

SECTION 33 16 13.13
WELDED STEEL TANK

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Ladder Institute (ALI): A14.3, Fixed Ladders.
2. American Petroleum Institute (API): STD 650, Welded Steel Tanks for Oil Storage.
3. American Society of Mechanical Engineers (ASME):
 - a. B16.11, Forged Fittings, Socket-Welding and Threaded.
 - b. B31.3, Process Piping.
 - c. BPVC SEC VIII, Division 1, Rules for Construction of Pressure Vessels.
 - d. BPVC SEC IX, Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.
4. American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
5. American Society of Nondestructive Testing (ASNT): SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing.
6. American Society of Safety Professionals (ASSP): Z359.1, The Fall Protection Code.
7. ASTM International (ASTM):
 - a. A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - b. A106/A106M, Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
 - c. A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - d. A181/A181M, Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.
 - e. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - f. A194/A194M, Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure of High Temperature Service, or Both.
 - g. A234/A234M, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.

- h. A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- i. A312/A312M, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
- j. A516/A516M, Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.
- k. A992/A992M, Standard Specification for Structural Steel Shapes.
- l. F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
- 8. American Water Works Association (AWWA):
 - a. C200, Steel Water Pipe 6 Inches and Larger.
 - b. C207, Steel Pipe Flanges for Waterworks Service—Sizes 4 In. through 144 In. (100 mm through 3,600 mm). C228, Stainless-Steel Pipe Flange Joints for Water Service—Sizes 2 In. through 72 In. (50 mm through 1,800 mm).
 - c. D100, Welded Carbon Steel Tanks for Water Storage.
- 9. American Welding Society (AWS):
 - a. A2.4, Standard Symbols for Welding, Brazing, and Nondestructive Examination.
 - b. A3.0, Standard Welding Terms and Definitions; Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying.
 - c. D1.1/D1.1M, Structural Welding Code—Steel.
 - d. QC 1, Standard for AWS Certification of Welding Inspectors.
- 10. International Building Code (IBC).
- 11. National Association of Corrosion Engineers (NACE): SP0178, Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to be Lined for Immersion Service.
- 12. National Electrical Manufacturers Association (NEMA): 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
- 13. NSF International (NSF):
 - a. NSF/ANSI 61, Drinking Water System Components—Health Effects.
 - b. NSF/ANSI 372, Drinking Water System Components—Lead Content.
- 14. Occupational Safety and Health Act (OSHA): 29 CFR 1910, Code of Federal Regulations.

1.02 DEFINITIONS

- A. BCL: Bottom capacity level is elevation above which the required capacity is provided.
- B. CJP: Complete Joint Penetration.

- C. CWI: Certified Welding Inspector.
- D. Freeboard: Vertical distance from bottom of roof purlin at wall and TCL.
- E. MT: Magnetic Particle Testing.
- F. NDT: Nondestructive Testing.
- G. PJP: Partial Joint Penetration.
- H. PQR: Procedure Qualification Record.
- I. PT: Liquid Penetrant Testing.
- J. RT: Radiographic Testing.
- K. TCL: Top capacity level is elevation of the lip of the overflow.
- L. UT: Ultrasonic Testing.
- M. VT: Visual Testing.
- N. WPQ: Welder Performance Qualification.
- O. WPS: Welding Procedure Specification.

1.03 SYSTEM DESCRIPTION

A. Steel Tank System:

1. Welded steel tank and accessories, and anchors (if required by analysis), as specified herein.
2. Concrete for Foundation: As specified in Section 03 30 00, Cast-in-Place Concrete.
3. Piping: As specified herein and as shown on the Drawings.
4. Internal lining and external coating system.
5. Welds Joining Tank Shells: CJP butt-joint welds. PJP groove welds not permitted.
6. Minimum Shell Plate Thickness: 1/4-inch.
7. Corrosion protection for underside of tank bottom.

1.04 AMERICAN IRON AND STEEL REQUIREMENT

- ##### A.
- All iron and steel products must be produced in the United States per the American Iron and Steel (AIS) requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 and subsequent statutes mandating domestic preference. Refer to USDA Rural Utilities Service (RUS) Bulletin 1780 35 for requirements, applicability, and exceptions.

1.05 DESIGN REQUIREMENTS

- A. Design, as specified herein, a welded steel tank and associated accessories, and anchors.
- B. Tank Dimensions:
 - 1. As shown on the Drawings, Storage Capacity: 110,000 U.S. gallons.
 - 2. Elevation(s):
 - a. BCL: See WSE Low Level on Drawing 70D3001.
 - b. TCL: See WSE High Level (at 12" PE/OF) on Drawing 70D3001.
- C. Design Loads:
 - 1. In accordance with Section 01 67 00, Product Requirements.
 - 2. In accordance with General Structural Notes on Drawing No. 01S0001 and as indicated below.
 - 3. Horizontal Wind Velocity and Loads: For overall stability and anchorage of tanks, calculate wind pressures in accordance with ASCE 7, AWWA D100, and State specialty codes that govern.
 - 4. Wind Girders and Intermediate Stiffeners: In accordance with AWWA D100, Section 3.5.
 - 5. Seismic Design Loads and Factors:
 - a. See General Structural Notes on the Drawing No. 01S0001 for:
 - 1) Risk Category.
 - 2) Seismic Design Category.
 - 3) Site Class.
 - 4) Seismic Importance Factor IE.
 - 5) SS.
 - 6) S1.
 - 7) SDS.
 - b. The U Scaling Factor equals 0.67.
 - c. Use General Design Procedure AWWA D100, Section 13.2.9.2.
 - d. RI equals 3.
 - e. Rc equals 1.5.
 - f. Freeboard equals maximum of 1 foot 6 inches or as required by calculations.
 - g. Use AWWA D100 Chapter 14 for design steel stresses.
 - 6. Hydrodynamic Hoop Stress of Each Shell Course:
 - a. Compute using AWWA D100 Section 13.5.4.2.3.
 - b. Hydrodynamic Hoop Tensile Stress: Add to hydrostatic hoop tensile stress in determining total stress.
 - c. Allowable Stress: Not to exceed maximum tensile stress set forth in AWWA D100 multiplied by 1.33 factor.

7. Vertical Buckling Stress:
 - a. Compute maximum longitudinal shell compression stresses using AWWA D100, Section 13.5.4.2.1.
 - b. Calculate tank shell section modulus and determine compressive bending stress for each shell course using computed overturning moments. Add tank dead load shell stress to compressive bending stress for each shell course.
 - c. Allowable Stress: Not to exceed maximum local buckling stress set forth in AWWA D100, Table 10 or Table 11 multiplied by 1.33 factor.
 8. Effective Stress:
 - a. Calculate effective stress by combining total hydrodynamic plus static hoop tension stress with vertical compression stress using Von Mises Theory for two-dimensional stress. Assume tension stress is algebraically positive and compression stress is negative.
 - b. Allowable Stress: Not to exceed maximum tensile stress set forth in AWWA D100 multiplied by 1.33 factor.
 9. Other Loads: Painters' trolley ring, 400-pound concentrated load at any point.
- D. Welds Joining Tank Shells: CJP butt-joint welds. PJP groove welds not permitted.

1.06 SUBMITTALS

- A. Action Submittals:
1. Tank construction drawings and calculations for steel tank system and accessories.
 - a. Calculations shall be signed and sealed by Contractor's tank designer.
 - b. All details shall satisfy the minimum requirements, sizes, and factors herein specified or shown.
 - c. Details of anchor bolt assembly including size, material, and placement method.
 2. Welding Data (Shop and Field):
 - a. Show on a weld map, complete information regarding base metal specification designation, location, type, size, and extent of welds with reference called out for WPS and NDE numbers in tail of welding symbol.
 - b. Clearly distinguish between shop welds and field welds.
 - c. Welding and NDE Symbols: In accordance with AWS A2.4.
 - d. Welding Terms and Definitions: In accordance with AWS A3.0.
 - e. Submit welding data together with Shop Drawings as a complete package.

3. Notch Tough WPSs:
 - a. Notch-tough welding shall be required for welding of tank shells and annular rings for all reservoirs designed per AWWA D100, Chapter 14.
 - b. Qualify WPSs for Supplementary Essential Variables in addition to essential variables as indicated in ASME Section IX, QW-251.2. Provide heat-input table on WPSs for welder guidance.
 - c. PQRs for notch-tough welding shall document heat-input control by monitoring volts, amps, and travel speed or time-rate of change of weld metal volume as calculated by measuring change in electrode length over a period of time.
 - d. Charpy V-notch tests shall be conducted on weld metal and heat affected zone. Test coupons shall be oriented transverse to final direction of rolling. Full size Charpy specimen test acceptance shall be same as base metal specified herein.

B. Informational Submittals:

1. Manufacturer's instructions for coating systems.
2. Manufacturer's Certificate of Compliance, in accordance with Section 01 67 00, Product Requirements.
3. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 67 00, Product Requirements.
4. Manufacturer's Test Reports:
 - a. Mill certifications for steel tank plates.
 - b. Mill certifications for structural steel.
5. Credentials and Statements of Qualification of Contractor's Personnel and Subcontractors:
 - a. Tank designer.
 - b. Tank manufacturer.
 - c. Tank installer.
 - d. Welder/welder operator.
 - e. Welding inspector.
 - f. NDT personnel.
 - g. Nonshrink grout manufacturer's representative.
 - h. Painting subcontractor.
6. Welding Documentation:
 - a. Shop and field WPSs and supporting PQRs.
 - b. NDT procedure specifications.
 - c. Shop and field CWI reports.
 - d. Shop and field NDT reports.
7. Field Test Results:
 - a. Vacuum test for flat bottom floor plate welds.
 - b. Hydrostatic test report.

1.07 QUALITY ASSURANCE

A. Qualifications:

1. Tank Designer: Registered professional engineer licensed to perform specified Work in the state of the Project.
2. Tank Installer: Certified by tank manufacturer as qualified to perform specified Work.
3. Experience requirements for tank manufacturer, tank designer, and tank installer shall include five or more steel tanks presently in water service, of similar size and character to specified Work, all in satisfactory operation for minimum of 5 years.
4. Welder/Welding Operator: Qualified by tank manufacturer or Contractor in accordance with referenced welding codes.
5. CWI: Certified in accordance with AWS QC 1, and having prior inspection experience with specified welding codes.
6. Nondestructive Testing Personnel: Personnel performing tests shall be NDT Level II certified in accordance with ASNT SNT-TC-1A.
7. Nonshrink Grout Manufacturer's Representative: Authorized and trained representative of grout manufacturer with minimum 3 years' experience in successful installation on steel tank projects. See additional requirements of Section 03 62 00, Grouting.
8. Painting Subcontractor: Minimum of 5 years' experience in lining and coating of welded steel tanks for water storage.

B. Welding Documentation:

1. WPSs: In accordance with ASME BPVC SEC IX (Forms QW-482 and QW-483) for shop welding and AWS D1.1 (Annex J Forms) for field welding.
2. WPQs: Qualified by tank fabricator in accordance with ASME BPVC SEC IX (Form QW-484) for shop welding and AWS D1.1 (Annex J Forms) for field welding.
3. CWI certificate(s).
4. NDT personnel certifications.

C. Regulatory Requirements:

1. Tank Accessories: In accordance with applicable safety and building codes, including Code of Federal Regulations, 29 CFR 1910.27, Fixed Ladders, OSHA, and IBC.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel:

1. Shell and Floor: AWWA D100, Section 14.
2. Steel Plate: 1/4-inch minimum thickness.
3. Roof:
 - a. Dome type.
 - b. API STD 650 or AWWA D100.
 - c. Columns: None.
 - d. Rafters: ASTM A992/A992M wide flange beams.
4. Annular Ring: Minimum 24 inches wide and same steel material and thickness as bottom shell course.
5. Rolled Shapes: ASTM A36 or ASTM A992/A992M.
6. Anchor Bolts (if required): ASTM F1554, Grade 55 with Supplementary Requirement S1. Minimum 1-1/2-inch diameter.
7. All steel shall be painted, lined, or coated in accordance with Section 09 97 13, Steel Tank Linings and Coatings.

2.02 ACCESSORIES

A. General: All steel accessories, including but not limited to flanges and bolting hardware, shall be painted, lined, or coated in accordance with Section 09 97 13, Steel Tank Linings and Coatings.

B. Shell Manways and Nozzles:

1. Design in accordance with API STD 650 or ASME BPVC SEC VIII, Division 1.
2. Flanged and bolted type, AWWA C207, Class D, with ring gaskets as indicated in AWWA C207, Table 1.
3. Clear Opening: Minimum As shown on the Drawings.
4. Cover: Blind flange per AWWA C207, Class D. Hinge to tank shell using heavy duty hinges.
5. Bolts and Nuts: In accordance with AWWA C207.
6. Nozzles: Minimum 1/2-inch-thick; ASTM A106/A106M, Grade B, or AWWA C200 fabricated from ASTM A516/A516M, Grade 70 plate.

C. Pipe Connections:

1. Inlet-outlet and drain connections as shown on the Drawings.
2. Standard weight ASTM A53/A53M, Grade B, Type E or Type S, ASTM A106/A106M, Grade B, or as shown on the Drawings.
3. Fabricate in accordance with ASME B31.3, Normal Fluid Service category.

- D. Reinforcing Plates at Shell Openings: In accordance with API 650, Section 5.7.2.
- E. Overflow:
1. Pipe: Standard weight, ASTM A53/A53M, Grade B, Type E or Type S, or ASTM A106/A106M, Grade B, and as shown.
 2. Flanges: AWWA C207, Class D, ring type.
 3. Grind sharp edges and corners smooth.
- F. Handrails:
1. 1-1/2-inch diameter, Schedule 40 steel pipe.
 2. Roll roof handrails to radius concentric with reservoir rim.
 3. Cap and weld pipe ends to seal out moisture where platform handrail posts bear on platform grating.
- G. Ladders: In accordance with ALI A14.3 and 29 CFR 1910.27.
- H. Rest Platforms and Landings:
1. Steel Grating: Metal bar type, rectangular, open construction.
 2. Main Bearing Bars: 1-1/4 inch by 3/16 inch.
 3. Band edges with bars similar to main bearing bars.
 4. Same materials as tank.
- I. Roof Vent:
1. Round, mushroom cap type.
 2. Materials: Type 316L stainless steel. All welds pickled and passivated.
 3. Screen: 1/2-mesh, heavy gauge, tack welded around and covering all open area of vent hood, same materials as vent hood.
 4. Designed to relieve pressure or vacuum in event screen frosts over or is otherwise clogged.
 5. Vent Open Area, Minimum:
 - a. Inlet (pressure condition): 1,000 gallons per minute.
 - b. Outlet (pressure condition): 7,000 gallons per minute.
 6. Vent hood assembly easily dismantled for maintenance.
 7. Provide heat tracing for vent neck and vent screen in cold climates.
 8. Provide isolation by means of insulating flange kit between vent hood base flange and tank flange connection.
- J. Caulking Manufacturer and Product: Sika; Flex 1A sealant.
- K. Anchor Bolts and Nuts: ASTM A193/A19eM, Grade B7 with ASTM A194/A194M, Grade 2H heavy hex nuts.

- L. Threaded Couplings: Black, forged steel, Class 3000, ASME B16.11.
- M. Pipe and Fittings:
 - 1. Steel Pipe 48-Inch and Smaller: ASTM A53/A53M, Type E or Type S, Grade B or ASTM A106/A106M, Grade B.
 - 2. Elbows and Tees: ASTM A181/A181M and ASTM A234/A234M, beveled ends for CJP butt-joint welding or attaching flanges. Extra Strong.
- N. Flanges: AWWA C207, Class D, unless shown otherwise.
 - 1. Gaskets: AWWA C207, Table 1.
 - 2. Bolts: ASTM A193/A193A, Grade B7 with ASTM A194/A194M, Grade 2H, heavy hex nuts.
- O. Safety Climb Device:
 - 1. Manufacturer and Product: Honeywell/Miller Saf-T-Climb Ladder System, or equal.
 - 2. General:
 - a. Furnish complete safety climb fall prevention systems for all ladders.
 - b. Furnish all accessories required to complete the system for each specific ladder.
 - c. Main System Components: Notched rail, rung clamps, dismount extension, grip shuttle, and climb harnesses.
 - d. Provide two climb harnesses for each ladder.
 - 3. Physical Characteristics:
 - a. Material: All components of the system shall be constructed of Type 316L stainless steel.
 - b. Dismount Extension: Removable extension kit for inside ladder with tie-down rod, mandrel, and carrier rail.
 - 4. Functional Characteristics: Each complete system shall allow the worker to operate freely in a normal climbing position during ascent or descent.
 - 5. Performance Characteristics: Test equipment in accordance with ALI A14.3. Test harnesses in accordance with ASSE Z359.1.

2.03 FABRICATION

- A. General:
 - 1. AWWA D100, Section 9 and Section 10.
 - 2. Shell Plate: Shop bent to radius shown.
 - 3. Lining: In accordance with Section 09 97 13, Steel Tank Linings and Coatings.

B. Welding:

1. Shell: CJP butt-joint welds on circumferential and longitudinal joints.
2. Overflow Pipe: Weld support straps to pipe prior to coating interior of pipe.
3. Ladder Guard: Weld hinges and hasp staple to ladder rails.

C. Finish:

1. Shop primer steel surfaces in accordance with Section 09 97 13, Steel Tank Linings and Coatings, unless otherwise noted.
2. Prepare galvanized surfaces to be painted in the field approximately 48 hours to 72 hours before painting as specified in Section 09 97 13, Steel Tank Linings and Coatings.
3. Hot-dip galvanize exterior handrails after fabrication in accordance with ASTM A123/A123M. Field cutting or welding of galvanized parts will not be permitted.
4. For items embedded in concrete, coat as specified in Section 09 90 00, Painting and Coating.
5. Galvanize components of bolted assemblies separately before assembly. Galvanizing of tapped holes is not required.

2.04 SOURCE QUALITY CONTROL

A. CWI shall be present whenever shop welding is performed.

B. CWI shall perform inspection at suitable intervals prior to assembly, during assembly, during welding, and after welding.

C. CWI duties include:

1. Verifying conformance of specified job material and proper storage.
2. Monitoring conformance with approved WPS.
3. Monitoring conformance of WPQ.
4. Inspecting weld joint fit-up and in-process inspection.
5. Providing 100 percent visual inspection of welds.
6. Coordinating with nondestructive testing personnel and reviewing test results.
7. Maintaining records and preparing report confirming results of inspection and testing comply with the Work.

PART 3 EXECUTION

3.01 CONCRETE

A. Placement: As specified in Section 03 30 00, Cast-in-Place Concrete.

3.02 GROUT

- A. Ringwall or Slab: Fill 6-inch wide by minimum 1-1/2 inch space between steel tank baseplate and ringwall or slab as specified in Section 03 62 00, Grouting.

3.03 TANK ERECTION

- A. General: Do not field bend steel plate.
- B. Anchor Bolts: Use anchor bolts to anchor tank to concrete foundation (if required by analysis).

3.04 WELDING

- A. General:
 - 1. Meet requirements of AWWA D100, ASME BPVC, SEC IX, Part QW for shop welding, and AWS D1.1 for field welding, except as modified herein.
 - 2. Welding shall be done only in presence of CWI.
 - 3. Shell Seams and Annular Rings: CJP butt-joint welds.
 - 4. Roof Vent: Continuously weld joints for watertight installation.
- B. Roof:
 - 1. Double-Curved Plates: Complete penetration butt-joint welded.
 - 2. Flat or Single-Curved Plates: Double-fillet welded.
 - 3. Continuously seal weld roof rafters to roof plates (interior and exterior).
 - 4. Continuously seal weld all other roof exterior and interior joints to preclude crevice corrosion and rust discoloration.
- C. Shell:
 - 1. Single-Curved Plates: CJP butt-joint groove welded.
 - 2. Openings: Groove or fillet welded. Provide post weld heat treatment of CJP butt joint welds in material thicker than 1-1/2 inches.
 - 3. Shell to Floor or Annular Ring:
 - a. Mechanically Anchored Tank (if required by analysis): Double fillet welded.
 - b. Self-Anchored Tank: CJP butt-joint welded with fillet transitions or double-sided fillet welds.
- D. Floor:
 - 1. Floor Plates: CJP butt joint welded.
 - 2. Openings: Groove or fillet welds.

E. Accessories and Attachments:

1. Joints: Seal welded, as minimum.
2. Steel Piping: CJP butt-joint welded.

3.05 WELD DEFECT REPAIR

- A. Repair and retest rejectable weld defects until sound weld metal has been deposited in accordance with weld acceptance indicated herein.

3.06 SAFETY CLIMB DEVICE

- A. Install mandrel in accordance with manufacturer's instructions to enable the worker to be attached to device at all times during climb without having to remove hands from ladder to operate system effectively, and able to easily pivot onto and off of rest platforms or landings while safely attached to device.
- B. When installed to any height, fall prevention system shall be extremely rigid and combine to become an integral part of structure.

3.07 FIELD FINISHING

- A. As specified in Section 09 97 13, Steel Tank Linings Coatings.

3.08 FIELD QUALITY CONTROL

- A. CWI shall be present whenever field welding is performed. CWI shall perform inspection at suitable intervals prior to assembly, during assembly, during welding, and after welding. CWI duties include:
1. Verifying conformance of specified job material and proper storage.
 2. Monitoring conformance with approved WPS.
 3. Monitoring conformance of WPQ.
 4. Inspecting weld joint fit up and in-process inspection.
 5. Providing 100 percent visual inspection of welds.
 6. Coordinating with nondestructive testing personnel and reviewing test results.
 7. Maintaining records and preparing report confirming results of inspection and testing comply with the Work.
- B. Weld NDT:
1. 100 percent VT by CWI of all welds for acceptance in accordance with AWS D1.1/D1.1M, Table 8.1 for Statically Loaded Nontubular Connections, unless more stringent NDT is required in this specification section.

2. Roof: MT at 10 percent rate per AWS D1.1/D1.1M, Table 8.1 for statically loaded nontubular connections.
3. Shell: Spot RT examine per AWWA D100, Sections 11.5, 11.6, or Chapter 14 as appropriate.
 - a. Openings:
 - 1) Groove Welds: 100 percent UT in accordance with ASME BPVC SEC VIII, Div. 1, Paragraph UW-53, and Appendix 12.
 - 2) Fillet Welds: 100 MT in accordance with AWS D1.1/D1.1M, Table 8.1 for Statically Loaded Nontubular Connections.
 - b. Connection to Floor: 100 percent MT in accordance with AWS D1.1/D1.1M, Table 8.1 for Statically Loaded Nontubular Connections.
4. Floor Opening Welds: 100 percent examine using NDT methods specified for shell opening welds.
5. Anchor Bolt Attachment Welds:
 - a. 100 percent NDT of all welds that support first three consecutive anchor bolts at tank base as follows:
 - 1) Fillet Welds: MT in accordance with AWS D1.1/D1.1M, Table 8.1 for Statically Loaded Nontubular Connections.
 - 2) Groove Welds: UT in accordance with ASME BPVC, SEC VIII, Div. 1, UW-53, and Appendix 12.
 - b. If rejection rate exceeds 5 percent, 100 percent examine next three anchor bolt supports using same testing procedures and acceptance criteria.
 - c. If rejection rate is less than 5 percent, testing rate may be reduced to 20 percent.
 - d. Engineer will determine welds to be tested.
6. Accessories and Attachments: MT at 10 percent rate in accordance with AWS D1.1/D1.1M, Table 8.1 for Statically Loaded Nontubular Connections.

C. Field Tests: In accordance with AWWA D100, Section 11:

1. Vacuum test flat bottom floor plate welds.
2. Hydrostatically test tank after painting is complete.

3.09 SUPPLEMENT

- A. The supplement listed below, following “End of Section,” is a part of this specification:
 1. Welded Steel Tank Data Sheet.

END OF SECTION