Department of Commerce
Division of Industrial Compliance
John R. Kasich, Governor
Jacqueline T. Williams, Director

Ohio Board of Building Standards
Building on the Code Education Series

Ohio Plumbing Code Drain & Venting Sections

Waste Stack Venting
Horizontal Wet Venting & Vertical Wet Venting
Circuit Venting
Combination Drain & Vent

December 11, 2015

Presentation Handout

Ohio Board of Building Standards
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OHIO BOARD OF BUILDING STANDARDS

BUILDING ON THE CODE

Ohio Plumbing Code Drain & Venting Sections

Waste Stack Venting

Horizontal Wet Venting & Vertical Wet Venting

Circuit Venting

Combination Drain & Vent

December 11, 2015

INTRODUCTIONS

- Frank A. Brykalski, Jr.
- OAPI NW Ohio Trustee
- DOC Plbg Inspector KOO452
- BBS Residential Plbg Inspector BBS 178
- BBS Non-Residential Plbg Inspector BBS 178
- OCILB Plumbing Training Agent #043
- Jason Shank
  - OAPI NE Ohio Trustee
  - ASSE International Region 6 Director
  - Hold DOC Plumbing Inspector Cert.
  - Training Director for CPCA/Local 55 JATC

Open Forum Session – Questions are Welcomed!

Who is in Attendance?

- Employed by…
  - Building Department? Health? State?
  - Full Time? Part?
  - Other Inspections you do?
- Experience as an Plumbing Inspector?
  - 5 or less years? 6-10? More than 10?
- Type of Inspections
  - Residential? Commercial? Design Approvals?

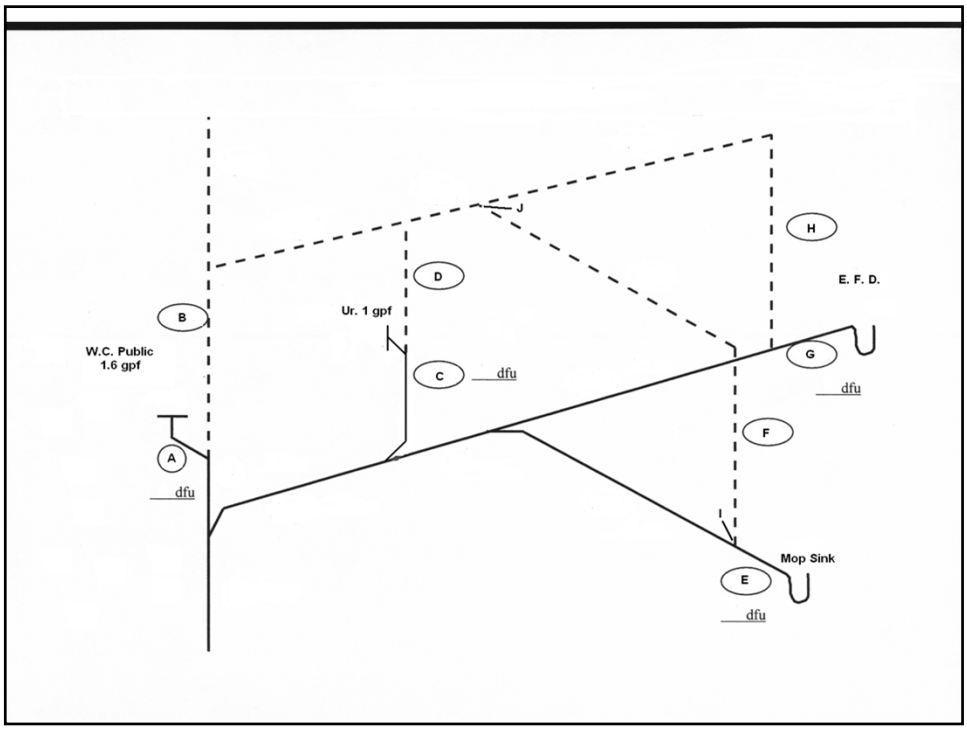
Outcomes/Objectives of this Session

- Identify the proper installation of the drain and vent section per each section – 909, 910, 911 and 912
- Describe the physical characteristics of the drain and vent.
- Discuss the rules and regulations.
- Identify issues with installations.
- Cite the applicable code section that applies to the installation
- Resolve any code conflicts…or agree to disagree!

Chapter 9

VENTS – Why we need them

5

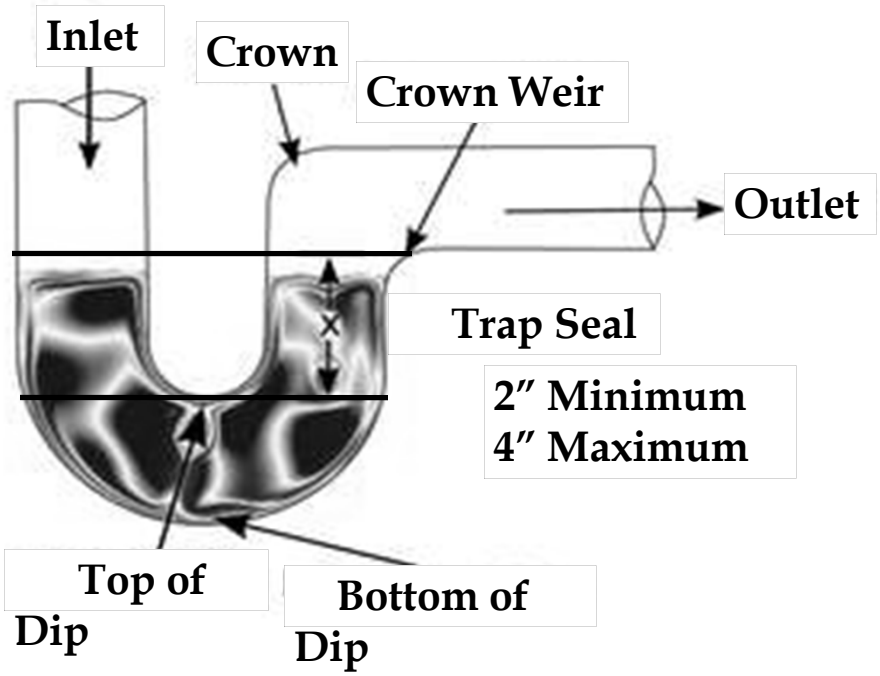


SECTION 901
GENERAL

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 column
(249Pa).

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.



Venting Methods

- ***907 - INDIVIDUAL VENT***
- ***908 - COMMON VENT***
- ***909 - WET VENTING***
- ***910 - WASTE STACK VENT***
- ***911 - CIRCUIT VENTING***
- ***912 - COMBINATION DRAIN AND VENT SYSTEMS***
- ***913 - ISLAND FIXTURE VENTS***

**** Numbering Due to Change with IPC 2015***

909.1
Wet Venting

909.1
Wet Venting

- *Any combination of two bathroom group fixtures located on the same floor level.*
- *Any arrangement of fixtures within a bathroom group can be wet vented.*
- *The vent can be connected to any bathroom group fixture except a floor drain. Lavatory, bathtub or shower, bidet, or a water closet.*
- *On the vertical pipe you may stack two tee's as used for a common vent or install a double sanitary tee or cross.*
- *On the horizontal wet vent, only one fixture is permitted upstream of the wet vented fixture drain.*
- *Table 909.3 shows the allowable dfu's permitted to drain into a wet vent pipe.*

11

BATHROOM GROUP

a - Water closet
a - Lavatory
a - Bathtub or Shower
Including or Excluding
a - Bidet and or an Emergency
Floor Drain or Both
Same Floor Level

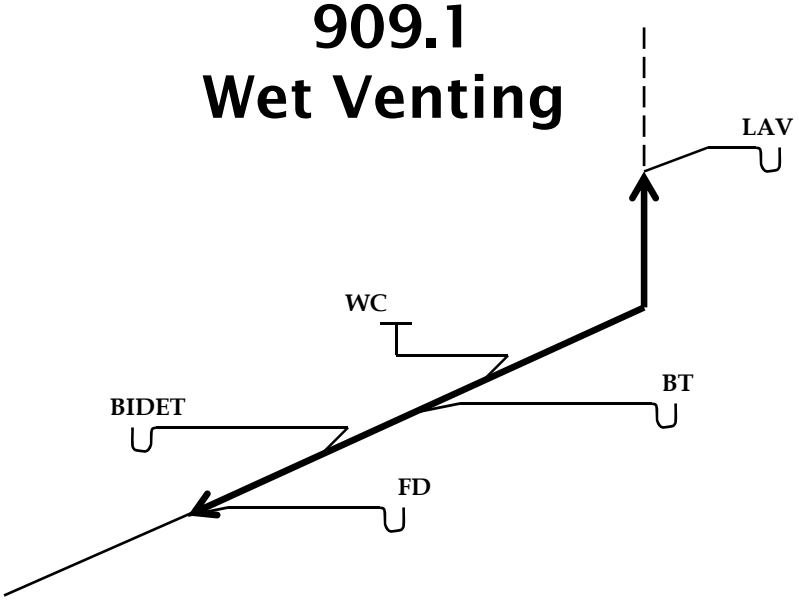
12

909.3
Wet Vent Size

PIPE SIZE (Inches)	MAXIMUM DISCHARGE FROM UPPER FIXTURE DRAIN (dfu's)
1 ½″	1
2″	4
2 ½″	6
3″	12

13

909.1
Wet Venting



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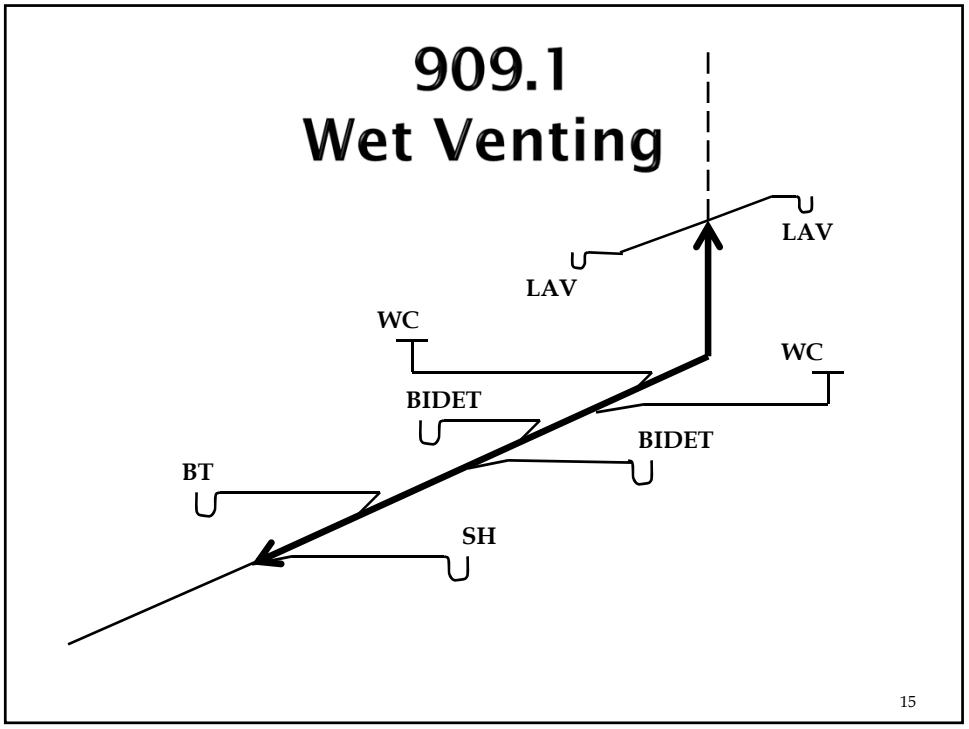
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LAV
WC
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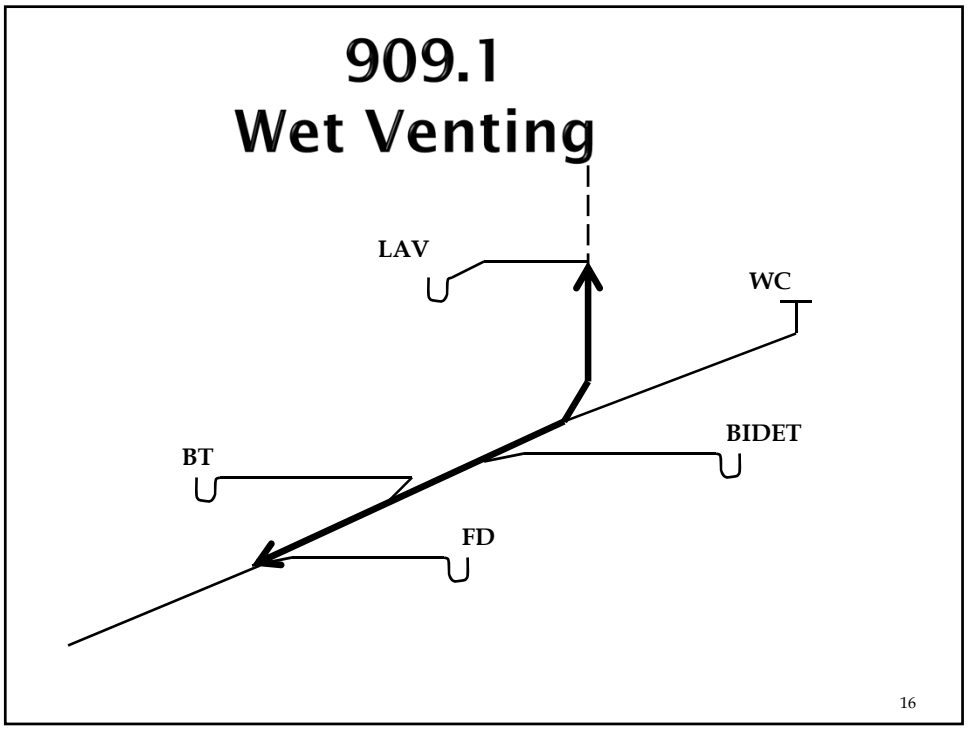
BIDET
BIDET
BT
SH
15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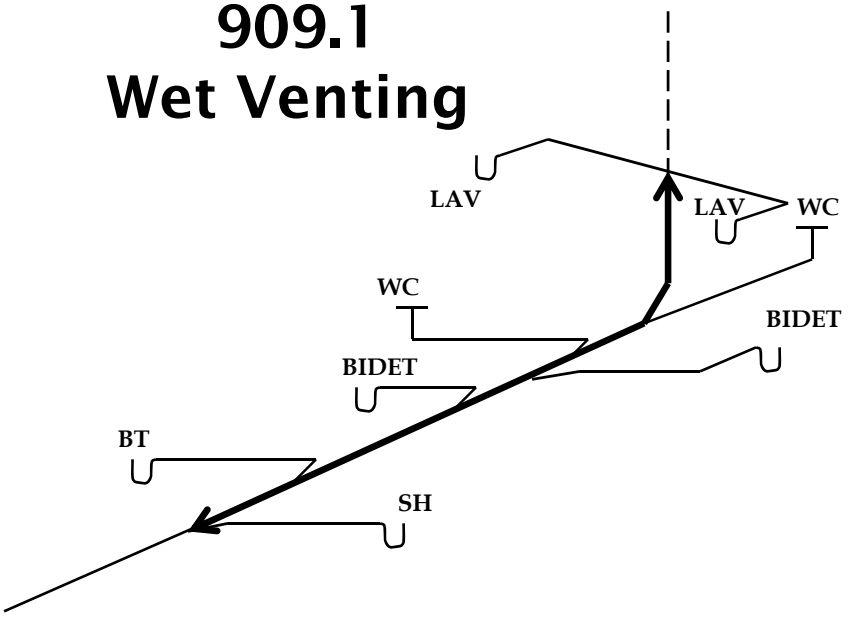
16

909.1
Wet Venting



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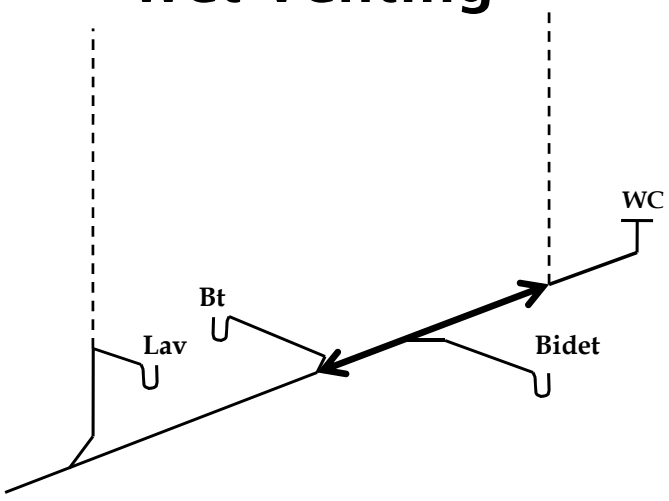

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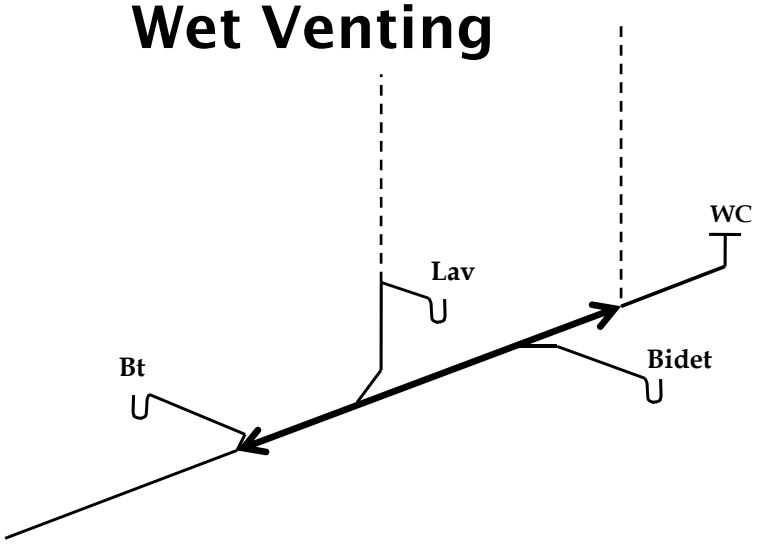

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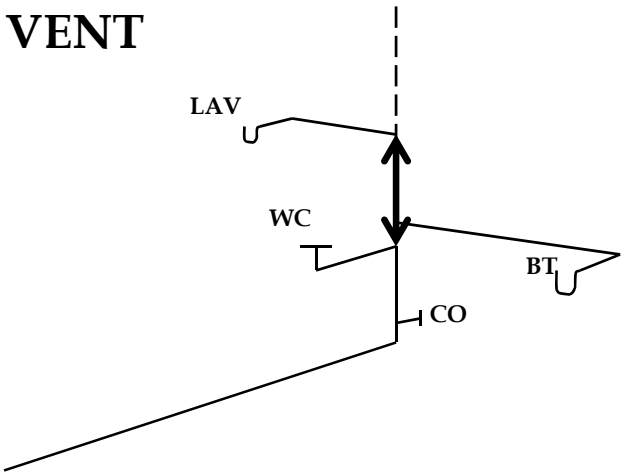

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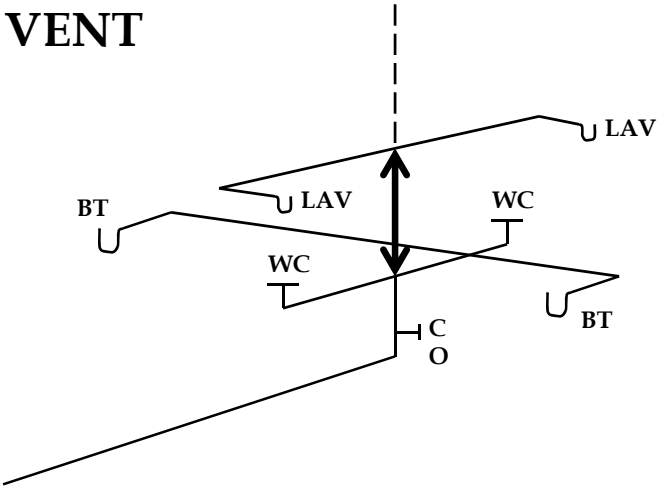

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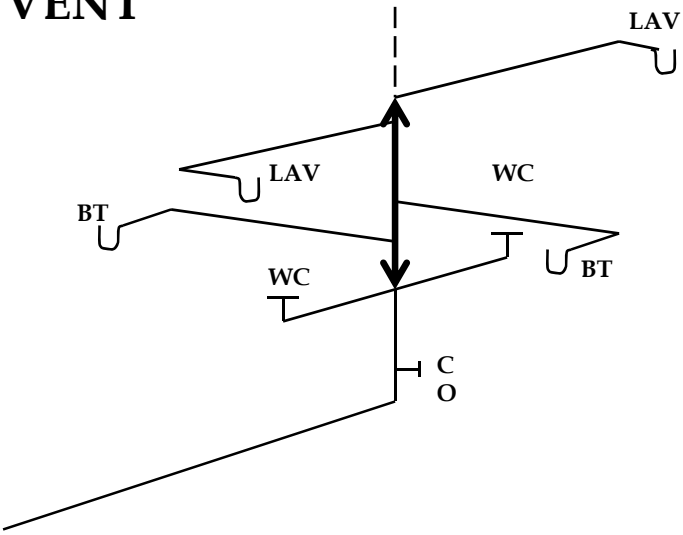

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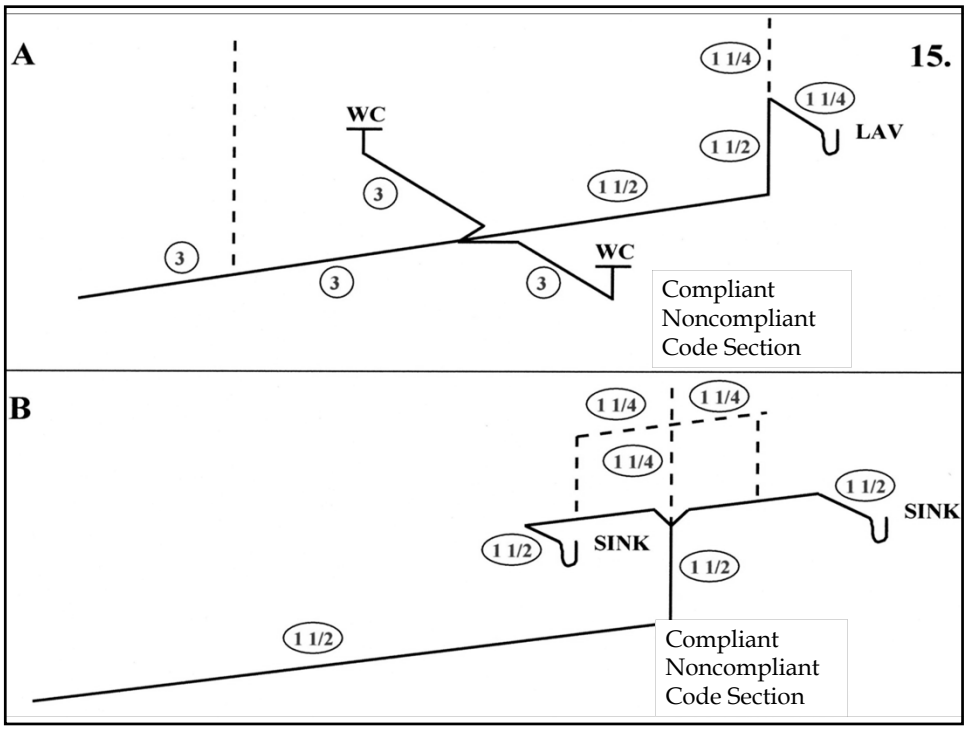
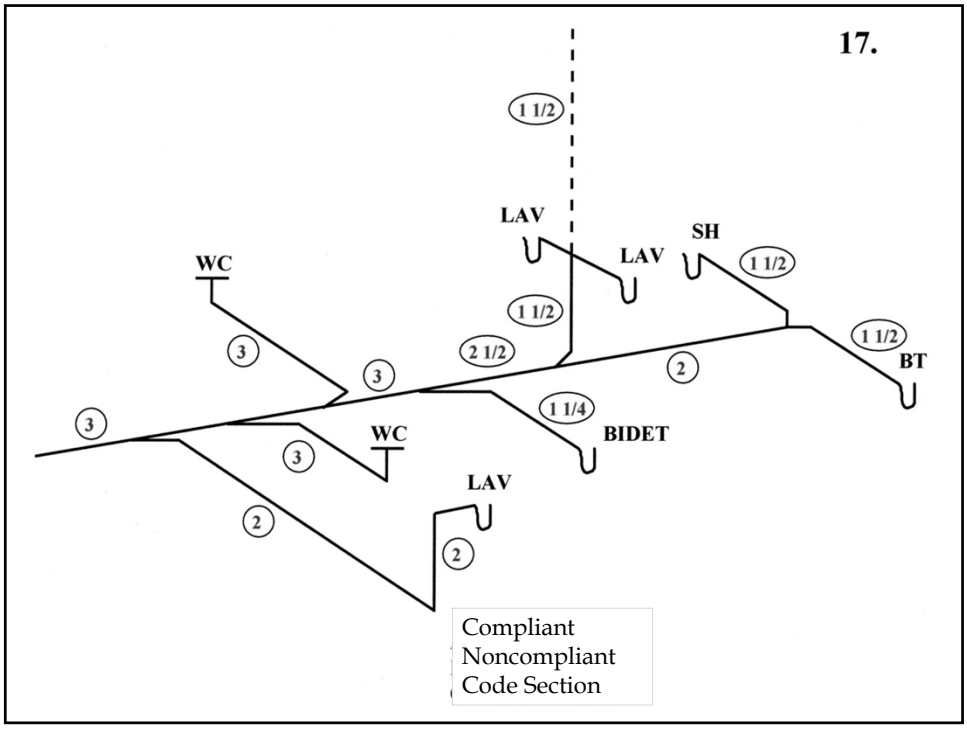
909.3
Wet Vent Size

PIPE SIZE (Inches)	MAXIMUM DISCHARGE FROM UPPER FIXTURE DRAIN (dfu's)
1 ½″	1
2″	4
2 ½″	6
3″	12

23

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LAV
LAV
SH
1 1/2
WC
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2 1/2
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2
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WC
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LAV
2
2
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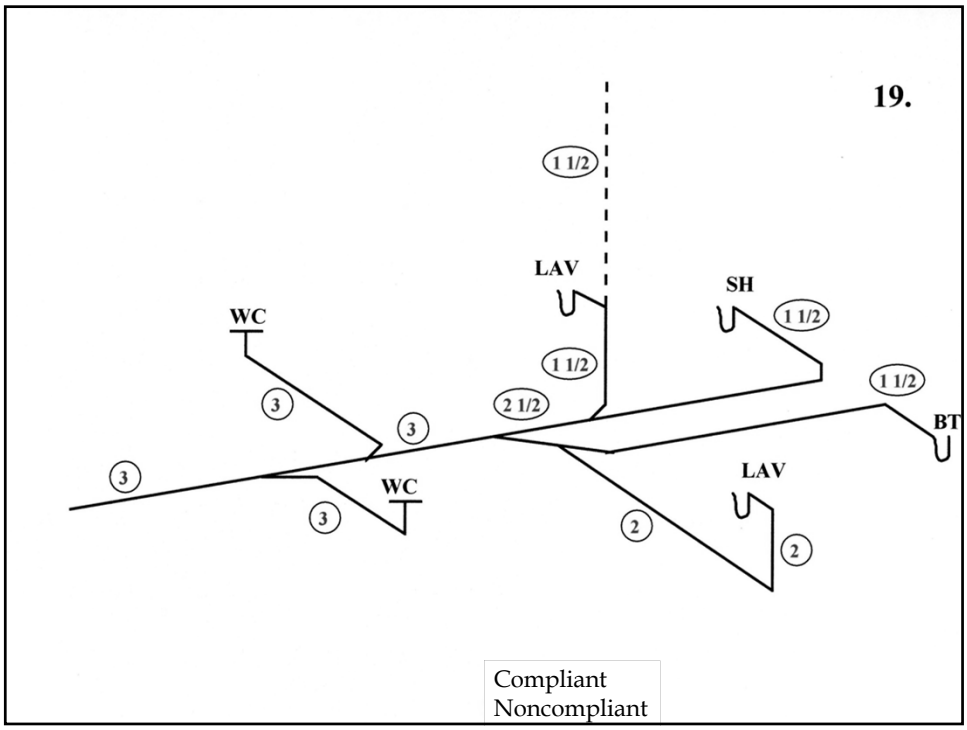
Noncompliant
Code Section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1 1/2
3
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BT
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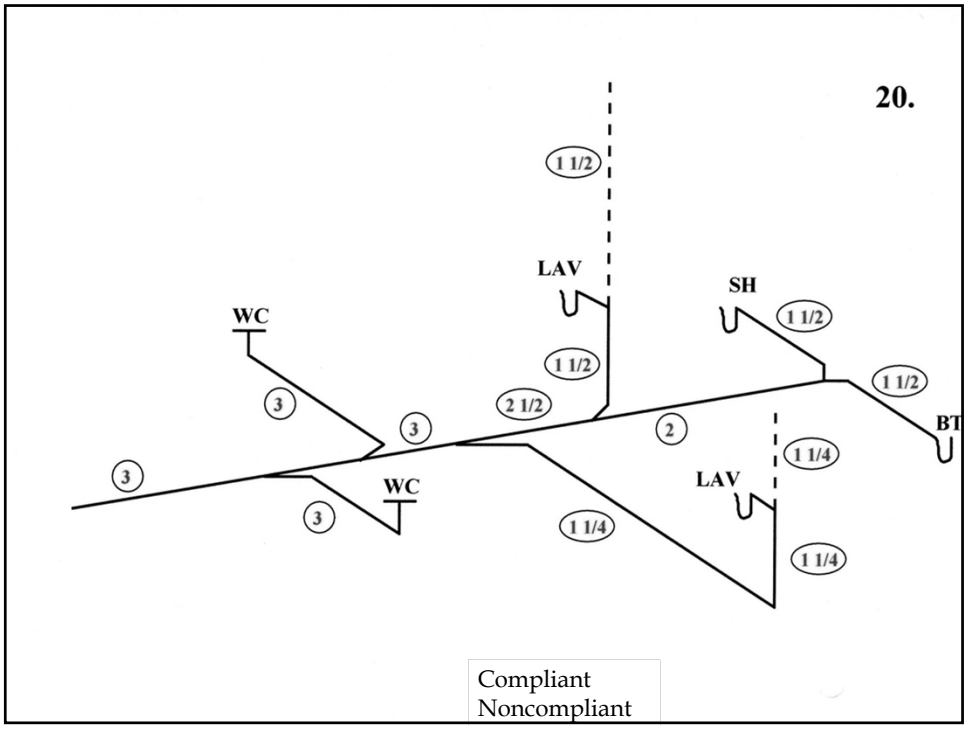
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1 1/2
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1 1/2
1 1/2
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1 1/4
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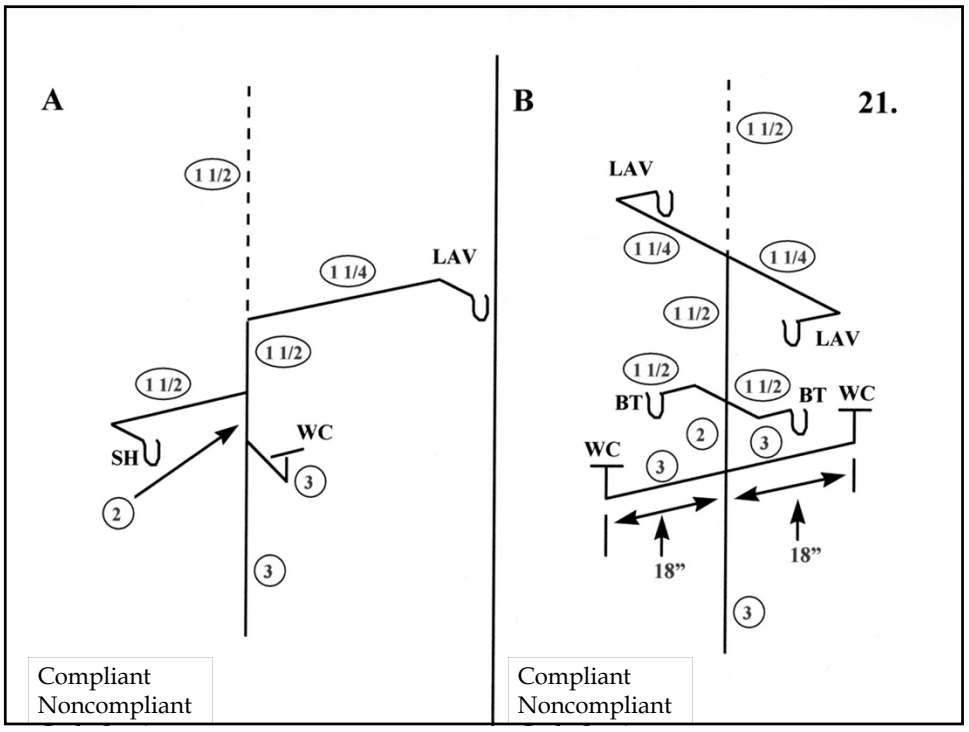
Noncompliant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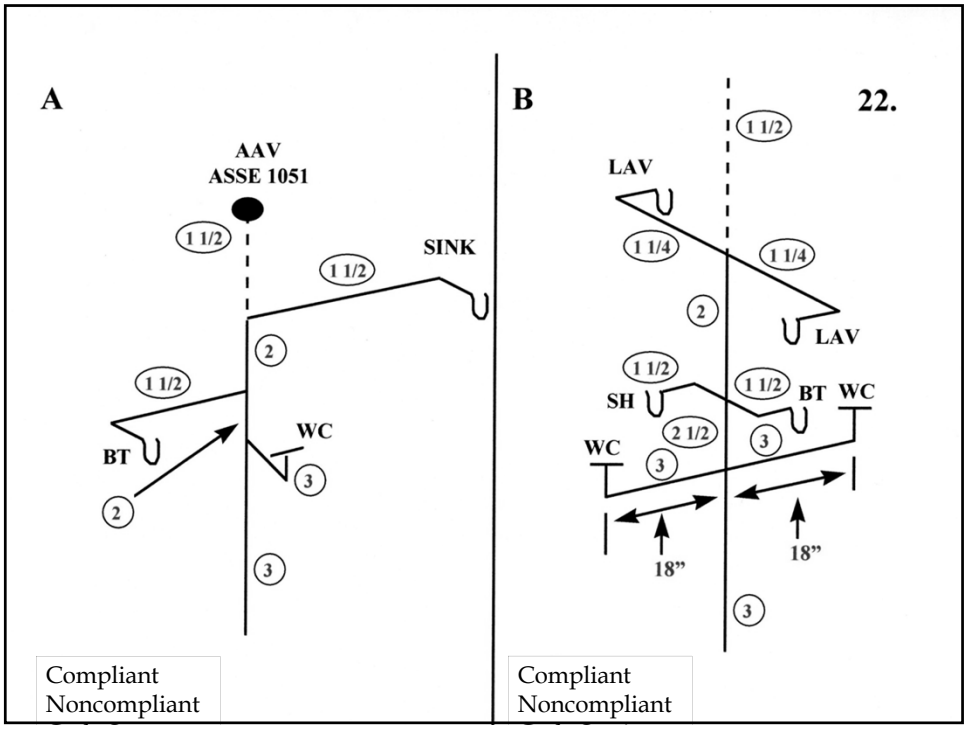
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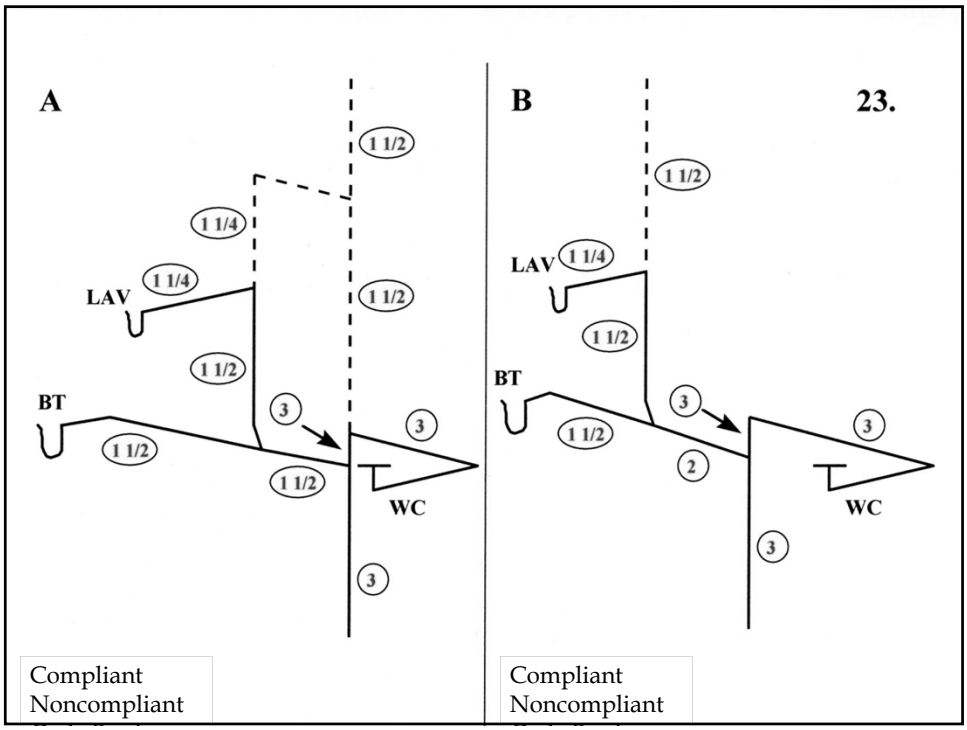
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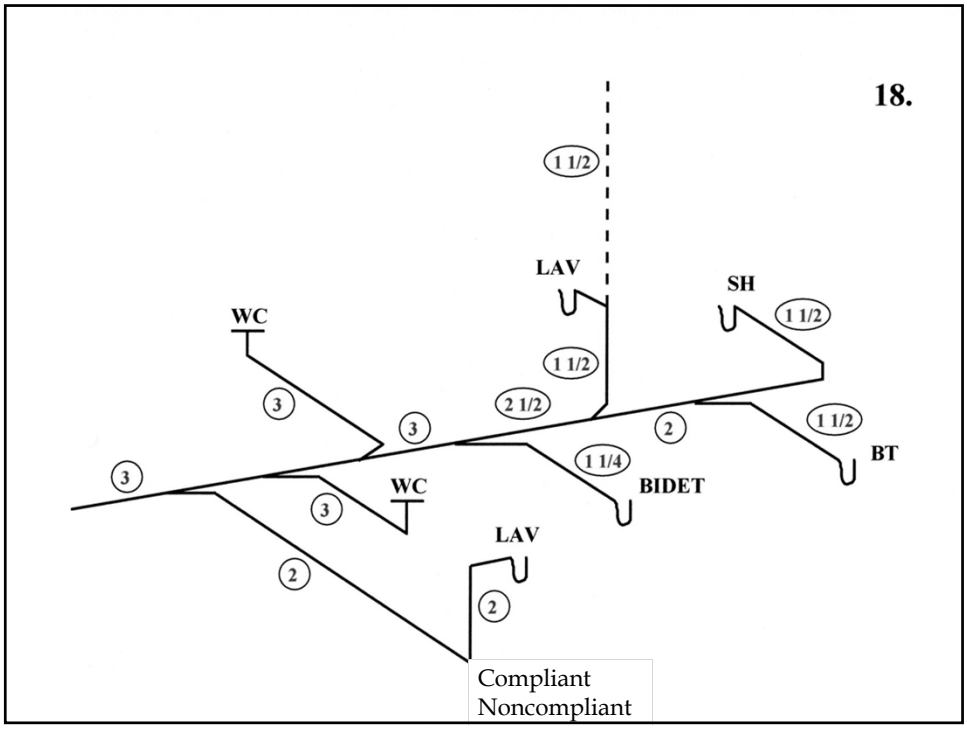
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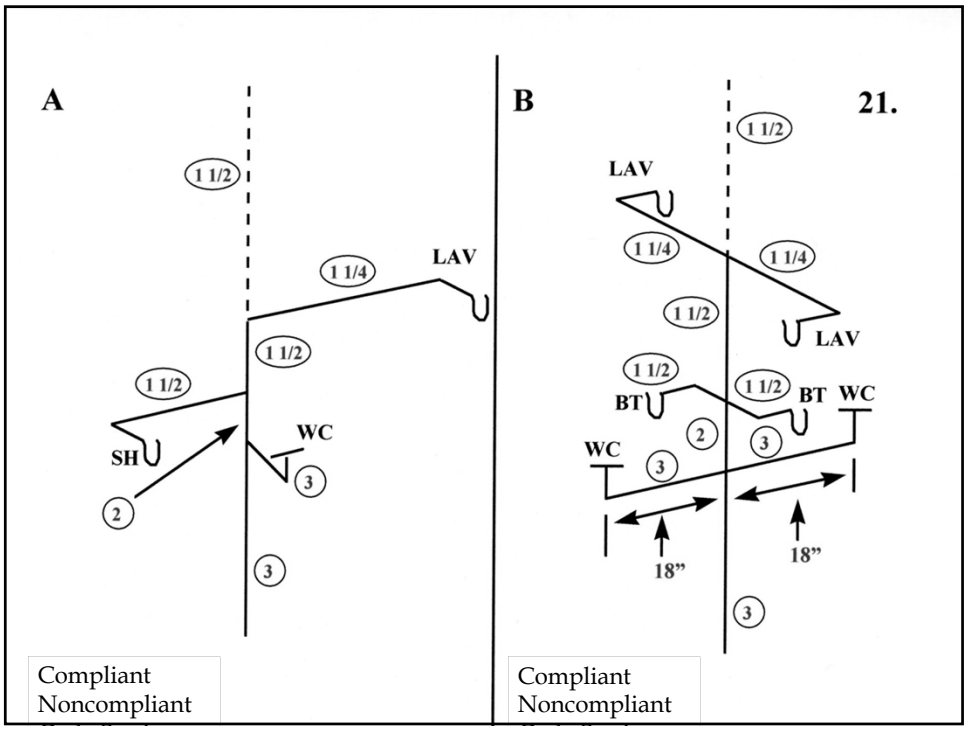
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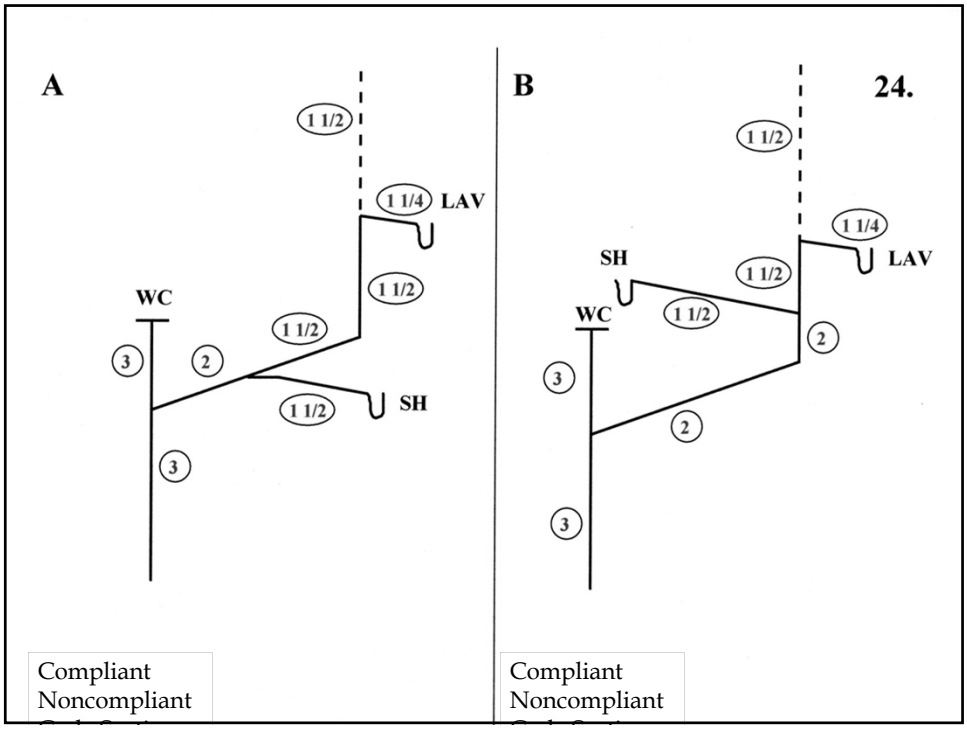
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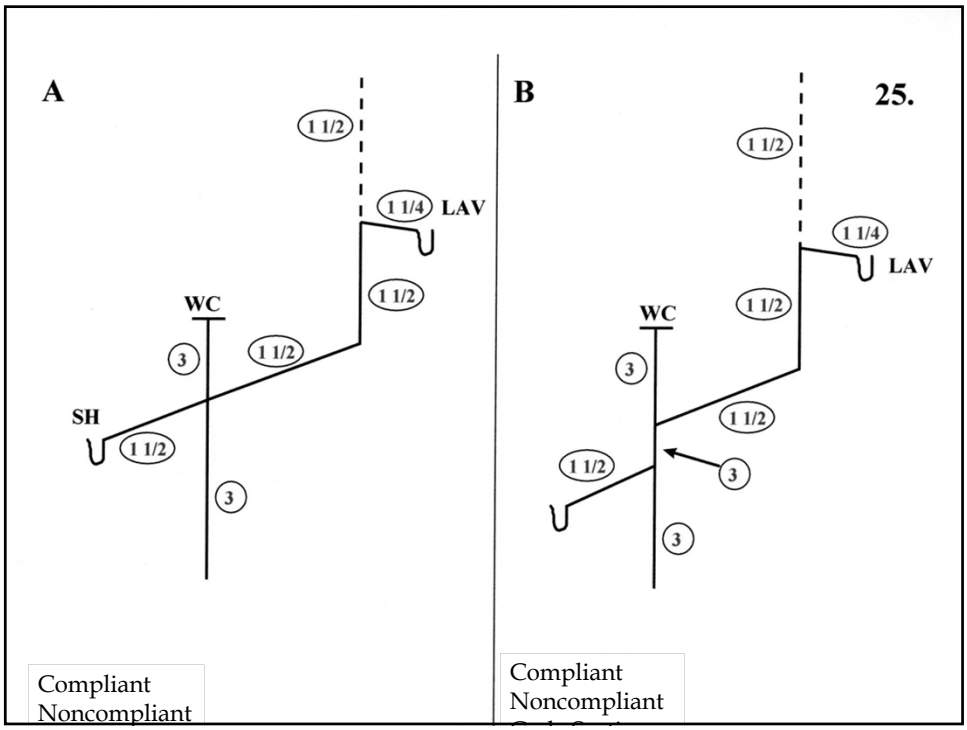
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3
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1 1/2
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Compliant
Noncompliant
Compliant
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910.1
Waste Stack Vent

910.1
Waste Stack Vent

- *Any type of plumbing fixtures except water closets and urinals.*
- *No offsets from the lowest fixture connection on the stack to six inches above the flood level rim of highest fixture connection to the stack.*
- *Offsets allowed below the lowest fixture connection.*
- *Table 910.4 shows the allowable dfu's permitted to drain into the waste stack vent.*
- *The waste stack vent is required to have a stack vent that is the same size as the waste stack, then a minimum of three inches through roof.*
- *Stacking of the tee's is permitted or double sanitary tee's or crosses as long as long as waste stack vent is sized properly.*

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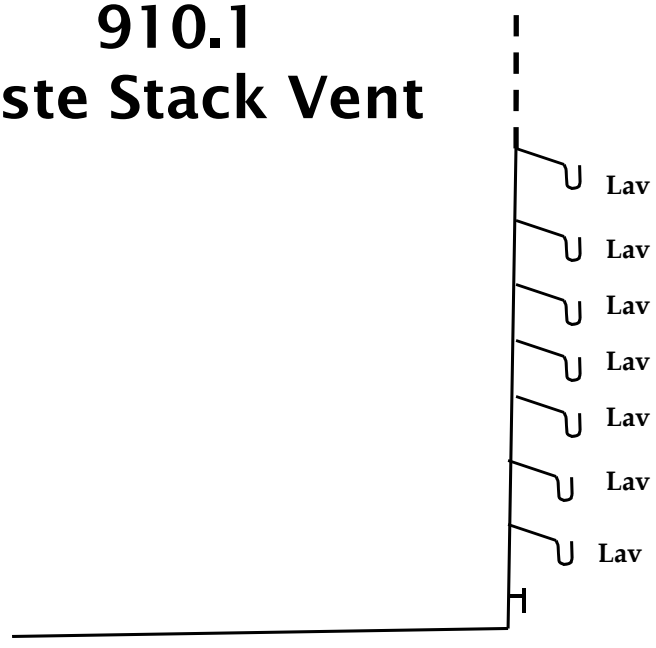
910.4
Waste Stack Vent Size

MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS(dfu)

STACK SIZE (Inches)	Total discharge into ONE branch interval	Total discharge into stack
1 ½″	1	2
2″	2	4
2 ½″	No limit	8
3″	No limit	24
4″	No limit	50
5″	No limit	75
6″	No limit	100

37

910.1
Waste Stack Vent



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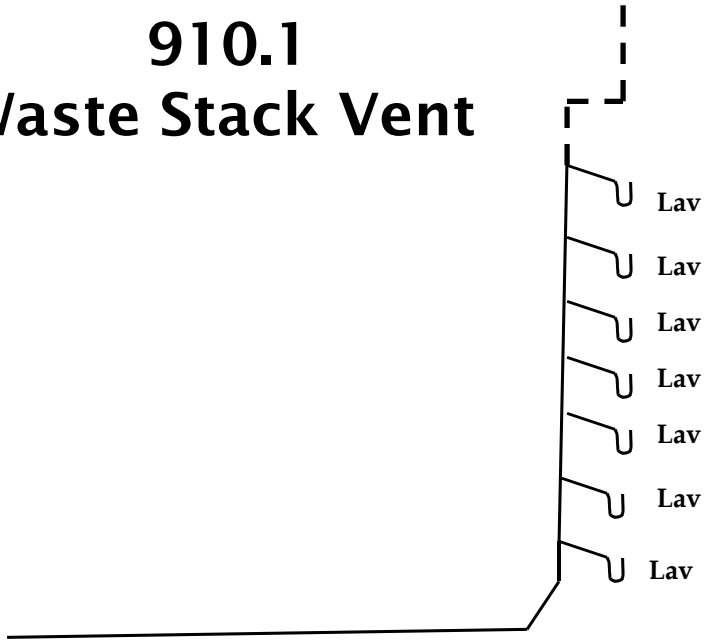
Waste Stack Vent



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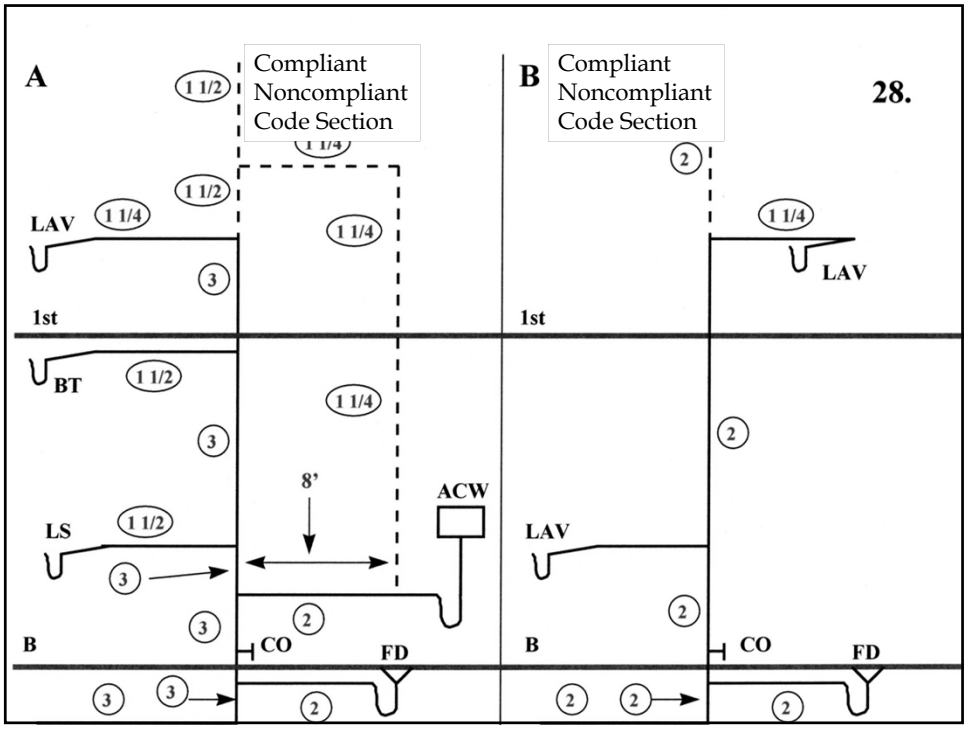
910.4
Waste Stack Vent Size

MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)

STACK SIZE (Inches)	Total discharge into ONE branch interval	Total discharge into stack
1 ½″	1	2
2″	2	4
2 ½″	No limit	8
3″	No limit	24
4″	No limit	50
5″	No limit	75
6″	No limit	100

40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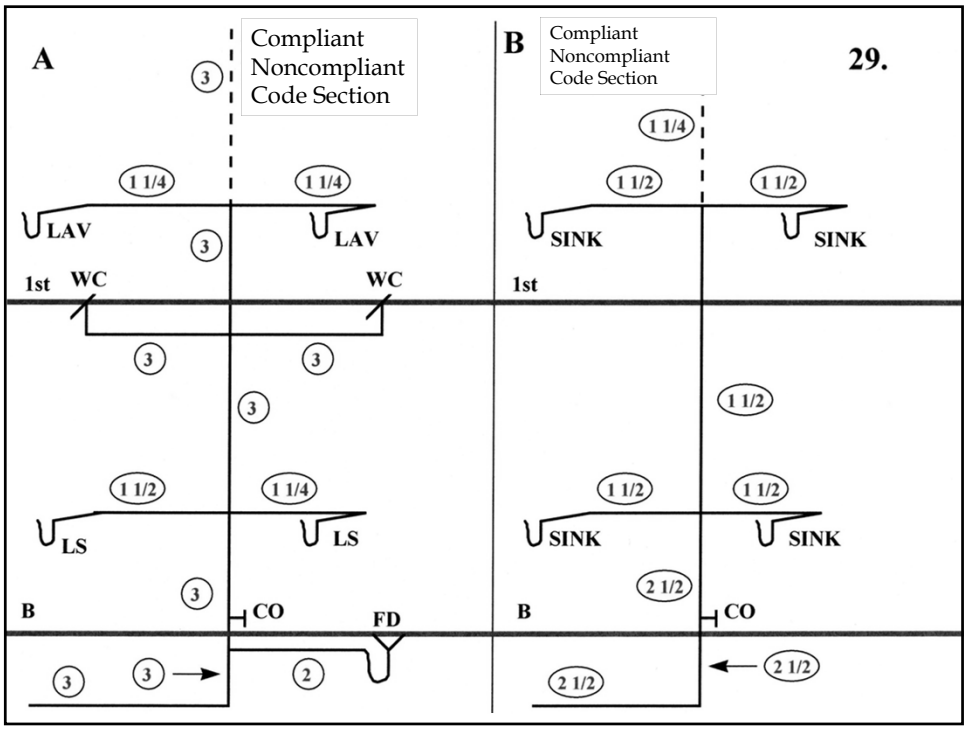
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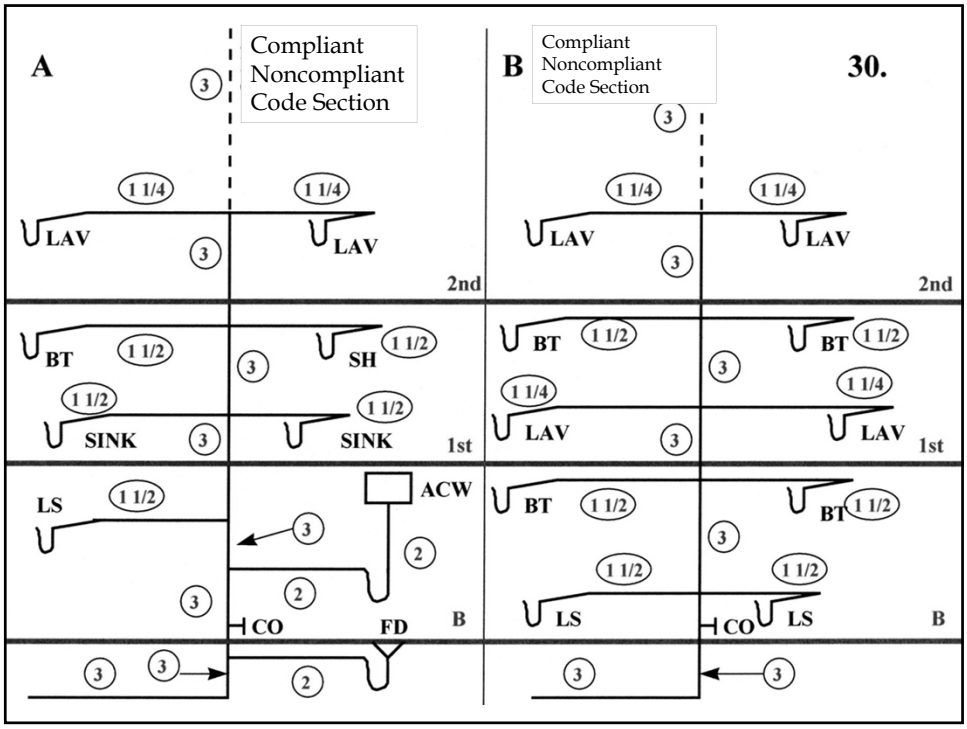
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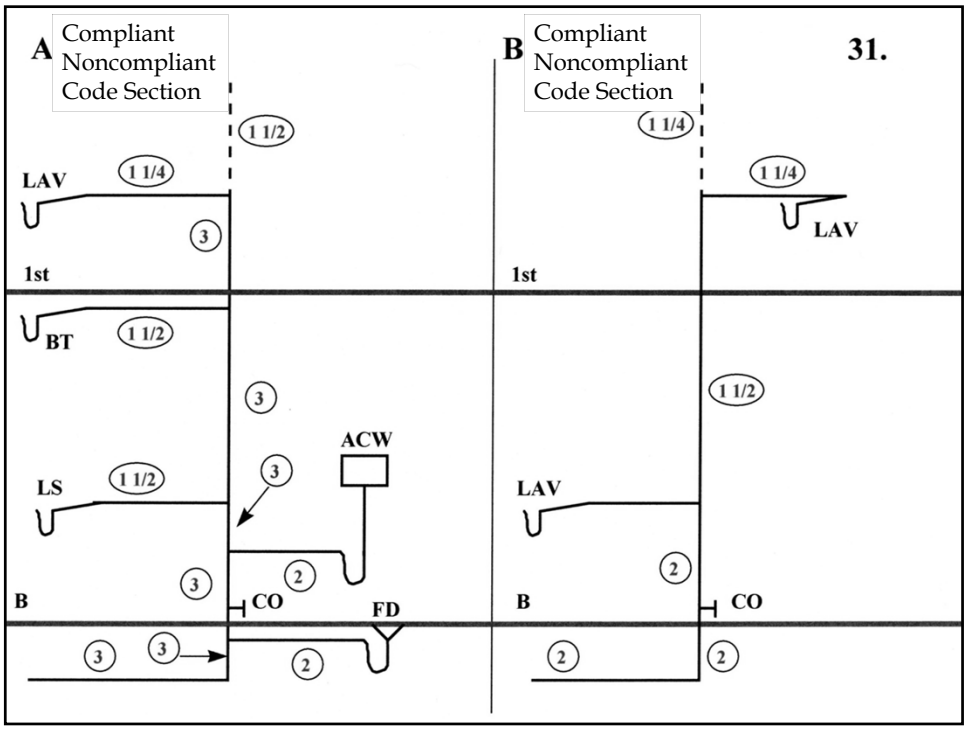
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Code Section

911
Circuit Venting

- ***Any plumbing fixtures connected to a horizontal branch of a horizontal main. The fixtures shall connect to the horizontal branch horizontally.***
- ***Any type of plumbing fixtures connected horizontally.***
- ***Minimum of two plumbing fixtures and a maximum of eight plumbing fixtures connected to each circuit vent system.***
- ***Vertical offsets are prohibited on the horizontal branch drain.***
- ***The dry vent shall connect to the horizontal branch between the two most upstream fixtures connected to the horizontal branch.***
- ***No fixtures can drain to the circuit vented vent.***
- ***Additional fixtures may drain into the circuit vented branch, if they are individually or common vented.***

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911
Circuit Venting

- *When there are four or more water closets and the horizontal branch is connecting to a stack with fixture draining above, there shall be a relief vent installed between the drainage stack and the most downstream fixture connection.*
- *The size of the relief vent shall be at least ½ the size of the horizontal branch. Minimum of 1 ¼ inches.*
- *A maximum of four drainage fixture units may drain into the relief vent.*
- *Remember, Table 906.1, maximum trap to vent distance allowed.*

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TABLE 710.1 (1)

BUILDING DRAINS AND SEWERS

DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF FIXTURE UNITS CONNECTED TO ANY PORTION[a] OF THE BUILDING DRAIN OR THE BUILDING SEWER, INCLUDING BRANCHES OF THE BUILDING DRAIN			
	Slope per foot			
	1/16 inch	1/8 inch	1/4 inch	1/2 inch
1 1/4			1	1
1 1/2			3	3
2			21	26
2 1/2			24	31
3		36	42	50
4		180	216	250
5		390	480	575
6		700	840	1,000
8	1,400	1,600	1,920	2,300
10	2,500	2,900	3,500	4,200
12	2,900	4,600	5,600	6,700

TABLE 710.1 (2)

HORIZONTAL FIXTURE BRANCHES AND STACKS[a]

DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF FIXTURE UNITS			
		Stacks[b]		
	Total for a horizontal branch	Total discharge into one branch interval	Total for stack of three branch intervals or less	Total for stack greater than three branch intervals
1 1/2	3	2	4	8
2	6	6	10	24
2 1/2	12	9	20	42
3	20	20	48	72
4	160	90	240	500
5	360	200	540	1,100
6	620	350	960	1,900
8	1,400	600	2,200	3,600
10	2,500	1,000	3,800	5,600
12	3,900	1,500	6,000	8,400
15	7,000	Footnote c	Footnote c	Footnote c

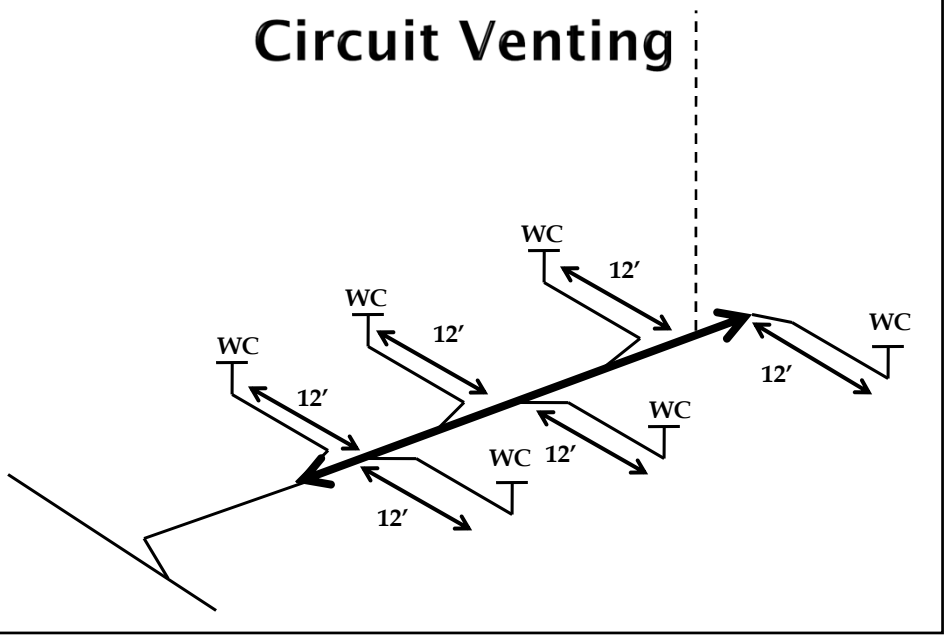
For SI: 1 inch = 25.4 mm

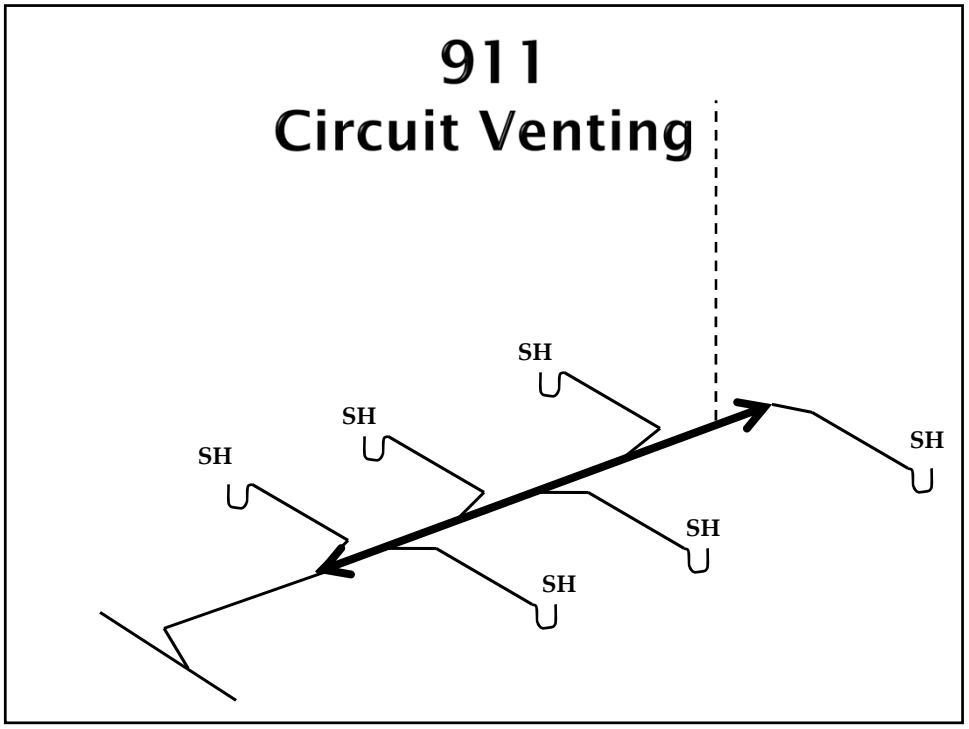
a. Does not include branches of the building drain.

b. Stacks shall be sized based on the total accumulated connected load at each story or branch interval. As the total accumulated connected load decreases, stacks are permitted to be reduced in size. Stack diameters shall not be reduced to less than one-half of the diameter of the largest stack required.

c. Sizing load based on design criteria.

911
Circuit Venting




911
Circuit Venting
SH
SH
SH
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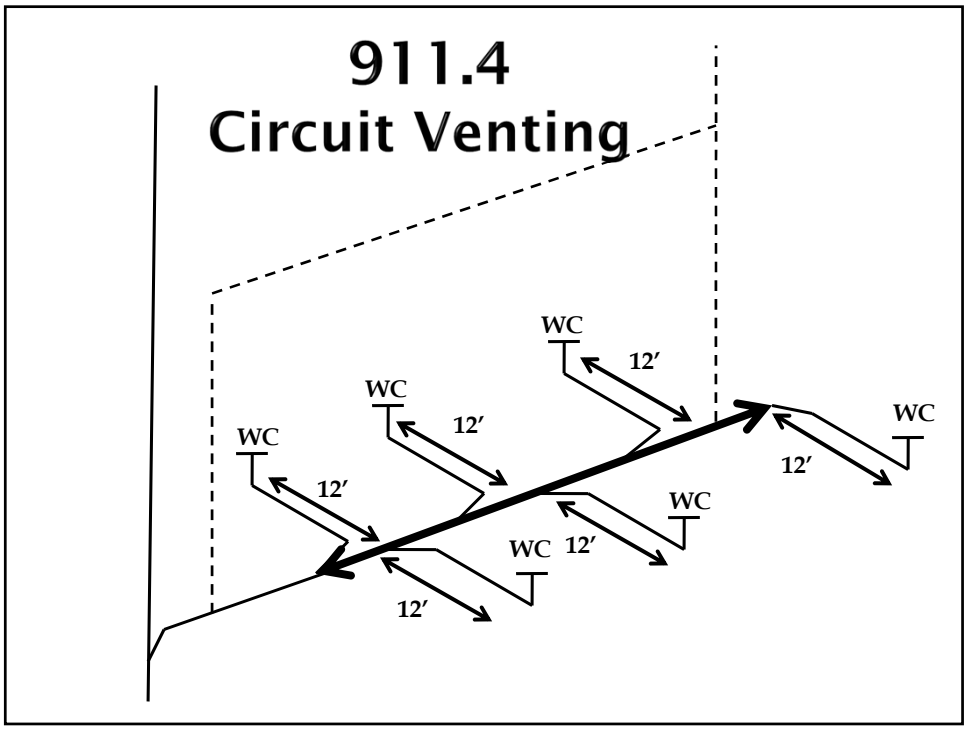
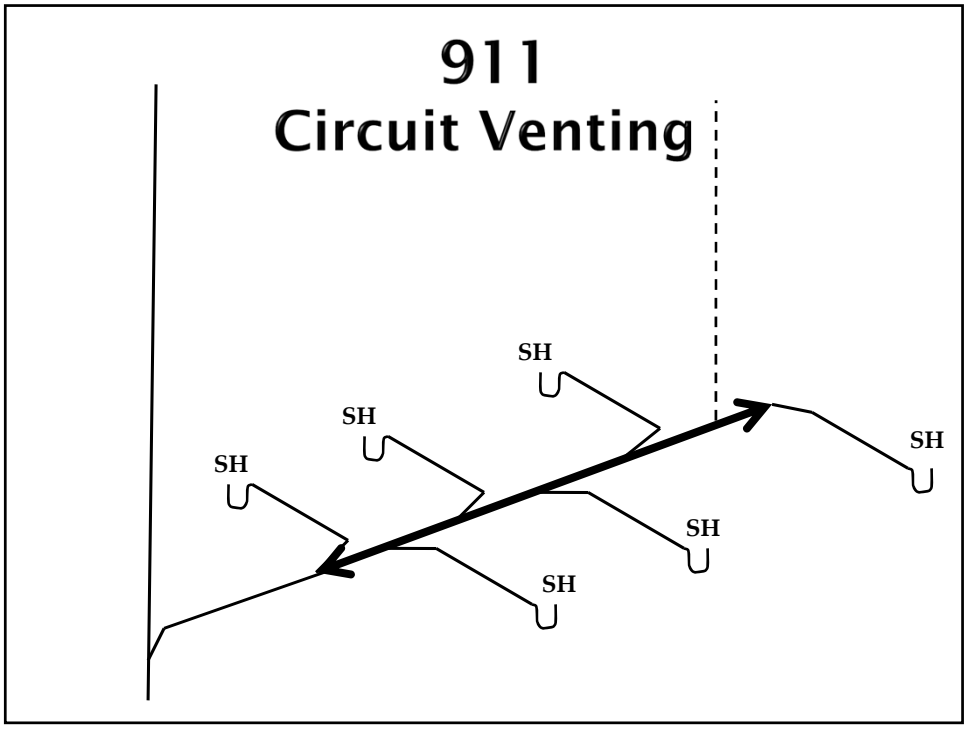
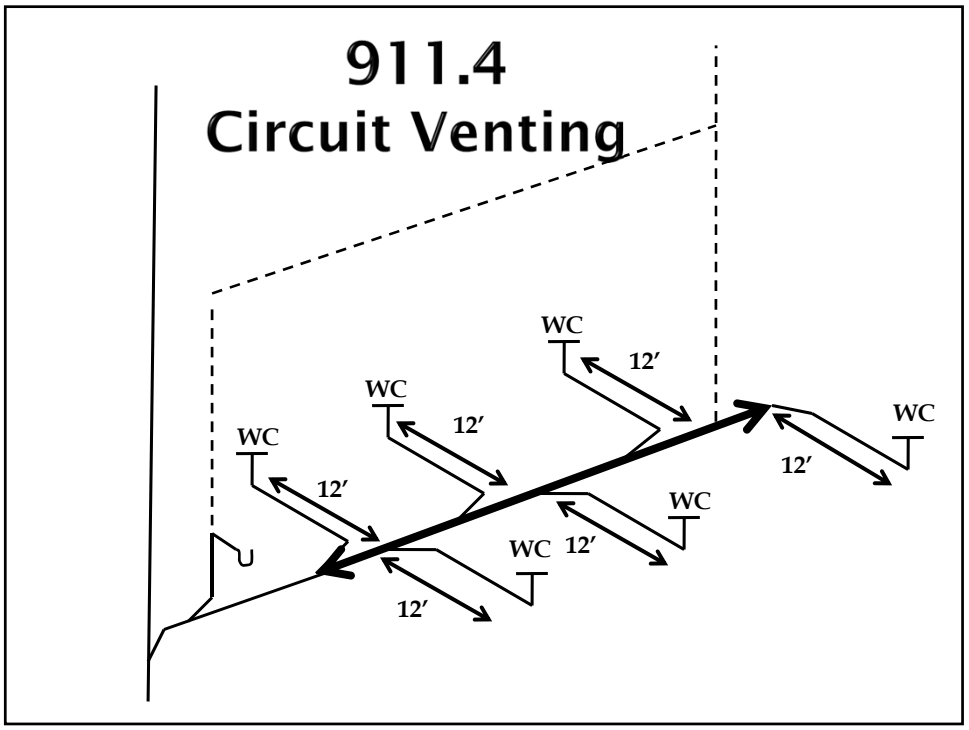
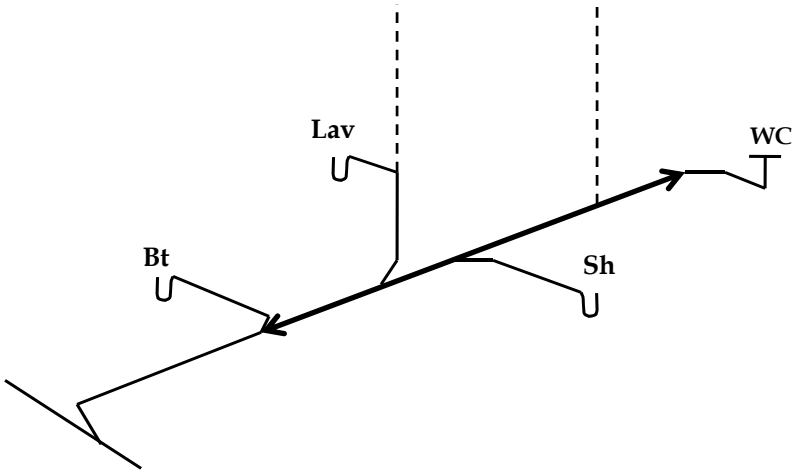
SH
SH


911.4
Circuit Venting
WC
12′
WC
12′
WC
12′
WC
12′
WC
12′
WC
12′

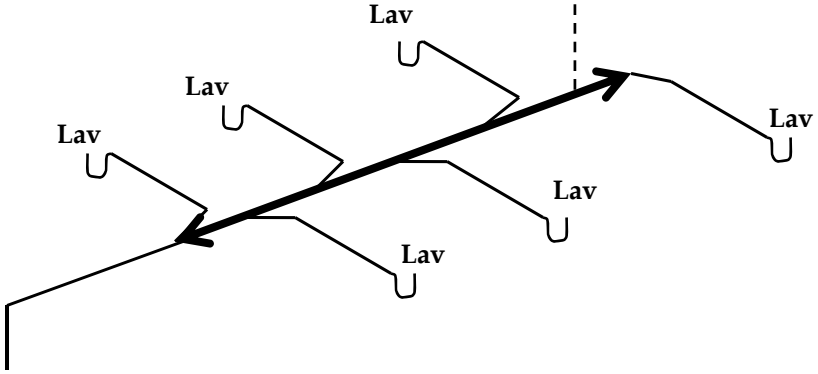

911
Circuit Venting
SH
SH
SH
SH
SH
SH

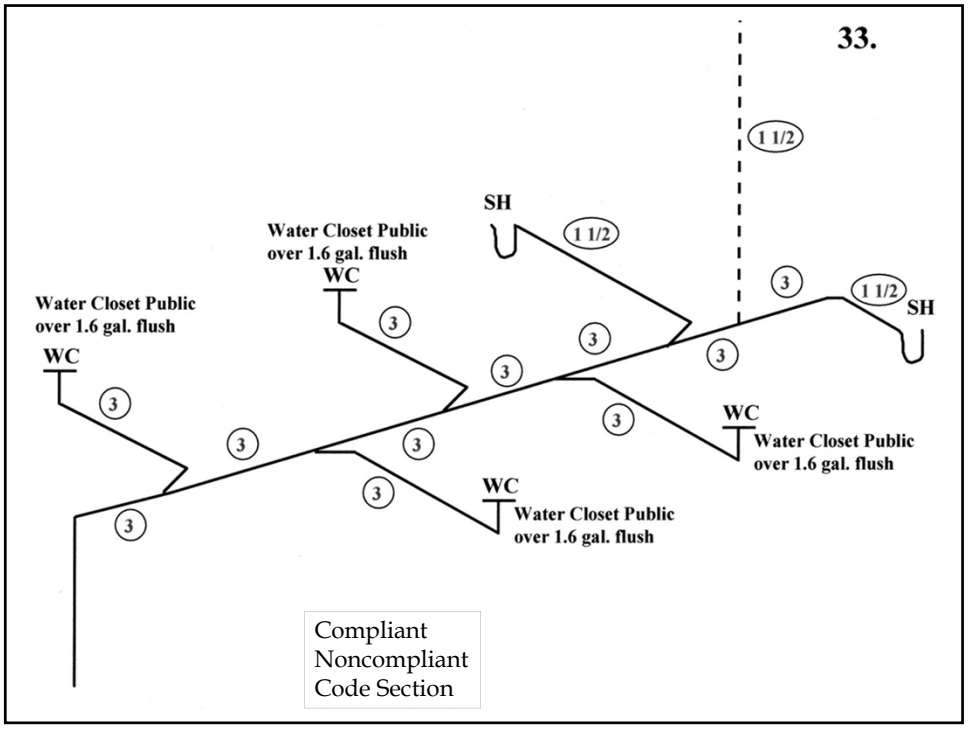

911.4
Circuit Venting
WC
12′
WC
12′
WC
12′
WC
12′
WC
12′
WC
12′

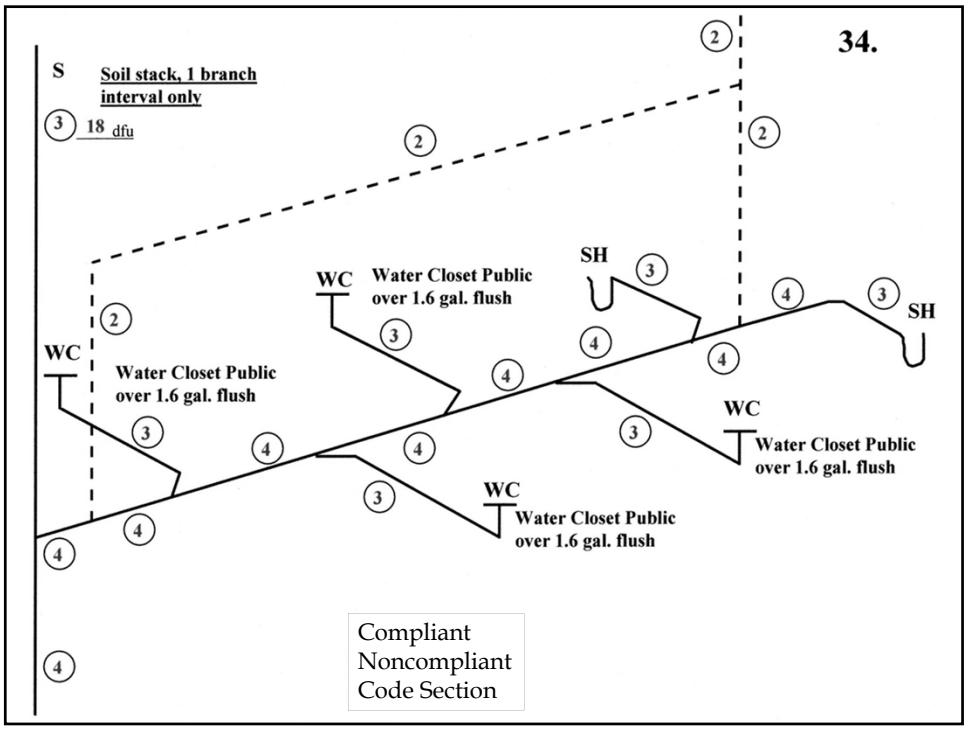
911.5
Circuit Venting

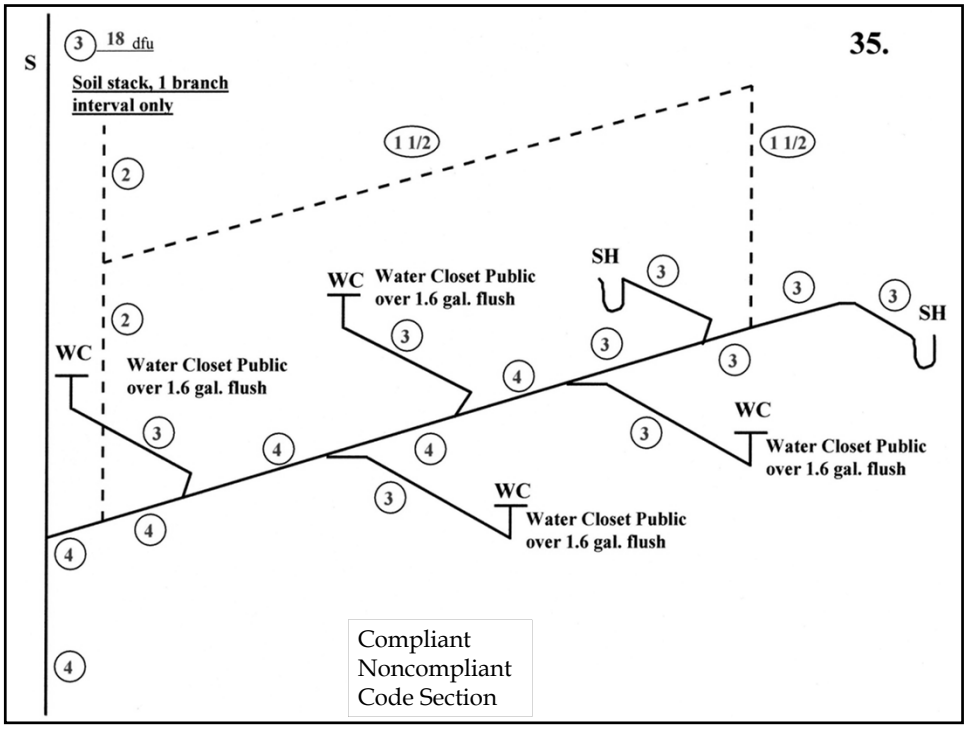


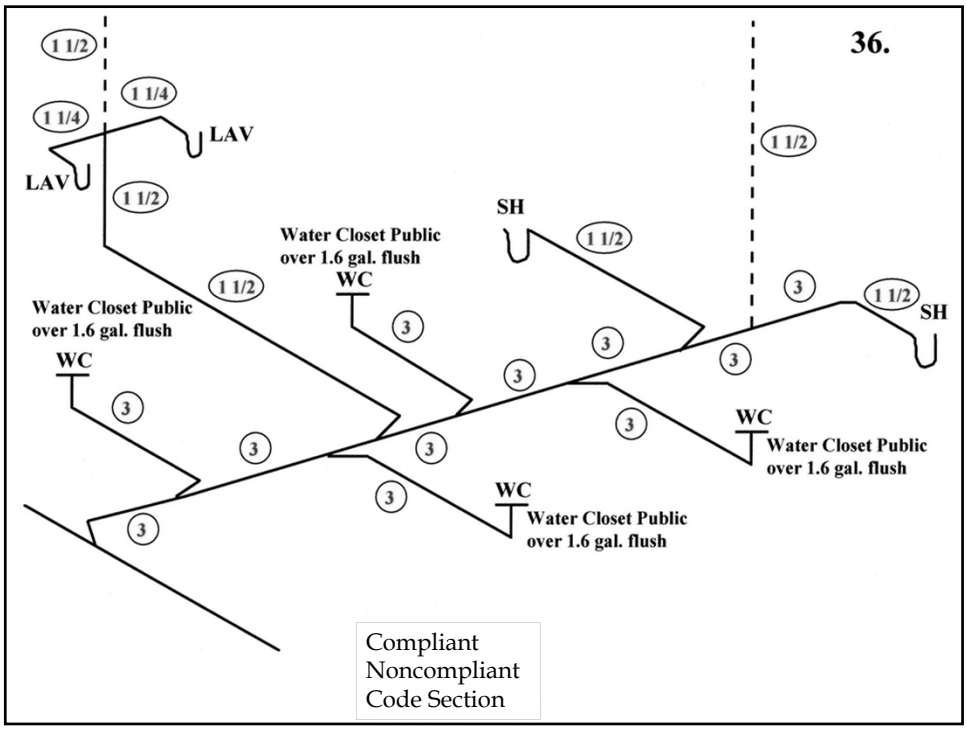
911
Circuit Venting

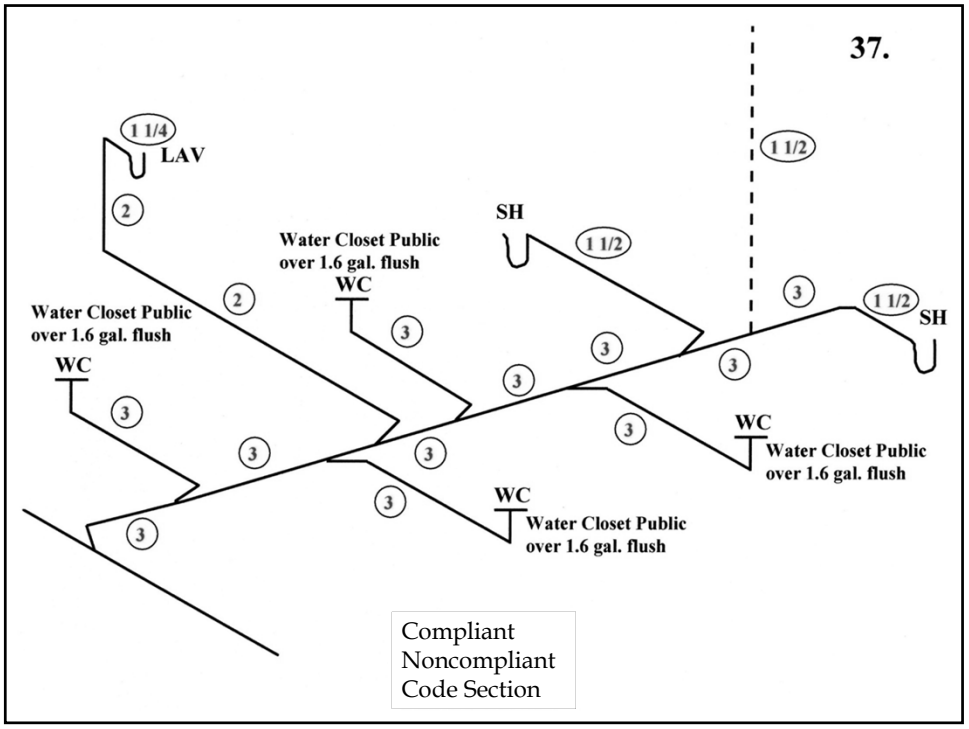


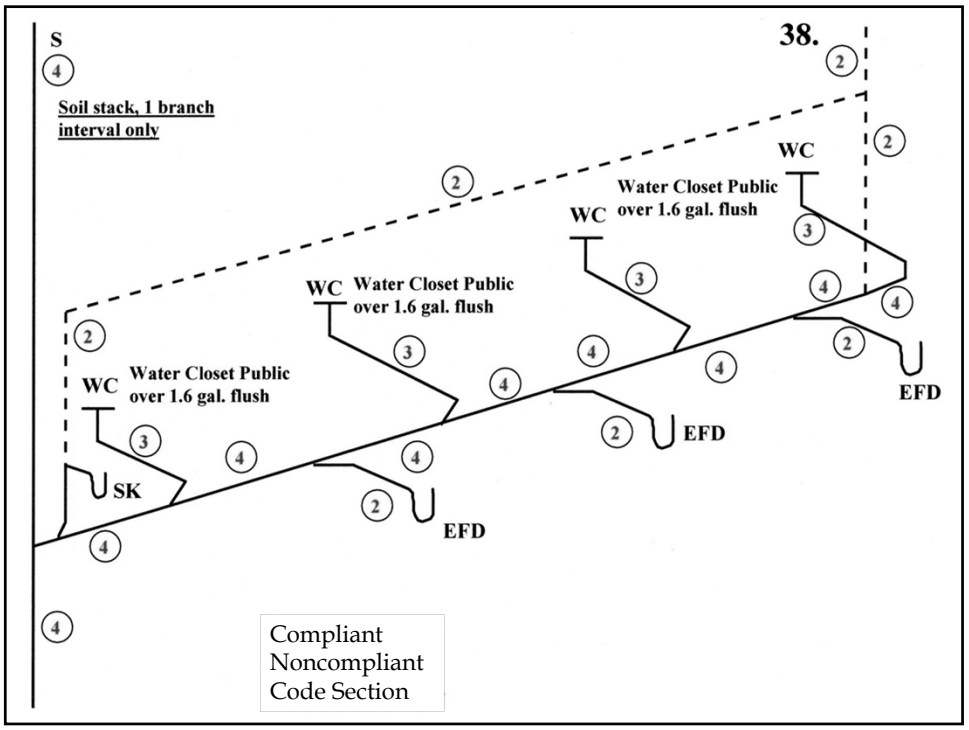

33.
1 1/2
SH
1 1/2
Water Closet Public
over 1.6 gal. flush
WC
Water Closet Public
over 1.6 gal. flush
WC
3
3
3
3
3
3
3
3
3
3
3
1 1/2
SH
WC
Water Closet Public
over 1.6 gal. flush
WC
Water Closet Public
over 1.6 gal. flush
Compliant
Noncompliant
Code Section

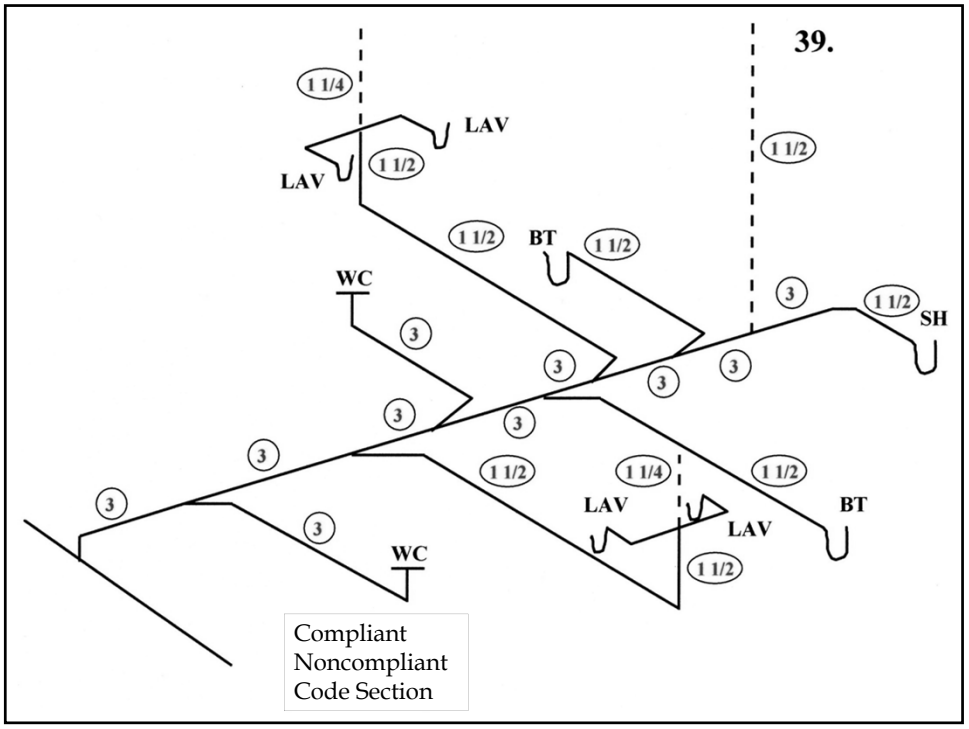

34.
2
S
Soil stack, 1 branch
interval only
3
18 dfu
2
2
2
SH
3
WC
Water Closet Public
over 1.6 gal. flush
3
4
4
3
SH
WC
Water Closet Public
over 1.6 gal. flush
4
4
4
4
3
3
4
4
4
WC
Water Closet Public
over 1.6 gal. flush
WC
Water Closet Public
over 1.6 gal. flush
4
4
Compliant
Noncompliant
Code Section


35.
S
3 18 dfu
Soil stack, 1 branch interval only
1 1/2
1 1/2
2
2
WC
Water Closet Public over 1.6 gal. flush
WC
Water Closet Public over 1.6 gal. flush
SH
SH
WC
Water Closet Public over 1.6 gal. flush
WC
Water Closet Public over 1.6 gal. flush
Compliant
Noncompliant
Code Section

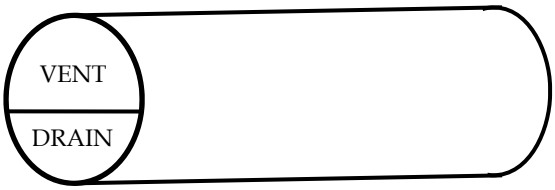

36.
1 1/2
1 1/4
1 1/4
LAV
LAV
1 1/2
1 1/2
1 1/2
SH
Water Closet Public over 1.6 gal. flush
WC
Water Closet Public over 1.6 gal. flush
WC
1 1/2
SH
WC
Water Closet Public over 1.6 gal. flush
WC
Water Closet Public over 1.6 gal. flush
Compliant
Noncompliant
Code Section


37.
1 1/4
LAV
2
Water Closet Public
over 1.6 gal. flush
WC
Water Closet Public
over 1.6 gal. flush
WC
SH
1 1/2
1 1/2
SH
WC
Water Closet Public
over 1.6 gal. flush
WC
Water Closet Public
over 1.6 gal. flush
Compliant
Noncompliant
Code Section


38.
S
Soil stack, 1 branch
interval only
WC
Water Closet Public
over 1.6 gal. flush
WC
Water Closet Public
over 1.6 gal. flush
WC
Water Closet Public
over 1.6 gal. flush
SK
EFD
EFD
EFD
Compliant
Noncompliant
Code Section



912 Combination Drain and Vent System



912
Combination Drain and Vent System

- ***Types of plumbing fixtures permitted are lavatories, sinks, drinking fountains and floor drains only. No food waste grinder units or clinical sinks.***
- ***The only vertical vertical pipe connection allowed is the connection from the fixture drain of the lavatory, sink, and the drinking fountain and the horizontal combination drain and vent pipe.***
- ***The maximum vertical distance is eight feet.***
- ***The minimum pipe size of a combination drain and vent is two inch.***
- ***Table 912.3 is the table used to size the combination drain and vent system.***
- ***The combination drain and vent shall connect to a horizontal drainage system that is being vented by one of the venting methods or the combination drain and vent system shall be vented. If the combination drain and vent system is connected to a building drain receiving the discharge from stacks only, the combination drain and vent system shall be provided with a vent. If a vented system is located anywhere within the building drain then a vent is not required on the combination drain and vent.***

66

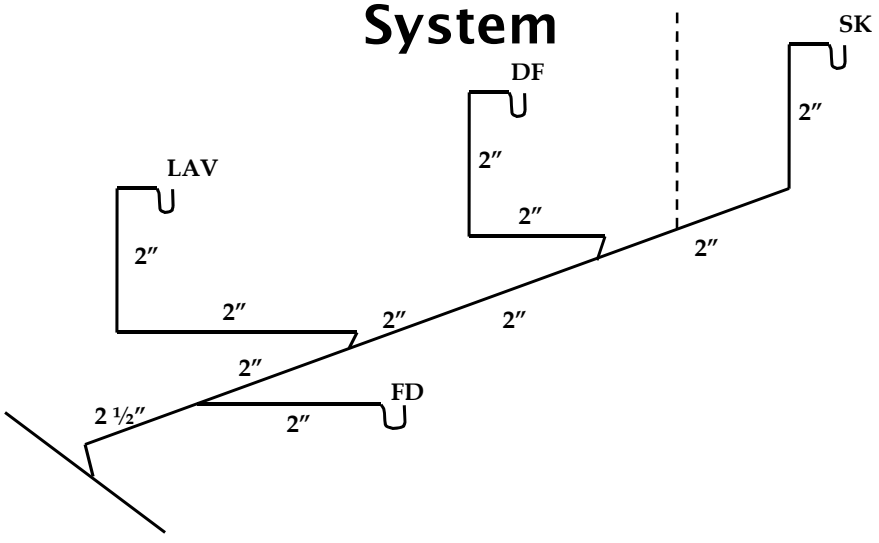
912.3
Size of Combination Drain and Vent Pipe

MAXIMUM NUMBER OF DRAINAGE FIXTURE UNIT (dfu)

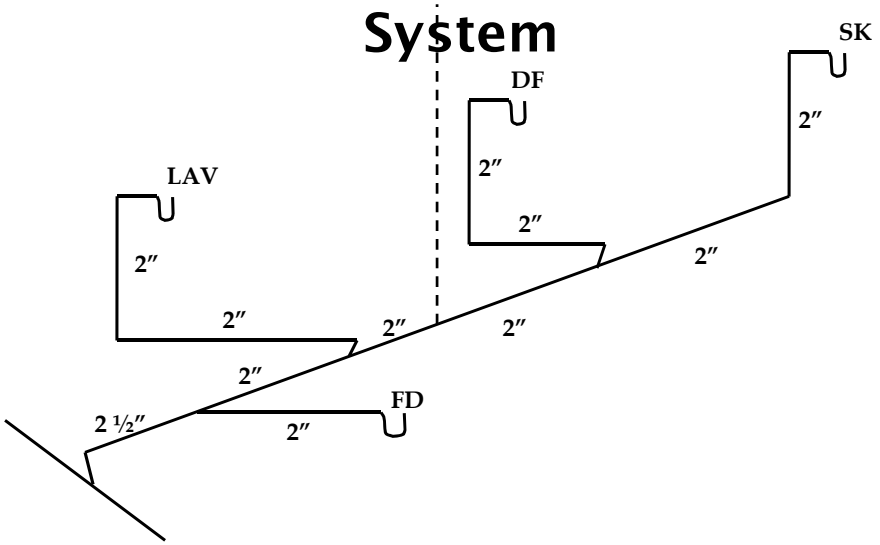
Diameter of Pipe (Inches)	Connecting to a Horizontal Branch or Stack	Connecting to a Building Drain or Building Sub-drain
2″	3	4
2 ½″	6	26
3″	12	31
4″	20	50
5″	160	250
6″	360	575

67

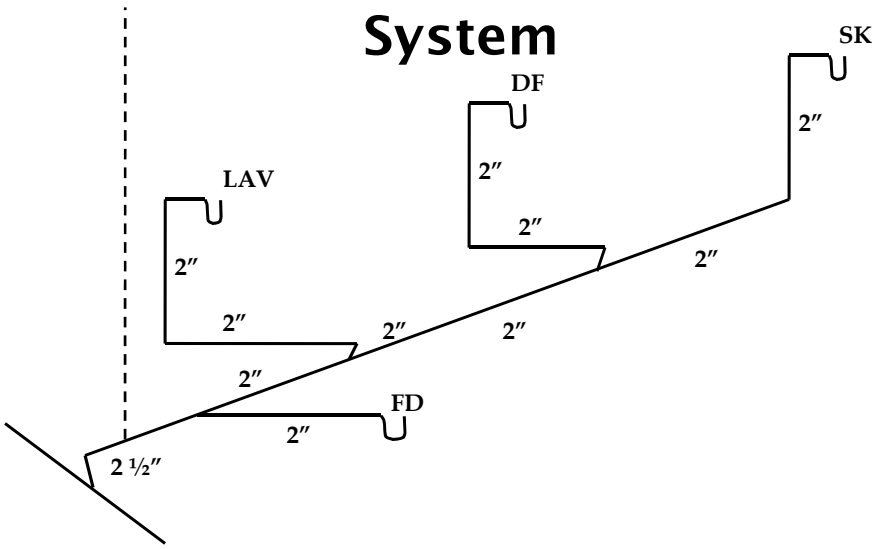
912
Combination Drain and Vent System



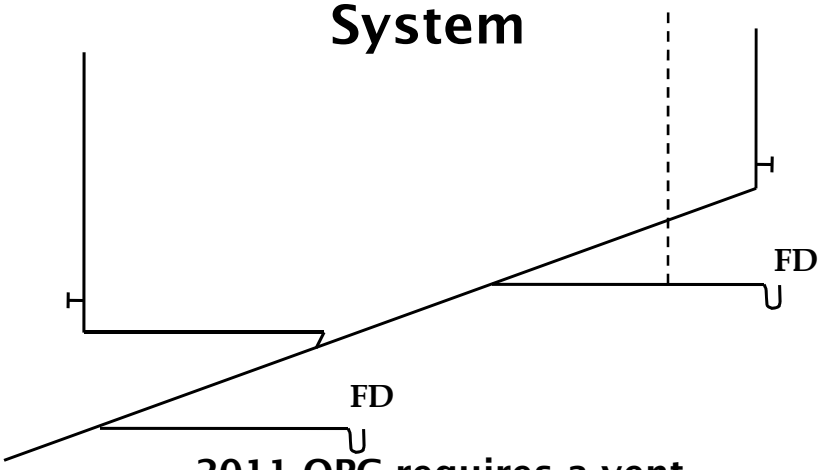
912
Combination Drain and Vent System



912
Combination Drain and Vent System

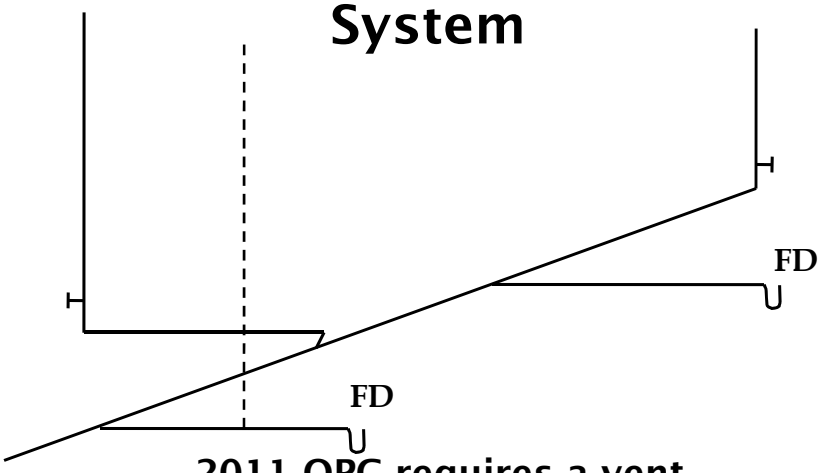


912
Combination Drain and Vent System



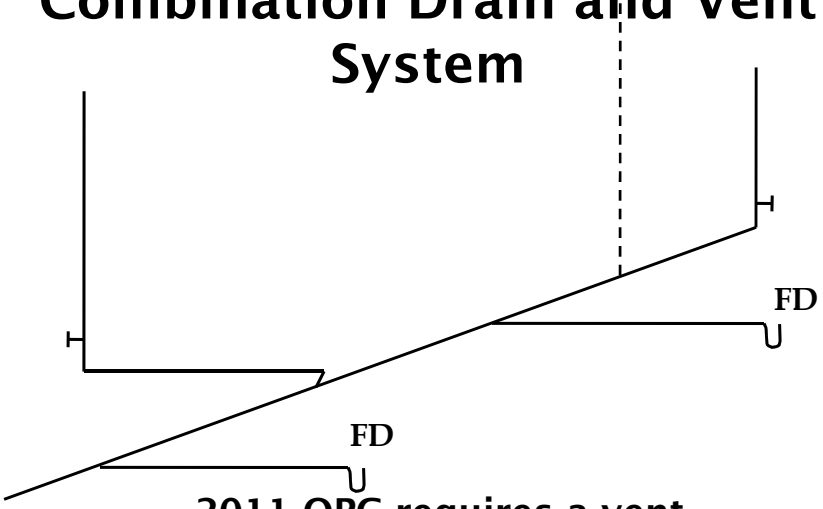
2011 OPC requires a vent anywhere on the building drain

912
Combination Drain and Vent System



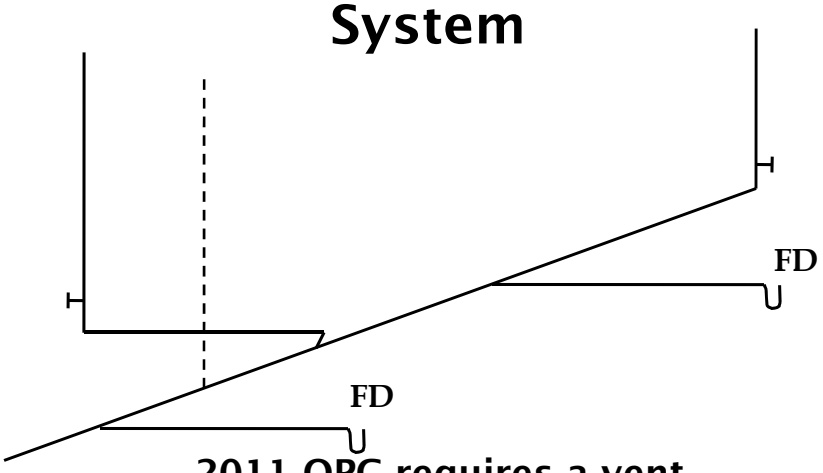
2011 OPC requires a vent anywhere on the building drain

912
Combination Drain and Vent System



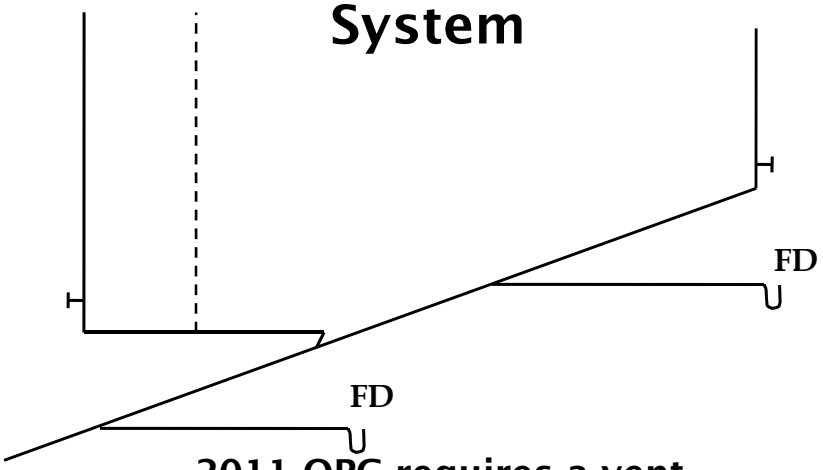
2011 OPC requires a vent anywhere on the building drain

912
Combination Drain and Vent System



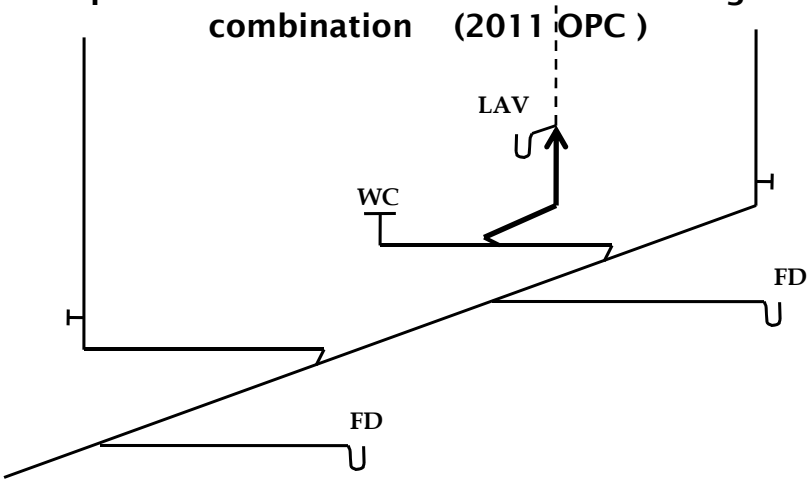
2011 OPC requires a vent anywhere on the building drain

912
Combination Drain and Vent System



2011 OPC requires a vent anywhere on the building drain

If a vent is located anywhere on building drain then combination drain and vent system is not required to have a vent on branch serving the combination (2011 OPC)

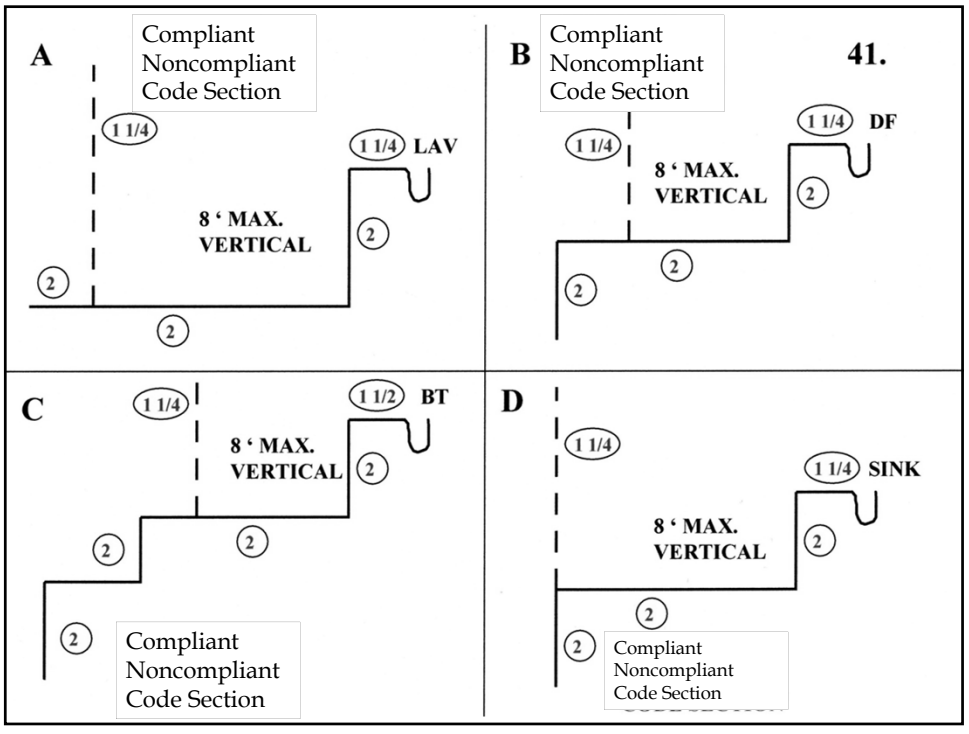


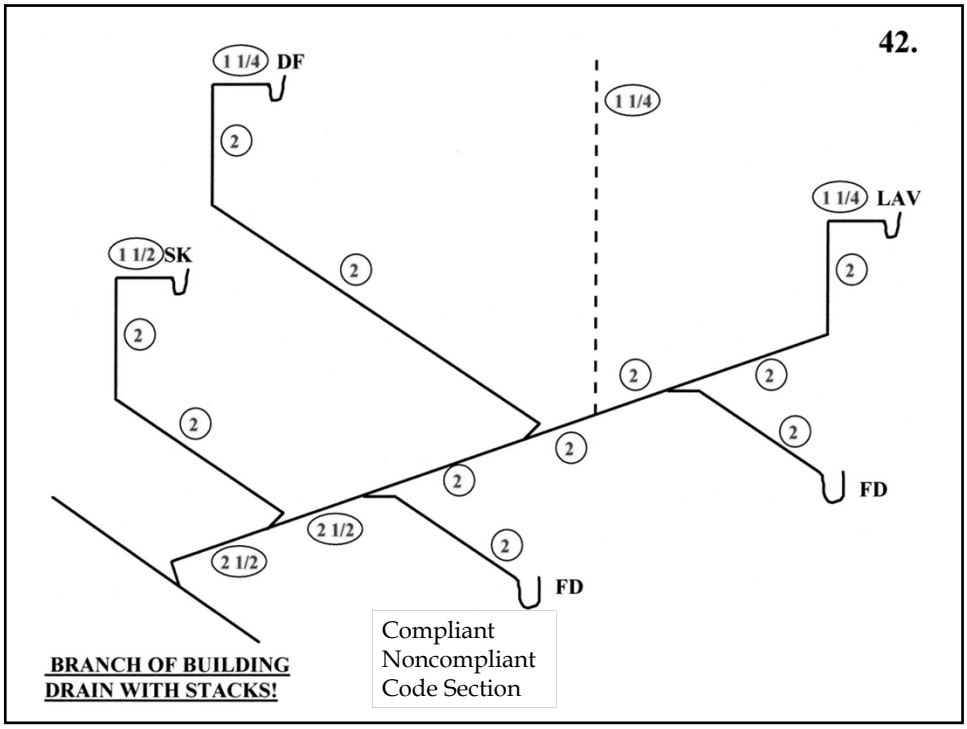
912.3
Size of Combination Drain and Vent Pipe

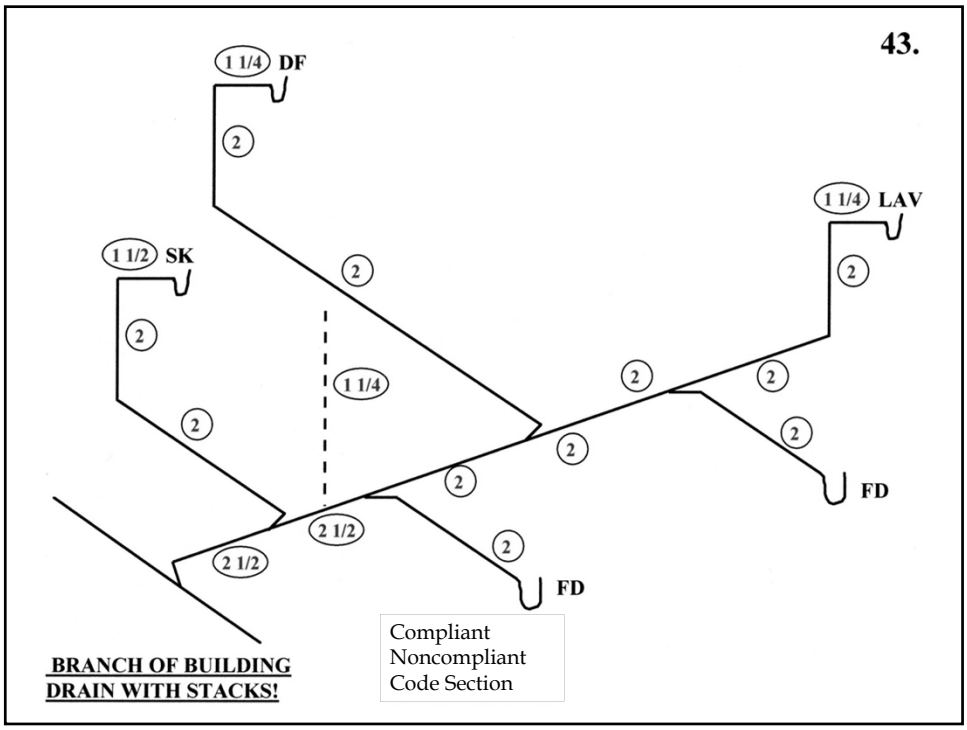
MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)

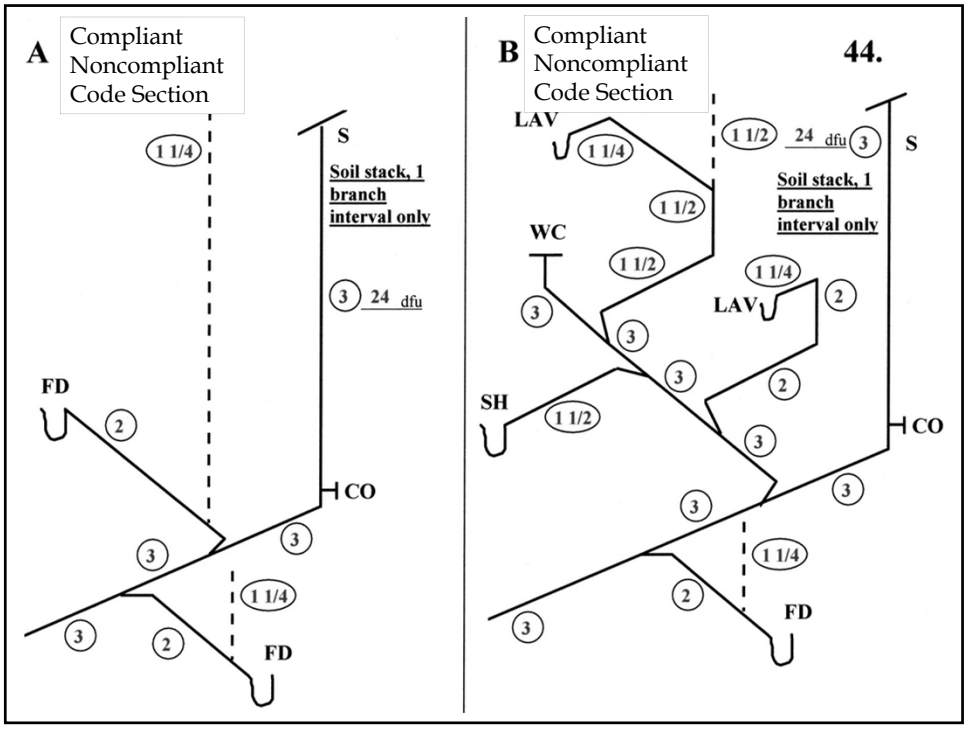
Diameter of Pipe (Inches)	Connecting to a Horizontal Branch or Stack	Connecting to a Building Drain or Building Sub-drain
2″	3	4
2 ½″	6	26
3″	12	31
4″	20	50
5″	160	250
6″	360	575

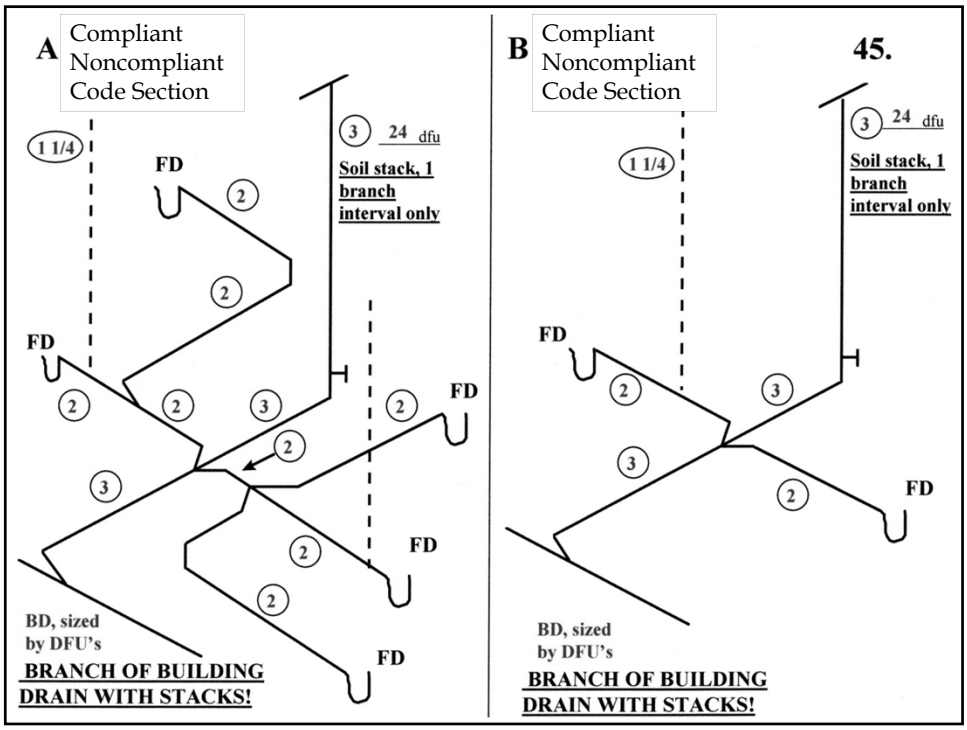
77

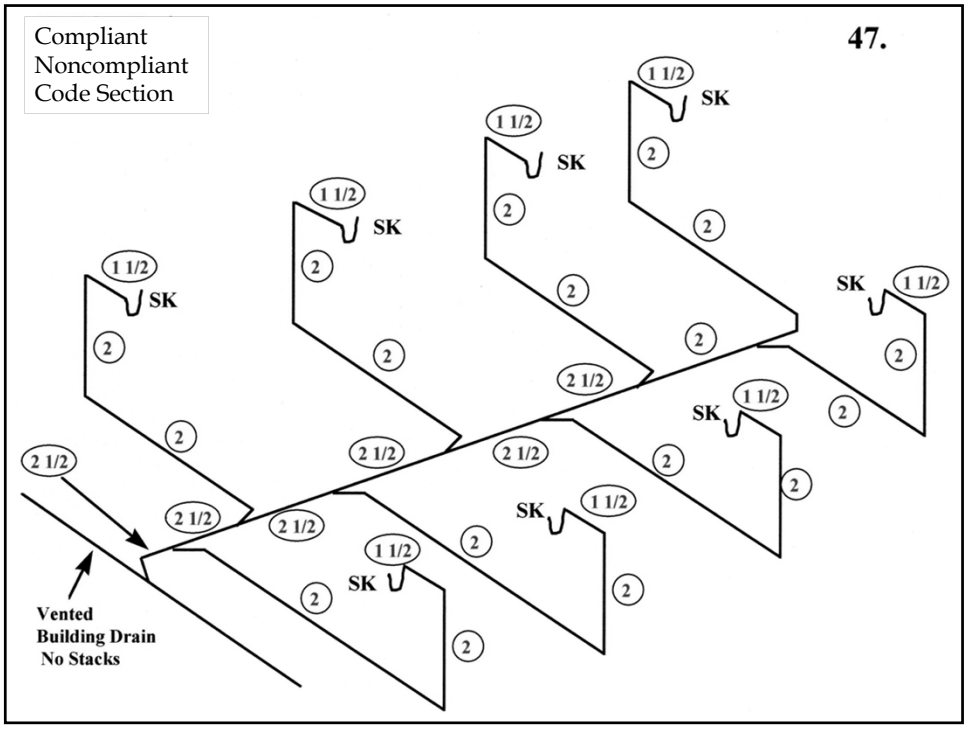


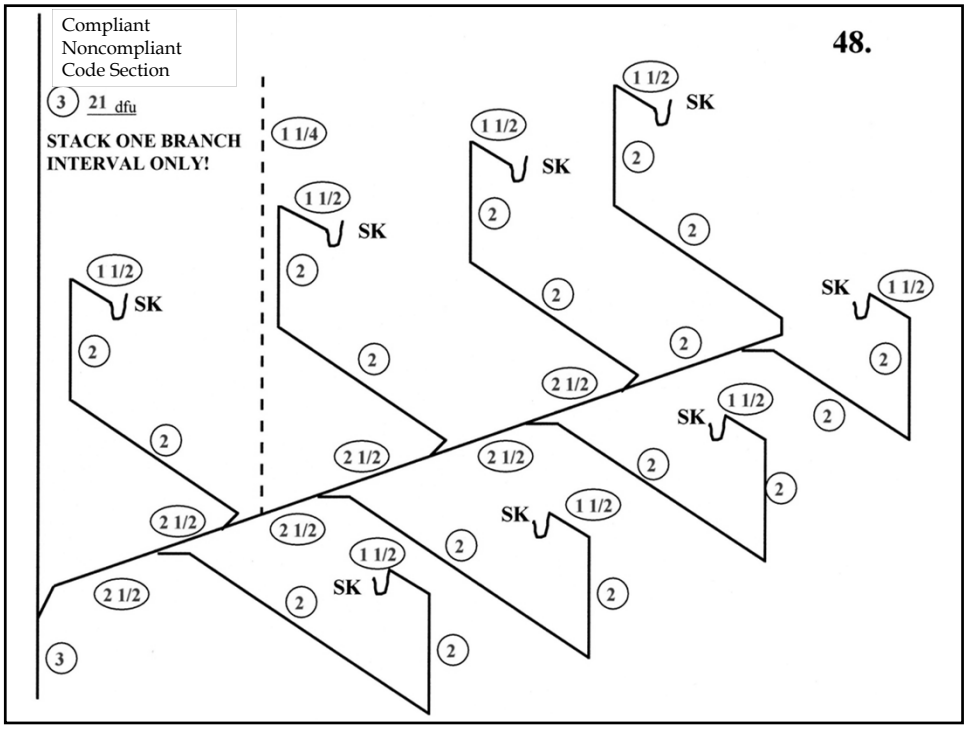

42.
1 1/4 DF
1 1/4
1 1/4 LAV
1 1/2 SK
2
2 1/2
FD
BRANCH OF BUILDING
DRAIN WITH STACKS!
Compliant
Noncompliant
Code Section

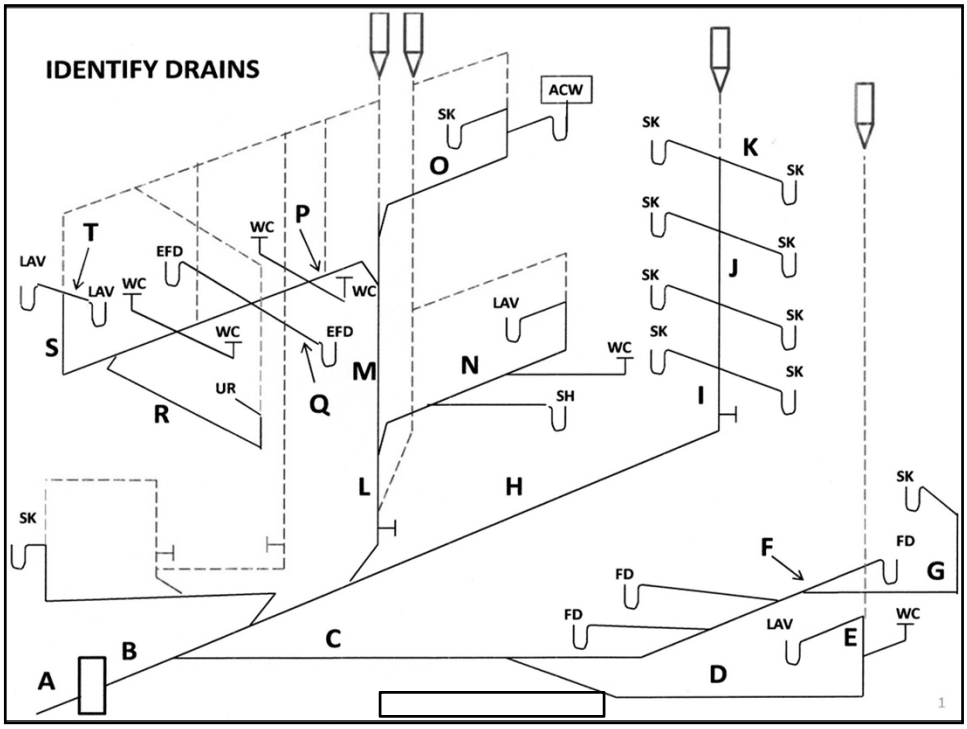

43.
1 1/4 DF
1 1/4 LAV
1 1/2 SK
2
1 1/4
2 1/2
FD
BRANCH OF BUILDING
DRAIN WITH STACKS!
Compliant
Noncompliant
Code Section

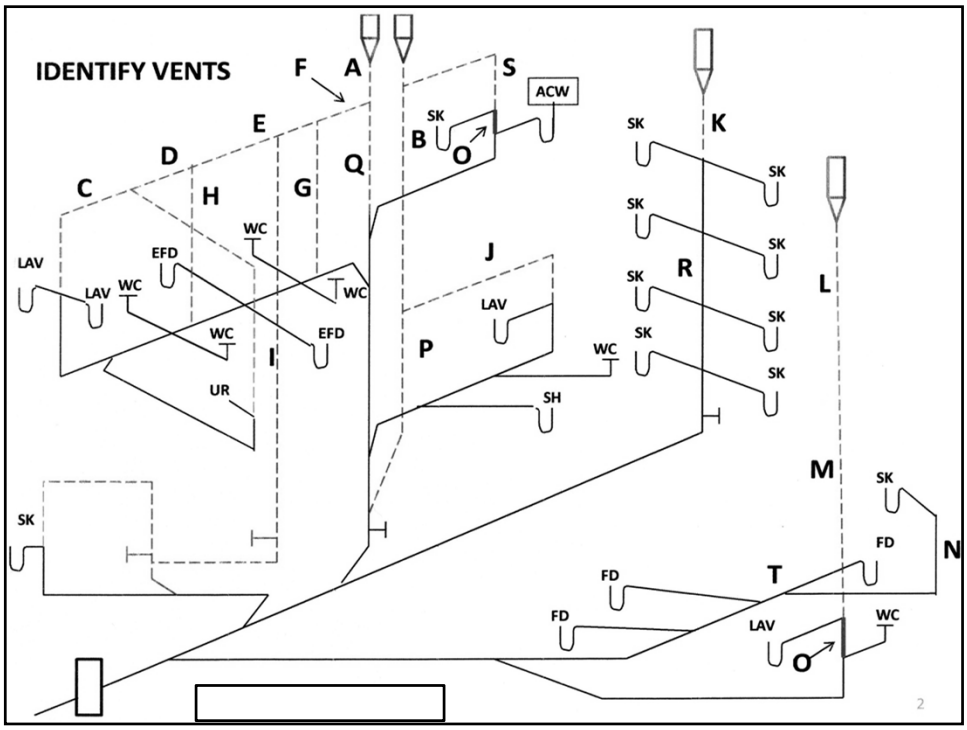

A
Compliant
Noncompliant
Code Section
1 1/4
S
Soil stack, 1 branch interval only
3 24 dfu
FD
2
CO
3
3
1 1/4
3
2
FD
B
Compliant
Noncompliant
Code Section
44.
LAV
1 1/4
1 1/2
24 dfu
3
S
Soil stack, 1 branch interval only
1 1/2
WC
1 1/2
1 1/4
LAV
2
3
3
3
2
SH
1 1/2
CO
3
3
3
1 1/4
2
FD
3


A
Compliant
Noncompliant
Code Section
3 24 dfu
1 1/4
FD
2
Soil stack, 1 branch interval only
2
FD
2
2
3
2
FD
2
3
2
FD
2
2
FD
BD, sized by DFU's
BRANCH OF BUILDING DRAIN WITH STACKS!
B
Compliant
Noncompliant
Code Section
45.
3 24 dfu
1 1/4
Soil stack, 1 branch interval only
FD
2
3
3
2
FD
BD, sized by DFU's
BRANCH OF BUILDING DRAIN WITH STACKS!


Compliant
Noncompliant
Code Section
47.
1 1/2
SK
2
2 1/2
Vented
Building Drain
No Stacks


Compliant
Noncompliant
Code Section
48.
3
21 dfu
STACK ONE BRANCH
INTERVAL ONLY!
1 1/4
1 1/2
SK
2
2 1/2
3


IDENTIFY DRAINS
ACW
SK
O
P
T
WC
LAV
EFD
S
M
N
Q
R
UR
SH
K
J
I
L
H
F
FD
G
E
D
C
B
A


IDENTIFY VENTS
F
A
S
ACW
E
B
SK
O
D
Q
K
C
H
G
WC
LAV
EFD
J
R
L
I
P
UR
SH
M
N
T
FD
E
D
C
B
A

OHIO PLUMBING CODE
DRAIN & VENTING SECTIONS

Presented By

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