

# CHAPTER 11

## STORM DRAINAGE

### 1101.0 General.

**1101.1 Where Required.** Roofs, paved areas, yards, courts, and courtyards shall be drained into a separate storm sewer system, or into a combined sewer system where a separate storm sewer system is not available, or to some other place of disposal satisfactory to the Authority Having Jurisdiction. In the case of one- and two-family dwellings, storm water shall be permitted to be discharged on flat areas, such as streets or lawns, so long as the storm water shall flow away from the building and away from adjoining property, and shall not create a nuisance.

**1101.2 Storm Water Drainage to Sanitary Sewer Prohibited.** Storm water shall not be drained into sewers intended for sanitary drainage only.

**1101.3 Material Uses.** Rainwater piping placed within the interior of a building or run within a vent or shaft shall be of cast-iron, galvanized steel, wrought iron, brass, copper, lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, stainless steel 304 or 316L (stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than six (6) inches (152 mm) above ground), or other approved materials, and changes in direction shall conform to the requirements of Section 706.0. ABS and PVC DWV piping installations shall be installed in accordance with IS 5, IS 9, and Chapter 15 "Firestop Protection." Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of a maximum of twenty-five (25) and a smoke-developed index of a maximum of fifty (50), when tested in accordance with the *Test for Surface-Burning Characteristics of the Building Materials* (see the Building Code standards based on ASTM E84 and UL 723.).

**1101.4 Expansion Joints Required.** Expansion joints or sleeves shall be provided where warranted by temperature variations or physical conditions.

### 1101.5 Subsoil Drains.

**1101.5.1** Subsoil drains shall be provided around the perimeter of buildings having basements, cellars, crawl spaces or floors below grade. Such subsoil drains shall be permitted to be positioned inside or outside of the footing, shall be of perforated or open-jointed approved drain tile or pipe, not less than three (3) inches (80 mm) in diameter, and shall be laid in gravel, slag, crushed rock, approved three-quarter (3/4) inch (19.1 mm) crushed, recycled glass aggregate,

or other approved porous material with not less than four (4) inches (102 mm) surrounding the pipe on all sides. Filter media shall be provided for exterior subsoil piping.

**1101.5.2** Subsoil drains shall be piped to a storm drain, to an approved water course, to the front street curb or gutter, to an alley, or the discharge from the subsoil drains shall be conveyed to the alley by a concrete gutter. Where a continuously flowing spring or groundwater is encountered, subsoil drains shall be piped to a storm drain or an approved water course.

**1101.5.3** Where it is not possible to convey the drainage by gravity, subsoil drains shall discharge to an accessible sump provided with an approved automatic electric pump. The sump shall be not less than fifteen (15) inches (381 mm) in diameter, eighteen (18) inches (457 mm) in depth, and provided with a fitted cover. The sump pump shall have an adequate capacity to discharge all water coming into the sump as it accumulates to the required discharge point, and the capacity of the pump shall be not less than fifteen (15) gpm (56.8 L/m). The discharge piping from the sump pump shall be not less than of one and one-half (1-1/2) inches (40 mm) in diameter and have a union or other approved quick-disconnect assembly to make the pump accessible for servicing.

**1101.5.4** For separate dwellings not serving continuously flowing springs or groundwater, the sump discharge pipe shall be permitted to discharge onto a concrete splash block with a minimum length of twenty-four (24) inches (610 mm). This pipe shall be within four (4) inches (102 mm) of the splash block and positioned to direct the flow parallel to the recessed line of the splash block.

**1101.5.5** Subsoil drains subject to backflow when discharging into a storm drain shall be provided with a backwater valve in the drain line so located as to be accessible for inspection and maintenance.

**1101.5.6** Nothing in Section 1101.5 shall prevent drains that serve either subsoil drains or areaways of a detached building from discharging to a properly graded open area, provided that:

- (1) They do not serve continuously flowing springs or groundwater;

- (2) The point of discharge is not less than ten (10) feet (3,048 mm) from any property line; and
- (3) It is impracticable to discharge such drains to a storm drain, to an approved water course, to the front street curb or gutter, or to an alley.

**1101.6 Building Subdrains.** Building subdrains located below the public sewer level shall discharge into a sump or receiving tank, the contents of which shall be automatically lifted and discharged into the drainage system as required for building sumps.

**1101.7 Areaway Drains.** Open subsurface space adjacent to a building, serving as an entrance to the basement or cellar of a building, shall be provided with a drain or drains. Such areaway drains shall be not less than two (2) inches (50 mm) in diameter for areaways at a maximum of one-hundred (100) square feet (9.3 m<sup>2</sup>) in area, and shall be discharged in the manner provided for subsoil drains not serving continuously flowing springs or groundwater (see Section 1101.5.2). Areaways in excess of one-hundred (100) square feet (9.3 m<sup>2</sup>) shall not drain into subsoil drains. Areaway drains for areaways exceeding one-hundred (100) square feet (9.3 m<sup>2</sup>) shall be sized according to Table 11-2.

**1101.8 Window Areaway Drains.** Window areaways at a maximum of ten (10) square feet (0.9 m<sup>2</sup>) in area shall be permitted to discharge to the subsoil drains through a two (2) inch (50 mm) pipe. However, window areaways exceeding ten (10) square feet (0.9 m<sup>2</sup>) in area shall be handled in the manner provided for entrance areaways (see Section 1101.7).

**1101.9 Filling Stations and Motor Vehicle Washing Establishments.** Public filling stations and motor vehicle washing establishments shall have the paved area sloped toward sumps or gratings within the property lines. Curbs not less than six (6) inches (152 mm) high shall be placed where required to direct water to gratings or sumps.

**1101.10 Paved Areas.** Where the occupant creates surface water drainage, the sumps, gratings, or floor drains shall be piped to a storm drain or an approved water course.

**1101.11 Roof Drainage.**

**1101.11.1 Primary Roof Drainage.** Roof areas of a building shall be drained by roof drains or gutters. The location and sizing of drains and gutters shall be coordinated with the structural design and pitch of the roof. Unless otherwise required by the Authority Having Jurisdiction, roof drains, gutters, vertical conductors or leaders, and horizontal storm drains for primary drainage shall be sized based on a storm of sixty

(60) minutes duration and one-hundred (100) year return period. Refer to Table D-1 (in Appendix D) for one-hundred (100) year, sixty (60) minute storms at various locations.

**1101.11.2 Secondary drainage.** Secondary (emergency) roof drainage shall be provided by one (1) of the methods specified in Section 1101.11.2.1 or 1101.11.2.2.

**1101.11.2.1 Roof Scuppers or Open Side.**

Secondary roof drainage shall be provided by an open-sided roof or scuppers where the roof perimeter construction extends above the roof in such a manner that water will be entrapped. An open-sided roof or scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.11.1. Scupper openings shall be not less than of four (4) inches (102 mm) high and have a width equal to the circumference of the roof drain required for the area served, sized by Table 11-1.

**1101.11.2.2 Secondary Roof Drain.**

Secondary roof drains shall be provided. The secondary roof drains shall be located not less than two (2) inches (51 mm) above the roof surface. The maximum height of the roof drains shall be a height to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.11.1. The secondary roof drains shall connect to a piping system conforming to Section 1101.11.2.2.1 or 1101.11.2.2.2.

**1101.11.2.2.1 Separate Piping System.**

The secondary roof drainage system shall be a separate system of piping, independent of the primary roof drainage system. The discharge shall be above grade, in a location observable by the building occupants or maintenance personnel. Secondary roof drain systems shall be sized in accordance with Section 1101.11.1 based on the rainfall rate for which the primary system is sized.

**1101.11.2.2.2 Combined System.**

The secondary roof drains shall connect to the vertical piping of the primary storm drainage conductor downstream of any horizontal offset below the roof. The primary storm drainage system shall connect to the building storm water that connects to an underground public storm sewer. The combined secondary