

2015 IPC CODE – CHAPTERS 8-9

SECTIONS 801-918.8

INDIRECT/SPECIAL WASTE

Changes to the 2012 Code are highlighted in yellow.

SECTION 801 - GENERAL

801.1 Scope.

This chapter shall govern matters concerning indirect waste piping and special wastes. This chapter shall further control matters concerning food-handling establishments, sterilizers, clear-water wastes, waste, swimming pools, methods of providing air breaks or air gaps, and neutralizing devices for corrosive wastes.

801.2 Protection.

Devices, appurtenances, appliances and apparatus intended to serve some special function, such as sterilization, distillation, processing, cooling, or storage of ice or foods, and that discharge to the drainage system, shall be provided with protection against backflow, flooding, fouling, contamination and stoppage of the drain.

SECTION 802 - INDIRECT WASTES

802.1 Where required.

Food-handling equipment, in other than dwelling units, clear-water waste, dishwashing machines and utensils, pots, pans and dishwashing sinks shall discharge through an indirect waste pipe as specified in Sections 802.1.1 through 802.1.8. Health-care related fixtures, devices and equipment shall discharge to the drainage system through an indirect waste pipe by means of an air gap in accordance with this chapter and Section 713.3. Fixtures not required by this section to be indirectly connected shall be directly connected to the plumbing system in accordance with Chapter 7.

802.1.1 Food handling.

Equipment and fixtures utilized for the storage, preparation and handling of food shall discharge through an indirect waste pipe by means of an air gap. Each well of a multiple-compartment sink shall discharge independently to a waste receptor.

802.1.2 Floor drains in food storage areas.

Floor drains located within walk-in refrigerators or freezers in food service and food establishments shall be indirectly connected to the sanitary drainage system by means of an air gap. Where a floor drain is located within an area subject to freezing, the waste line serving the floor drain shall not be trapped and shall indirectly discharge into a waste receptor located outside of the area subject to freezing.

Exception: *Where protected against backflow by a backwater valve, such floor drains shall be indirectly connected to the sanitary drainage system by means of an air break or an air gap.*

802.1.3 Potable clear-water waste.

Where devices and equipment, such as sterilizers and relief valves, discharge potable water to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air gap.

802.1.4 Swimming pools.

Where waste water from swimming pools, backwash from filters and water from pool deck drains discharge to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air gap.

802.1.5 Nonpotable clear-water waste.

Where devices and equipment such as process tanks, filters, drips and boilers discharge nonpotable water to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air break or an air gap.

802.1.6 Domestic dishwashing machines.

Domestic dishwashing machines shall discharge indirectly through an air gap or air break into a waste receptor in accordance with Section 802.2, or discharge into a **wye branch** fitting on the tailpiece of the kitchen sink or the dishwasher connection of a food waste **disposer**. The waste line of a domestic dishwashing machine discharging into a kitchen sink tailpiece or food waste **disposer** shall connect to a deck-mounted air gap or the waste line shall rise and be securely fastened to the underside of the sink rim or counter.

802.1.7 Commercial dishwashing machines.

The discharge from a commercial dishwashing machine shall be through an air gap or air break into a waste receptor in accordance with Section 802.2.

802.1.8 Food utensils, dishes, pots and pans sinks.

Sinks, in other than dwelling units, used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans or service ware used in the preparation, serving or eating of food shall discharge indirectly through an air gap or an air break to the drainage system.

802.2 Installation.

Indirect waste piping shall discharge through an air gap or air break into a waste receptor.

Waste receptors shall be trapped and vented and shall connect to the building drainage system.

Indirect waste piping that exceeds 30 inches (762 mm) in developed length measured horizontally, or 54 inches (1372 mm) in total developed length, shall be trapped.

Exception: *Where a waste receptor receives only clearwater waste and does not directly connect to a sanitary drainage system, the receptor shall not require a trap.*

802.2.1 Air gap.

The air gap between the indirect waste pipe and the flood level rim of the waste receptor shall be not less than twice the effective opening of the indirect waste pipe.

802.2.2 Air break.

An air break shall be provided between the indirect waste pipe and the trap seal of the waste receptor.

802.3 Waste receptors.

For other than hub drains that receive only clear-water waste and standpipes, a removable strainer or basket shall cover the outlet of waste receptors. Waste receptors shall not be installed in concealed spaces. Waste receptors shall not be installed in plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors. Ready access shall be provided to waste receptors.

802.3.1 Size of receptors.

A waste receptor shall be sized for the maximum discharge of all indirect waste pipes served by the receptor. Receptors shall be installed to prevent splashing or flooding.

802.3.2 Hub drains.

A hub drain shall be in the form of a hub or a pipe extending not less than 1 inch (25 mm) above a water-impervious floor.

802.3.3 Standpipes.

Standpipes shall be individually trapped. Standpipes shall extend not less than 18 inches (457 mm) but not greater than 42 inches (1066 mm) above the trap weir. Access shall be provided to standpipes and drains for rodding.

SECTION 803 - SPECIAL WASTES

803.1 Neutralizing device required for corrosive wastes.

Corrosive liquids, spent acids or other harmful chemicals that destroy or injure a drain, sewer, soil or waste pipe, or create noxious or toxic fumes or interfere with sewage treatment processes shall not be discharged into the plumbing system without being thoroughly diluted, neutralized or treated by passing through an approved dilution or neutralizing device. Such devices shall be automatically provided with a sufficient supply of diluting water or neutralizing medium so as to make the contents noninjurious before discharge into the drainage system. The nature of the corrosive or harmful waste and the method of its treatment or dilution shall be approved prior to installation.

803.2 System design.

A chemical drainage and vent system shall be designed and installed in accordance with this code. Chemical drainage and vent systems shall be completely separated from the sanitary systems. Chemical waste shall not discharge to a sanitary drainage system until such waste has been treated in accordance with Section 803.1.

SECTION 804 - MATERIALS, JOINTS AND CONNECTIONS

804.1 General.

The materials and methods utilized for the construction and installation of indirect waste pipes and systems shall comply with the applicable provisions of Chapter 7.

2015 IPC CODE - CHAPTER 9

VENTS

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 pressure differential of more than 1 inch of water column (249 Pa).

901.2.1 Venting required.

Traps and trapped fixtures shall be vented in accordance with one of the venting methods specified in this chapter.

901.3 Chemical waste vent systems.

The vent system for a chemical waste system shall be independent of the sanitary vent system and shall terminate separately through the roof to the outdoors or to an air admittance valve that complies with ASSE 1049. Air admittance valves for chemical waste systems shall be constructed of materials approved in accordance with Section 702.5 and shall be tested for chemical resistance in accordance with ASTM F 1412.

901.4 Use limitations.

The plumbing vent system shall not be utilized for purposes other than the venting of the plumbing system.

901.5 Tests.

The vent system shall be tested in accordance with Section 312.

901.6 Engineered systems.

Engineered venting systems shall conform to the provisions of Section 919.

SECTION 902 - MATERIALS

902.1 Vents.

The materials and methods utilized for the construction and installation of venting systems shall comply with the applicable provisions of Section 702.

902.2 Sheet copper.

Sheet copper for vent pipe flashings shall conform to ASTM B 152 and shall weigh not less than 8 ounces per square foot (2.5 kg/m²).

902.3 Sheet lead.

Sheet lead for vent pipe flashings shall weigh not less than 3 pounds per square foot (15 kg/m²) for field-constructed flashings and not less than 2 ½ pounds per square foot (12 kg/m²) for prefabricated flashings.

SECTION 903 - VENT TERMINALS

903.1 Roof extension.

Open vent pipes that extend through a roof shall be terminated not less than [NUMBER] inches (mm) above the roof. Where a roof is to be used for assembly or as a promenade, observation deck, sunbathing deck or similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof.

903.2 Frost closure.

Where the 97.5-percent value for outside design temperature is 0°F (-18°C) or less, vent extensions through a roof or wall shall be not less than 3 inches (76 mm) in diameter. Any increase in the size of the vent shall be made not less than 1 foot (305 mm) inside the thermal envelope of the building.

903.3 Flashings.

The juncture of each vent pipe with the roof line shall be made water tight by an approved flashing.

903.4 Prohibited use.

A vent terminal shall not be used for any purpose other than a vent terminal.

903.5 Location of vent terminal.

An open vent terminal from a drainage system shall not be located directly beneath any door, openable window, or other air intake opening of the building or of an adjacent building, and any such vent terminal shall not be within 10 feet (3048 mm) horizontally of such an opening unless it is 3 feet (914 mm) or more above the top of such opening.

903.6 Extension through the wall.

Vent terminals extending through the wall shall terminate at a point not less than 10 feet (3048 mm) from a lot line and not less than 10 feet (3048 mm) above average ground level. Vent terminals shall not terminate under the overhang of a structure with soffit vents. Side wall vent terminals shall be protected to prevent birds or rodents from entering or blocking the vent opening.

903.7 Extension outside a structure.

In climates where the 97.5 percent value for outside design temperature is less than 0°F (-18°C), vent pipes installed on the exterior of the structure shall be protected against freezing by insulation, heat or both.

SECTION 904 - OUTDOOR VENT EXTENSIONS**904.1 Required vent extension.**

The vent system serving each building drain shall have not less than one vent pipe that extends to the outdoors.

904.1.1 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. Such vent shall not be an island fixture vent as allowed by Section 916.

904.1.2 Size.

The required vent shall be sized in accordance with Section 906.2 based on the required size of the building drain.

904.2 Vent stack required.

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

Exception: *Drainage stacks installed in accordance with Section 913.*

904.3 Vent termination.

Vent stacks or stack vents shall terminate outdoors to the open air or to a stack-type air admittance valve in accordance with Section 918.

904.4 Vent connection at base.

Vent stacks 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.

904.5 Vent headers.

Stack vents and vent stacks connected into a common vent header at the top of the stacks and extending to the open air at one point shall be sized in accordance with the requirements of Section 906.1. The number of fixture units shall be the sum of all fixture units on all stacks connected thereto, and the developed length shall be the longest vent length from the intersection at the base of the most distant stack to the vent terminal in the open air, as a direct extension of one stack.

SECTION 905 - VENT CONNECTIONS AND GRADES

905.1 Connection.

Individual, branch and circuit vents shall connect to a vent stack, stack vent, air admittance valve or extend to the open air.

905.2 Grade.

Vent and branch vent pipes shall be so graded and connected as to drain back to the drainage pipe by gravity.

905.3 Vent connection to drainage system.

Every dry vent connecting to a horizontal drain shall connect above the centerline of the horizontal drain pipe.

905.4 Vertical rise of vent.

Every dry vent shall rise vertically to a point not less than 6 inches (152 mm) above the flood level rim of the highest trap or trapped fixture being vented.

Exception: *Vents for interceptors located outdoors.*

905.5 Height above fixtures.

A connection between a vent pipe and a vent stack or stack vent shall be made at not less than 6 inches (152 mm) above the flood level rim of the highest fixture served by the vent.

Horizontal vent pipes forming branch vents, relief vents or loop vents shall be located not less than 6 inches (152 mm) above the flood level rim of the highest fixture served.

905.6 Vent for future fixtures.

Where the drainage piping has been roughed-in for future fixtures, a rough-in connection for a vent shall be installed. The vent size shall be not less than one-half the diameter of the rough-in drain to be served. The vent rough-in shall connect to the vent system, or shall be vented by other means as provided for in this chapter. The connection shall be identified to indicate that it is a vent.

SECTION 906 - VENT PIPE SIZING

906.1 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 906.1, but in no case shall the diameter be less than one-half the diameter of the drain served or less than 1 ¼ inches (32mm).

TABLE 906.1

SIZE AND DEVELOPED LENGTH OF STACK VENTS AND VENT STACKS

DIAMETER OF SOIL OR WASTE STACK (inches)	TOTAL FIXTURE UNITS BEING VENTED (dfu)	MAXIMUM DEVELOPED LENGTH OF VENT (feet) ^a										
		DIAMETER OF VENT (inches)										
		1 / 4	1 / 2	2	1 / 2	3	4	5	6	8	10	12
1 / 4	2	30										
1 / 2	8	50	150	—	—	—	—	—	—	—	—	—
1 / 2	10	30	100									
2	12		75	200								
2	10	30	50	150								
1 / 2	42	26	30	100	300	—	—	—	—	—	—	—
3	10		42	150	360	1,040						
3	21	—	32	110	270	810	—	—	—	—	—	—
3	53		27	94	230	680						
3	102			86	210	620						
4	43	—	25	35	85	250	980	—	—	—	—	—
4	140			27	65	200	750					
4	320			23	55	170	640					
4	540	—	—		50	150	580	—	—	—	—	—
5	190			21	28	82	320	990				
5	490				21	63	250	760				
5	940	—	—	—	18	53	210	670	—	—	—	—
5	1,400				16	63	190	590				
6	500					33	130	400	1,000			
6	1,100	—	—	—	—	26	100	310	780	—	—	—
6	2,000					22	84	260	660			
6	2,900					20	77	240	600			
8	1,800	—	—	—	—		31	95	240	940	—	—
8	3,400						24	73	190	729		
8	5,600						20	62	160	610		
8	7,600	—	—	—	—	—	18	56	140	560		—
10	4,000							31	78	310	960	

DIAMETER OF SOIL OR WASTE STACK (inches)	TOTAL FIXTURE UNITS BEING VENTED (dfu)	MAXIMUM DEVELOPED LENGTH OF VENT (feet) ^a										
		DIAMETER OF VENT (inches)										
		1 / 4	1 / 2	2	1 2 / 2	3	4	5	6	8	10	12
10	7,200							24	60	240	740	
10	11,000	—	—	—	—	—	—	51	51	200	630	—
10	15,000							18	46	180	571	
12	7,300								31	120	380	940
12	13,000	—	—	—	—	—	—	—	24	94	300	720
12	20,000								20	79	250	610
12	26,000								18	72	230	500
15	15,000	—	—	—	—	—	—	—		40	130	310
15	25,000									31	96	240
15	38,000	—	—	—	—	—	—	—	—	26	81	200
15	50,000									24	74	180

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The developed length shall be measured from the vent connection to the open air.

906.2 Vents other than stack vents or vent stacks.

The diameter of individual vents, branch vents, circuit vents and relief vents shall be not less than 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 (32 mm) in diameter. Vents exceeding 40 feet (12 192 mm) 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 908.2.

906.3 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.

906.4 Multiple branch vents.

Where multiple branch vents are connected to a common branch vent, the common branch vent shall be sized in accordance with this section based on the size of the common horizontal drainage branch that is or would be required to serve the total drainage fixture unit load being vented.

906.5 Sump vents.

Sump vent sizes shall be determined in accordance with Sections 906.5.1 and 906.5.2.

906.5.1 Sewage pumps and sewage ejectors other than pneumatic.

Drainage piping below sewer level shall be vented in the same manner as that of a gravity system. Building sump vent sizes for sumps with sewage pumps or sewage ejectors, other than pneumatic, shall be determined in accordance with Table 906.5.1.

**TABLE 906.5.1
SIZE AND LENGTH OF SUMP VENTS**

DISCHARGE CAPACITY OF PUMP (gpm)	MAXIMUM DEVELOPED LENGTH OF VENT (feet) ^a					
	Diameter of vent (inches)					
	1 / 4	1 / 2	2	2 / 2	3	4
10	No limit ^b	No limit	No limit	No limit	No limit	No limit
20	270	No limit	No limit	No limit	No limit	No limit
40	72	160	No limit	No limit	No limit	No limit
60	31	75	270	No limit	No limit	No limit
80	16	41	150	380	No limit	No limit
100	10 ^c	25	97	250	No limit	No limit
150	Not permitted	10 ^c	44	110	370	No limit
200	Not permitted	Not permitted	20	60	210	No limit
250	Not permitted	Not permitted	10	36	132	No limit
300	Not permitted	Not permitted	10 ^c	22	88	380
400	Not permitted	Not permitted	Not permitted	10 ^c	44	210
500	Not permitted	Not permitted	Not permitted	Not permitted	24	130

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

- a. Developed length plus an appropriate allowance for entrance losses and friction due to fittings, changes in direction and diameter. Suggested allowances shall be obtained from NBS Monograph 31 or other approved sources. An allowance of 50 percent of the developed length shall be assumed if a more precise value is not available.
- b. Actual values greater than 500 feet.
- c. Less than 10 feet.

906.5.2 Pneumatic sewage ejectors.

The air pressure relief pipe from a pneumatic sewage ejector shall be connected to an independent vent stack terminating as required for vent extensions through the roof. The relief pipe shall be sized to relieve air pressure inside the ejector to atmospheric pressure, but shall be not less than inches 1 ¼ inches (32 mm) in size.

SECTION 907 - VENTS FOR STACK OFFSETS

907.1 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.

907.2 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 904.4. The offset shall be considered the base of the stack.

907.3 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 908 - RELIEF VENTS-STACKS OF MORE THAN 10 BRANCH INTERVALS

908.1 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.

908.2 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 909 - FIXTURE VENTS

909.1 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 drain from the trap weir to the vent fitting are within the requirements set forth in Table 909.1.

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.*

TABLE 909.1

MAXIMUM DISTANCE OF FIXTURE TRAP FROM VENT

SIZE OF TRAP (inches)	SLOPE (inch per foot)	DISTANCE FROM TRAP (feet)
1 / 4	1 / 4	5
1 / 2	1 / 4	6
2	1 / 4	8
3	1 / 8	12
4	1 / 8	16

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 inch per foot = 83.3 mm/m.

909.2 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 for water closets, be below the weir of the trap.

909.3 Crown vent.

A vent shall not be installed within two pipe diameters of the trap weir.

SECTION 910 - INDIVIDUAL VENT

910.1 Individual vent permitted.

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.

SECTION 911 - COMMON VENT

911.1 Individual vent as common vent.

An individual vent is permitted to vent two traps or trapped fixtures as a common vent. The traps or trapped fixtures being common vented shall be located on the same floor level.

911.2 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.

911.3 Connection at different levels.

Where the fixture drains connect at different levels, the vent shall connect as a vertical extension of the vertical drain. The vertical drain pipe connecting the two fixture drains shall be considered the vent for

the lower fixture drain,

and shall be sized in

accordance with Table

911.3. The upper fixture

shall not be a water

closet.

**TABLE 911.3
COMMON VENT SIZES**

PIPE SIZE (inches)	MAXIMUM DISCHARGE FROM UPPER FIXTURE DRAIN (dfu)
1 1 / 2	1
2	4
1 2 / to 3 2	6

For SI: 1 inch = 25.4 mm.

SECTION 912 - WET VENTING

912.1 Horizontal wet vent permitted.

Any combination of fixtures within two bathroom groups located on the same floor level is permitted to be vented by a horizontal wet vent. The wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent along the direction of the flow in the drain pipe to the most downstream fixture drain connection to the horizontal branch drain. Each wet-vented fixture drain shall connect independently to the horizontal wet vent.

Only the fixtures within the bathroom groups shall connect to the wet-vented horizontal branch drain. Any additional fixtures shall discharge downstream of the horizontal wet vent.

912.1.1 Vertical wet vent permitted.

Any combination of fixtures within two bathroom groups located on the same floor level is permitted to be vented by a vertical wet vent. The vertical wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent down to the lowest fixture drain connection. Each wet-vented fixture shall connect independently to the vertical wet vent. Water closet drains shall connect at the same elevation. Other fixture drains shall connect above or at the same elevation as the water closet fixture drains. The dry-vent connection to the vertical wet vent shall be an individual or common vent serving one or two fixtures.

912.2 Dry vent connection.

The required dry-vent connection for wet-vented systems shall comply with Sections 912.2.1 and 912.2.2.

912.2.1 Horizontal wet vent.

The dry-vent connection for a horizontal wet-vent system shall be an individual vent or a common vent for any bathroom group fixture, except an emergency floor drain. Where the dry-vent connects to a water closet fixture drain, the drain shall connect horizontally to the horizontal wet-vent system. Not more than one wet-vented fixture drain shall discharge upstream of the dry-vented fixture drain connection.

912.2.2 Vertical wet vent.

The dry-vent connection for a vertical wet-vent system shall be an individual vent or common vent for the most upstream fixture drain.

912.3 Size.

The dry vent serving the wet vent shall be sized based on the largest required diameter of pipe within the wet-vent system

served by the dry vent. The wet

vent shall be of a size not less

than that specified in Table 912.3,

based on the fixture unit

discharge to the wet vent.

**TABLE 912.3
WET VENT SIZE**

WET VENT PIPE SIZE (inches)	DRAINAGE FIXTURE UNIT LOAD (dfu)
1	1
1 1/2	4
2	6
2 1/2	12
3	

For SI: 1 inch = 25.4 mm.

SECTION 913 - WASTE STACK VENT

913.1 Waste stack vent permitted.

A waste stack shall be considered a vent for all of the fixtures discharging to the stack where installed in accordance with the requirements of this section.

913.2 Stack installation.

The waste stack shall be vertical, and both horizontal and vertical offsets shall be prohibited between the lowest fixture drain connection and the highest fixture drain connection. Fixture drains shall connect separately to the waste stack. The stack shall not receive the discharge of water closets or urinals.

913.3 Stack vent.

A stackvent shall be provided for the waste stack. The size of the stackvent shall be not less than the size of the waste stack. Offsets shall be permitted in the stackvent, shall be located not less than 6 inches (152 mm) above the flood level of the highest fixture and shall be in accordance with Section 905.2. The stackvent shall be permitted to connect with other stackvents and vent stacks in accordance with Section 904.5.

913.4 Waste stack size.

The waste stack shall be sized based on the total discharge to the stack and the discharge within a branch interval in accordance with Table 913.4. The waste stack shall be the same size throughout its length.

**TABLE 913.4
WASTE STACK VENT SIZE**

STACK SIZE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)	
	Total discharge into one branch interval	Total discharge for stack
1 1 / 2	1	2
2	2	4
1 2 / 2	No limit	8
3	No limit	24
4	No limit	50
5	No limit	75
6	No limit	100

For SI: 1 inch = 25.4 mm.

SECTION 914 - CIRCUIT VENTING

914.1 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.

914.1.1 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 conform to the requirements of this section.

914.2 Vent connection.

The circuit vent connection shall be located between the two most upstream fixture drains. The vent shall connect to the horizontal branch and shall be installed in accordance with Section 905. The circuit vent pipe shall not receive the discharge of any soil or waste.

914.3 Slope and size of horizontal branch.

The slope of the vent section of the horizontal branch drain shall be not greater than one unit vertical in 12 units horizontal (8.3-percent slope). The entire length of the vent section of the horizontal branch drain shall be sized for the total drainage discharge to the branch.

914.3.1 Size of multiple circuit vent.

Each separate circuit-vented horizontal branch that is interconnected shall be sized independently in accordance with Section 914.3. 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.

914.4 Relief vent.

A 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.

914.4.1 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 in accordance with Section 905.

914.4.2 Fixture drain or branch.

The relief vent is permitted to be a fixture drain or fixture branch for fixtures located within the same branch interval as the circuit-vented horizontal branch. The maximum discharge to a relief vent shall be four fixture units.

914.5 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.

SECTION 915 - COMBINATION WASTE AND VENT SYSTEM

915.1 Type of fixtures.

A combination waste and vent system shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains. Combination waste and vent systems shall not receive the discharge from a food disposer or clinical sink.

915.2 Installation.

The only vertical pipe of a combination waste and vent system shall be the connection between the fixture drain and the horizontal combination waste and vent pipe. The vertical distance shall not exceed 8 feet (2438 mm).

915.2.1 Slope.

The slope of a horizontal combination waste and vent pipe shall not exceed one-half unit vertical in 12 units

horizontal (4-percent slope) and shall not be less than that indicated in Table 704.1.

915.2.2 Size and length.

The size be that indicated in Table 915.2.2 unlimited.

TABLE 915.2.2

SIZE OF COMBINATION WASTE AND VENT PIPE

DIAMETER PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)	
	Connecting to a horizontal branch or stack	Connecting to a building drain or building subdrain
2	3	4
1 1/2	6	26
3	12	31
4	20	50
5	160	250
6	360	575

For SI: 1 inch = 25.4 mm.

915.2.3 Connection.

The combination waste and vent system shall be provided with a dry vent connected at any point within the system or the system shall connect to a horizontal drain that serves vented fixtures located on the same floor. Combination waste and vent systems connecting to building drains receiving only the discharge from one or more stacks shall be provided with a dry vent. The vent connection to the combination waste and vent pipe shall extend vertically to a point not less than 6 inches (152 mm) above the flood level rim of the highest fixture being vented before offsetting horizontally.

915.2.4 Vent size.

The vent shall be sized for the total drainage fixture unit load in accordance with Section 906.2.

915.2.5 Fixture branch or drain.

The fixture branch or fixture drain shall connect to the combination waste and vent within a distance specified in Table 909.1. The combination waste and vent pipe shall be considered the vent for the fixture.

SECTION 916 - ISLAND FIXTURE VENTING

916.1 Limitation.

Island fixture venting shall not be permitted for fixtures other than sinks and lavatories. Residential kitchen sinks with a dishwasher waste connection, a food waste **disposer**, or both, in combination with the kitchen sink waste, shall be permitted to be vented in accordance with this section.

916.2 Vent connection.

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 point not less than 6 inches (152 mm) above the highest island fixture being vented before connecting to the outside vent terminal.

916.3 Vent installation below the fixture flood level rim.

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 906.2. 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.

SECTION 917 - SINGLE STACK VENT SYSTEM

917.1 Where permitted.

A drainage stack shall serve as a single stack vent system where sized and installed in accordance with Sections 917.2 through 917.9. The drainage stack and branch piping shall be the vents for the drainage system. The drainage stack shall have a stack vent.

917.2 Stack size.

Drainage stacks shall be sized in accordance with Table 917.2. 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

**TABLE 917.2
SINGLE STACK SIZE**

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

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

stack. A 3-inch (76 mm) stack shall serve not more than two water closets.

917.3 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-inch (76 mm) horizontal branch at a point within a developed length of 18 inches (457 mm) measured horizontally from the stack. Where a water closet is within 18 inches (457 mm) measured horizontally from the

stack and not more than one fixture with a drain size of not more than 1 ½ inches (38 mm) connects to a 3-inch (76 mm) horizontal branch, the branch drain connection to the stack shall be made with a sanitary tee.

917.4 Length of horizontal branches.

The length of horizontal branches shall conform to the requirements of Sections 917.4.1 through 917.4.3.

917.4.1 Water closet connection.

Water closet connections shall be not greater than 4 feet (1219 mm) 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 (2438 mm).*

917.4.2 Fixture connections.

Fixtures other than water closets shall be located not greater than 12 feet (3657 mm) in developed length, measured horizontally from the stack.

917.4.3 Vertical piping in branch.

The length of vertical piping in a fixture drain connecting to a horizontal branch shall not be considered in computing the fixture's distance in developed length measured horizontally from the stack.

917.5 Minimum vertical piping size from fixture.

The vertical portion of piping in a fixture drain to a horizontal branch shall be 2 inches (51 mm). The minimum size of the vertical portion of piping for a water-supplied urinal or standpipe shall be 3 inches (76 mm). The maximum vertical drop shall be 4 feet (1219 mm). Fixture drains that are not increased in size, or have a vertical drop in excess of 4 feet (1219 mm), shall be individually vented.

917.6 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 917.4. 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, air admittance valve, or shall terminate outdoors.

917.7 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 907. Fixture connections shall not be made to a stack within 2 feet (610 mm) above or below a horizontal offset.

917.8 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.

917.9 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).

SECTION 918 - AIR ADMITTANCE VALVES

918.1 General.

Vent systems utilizing air admittance valves shall comply with this section. Stack-type air admittance valves shall conform to ASSE 1050. Individual and branch type air admittance valves shall conform to ASSE 1051.

918.2 Installation.

The valves shall be installed in accordance with the requirements of this section and the manufacturer's instructions. Air admittance valves shall be installed after the DWV testing required by Section 312.2 or 312.3 has been performed.

918.3 Where permitted.

Individual, branch and circuit vents shall be permitted to terminate with a connection to an individual or branch-type air admittance valve in accordance with Section 918.3.1. Stack vents

and vent stacks shall be permitted to terminate to stack-type air admittance valves in accordance with Section 918.3.2.

918.3.1 Horizontal branches.

Individual and branch-type air admittance valves shall vent only fixtures that are on the same floor level and connect to a horizontal branch drain. Where the horizontal branch is located more than four branch intervals from the top of the stack, the horizontal branch shall be provided with a relief vent that shall connect to a vent stack or stack vent, or extend outdoors to the open air. The relief vent shall connect to the horizontal branch drain between the stack and the most downstream fixture drain connected to the horizontal branch drain. The relief vent shall be sized in accordance with Section 906.2 and installed in accordance with Section 905. The relief vent shall be permitted to serve as the vent for other fixtures.

918.3.2 Stack.

Stack-type air admittance valves shall be prohibited from serving as the vent terminal for vent stacks or stack vents that serve drainage stacks having more than six branch intervals.

918.4 Location.

Individual and branch-type air admittance valves shall be located a minimum of 4 inches (102 mm) above the horizontal branch drain or fixture drain being vented. Stack-type air admittance valves shall be located not less than 6 inches (152 mm) above the flood level rim of the highest fixture being vented. The air admittance valve shall be located within the maximum developed length permitted for the vent. The air admittance valve shall be installed not less than 6 inches (152 mm) above insulation materials.

918.5 Access and ventilation.

Access shall be provided to all air admittance valves. Such valves shall be installed in a location that allows air to enter the valve.

918.6 Size.

The air admittance valve shall be rated in accordance with the standard for the size of the vent to which the valve is connected.

918.7 Vent required.

Within each plumbing system, not less than one stack vent or vent stack shall extend outdoors to the open air.

918.8 Prohibited installations.

Air admittance valves shall not be installed in nonneutralized special waste systems as described in Chapter 8 except where such valves are in compliance with ASSE 1049, are constructed of materials approved in accordance with Section 702.5 and are tested for chemical resistance in accordance with ASTM F 1412. Air admittance valves shall not be located in spaces utilized as supply or return air plenums. Air admittance valves without an engineered design shall not be utilized to vent sumps or tanks of any type.