

**SECTION 23 11 23  
FACILITY NATURAL-GAS PIPING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

Fuel gas systems, including piping, equipment and all necessary accessories as designated in this section.

**1.2 RELATED WORK**

- A. Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.
- B. Section 07 84 00, FIRESTOPPING.
- C. Section 07 92 00, JOINT SEALANTS.
- D. Section 09 91 00, PAINTING.
- E. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.
- F. Section 22 05 23, GENERAL DUTY VALVES FOR PLUMBING PIPING
- G. Section 23 08 00, COMMISSIONING OF HVAC SYSTEMS

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.
- B. Manufacturer's Literature and Data:
  - 1. Pipe & Fittings.
  - 2. Valves.
  - 3. Strainers.
  - 4. All items listed in Part 2 - Products.

**1.4 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Federal Specifications (Fed. Spec.):
  - A-A-59617.....Unions, Brass or Bronze Threaded, Pipe  
Connections and Solder-Joint Tube Connections
- C. American National Standards Institute (ANSI):
  - American Society of Mechanical Engineers (ASME): (Copyrighted Society)
  - A13.1-(2007) .....Scheme for Identification of Piping Systems
  - B16.3- (2006).....Malleable Iron Threaded Fittings: Classes 150  
and 300 ANSI/ASME
  - B16.9-2007.....Factory-Made Wrought Steel Buttwelding Fittings  
ANSI/ASME
  - B16.11-2009.....Forged Steel Fittings, Socket-Welding and  
Threaded ANSI/ASME

- B31.8-2010 .....Gas Transmission and Distribution Piping  
Systems ANSI/ASME
- D. American Society for Testing and Materials (ASTM):
  - A47-99(2009) .....Standard Specification for Ferritic Malleable  
Iron Castings
  - A53-10.....Standard Specification for Pipe, Steel, Black  
and Hot-Dipped, Zinc-coated Welded and Seamless
  - A183-09.....Standard Specification for Carbon Steel Track  
Bolts and Nuts
  - A536-09.....Standard Specification for Ductile Iron  
Castings
  - A733-03(2009) e1.....Standard Specification for Welded and Seamless  
Carbon Steel and Austenitic Stainless Steel  
Pipe Nipples
  - B687-99(2005) e1.....Standard Specification for Brass, Copper, and  
Chromium-Plated Pipe Nipples
- E. National Fire Protection Association (NFPA):
  - 54-2009 .....National Fuel Gas Code
- F. International Code Council
  - IPC 2009 .....International Plumbing Code
  - IFGC 2009.....International Fuel Gas Code
- G. International Association of Plumbing and Mechanical Officials (IAPMO):
  - Uniform Plumbing Code - 2009
  - IS6-06.....Installation Standard
- H. Manufacturers Standardization Society of the Valve and Fittings  
Industry, Inc. (MSS):
  - SP-72-2010 .....Ball Valves with Flanged or Butt-Welding for  
General Service
  - SP-110-2010.....Ball Valve Threaded, Socket-Welding, Solder  
Joint, Grooved and Flared Ends

**1.5 SYSTEM PRESSURE**

Natural gas systems unless otherwise noted are designed and materials and equipment selected to prevent failure under gas pressure of 7 psi) entering government property.

**PART 2 - PRODUCTS**

**2.1 NOT USED**

**2.2 FUEL GAS PIPING**

- A. Pipe: Black steel, ASTM A53, Schedule 40.

B. Nipples: Steel, ASTM A733, Schedule 40.

C. Fittings:

1. Sizes 50 mm (2 inch) under ANSI B 16.3 threaded malleable iron.
2. Over 50 mm (2 inch) and up to 100 mm (4 inch) ANSI B16.11 socket welded.

D. Joints: Provide welded or threaded joints.

### **2.3 EXPOSED FUEL GAS PIPING**

A. Finished Room: For the Permanent Kitchen use full iron pipe size chrome plated brass piping for exposed fuel gas piping connecting fixtures and equipment when not concealed by apron including those furnished by the Government or specified in other sections.

1. Pipe: Fed. Spec. WW-P-351, standard weight
2. Fittings: ANSI B16.15 cast bronze threaded fittings with chrome finish, (125 and 250).
3. Nipples: ASTM B 687, Chromium-plated.
4. Unions: 50 mm (2 inches and smaller) Mss SP-72, SP-110, Brass or Bronze threaded with chrome finish. Unions 65 mm (2-1/2 inches) and larger shall be flange type with approved gaskets.
5. Valves: Mss SP-72, SP-110, Brass or bronze with chrome finish.

B. Temporary Kitchen, Unfinished Rooms, Mechanical Rooms and Rooftop: Chrome-plated brass piping is not required. Paint piping systems as specified in Section 09 91 00, PAINTING

### **2.4 VALVES**

A. Ball Valve: Bronze body, rated for 1025 kPa at 185°C (150 psi at 365°F), 1725 kPa at 121°C (250 psi at 250°F), reinforced TFE seat, stem seal and thrust washer; end entry, threaded ends, UL-listed for natural or LP gas shut off service when used on those services.

B. Gas Vent Cocks: Type 701: Bronze body, tee handle, rated for 205 kPa at 38°C (30 psi at 100°F), ground plug, rated for tight shut-off on fuel gas service.

### **2.5 WATERPROOFING**

A. Floors: Provide cast iron stack sleeve with flashing device and an underdeck clamp. After stack is passed through sleeve, provide a waterproofed caulked joint at top hub.

### **2.6 STRAINERS**

A. Provide on high pressure side of pressure reducing valves, on inlet side of equipment subject to sediment damage Strainer element shall be removable without disconnection of piping.

B. Gas Lines: "Y" type with removable mesh lined brass strainer sleeve.

C. Body: Smaller than 80 mm (3 inches), brass or bronze.

## **2.7 DIELECTRIC FITTINGS**

Provide dielectric couplings or unions between ferrous and non-ferrous pipe.

## **2.8 GAS EQUIPMENT CONNECTORS**

Flexible connectors with Teflon core, interlocked galvanized steel protective casing, AGA certified design.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

A. General: Comply with the International Fuel Gas Code and the following:

1. Install branch piping for fuel gas and connect to all fixtures, valves, cocks, outlets and equipment, including those furnished by the Government or specified in other sections.
2. Pipe shall be round and straight. Cutting shall be done with proper tools. Pipe, shall be reamed to full size after cutting.
3. All pipe runs shall be laid out to avoid interference with other work.
4. Install valves with stem in horizontal position whenever possible. All valves shall be easily accessible.
5. Install union and shut-off valve on pressure piping at connections to equipment.
6. Pipe Hangers, Supports and Accessories:
  - a. All piping shall be supported per the International Fuel Gas Code, Chapter No. 4.
  - b. Shop Painting and Plating: Hangers, supports, rods, inserts and accessories used for Pipe supports shall be shop coated with red lead or zinc Chromate primer paint.
  - c. Floor, Wall and Ceiling Plates, Supports, Hangers:
    - 1) Solid or split unplated cast iron, chrome plated in finished areas.
    - 2) All plates shall be provided with set screws.
    - 3) Pipe Hangers: Height adjustable clevis type.
    - 4) Adjustable Floor Rests and Base Flanges: Steel.
    - 5) Hanger Rods: Mild, low carbon steel, fully threaded or Threaded at each end with two removable nuts at each end for positioning rod and hanger and locking each in place.
    - 6) Riser Clamps: Malleable iron or steel.

7) Self-drilling type expansion shields shall be "Phillips" type, with case hardened steel expander plugs.

8) Miscellaneous Materials: As specified, required, directed or as noted on the drawings for proper installation of hangers, supports and accessories.

7. Install cast chrome plated escutcheon with set screw at each wall, floor and ceiling penetration in exposed finished locations.

8. Penetrations:

a. Fire Stopping: Where pipes pass through fire partitions, fire walls, smoke partitions, or floors, install a fire stop that provides an effective barrier against the spread of fire, smoke and gases as specified in Section 07 84 00, FIRESTOPPING. Completely fill and seal clearances between piping and openings with the fire stopping materials.

b. Waterproofing: At floor penetrations, completely seal clearances around the pipe and make watertight with sealant as specified in Section 07 92 00, JOINT SEALANTS.

B. Piping shall conform to the following:

1. Fuel Gas:

a. Entire new fuel gas piping installation shall be in accordance with requirements of NFPA 54.

b. Provide fuel gas piping with plugged drip pockets at low points.

### **3.2 CLEANING OF SYSTEM AFTER INSTALLATION**

Clean all new piping systems to remove all dirt, coatings and debris. Remove all valves, controls etc., and reinstall after piping system has been cleaned.

### **3.3 TESTS**

A. General: Test new piping system either in its entirety or in sections after system is installed or cleaned.

B. Test shall be made in accordance with Section 406 of the International Fuel Gas Code. The system shall be tested at a minimum of 1.5 times maximum working pressure, but not less than 3 psig (20 kPa) gage)100 psig (690 kPa).

(END)