

---

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1        Section 22 05 00 - Common Work Results for Plumbing.
- .2        Section 23 05 05 - Installation of Pipework.
- .3        Section 23 08 01 -Performance Verification of Mechanical Piping Systems.
- .4        Section 23 08 02 - Cleaning and Start-up of Mechanical Piping Systems.

**1.2                REFERENCES**

- .1        American Society of Mechanical Engineers (ASME).
  - .1        ANSI/ASME B16.3-06, Malleable-Iron Threaded Fittings, Classes 150 and 300.
  - .2        ANSI/ASME B16.5-03, Pipe Flanges and Flanged Fittings.
  - .3        ANSI/ASME B16.9, Factory-Made Wrought Buttwelding Fittings.
  - .4        ASME B16.18-01, Cast Copper Alloy Solder Joint Pressure Fittings.
  - .5        ASME B16.22-01, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
  - .6        ASME B18.2.1-96, Square and Hex Bolts and Screws Inch Series.
- .2        American Society for Testing and Materials International (ASTM).
  - .1        ASTM A47/A47M-99 (2004), Standard Specification for Ferritic Malleable Iron Castings.
  - .2        ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
  - .3        ASTM A106/A106M-08, Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service.
  - .4        ASTM A234, Carbon Steel Weld.
  - .5        ASTM B75M-99, Standard Specification for Seamless Copper Tube.
- .3        Canadian Standard Association (CSA International).
  - .1        CAN/CSA B149.1-10, Natural Gas and Propane Installation Code.
  - .2        CSA W47.1-F03, Certification of Companies for Fusion Welding of Steel.
- .4        Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1        Material Safety Data Sheets (MSDS).

**1.3                SUBMITTALS**

- .1        Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet for piping, fittings, and equipment. Indicate on manufacturers catalogue literature for valves.
- .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 Instructions:
  - .1 Submit manufacturer's installation instructions.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit all required documents and items after completion of work for incorporation into manual, such as specified in Section 01 78 00 - Closeout Submittals.
- .2 Maintenance Data Sheets:
  - .1 Maintenance data sheets must include the following elements:
    - .1 A description of the equipment, including the manufacturer's name, type, model, year of manufacture and the power, flow, or capacity;
    - .2 Relevant details concerning operation, maintenance and servicing;
    - .3 A list of recommended spare parts.

#### **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.

## **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 ABOVE GROUND PIPING**

- .1 Steel Pipe: complying with ASTM A53/A53M Standard, Grade B, Schedule 40 with the following characteristics:
  - .1 Piping of diameter of NPS ½ to NPS 2: screwed end;
  - .2 Piping of diameter of NPS 2½ and more: plain end.

### **2.2 JOINTS**

- .1 Screwed Fittings: lead-free pipe dope.
- .2 Welded Joints: To CSA W47.1 Standard.
- .3 Flange Gaskets: Non-metallic flat.
- .4 Weld piping of NPS 2½ and more.
- .5 Refer to Section 23 05 17 - Pipe Welding.

### **2.3 FITTINGS**

- .1 Steel pipe fittings, screwed, flanged or welded:
  - .1 Malleable iron: screwed, banded, Class 150, in compliance with ANSI/ASME B16.3.
  - .2 Flanges and flanged fittings: Class 150, to ANSI/ASME B16.5.
  - .3 Welding: butt-welding fittings, Schedule 40, to ASTM A234 and ANSI/ASME B16.9.
  - .4 Unions: malleable iron, brass to iron, ground seat, to ASTM A47/A47M.
  - .5 Bolts and nuts: to ASME B18.2.1.
  - .6 Nipples: Schedule 40, to ASTM A53/A53M.

### **2.4 VALVES**

- .1 All valves for gas network must be CSA listed.
- .2 Ball valves with nominal diameter equal to or less than NPS 2, screwed:
  - .1 Class 150.

- .2 Bronze body, chrome plated brass ball valve, adjustable Teflon PTFE seal, brass trim press, Teflon PTFE seat, and steel lever.
- .3 Acceptable products:
  - .1 Kitz n° 58;
  - .2 Red-White n° 5044A;
  - .3 Replacement materials or products: approved by addendum according to Instructions to bidders.
- .3 Ball valves with pressure reading fitting.
  - .1 Bronze body, chrome ball valve and Teflon PTFE seat.
  - .2 Listed UL, CSA and ANSI B.16.33, for natural gas operation of 860 kPa.
  - .3 Acceptable products:
    - .1 Maxitrol, model BV250;
    - .2 Replacement materials or products: approved by addendum according to Instructions to bidders.
- .4 Cylindric plug ball valves:
  - .1 Wide open, lubricated, listed CSA, cast iron body and key maneuver, Class 125.
  - .2 Acceptable products:
    - .1 NPS 2 and less, threaded fittings: Newman-Milliken, fig. 170M.
    - .2 NPS 2½ and more, flanged fittings: Newman-Milliken, fig. 171M.
    - .3 Replacement materials or products: approved by addendum according to Instructions to bidders.
- .5 Emergency closing control valves (SAU):
  - .1 Guillotine-type valves with manual reset, normally closed, fully open, equipped with an actuator operating on 120 V and connected to the annunciator panel.
  - .2 Connection to the annunciator panel by Division 26.
  - .3 Acceptable products:
    - .1 NPS 2 and less, threaded fittings: Maxon, 5000 Series.
    - .2 NPS 2½ and more, flanged fittings: Maxon, 5000 Series, model CP.
    - .3 Replacement materials or products: approved by addendum according to Instructions to bidders.

## 2.5 GOVERNOR

- .1 Gas Governor (RPG):
  - .1 Diaphragm type, with or without vent, for operational pressure under 14 kPa.
  - .2 Characteristics: see drawings.
  - .3 Acceptable products:
    - .1 Maxitrol;
    - .2 Equimeter;

- .3 Replacement materials or products: approved by addendum according to Instructions to bidders.
- .2 All governors must be CSA listed and be equipped with a vent, an integrated pressure relief valve and a replaceable orifice.

## 2.6 GAS METER

- .1 Hybrid type (digital/analog) gas meter for installation in-line with with display panel and remote reading device.
- .2 Operating Pressure: 14 kPa.
  - .1 Characteristics– CG-1:
    - .1 Flow of 34.64 m<sup>3</sup>/h;
    - .2 Maximal pressure drop of 0.9 inch of water;
    - .3 Nominal pipe size of fittings NPS 1½.
  - .2 Characteristics – CG-2:
    - .1 Flow of 15.93 m<sup>3</sup>/h;
    - .2 Maximal pressure drop of 0.9 inch of water;
    - .3 Nominal pipe size of fittings NPS 1¼.
  - .3 Acceptable products:
    - .1 Gas meter: Onicon, model F-5200;
    - .2 Display panel: Onicon, modele D-100-OTP1;
    - .3 Replacement materials or products: approved by addendum according to Instructions to bidders.

## 2.7 UNDERGROUND PIPING

- .1 Polyethylen Piping:
  - .1 Polyethylen piping complying with CSA B137.4 Standard. Maximal operating pressure of 206 kPa.
  - .2 Acceptable products:
    - .1 Gastite;
    - .2 Replacement materials or products: approved by addendum according to Instructions to bidders.

## Part 3 Execution

### 3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage, installation instructions, and datasheet.

### 3.2 PIPING

- .1 Install in accordance with Section 23 05 05 - Installation of Pipework, CAN/CSA B149.1 Standard, and supplemented as specified in present section.
- .2 Use connections in accordance with ANSI Standards to connect piping.
- .3 Unless stated otherwise, connect piping to the equipment according to manufacturer's instructions.
- .4 Install piping by tilting piping toward low points, in the direction of fluid flow.
- .5 Install Drip Points:
  - .1 At low points in piping system.
  - .2 At connections to equipment.
- .6 Use eccentric reducers for connecting pipes of different diameters; direct to ensure a good flow of the fluid.
  - .1 Perform welds in accordance with Section 23 05 17 - Pipe Welding.
- .7 Provide adequate clearance to allow access to the elements and their maintenance.
- .8 Deburr pipe extremities, descale than clean, both inside and outside of pipe.
- .9 Install piping so that the removal of equipment requires minimal disassembly.
- .10 Perform welds in accordance with Section 23 05 17 - Pipe Welding.

### 3.3 UNDERGROUND PIPING

- .1 Polyethylen Piping:
  - .1 Polyethylen piping must be equipped with a traceable wire or an equivalent device.
  - .2 Gas passing through underground plastic piping or tubes must be controlled by a shut-off valve located above ground level.
- .2 Steel Pipe:
  - .1 Steel pipes that are buried must be protected against corrosion and have a diameter of at least NPS ½. They must be jointed or welded together.
  - .2 Every buried pipe should be installed at a depth of at least 400 mm, or at least 600 mm in a commercial vehicle entrance or under a parking lot.
- .3 Bottom of the trench should be leveled to prevent sagging of the pipes. The backfill should not contain sharp objects or large stones or foreign materials that could damage the pipes.

- .4 Tally must be installed at mid-depth, above the underground piping, in order to facilitate localisation.
- .5 All underground pipe installation must be inspected by a Gaz Métro's representative before being buried.

### **3.4 VALVES**

- .1 Unless otherwise indicated, install valves with stems upright or horizontal.
- .2 Install valves at branch take-offs to isolate pieces of equipment, and as indicated.
- .3 Channel pressure relief valve discharge to the outside of the building.
- .4 Install valves with pressure reading connection to each device.

### **3.5 FIELD QUALITY CONTROL**

- .1 Site Tests/Inspection:
  - .1 Test system in accordance with CAN/CSA B149.1 and requirements of authorities having jurisdiction.
- .2 Procedure:
  - .1 Verify performance of the elements of network.
  - .2 Refer to Section 23 08 01- Performance Verification of Mechanical Piping Systems.

### **3.6 ADJUSTING**

- .1 Pre-Start-Up Inspections:
  - .1 Check vents from regulators and control valves terminate outside of the building at an approved location, where it will not be obstructed nor damaged.
  - .2 Check gas trains, and make sure entire installation is approved by authority having jurisdiction.
- .2 Site Tests/Inspection:
  - .1 Test system in accordance with CAN/CSA B149.1 and requirements of authorities having jurisdiction.
- .3 Procedure:
  - .1 Verify performance of the elements of network.

### **3.7 PURGING**

- .1 Purge after pressure test in accordance with CAN/CSA B149.1 Standard.

**3.8 CLEANING**

- .1 Proceed to cleaning in accordance with Section 23 08 02 - Cleaning and Start-Up of Mechanical Piping Systems, CAN/CSA B149.1 Standard, and supplemented as specified in the present section.
- .2 Upon completion and verification of performance of installation, remove excess materials, rubbish, tools, and equipment.

**END OF SECTION**