Vertical Wet Venting

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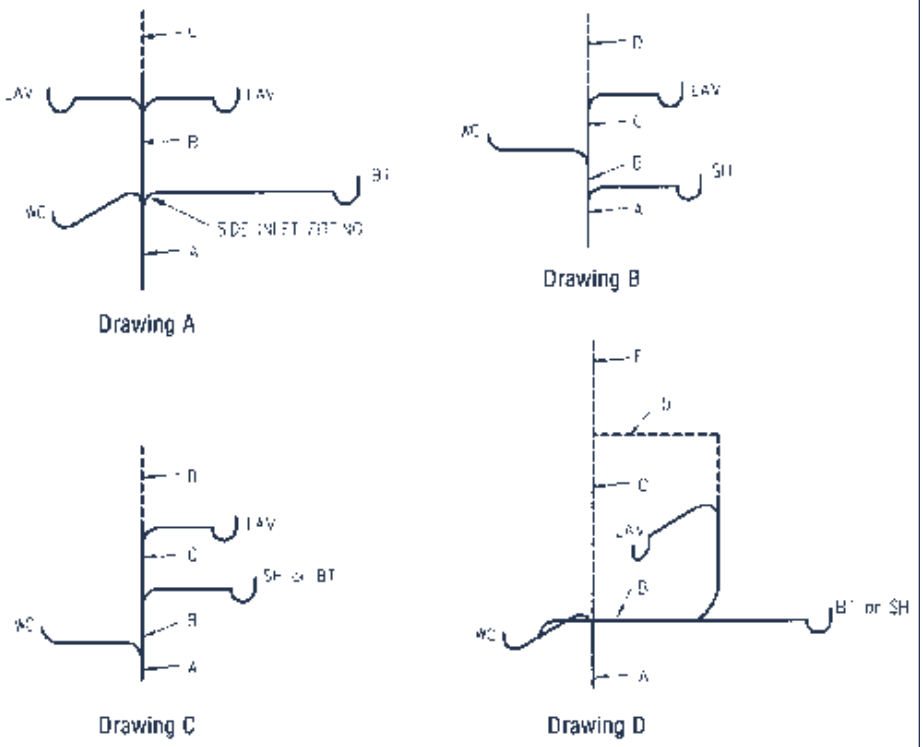
During ASPE's early years, the Los Angeles Chapter had a code interpretations committee, under the direction of Ed Saltzberg, that sent questionnaires to California jurisdictions to ask for clarification on specific plumbing installations. We are going to attempt to do a similar thing with "Code Update." We will prepare diagrams and questions regarding a specific installation, then forward them to both the International Association of Plumbing and Mechanical Officials (IAPMO) Code Answer & Analysis Committee and International Code Council (ICC) for response.

If any of our readers have a specific installation they would like to present to IAPMO and ICC, please forward the questions or diagrams to me and I will try to include them in a future article.

This month's questions deal with vertical wet venting.

The enclosed drawings (**Figure 1**) show four vertical wet-vent installations. Please answer the following questions.

Figure 1. Four Drawings of Vertical Wet-Vent Installations



1. Are the four methods of wet venting shown in the drawings approved by your code? If not, which do not meet its requirements? Why?

IAPMO's response: Drawings A and C would be code compliant. Drawing B would not be code compliant, and Drawing D is configured in a way that is not clear. (Is the drainage pipe connected to the closet bend?) If the pipe labeled *B* in Drawing D is connected to the closet bend, as it appears, the entire installation would be noncompliant per the Uniform Plumbing Code (UPC). No branch piping (or additional trap arm) is permitted to be connected to a trap arm (closet bend).

ICC's response: The examples illustrated in Drawings A, C, and D are acceptable under International Plumbing Code (IPC) Section 909 and International Residential Plumbing Code (IRC) Section P3108. In Drawing B, the shower would not be permitted to connect to the vertical drain below the water closet as prohibited in IRC Section P3108.4. This requirement has also been added to the 2003 IPC in Section 909.1.1.

2. Please fill out the enclosed table to show the pipe sizing for Drawings A–D. If a drawing is not acceptable, draw a line through the box.

Table 1 shows the IAPMO and ICC responses.

3. Are there any restrictions in the use of vertical wet venting in your code? (i.e., Can wet venting be used in both residential and commercial installations?)

IAPMO's response: Vertical wet venting is allowable in either residential or commercial applications.

ICC's response: Wet venting can be used in both the IRC and IPC (for residential and commercial applications), as stated in IRC Section P3108 and IPC Section 909. The restrictions in the IRC and IPC are as follows: Wet venting is limited to any combination of fixtures within two bathroom groups located on the same floor level; vertical wet venting requires all water closet drains to connect at the same elevation and other fixture drains to connect above or at the same elevation as the water closet fixture drains.

4. Are there any restrictions on the types of fixtures allowed on a vertical wet-vented system? (The diagram shows water closets, lavatories, bathtubs, and showers. Can other fixtures, such as floor-mounted mop sinks or drinking fountains, be installed?)

IAPMO's response: Wet-vented sections of pipe are limited to trap arms that serve a fixture or fixtures in sets that are rated at no more than two fixture units. Thus, individual fixtures with a fixture unit value no greater than two fixture units (e.g., sinks, urinals, bathtubs, showers), or sets of fixtures that have an assigned value no greater than two fixture units (e.g., two or three lavatories in sets, as

Table 1. Correct Pipe Sizes for Drawings A–D

	UPC (IAPMO) Pipe Sizes for Each Section					IPC (ICC) Pipe Sizes for Each Section				
	A	*B*	*C*	*D*	*E*	*A*	*B*	*C*	*D*	*E*
Drawing A	3"	2"	2"	—	—	3"	2"	1½"	—	—
Drawing B	—	—	—	—	—	—	—	—	—	—
Drawing C	3"	2½"	2"	2"	—	3"	2"	1½"	1½"	—
Drawing D	—	—	—	—	—	3"	2"	1½"	1½"	1½"

defined in Section 1001.2) may discharge into the vent of the fixture(s) below.

ICC's response: Yes. Not only are they limited to a vertical wet-vented system, all wet-vented fixtures are limited to those typically used in a bathroom group, as defined in IRC Section 202, for a total of eight fixtures, and, as defined in the IPC Section 202, for a total of 10 fixtures, and required in both codes to be on the same floor level.

5. Are there any length restrictions in any section of piping? If so, what are the restrictions?

IAPMO's response: No wet-vented section of piping is permitted to exceed 6 feet 0 in. in developed length. This measurement begins at the trap arm inlet of the lowest fixture discharging into the stack and terminates at the trap arm of the highest fixture(s) discharging into the wet-vented portion of this stack. (The continuous vent section begins just above the highest trap arm inlet.) The objective is to ensure that all fixtures served by the wet-vent section are on the same floor level.

ICC's response: There are no limitations on the length of the vent piping except the distance requirement from trap to vent in accordance with IPC Section 906.1 and IRC Section P3105.1.

Additional Commentary from IAPMO

The minimum pipe size allowed for a wet-vented section is 2 in., regardless of the required waste size of the upper fixture(s). No more than four fixtures may be connected to a wet-vented section of pipe. The wet-vented pipe section that serves the upper fixture or fixtures shall be increased by not less than one pipe size more than would be required in a standard system of waste and vent piping, and this wet-vented section of pipe may be no less than 2 in. in diameter under any circumstances. Increasing the pipe diameter by one size nearly doubles the area, thereby allowing waste and air to flow within the same stack with minimal obstruction to either. The effective interior area is increased sufficiently to avoid putting the trap seals at risk because of air pressure fluctuations during the flow of upper-fixture waste within this oversized piping.

Wet-vent sizing is *not* based upon the vent requirements of the lower fixtures in the wet-vent array. In all cases, the basis for sizing a wet-vent section is the minimum drainpipe requirement of the upper fixtures. The wet-vent section is always sized based upon an increase of one pipe size above the standard pipe size requirements for the upper fixture(s). The UPC stipulates that no kitchen sink shall be provided with less than a 2-in. drain line, whether installed in the horizontal or the vertical position. Therefore, a wet-vented section serving a kitchen sink would require no less than a 2½-in. pipe section (wet vent) below the kitchen sink—one pipe size larger than would be normal (i.e., 2 in.) if the sink were not discharging into a wet vent.

No fixture that imposes a fixture unit load greater than two fixture units may discharge into the vent of another fixture. For example, a clothes washer standpipe (three fixture units) may not be wet vented over another fixture, regardless of the size of the vent or the type of fixture being wet vented. A clothes washer discharge (pumped or gravity) would largely fill the vertical waste pipe/vent for a period of time. Consequently, there would be virtually no venting for the lower fixture(s) during the upper fixture discharge period. The quantity and nature of the discharge from commercial sinks, service sinks, and similar fixtures would be totally unsuitable for wet venting, as would water closets and other surge-discharge fixtures.

Wet venting is a limited-use expedient that is acceptable as long as the waste from above does not fully occupy the shared pipe that is venting fixtures installed below. This objective is accomplished by oversizing the wet-vent section by at least one pipe size and by limiting the discharge from connected trap arms to two or fewer fixture units. The unconventional nature of wet venting limits the number of applications that are considered acceptable.

Additional Commentary from ICC

In Drawing A, pipe section *B* is a wet vent. Side inlet fitting is acceptable horizontal to vertical.

In Drawing B, *SH* connection is not permitted below *WC* connection. It should be moved to the same level or above *WC* connection.

In Drawing C, pipe sections *B* and *C* are wet vented.

In Drawing D, *BT, SH,* and *WC* are wet vented.

Note: The views expressed in the ICC response are those of Carl Marbery, senior technical staff at ICC, and do not necessarily reflect the opinion of ICC. The views expressed in the IAPMO response were provided by Jay Mundy, CIPE CPD, of IAPMO's Code Answer & Analysis Committee. ■

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