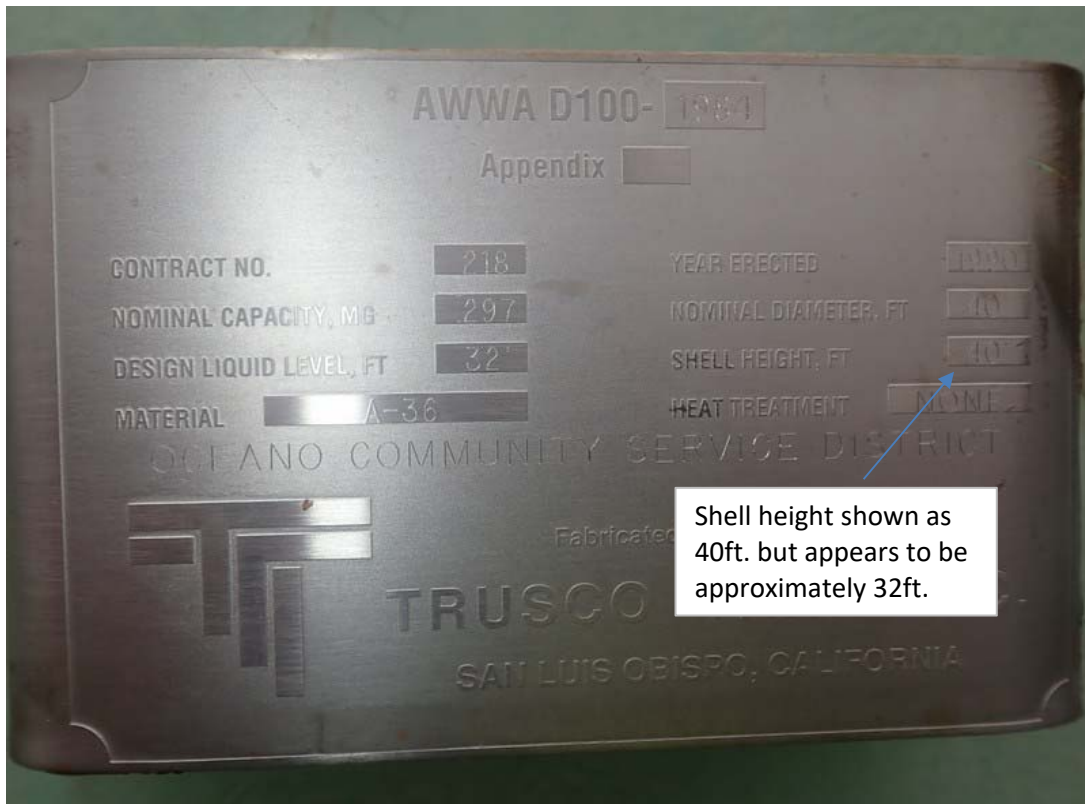
The following recommendations are based on our experience as engineers and inspectors with regard to the best industry practices used by both public and private tank owners. The intent is to provide information that will likely help lower risks, optimize water quality and increase long term value for the tank owner(s). Our scope of work does not include a safety audit or evaluation but we are making recommendations where we have noted potential issues. The owner's insurance provider or safety consultant should be consulted for a review of the safety features of this facility where desired.

1. The tank appears to have only the 30-year-old original coating. The coatings on portions of this tank have not been preventing corrosion for years. Serious damage has resulted. Recoat the interior and exterior as soon as possible to prevent additional damage and repair cost.
2. Rehabilitate the roof. Consider options including: 1) Welded patch plates to repair areas on roof and replacement of selected rafters and 2) Replacing the entire roof.
6. Do not allow personnel to access the roof without engineered anchorage and fall protection. For this inspection, ATS provided engineering evaluation only for temporary anchorage and temporary tie-back to protect personnel for work on the tank roof.
7. The roof at the base of the guardrails is severely corroded and the guardrails will not provide protection. Install base plates where serious corrosion has reduced guardrail structural attachment to the roof.
3. Movement from the inlet is wearing out the components of the level gauge. Install a stilling well for the level gauge float or use some other design solution to keep the

- adjacent inlet from causing excessive movement or consider a change to a pressure sensing system. Replace worn level gauge components during rehabilitation.
4. Repair vent hood brackets as soon as possible. Serious corrosion has damaged the roof vent hood attachment brackets. The vent hood is not fastened as designed. Loose vent hoods have been known to blow off of roofs in high winds.
  5. Check the shell height, volume and design liquid level shown on the tank name plate. The plate shows the design liquid level of 32'. It appears that the shell is 31.75 ft. Also, the nominal capacity does not calculate correctly for the dimensions shown. If this is determined to be an error on the name plate, it should be corrected.
  6. Control corrosion at the tank chime (bottom extension at the shell) to help prevent the need for a bottom replacement.
  7. Continue to provide regular inspections. AWWA D100-11 Standard for Welded Steel Tanks Specifies inspection and corrective maintenance every three years. AWWA Manual of Water Supply Practices, M42, for Steel Water Storage Tanks (2013) states "the tank should be inspected at least once every 3 to 5 years or as required by state regulatory agencies". M42 additionally states that "The results of the tank evaluation or pre-bid inspection should be certified by a professional engineer."



Overall view of the tank.



Tank nameplate. The stated shell height of 40 ft. appears to be incorrect. The design liquid level of 32 ft. gives a volume of 0.3 MG so there may be an error there too.



This view shows a typical mechanical anchor along with lower shell. Significant corrosion is present.



This close view of the exterior lower shell and bottom chime shows serious corrosion found on the outer edge of the chime. Continued corrosion here will eventually create a condition where bottom replacement is necessary.





The upper shell and roof joint are shown in this photo. The coatings are in fair condition with significant aging of the coating and scattered corrosion.



This is a typical view of the lower exterior shell. Scattered corrosion points are starting where aging coatings are losing the ability to protect the steel.



The roof vent consists of a fiberglass cover over a steel riser pipe.



This is a view of the underside of the vent hood. The screen appears to be intact and bug proof. Serious corrosion has damaged the roof vent hood attachment that keeps the hood from blowing off during high winds.





The exterior roof is the area with the worst corrosion on the tank. Approximately 50 locations have serious metal loss. ATS repaired the 10 worst locations that had holes where the 3/16inch thick roof has rusted through.



This is an addition view of a typical corroded area on the tank roof.



This is one of 10 holes in the roof where ATS provided temporary repairs to immediately seal the roof and meet regulatory requirements.



This view shows 2 locations after temporary repair of the holes using fiber reinforced epoxy. The epoxy is NSF 61 certified for use and contact with potable water.





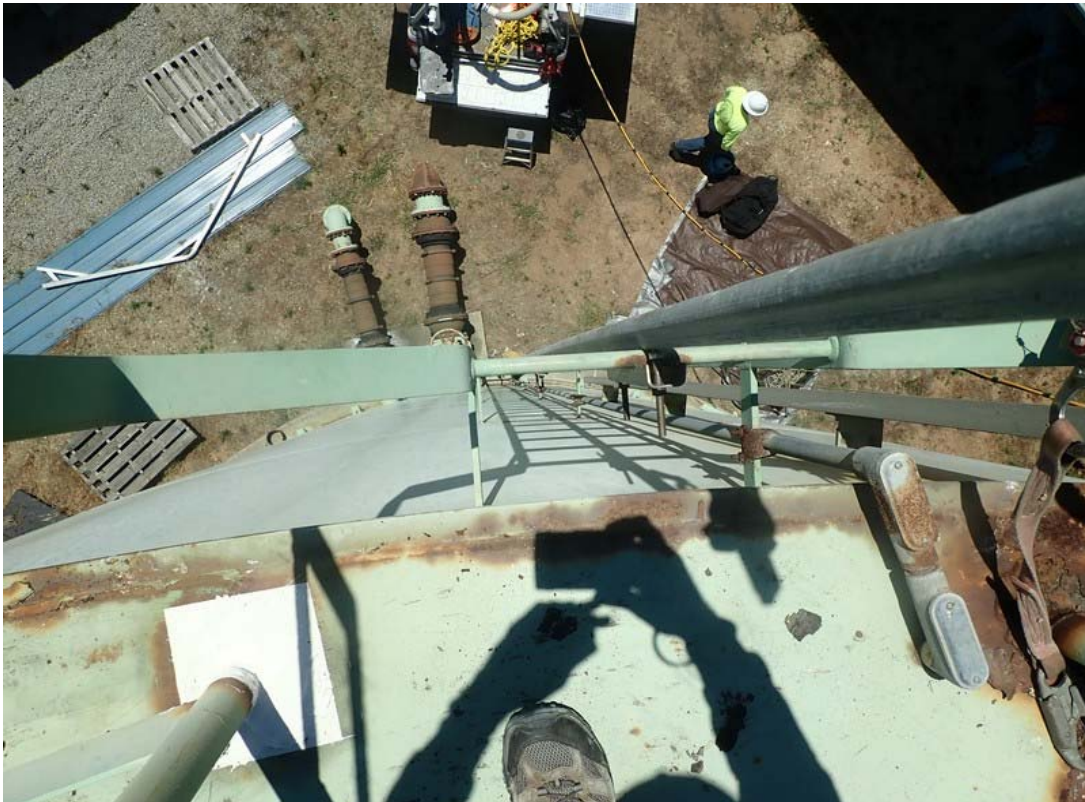
This photo shows one of several areas of serious corrosion on the exterior ladder.



This is a close view of the ladder area shown above. Approximately 50% of the ladder stringer metal thickness is lost to corrosion.



This photo shows serious corrosion and a hole at the base of a guardrail post. This guardrail was designed to help provide safe access to the roof but clearly it is severely weakened.



This view shows the guardrail post after repair by ATS. The repair only provides a temporary non-structural seal for public health purposes. The patch does not make the guardrail or roof safe for access by personnel without special techniques.





Exterior view of the manway.



This view shows exterior piping with some corrosion with what appears to be insignificant metal loss. Flexible couplings are in place for seismic movement.

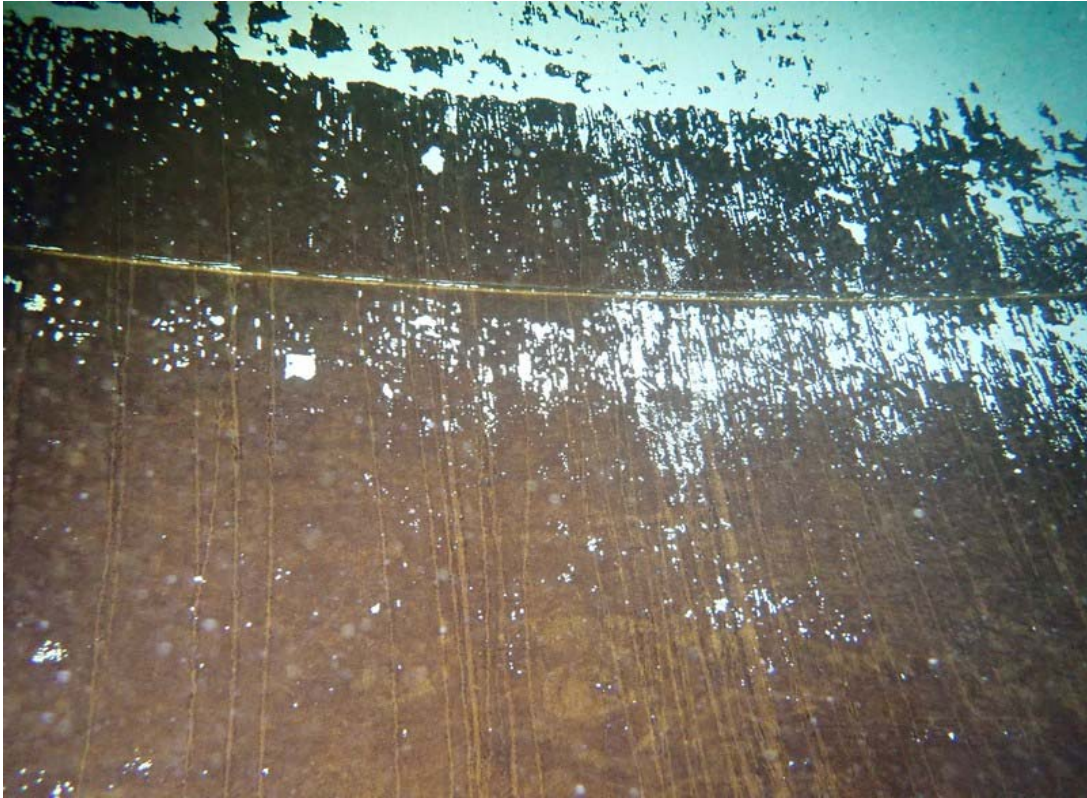


This photo shows a corrosion spot at the interior side of the shell to roof joint. ATS installed a temporary repair to seal this hole. This was the largest hole in the roof but many other locations of serious corrosion are present.



This view is representative of the conditions found on the interior shell, roof plate and rafter.





Upper interior shell. Water staining is visible but only minor corrosion is present.



Interior shell in the submersion zone. This view shows a horizontal weld with sediment or staining visible along the top. The interior shell steel appears to be in good condition.

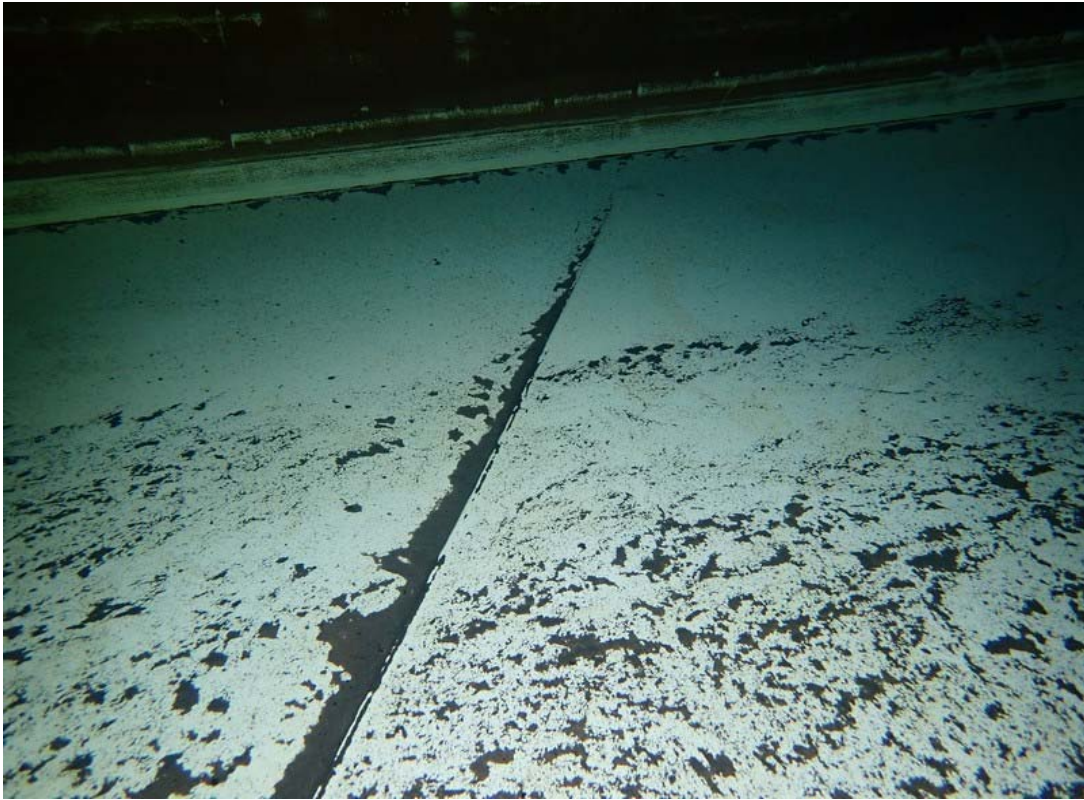
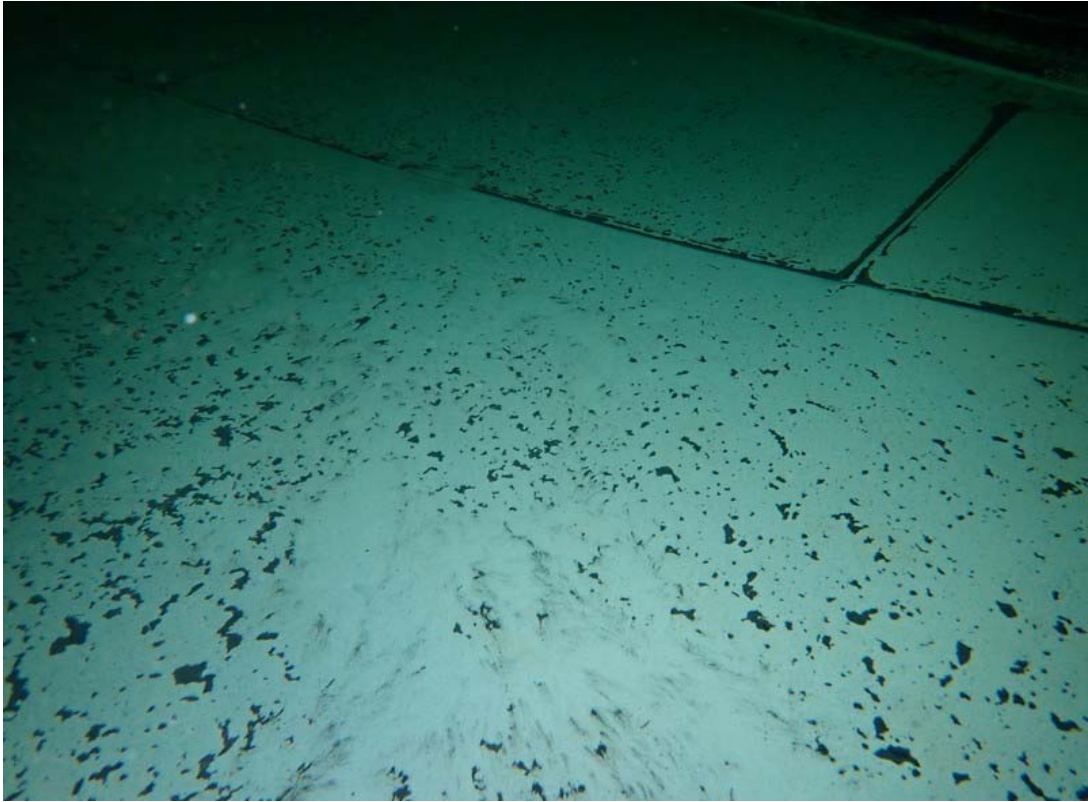


Photo of the interior bottom shell and shell coupling shows the typical condition found. No significant corrosion was noted.



This photo provides a close view of the area shown in the top photo this page. Some scattered blistering is visible (arrow) but no significant corrosion is present.





Sample area of bottom showing typical conditions. Spots of sediment are scattered and sediment removal was not part of the scope of work. No significant corrosion was noted although sediment reduces the ability to see corrosion.



Close view of a weld in the bottom.



Close view of the interior bottom at an area with a dense pattern of small unbroken blisters. Blisters like this are not uncommon. Unbroken blisters usually do not allow significant corrosion.

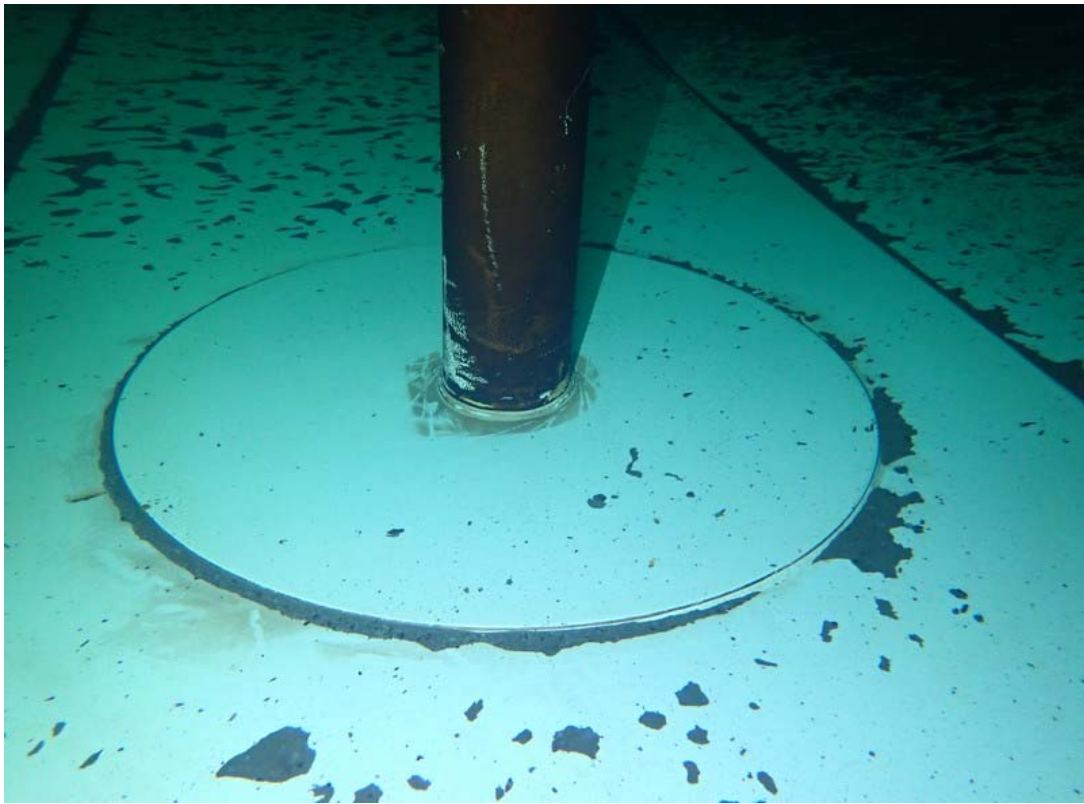


This view shows bottom sediment.





This shot was taken looking upward at the center column. All coatings on the column were in fair condition and no significant corrosion was present.



This view is of the lower portion of the center column and base plate. No significant corrosion is present.



Upper center column, rafters and roof plate.



Close view of the center support and rafters. Significant corrosion and heavy staining is visible at the ends of the rafters and at inaccessible areas.





Interior roof plate and rafters. Broad view. Some minor bowing is present in the rafters. This view shows an example of nearly rust free plate but a hole is visible at the shell to roof joint (arrow). The hole was sealed by ATS.



This is a close view of the top flange of a rafter at one of the numerous areas with serious corrosion. This rafter flange has serious metal loss that affect the load carrying capacity.



Roof plate rafter with visible corrosion.



An additional view of the interior roof.



View of the roof hatch from the interior. The arrow indicates the location of a hole that was sealed by ATS.



This view shows the interior ladder below the surface.





Overflow piping and support as viewed looking upward from the bottom.



This view is of the inside of the overflow weir. Some corrosion is visible but the pipe appears to be free of obstructions.





Shell mounted piping as viewed from the interior.



Interior view of the shell nozzle on the right side of the top photo of this page. Blisters in the coating are visible as rounded white spots. Minor corrosion is present.





This view shows the interior side of the sample tap. Blisters in the coating are visible.



This view shows the interior of the drain pipe. Some corrosion is visible on the interior edge of the pipe (arrow).



Level gauge float with temporary repair to the attachment. The interior float is not designed for the amount of movement that is created by the adjacent high inlet.



Level gauge guy wire and retainer ring on the float. The arrow shows the wear on the ring from excessive movement of the float from the adjacent inlet.



# DAILY REPORT

**PROJECT:** 0.4MG Tank Inspection

**LOCATION:** Tank Site

**CLIENT:** Oceano CSD

**DATE:** 7/22/20

**Gage:** Elektro-Physik Type 1 Pull off gage S/N 025962

	<u>Roof</u>	<u>Roof</u>	<u>Shell Mid Ht. @ Ladder</u>
	5.3 mils	4.7 mils	7.4 mils
	5.6 mils	5.2 mils	7.1 mils
	5.7 mils	5 mils	8.1 mils
	3.4 mils	4.6 mils	10.4 mils
	4.3 mils	5.4 mils	9.3 mils
Average	4.86 mils	4.98 mils	8.46 mils

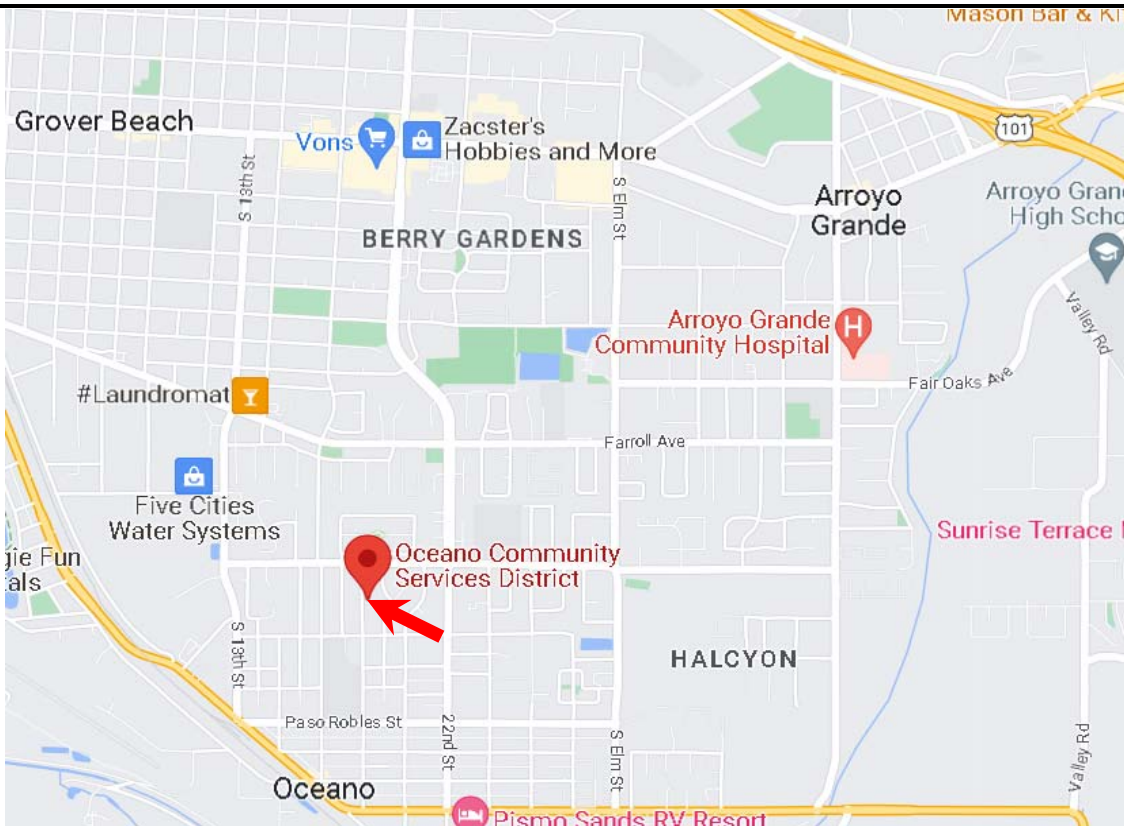
	<u>Shell Mid Ht. @ Ladder</u>
	5.9 mils
	8.4 mils
	8.7 mils
	8 mils
	7 mils
Average	7.6 mils

**END OF APPENDIX C-DIVE REPORT**

## **APPENDIX D**

### **PROJECT LOCATION & EXISTING CONDITIONS**





Project site location: Across from 1348 19th. St., Ocean, CA. Tank site indicated by the red arrow. GPS Coordinates: 35°06'19.5"N 120°36'37.2"W



Plan view of site.

**TITLE: PROJECT SITE LOCATION**

**PROJECT:** Ocean Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 7/16/2023 (Rev. 7/26/2023)

ATS, Inc - Project Manual Appendix A-1





View of tank and portion of Contractor "lay-down" area.



Access gate and tank site.

**TITLE: PROJECT SITE PHOTOS**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 5/11/2022 (Rev. 7/26/2023)  
(vi) Technical Specifications

ATS, Inc - Project Manual A-2



Ponding and corrosion indicate that the compression ring has an upward tilt that will require adjustment to facilitate the fit-up and welding of the new 1:12 roof.

Contractor to provide new roof penetration with coupling with plug near the roof hatch.



Existing guardrails are severely corroded and do not provide adequate strength to function as guardrail. Persons accessing the tank roof shall provide fall protection not associated with existing guardrail.

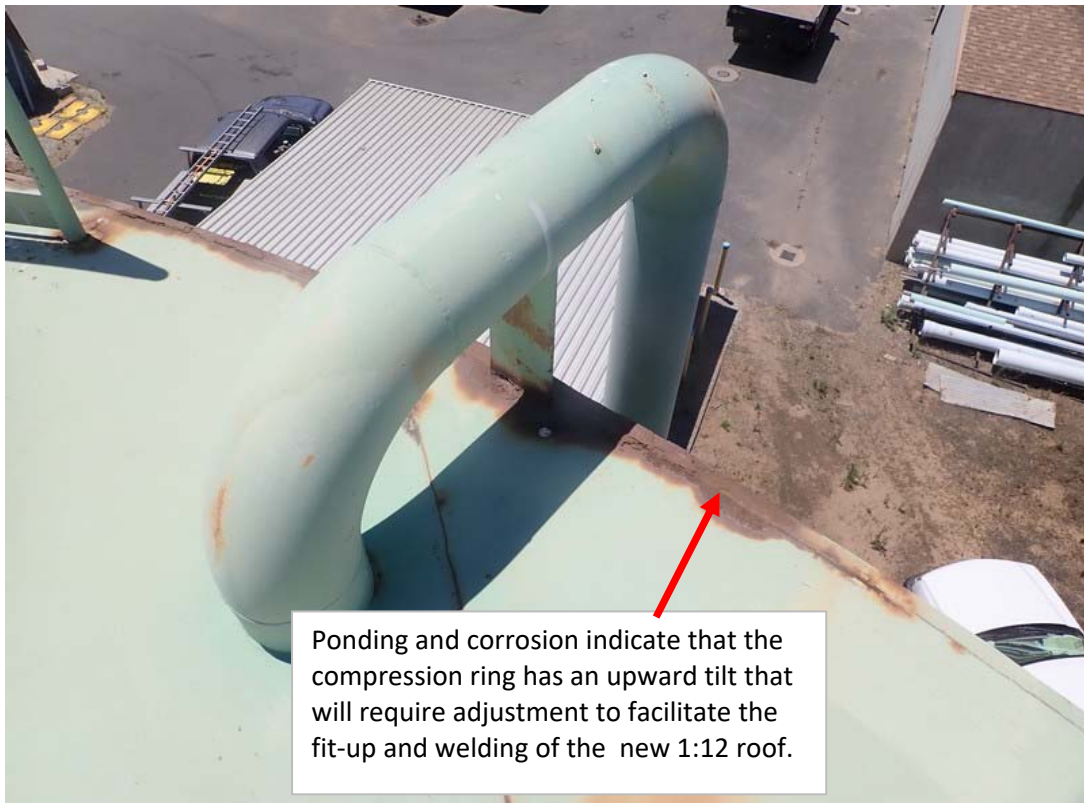
**TITLE: PROJECT SITE PHOTOS**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 5/11/2022 (Rev. 7/26/2023)

ATS, Inc - Project Manual Appendix A-3





Existing inlet piping on the tank roof. This pipe will be reattached to the new roof.



This view shows the existing inlet piping.

**TITLE: PHOTOS OF EXISTING TANK DETAILS - INLET PIPING**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 5/11/2022  
(vi) Technical Specifications

ATS, Inc - Project Manual Appendix A-4



Existing inlet and only a few inches of freeboard.



Original name plate with incorrect height shown.

**TITLE: PHOTOS OF EXISTING TANK DETAILS**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

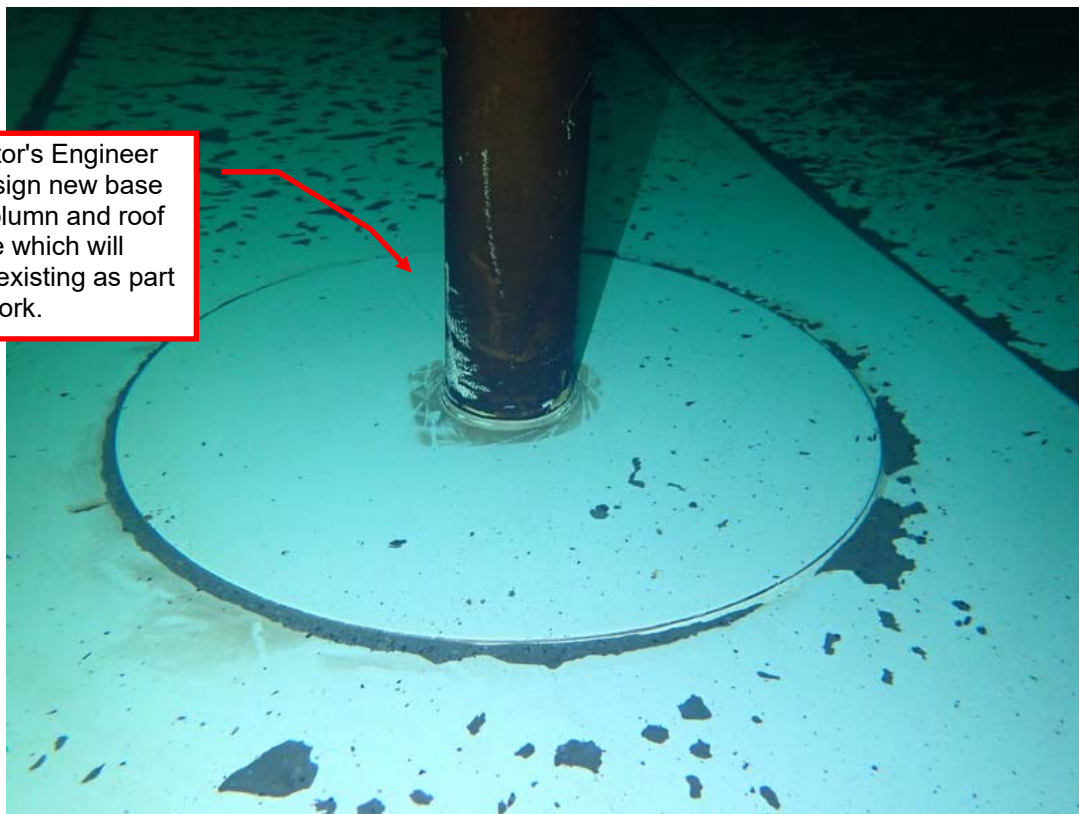
**DATE:** 5/11/2022  
(vi) Technical Specifications

ATS, Inc - Project Manual Appendix A-5





Existing roof column, roof structure and plate that are to be replaced with new formed plate roof.



Contractor's Engineer shall design new base plate, column and roof structure which will replace existing as part of this work.

Existing column and base plate.

**TITLE: PHOTOS OF EXISTING STRUCTURE TO BE REPLACED**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 5/11/2022  
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Existing cathodic protection system shall be removed as part of the work.



This photo shows the existing level gauge float and guy wire. Wear is visible from wave action produced by inlet flow. A stilling well will be provided as part of this work.

**TITLE: TANK DETAILS - EXISTING CATHODIC PROTECTION AND FLOAT**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 5/11/2022  
(vi) Technical Specifications

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Existing cathodic protection panel. The panel and post are to be removed. The wires shall be removed to the first junction box. The conduit shall be capped and abandoned in place.



The circuit breaker for the cathodic protection system is in this panel. Other items are on the same breaker.

**TITLE: PHOTOS OF EXISTING CATHODIC PROTECTION SYSTEM**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 7/3/2023  
(vi) Technical Specifications

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Apparent first junction box from the CP panel located in the well shed near the breaker box.



View of site looking northward along the eastern fence

**TITLE: PHOTOS OF CATHODIC PROTECTION CONDUIT AND SITE AT BACK FENCE**

**PROJECT:** Oceano Community Services District, Water Tank Recoating and Roof Replacement Project

**DATE:** 7/26/2023  
(vi) Technical Specifications

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