



Plumbing Vents

This edition of the Code Outreach Program is intended to guide code users in understanding the purpose and the proper installation of a venting system regulated by the provisions in the 2020 Plumbing Code of New York State (PCNYS).

Chapter 9 of the 2020 PCNYS is dedicated to vents. Vents are a necessary part of the plumbing system whose purpose is to allow the entrance or emission of gas in the plumbing system to equalize pressure and prevent excessive pressure from being applied to the water trap seal. A proper venting system shall ensure that the pressure differential applied to a water trap seal does not exceed 1 inch of water column. The venting system is present throughout the plumbing system because each trapped fixture is required to be vented (Section 901.2.1).

A variety of methods can be used to vent a plumbing system and several options will be discussed herein but this is not a comprehensive list. According to Section 910, a fixture is always allowed to be individually vented, however, when multiple fixtures are provided, other venting methods are commonly used to reduce materials and labor.

The following terms are contained herein and defined in Chapter 2 of the 2020 PCNYS: bathroom group, developed length, fixture trap, stack, and waste.

Wet Venting

Wet venting is permissible when it complies with the provisions of Section 912 of the 2020 PCNYS. Wet venting carries the discharge from fixtures at a higher level in the drainage system and is used to reduce the number of individual vent pipes. According to Section 912.1, a horizontal wet vent is allowed to vent *“any combination of fixtures within two bathroom groups located on the same floor level.”* The minimum diameter of the horizontal wet vent pipe as a function of the drainage fixture unit (dfu) load is specified in Table 912.3. For the same dfu load, the diameter of a horizontal wet vent pipe is larger than the size required for a drain pipe by Table 710.1(1) of the 2020 PCNYS because the wet vent pipe must allow for a larger air space for vent flow. The maximum allowable distances from the fixture to the wet vent are listed in Table 909.1.

Waste Stack Vent

A waste stack vent is permitted when complying with the requirements of Section 913. This type of venting saves materials by not requiring a fixture to be individually vented. A waste stack vent carries the waste discharge from the fixtures it vents. The waste stack is required to be vertical and contain no horizontal or vertical offsets between the highest and lowest fixture drain connections. As the name implies, the waste stack is only allowed to carry waste but shall not receive the discharge from water closets or urinals. The waste stack shall be the same size throughout its length and shall be sized according to Table 913.4, which is based on the total discharge for the stack and the total discharge within a one branch interval. The minimum pipe diameter for stack vents is determined from the developed length and the total dfu load connected thereto in accordance with Table 906.1.

Circuit Venting

Circuit venting, which is described in Section 914, is a venting method that shares some aspects of horizontal wet venting but, unlike wet venting, is not subject to the pipe sizing table and instead, the circuit vent portion of the horizontal branch drain is sized based on dfu load in Table 710.1(2) of the 2020 PCNYS. Circuit venting is allowed for no more than eight fixtures (see Section 914.1) connected to a horizontal branch drain and each fixture drain shall connect horizontally to the horizontal branch being circuit vented. The reason fixture drains must be connected horizontally and not vertically is to prevent waste and soil from interfering with the air circulating in the top half of the horizontal branch drain. The circuit vent connection must also be located between the two most upstream fixture vents and is not allowed to receive the discharge of any soil or waste (Section 914.2). If a circuit vent contains 4 or more water closets a relief vent shall be installed in accordance with Section 914.4. The diameter of the circuit and relief vents shall be not less than one-half the required diameter of the drain served and the vent pipe shall be increased by one nominal pipe size for the entire developed length of the vent pipe when exceeding 40 feet in developed length.

Single Stack System

In a single-stack vent system, the drainage stack serves as both drain and vent and therefore requires larger pipe diameters than other venting systems. The drainage stack is sized in accordance with Table 917.2 and is based on the maximum number of dfu units and stack height, but there is an additional restriction that *“a 3-inch stack shall not serve more than two water closets.”* The maximum allowable length of horizontal branches is more restrictive than in some other venting systems and is subject to the provisions in Section 917.4. For example, for fixtures other than water closets, the maximum developed length of a horizontal branch is 12 feet (Section 917.4.2). An additional restriction is the prohibition of horizontal branches on the lower two floors when the stack is taller than 2 branch intervals.

Vent Terminals

Regardless of the venting method, vent termination must comply with the provisions of Section 903 and the distance of the trap to the vent must comply with Section 909.1. Vent terminations commonly extend through a roof and must be terminated not less than 18 inches above the roof except that *“a roof is to be used for assembly or as a promenade, observation deck, sunbathing deck or similar purposes, open vent pipes shall terminate not less than 7 feet above the roof.”*