

## CHAPTER 9

# VENTS

### SECTION 901 GENERAL

**901.1 Scope.** The provisions of this chapter shall govern the materials, design, construction and installation of vent systems.

**901.2 Trap seal protection.** The plumbing system shall be provided with a system of vent piping that will permit the admission or emission of air so that the seal of any fixture trap shall not be subjected to a pneumatic pressure differential of more than 1 inch of water (249 Pa).

**901.2.1 Venting required.** Every trap and trapped fixture shall be vented in accordance with one of the venting methods specified in this chapter.

**901.3 Chemical waste vent system.** The vent system for a chemical waste system shall be independent of the sanitary vent system and shall terminate separately through the roof to the open air.

**901.4 Use limitations.** The plumbing vent system shall not be utilized for purposes other than the venting of the plumbing system.

**901.5 Tests.** The vent system shall be tested in accordance with Section 312.

**901.6 Engineered systems.** Engineered venting systems shall conform to the provisions of Section 918.

### SECTION 902 MATERIALS

**902.1 Vents.** The materials and methods utilized for the construction and installation of venting systems shall comply with the applicable provisions of Section 702.

**902.2 Sheet copper.** Sheet copper for vent pipe flashings shall conform to ASTM B 152 and shall weigh not less than 8 ounces per square foot (2.5 kg/m<sup>2</sup>).

**902.3 Sheet lead.** Sheet lead for vent pipe flashings shall weigh not less than 3 pounds per square foot (15 kg/m<sup>2</sup>) for field-constructed flashings and not less than 2.5 pounds per square foot (12 kg/m<sup>2</sup>) for prefabricated flashings.

### SECTION 903 VENT STACKS AND STACK VENTS

**903.1 Stack required.** Every building in which plumbing is installed shall have at least one stack the size of which is not less than one-half of the required size of the building drain, *and not less than 2 inches in diameter*. Such stack shall run undiminished in size and as directly as possible from the building drain through to the open air or to vent header that extends to the

open air.

**903.1.1 Connection to drainage system.** A main vent that is a vent stack shall connect to the building drain or to the base of a drainage stack in accordance with Section 903.4. A main vent that is a stack vent shall be an extension of the drainage stack.

**903.2 Vent stack required.** A vent stack shall be required for every drainage stack that is five branch intervals or more.

**903.3 Vent termination.** Every vent stack or stack vent shall extend outdoors and terminate to the open air.

**903.4 Vent connection at base.** Every vent stack shall connect to the base of the drainage stack. The vent stack shall connect at or below the lowest horizontal branch. Where the vent stack connects to the building drain, the connection shall be located downstream of the drainage stack and within a distance of ten times the diameter of the drainage stack.

**903.5 Vent headers.** Stack vents and vent stacks connected into a common vent header at the top of the stacks and extending to the open air at one point shall be sized in accordance with the requirements of Section 916.1. The number of fixture units shall be the sum of all fixture units on all stacks connected thereto, and the developed length shall be the longest vent length from the intersection at the base of the most distant stack to the vent terminal in the open air, as a direct extension of one stack.

### SECTION 904 VENT TERMINALS

**904.1 Roof extension.** All open vent pipes that extend through a roof shall be terminated at least 6 inches (mm) above the roof, except where the roof space is accessible by the public or the building tenants, the vent extensions shall be run at least 7 feet (2134 mm) above the roof.

**904.2 Frost closure.** Where the 97.5-percent value for outside design temperature is less than 0°F (-18°C), every vent extension through a roof or wall shall be a minimum of 3 inches (76 mm) in diameter. Any increase in the size of the vent shall be made inside the structure a minimum of 1 foot (304.8 mm) below the roof or inside the wall.

**904.3 Flashings.** The juncture of each vent pipe with the roof line shall be made water tight by an approved flashing.

**904.4 Prohibited use.** Vent terminals shall not be used as a flag pole or to support flag poles, television aerials or similar items, except when the piping has been anchored in an approved manner.

**904.5 Location of vent terminal.** An open vent terminal from

a drainage system shall not be located directly beneath any door, openable window, or other air intake opening of the building or of an adjacent building, and any such vent terminal shall not be within 10 feet (3048 mm) horizontally of such an opening unless it is at least 2 feet (610 mm) above the top of such opening.

**904.6 Extension through the wall.** Vent terminals extending through the wall shall terminate a minimum of 10 feet (3048 mm) from the lot line and 10 feet (3048 mm) above average ground level. Vent terminals shall not terminate under the overhang of a structure with soffit vents. Side wall vent terminals shall be protected to prevent birds or rodents from entering or blocking the vent opening.

**904.7 Extension outside a structure.** In climates where the 97.5-percent value for outside design temperature is less than 0°F (-18°C), vent pipes installed on the exterior of the structure shall be protected against freezing by insulation, heat or both.

**SECTION 905  
VENT CONNECTIONS AND GRADES**

**905.1 Connection.** All individual, branch and circuit vents shall connect to a vent stack, stack vent, air admittance valve or extend to the open air.

**905.2 Grade.** All vent and branch vent pipes shall be so graded and connected as to drain back to the drainage pipe by gravity.

**905.3 Vent connection to drainage system.** Every dry vent connecting to a horizontal drain shall connect above the centerline of the horizontal drain pipe.

**905.4 Vertical rise of vent.** Every dry vent shall rise vertically to a minimum of 6 inches (152 mm) above the flood level rim of the highest trap or trapped fixture being vented.

**905.5 Height above fixtures.** A connection between a vent pipe and a vent stack or stack vent shall be made at least 6 inches (152 mm) above the flood level rim of the highest fixture served by the vent. Horizontal vent pipes forming branch vents, relief vents or loop vents shall be at least 6 inches (152 mm) above the flood level rim of the highest fixture served.

**905.6 Vent for future fixtures.** Where the drainage piping has been roughed-in for future fixtures, a rough-in connection for a vent shall be installed. The vent size shall be not less than one-half the diameter of the rough-in drain to be served. The vent rough-in shall connect to the vent system, or shall be vented by other means as provided for in this chapter. The connection shall be identified to indicate that the connection is a vent.

**SECTION 906  
FIXTURE VENTS**

**906.1 Distance of trap from vent.** Each fixture trap shall have a protecting vent located so that the slope and the developed length in the fixture drain from the trap weir to the vent fitting

are within the requirements set forth in Table 906.1.

**TABLE 906.1  
MAXIMUM DISTANCE OF FIXTURE TRAP FROM VENT**

SIZE OF TRAP (inches)	SIZE OF FIXTURE DRAIN (inches)	SLOPE (inch per foot)	DISTANCE FROM TRAP (feet)
1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1/4	3 <sup>1</sup> / <sub>2</sub>
1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1/4	5
1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	1/4	5
1 <sup>1</sup> / <sub>2</sub>	2	1/4	6
2	2	1/4	8
3	3	1/8	10
4	4	1/8	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 inch per foot = 0.0833 mm/m.

**906.2 Venting of fixture drains.** The vent for a fixture drain, except where serving a fixture with integral traps, such as water closets, shall connect above the weir of the fixture trap being vented.

**906.3 Crown vent.** A vent shall not be installed within two pipe diameters of the trap weir.

**SECTION 907  
INDIVIDUAL VENT**

**907.1 Individual vent permitted.** Each trap and trapped fixture is permitted to be provided with an individual vent. The individual vent shall connect to the fixture drain of the trap or trapped fixture being vented.

**SECTION 908  
COMMON VENT**

**908.1 Individual vent as common vent.** An individual vent is permitted to vent two traps or trapped fixtures as a common vent. The traps or trapped fixtures being common vented shall be located on the same floor level.

**908.2 Connection at the same level.** Where the fixture drains being common vented connect at the same level, the vent connection shall be at the interconnection of the fixture drains or downstream of the interconnection.

**908.3 Connection at different levels.** Where the fixture drains connect at different levels, the vent shall connect as a vertical extension of the vertical drain. The vertical drain pipe connecting the two fixture drains shall be considered the vent for the lower fixture drain, and shall be sized in accordance with Table 908.3. The upper fixture shall not be a water closet.

**TABLE 908.3  
COMMON VENT SIZES**

PIPE SIZE (inches)	MAXIMUM DISCHARGE FROM UPPER FIXTURE DRAIN (dfu)
1 <sup>1</sup> / <sub>2</sub>	1
2	4
2 <sup>1</sup> / <sub>2</sub> to 3	6

For SI: 1 inch = 25.4 mm.

sized in accordance with Section 916.2 and installed in accordance with Section 905. The relief vent shall be permitted to serve as the vent for other fixtures.

**917.4 Location.** The air admittance valve shall be located a minimum of 4 inches (102 mm) above the horizontal branch drain or fixture drain being vented. The air admittance valve shall be located within the maximum developed length permitted for the vent. The air admittance valve shall be installed a minimum of 6 inches (152 mm) above insulation materials.

**917.5 Access and ventilation.** Access shall be provided to all air admittance valves. The valve shall be located within a ventilated space that allows air to enter the valve.

**917.6 Size.** The air admittance valve shall be rated in accordance with the standard for the size of the vent to which the valve is connected.

**917.7 Vent required.** Within each plumbing system, a minimum of one stack vent or vent stack shall extend outdoors to the open air.

**917.8 Prohibited installations.** Air admittance valves shall not be installed in nonneutralized special waste systems as described in Chapter 8. Valves shall not be located in spaces utilized as supply or return air plenums.

## **SECTION 918 SINGLE STACK PLUMBING SYSTEM**

**918.1 Approval.** *The plumbing official shall require that necessary plans submitted under this section are signed by a registered professional engineer*

**TABLE 918.2  
MINIMUM DIAMETER AND MAXIMUM LENGTH OF INDIVIDUAL BRANCH FIXTURE VENTS AND  
INDIVIDUAL FIXTURE HEADER VENTS FOR SMOOTH PIPES**

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