

PART 1: GENERAL

1.01 Purpose:

This standard is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. The responsibility of the engineer is to apply the principles of this section such that the University may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be justified through LCC analysis and submitted to the University for approval.

1.02 References:

1.03 Requirements:

- A. Design system to achieve a minimum pressure drop of .05 inches w.c., with a minimum pressure down stream of the meter at 7 inches w.c. to 14 inches w.c. and a maximum operating pressure of 5 psig pressure downstream of the meter. Higher operating pressure requires pre approval from SHSU Facilities Services.
- B. Design shall include all information required by the Authority Having Jurisdiction and SHSU Facilities Services and Utilities departments.
- C. Design shall include piping layout indicating total equivalent length pipe and all connected equipment, total friction loss in piping system and equipment demand capacities (total connected load) throughout piping system.
- D. Indicate minimum pressure requirements at outlet of meter, extent of work to be completed by utility company, meter location, work required by owner to allow meter assembly to be installed, all site information including building location, gas service location (utility supply mains), any low pressure cutoff requirements, equipment with pilot lights and all future equipment and capacities.
- E. Provide sleeved pipe runs through enclosed spaces, plenums and above corridor ceilings. Ventilate sleeve on both ends to exterior of building. Route piping exposed in ventilated spaces where possible.
- F. Base pressure ratings on natural gas piping system maximum design pressures.
- G. Provide pipe identification complying with ANSI A13.1 Scheme for Identification of Piping Systems in accordance with the following:
 - 1. Building Distribution Piping: Plastic pipe markers
 - 2. Gas Service: Underground type plastic line markers
 - 3. Gas Valves: Plastic valve tags
- H. Gas piping entering a building shall first rise above grade exterior to the building and be provided with a wrench operated shutoff valve in the horizontal portion of the exterior piping.
- I. It shall be the Contractor's responsibility to make all arrangements and pay for all services, fees, and material which are required to have the gas company extend its gas main to the property line and to install the regulator and/or meter required for the project.
- J. Verify and coordinate, with the actual various users on the site, all the times and timing involved with modification, additions to, or alterations thereof, of gas piping serving these users

- K. The gas regulator bypass globe valve shall be sized to provide a pressure drop equal to the regulator when fully open. It shall include provision for locking shut with a large padlock.
- L. Provide a wrench operated plug cock valve at the inlet and discharge side of the gas meter and pressure regulators and at building entrance.
- M. Provide zone valves on each floor easily accessible for maintenance personnel for isolation and testing.
- N. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- O. Route piping in orderly manner to conserve building space and not to interfere with use of space. Maintain gradient and group piping wherever practical at common elevations.
- P. Design piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- Q. Route piping parallel to other piping. Maintain a minimum of 12" clearance between gas piping and steam or hydronic piping above 200 degrees F.
- R. Provide shutoff gas cock and drip leg at each gas-fired equipment connection. Comply with equipment manufacturer's instructions.
- S. Provide gas shutoff outside building, upstream of meter, at pipe entry to building in adjustable gas service valve box with cover set flush to finish grade.
- T. Provide access where valves and fittings are not exposed. Coordinate access door location with architectural features.
- U. Establish elevations of buried piping outside the building to ensure a minimum of cover. All buried piping shall be installed with tracer wire.
- V. Provide protective bollards for gas meter installations, horizontally spaced no more than four feet apart and 36" high. Bollards should be constructed of galvanized steel, 6" diameter, with a minimum 0.25" wall thickness, or 4" diameter concrete-filled, schedule 40 galvanized steel pipe. Bollards should be permanent-type, and anchored to 18" X 42" concrete foundation with ASTM 3/4" x 12" ASTM - A36 galvanized L hook anchor bolts.
- W. ERW pipe shall not be used on SHSU campuses.

PART 2 PRODUCTS

2.01 Pipe and pipe fittings:

- A. All pipe used for the fabrication of gas piping systems shall be Schedule 40 black steel pipe ASTM A-53.
- B. Unless otherwise specifically required, all steel pipe provided for gas piping systems shall be provided with plain ends and assembled with weld fittings on all pipe larger than 2". All pipe 2"

and smaller shall be threaded. No pipe smaller than 3/4", except as detailed for laboratory furniture, shall be used. From the emergency shutoff valve to the outlets, the pipe shall be assembled with threaded fittings provided all joints are exposed or within the confines of the laboratory furniture.

C. For all buried steel piping, machine wrap pipe using 50% overlap wrap, with polyvinyl chloride tape. Hand wrap fittings using 100% overlap wrap extending 6" beyond fitting onto wrapped pipe. Comply with tape manufacturer's installation instructions. Installation standards and procedures of the utility company shall be strictly followed. At a point 6' from the building and the final riser to meter or building entrance point shall be wrapped steel.

D. Not Used

E. ERW Pipe shall not be used.

F. The Pro-Press pipe jointing system will be allowed for all piping systems 2" or smaller.

2.02 Valves:

A. Gas Cocks 2" and smaller shall be AGA approved 150 PSI non-shock WOG, bronze straightway cock, flat or square head with threaded ends.

B. Gas cocks 2-1/2" and larger shall be AGA approved 125 PSI non-shock WOG, iron body bronze mounted, straightway cock, square head with flanged ends.

C. Not Used

D. Control station shall be pushbutton station mounted in 2-gang box, one normally open key operated contract, and one normally closed pushbutton operated contact. Faceplate shall be inscribed with "Gas Valve Control" on top, "Open" over keyhole, and "Closed" over pushbutton.

E. Pressure regulating valves shall be single stage, steel jacketed, corrosion-resistant gas pressure regulator. Provide with elevation compensator and atmospheric vent routed to outdoors, full size of outlet, and terminated in weather proof hood. Provide with threaded ends for 2" and smaller, flanged ends for 2-1/2" and larger. Size for required inlet and outlet gas pressures, specific gravity and volume flow. Provide gas shutoff valve upstream of each pressure regulating valve.

F. Provide AGA plug valves for shut-off and to isolate equipment, part of systems, and vertical risers.

2.03 Flanges:

A. In all instances in which flanges are required for the installation of flanged fittings for gas lines, the Contractor shall provide Crane or Walworth weld neck pattern, Class 150 forged steel flanges

2.04 Drip Pipes:

Not Used

J. HEADERS:

A. The gas distribution header installed by this Contractor in the building shall be fabricated of Schedule 40 steel pipe.

2.05 COCKS:

- A. Near the point at which each outgoing line leaves the gas header, the Contractor shall install an AGA gas stop valve or gas cock. These wrench operated valves shall each be provided with an appropriate wrench. Cocks of the same type shall, moreover, be installed at each point indicated on the Drawings.

2.06 UNDERGROUND PIPING

- A. All underground piping shall be fusion welded HDPE.

PART 3 EXECUTION

3.01 TESTING:

- A. Natural gas piping shall be tested in accordance with International Fuel Gas Code requirements. Refer to Appendix 6.01.06 for further information.

END OF STANDARD