

1 General

1.1 **WORK INCLUDED**

- .1 Supply, factory test and clean, deliver, unload and install three new aboveground carbon steel storage tanks as follows:
 - .1 Engine Oil (EO)
 - .2 Waste Engine Oil (WO)
 - .3 Waste Engine Anti-Freeze (WAF)
- .2 Tank size, capacity, design, and construction are as detailed on drawings and as specified herein including:
 - .1 Preparation, prime and finish painting of non-stainless steel tanks exterior and accessories
 - .2 Tank fittings and accessories
 - .3 Inspection and shop testing for leakage

1.2 **QUALITY ASSURANCE**

- .1 Fabricate ULC listed and labelled tanks in conformance with Gasoline Handling Act and NFC requirements.

1.3 **REFERENCES**

- .1 Conform to the latest edition of the following:
 - .1 ASTM A36 - Standard Specification for Carbon Structural Steel
 - .2 ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 - .3 ASTM A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
 - .4 SSPC - Steel Structures Painting Council "Steel Structures Painting Manual"
 - .5 CAN-S601 - Standard for Shop Fabricated Steel Aboveground Tank for Flammable and Combustible Liquids
 - .6 ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip (Withdrawn 2014)
 - .7 ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes

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| .8 | ASTM A209-88A | - Standard Specification for Seamless Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes |
| .9 | ANSI/ASME B36.19M | - Stainless Steel Pipe |
| .10 | AWS A5.4 | - Specification for Stainless Steel Electrodes for Shielded Metal Arc Welding |
| .11 | AWS A5.9 | - Specification for Bare Stainless Steel Welding Electrodes and Rods |
| .12 | AWS C5.5 | - Gas Tungsten Arc Welding, Recommended Practices for |
| .13 | AWS C5.6 | - Gas Metal Arc Welding, Recommended Practices for |
| .14 | CAN/CSA-G40.20/G40.21-M | - General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel |
| .15 | CSA W47.1 | - Certification of Companies for Fusion Welding of Steel |
| .16 | CSA W48.1-M | - Filler Metals and Allied Materials for Metal Arc Welding |
| .17 | CSA W59-M | - Welded Steel Construction (Metal Arc Welding) |
| .18 | CAN/CSA-W117.2-M | - Safety in Welding, Cutting and Allied Processes |
| .19 | CSA W178.1 | - Certification of Welding Inspection Organizations |
| .20 | CSA W178.2 | - Certification of Welding Inspectors |

1.4

SUBMITTALS

- .1 Submit Shop Drawings, design calculations, and applicable manufacturer Product data for the following, in accordance with Section 01 33 00.
 - .1 Materials and paint systems
 - .2 Criteria on which tanks have been designed
 - .3 Certificate of conformance to governing authorities
 - .4 Arrangement and details of tanks, accessories, internal piping and supports
 - .5 Mill certificates for steel
 - .6 Shipping and operating weights and dimensions
 - .7 Manufacturer's warranties and guarantees
- .2 Submit written inspection reports and test certificates as specified herein.

2 Products

2.1 **MATERIALS**

- .1 Plates: Conforming to ASTM A283.
- .2 Stainless steel: SA-260 type 304L stainless steel.
- .3 Structural members and miscellaneous metal fabrications: Steel conforming to ASTM A36 or CAN/CSA G40.20/G40.21-M.

2.2 **FABRICATION**

- .1 Welding shall be performed by qualified operators per CSA W47.1 in compliance with W48.1 and W59-M.

2.3 **ABOVEGROUND STORAGE TANKS**

- .1 Furnish tanks and accessories for all process fluid tanks included in this project.
- .2 The tank manufacturer and Subcontractor shall jointly design, fabricate, deliver, erect, fit, and test the aboveground horizontal storage tanks for flammable and combustible liquids, complete with all accessories/appurtenances, wear plates, saddles, grounding pads, openings and nozzles, heater and insulation as specified and indicated on the drawings for the process fluids to be stored and dispensed.
- .3 Tank capacity, openings and nozzles, size, orientation and configuration shall be as scheduled and indicated on the drawings and finalized on reviewed Shop Drawings. Flange connection shall be Class 150.
- .4 All tanks to be ULC listed conforming to CAN4-S601-M.
- .5 Seal welded shell protecting wear plates at fill lines, gauge ports, recirculating ports, internal pump suctions and where indicated.
- .6 Provide studs on top of tank for platform supports.
- .7 Provide pads welded to each end of tank for connection to ground grid.
- .8 Comply with referenced CSA standards for welding materials, methods, welding atmosphere, quality control and non-destructive testing.
- .9 Clean welds by removing all scale, slag, splatter and burrs. Grind rough areas of all welds smooth on exterior and flush on interior.
- .10 Shop test fabricated tank to conform to the testing pressures, methods and procedures established in the referenced codes. Where leaks are detected, repair welds as recommended by the codes.
- .11 After fabrication of the tanks, blast clean interior and exterior surfaces including all appurtenances and accessories of uncoated ferrous material per SSPC-SP6 "System and Specifications Steel Structural Painting Manual". Remove grit from blasting and vacuum clean all surfaces. Ensure all welds are complete and ground smooth per SSPC recommendations.
- .12 Provide paint coating system manufacture by Carboline Company, Glidden Co. Ltd., Futura Coating Inc., or PPG Industries.

- .13 Provide the following paint coating systems or approved equivalent by one of the manufacturers specified herein:
 - .1 Primer: Carboline Company "Carbo Zinc II"
 - .2 Topcoat: Glidden Co. Ltd. "5200 Series" polyamide epoxy coating
- .14 Shop apply protective coating to exterior surface of carbon steel tanks per manufacturer's recommendation. Apply two-coat system to 3 mil of primer and 5 mil of top coat dry film thickness. Apply 3 mils of primer to carbon steel tanks to be covered with thermal insulation.
- .15 Internally and externally passivate stainless steel tanks in accordance with ASTM A380.
- .16 All openings in the tank shall be sealed using throw away graphite gaskets and blind flanges, or plugged after cleaning during shipping and field erection and testing. Manhole bolts shall be stainless steel. All other bolts may be stainless steel or otherwise shall be corrosion protected to prevent rust.
- .17 Ship tanks under nitrogen blanket.
- .18 Tanks shall be pressure tested with nitrogen gas per ULC requirement after erection on Site.
- .19 For ATF, EGF, PSF tanks, provide heater wells, pipe inserted heaters, heater controller with contactors, thermal insulation and aluminum cladding as indicated to maintain tank temperature at 15°C.
- .20 Acceptable tank manufacturers:
 - .1 Clemmer Industries Ltd.
 - .2 DTE Industries Ltd.
 - .3 O'Connor Tanks Ltd.

3 Execution

3.1 **INSPECTION AND TESTING**

- .1 Provide necessary equipment and perform Work required to inspect and test tanks to conform to ULC and NFC requirements.

3.2 **SUPERVISION**

- .1 Coordinate with **Section 15996** and provide supervision for:
 - .1 Unloading, transportation to final location, and installation of equipment.
 - .2 Connection of piping to equipment.
- .2 Submit report of satisfactory completion of Work to Owner's Representative.

3.3 **TESTING AND COMMISSIONING**

- .1 Provide all supervision and engineering support necessary to assist tank installer to test and commission equipment and prove performance meets specified requirements.

- .2 All tanks have been specified to be delivered sealed after factory inspection, cleaning and passivation. It is intended that the Contractor maintain the integrity of the seals/closures, and to warrant the level of cleanliness during the installation process so that no field cleaning and flushing of the tank will be necessary.
- .3 To test the cleanliness of the tanks interior after completion of installation and prior to filling, the Contractor shall perform the following sampling and test:
 - .1 Test tank for ground continuity.
 - .2 Purge oxygen from tank to less than 3% by volume with not less than 3 to 5 tank volumes of nitrogen.
 - .3 Obtain virgin fluids from the respective suppliers (check with Owner prior to purchase). Test with a minimum of two 200 L drums of virgin fluid per tank.
 - .4 From the most convenient access, inject the virgin fluid through at least three points including opposite ends. The Contractor and Owner's Representative shall sample fluid from the tank and send sample to the Supplier for analysis. Obtain written approval from the Supplier that the sampled fluid is acceptable for cleanliness.
 - .5 If the tank cleanliness is not acceptable, the Contractor and the tank manufacturer shall develop a written procedure to clean the tank on site in a safe manner acceptable to the Owner.
 - .6 Upon written acceptance of tank cleanliness from the Owner, the tanks shall then be filled with the Products as provided by the Owner.

End Of Section