608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.

608.1 Inadequate Water Pressure. A minimum water pressure equal to 1.25bar (18.0 psi) shall be ensured in the distribution system. In situations where this is unavailable, a suitable booster pump shall be installed (see Section 608.1.1). Booster pumps shall be installed on the discharge side of the elevated tank that supplies the water to the building in accordance with the manufacturer's instructions and engineering design. Pressure to be generated by the booster pump shall depend on the type of fixtures installed.

608.1.1 Booster Pumps. Booster pumps shall operate on the following principles:

(1) Cut-in and cut-off at preset low/high pressure limits.

(2) Variable Frequency Drive (VFD), wherein the frequency of the motor shall be determined by the system demand.

Booster pumps shall preferably be provided with a flooded suction from a storage tank. Where this is not feasible, either submersible pumps or pumps with adequate priming arrangements shall be provided. All booster pumps shall have dry run protection.

Water pressure tanks in a hydro-pneumatic booster system shall be provided with a pressure relief valve and be set at a maximum pressure equal to the rating of the tank. Such valves shall be sized and installed in accordance with the manufacturer's instruction.

608.2 Excessive Water Pressure. Where static water pressure in the water supply piping exceeds 6bar (80 psi), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 6.5bar (80 psi) or less. Pressure regulator(s) equal to or exceeding 40mm (1.5 in.) shall not require a strainer. Such regulator(s) shall control the pressure to all water outlets in the building unless otherwise approved by the Authority Having Jurisdiction. Each such regulator and strainer shall be accessibly located above ground or in a vault equipped with a properly sized and sloped, bore-sighted drain to daylight, shall be protected from mechanical damage, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping. Pipe size determinations shall be based on 80 percent of the reduced pressure. An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. The expansion tank shall be properly sized and installed in accordance with the manufacturer's instructions and listing. Systems designed by registered engineers shall be permitted to use approved pressure relief valves in lieu of expansion tanks, provided such relief valves have a maximum pressure relief setting of 7bar (100 psi) or less.

608.3 Thermal Expansion. Any water system provided with a check valve, backflow preventer, pressure regulating valve, or any other normally closed device that prevents the dissipation of building pressure back into the water main shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized and installed in accordance with the manufacturer's recommendation.

609.0 Installation, Testing, Unions, and Location.

609.1 Installation. Water piping shall be adequately supported in accordance with Section 314.0. Burred ends shall be reamed to the full bore of the pipe or tube. Changes in direction shall be made by the appropriate use of fittings, except that changes in direction in copper tubing may be made with bends, provided that such bends are made with bending equipment that does not deform or create a loss in the cross-sectional area of the tubing. Changes in direction are allowed with flexible pipe and tubing without fittings in accordance with the manufacturer's installation instructions. Provisions shall be made for expansion in hot-water piping. Piping, equipment, appurtenances, and devices shall be installed in a manner conforming with the provisions and intent of this code. The cover for water service piping shall be not less than 30cm (12 in.) below finish grade.

609.2 Water pipes shall not be run or laid in the same trench as building sewer or drainage piping constructed of materials that are not approved for use within a building unless both of the following conditions are met:

609.2.1 The bottom of the water pipe, at all points, shall be not less than 30cm (12 in.) above the top of the sewer or drain line.

609.2.2 The water pipe shall be placed on a solid shelf, excavated at one side of the common trench with a clear horizontal distance of not less than 30cm (12 in.) from the sewer or drain line.

Water pipes crossing sewer or drainage piping materials that are not approved for use within a building shall be laid not less than 30cm (12 in.) above the sewer or drain pipe.