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ARTICLE

Methods to Venting Plumbing Fixtures and Traps in the 2009 International Plumbing Code - Part 2

By Lee Clifton, PMG, Director of Plumbing Programs, International Code Council

Quality venting systems take careful planning.

Part 2 of a Four-Part Series

In Part 1 of this series, we discussed conventional venting systems in the 2009 International Plumbing Code. In Part 2, we will continue to present the various approaches to venting that are permitted in the 2009 IPC. You will find that these venting provisions offer the installer and designer different paths to achieving an adequately vented system that could result in cost savings along with ease of installation in different types of construction.

Non-Conventional Venting Methods

Proper application of these venting options can substantially reduce the amount of pipe and fittings used, while still providing proper venting. Inspectors and plumbers often overlook the opportunities afforded by these different venting methods, which have been proven to save money and may be helpful in areas where conventional venting methods may be difficult to install.

Let's begin with the two remaining specific venting methods.

Island Fixture Venting

This is a specific method for venting an island sink, one limited to sinks and lavatories. Residential kitchens sinks with a dishwasher waste connection, a food waste grinder, or both, in combination with the kitchen sink waste, shall be permitted.

The island fixture vent shall connect to the fixture drain as required for an individual or common vent. The vent shall rise vertically to above the drainage outlet of the fixture being vented before offsetting horizontally or vertically downward. The vent or branch vent for multiple island fixture vents shall extend to a minimum of 6 inches (152 mm) above the highest island fixture being vented before connecting to the outside vent terminal.

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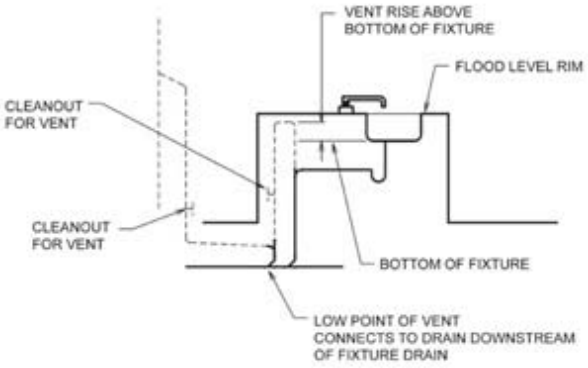
The vent located below the flood level rim of the fixture being vented shall be installed as required for drainage piping in accordance with Chapter 7, except for sizing. The vent shall be sized in accordance with Section 916.2. The lowest point of the island fixture vent shall connect full size to the drainage system.

The connection shall be to a vertical drain pipe or to the top half of a horizontal drain pipe. Cleanouts shall be provided in the island fixture vent to permit rodding of all vent piping located below the flood level rim of the fixtures. Rodding in both directions shall be permitted through a cleanout.

As you can see from the diagram for this installation, this venting method provides for a free flow of air where liquid is not being trapped in the lowest portion of the vent, because of its connection to the drain. This method will work well in a crawl space or underground application.

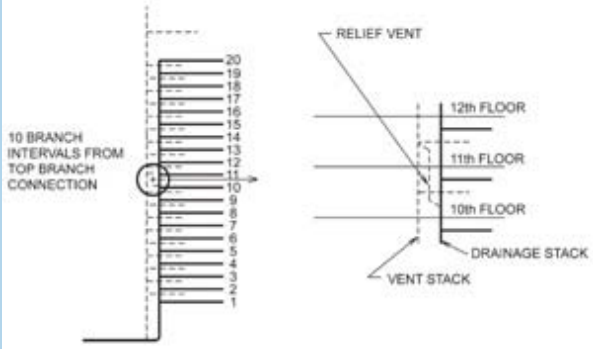


Click here to see a diagram of how island fixture venting provides a free flow of air, so that liquid is not trapped in the lowest portion of the vent.

Relief Vents-Stacks for More Than 10-Branch Intervals

This venting method requires a relief vent equal to the size of the vent stack it connects with for buildings exceeding 10-branch intervals. A relief vent must be located at every 10-branch intervals, measured from the highest horizontal drainage branch, and then calculated downward to the base of the stack.

The lower end of the relief vent is connected to the soil or waste stack below the level of the horizontal branch that serves the floor level within the branch interval required to have the relief vent. The location of this connection is intended to allow waste that might get into the relief vent, including condensation, to reach a waste line. This connection is made using a wye fitting installed as a drainage fitting in order to not impair the flow. The upper connection of the relief vent is made to the vent stack and is to be located a minimum of 3 feet (914 mm) above the floor level of the same horizontal branch. This connection is made using a wye fitting installed in an inverted position. The 3-foot (914 mm) minimum height required is a common theme in Chapter 9 and is intended to prevent waste flow from entering the vent stack.



Click here to see a diagram of Relief Vents-Stacks for More Than 10-Branch Intervals

Air-admittance Valves

There are two methods of venting that could be considered as alternates.

The air-admittance valve (AAV) is a device designed to allow air into the vent pipe when negative pressure develops in the system. In this way, it is used on individual vents, branch vents and circuit vents in lieu of terminating to the exterior of the structure. Stack vents and vent stacks are permitted to terminate to a stack type air admittance valve. The exception is for stack vents or vent stacks that serve drainage stacks exceeding six-branch intervals.

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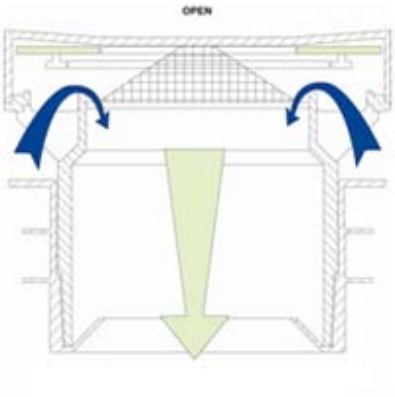

The air-admittance valve (AAV) opens to admit air to relieve negative pressure. Click here to see larger image.

Continued from previous page

Because the AAV will not allow positive pressures to pass through, there are certain installation requirements that are specified in the IPC. The one open pipe vent required on every building drainage system in Section 917.7, Vent Required, and Section 903.1, Required Vent Extension, mandates that at least one vent pipe shall extend to the outdoors to relieve the system's positive pressure. Section 917.3.2 contains measures for pressure relief by requiring the installation of a relief vent where the horizontal branch is located more than four branch intervals from the top of the stack.

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Engineered Vent Systems

This type of venting system is considered to be an alternative engineered design. Notice that according to Table 918.2, which provides criteria for determining cubic feet or air flow per minute for various diameters of pipe, a vent can be as small as ½ inch in

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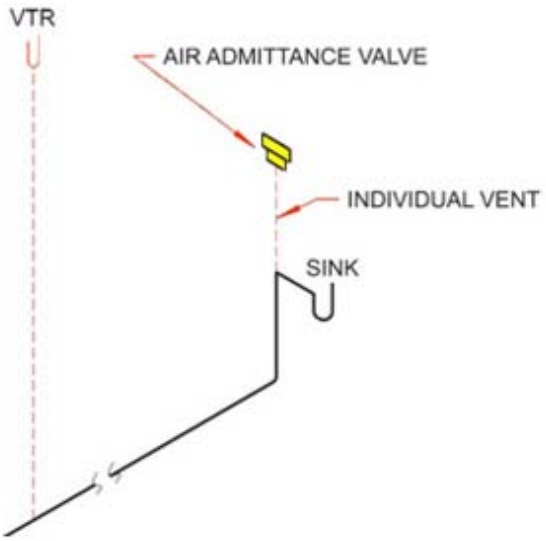

diameter.

After the individual vent airflow rate is determined by the equation in Section 918.2, the size and developed length are determined by Table 918.2. The values in the table indicate the maximum developed length for a given pipe size and the individual vent airflow rate. Note that the engineered vent system must be designed, signed and sealed by a registered design professional and will need to be submitted for review by the code official in accordance with Section 105 of the IPC.

Table 918.2
Minimum Diameter and Maximum Length of Individual Branch Fixture Vents and Individual Fixture Header Vents for Smooth Pipes

DIAMETER OF VENT PIPE (inches)	INDIVIDUAL VENT AIRFLOW RATE (cubic feet per minute)																		
	Maximum developed length of vent (feet)																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1/2	95	25	13	8	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1
3/4	100	88	47	30	20	15	10	9	7	6	5	4	3	3	3	2	2	2	2	1
1	—	—	100	94	65	48	37	29	24	20	17	14	12	11	9	8	7	7	6	6
1 1/4	—	—	—	—	—	—	—	100	87	73	62	53	46	40	36	32	29	26	23	21
1 1/2	—	—	—	—	—	—	—	—	—	—	—	100	96	84	75	65	60	54	49	45
2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100

For SI: 1 inch = 25.4 mm, 1cubic foot per minute = 0.4719L/s, 1 foot = 304.8 mm.

In part three of this series we will look at the common vent, waste stack vent, and wet vent systems. These are three of the remaining five venting methods for which the IPC is probably best known. Series four will cover circuit venting and combination drain and vent systems.

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