

Basis of Design

This section applies to underground natural gas distribution systems.

Background

- Puget Sound Energy (PSE) supplies high-pressure (above 60 PSI) natural gas to the main campus via a distribution station located at the power plant. The University owns all the natural gas piping supplied from that location. University facilities at other locations are served by PSE and are metered separately. See University drawing 806-RU-02 for more information.
- Refer to University drawings 875RU-1 through 875RU-18 for utilities. The above drawings are updated regularly, but are schematic and may not be accurate or complete.

Design Criteria

- Design and install natural gas service and distribution piping in accordance with American Society of Mechanical Engineers Code for Gas Transmission and Distribution Piping Systems (ASME B31.8).
- Provide engineering calculations used to size the piping.
- Bury piping with 30 inches of cover from finish grade to top of pipe. Use Seattle aggregate No. 9 for pipe bedding. Refer to the section on earthwork backfill requirements.
- Refer to Utility Corridor Arrangement drawing (see Roadways section) for piping placement under roadways.

Design Evaluation

The following information is required to evaluate the design:

- Programming Phase: Statement of design intent.
- Schematic Phase: Drawings showing existing utilities and a narrative material and system description.
- Design Development Phase: Demolition plans, utility plans showing new and existing utilities, utility details, and an outline specification.
- Construction Document Phase: Complete plans and specifications.
 - 1) Include pipe sizes, points of connection, valve details, supports, meters, trench and bedding details, connection and joint details, vault plans and sections, building penetration details, and invert elevations at building connections.
 - 2) Include plans showing all existing underground tunnels and utilities (power, communications, gas, water, storm drain, sanitary sewer, and street lighting). A survey drawing may be adequate for this purpose providing it has been reviewed to ensure all utilities are included and that each utility is clearly distinguishable from other drawing information.

Construction Submittals

- Provide standard industry submittal requirements.

Related Sections

- Facilities Services Design Guide - Earthwork
- Facilities Services Design Guide - Roadways

Products, Materials and Equipment

- All products, materials, and equipment shall conform to ASME B31.8 standards.
- Pipe and fittings: SDR 11 polyethylene with an accessible and properly grounded tracer wire. Use prefabricated fittings for transition from plastic to steel. Above-ground piping shall be steel. Use prefabricated fittings, designed to prevent stress from being transferred to the underground plastic pipe, when transitioning from underground polyethylene to above ground steel.
- Valves: AGA or API listed polyethylene ball valve, with 2-inch square operator nut
- Valve Boxes: Cast iron, two-section box. Include top section with cover and "GAS" lettering.
- Exterior below grade pipe penetrations: Link-Seals, or approved substitution

Installation, Fabrication and Construction

- Fabricate, install, and inspect all gas distribution and service piping in accordance with ASME B31.8. Include an air test at 90 PSI for 4 hours with no allowable pressure drop.
- Installation shall be by PSE approved contractor.
- Connect and activate new lines under the supervision of University engineering staff.
- University staff must inspect all gas piping installations before backfill
- Valves, piping, and fittings shall be heat fusion bonded polyethylene. Connections to steel piping shall be welded.
- The University Construction Coordinator shall make test arrangements with the Contractor and shall notify University Campus Engineering staff as to the date and time of testing. University staff shall witness testing before gas lines are placed in service.
- Refer to the following University drawings:
 - 1) Roadway & Utility Corridor Arrangement (see Roadways section)
 - 2) Site Work & Utilities Symbols (see Storm Drainage section)

END OF DESIGN GUIDE SECTION