



.1 Campus Heating Mains

- .1 All piping shall be Schedule 40 steel to ASTM A53 Grade B.
- .2 All piping shall be welded except manual air vent and drain valves may be screwed and piping downstream of them may be screwed.
- .3 Manual air vent and drain valves shall be ball valves with wing-type (not lever-type) handles.
- .4 There shall be no high or low point in the piping between heating mains manholes. If this cannot be avoided then air vents/drains must be provided at the high/low point.
- .5 Valves (other than air vent and drain valves) shall be class 150 ball valves. 150psig/400°F. $\geq 1\frac{1}{2}$ " must be equipped with gear driven operator to slow speed to open valve. ≥ 4 " to have $\frac{3}{4}$ " gate bypass for warmup.
- .6 For the most part these mains run underground. Where underground they shall run in a concrete trench typical in design and construction to the existing which are designed for water-tightness and to have removable lids.
- .7 Mains valves, drain valves and vents shall be in accessible manholes or in building mechanical rooms.
- .8 Where possible arrange take-offs for a building to be valved such that future shutdown of a section of the mains will not interrupt service to the building.

.2 Building Heating, Heat Recovery, and Chilled Water Piping and Valves

- .1 Piping may be steel to ASTM A53 Grade B or type L copper, to ASTM B88M-86.
- .2 Connections for steel pipe shall be welded and flanged on pipe NPS 2-1/2 [65 mm] diameter and larger and shall be screwed on pipe NPS 2 [50 mm] diameter and smaller.
- .3 Connections for copper pipe shall be brazed with silver base brazing alloy, 538°C [1000°F] melting point but with soldered to screwed cast bronze fittings (to ANSI B16.18) or wrought copper fittings (to ANSI B16.22).
- .4 Grooved mechanical couplings are not acceptable.
- .5 Press-fit type couplings are not acceptable.
- .6 Valves NPS 2-1/2 [65 mm] and larger shall be flanged. Valves NPS 2-1/2 (65 mm) and smaller shall be soldered or screwed.
- .7 Butterfly valves may only be used on Heat Recovery or Chilled Water System systems or Heating Water systems where the maximum design temperature does not exceed 180°F (82°C).
- .8 Balance valves shall be multiple-turn, memory stop, positive shut-off with inlet and outlet pressure connections, calibrated for flow measuring.
Acceptable Products: Armstrong CBV, Tour & Anderssen STA.

.3 Pressure Gauges

- .1 Minimum 85 mm (3-1/2" diameter), with isolating cock, Imperial and S.I. units. Selected for normal working pressure is about mid-range.
- .2 Dwyer magnehelic gauge across each filter bank



.4 Piped systems Cleaning

- .1 For the campus heating mains, process water lines or chilled water lines, retain the services of a professional Cleaning Agency to supervise the chemical cleaning and flushing of the new piping. Facilities Management Mechanical Shop will provide the subsequent chemical treatment.