

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 American Society of Mechanical Engineers (ASME)
    - .1 ASME-B16.3-2006, Malleable-Iron Threaded Fittings: Classes 150 and 300.
    - .2 ASME-B16.9-2007, Factory-Made Wrought Steel Butt welding Fittings.
  - .2 ASTM International
    - .1 ASTM A 47/A 47M-99(2004), Standard Specification for Ferritic Malleable Iron Castings.
    - .2 ASTM A 53/A 53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
  - .3 Canadian Environmental Protection Act (CEPA)
    - .1 CCME PN 1326-2008, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.
  - .4 Canada Green Building Council (CaGBC)
    - .1 LEED Canada-NC Version 3, 2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.
  - .5 CSA International
    - .1 CSA-B139-09, Installation Code for Oil Burning Equipment.
    - .2 CSA-B140.0-03, Oil Burning Equipment: General Requirements.
    - .3 CSA-C282-05, Emergency Electrical Power Supply for Buildings.
  - .6 Green Seal Environmental Standards (GSES)
    - .1 Standard GS-11-2008, 2nd Edition, Paints and Coatings.
  - .7 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
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1.1 REFERENCES  
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- .8 Manufacturers Standardization Society of the Valve and Fitting Industry (MSS)
  - .1 MSS-SP-80-08, Bronze Gate, Globe, Angle and Check Valves.
- .9 National Fire Code of Canada (NFCC 2010)
- .10 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
- .11 Underwriter's Laboratories of Canada (ULC)
  - .1 ULC ORD-C107.12-1992, Line Leak Detection Devices for Flammable Liquid Piping.

1.2 ADMINISTRATIVE  
REQUIREMENTS

- .1 Pre-Installation Meeting:
  - .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations.

1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Product Data:
    - .1 Provide manufacturer's printed product literature, specifications and datasheets for piping, fittings and equipment and include product characteristics, performance criteria, physical size, finish and limitations.
      - .1 Indicate on manufacturer's catalogue literature the following:
        - valves.
        - .2 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures.
  - .3 Indicate VOC's for adhesive and solvents during application and curing.
  - .4 Certificates:
    - .1 Submit certificates signed by manufacturer certifying that materials comply
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| <u>1.3 ACTION AND<br/>INFORMATIONAL<br/>SUBMITTALS<br/>(Cont'd)</u> | <ul style="list-style-type: none"><li>.4 Certificates: (Cont'd)<ul style="list-style-type: none"><li>.1 (Cont'd)<br/>with specified performance characteristics and physical properties.</li></ul></li><li>.5 Sustainable Design Submittals:<ul style="list-style-type: none"><li>.1 LEED Canada-NC Version 3, 2009.<br/>Submittals: in accordance with Section 01 35 21 - LEED Requirements.</li></ul></li></ul>  |
| <u>1.4 CLOSEOUT<br/>SUBMITTALS</u>                                  | <ul style="list-style-type: none"><li>.1 Submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.</li></ul>  |
| <u>1.5 QUALITY<br/>ASSURANCE</u>                                    | <ul style="list-style-type: none"><li>.1 Sustainability Standards Certification:<ul style="list-style-type: none"><li>.1 Low-Emitting Materials: provide listing of adhesives and sealants and paints and coatings and carpet used in building, comply with VOC and chemical component limits or restriction requirements.</li></ul></li><li>.2 Ensure piping is installed by company individual authorized by authority having jurisdiction.</li></ul>  |
| <u>1.6 DELIVERY,<br/>STORAGE AND<br/>HANDLING</u>                   | <ul style="list-style-type: none"><li>.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.</li><li>.2 Delivery and Acceptance Requirements:<ul style="list-style-type: none"><li>.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.</li></ul></li><li>.3 Packaging Waste Management: remove for reuse or return of pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.</li></ul> |
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## PART 2 - PRODUCTS

<u>2.1 FILL VENT AND CARRIER PIPE</u>	.1	Materials as per CSA-B139, CEPA SOR/2008-197, NFCC.
	.2	Steel: to ASTM A 53/A 53M, Schedule 40, socket welded unless otherwise noted.
<u>2.2 STEEL PIPE COATING</u>	.1	Exterior piping and piping in Generator Room to be painted with one coat of epoxy primer and two (2) coats of corrosion resistant epoxy enamel.
<u>2.3 JOINTING MATERIAL</u>	.1	Threaded fittings: teflon tape or pipe joint compound suitable for diesel fuel or pulverized lead paste.
<u>2.4 FITTINGS</u>	.1	Steel: .1 Malleable iron: screwed, banded, Class 150 to ASME-B16.3. .2 Welding: socket-welded. .3 Unions: malleable iron, brass to iron, ground seat, screwed, to ASTM A 47/A 47M. .4 Nipples: Schedule 40, to ASTM A 53/A 53M.
<u>2.5 BALL VALVES</u>	.1	NPS 2 and under: bronze body, screwed ends, TFE seal, hard chrome ball, 4 MPa, WOG.
<u>2.6 SWING CHECK VALVES</u>	.1	NPS 2 and under, screwed: to MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, renewable composition disc suitable for oil service, screw in cap, regrindable seat.

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- 2.7 FUEL OIL TRANSFER PUMPS .1 Positive displacement self-priming, rotary gear screw type, direct driven from TEFC motor, mounted on common base. Complete with mechanical seal, permanently sealed ball bearings, relief valve, compound gauge on inlet, pressure gauge on discharge. See schedule on drawings for size and capacity.
- 2.8 OIL FILTER .1 Duplex type replaceable cartridge type as recommended by oil burner manufacturer.
- .2 Furnish spare filter cartridge.
- 2.9 OIL METERS .1 Accuracy: tested and certified by manufacturer for accuracy within plus or minus 0.2% between 20% and 100% rated capacity.

PART 3 - EXECUTION

- 3.1 APPLICATION .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.2 PIPING .1 Install piping in accordance with Section 23 05 05 - Installation of Pipework, supplemented as specified.
- .2 Install oil piping system in accordance with NFCC, CSA-B139 and CSA-B140.0.
- .3 Slope piping down in direction of storage tank. Do not install piping with traps.
- .4 Above ground piping to be protected from physical damage due to impact.
- .5 Piping inside building:  
.1 Ensure piping in solid flooring is installed to CSA-B139.
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3.2 PIPING  
(Cont'd)

- .5 Piping inside building: (Cont'd)
  - .2 Use flare joint approved fitting to CSA-B139 for steel piping.
  - .3 Install filter, ball valve, and fire valve at burners.
- .6 Fill, vent, suction and return piping outside building:
  - .1 Steel piping welded throughout except at tanks where electrically isolating fittings are used.
  - .2 Grading: slope piping at 1% minimum back to tanks.
- .7 Piping at tanks:
  - .1 Suction: terminate 150 mm from bottom of tank with foot valve and strainer.
  - .2 Comply with CSA-B139 for piping for venting at tanks including venting whistle venting alarm.
  - .3 Fill pipes: install to comply with CSA-B139.
    - .1 Include vapour tight tamperproof cover.
    - .2 Equip fill pipes on tanks with capacity greater than 5000 L with liquid and vapour tight connections.
    - .3 Install overflow protection device in accordance with Section 33 56 13.
- .8 Clearly label piping runs in legible form indicating:
  - .1 Piping product content.
  - .2 Direction of flow.
  - .3 Identify transfer points in piping systems to CPPI Colour-Symbol System to Mark Equipment and Vehicles for Product Identification

3.3 VALVES

- .1 Install valves with stems upright or horizontal unless approved otherwise by Departmental Representative.
  - .2 Install ball valves at branch take-offs, to isolate pieces of equipment and as indicated.
  - .3 Identify and tag valves in accordance with CPPI colour-symbol system.
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- 3.4 OIL TRANSFER PUMPS
- .1 Equip pumps with check valve installed below suction pump to permit contents of pipe to drain back to storage tank if suction is broken.
  - .2 Install ball -valves on inlet and discharge connections.
  - .3 Install pressure gauge at pump discharge, compound gauge on pump inlet connection.
  - .4 Install relief valve in pump discharge piping with relief valve discharge pipe.
- 3.5 OIL FILTERS
- .1 Install ULC approved in supply line.
  - .2 At time of acceptance, replace filter cartridge with new.
- 3.6 OVERFILL AND SPILL PROTECTION
- .1 To CSA-B139 and NFCC.
  - .2 Overfill alarm by controls contractor. Alarm to be activated at 90% of tank capacity.
- 3.7 FIELD QUALITY CONTROL
- .1 Site Tests/Inspection:
    - .1 Test system to CSA-B139 and CSA-B140.0 and authorities having jurisdiction.
    - .2 Isolate tanks from piping pressure tests.
    - .3 Maintain test pressure with compressed air for two (2) hours.
  - .2 Manufacturer's Field Services:
    - .1 Have manufacturer of products, supplying materials for Work of this Section, review Work involved in handling, installation/application, protection and cleaning, of its products and submit written reports, in acceptable format, to verify compliance of Work with Contract.
    - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product
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- 3.7 FIELD QUALITY CONTROL  
(Cont'd)
- .2 Manufacturer's Field Services: (Cont'd)
- .2 (Cont'd)  
installation in accordance with manufacturer's instructions.
- .3 Schedule site visits, to review Work, at stages listed:
- .1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.
- .2 Upon completion of the Work, after cleaning is carried out.
- .4 Obtain reports, within 3 days of review, and submit, immediately, to Departmental Representative.
- .3 Performance Verification:
- .1 Refer to Section 23 08 01 - Performance Verification Mechanical Piping System.
- 3.8 CLEANING
- .1 Clean in accordance with manufacturer's written recommendations, supplemented as follows:
- .1 Only after tank has been registered and pressure testing is complete, flush with number 2 fuel oil for a minimum of two hours. Clean strainers and filters.
- .2 Dispose of fuel oil used for flushing out in accordance with requirements of authority having jurisdiction.
- .3 Ensure vents from regulators, control valves are terminated in approved location and are protected against blockage and damage.
- .4 Ensure entire installation is approved by authority having jurisdiction.
- .5 Clean in accordance with Section 01 74 11 - Cleaning.
- .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal 01 35 21 - LEED Requirements.