Ohio Board of Building Standards
Building on the Code Education Series

Ohio Plumbing Code Drain & Venting Sections Pt 2
Fixture Vents & Individual Vents and Common Venting
Stack Vents, Vent Stacks, Relief Vents & Offsets
Vent Pipe Sizing
Single Stack Vent Systems

April 15, 2016

Presentation Handout
INTRODUCTIONS

• Frank A. Brykalski, Jr.
  □ OAPI NW Ohio Trustee
  □ DOC Plumbing Inspector KOO452
  □ BBS Residential Plumbing Inspector BBS 178
  □ BBS Non-Residential Plumbing 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
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?

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• Type of Inspections
  — Residential? Commercial? Design Approvals?
Outcomes/Objectives of this Session

• Identify the proper installation of the drain and vent section per each OPC Section – 901, 903, 905, 906, 907, 908, 914, 915, 916, and 920.
• 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?
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.
Section 906
FIXTURE VENTS

906.1 Distance of trap from vent. Each fixture trap shall have a protecting vent located so that the slope and the developed length in the fixture from the trap weir to the vent fitting is within the requirements set forth in Table 906.1

*Exception: The developed length of the fixture drain from the trap weir to the vent fitting for self-siphoning fixtures such as water closets, shall not be limited in individual vents, common vents, and wet vent systems only.*

<table>
<thead>
<tr>
<th>SIZE OF TRAP (inches)</th>
<th>SLOPE (inches per foot)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1 ¼”</td>
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<tr>
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<td>1/8”</td>
<td>12’</td>
</tr>
<tr>
<td>4”</td>
<td>1/8”</td>
<td>16’</td>
</tr>
</tbody>
</table>
906.3 – Crown Vent

• Crown Vent – A vent **SHALL NOT** be installed within 2 pipe diameters of the trap weir.

<table>
<thead>
<tr>
<th>TRAP SIZE</th>
<th>MIN DISTANCE TRAP TO VENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ¼”</td>
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</tr>
<tr>
<td>1 ½”</td>
<td>3”</td>
</tr>
<tr>
<td>2”</td>
<td>4”</td>
</tr>
<tr>
<td>3”</td>
<td>5”</td>
</tr>
</tbody>
</table>

VENT OPENING WOULD CLOG RESULTING IN AN UNVENTED TRAP

ORIGIONAL CROWN VENTING METHOD

2 PIPE DIAMETERS MINIMUM BEFORE VENT CONNECTION

CROWN VENTING

NOT LESS THAN TWICE THE DIAMETER OF THE TRAP

CROWN VENTING
906.3 – Crown Vent

VENT OPENING WOULD CLOG RESULTING IN AN UNVENTED TRAP

ORIGINAL CROWN VENTING METHOD  2 PIPE DIAMETERS MINIMUM BEFORE VENT CONNECTION

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<td>2”</td>
<td>4”</td>
</tr>
<tr>
<td>3”</td>
<td>5”</td>
</tr>
</tbody>
</table>

906.3 – Crown Vent

NOT LESS THAN TWICE THE DIAMETER OF THE TRAP
REMEMBER!!
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).

REMEMBER!!
Every trap and trapped fixture shall be vented in accordance with one of the venting methods specified in this chapter.
905.1 - Connection

- All individual, branch, and circuit vents shall:
  1. Connect to a vent stack, or
  2. Connect to a stack vent, or
  3. Extend to open air, or
  4. Connect to an air admittance valve. (A.S.S.E. 1050 or 1051)

#1. Connect to a vent stack.

#2. Connect to a stack vent.
#3. Extend to the open air.

#4. Connect to an air admittance valve. (A.S.S.E. 1051)

Section 905.2 GRADE
Section 905.3
VENT CONNECTED TO DRAINAGE SYSTEM
Section 905.3
VERTICAL RISE OF VENT
**Improperly Connected Vent Serving a Drain**

If drain is blocked, the fixture will drain through the vent stack.

**Properly Connected Vent Serving a Drain**

If drain is blocked, the fixture will overflow.

MOP SINK

FLOOD LEVEL RIM

VENT STACK

WASTE STACK

6" MIN

Orientation to the Ohio Plumbing Code
906.2
VENTING OF FIXTURE DRAINS

The total fall in a fixture drain due to pipe slope shall not exceed the diameter of the fixture drain, nor shall the vent connection to a fixture drain, except water closets, be below the weir of the trap.
The open vent at point A should not be lower than point B when a straight level line is drawn between the two points.

THE TRAP WEIR (2) MUST BE PLACED BELOW THE HIGHEST OPENING TO THE VENT (1)
LONG-PATTERN FITTING NOT ACCEPTABLE. THE TRAP WEIR (A) RISES ABOVE THE VENT INLET (B) WHICH INCREASES THE POSSIBILITY OF SELF-SIPHONAGE.

Non-Compliant vent, vent connection below weir of trap could self-siphon but, Compliant with Table 706.3 – Must Comply to both

Compliant vent, vent connection below weir of trap for water closets only and Code Section 706.3 - Exception

Note – Table 706.3 is for drainage fittings and not venting fittings
VENTING OF FIXTURE DRAINS

906.2
Venting of Fixture Drains

WALL MOUNTED WATER CLOSET

WATER CLOSET CARRIER SYSTEM
2011 Ohio Plumbing Code Venting Methods

907 - INDIVIDUAL VENT
908 - COMMON VENT
909 - WET VENTING
910 - WASTE STACK VENT
911 - CIRCUIT VENTING
912 - COMBINATION DRAIN & VENT
913 - ISLAND FIXTURE VENTS
920 – SINGLE STACK VENT SYSTEM*

* Added Jan. 1st 2016

SECTION 907
INDIVIDUAL VENT

An individual vent is a vent for a single fixture.
907.1

**Individual Vent**

- An *individual vent* is a vent for a single fixture.

- Each fixture trap and trap is allowed to be provided with an individual vent.

- The *individual vent* shall connect to the fixture drain of the trap or the trapped fixture being vented.

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907.1

- Each trap and trapped fixture is permitted to be provided with an individual vent.
- The individual vent *shall* connect to the fixture drain of the trap or trapped fixture being vented.
- *Shall* comply to ALL of section 905.
- *(Vent Connections and Grade)*
- *Shall* comply to ALL of section 906.
- *(Fixture Vents)*
- *Shall* comply to section 706.3.
- *(Fittings for Change of Direction)*
POOR BUT ACCEPTABLE

BETTER

BEST

INDIVIDUAL VENT

907.1

Individual Vent
Sizing of Drain and Individual Vent

- Shall comply to ALL of section 905 Vent Connections and Grades
- Shall comply to section 706.3 Fittings for Change of Direction
- Shall comply to ALL of section 906 Fixture Vents
- Shall comply with section 709.1 or 709.2 Values for Fixtures
  Fixtures not listed in Table 709.1
- Shall comply with section 916.2 and 916.3 Vents other than Stack Vents and Vent Stacks

Developed Length

Check for: 905, 706.3, 906, 709.1 or 709.2, 916.2 and 916.3

ALL FIXTURES ON SAME FLOOR LEVEL!
TABLE 906.1
MAXIMUM DISTANCE OF FIXTURE TRAP FROM VENT

<table>
<thead>
<tr>
<th>SIZE OF TRAP (inches)</th>
<th>SLOPE (inches per foot)</th>
<th>DISTANCE FROM TRAP (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ¼”</td>
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<tr>
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<tr>
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<td>1/8”</td>
<td>12’</td>
</tr>
<tr>
<td>4”</td>
<td>1/8”</td>
<td>16’</td>
</tr>
</tbody>
</table>
An common vent is a vent for two fixtures on the same floor level.

908.1 Common Vent

- Any two traps or trapped fixtures can be vented by a common vent.
- Maximum of any two fixture on the same floor level.
- The upper fixture can not be a water closet.
- 908.2 at the same level, means using a double sanitary tee or sanitary cross on the vertical.
- 908.3 fixtures at different levels, means stacking two tees on the vertical.
908.1 Common Vent

- If a common vent is used on a horizontal fitting, the fitting shall be a double pattern fitting.
- Crosses or sanitary tee’s shall not be permitted on a horizontal pipe.
- Remember, table 906.1 trap to vent distance.
- Table 908.3, shows allowable dfu’s for common vent between the vent for lower fixture and drain for upper fixture.

<table>
<thead>
<tr>
<th>SIZE OF TRAP (inches)</th>
<th>SLOPE (inches per foot)</th>
<th>DISTANCE FROM TRAP (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ¼’</td>
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<td>5’</td>
</tr>
<tr>
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<td>1/4”</td>
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</tr>
<tr>
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<td>16’</td>
</tr>
</tbody>
</table>
**908 Common Vent**

- SK
- LAV
- WC
- CO

**908.1 Common Vent**

- WC
- LAV
- WC

LESS THAN 18"

18” MIN

18” MIN
908 Common Vent

### TABLE 908.3
Common Vent Sizing

<table>
<thead>
<tr>
<th>PIPE SIZE (Inches)</th>
<th>MAXIMUM DISCHARGE FROM UPPER FIXTURE DRAIN (dfu’s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ½”</td>
<td>1</td>
</tr>
<tr>
<td>2”</td>
<td>4</td>
</tr>
<tr>
<td>2 ½” to 3”</td>
<td>6</td>
</tr>
</tbody>
</table>
908.1 Common Vent

908.2 CONNECTION AT SAME LEVEL
908.2 CONNECTION AT SAME LEVEL

Connection at the same level:

Where the fixture drains being common vented connect at the same level, the vent connection shall be at the interconnection of the fixture drains or downstream of the interconnection.

*Common vent on the horizontal shall be a double pattern fitting.*
908.2
Connection at the same level:

706.3
Double Pattern Fitting
Twin 90 (2” and smaller)
Double WYE
Double WYE and 1/8 Bend

908.2
CONNECTION AT SAME LEVEL
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CONNECTION AT SAME LEVEL
Check for: 905, 706.3, 906, 709.1 or 709.2, 916.2 and 916.3

Check for: 905, 706.3, 906, 709.1 or 709.2, 916.2 and 916.3
Check for: 905, 706.3, 906, 709.1 or 709.2, 916.2 and 916.3

**URINAL = 1 GALLON PER FLUSH!**

**ALL FIXTURES ON SAME FLOOR LEVEL!**

**COMPLIANT**

**NONCOMPLIANT**

**CODE SECTION**
SECTION 903
OUTDOOR VENT EXTENSION
• **903.1 Required vent extension.** The vent system serving each building drain shall have at least one vent pipe that extends to the outdoors *through and above the roof.*
Vent Terminal

ROOF

12” min.

ROOF

12” min.

VENT

7’ min.

ROOF SUN DECK

Orientation to the Ohio Plumbing Code
STACK VENT

The extension of a soil or waste stack above the highest horizontal drain connected to the stack.
• **903.1.1 Installation.** The required vent shall be a dry vent that connects to the building drain or an extension of a drain that connects to the building drain.
A vertical vent pipe installed primarily for the purpose of providing circulation of air to and from any part of the drainage system.
VENT STACK

• **903.2 Vent stack required.** A vent stack shall be required for every drainage stack that has five branch intervals or more.

BRANCH INTERVAL

*A branch interval is the distance between two horizontal branches that connects to a stack.*
**VENT STACK**

**903.4 Vent connection at base.** Every vent stack shall connect to the base of the drainage stack. The vent stack shall connect at or below the lowest horizontal branch. Where the vent stack connects to the building drain, the connection shall be located downstream of the drainage stack and within a distance of 10 times the diameter of the drainage stack.
STACK VENT

- **903.1.2 Size.** The required vent shall be sized in accordance with Section 916.1 based on the required size of the building drain.
SECTION 916.1
SIZE OF STACK VENTS 
AND 
VENT STACKS

<table>
<thead>
<tr>
<th>DIAMETER OF INLET (IN)</th>
<th>TOTAL FIXTURE UNITS SERVED (UNIT)</th>
<th>MAXIMUM DEVELOPED LENGTH OF STACK (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4</td>
<td>2</td>
<td>30 150</td>
</tr>
<tr>
<td>1 1/2</td>
<td>3</td>
<td>20 100</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>15 75</td>
</tr>
<tr>
<td>2 1/2</td>
<td>5</td>
<td>10 50</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>5 25</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>2 10</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>1 1</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
<td>1 1</td>
</tr>
<tr>
<td>8</td>
<td>33</td>
<td>1 1</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>1 1</td>
</tr>
<tr>
<td>12</td>
<td>80</td>
<td>1 1</td>
</tr>
</tbody>
</table>

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Per 39: 1 inch = 25.4 mm, 1 foot = 304.8 mm
4. The developed lengths should be measured from the waste connection to the open air.
916.1 Size of stack vents and vent stacks. The minimum required diameter of stack vents and vent stacks shall be determined from the developed length and the total of drainage fixture units connected thereto in accordance with Table 916.1, but in no case shall the diameter be less than one-half the diameter of the drain served or less than 1¼” (32 mm).
SECTION 916.2
VENTS OTHER THAN STACK VENTS AND VENT STACKS
916.2 Vents other than stack vents or vent stacks.
The diameter of individual vents, branch vents, circuit vents and relief vents shall be at least one-half the required diameter of the drain served. The required size of the drain shall be determined in accordance with Table 710.1(2). Vent pipes shall not be less than 1 ¼ inches in diameter.

*Vents exceeding 40 feet in developed length shall be increased by one nominal pipe size for the entire developed length of the vent pipe.*

Relief vents for soil and waste stacks in buildings having more than 10 branch intervals shall be sized in accordance with Section 914.2.

916.3 Developed length.
The developed length of individual, branch, circuit and relief vents shall be measured from the farthest point of vent connection to the drainage system to the point of connection to the vent stack, stack vent or termination outside of the building.
A-C = Stack Vent
A-B = 17'
B-C = 6'
B-D = 21'
D-E = 14'
E-F = 8'
D-G = 29'
G-H = 8'
G-I = 14'
I-J = 8'

Size DWV to OPC minimum sizes
SECTION 914
RELIEF VENTS
STACKS MORE THAN 10 BRANCH INTERVALS
914.1 **Where required.** Soil and waste stacks in buildings having more than 10 branch intervals shall be provided with a relief vent at each tenth interval installed, beginning with the top floor.

914.2 **Size and connection.** The size of the relief vent shall be equal to the size of the vent stack to which it connects. The lower end of each relief vent shall connect to the soil or waste stack through a wye below the horizontal branch serving the floor, and the upper end shall connect to the vent stack through a wye not less than 3 feet (914 mm) above the floor.
SECTION 915 VENTS FOR STACK OFFSETS
STACK

A vertical pipe that extends one story.

STORY

The space between two adjacent floors or between a floor and the roof of a building. Typically a story is 3.0 to 3.5 meters high (about 10 to 20 feet).
A branch interval is the distance between two horizontal branches that connects to a stack.
915.1 Vent for horizontal offset of drainage stack. Horizontal offsets of drainage stacks shall be vented where five or more branch intervals are located above the offset. The offset shall be vented by venting the upper section of the drainage stack and the lower section of the drainage stack.

915.2 Upper section. The upper section of the drainage stack shall be vented as a separate stack with a vent stack connection installed in accordance with Section 903.4. The offset shall be considered the base of the stack.
**SECTION 915.2**

- 710.1(2) Horizontal Branches
- 2’ Min. No Connections
- Horizontal Branches Below Offset

**916.1 Stack Vent**

**915.2 Upper Section Vent Stack**

**710.1.1 Horizontal Stack Offset**

- 2’ Min. No Connections
- Offset Venting Required

**710.1.1 Building Drain**

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**915.3 Lower section.** The lower section of the drainage stack shall be vented by a yoke vent connecting between the offset and the next lower horizontal branch. The yoke vent connection shall be permitted to be a vertical extension of the drainage stack. The size of the yoke vent and connection shall be a minimum of the size required for the vent stack of the drainage stack.
SECTION 920
SINGLE STACK VENT SYSTEM
SECTION 920
SINGLE STACK VENT SYSTEM

THE SINGLE STACK VENTING SYSTEM HAS BEEN AROUND FOR A LONG TIME, COMMONLY REFERED TO AS THE “PHILADELPHIA SINGLE STACK SYSTEM”
The theory behind this system, is to **oversize** the pipes to allow for adequate air flow to vent the system.
920.1
Where permitted.

A drainage stack shall serve as a single stack vent system where sized and installed in accordance with Sections 920.2 through 920.9. The drainage stack and branch piping shall be the vents for the drainage system.

_The drainage stack shall have a stack vent._

The Drainage Stack shall have a Stack Vent equal in size to the Waste Stack. This Stack Vent shall terminate to the outdoors.
Drainage stacks shall be sized in accordance with Table 920.2. Stacks **shall be uniformly sized** based on the total connected drainage fixture unit load. **The stack vent shall be the same size as the drainage stack.** A 3-inch stack shall serve not more than two water closets.
Stacks shall be uniformly sized and the stack vent shall be same size as the waste stack.

TABLE 920.2 SINGLE STACK SIZE

<table>
<thead>
<tr>
<th>STACK SIZE (inches)</th>
<th>MAXIMUM CONNECTED DRAINAGE FIXTURE UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stacks less than 75 feet in height</td>
</tr>
<tr>
<td></td>
<td>Stacks 75 feet to less than 160 feet in height</td>
</tr>
<tr>
<td></td>
<td>Stacks 160 feet and greater in height</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>225</td>
</tr>
<tr>
<td>5</td>
<td>480</td>
</tr>
<tr>
<td>6</td>
<td>1,015</td>
</tr>
<tr>
<td>8</td>
<td>2,320</td>
</tr>
<tr>
<td>10</td>
<td>4,500</td>
</tr>
<tr>
<td>12</td>
<td>8,100</td>
</tr>
<tr>
<td>15</td>
<td>13,600</td>
</tr>
</tbody>
</table>

NP = NOT POSSIBLE or NOT PERMITTED
Comparison between the Single Stack System and the Waste Stack System DFU Loads

### Table 920.2 Single Stack Size

<table>
<thead>
<tr>
<th>Stack Size (inches)</th>
<th>MAXIMUM CONNECTED DRAINAGE FIXTURE UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stacks less than 75 feet in height</td>
</tr>
<tr>
<td></td>
<td>Stacks 75 feet to less than 160 feet in height</td>
</tr>
<tr>
<td></td>
<td>Stacks 160 feet and greater in height</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>226</td>
</tr>
<tr>
<td>5</td>
<td>480</td>
</tr>
<tr>
<td>6</td>
<td>1,015</td>
</tr>
<tr>
<td>8</td>
<td>2,320</td>
</tr>
<tr>
<td>10</td>
<td>4,900</td>
</tr>
<tr>
<td>12</td>
<td>8,100</td>
</tr>
<tr>
<td>15</td>
<td>13,600</td>
</tr>
</tbody>
</table>

NP = NOT POSSIBLE or NOT PERMITTED

### Table 910.4 Waste Stack Vent Size

<table>
<thead>
<tr>
<th>Stack Size (inches)</th>
<th>MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total discharge into one branch interval</td>
</tr>
<tr>
<td></td>
<td>Total discharge for stack</td>
</tr>
<tr>
<td>1 1/2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2 1/2</td>
<td>No limit</td>
</tr>
<tr>
<td>3</td>
<td>No limit</td>
</tr>
<tr>
<td>4</td>
<td>No limit</td>
</tr>
<tr>
<td>5</td>
<td>No limit</td>
</tr>
<tr>
<td>6</td>
<td>No limit</td>
</tr>
</tbody>
</table>
910 Waste Stack Vent, the height is unlimited, but shall NOT receive the discharge of water closets and urinals.

920 Single Stack System has Limitations on Height But can receive all types of plumbing fixtures.
920.3 Branch Size.

Horizontal branches connecting to a single stack vent system shall be sized in accordance with Table 710.1(2).

Not more than one water closet shall discharge into a 3” horizontal branch at a point within a developed length of 18 inches measured horizontally from the stack. Where a water closet is within 18 inches measured horizontally from the stack and not more than one fixture with a drain size of not more than 1 ½” connects to a 3” horizontal branch, the branch drain connection to the stack shall be made with a sanitary tee.

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**TABLE 710.1(2) HORIZONTAL Fixture BRANCHES AND STACKS**

<table>
<thead>
<tr>
<th>DIAMETER OF PIPE (Inches)</th>
<th>MAXIMUM NUMBER OF DRAINAGE Fixture UNITS (ft³)</th>
<th>Stacks³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total for horizontal branch</td>
<td>Total discharge into one branch interval</td>
</tr>
<tr>
<td>1 1/2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2 1/2</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
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<td>20</td>
</tr>
<tr>
<td>4</td>
<td>160</td>
<td>90</td>
</tr>
<tr>
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<td>6</td>
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<tr>
<td>10</td>
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<tr>
<td>12</td>
<td>3,900</td>
<td>1,500</td>
</tr>
<tr>
<td>15</td>
<td>7,000</td>
<td>Note c</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

a. Does not include branches of the building drain. Refer to Table 710.1(3).³

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 permitted to be reduced in size. Stack diameters shall not be reduced to less than one-half of the diameter of the largest stack size required.

c. Sizing based on design criteria.
920.3 Branch Size
Horizontal branches connecting to a single stack vent system shall be sized in accordance with Table 710.1(2).
4/11/2016

**TABLE 710.1(2)**

HORIZONTAL FIXTURE BRANCHES AND STACKS

<table>
<thead>
<tr>
<th>Diameter of Pipe (inches)</th>
<th>Total for horizontal branch</th>
<th>Total discharge into one branch interval</th>
<th>Total for stack of three branch intervals or less</th>
<th>Total for stack greater than three branch intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(\frac{1}{2})</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>6</td>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>2(\frac{1}{2})</td>
<td>12</td>
<td>9</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>20</td>
<td>48</td>
<td>72</td>
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<tr>
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<tr>
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<td>360</td>
<td>200</td>
<td>540</td>
<td>1,100</td>
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<tr>
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<td>620</td>
<td>350</td>
<td>960</td>
<td>1,900</td>
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<tr>
<td>8</td>
<td>1,400</td>
<td>600</td>
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<td>2,500</td>
<td>1,000</td>
<td>3,800</td>
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<tr>
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<td>1,500</td>
<td>6,000</td>
<td>8,400</td>
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<tr>
<td>15</td>
<td>7,000</td>
<td>Note c</td>
<td>Note c</td>
<td>Note c</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

a. Does not include branches of the building drain. Refer to Table 710.1(1).*

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 permitted to be reduced in size. Stack diameters shall not be reduced to less than one-half of the diameter of the largest stack size required.

c. Sizing load based on design criteria.

---

**920.3 Branch Size.**

**Not more than one water closet shall discharge into a 3-inch horizontal branch at a point within a developed length of 18 inches measured horizontally from the stack.**
Horizontal branches connecting to a single stack vent system shall be sized in accordance with Table 710.1(2).

Not more than one water closet shall discharge into a 3” horizontal branch at a point within a developed length of 18” measured horizontally from the stack.

Where a water closet is within 18” measured horizontally from the stack and not more than one fixture with a drain size of not more than 1 ½” connects to a 3” horizontal branch, the branch drain connection to the stack shall be made with a sanitary tee.
Horizontal branches connecting to a single stack vent system shall be sized in accordance with Table 710.1(2).

Not more than one water closet shall discharge into a 3” horizontal branch at a point within a developed length of 18” measured horizontally from the stack.

Where a water closet is within 18” measured horizontally from the stack and not more than one fixture with a drain size of not more than 1 ½” connects to a 3” horizontal branch, the branch drain connection to the stack shall be made with a sanitary tee.
920.4 Length of horizontal branches.

The length of horizontal branches shall conform to the requirements of Sections 920.4.1 through 920.4.3.
920.4.1 Water closet connection.

Water closet connections shall be not greater than 4 feet in developed length measured horizontally from the stack.
920.4.1 Water Closet Connection.

Water closet connections shall be not greater than 4 feet in developed length measured horizontally from the stack.

Exception: Where the connection is made with a sanitary tee, the maximum developed length shall be 8 feet.
920.4.1 Water Closet Connection.

Water closet connections shall be not greater than 4 feet in developed length measured horizontally from the stack.

Exception: Where the connection is made with a sanitary tee, the maximum developed length shall be 8 feet.
920.4.2 Fixture connections.

Fixtures other than water closets shall be located not greater than 12 feet in developed length, measured horizontally from the stack.
920.5 Minimum vertical piping size from fixture.

The vertical portion of piping in a fixture drain to a horizontal branch shall be 2 inches.
The minimum size of the vertical portion of piping for a water-supplied urinal or standpipe shall be 3 inches. **The maximum vertical drop shall be 4 feet.**
Fixture drains that are not increased in size, or have a vertical drop in excess of 4 feet, shall be individually vented.

Distance in Developed Length Measured Horizontally from the Stack (NO VERTICAL)
920.5 Minimum vertical piping size from fixture.

The vertical portion of piping in a fixture drain to a horizontal branch shall be 2 inches. The minimum size of the vertical portion of piping for a water-supplied urinal or standpipe shall be 3 inches. The maximum vertical drop shall be 4 feet. Fixture drains that are not increased in size, or have a vertical drop in excess of 4 feet, shall be individually vented.

Distance in Developed Length Measured Horizontally from the Stack (NO VERTICAL)
920.5 Minimum vertical piping size from fixture.

The vertical portion of piping in a fixture drain to a horizontal branch shall be 2 inches.
The minimum size of the vertical portion of piping for a water-supplied urinal or standpipe shall be 3 inches. **The maximum vertical drop shall be 4 feet.**
Fixture drains that are not increased in size, or have a vertical drop in excess of 4 feet, **shall be individually vented.**

![Diagram showing vertical piping and venting requirements](image-url)
920.6 Additional venting required.

Additional venting shall be provided where more than one water closet discharges to a horizontal branch and **where the distance from a fixture trap to the stack exceeds the limits in Section 920.4.** Where additional venting is required, the fixture(s) shall be vented by individual vents, common vents, wet vents, circuit vents, or a combination waste and vent pipe. The dry vent extensions for the additional venting shall connect to a branch vent, vent stack, stack vent, or shall terminate outdoors.
920.6 Additional venting required.
Additional venting shall be provided where more than one water closet discharges to a horizontal branch and **where the distance from a fixture trap to the stack exceeds the limits in Section 920.4.** Where additional venting is required, the fixture(s) shall be vented by individual vents, common vents, wet vents, circuit vents, or a combination waste and vent pipe. The dry vent extensions for the additional venting shall connect to a branch vent, vent stack, stack vent, or shall terminate outdoors.

920.4.1 Water closet connection.
Water closet connections shall be not greater than 4 feet (8’ by Exception)

920.4.2 Fixture connections.
Fixtures other than water closets shall be located not greater than 12 feet

920.5 Minimum vertical piping size from fixture.
(The maximum vertical drop shall be 4 feet)
**920.7 Stack Offsets.**
Where fixture drains are not connected below a horizontal offset in a stack, a horizontal offset shall not be required to be vented.
920.7 Stack offsets.
Where fixture drains are not connected below a horizontal offset in a stack, a horizontal offset shall not be required to be vented. Where horizontal branches or fixture drains are connected below a horizontal offset in a stack, the offset shall be vented in accordance with Section 915.
Fixture connections shall not be made to a stack within 2 feet above or below a horizontal offset.

915.1 Offset Venting Required
SECTION 915
VENTS FOR STACK OFFSETS

915.2 Upper section.
The upper section of the drainage stack shall be vented as a separate stack with a vent stack connection installed in accordance with Section 903.4. The offset shall be considered the base of the stack.

915.1 Offset Venting Required

710.1(2) Horizontal Branches

2' Min. No Connections

Horizontal Branches Below Offset

Stack 710.1.1 Building Drain
915.3 **Lower section.**
The lower section of the drainage stack shall be vented by a yoke vent connecting between the offset and the next lower horizontal branch. The yoke vent connection shall be permitted to be a vertical extension of the drainage stack. The size of the yoke vent and connection shall be a minimum of the size required for the vent stack of the drainage stack.
SECTION 920
SINGLE STACK VENT SYSTEM

920.8 Prohibited lower connections. Stacks greater than 2 branch intervals in height shall not receive the discharge of horizontal branches on the lower two floors. There shall be no connections to the stack between the lower two floors and a distance of not less than 10 pipe diameters downstream from the base of the single stack vented system.
920.8 Prohibited lower connections.
Stacks greater than 2 branch intervals in height shall not receive the discharge of horizontal branches on the lower two floors. **There shall be no connections to the stack between the lower two floors and a distance of not less than 10 pipe diameters downstream from the base of the single stack vented system.**
920.8 Prohibited lower connections.
Stacks greater than 2 branch intervals in height shall not receive the discharge of horizontal branches on the lower two floors. **There shall be no connections to the stack between the lower two floors and a distance of not less than 10 pipe diameters downstream from the base of the single stack vented system.**

920.9 Sizing Building Drains and Sewers

The building drain and building sewer receiving the discharge of a single stack vent system shall be sized in accordance with **Table 710.1(1).**
Ohio Plumbing Code
Drain & Venting Sections Part 2

Presented By
Instructors of the Ohio Association of Plumbing Inspectors
www.oapi.org

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