

SPECIFICATIONS - DETAILED PROVISIONS
Section 13312 - Bolted Steel Tanks for Water Storage

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SECTION 13312
BOLTED STEEL TANKS FOR WATER STORAGE

PART 1 - GENERAL

1.01 REQUIREMENT

Under these specifications the Contractor shall be required to furnish, deliver, and erect the bolted steel tank with steel roof which includes all appurtenances hereinafter described in these specifications, at the site and within the time as designated in the Special Requirements of this specification. When reference is made to other than District specifications, the latest revision shall be used.

Some work for this tank may or may not be provided by others, depending upon whether the work has been specified in the Special Conditions. Work that may be provided by others includes the following:

- Rough and/or fine grading of tank site.
- Tank foundation ring or retainer ring.
- Installation of valve pits and special piping.
- Access roads to the tank site.
- Paving to and around tank site.
- Fencing.
- Painting and coatings.

The appropriate Section, with respect to the above list, has been included within this specification or elsewhere in the Contract Documents if that work is to be provided by the tank contractor.

- A. Access Roads. Neither the terms hereof nor anything shown on the drawing in connection with the right-of-way provided by the District shall be construed to entitle the Contractor to conduct operations on said right-of-way in violation of any ordinance or regulation restricting interference with water courses and drainage channels, road, alleys, or street until he has obtained permits therefore from the proper authorities.

Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street or way during performance of the contract work and he shall so conduct his operations as not to interfere unnecessarily with the authorized work of other agencies in such streets and ways.

- B. Power. The Contractor shall provide at his own expense all necessary power required for his operations under the contract. The Contractor shall provide and maintain in good order such modern power equipment and installation as shall be adequate in the opinion of the Engineer to perform in a safe and satisfactory manner the work required by the contract.

- C. Construction Area. Sufficient area at the tank site will be provided by the District for storage of materials and operation of equipment.

1.02 QUALITY ASSURANCE

- A. Materials. All materials and articles furnished by the Contractor and used for installation in the work shall conform to the respective specifications or brands herein designated and in the event the materials are not specified in detail in these specifications, the materials shall conform to the best standard construction practice as determined by the Engineer. All materials furnished shall be subject to rigid inspection and no material shall be used in the work until it has been inspected and accepted by the Engineer.
- B. Lines, Grades and Measures. All lines and grades will be established by the Engineer and the Contractor shall provide him with such assistance and materials as may be required. The Contractor shall carefully preserve all survey stakes and reference points so far as possible. Should any stakes or points be removed or destroyed unnecessarily by any act of the Contractor or his employees, they may be reset at the Contractor's expense.

The Contractor shall inform the Engineer a reasonable length of time in advance of the times and places at which he intends to work in order that lines and grades may be furnished, that inspection may be provided, and that necessary measurements for records and payments may be made with minimum inconvenience.

1.03 SUBMITTALS

The Contractor shall furnish certified copies of reports of tests or analyses of any of the materials used in the work and in accordance with applicable specifications for the material as provided in these specifications. All certificates shall be furnished and all tests and analyses required in connection therewith shall be made at the expense of the Contractor.

The Contractor shall furnish to the Engineer as soon as issued, duplicate copies of all orders placed outside the Contractor's plant for articles or materials to be furnished by the Contractor for incorporation in the work. Said orders in all cases shall carry a notation to the effect that the articles and materials are subject to inspection and acceptance by the District, said inspection to be both during manufacture and after delivery at the site of the work. The Contractor shall also furnish the Engineer with such additional information as reasonably may be required regarding the character of the materials and the progress of their procurement.

After award of the contract and prior to any construction, the Contractor shall furnish a complete set of design drawings (including fabrication and shop drawings) that shows the tank configuration on the site which Contractor proposes to erect, including tank diameter, height, and roof type. The Contractor shall furnish the required drawings of the tank foundation for construction, and all fabrication drawings of the tank and appurtenances, and all equipment data, for approval by the

Engineer. Design calculations for the tank foundation, the tank, shell, tank roof, interior tank structural system, tank overflow, tank vent, and all related tank appurtenances shall also be submitted for approval. The tank overflow shall be designed for the flow as shown on the contract drawings, as specified in the Special Conditions, or as required by the Engineer to accommodate the tank inlet line capacity.

1.04 JOB CONDITIONS

- A. Contractor's Equipment. The Contractor shall provide such modern plant and equipment as may be necessary in the opinion of the Engineer to perform in a satisfactory and acceptable manner, and in accordance with the specifications, all the work required of the Contractor.

- B. Dust Abatement. The Contractor shall furnish all labor, equipment and means required and shall carry out protective measures wherever and as often as necessary in the opinion of the Engineer to prevent his operations from producing dust in amounts damaging to property or causing nuisance. The Contractor shall be responsible for any damage resulting from dust originating from his operations. The dust abatement measures shall be continued until all required resurfacing is completed or until the Contractor has completed arrangements with the proper authorities whereby he is relieved of further responsibility. Such arrangements shall be approved by the Engineer prior to their completion. All compensation to be received for dust abatement shall be included in the prices named for appropriate items of the bidding sheet.

1.05 PAYMENT

- A. Measurement for Payment. Quantities for furnishing all materials and erecting bolted steel tanks as shown on the Contract Drawings, as described on the Bidding Sheet and specified herein, will be measured in place on the basis of furnishing, delivery and erection of each completed tank including steel plate, accessories, miscellaneous metalwork, protective coatings, and other miscellaneous items required for the completed structure as described herein.

- B. Payment. Upon proper bonding, payment will be made in two phases:
 - 1. 80% upon completion of tank erection, less 10% retention.
 - 2. Remainder upon completion of painting, less 10% retention.

Retention amount will be paid thirty (30) days after recording of Notice of Acceptance.

Without bonding, total payment will be made thirty (30) days after recording of Notice of Acceptance.

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1.06 GUARANTEE

The Contractor hereby guarantees that the entire work constructed by him under the contract will fully meet all requirements thereof as to quality of workmanship and of materials furnished by him. The Contractor hereby agrees to make at his own expense any repairs or replacements made necessary by defective materials or workmanship supplied by him which have become evident within one (1) year after the Notice of Completion and Acceptance of the Work is filed, and to restore to full compliance with the requirements of these specifications any part of the tank or appurtenant works which during said one-year period is found to be deficient with respect to any provision of this specification. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Engineer. If the Contractor fails to make the repairs and replacements promptly, the District may do the work and the Contractor and his surety shall be liable to the District for the cost thereof.

A warranty inspection of the coating and painting shall be conducted during the eleventh month following completion of all coating and painting work. All personnel present at the preconstruction conference are requested to attend this inspection. All defective coating and painting work shall be repaired in accordance with this specification and to the satisfaction of the Engineer.

PART 2 - PRODUCT

2.01 TANK

The materials, design, fabrication and erection of bolted steel tanks shall be in accordance with the requirements of the latest revision of API (Std. 12B) Specification for Bolted Production Tanks. The tank roof shall be of steel plate supported by steel beams, and column(s) of steel pipe. All gaskets shall be made from new material, approved by the Engineer, suitable for use with storage of potable water. No vents will be permitted in the tank shell or roof except as required in these detailed specifications. Testing of the tank after erection shall be done in accordance with the requirements of these specifications.

It is the intention to use the Contractor's standard size tanks for the capacities as shown on the Bidding Sheet. The capacity of each tank shall be the rated capacity at the top of the overflow.

2.02 ACCESSORIES

The following items shall be furnished with each tank and fabrication in accordance with the applicable sections of the latest revision of the specifications stated herein, to be oriented as shown on the Contract Drawings or oriented in the field by the Engineer:

- A. Shell Manhole. As per API Std. 12B.
- B. Outside Tank Ladder. As per AWWA Specification D100, extending from top of tank to eight (8) feet above ground, with safety cage per District drawings.

- C. Inside Tank Ladder. Similar to outside tank ladder, extending from bottom of tank to roof.
- D. Roof Hatch. As per AWWA Specification D100 and District drawings.
- E. Vent. As per AWWA Specification D100, shall be located at the center of the roof and provided with screening against insects.
- F. Tank Roof Guard Rail. Per District drawing B-330 or other designated drawing.
- G. Gage Board. Shand & Jurs or approved equal in accordance with District drawing B-560 - complete with float, guides, gage board with wood backing, spring assemblies and indicator. Target shall run on two wires suspended independently from gage board, as approved.

PART 3 - EXECUTION

Compliance with Regulations. The Contractor shall familiarize himself and comply with all applicable state, county and municipal rules and regulations pertaining to sanitation, fire protection, barriers, warning lights and signs, and with forced-ventilation requirements for coating application and curing.

3.01 TANK ERECTION

The tank specified under PART 2 - PRODUCT shall be erected in accordance with the provisions of the API Standard recited in Article 2.01 of this Specification 13312, the Special Conditions, the Contract Drawings, and approved submittals.

3.02 VACUUM TESTING

After erection of the tank but before leak testing and disinfection, all joints in the tank bottom shall be vacuum tested per the procedures outlined in AWWA D-100.

3.03 EXTERIOR SURFACE COATINGS

Where required by the Special Conditions of these specifications, the Contractor shall apply coatings to all exterior surfaces of the tank and appurtenances in accordance with the requirements of the manufacturer and these specifications.

All exterior surfaces shall be given a "Commercial Blast Cleaning" per SSPC-SPG-63. Apply two (2) coats of colored Amercoat #35 to total dry film thickness of 5-6 mils. Color shall be EMWD Tan (color chip is required before application). Sandblasted surfaces shall not be left overnight before coating. The exterior surface shall be cleaned thoroughly, leaving the surface free of all dust, moisture and any impurities.

3.04 INTERIOR SURFACE COATING

Where required by the Special Conditions the Contractor shall apply coatings to all interior surfaces of the tank and appurtenances in accordance with the requirements of the manufacturer and these specifications, properly utilizing required forced-ventilation.

The interior surfaces of the tank and all appurtenances within the tank shall be thoroughly dried and blasted per SSPC-SP5-63, "White Metal Blast Cleaning". All dust shall be removed by brushing or industrial vacuum. Sandblasted surfaces shall not be left overnight prior to prime coating. Inside of tank, including bottom, shall be primed with one (1) spray coat of Amercoat #86, let dry twenty four (24) hours, then one (1) cross-spray coat of Amercoat #87 to a total dry film thickness of 8-10 mils. Connecting bolts shall be brushed with Amercoat #86 before spraying Amercoat #87. The inside final coat of paint shall be allowed to cure at least two (2) weeks before placing the tank in service.

The manhole covers shall be left open during the paint drying period to allow ventilation. A two (2) inch x six (6) inch board shall be placed over the shell manhole to prevent anyone from entering the tank. Board and bolts shall be furnished by the tank contractor.

3.05 LEAK TESTING

After completion of construction, the tank shall be filled with water and tested for leaks. All leaks shall be marked, the tank drained and repairs affected as approved by the Engineer. When accepted, the tank shall be drained and the integrity of the interior and exterior coatings restored as approved by the Engineer. The District will fill the tank and dispose of the water.

3.06 INTERIOR DISINFECTION AND CONTAMINANT ANALYSIS

In those contracts requiring the Tank Contractor to provide the interior coatings, following the manufacturer's recommended period of curing of the interior coating with the required forced-ventilation, the tank shall be filled and checked for leaks using water supplied by the District to the tank site. Prior to initial filling, the tank interior shall be washed and disinfected using a method approved by the District. One acceptable method of disinfection shall be to fill the bottom one foot of the tank with 150 ppm chlorinated water and with a pressurized hose and nozzle system, spray the entire unsubmerged portion of the tank using the 150 ppm chlorinated water source. The tank shall then be drained, refilled and left to soak for seven (7) days (ten [10] days for M.E.K.). The District will then take samples which will be analyzed for certain organic contaminants (T.C.E, P.C.E, T.C.A., Xylol, Tuluol, M.E.K., etc.) which may leach from the coating surface. Provided that the levels of organic contaminants are sufficiently low to satisfy the Sanitary Engineering Branch of the Department of Health, the tank may then be placed in service. If the organic contaminants are undesirably high, the tank will then be drained, flushed, and refilled completely, and tests will be repeated for the organic contaminants in question. The contractor will absorb the expenses of a second and subsequent tank flushing(s), filling(s), soaking(s), and organic contaminant analysis(es).

3.07 CLEANING UP DURING CONSTRUCTION

The Contractor shall keep the premises occupied by him in a neat and clean condition, and free from unsightly accumulation of rubbish. Upon completion of the work and before the final estimate is submitted, the Contractor shall, at his own cost and expense, satisfactorily dispose of or remove from the vicinity of the work all plants, buildings, rubbish, unused materials, concrete forms, and other equipment and materials belonging to him or used under his direction during the construction, and in the event of his failure to do so, the same may be removed and disposed of by the District at the Contractor's expense.

Fences on the right-of-way shall be removed by the Contractor where necessary for the performance of the work, and where required shall be rebuilt in as good condition as found. Where designated, fences shall be maintained until the work is completed or their removal is authorized. Where the Contractor removes existing fences to facilitate the work, temporary fence protection for lands adjacent to the right-of-way shall be provided at all times during the continuation of the Contract. Such temporary fence protection shall be adequate to prevent livestock from straying from or onto adjacent lands and shall be constructed complete with gates and/or cattle guards. The cost of all work described in this paragraph shall be included in the prices bid for other items of work.

END OF SECTION 13312

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