

data to supplement shop drawings.

- .1 Size, materials and locations of ladders, ladder cages, catwalks and lifting lugs.
 - .2 Tanks capacity.
 - .3 Size and location of fittings.
 - .4 Accessories: provide details and manufacturers product data.
 - .5 Finishes.
 - .6 Electronic accessories: provide details and manufacturers product data.
 - .7 Piping, valves and fittings: type, materials, sizes, piping connection details, valve shut-off type and location, etc.
 - .8 Anchors: description, material, size and locations.
 - .9 Level gauging: Provide details and manufacturer's product data.
 - .10 Ancillary devices: provide details and manufacturer's product data.
- .4 Provide maintenance data for tank appurtenances for incorporation into Operations and Maintenance Manual as specified in Section 01 77 00 - Closeout Procedures.

Part 2 - Products

2.1 TANKS: CONVENTIONAL STEEL

Aboveground Steel Tanks - ULC S601

The Contractor is required to supply and install three (3) new, aboveground double-walled steel ULC S601 petroleum storage tanks (4,546 litres Diesel for Generator #1 and 9,100 litres Heating Oil for Lauzier Building Heating System, and 1,135 litres Diesel for Lauzier Building Motive Fuel-Dispensing). The tanks are to be shop fabricated and come complete with the following:

- access stair and fill platform (see dwg for

- minimum arrangement, size and orientation for each system)
- tank decals on three (3) sides indicating storage capacity and product stored (diesel and heating oil)
 - ULC identification tag
 - spill containment boxes with 100mm or 50mm fill connection, 32mm dip port and spare 19mm fitting as per the design drawings
 - tank gauges as indicated on the design drawings (OPW 200TG or equal, typ.)
 - overfill prevention (vent whistles and/or positive closing valves as per the design drawings)
 - interstitial vacuum monitoring with vacuum gauge in protective cover with visual access
 - interstitial relief vent
 - emergency venting c/w gasketed covers
 - dip-stick and holder (as indicated on drawings)
 - two support saddles (100% welded to tank) with four (4) 25mm (1") anchor holes
 - laminated dip chart
 - shop painted with 3-part zinc primer, 2-part epoxy base coat, 2-part polyurethane high gloss finish on final coat.

The tank saddles shall have four 25 mm diameter holes for anchoring to concrete pad. The tank access ladder with fill platform shall be galvanized steel.

Tank Fitting Requirements:

- Diesel Generator #1:
 - o 7 - 100mm (4") Dia. Bungs
 - o 1 - Spill Containment Box (12"x18", 12" high)
 - One x 32mm (1 ¼") Dia. Dip Port
 - One x 100 mm (4") Dia. Fill

- One x 20mm ($\frac{3}{4}$ ") Dia.
- Lauzier Building Heating Oil:
 - 5 - 100mm (4") Dia. Bungs
 - 1 - Spill Containment Box (12"x18", 12" high)
 - One x 32mm (1 $\frac{1}{4}$ ") Dia. Dip Port
 - One x 100mm (4") Dia. Fill
 - One x 20mm (3/4") Dia.
- Lauzier Building Diesel Fuel-Dispensing:
 - 3 - 50mm (2") Dia. Bungs
 - 1 - Spill Containment Box (12"x18", 12" high)
 - One x 32mm (1 $\frac{1}{4}$ ") Dia. Dip Port
 - One x 50mm (2") Dia. Fill
 - One x 20mm (3/4") Dia.

Aboveground Steel Tank - ULC S602

The Contractor is required to supply and install one (1) new, aboveground double-walled steel ULC S602 vertical petroleum storage tank (234 litres Diesel, Generator #1 Daytank). The tank is to be shop fabricated and come complete with the following:

- tank decals on two (2) sides indicating storage capacity and product stored (diesel)
- ULC identification tag
- tank gauge as indicated on the design drawings (Scully Golden Gauge or equal, typ.)
- interstitial vacuum monitoring with vacuum gauge in protective cover with visual access
- interstitial relief vent
- 250mm high tank base designed for anticipated seismic forces in the St. Andrews area, complete with anchor holes in base plates
- shop painted with 3-part zinc primer, 2-part epoxy base coat, 2-part polyurethane high gloss finish on final coat.

Tank Fitting Requirements:

Part 1 - General

- 1.1 RELATED REQUIREMENTS
- .1 Section 01 10 10 - General Instructions.
 - .2 Section 33 56 13 - Aboveground Fuel Storage Tanks.
- 1.2 REFERENCES
- .1 ASTM International
 - .1 API 6D, Specification for pipeline valves.
 - .2 ANSI/ASME B16.11, Forged Fittings, Socket-Welding and Threaded.
 - .3 ASTM A48, Specification for Gray Iron Castings.
 - .4 ASTM A181/A181M, Specification for Forgings, Carbon Steel, for General Purpose Piping.
 - .2 All codes and standards are to be latest editions unless noted otherwise.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- 1.4 CLOSEOUT SUBMITTALS
- .1 Submit in accordance with Section 01 77 00 - Closeout Procedures.
 - .2 Operation and Maintenance Data: submit operation and maintenance data to be incorporation into manual.
- 1.5 MAINTENANCE MATERIAL SUBMITTALS
- .1 Spare parts:
 - .1 Furnish following spare parts:
 - .1 Filter elements (1 set for commissioning, 1 replacement set)

1.6 DELIVERY,
STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 - Products

2.1 GENERAL

- .1 Valves: repackable under full line pressure while fully open.

2.2 GENERATOR
SYSTEM TRANSFER PUMPSET

- .1 Positive displacement helical gear pump (5USGPM @ 100PSI)
- .2 1HP TEFC close coupled electric motor
- .3 Spill containment drip pan with liquid sensor.
- .4 Basket strainer.
- .5 Full Flow relief valve.
- .6 Compound pressure/vacuum gauge on pump inlet.
- .7 Pressure gauge on pump outlet.
- .8 High/Low pressure switch on pumpset outlet.
- .9 Pump controller with:
 - NEMA/CSA 1 Enclosure
 - Circuit Breaker
 - Magnetic Motor Starter
 - HOA switch
 - Run Lights

- Override Relays
- High Pressure Cut-out with light and manual reset
- Low Pressure Cut-out with override, light and manual reset
- Power On light.

2.3 STORAGE TANK
SYSTEM PIPING

- .1 Pipe:
 - .1 Carbon steel:
 - .2 50 mm and smaller: Schedule 40 Seamless to ASTM A-106 Gr. B, or ASTM A-53 Gr. B, Type S.
 - .2 Pipe:
 - .1 Copper:
 - .2 Type G, K and L, soft copper tubing - Jacketed.
 - .3 Fittings:
 - .1 Carbon steel:
 - .2 50 mm and smaller: ASTM A-105, ANSI B16.11 and B1.20.1, threaded or socket welded.
 - .4 Joints:
 - .1 Buried: Not applicable.
 - .2 Aboveground: welded joints conforming to provincial, federal and municipal regulations or requirements of CSA W47.1 and; threaded joints using compound for product being handled (socket welded joints are permissible).
 - .3 Copper: Brass-flared fittings
 - .4 All pipe ends to be properly prepared, de-burred and free from defects prior to making joints.
 - .5 Flexibility:
 - .1 Incorporate into construction as required.

- .6 Corrosion and product protection:
 - .1 All non-stainless steel piping, fittings and flanges shall be surface prepared and painted (1 coat epoxy primer, 2 coats epoxy enamel).
- .7 Ball/Relief Valves:
 - .1 50 mm and smaller, 150 WOG Rating, threaded ends, 2-piece design, full bore, fire tested to API 607.
 - .2 Bypass pressure relief valves:
 - .1 Set to relieve at 172 kPa.
- .8 Solenoid Valve:
 - .1 Shall be normally closed, brass or stainless steel body, size as per design drawings, c//w internal bypass
- .9 Identification:
 - .1 Apply permanent markings to all product pipelines indicating the product transferred and flow direction.

2.4 ANCHORS,
GUIDE SLIDES

- .1 Anchors:
 - .1 Provide as indicated.

2.5 SUPPORTS,
HANGERS, INSERTS

- .1 Use standard components and assemblies by one manufacturer wherever possible.
- .2 Support piping as indicated on the design drawings.

Part 3 - Execution

3.1 PREPARATION

- .1 Lay out work in accordance with lines and grades as indicated.
- .2 As indicated or for small bore piping not shown on layout drawings, locate so that it will not constitute hazard to personnel or equipment.

3.2 VALVES

- .1 Install valves to control flow and to isolate equipment as indicated.

- .2 Install in accordance with manufacturer's recommendations.

3.3 COMMISSIONING

- .1 Dispose of flushing liquids to approval of authority having jurisdiction.
- .2 Isolate the above-ground storage tank from piping system pressure tests.
- .3 Test piping systems and pumps with compressed air as per piping manufacture's recommendations. Hold pressure for 2 hrs.
- .4 All testing (methods, results) to be documented in reports and submitted to Consultant and included in site maintenance manuals.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION