Part 1 General

1.1 RELATED SECTIONS

.1 Section 22 05 00 - Common Works Results for Plumbing.

.2 Section 23 05 05 - Installation of Pipework.

.3 Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.

.4 Section 23 08 02 - Cleaning and Start-up of Mechanical Piping Systems.

1.2 REFERENCES

.1 American National Standards Institute/National Fire Prevention Association (ANSI/NFPA).

.1 ANSI/NFPA 329, Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases.

.2 American Society of Mechanical Engineers (ASME).

.1 ASME B1.20.1, Pipe Threads, General Purpose (inch).

.2 ASME B16.3, Malleable-Iron Threaded Fittings.

.3 ASME B16.9, Factory-Made Wrought Steel Buttwelding Fittings.

.4 ANSI/ASME B16.11, Forged Steel Fittings, Socket-Welding and Threaded.

.5 ASME B16.34, Valves-Flanged, Threated and Welding End.

.3 American Society for Testing and Materials International (ASTM).

.1 ASTM A47/A47M, Standard Specification for Ferritic Malleable Iron Castings.

.2 ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.

.3 ASTM A234, Carbon Steel Weld.

.4 ASTM B61, Standard Specification for Steam or Valve Bronze Castings.

.5 ASTM B75M, Standard Specification for Seamless Copper Tube.

.4 American Petroleum Institute (API).

.1 API 598, Valve Inspection and Testing.

.2 API 602, Steel Gate, Globe and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries.

.3 API 607, Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats.

.5 Canadian Standards Association (CSA)/CSA International.

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

.2 CSA B140.0, Oil Burning Equipment: General Requirements.

.6 Manufacturers Standardization Society of the Valve and Fitting Industry (MSS).

.1 MSS-SP-25, Standard Marking System for Valves Fittings, Flanges and Unions.

.2 MSS-SP-71, Cast Iron Swing Check Valves, Flanged and Threaded Ends.

.3 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.

.4 MSS-SP-83, Class 3000 Steel Pipe Unions, Socket Welding and Threaded.

.7 Health Canada / Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.8 Underwriters Laboratories of Canada (ULC).

.1 ULC/ORD-C180, Liquid Level Gauges and Indicators for Fuel Oil and Lubricating Oil Tanks.

.2 ULC C331, Strainers for Flammable Fluids and Anhydrous Ammonia.

.3 ULC C340, Standard for the Testing of Pipe Joint Compounds.

.4 ULC C842, Valves for Flammable and Combustible Liquids.

.5 ULC C1321, Guide for The Investigation Of Seal Materials - Polytetrafluoroethylene Plastic Tape.

.9 Canadian Consolidated Regulations.

.1 Storage Tank System for Petroleum Products and Allied Petroleum Product Regulations (SOR/2008-197).

1.3 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.

.3 Test Reports:

.1 Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

.4 Certificates:

.1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.5 Instructions:

.1 Provide manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

.1 Submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Data Sheets:

.1 Data sheets must include:

.1 A description of the equipment, including the manufacturer's name, type, model, year of manufacture and the power, speed, or capacity;

.2 Submit the technical requirements, specifications and the manufacturer's documentation for equipment and proposed materials;

.3 A list of recommended spare parts.

.3 Provide necessary instructions for the operation and maintenance accessories of tanks and leak detection system.

1.5 HEALTH AND SAFETY

.1 Take necessary measures to ensure health and safety on construction site, in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling, in accordance with Waste Management Plan.

.4 Sort steel, metal, and plastic waste, and dispose them in appropriate designated bins in conformity with the Waste Management Plan.

.5 Disposed unused metallic elements in designated area for metal recycling.

.6 Place in designated containers substances that meet the definition of toxic or hazardous waste.

.7 Handle and dispose hazardous materials in accordance with Canadian law on the protection of the environment, the Transportation of Dangerous Goods Act.

.8 Dispose paint products or unused coatings to an authorized collection site for hazardous materials.

.9 It is prohibited to dispose unused sealants in drains, rivers, lakes, on the ground or at any other location where it could present a risk to health or the environment.

1.7 ACCEPTABLE PRODUCTS AND MATERIALS

.1 Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products.

Part 2 Products

2.1 CARRIER PIPE

.1 NPS ¾: copper tubing covered with an orange polyethylene coating, UL and ULC listed.

2.2 FILLING PIPE

.1 Steel Pipes: to ASTM A53/A53M, Schedule 40, electric resistance welded. Fixed to the wall.

.2 Pipe must be extended to a height of 1 m above the ground and must be equipped with a sealed cap with eye for padlock.

.1 Acceptable products:

.1 Metroheat, model E600;

.2 RNG, model 632;

.3 Replacement materials or products: approved by addendum according to Instructions to bidders.

2.3 VENTILATION PIPE

.1 Exterior Piping:

.1 Steel pipes: to ASTM A53/A53M, Schedule 40, electric resistance welded. Fixed to the wall.

.2 Above Ground Piping:

.1 Steel pipes: to ASTM A53, Schedule 40, Grade B, electric resistance welded.

.2 Steel pipe paint coating line with manufacturers' recommendations.

.3 Vents ending in rain-caps:

.1 Acceptable products:

.1 OPW, model 23-0055;

.2 Replacement materials or products: approved by addendum according to Instructions to bidders.

2.4 SLEEVES FOR OIL PRO-TEC^{MC} PIPING

.1 HDPE Sleeves:

.1 Acceptable products:

.1 KAMCO, Pro-Tec Plus^{MC};

.2 Replacement materials or products: approved by addendum according to Instructions to bidders.

2.5 JOINTS

.1 Above Ground Piping:

.1 NPS 2 or under: screwed fittings with Teflon tape, tapered threads conforming to ASTM A47M Standard, Grade 32510.

.2 Teflon tape conforming to ULC C1321 or sealant containing conforming to ULC C340.

.3 NPS2½ or greater: flanged fittings and flanges to be welded in accordance with CSA W47.1.

2.6 FITTINGS

.1 Above Ground Piping:

.1 Malleable iron: screwed, banded, Class 150 to ASME-B16.3.

.2 Nipples: Schedule 40, to ASTM A53/A53M.

.3 Forged steel fitting: screwed, to ANSI/ASME B16.11, Class 2000.

.4 Unions: forged steel, ground seat, screwed, to ASTM A47/A47M, Class 3000.

.5 Unions: malleable iron, brass to iron, ground seat, screwed, to ASTM A47/A47M, Class 150.

.6 Welded fittings: forged steel, Schedule 40, seamless, butt-welding to ASME-B16.9 and ASTM A234.

2.7 BALL VALVES

.1 NPS 3 or under, screwed:

.1 Complying with ULC 842 (UL 842) or API 607 "Fire Safe" Class 600 Standard, steel body A216WCB, seal in graphite, solid stainless steel shutter (rotating) modified seat R-PTFE and joystick lever lockable.

.2 Acceptable products:

.1 Kitz AKSCTHWZM-FS;

.2 MAS CSSF3-HD-FS;

.3 Jenkins No. 201J;

.4 Milwaukee;

.5 Replacement materials or products: approved by addendum according to Instructions to bidders.

2.8 CHECK VALVES

.1 NPS 2 or under, screwed:

.1 In accordance with NSS SP-25, API 602, ASME B16.34 and ASME B1.20.1 Standards, and tested according to API 598, Class 800 forged steel body A105N.

.2 Acceptable products:

.1 Bonney Forge HL-31-T;

.2 Beric 502TX8A08;

.3 Replacement materials or products: approved by addendum according to Instructions to bidders.

2.9 REPLACEMENT OIL FILTER

.1 Cartridge 100% wool that does not disintegrate, having a filtering capability of 10 micron.

.2 Acceptable Products:

.1 EXACTA, model E401-999;

.2 Replacement materials or products: approved by addendum according to Instructions to bidders.

2.10 VENTING WHISTLE

.1 Venting whistle hypersonore HDPE with gray cast iron body, for opening of 32 mm and 50 mm, noise level of 85 decibels and ULC listed.

2.11 VENT CAP

.1 Vent Cap: 32 mm made of Zamak.

2.12 FILLING CAP

.1 Lockable Filling Cap: 50 mm made of Zamak.

2.13 FILTER WITH DOUBLE STRAINER

.1 Double Strainer Type: replaceable cartridge on the oil inlet. Screwed connections for NPS 2 or under; flanged connections for NPS 2½ or greater.

.2 Mail strainers chosen according to manufacturer’s recommendations equipment installed.

.3 Provide two spare cartridges.

.4 Acceptable Products:

.1 Brooks, Ball-Plex Series;

.2 Hart;

.3 Replacement materials or products: approved by addendum according to Instructions to bidders.

2.14 STAINLESS STEEL FLEXIBLE CONNECTION

.1 Internal Pipe: Corrugated, stainless steel flexible pipe.

.1 Exterior sleeve composed of a stainless steel weave.

.2 Diameter and type of end elements: according to indications on drawing.

.3 Flexible connections must be designed to support operating pressures and temperatures of 1 034 kPa and 93 °C.

.1 Operating conditions must meet the requirements that are applied to the rest of the network.

.2 The connections must be able to absorb lateral displacements of 13 mm, the ratio between the length of the flexible connection and its diameter must not be inferior to six.

.4 End Piece: as appropriate for the pipe.

.5 Acceptable Products:

.1 NPS 2 and under : Connectall, Style-19Z Series; Flexonics, model BSN.

2.15 OIL MANAGEMENT SYSTEM

.1 System including the following components, interconnected between them by Division 26:

.1 Management panel located in the tank room, including a printer and communication modules and memory;

.2 Individual management level sensor;

.3 Interface equipment between the control panel and the centralized system;

.4 Management Software;

.5 Gauging devices and mechanical float level indicators in internal tanks of small capacity.

.2 System programmed to perform the following functions:

.1 Indication of the amount of product in stock and the following characteristics of conserved product:

.1 Liter of fuel in tank:

.1 Millimeters of accumulated water in the tank bottom.

.2 Millimeters of fuel in the tank.

.2 Fuel delivery slip.

.3 Visual and audible warning devices indicating the following conditions:

.1 Product overflow;

.2 A low level of product in the tank;

.3 A large amount of water.

.4 Diagnostics established using probes.

.5 Leak testing.

.6 Probes and preset and factory calibrated sensors, adapted to the diameter of the tank.

.7 Auxiliary devices:

.1 System permitting communication with the central facility for network monitoring purposes and inventory verification.

.2 Security locking system controlling the current mode of operation, the introduction or modification of tank parameters or other network elements, and building diagnostics to check the status of hardware and software within the network.

.3 Acceptable products:

.1 Control panel:

.1 VeederRoot No. 848290-122, detection panel, model TLS350R with printer, including:

.1 Expansion memory, No. 330532-001;

.2 Two modules of Mag Probe, No. 329356-002;

.3 One interface module for communication with central panel, No. 329360-001;

.4 One module RS232, No. 330148-001;

.5 One Ethernet-TCP-IP/Communication module, No. 330-030-425;

.6 For communication with a central PC and communication software, No. 330149-002 and No. 848940-005.

.2 Management level sensor for each interior tank:

.1 One Mag Probe with standard water detector, No. 847391-1XX.

.2 A float assembly for light oil, DN 2, No. 846400-102.

.3 A mounting assembly, No. 312020-984.

.4 Cap and collar for the level sensor, No. 312020-952.

.3 Replacement materials or products: approved by addendum according to Instructions to bidders.

.4 Starting up of system performed by a contractor recognized from the distributor and manufacturer.

.5 Components assembly of tank management components from a single manufacturer.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance 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 CSA-B139 and CSA-B140.0.

.3 Slope piping down in direction of storage tank, unless otherwise indicated.

.4 Use eccentric reducers to connect different diameter pipes to ensure the free flow of liquid.

.5 Provide adequate clearance for access to equipment, fixtures and fittings, and maintenance of these elements.

.6 Deburr the pipe ends, descale these and clean, both inside and outside.

.7 Put two coats of bituminous protection on vent and filling pipe to bury.

.8 Piping at tanks:

.1 Suction: terminate 150 mm from bottom of tank with foot valve and strainer.

.2 Vent pipe: pipe to penetrate into the tank to within 25 mm from the top and bring the other end to a height of 3000 mm above the ground, equipped with a weatherproof cap and ventilation failure alarm.

.3 Filling pipe: bring the pipe to the specified height and equipped the end with a lockable female cap with chain and padlock.

.4 Dipstick: extend tube to within 150 mm from bottom of tank. Terminate at grade with lockable cap and chain, and watertight cover.

3.3 VALVES

.1 Install valves with stems upright or horizontal unless approved otherwise by Departmental Representative.

.2 Install gate valves at branch take-offs, to isolate pieces of equipment, and as indicated.

3.4 QUALITY CONTROL ON SITE

.1 Site Tests/Inspection:

.1 Test system to CSA-B139 and CSA-B140.0 Standards and authorities having jurisdiction.

.2 Isolate tanks from piping pressure tests.

.2 Field Services:

.1 Submit tanks leak tests in the presence of the authorities having jurisdiction.

.2 Provide a slope towards the tank filler pipe.

.3 Manufacturer's field services.

3.5 BALANCING

.1 Balancing the systems so that the actual flow is 10% of design flow.

.2 Use balancing methods described in section 23 05 93 - Testing, Adjusting and Balancing for HVAC.

3.6 CLEANING

.1 Clean in accordance with Section 23 08 02 - Cleaning and Start-Up of Mechanical Piping Systems and with manufacturer's written recommendations, supplemented as follows:

.2 Flush after pressure test with number 2 fuel oil for a minimum of two hours. Clean strainers and filters.

.3 Dispose of fuel oil used for flushing out in accordance with requirements of authority having jurisdiction.

.4 Ensure vents from regulators, control valves are terminated in approved location and are protected against blockage and damage.

.5 Ensure entire installation is approved by authority having jurisdiction.

.6 After work and performance verifications are completed, remove excess materials, rubbish, tools, and equipment.

END OF SECTION