

**1 PART 1 GENERAL****2 DESCRIPTION**

3 The requirements of this section apply to the fuel storage, handling, and distribution systems for the facility.

4  
5 Related Work: The requirements of Section 23 05 00, Common HVAC Materials and Methods, also apply to  
6 this section.

**8 CODES AND STANDARDS**

9 General

10  
11 NFPA 30, 31

12  
13 UL-142

**15 SUBMITTALS**

16 Required for all items to be installed.

**17 PART 2 PRODUCTS****18 PIPING MATERIALS**

19 Black Steel Pipe:

20 Applications: Above ground only.

21 Natural Gas, indoors.

22 Propane above grade only.

23 Pipe: Schedule 40, standard black steel pipe ASTM A-120 or A-53.

24 Threaded Fittings: For above ground installations only. Banded class 150 malleable iron fittings,  
25 ANSI B16.3 to 150 psi.

26 Welding Fittings: Standard weight, seamless steel, beveled end fittings, ANSI B16.9.

27 MegaPress Fittings: ½-inch through 2-inch shall conform to ASME B31.1, ASME B31.3, or ASME  
28 B31.9. Fittings shall have zinc and nickel coating, an HNBR sealing element, 420 stainless steel grip  
29 ring, separator ring, and an un-pressed fitting leak identification feature. Sealing elements shall be  
30 verified for the intended use. Viega MegaPress or Engineer approved equal.

31

32 Flexible Fuel Gas Piping (CSST):

33 Application: 2 psi or less for final connection of equipment.

34 Natural gas where concealed.

35 Pipe: Corrugated 300 Series stainless steel tubing with yellow polyethylene jacketing.

36 Fittings: Fittings shall be yellow brass and provide a self-flaring connection to the tubing. Systems  
37 incorporating gaskets or o-rings are not acceptable.

38 Underground Installations: CSST pre-sleeved with heavy wall internally ribbed polyethylene  
39 secondary venting conduit with end seals and vent connection fittings.

40 Approvals: System shall be listed by an approved independent laboratory and approved for use by  
41 the local code officials. TracPipe, Gastite, or approved.

42

**43 PIPING ACCESSORIES**

44 Fuel Gas Valves: UL listed or AGA approved valves.

45 10 psig or Less:

46 Ball: NIBCO bronze body T/S 585-70-UL, brass body FP-600.

47

48 Strainers: Threaded bronze or iron body for 175 working pressure, Y pattern with 1/32" stainless steel  
49 perforated screen.

50

51 Gas Pressure Regulators: Size based on pressures indicated on the Drawings and for 1.5 times connected  
52 load. Style and model as approved by Northwest Natural Gas Co. Maxitrol, Rockwell, Fisher, Reliance, or  
53 approved substitute.

54

- 1 Gas Appliance Connectors: For low pressure gas connection to indoor or outdoor stationary appliances, AGA  
2 approved corrugated stainless steel tubing with zinc plated steel end fittings. Brasscraft or approved  
3 substitute.  
4
- 5 Gas Valve Wall Boxes: 16 gauge steel door with 20 gauge steel wall box. Provide with prime white finish.  
6 Door shall be flush frame style with turned edges and concealed hinge. Provide with paddle latch. MIFAB  
7 MI-VB Series.  
8
- 9 Indoor & Outdoor Rated Gas Flex: Corrugated T-316L stainless steel hose and T-321 stainless steel exterior  
10 braid. Rated for natural gas at working pressure of 60 psi min. Flexonics 401 H Series or equal.

### 11 **PART 3 EXECUTION**

#### 12 **EQUIPMENT INSTALLATION**

13 Locating and Positioning Equipment: Observe all Codes and Regulations and good common practice in  
14 locating and installing mechanical equipment and material so that complete installation presents the least  
15 possible hazard. Maintain adequate clearances for repair and service to all equipment. Installation of any  
16 equipment with less than minimum clearances shall not be accepted.  
17

18 Anchorage: Anchor and/or brace mechanical equipment, piping and ductwork to resist displacement due to  
19 seismic action; include snubbers on equipment mounted on spring isolators.  
20

#### 21 **PIPE INSTALLATION**

22 General: Install pipe, tube and fittings in accordance with recognized industry practiced for each indicated  
23 service without piping failure. Install each run with a minimum of joints and couplings, but with adequate and  
24 accessible unions and flanges for disassembly, maintenance and/or replacement of valves and equipment.  
25 Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections.  
26

27 Ferrous Threaded Piping: Thread pipe in accordance with ANSI 82.1; cut threads full and clean using sharp  
28 dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound  
29 where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave no  
30 more than 3 threads exposed.  
31

32 Flexible Gas Piping (CSST): Comply with manufacturer's recommendations for system installation. Provide  
33 striker plates and supports as required. All penetrations of finished walls, including mechanical room walls,  
34 shall be accomplished using surface or recessed termination fittings. Where installed underground below a  
35 building, vent the conduit to outdoors per Code.  
36

37 Changes in Direction: Use fittings for all changes in direction. Run lines parallel with building surfaces.  
38

39 Unions and Flanges: At all equipment to permit dismantling and elsewhere as consistent with good  
40 installation practice.  
41

42 Expansion: Provide loops, swing joints, anchors, runouts and spring pieces to prevent damage to piping or  
43 equipment.  
44

#### 45 **GAS SERVICE**

46 Run all gas distribution piping and make final connections to all gas using equipment. Install regulators to  
47 deliver proper inlet pressures and vent regulators to outside where required.  
48

#### 49 **CLEANING**

50 General: Clean all dirt and construction dust and debris from all mechanical piping systems and leave in a  
51 new condition. Touch up paint where necessary.  
52

53 Fuel Piping: Blow clear of debris with nitrogen or oil free air.  
54

#### 55 **TEST**

## FACILITY FUEL SYSTEMS

23 10 00-3

1 General: Minimum duration of two hours or longer, as directed for all tests. Furnish report of test observation  
2 signed by qualified inspector. Make all tests before applying insulation, backfilling, or otherwise concealing  
3 piping or connecting fixtures or equipment. Where part of the system must be tested to avoid concealment  
4 before the entire system is complete, test that portion separately, same as for entire system.

5

6 Natural Gas Piping: One half hour minimum air at 60 psig for 2 psig gas, and 15 minutes at 10 psig for 7"  
7 water gauge natural gas or as approved and certified by serving utility.

8

### MECHANICAL PAINTING

9  
10 Uninsulated Piping: Paint black steel piping in moist equipment rooms, crawl spaces, inside of secondary  
11 containment piping, or exposed to weather two (2) coats black rust-inhibiting paint.

12

13

14

END OF SECTION