

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

1. GENERAL

1.1 Scope

.1 The following statement generally describes the scope of work covered by this Section. All tank volumes are nominal, and tanks shall be selected accordingly from the manufacturer's standard product line :

.1 Provision of:

.1 Double Wall Steel Tanks

.1 25,000 Litre Diesel exterior

.2 Combined/compartmentalized 5,000 litre Diesel / 2,500 litre Gasoline exterior.

.3 Three inside day tanks.

.2 Tank Skid as indicated.

.3 Platforms as indicated.

.4 Emergency and normal vents and terminations.

.5 Overfill limiters.

.6 Anti-siphon devices.

.7 Tank level indicating/switching.

.8 Interstitial space monitoring.

1.2 Related Requirements

.1 Division 1 – General Requirements.

.2 Section 23 11 27 – Piping and Fittings.

.3 Division 25 – Controls.

1.3 References

.1 CAN/CSA-B139-09, Installation Code for Oil Burning Equipment.

.2 CCME PN 1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, as amended by the Manitoba Regulation 188/2001 – the Dangerous Goods Handling and Transportation Act.

.3 CSA 22.1, Canadian Electrical Code.

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .4 CPPI – Recommended Practice: Operation of Shop Fabricated Aboveground Petroleum Storage Tank Systems.
- .5 Canadian Environmental Protection Act.
- .6 National Building Code of Canada 2010, as amended by the Manitoba Building Code.
- .7 National Fire Code of Canada 2010, as amended by the Manitoba Fire Code.
- .8 Standards and Practices for Instrumentation, Tenth Edition – 1989.
- .9 Transportation of Dangerous Goods Act.
- .10 ULC-C842, Valves for Flammable and Combustible Liquids.
- .11 WHIMS Workplace Hazardous Material Information System.
- .12 The Master Painters Institute (MPI).
 - .1 Architectural Painting Specification Manual - September 2002.
- .13 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .14 Underwriters' Laboratories of Canada (ULC).
 - .1 ULC-S601-2007, Shop Fabricated Steel Aboveground Tanks for Flammable and Combustible Liquids.
 - .2 ULC-S653-06, Aboveground Steel Contained Tank Assemblies for Flammable and Combustible Liquids.

1.4 Action and Informational Submittals

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate details of construction, appurtenances, installation, and leakage detection system.
- .3 Shop drawings to detail and indicate the following as applicable to project requirements. Submit manufacturer's product data to supplement shop drawings.
 - .1 Overfill Protection Valve and Drop Tube.
 - .2 Monitoring Devices and level float switches.
 - .3 Signage.
 - .4 Leak Detection provisions (access to the secondary containment).
- .4 Shop drawings to show the following information:

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .1 Size, materials and locations of ladders, ladder cages, catwalks and lifting lugs.
 - .2 Tank capacity.
 - .3 Size and location of fittings.
 - .4 Environmental compliance package accessories.
 - .5 ULC Label, type size and location.
 - .6 Accessories: provide details and manufacturers product data.
 - .7 Size, materials and locations of railings, stairs, ladders and walkways.
 - .8 Finishes.
 - .9 Piping, valves and fittings: type, materials, sizes, piping connection details, valve shut-off type and location.
 - .10 Spill containment on vessel fill connection.
 - .11 Grounding and bonding: provide details of design, type, materials and locations.
- .5 Provide maintenance data for tank appurtenances for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .5 Ensure emptied containers are sealed and stored safely.

2. PRODUCTS

2.1 General

- .1 Supply and install tanks in conformance with all applicable regulations and permit requirements whether specifically named or not below. The tanks shall meet the following criteria.
- .2 The tanks shall be double-walled steel tanks constructed in conformance with ULC-S601-00, "Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids".

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .3 Tanks shall be in compliance with all applicable provisions of the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, PN 1326, 2003 (CCME Code) as amended by, and must be eligible for permitting under, Manitoba Regulation 188/2001.
- .4 Tanks shall be suitable for tight-fill connections.
- .5 Tanks shall be supplied complete with:
 - .1 Lifting lugs.
 - .2 Supports suitable for direct placement on a flat surface, as indicated below or on the Drawings.
 - .3 Regulatory signs and information decals, and additional signs as indicated on the Drawings.

2.2 Outdoor Diesel Fuel Storage Tank

- .1 Horizontal cylindrical tank.
- .2 Tank nominal capacities shall be:
 - .1 One of 25,000 litre capacity.
- .3 Compatible with biodiesel fuel up to a B50 blend (50% biodiesel to 50% diesel fuel), ultra-low sulphur diesel fuel and marked diesel fuel.
- .4 Tanks shall be designed with all code require fittings, including the fittings indicated herein and on the drawings:
 - .1 50 mm fuel outlet with suction tube to within 150 mm of tank bottom.
 - .2 Emergency vent on primary.
 - .3 50 mm fuel dip port.
 - .4 50 mm for mechanical level indicator.
 - .5 100 mm top connection fill opening, with overfill protection, drop tube to within 150 mm of tank bottom, and wear plate.
 - .6 Water draw off connection with tube to within 6mm of bottom of primary tank.
 - .7 50 mm vent on primary.
 - .8 100 mm spare on primary.
 - .9 Emergency vent on containment.
 - .10 100 mm secondary containment monitor bung with plug.

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .5 Finish:
 - .1 Surface preparation and basecoat/primer to coating manufacturer's recommendations.
 - .2 High-build polyurethane coating, or approved equivalent in accordance with B7.
 - .3 Colour: white.
- .6 Accessories:
 - .1 Proprietary type galvanized channel track supports ("Unistrut or approved equivalent in accordance with B7) for end mounting of piping and devices.
 - .2 All regulatory labels and decals.
 - .3 City of Winnipeg Labelling as indicated on the Drawings.
 - .4 Heavy duty full length skid, with extensions suitable for mounting of pump packages and hose reels, and as indicated on the Drawings.
 - .5 Tank top grating type platform:
 - .1 For access to monitoring ports and devices, with dual rail guard rail on all open sides.
 - .2 Parallel to tank access stair, open riser, serrated or equivalent open tread surface, with dual rail guard rail on open side.
 - .3 As indicated on the drawings.
 - .7 Acceptable material: Westeel, Steelcraft-Clemmer, or approved equal in accordance with B7.

2.3 Indoor Diesel Fuel Auxiliary (Day) Steel Tanks

- .1 Tanks shall be horizontal tanks, with vertical "oval" shape.
- .2 The tanks shall be compatible with biodiesel fuel up to a B50 blend (50% biodiesel to 50% diesel fuel), ultra-low sulphur diesel fuel and marked diesel fuel.
- .3 The tank for the low-lift pump engine and for the generator engine shall be designed with top fittings for/as follows:
 - .1 50 mm engine supply connection bung, located on the end of the tank, near the bottom, so that 5% of the tank volume remains below the bottom of that connection point.
 - .2 Emergency vent on primary.
 - .3 50 mm top connection fill opening, with mechanical overfill protection, drop tube to within 150 mm of tank bottom, and wear plate.
 - .4 50 mm fuel dip/metering port.

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .5 50 mm mechanical fuel level monitoring device bung, near tank centre.
 - .6 Two 50 mm Engine fuel return connections.
 - .7 50 mm overflow / regular vent connection.
 - .8 50 mm primary water draw off connection with tube to within 6 mm of tank bottom.
 - .9 Emergency vent on containment.
 - .10 50 mm containment space monitoring port.
- .4 The tanks for the two fire pump engines shall be designed with top fittings as indicated below. The engine fuel supply connection shall be located on the end of the tank, near the bottom, so that 5% of the tank volume remains below the bottom of that connection point.
- .1 50 mm front mounted engine supply connection bung, located on the end of the tank, near the bottom, so that 5% of the tank volume remains below the bottom of that connection point.
 - .2 Emergency vent on primary.
 - .3 50 mm top connection fill opening, with mechanical overfill protection, drop tube to within 150 mm of tank bottom, and wear plate.
 - .4 50 mm fuel dip/metering port.
 - .5 50 mm mechanical fuel level monitoring device bung, near tank centre.
 - .6 50 mm Engine fuel return connections.
 - .7 50 mm overflow / regular vent connection.
 - .8 50 mm primary water draw off connection with tube to within 6 mm of tank bottom.
 - .9 Emergency vent on containment.
 - .10 50 mm containment space monitoring port.
- .5 Finish:
- .1 Surface preparation and basecoat/primer to coating manufacturer's recommendations.
 - .2 Powder Coated.
 - .3 Colour: white.
- .6 The tank approximate capacities shall be:
- .1 Two of 450 litre capacity, one for each Fire Pump.
 - .2 One of 1000 litre capacity for low lift pump and generator set.

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .7 Acceptable material: Westeel, or approved equal in accordance with B7.

2.4 Outdoor Combined Compartmentalized Steel Diesel and Gasoline Storage Tank

- .1 Diesel tank shall be compatible with biodiesel fuel up to a B50 blend (50% biodiesel to 50% diesel fuel), ultra-low sulphur diesel fuel and marked diesel fuel.
- .2 The gasoline tank shall be compatible with gasoline fuel and ethanol fuel up to an E85 blend (85% ethanol to 15% gasoline).
- .3 Tank nominal capacity:
 - .1 Diesel: 5,000 litres.
 - .2 Gasoline: 2,500 litres.
- .4 Tanks shall be designed with all code require fittings, including the fittings indicated herein and on the Drawings:
 - .1 50 mm fuel outlet with suction tube to within 150 mm of tank bottom.
 - .2 Emergency vent on primary.
 - .3 50 mm fuel dip port.
 - .4 50 mm for mechanical level indicator.
 - .5 100 mm top connection fill opening, with overfill protection, drop tube to within 150 mm of tank bottom, and wear plate.
 - .6 Water draw off connection and tube to within 6mm of bottom of primary tank.
 - .7 50 mm vent on primary.
 - .8 100 mm spare on primary.
 - .9 Emergency vent on containment.
 - .10 100 mm secondary containment monitor bung with plug.
- .5 Finish:
 - .1 Surface preparation and basecoat/primer to coating manufacturer's recommendations.
 - .2 High-build polyurethane coating, or approved equivalent in accordance with B7.
 - .3 Colour: white.
- .6 Accessories:
 - .1 Proprietary type galvanized channel track supports ("Unistrut or approved equivalent in accordance with B7) for end mounting of piping and devices.

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .2 All regulatory labels and decals.
- .3 City of Winnipeg Labelling as indicated on the drawings.
- .4 Shared access platform
 - .1 Grating type platform deck with single guard rail on end both side along tank.
 - .2 In line access stair, open riser, serrated or equivalent grating tread surface, with single guard rails on both sides.
 - .3 To provide access to all manual tank dip monitoring locations.
 - .4 As indicated on the drawings.
- .7 Acceptable material: Westeel, Steelcraft-Clemmer or approved equal in accordance with B7.

2.5 Overfill Protection Devices

- .1 All tanks shall be equipped with mechanical overfill devices.
- .2 Float-operated in-line mechanical valve complete with aluminum drop-tube to automatically shut-off the flow of fuel into the tank when the tank reaches 95% full level.
- .3 Non-shocking closure/fuel stop.
- .4 Construction:
 - .1 To ULC-S661.
 - .2 Corrosion resistant material compatible with product being stored.
 - .3 Unimpeded float movement from fully open to fully closed position.
 - .4 Overfill Protection Valve to bleed pressure from the fill line into the tank to prevent over pressurization due to thermal expansion.
 - .5 Aluminum drop-tube to 150 mm above the tank bottom elevation.
 - .6 Stainless steel, aluminum other compatible corrosion-resistant pipe material to connect the overfill protection valve to the NPS half-coupling in the tank shell.
 - .7 Acceptable material:
 - .1 Storage Tanks: Clay & Bailey Model 1228-03-2216. 2x4 Fill Valve.
 - .2 Day Tanks: Clay & Bailey 1228-03-1206 1x2 Fill Valve.

2.6 Grounding and Bonding

- .1 To Section 26 05 00 - Common Work Results - Electrical.

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

2.7 Mechanical Level Monitoring System

- .1 Level indicators are to be mechanical gauges in a totally enclosed environment.
- .2 Gauge body to include large viewing window, light aperture to illuminate the gauge with ambient or external flashlight.
- .3 All components to be rated for the end use liquid.
- .4 Tape to be operated by the counterweight on one end of tape maintaining tension and counterbalancing a float on the opposite end of the tape.
- .5 The tape shall be marked in increments of 1.5 mm (1/16") and be readable from up to 3.6 m away.
- .6 Overall length of gauge tape to be suitable for tank depth, marked in 3 sections with range of 0 - 3.6 m (0 - 144") of fuel depth.
- .7 Gauge body tapped for installation on a 50 mm threaded pipe riser above the top of the tank.
- .8 Acceptable material: Clay & Bailey model 1313-02 series or approved equivalent in accordance with B7.

2.8 Fire Pump Secondary Containment Fuel Tank Monitoring Systems

- .1 Refer Division 25.

2.9 Day Tank Level Switching and Alarm System

- .1 Refer Division 25

3. EXECUTION

3.1 Installation

- .1 Install tanks in accordance with the National Fire Code of Canada and manufacturer's recommendations and CCME PN 1326.
- .2 Position tanks using lifting lugs and hooks, and where necessary use spreader bars. Do not use chains or straps in contact with tank walls.
- .3 Install tanks using licensed and certified installers.
 - .1 Anchor tanks to foundation.
 - .2 Install vent risers, guardrails, handrails, platforms and stairs.
 - .3 Install new NPS 75 floating suction and overfill protection valve with drop-tube into tank interior once tank is installed on its final foundations.
 - .4 Provide all required signage not currently present on the tanks that is required by codes and regulations, including but not limited to:

ABOVEGROUND FUEL STORAGE AND SUPPLY TANKS AND DEVICES

- .1 C.P.P.I. product identification tag on the fill connection within the spill box.
 - .2 No Smoking signage in bilingual language or international symbols.
 - .3 Signage about keeping flames and sources of ignition more than 7.5 m away from the tanks.
 - .4 T.D.G. placard with U.N. number for product on end of tank facing the pavement area (south).
- .4 Provide certification of installation to Contract Administrator.

3.2 Field Quality Control

- .1 Test tanks for leaks to requirements of the National Fire Code of Canada once installed on their new foundation and prior to the connection of any piping. Conduct test in the presence of the authority having jurisdiction.

3.3 Touch-Up

- .1 Where existing exterior finish of the tanks' coating is damaged, touch-up with original coating material.

3.4 Day Tank Level Alarm and Leak Detection Systems

- .1 Refer Division 26.

END OF SECTION