

SEATTLE / KING COUNTY PUBLIC HEALTH
Community Environmental Health
Plumbing / Gas Piping Inspections

DECISIONS / INTERPRETATIONS
of the Chief Plumbing Inspector

Date: July 11, 2016

Decision No. 16-001

Subject: Horizontal Wet Venting for a Bathroom Group and Circuit Venting

Code / Section: 2015 UPC, Sections 908.2 and 911.0

Decision. The provisions for horizontal wet venting for bathroom groups have been modified from the 2012 UPC, and the circuit venting provisions have been moved from an appendix chapter to Chapter 9 also. The attached information and diagrams may be helpful in understanding these relatively new and recently modified provisions. Please note that some circuit venting designs may require a plan review prior to installation (see comment to Section 911.0).

Effective Date: July 11, 2016



Dave W Cantrell
Chief Plumbing Inspector

2015 UPC – HORIZONTAL WET VENTING FOR A BATHROOM GROUP

908.2 Horizontal Wet Venting for a Bathroom Group. A bathroom group located on the same floor level shall be permitted to be vented by a horizontal wet vent where all of the conditions of Section 908.2.1 through Section 908.2.5 are met.

The 2015 UPC now limits this to one bathroom group rather than two bathroom groups. A bathroom group is defined in Chapter 2 as “any combination of fixtures, not to exceed one water closet, two lavatories, either one bathtub or one combination bath/shower, and one shower, and may include a bidet and an emergency floor drain”. For instance, what is commonly referred to as a master bathroom that may contain two lavatories, a water closet, a bathtub, and a separate shower compartment meets the definition of a bathroom group. It could also include a bidet and an emergency floor drain, for a total of 7 fixtures. Note that a bathroom group no longer includes a urinal. A bathroom group is not limited to residential occupancies. Horizontal wet venting of more than the number and/or type of fixtures that are within the definition of a bathroom group may be accomplished by means of circuit venting as outlined in Section 911.0.

(See Example #1 for a comparison of Horizontal Wet Venting for a Bathroom Group and Circuit Venting)

(See Example #2 for an example of a Horizontal Wet Vent for a Bathroom Group)

908.2.1 Vent Connection. The dry vent connection to the wet vent shall be an individual vent for the bidet, shower, or bathtub. One or two vented lavatory(s) shall be permitted to serve as a wet vent for a bathroom group. Only one wet-vented fixture drain or trap arm shall discharge upstream of the dry-vented fixture drain connection. Dry vent connections to the horizontal wet vent shall be in accordance with Section 905.2 and Section 905.3.

The purpose of the vent is to provide sufficient air circulation to the horizontal branch drain, which then serves as the vent for additional traps connecting to the horizontal drain. A “dry vent” would be the vent connection downstream of a single trap serving a bidet, shower or bathtub, not a water closet or emergency floor drain. The horizontal branch drain may also be served by one or two vented lavatories that are served by an individual vent, common vent, or vertical wet vent. The connection of the “dry vent” would be in the same manner that a vent connection would be made for a single trap as prescribed in Sections 905.2 and 905.3. Other fixtures that are within the bathroom group and are individually vented may connect to the wet-vented horizontal branch drain horizontally, vertically, or at any angle in between.

(See Example #3 for some illustrations of both compliant and noncompliant connections)

908.2.2 Size. The wet vent shall be sized based on the fixture unit discharge into the wet vent. The wet vent shall be not less than 2 inches (50 mm) in diameter for 4 drainage fixture units (dfu) or less, and not less than 3 inches (80 mm) in diameter for 5 dfu or more. The dry vent shall be sized in accordance with Table 702.1 and Table 703.2 based on the total fixture units discharging into the wet vent.

The wet-vented horizontal branch drain shall not be less than 2-inch diameter. Where 5 or more drainage fixture units discharge into the wet-vented horizontal branch drain, it shall be increased to not less than 3-inch diameter. The dry vent must be sized for the total drainage fixture units being served. Where a water closet is being served by the wet-vented horizontal

branch drain, the dry vent must be a minimum 2-inch diameter. Otherwise, a total of 8 drainage fixture units may be served by a 1½-inch diameter dry vent.

908.2.3 Trap Arm. The length of the trap arm shall not exceed the limits in Table 1002.2. The trap size shall be in accordance with Section 1003.3. The vent pipe opening from the horizontal wet vent, except for water closets and similar fixtures, shall not be below the weir of the trap.

The wet-vented horizontal branch drain serves as the vent for the traps. Therefore, the trap arm length and installation provisions of Chapter 10 for trap arms will apply. Should a trap be further than the maximum distance allowed or elevated above the horizontal wet vented branch drain, the trap can be individually vented. In this case, the individually vented trap would not be counted in the total drainage fixture units being served when determining the size of the dry vent.

~~908.2.4 Water Closet.~~ ~~The water closet fixture drain or trap arm connection to the wet vent shall be downstream of fixture drain or trap arm connections to the horizontal wet vent.~~

This section has been deleted by Washington State amendment, hence the strikeout of this section shown. Therefore, the water closet can be connected at any point within the wet-vented horizontal branch drain. However, it cannot be located upstream of the dry vent serving the wet-vented horizontal branch drain as outline in Section 908.2.1.

908.2.5 Additional Fixtures. Additional fixtures shall discharge downstream of the wet vent system and be conventionally vented. Only the fixtures within the bathroom group shall connect to the wet-vented horizontal branch.

Connections serving fixtures that are not part of the bathroom group must be connected downstream of the wet-vented horizontal branch drain. For instance, kitchen or laundry fixtures cannot connect upstream or within the wet-vented horizontal branch drain, but must connect downstream. Multiple wet-vented horizontal branch drains cannot be connected in series except as prescribed in Section 911.0 for circuit venting.

(See Example #1 for a comparison of Horizontal Wet Venting for a Bathroom Group and Circuit Venting)

2015 UPC – CIRCUIT VENTING

911.0 Circuit Venting.

Circuit venting has been moved from Appendix C into Chapter 9. While circuit venting is a prescriptive method of horizontal wet venting, it can include numerous trap arm and fixture drain connections. At this time, where multiple circuit vents are to be installed in nonresidential or multifamily buildings, a plan review shall be required prior to inspection. The fee for the plan review is \$184. The plan review shall not be required for one-and two-family dwellings and townhouses.

911.1 Circuit Vent Permitted. A maximum of eight fixtures connected to a horizontal branch drain shall be permitted to be circuit vented. Each fixture drain shall connect horizontally to the horizontal branch being circuit vented. The horizontal branch drain shall be classified as a vent from the most downstream fixture drain connection to the most upstream fixture drain connection to the horizontal branch.

Circuit venting is based on many of the same principles as horizontal wet venting for a bathroom group. However, it will allow for the connection of other types or totals of similar fixtures that may be outside of the definition of a bathroom group. Eight (8) fixture traps (trap arms) are allowed to be circuit vented on one branch. Similar to horizontal wet venting for a bathroom group, trap arms must connect on the horizontal and shall conform to the trap arm provisions of Chapter 10. In this case however, additional fixture drains (drains from other fixtures that are individually or common vented) connecting to the circuit vented branch must also connect horizontally to the horizontal branch drain.

(See Example #1 for a comparison of Horizontal Wet Venting for a Bathroom Group and Circuit Venting)

(See Example #6 for an illustration of a circuit vent serving a residential dwelling unit)

911.1.1 Multiple Circuit-Vented Branches. Circuit-vented horizontal branch drains are permitted to be connected together. Each group of a maximum of eight fixtures shall be considered a separate circuit vent and shall be in accordance with the requirements of this section.

Circuit-vented branches may connect either in series or in parallel. Each group of up to eight trap arms must be considered as a separate circuit-vented branch and be installed accordingly.

(See Example #4 for Circuit Venting in Parallel)

(See Example #5 for Circuit Venting in Series)

911.2 Vent Size and Connection. The circuit vent shall be not less than 2 inches (50 mm) in diameter and the connection shall be located between the two most upstream fixture drains. The vent shall connect to the horizontal branch on the vertical. The circuit vent pipe shall not receive the discharge of a soil or waste.

The circuit vent must connect between the most upstream trap arm and the next downstream trap arm or fixture drain connection to the circuit vented branch. The most upstream fixture

should not be a fixture that is seldom used, such as a floor drain. Since the circuit vent is truly a dry vent, it must be installed in accordance with Section 905. The size of the circuit vent shall be a minimum of ½ the diameter of the horizontal branch drain it connects to in accordance with Section 904.1, but not less than 2-inch.

911.3 Slope and Size of Horizontal Branch. The slope of the vent section of the horizontal branch drain shall be not more than 1 inch per foot (83.3 mm/m). The entire length of the vented section of the horizontal branch drain shall be sized for the total drainage discharge to the branch.

The principle of a circuit vent is that the drainage branch is entirely horizontal. A maximum pitch of 1-inch per foot ensures that the branch remains horizontal without any vertical offsets. The horizontal drainage branch must also be uniformly sized to establish consistent flow characteristics and the free movement of air. Unlike horizontal wet venting for a bathroom group, circuit venting does not depend on a unique sizing provision. Rather, it is sized the same as any horizontal drain based on the drainage fixture unit values in Chapter 7. Because it is uniformly sized for its full length, the horizontal branch will be oversized for all but the most downstream portion.

911.3.1 Size of Multiple Circuit Vent. Multiple circuit vented branches shall be permitted to connect on the same floor level. Each separate circuit-vented horizontal branch that is interconnected shall be sized independently in accordance with Section 911.3. The downstream circuit-vented horizontal branch shall be sized for the total discharge into the branch, including the upstream branches and the fixtures within the branch.

Each circuit-vented branch must be uniformly sized based on the total drainage load on that branch, including any drainage load from upstream branches. If an increase in pipe size is required, the location must be at the interconnection of the two circuit-vented branches.

911.4 Relief Vent. A 2 inch (50 mm) relief vent shall be provided for circuit-vented horizontal branches receiving the discharge of four or more water closets and connecting to a drainage stack that receives the discharge of soil or waste from upper horizontal branches.

A relief vent is required where the circuit vented horizontal drain receives the discharge of more than three (3) water closets, and connects to a drainage stack serving fixtures from one or more floors above. Both circumstances must exist for the relief vent to be required. The size of the relief vent shall be a minimum of ½ the diameter of the horizontal branch drain it connects to in accordance with Section 904.1, but not less than 2-inch.

911.4.1 Connection and Installation. The relief vent shall connect to the horizontal branch drain between the stack and the most downstream fixture drain of the circuit vent. The relief vent shall be installed on the vertical to the horizontal branch.

The relief vent must connect between the stack and the most downstream fixture drain or trap arm connection to the horizontal branch and is required to connect on the vertical.

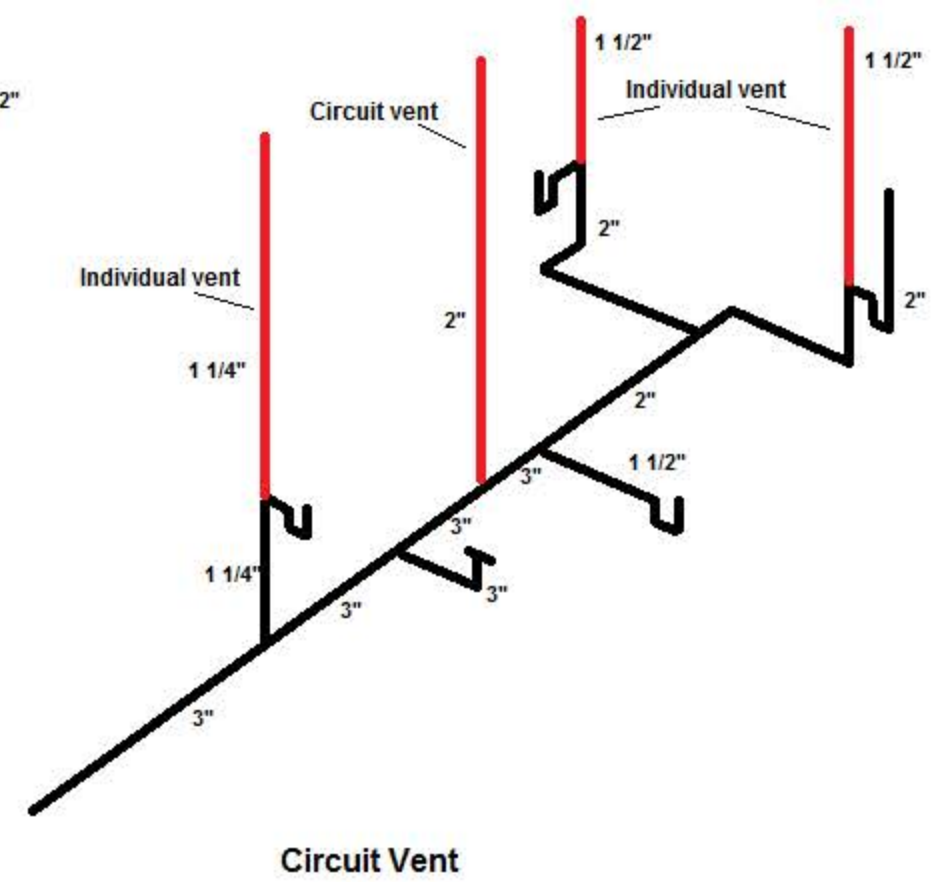
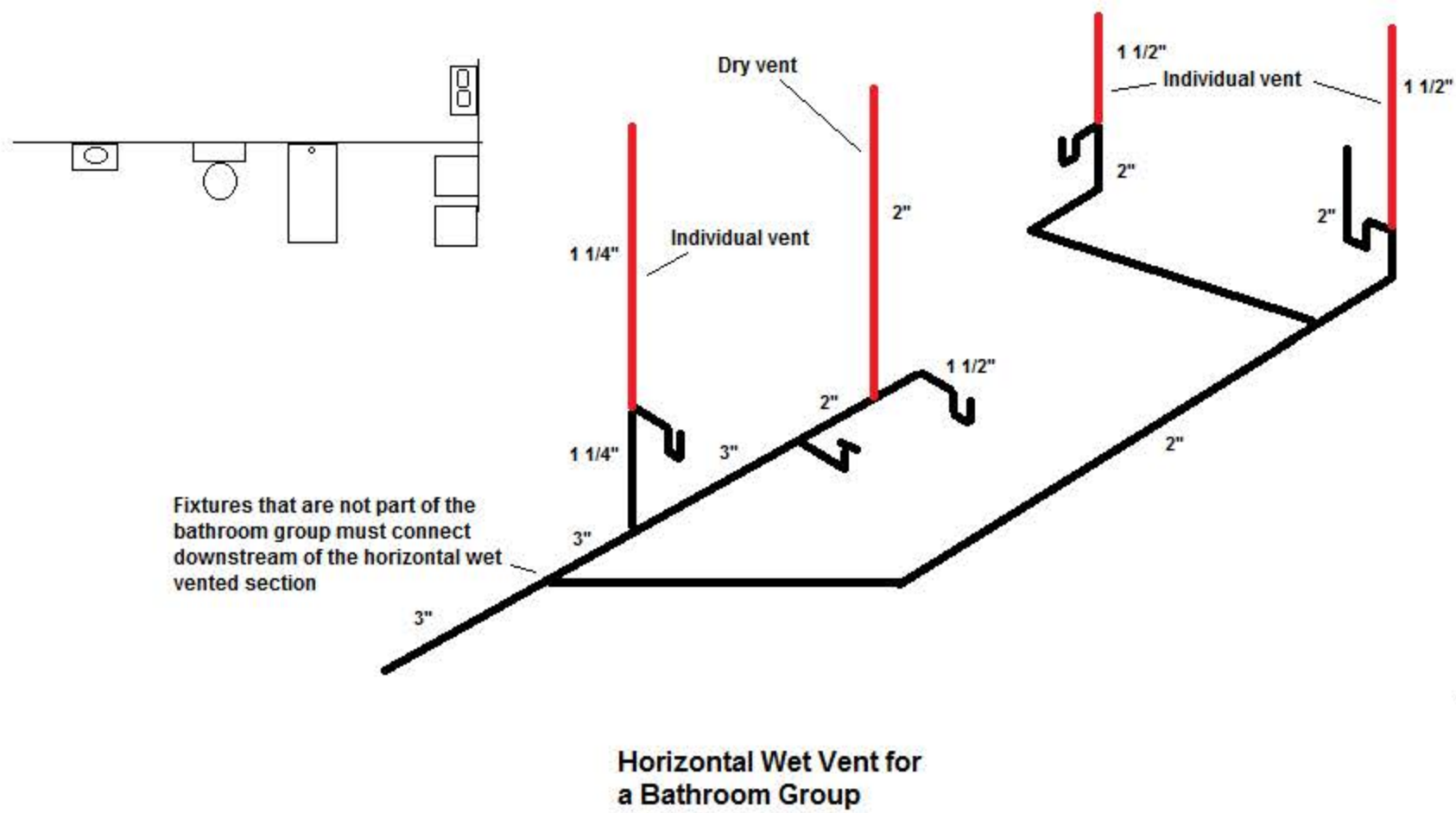
(See Examples #5 and #7 which show where the connection of a relief vent must be located)

911.4.2 Fixture Drain or Branch. The relief vent is permitted to be a fixture drain or fixture branch for a fixture located within the same branch interval as the circuit-vented horizontal branch. The discharge to a relief vent shall not exceed 4 fixture units.

Unlike the circuit vent that must be dry, the relief vent is permitted to serve as a drain for one (1) fixture installed within the same circuit-vented branch on the same floor/story. When a relief vent serves as a fixture branch, that vent is subject to the same sizing requirements as an individual vent. Regardless of the size of the relief vent, it is limited to a maximum 4 drainage fixture units. For instance, the relief vent connecting to a 6-inch horizontal branch drain must be a minimum 3-inch diameter, but would still only be allowed to serve as a drain for 1 fixture not to exceed 4 drainage fixture units.

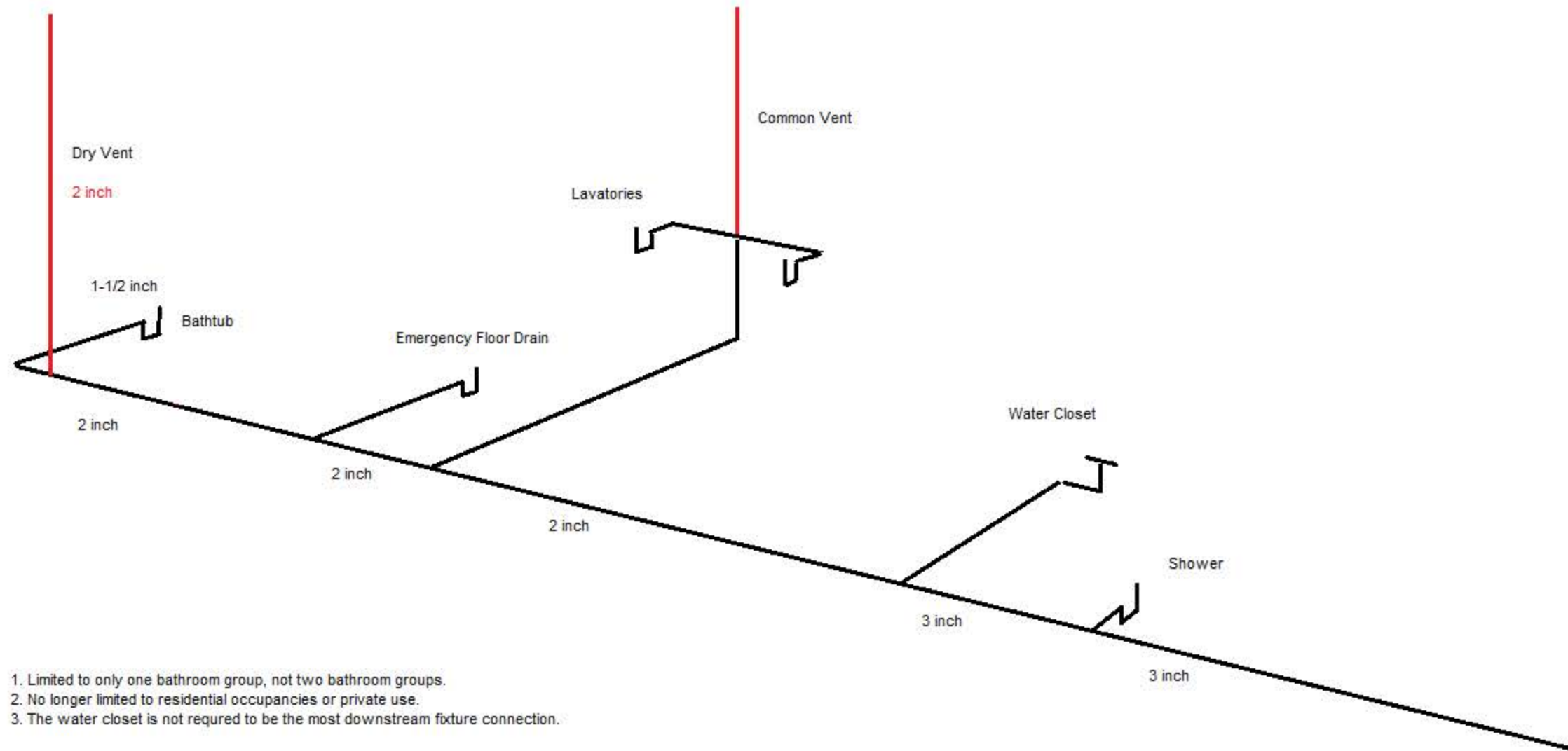
911.5 Additional Fixtures. Fixtures, other than the circuit-vented fixtures, are permitted to discharge to the horizontal branch drain. Such fixtures shall be located on the same floor as the circuit-vented fixtures and shall be either individually or common vented.

Where additional fixtures other than the circuit-vented fixtures are located on the same floor as a circuit-vented branch, such fixtures are allowed to connect to the circuit-vented branch. The additional fixtures must be separately vented, and the additional drainage load of those fixtures must be considered in sizing the circuit-vented branch. Such fixture drains must connect to the horizontal branch drain on the horizontal as required in Section 911.1.



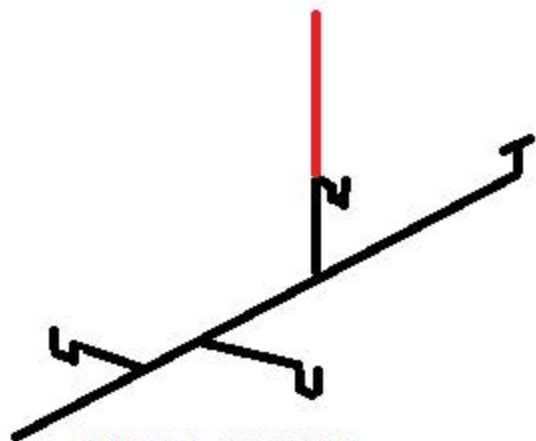
VENTING COMPARISON

EXAMPLE #1

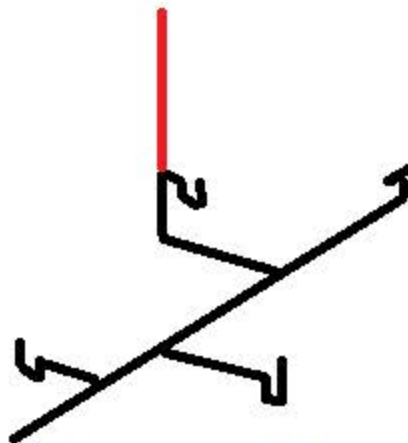


HORIZONTAL WET VENTING FOR A BATHROOM GROUP

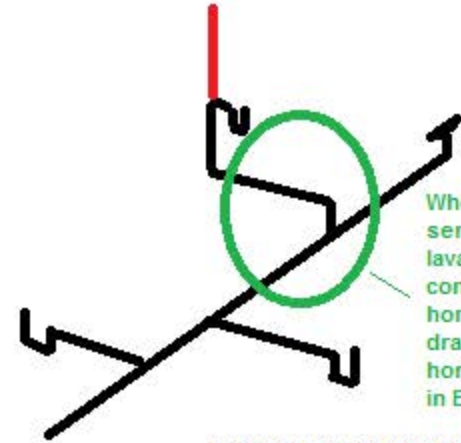
EXAMPLE #2



EXAMPLE 1 - COMPLIANT



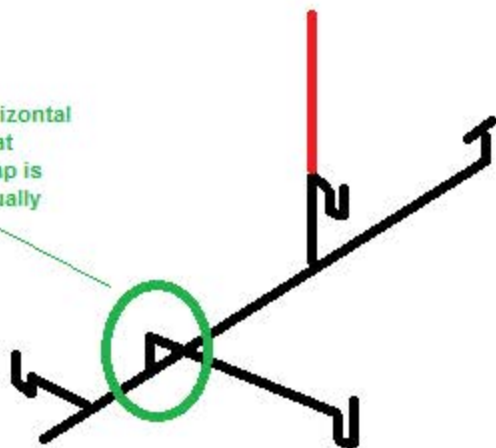
EXAMPLE 2 - COMPLIANT



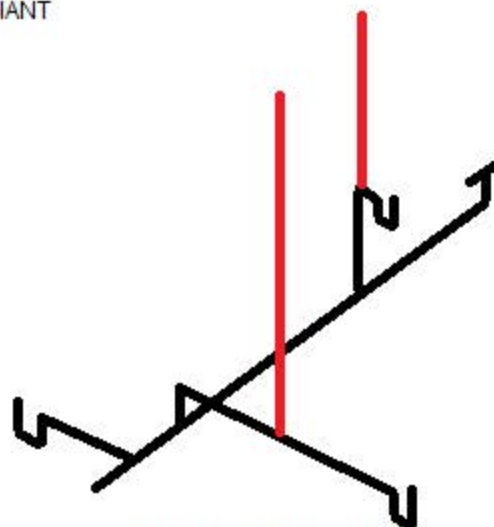
Where the dry vent serves on or two lavatories, the drain connection to the horizontal branch drain must be on the horizontal as shown in Example 2.

EXAMPLE 3 - NONCOMPLIANT

The trap is elevated above the horizontal wet vented branch drain unlike that shown in Example 1. Where the trap is elevated, the trap must be individually vented as shown in Example 5.

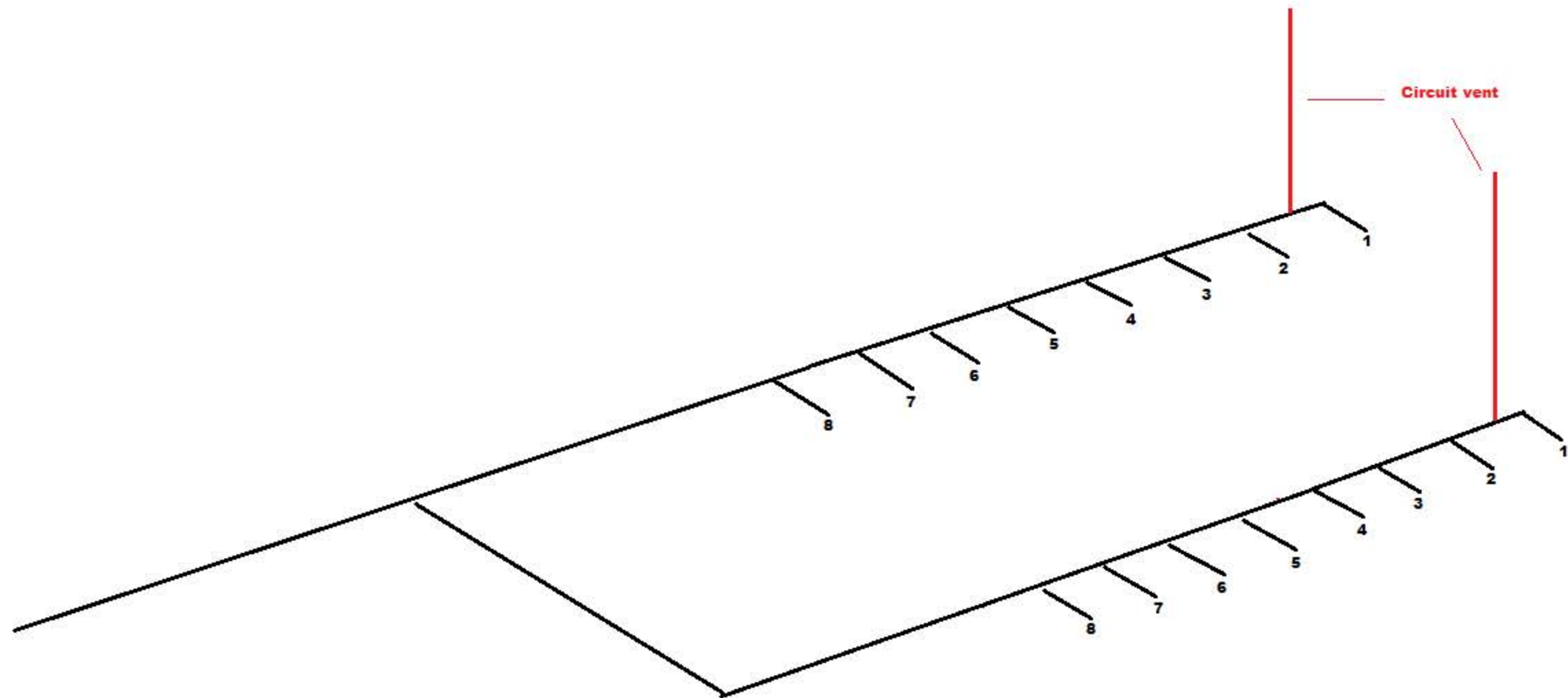


EXAMPLE 4 - NONCOMPLIANT



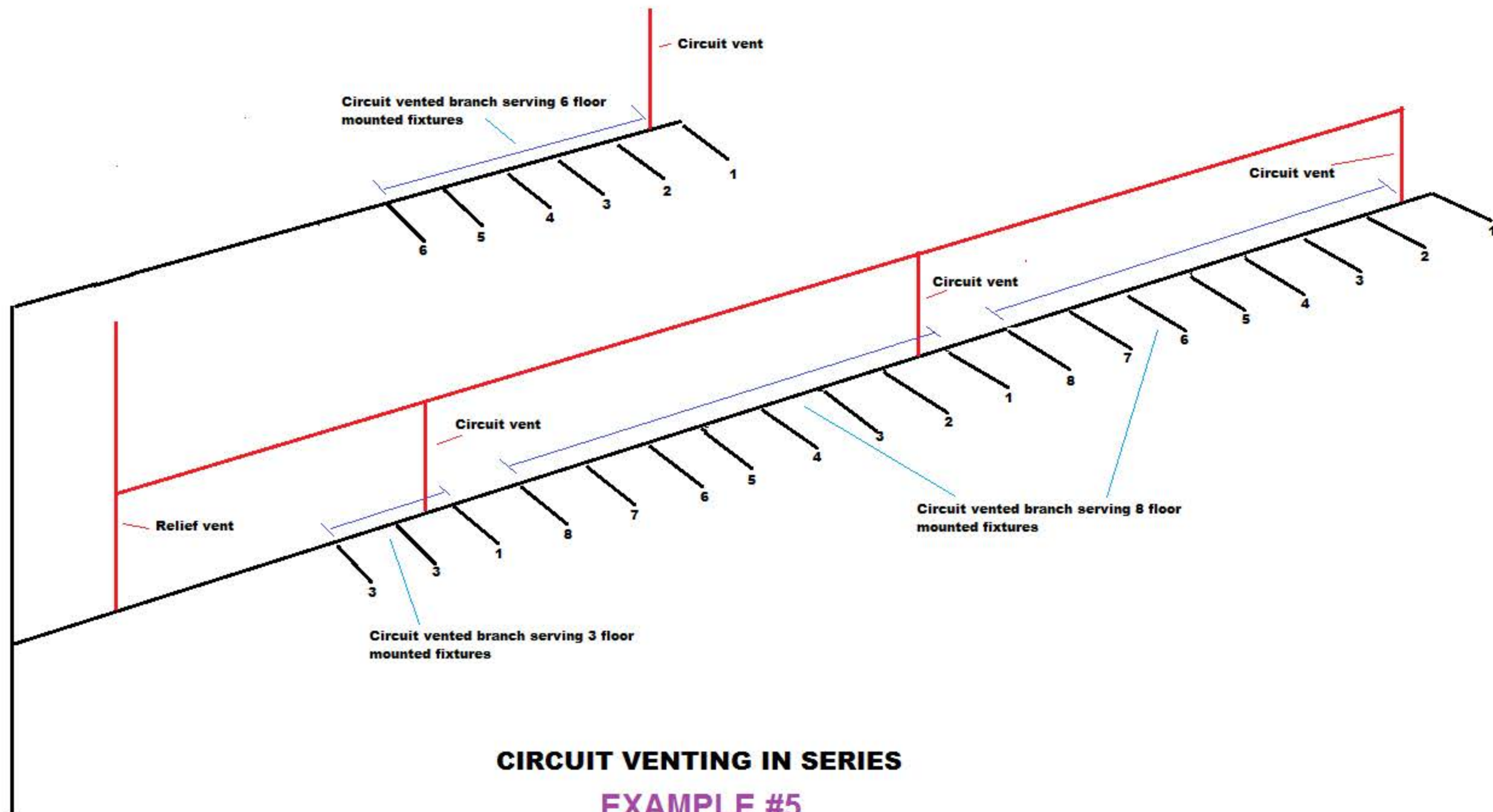
EXAMPLE 5 - COMPLIANT

EXAMPLE #3



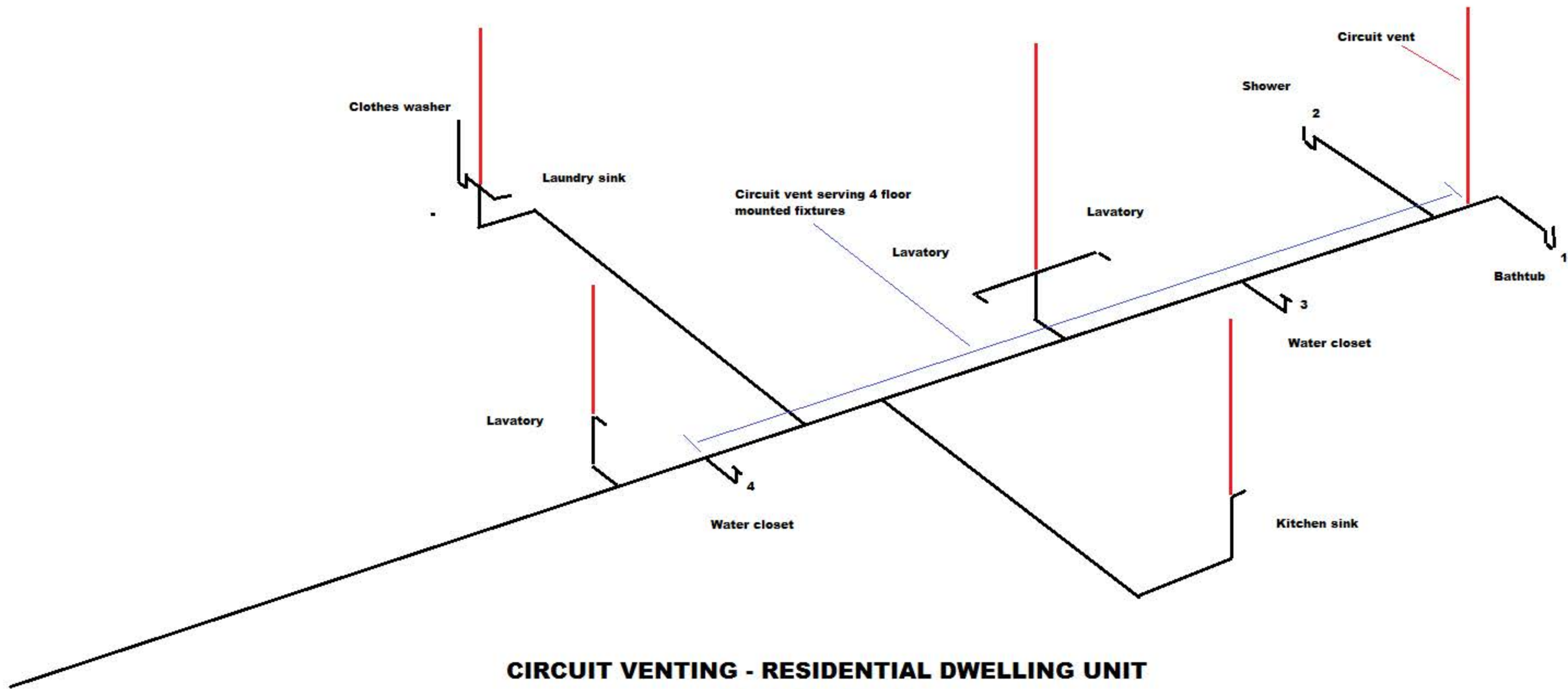
CIRCUIT VENTING IN PARALLEL

EXAMPLE #4



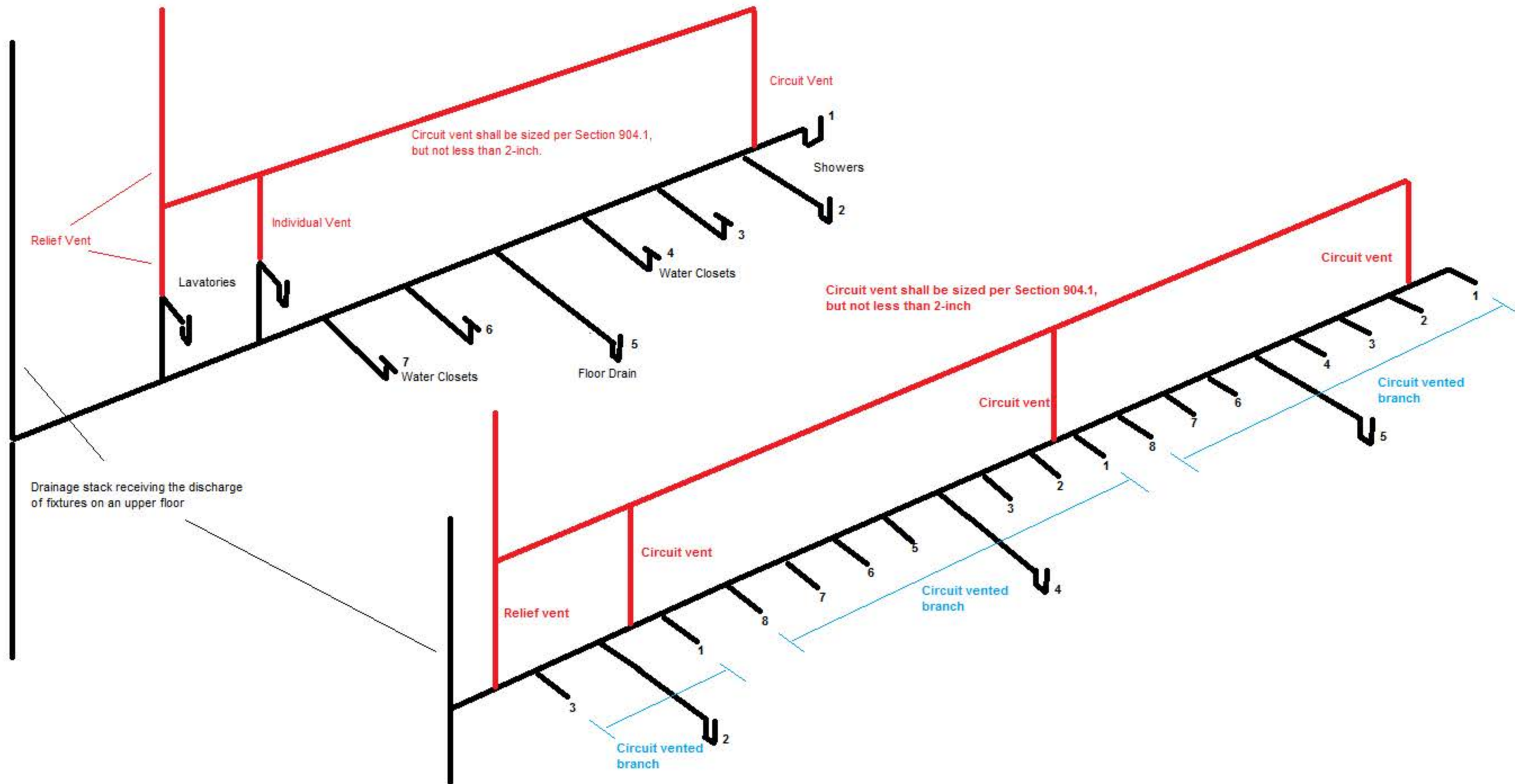
CIRCUIT VENTING IN SERIES

EXAMPLE #5



CIRCUIT VENTING - RESIDENTIAL DWELLING UNIT

EXAMPLE #6



EXAMPLE #7