Design Standard
Gas Piping for Laboratory Facilities

Revisions Log:

Version	Date	Description of changes/updates
2	January 14, 2016	• Added preferred fixture citation for science classroom gas turrets

Purpose:

Laboratory gas piping systems are an essential element of lab plumbing systems. This design standard has the purpose of creating a consistent application of lab gas system requirements throughout the East Side Union High School District. The intent is to achieve a standard of quality for maintenance and reliability throughout all renovation and new building projects.

Design Standard:

Design and specify work to include materials, installation, and testing of piping, valves, and appurtenances for natural gas systems for a complete and operable system.

- Size gas piping for estimated maximum demand flow in CFH (using 1000 BTU per cubic foot) per code requirements. Coordinate with Food Service consultant and mechanical engineer to include non-lab fuel loads.
- Steel Pipe (Above Grade Installation):
  - 2 Inches and Smaller: Schedule 40, A53 black steel pipe and threaded black malleable threaded fittings.
  - 2-1/2 Inches and Larger: Schedule 40, A53 black pipe with Schedule 40 butt weld fittings.
  - ASTM A53, electric-resistance welded (Type E) or seamless (Type S), Grade B, black, Schedule 40 pipe, manufactured for threaded or welded pipe connections.
  - Exposed piping should be PVC coated or painted to identify the contents
- Steel Pipe (Exterior of Building Below Grade Installations)
  - 2 Inches and Smaller: Schedule 40, A53 black steel pipe and threaded black malleable threaded fittings.
  - 2-1/2 Inches and Larger: Schedule 40, A53 black pipe with butt weld fittings.

  - ASTM A53, electric-resistance welded (Type E) or seamless (Type S), Grade B, black, Schedule 40 pipe, manufactured for threaded or welded pipe connections.
  - Underground Steel Piping Corrosion Protection: Factory wrap un-insulated underground steel piping systems with protective coating composed of a coal-tar saturated wrapping tape over a 20 mil thick coal-tar epoxy coating, equivalent to "Republic X-Tru-Coat." Wrap joints spirally with a minimum overlap of 1/2 tape width. Extend wrap not less than 3 inches above grade. Provide high voltage holiday detector test of coating to check for holidays. Provide cathodic protection to meet requirements of NACE Standard RP0169-2002

- Polyethylene Pipe : not allowed
- Gas Valves:
  - 2 Inches and Smaller: Ball valves. UL listed, two-piece construction, threaded, bronze body, conventional port, 250 PSI WOG working pressure
  - 2-1/2 Inches and Larger: 100 to 125 PSI rated, all bronze or ironbody/bronze trimmed plug cock type, square head or tee/lever handle operation, lockable in the closed position. CSA approved.
- Science Classroom Gas Turrets: Deck mounted single ball valves turret with single ball valve and check:
  - Chicago Faucets 980-VR909CAGCP
- Gas Pressure Regulators: Diaphragm and spring actuated type, with vented relief feature. Construction, pressure range and venting features suitable for intended service. Regulator to meet code and serving utility requirements. Pipe vented type to atmosphere in approved location.
- Provide readily accessible shutoff valves, pressure regulators and unions at connections to lab equipment. Provide dirt/drip legs at low points of natural gas and compressed air piping.

Approved Manufacturers:

- Gas seismic valves:
  - Quake Master
  - KOSO
  - SafeTquake.
- Pressure regulators
  - American Master Company
- Valves
  - Apollo
  - Jenkins Bros.
  - Lunkenheimer Co.
  - Nibco

  - Watts
- Gas Turrets
  - Chicago

Substitutes Allowed:

Yes, if performance and quality equivalency can be evidenced.

Associated Design Standards and Construction Specifications

- Division 22 Plumbing Design Standards and Construction Specifications
- 23 11 23 - Facility Natural-Gas Piping

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