

when the installation of such device produces an excessive pressure drop in any such water supply piping. In the absence of specific pressure drop information, the diameter of the inlet or outlet of any such device or its connecting piping shall be not less than the diameter of such water distribution piping to the fixtures served by the device.

Such devices shall be of a type approved by the Authority Having Jurisdiction and shall be tested for flow rating and pressure loss by an approved laboratory or recognized testing agency to standards consistent with the intent of this chapter.

610.3 The quantity of water required to be supplied to every plumbing fixture shall be represented by water supply fixture unit values, as shown in Table 6-7.

610.4 Listed parallel water distribution systems shall be installed in accordance with their listing, but at no time shall any portion of the system exceed the maximum velocities allowed by this code.

610.5 Except where the type of pipe used and the water characteristics are such that no decrease in capacity due to length of service (age of system) may be expected, all friction-loss data shall be obtained from the charts in Appendix A of this code. Friction or pressure losses in the water meter, valve, and fittings shall be obtained from the same sources. Pressure losses through water-treating equipment, backflow prevention devices, or other flow-restricting devices shall be computed as required by Section 610.2.

610.6 On any proposed water piping installation sizing, the following conditions shall be determined:

- (1) Determine static pressure for highest outlet (elevation difference to highest outlet).
- (2) Determine friction head loss (pump to farthest fixture x 1.5 [equals equivalent length]).
- (3) Required outlet pressure [fixture with most pressure requirements (i.e. flush valves etc.)].
- (4) Head loss through PRV at pump (add total for required initial pressure).
- (5) Total number of water supply fixture units as determined from Table 6-7, Separate Cold and Hot Water Supply Fixture Unit Values, for the fixtures to be installed.
- (6) Convert to L/min. (gpm) as determined from Table 6-9.
- (7) Head on pump (total required initial pressure).
- (8) Suction pressure (bar).
- (9) Select pump capacity and head (based on L/min. at a head of bar).
- (10) Water service must supply total L/min (gpm) (use friction loss tables for appropriate type of material).

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- (11) Determine pressure loss of pipe (per 100m [100 ft.] of pipe).
- (12) Determine sizing for main (designing velocities at or below 2.4m/s [8fps] and manufacturer's recommendations).
- (13) Determine sizing for branches (from the most remote riser work towards source of supply).
 - (a) Use table for converting WSFU to L/min (gpm) (Table 6-9) and the friction loss tables for selecting pipe sizes for the corresponding L/min (gpm) flow (Appendix A tables for friction loss).

610.7 Sizing for Velocity. Water piping systems shall not exceed the maximum velocities listed in this section or Appendix A.

610.7.1 Water Supply Systems. Maximum velocities in pipe, tubing, and fitting systems shall not exceed 2.4m/s (8 fps) in cold water and 1.5m/s (5 fps) in hot water.

610.8 Exceptions. The provisions of this section relative to size of water piping shall not apply to the following:

- (1) Water supply piping systems designed in accordance with recognized engineering procedures acceptable to the Authority Having Jurisdiction.
- (2) Alteration of or minor additions to existing installations, provided the Authority Having Jurisdiction finds that there will be an adequate supply of water to operate all fixtures.
- (3) Replacement of existing fixtures or appliances.
- (4) Piping that is part of fixture equipment.
- (5) Unusual conditions where, in the judgment of the Authority Having Jurisdiction, an adequate supply of water is provided to operate fixtures and equipment.
- (6) Nonpotable water lines as defined in Section 601.2.
- (7) The size and material of irrigation water piping installed outside of any building or structure and separated from the potable water supply by means of an approved airgap or backflow prevention device is not regulated by this code. The potable water piping system supplying each such irrigation system shall be adequately sized as required elsewhere in this chapter to deliver the full connected demand of both the domestic use and the irrigation systems.

611.0 Manifold or Gridded Systems.

611.1 General. Manifold and gridded systems shall be installed as a remote manifold design. Hot and