Introduction

Description

This seminar is intended to provide participants with specific topics from the 2009 International Plumbing Code (IPC®) and the 2009 International Residential Code (IRC®) as it relates to plumbing requirements. Topics include commercial kitchen installations, soap and chemical dispenser installations, ceiling height requirements over fixtures, air admittance valves, and the differences between the IPC and the IRC.

Goal

The goal of this seminar is for participants to reinforce their knowledge on specific topics in the IPC and IRC as it relates to plumbing.

Objectives

Upon completion of this seminar participants will be better able to:

- Explain the permit process and how it relates to plumbing inspections.
- Describe the components of a commercial kitchen installation.
- Explain acceptable soap and chemical dispenser installations.
- Discuss the difference between the 2009 IPC and the 2009 IRC.
- Describe the ceiling height requirements over fixtures.
- Explain the requirements for air admittance valves.

Contents

- New Hampshire updates
- Permits
- Commercial kitchen installations
- Soap and chemical dispenser installations
- IRC vs. IPC differences
- Ceiling height requirements over fixtures
- Air admittance valves

State of New Hampshire Department of Safety
Division of Fire Safety
Bureau of Building Safety & Construction

PLUMBING SAFETY & LICENSING SECTION

Effective July 1. 2010, the Plumbers' Licensing Board moved into the Department of Safety under the direction of the Fire Marshal's Office.

Mailing Address: Division of Fire Safety
Department of Safety
33 Hazen Drive
Concord, NH 03305

Physical Address: NH Division of Fire Safety
Incident Planning and Operations Center
110 Smokey Bear Blvd
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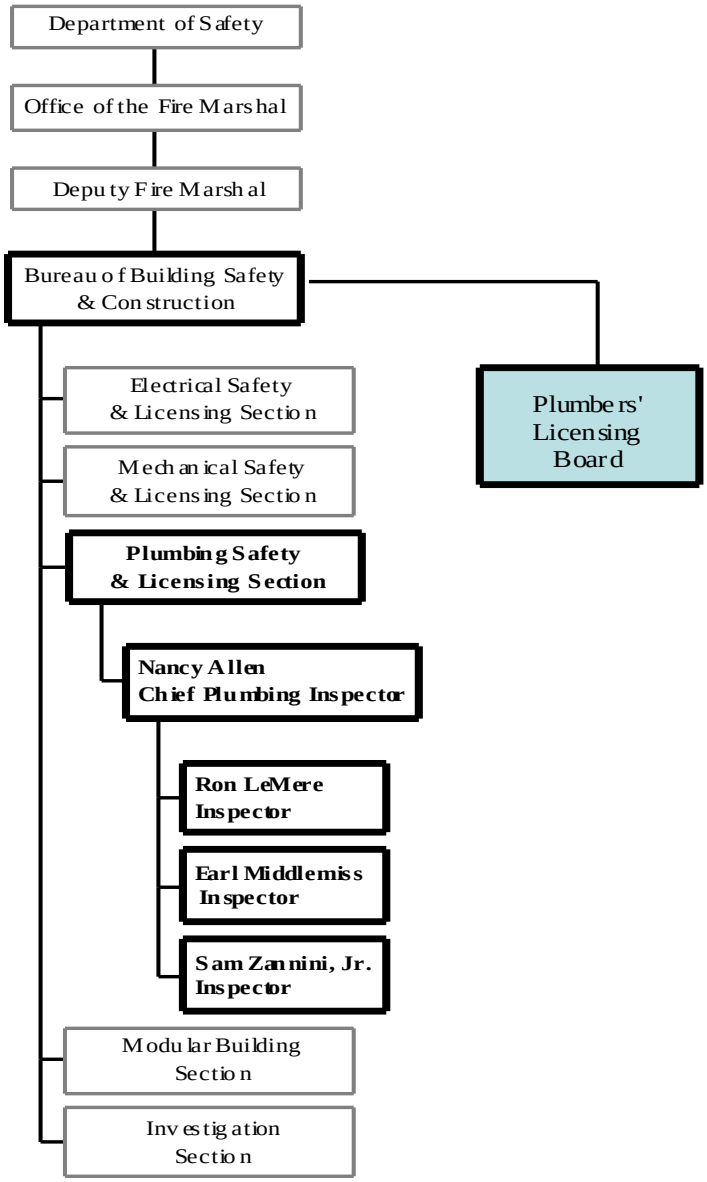
Richard Zannini, *Vice Chair*
Daniel Duckett, *Consumer*
Timothy Dupont, *Plumber*
Brian Thomas, *Consumer*

Go to www.nh.gov/safety/buildingcodereviewboard for complete set of amendments
2009 IPC Amendments, adopted, effective 4/1/2010

PLUMBING SAFETY & LICENSING



Go to www.nh.gov/safety/buildingcodereviewboard for complete set of amendments
2009 IPC Amendments, adopted, effective 4/1/2010

How to Become a Seminar Teacher?
Administrative Rule Plu 403.02

1. Be a NH licensed Master plumber for at least 2 consecutive years or a NH licensed Journeyman plumber for a least 5 consecutive years.
2. Notify the Plumbing Safety & Licensing Section if interested. You will be put on their mailing list to receive information.
3. Attend an annual training program provided by the Plumbing Safety & Licensing Section.
4. Interested licensees attending the annual training program receive 3 hours seminar credit.

Advertising Plumbing Services
Administrative Rule Plu 408.03

Plumbing License number shall be displayed when advertising.

1. Vehicle Advertising:
   - On all parts of the vehicle where the name of the master plumber is displayed.
   - The license number must be legible and at least 3" high.

2. Non-Vehicle Advertising:
   - TV
   - Radio
   - Newspapers
   - Internet
   - Movie theaters
   - Business Cards
   - Stationary

   Print Advertising: License number shall be at least 1/3 the size of the type used for the business name/licensed plumber.

   Auditory Advertising: License number shall be announced at least once during ad.

Disciplinary Action to Licensed Plumbers
Administrative Rule Plu 407

What is MISCONDUCT?

1. The practice of fraud or deceit in procuring or attempting to procure a license;

2. Conviction while licensed or certified of:
    a. A felony
    b. Any criminal offense involving injury to a victim or the risk of such injury
    c. Any criminal offense involving dishonesty

3. Any unprofessional conduct, or dishonorable conduct unworthy of, and affecting the practice of, plumbing or water treatment, including:
    a. Any violation of Plu 500;
    b. Code violations of the state building code;
    c. Any violation of a local code more stringent than the state building code;
    d. Allowing an unlicensed person or unregistered apprentice to work for the licensed plumber; and
    e. A licensee allowing an apprentice to work in violation of the apprentice law (RSA 278) and rules.

4. Negligent or willful acts performed in a manner inconsistent with the health or safety of persons under the care of the licensee or certificate holder;

5. Addiction to the use of alcohol or other habit-forming drugs to a degree which renders him or her unfit to practice plumbing or water treatment;

6. Mental or physical incompetence to practice plumbing or water treatment;

7. Willful or repeated violation of RSA 329-A; and

8. Suspension or revocation without reinstatement of a license or certification similar to one issued under RSA 329-A in another jurisdiction.

What are the SANCTIONS for misconduct?

1. Reprimand
2. Suspension for up to 5 years
3. Limitation for up to 5 years
4. Restriction for up to 5 years
5. Revocation
6. Additional continuing education

What is the PROCEDURE for imposing disciplinary sanctions?

1. Through a formal disciplinary hearing in front of the Plumbers' Licensing Board
2. Through a settlement agreement between the licensee and the Plumbers' Licensing Board.

Permits & Licenses

1. Permits are required. If in doubt, contact the local authority having jurisdiction (AHJ) prior to work beginning. **Administrative Rule Plu 504.01(e)**

2. Licensees shall not obtain a permit for a project and allow another business or person to work under the permit. **Administrative Rule Plu 504.01(b)**

3. Notify the Plumbing Safety & Licensing Section of all plumbing work in un-inspected communities. **Administrative Rule Plu 408.01(c)**

4. Journeyman shall not be in the business of plumbing. Journeyman may not be a subcontractor. Journeyman may not receive payment for work from anyone except a bona fide employer. **RSA 329-A:2**

Other…

All licensees and certificate holders are required to stay informed of all current codes, laws and rules pertaining to plumbing.

101.1 Title. These regulations shall be known as the *International Plumbing Code* of ~~[NAME OF JURISDICTION]~~ the State of New Hampshire hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction. This code shall also regulate nonflammable medical gas, inhalation anesthetic, vacuum piping, nonmedical oxygen systems and sanitary and condensate vacuum collection systems. ~~The installation of fuel gas distribution piping and equipment, fuel gas-fired water heaters, and water heater venting systems shall be regulated by the International Fuel Gas Code~~. Fuel gas systems shall comply with the New Hampshire Fire Code, Saf-C 6000 (NFPA 54). Provisions in the appendices shall not apply unless specifically adopted.

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not having more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.

104.2 Rule-making authority. The code official shall have authority as necessary in the interest of public health, safety and general welfare to adopt and promulgate written rules and regulations to interpret and implement the provisions of this code to secure the intent thereof and to designate requirements applicable because of local climatic or other conditions. Such rules shall not have the effect of waiving structural or fire performance requirements specifically provided for in this code, or of violating accepted engineering practice involving public safety."

106.6.2 Fee schedule. The fees for all plumbing work shall be as indicated by administrative rules Plu 306.01 and/or as determined by the local jurisdiction. ~~in the following schedule. [JURISDICTION TO INSERT APPROPRIATE SCHEDULE]~~

Delete Section 106.6.3 as follows:

~~106.6.3 Fee refunds. The code official shall authorize the refunding of fees as follows.~~

~~1. The full amount of any fee paid hereunder which was erroneously paid or collected.~~

~~2. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.~~

~~3. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.~~

~~The code official shall not authorize the refunding of any fee paid except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~

108.4 Violation penalties. Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair plumbing work in violation of the approved construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be ~~guilty of a [SPECIFY OFFENSE] punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment~~ subject to penalties as

prescribed by law. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

108.5 Stop work orders. Upon notice from the code official that plumbing system is being done contrary to the provisions of this code or in a dangerous or unsafe manner, such work shall immediately cease. Such notice shall be in writing and shall be given to the owner of the property, or to the owner's agent, or to the person doing the work. The notice shall state the conditions under which work is authorized to resume. Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. Any person who shall continue any work on the system after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be ~~liable for a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars~~ subject to penalties as prescribed by law.

301.3 Connections to the sanitary drainage system. All plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent the indirect waste systems required by Chapter 8.

Exception: Bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to discharge to the sanitary drainage system where such fixtures discharge to an approved gray water system for subsurface landscape irrigation provided that all irrigation use is first approved by the State of NH Department or Environmental Services.

305.6.1 Sewer depth. Building sewers that connect to private sewage disposal systems shall conform to RSA 485-A relative to minimum depth below finished grade ~~be a minimum [NUMBER] inches (mm) below finished grade at the point of septic tank connection~~. Building sewers that connect to public sewers shall be a minimum depth of 48 inches (1219 mm) below grade or adequately insulated to afford the same protection whenever a condition arises that the 48 inches (1219 mm) cannot be attained.

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for *dwelling units* and *sleeping units*.
2. Separate facilities shall not be required in structures or tenant spaces with a total *occupant load*, including both the employees and customers, of 15 or less.
3. Separate facilities shall not be required in mercantile occupancies in which the maximum *occupant load* is 50 or less.
4. Separate facilities shall not be required in assembly occupancies that serve food with a total *occupant load*, including both employees and customers, of less than 25.

404.1 Where required. Accessible plumbing facilities and fixtures shall be provided in accordance with the *International Building Code* and the State of New Hampshire Architectural Barrier Free Design Standards.

501.2 Water heater as space heater. Where a combination potable water heating and space heating system requires water for space heating at temperatures higher than 140°F (60°C), a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of ~~140°F (60°C)~~ 130°F (55°C) or less. The potability of the water shall be maintained throughout the system.

501.6 Water temperature control in piping from tankless heaters. The temperature of water from tankless heaters intended for faucets for domestic or personal hygiene use shall be a maximum of 130°F (55°C) ~~140°F (60°C)~~ when intended for domestic uses. This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

501.8 Temperature controls. All hot water supply systems shall be equipped with automatic temperature controls capable of adjustments from the lowest to the highest acceptable temperature settings for the intended temperature operating range. The temperature of water supplied at faucets for domestic or personal hygiene use shall be limited to a maximum of 130°F (55°C).

605.22.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A ~~purple~~ primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564 or CSA CAN/CSA-B137.3 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM 2855. Solvent-cement joints shall be permitted above or below ground.

607.1 Where required. In residential *occupancies*, *hot water* not to exceed 130°F (55°C) shall be supplied ~~to~~ at all plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance. In nonresidential *occupancies*, *hot water* shall be supplied for culinary purposes, cleansing, laundry or building maintenance purposes. In nonresidential *occupancies*, *hot water* or *tempered water* shall be supplied for bathing and washing purposes. *Tempered water* shall be supplied through a water temperature limiting device that conforms to ASSE 1070 and shall limit the *tempered water* to a maximum of 110ºF (43ºC). This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

701.2 Sewer required. Every building in which plumbing fixtures are installed and all premises having drainage piping shall be connected to a public sewer, where available, or an approved private sewage disposal system in accordance with ~~the International Private Sewage Disposal Code~~ RSA 485-A:29-44.

705.8.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A [~~purple~~] primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564 or CSA CAN/CSA-B137.3, CSA CAN/CSA-B181.2 or CSA CAN/CSA-B182 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM 2855. Solvent-cement joints shall be permitted above or below ground.

705.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A [~~purple~~] primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564 or CSA CAN/CSA-B137.3, CSA CAN/CSA-B181.2 or CSA CAN/CSA-B182 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM 2855. Solvent-cement joints shall be permitted above or below ground.

Section 904.1 Roof extension. All open pipes that extend through a roof shall be terminated at least 12 inches (305 mm) above the roof, except that where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least 7 feet (2134 mm) above the roof.

Adopt Appendix B in its entirety per Section 101.2:

APPENDIX B
RATES OF RAINFALL FOR VARIOUS CITIES

Adopt Appendix C in its entirety per Section 101.2:

APPENDIX C
GREY WATER RECYCLING SYSTEMS

Adopt Appendix F in its entirety per Section 101.2:

APPENDIX F
STRUCTURAL SAFETY

Adopt Appendix G in its entirety per Section 101.2:

APPENDIX G
VACUUM DRAINAGE SYSTEM

End of International Plumbing Code® 2009 amendments

International Residential Code® 2009
Amendments
State of New Hampshire
Effective April 1, 2010

R101.1 Title. These regulations shall be known as the *Residential Code for One- and Two-Family Dwellings* of ~~[NAME OF JURISDICTION]~~ the State of New Hampshire hereinafter referred to as "this code."

R102.6 Existing structures. The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, ~~*the International Property Maintenance Code or the International Fire Code,*~~ or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.

Add footnote "l" to the Ground Snow Load column of TABLE R301.2(1) CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA as follows:

l. The jurisdiction shall fill in this part of the table with the ground snow load from Figure R301.2(5) or from Table 1 of *Ground Snow Loads for New Hampshire* ERDC/CRREL TR-02-6.

R313.1 Townhouse automatic fire sprinkler systems. Effective April 1, 2012 an automatic residential fire sprinkler system shall be installed in *townhouses.*

Exception: An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed

R313.2 One- and two-family dwellings automatic fire systems. Effective April 1, 2012 an automatic residential fire sprinkler system shall be installed in one- and two-family *dwellings*.

Exception: An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system

R313.2.1 One- and two-family dwellings automatic fire systems. Buildings provided with an automatic residential fire sprinkler system shall be allowed to exercise all credits regarding egress in accordance with RSA 155-A:2 II (NFPA 101).

Delete Chapter 24 in its entirety and add the following:

CHAPTER 24
FUEL GAS

G2401.1. Fuel gas systems shall comply with the New Hampshire Fire Code, Saf-C 6000 (NFPA 54).

P2601.2 Connections. Plumbing fixtures, drains, and appliances used to receive or discharge liquid waste or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems.

Exception: Bathtubs, showers, lavatories, clothes washers and laundry trays are not required to discharge to the sanitary drainage system where those fixtures discharge to an *approved* gray water system provided the system complies with Appendix O.

P2603.6.1 Sewer depth. *Building sewers* that connect to private sewage disposal systems shall ~~be a minimum of [NUMBER] inches (mm) below finished *grade* at the point of septic tank connection.~~ conform to RSA 485-A relative to minimum depth below finished grade. *Building sewers* that connect to public sewers shall be a minimum depth of ~~[NUMBER]~~ 48 inches (1219 mm) below *grade* or adequately insulated to afford the same protection whenever a condition arises that the 48 inches cannot be attained.

Add Section P2801.8 as follows:

P2801.8 Water temperature at faucets. Water temperature shall be limited to 130°F (55°C) at faucets used for personal and domestic hygiene. This shall not effect other water temperature requirements in this code.

Add Section P2801.9 as follows:

P2801.9 Water temperature control in piping from tankless heaters. The temperature of water from tankless water heaters intended for faucets for domestic or personal hygiene use shall be a maximum of 130°F (55°C). This provision shall not supersede the requirement for protective shower valves in accordance with Section P2708.3.

P2802.2 Temperature control. Where a combination water heater-space heating system requires water for space heating at temperatures exceeding 130 ~~140~~ degrees F (55 ~~60~~ degrees C), a master thermostatic mixing valve complying with ASSE 1017 shall be installed to temper the water to a temperature of 130 ~~140~~ degrees F (55 ~~60~~ degrees C) or less for domestic uses.

Add Section P2804 as follows:

SECTION P2804
WATER TEMPERATURE

P2804.1 Maximum temperature. Hot water not to exceed 130°F (55°C) shall be supplied at all plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleaning, laundry or building maintenance. This provision shall not supersede the requirement for protective shower valves in accordance with Section P2708.3.

P2903.10 Hose Bibb. Hose bibbs subject to freezing, including the "frost-proof" type, shall be equipped with an accessible stop-and-waste type valve inside the building so that they can be controlled and/or drained during cold periods.

~~**Exception:** Frostproof hose bibbs installed such that the stem extends through the building insulation into an open heated or semiconditioned space need not be separately valved.~~

P2905.9.1.3 PVC Plastic pipe. A ~~purple~~ primer that conforms to ASTM F 656 shall be applied to PVC solvent cemented joints. Solvent cement for PVC plastic pipe conforming to ASTM D 2564 shall be applied to all joint surfaces.

P3003.9.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A ~~purple~~ primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564 or CSA B137.3, CSA B181.2 shall be applied to all joint surfaces.

The joint shall be made while the cement is wet and shall be in accordance with ASTM 2855. Solvent-cement joints shall be permitted above or below ground.

P3003.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A ~~purple~~ primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564 or CSA B137.3, CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM 2855. Solvent-cement joints shall be permitted above or below ground.

Adopt Appendix G in its entirety per Section R102.5:

APPENDIX G
SWIMMING POOLS, SPAS AND HOT TUBS

Adopt Appendix J in its entirety per Section R102.5:

APPENDIX J
EXISTING BUILDINGS AND STRUCTURES

Adopt Appendix O in its entirety per Section R102.5:

APPENDIX O
GREY WATER RECYCLING SYSTEMS

End of International Residential Code® 2009 amendments

Permits

Duties and powers of the code official (IPC Section 104)

104.1 General.

- The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits.

- The code official shall receive applications, review construction documents and issue permits for the installation and alteration of plumbing systems, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

104.3 Inspections.

- The code official shall make all the required inspections, or shall accept reports of inspection by approved agencies or individuals. All reports of such inspections shall be in writing and certified by a responsible officer of such approved agency or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report unusual technical issues that arise, subject to the approval of the appointing authority.

PERMITS Q&A

1. What are the responsibilities of the code official as it relates to permits?

2. What should take place when a complex or unusual situation arises relative to plumbing inspections?

Commercial Kitchen Installations

Traps, Interceptors and Separators Inspection (Chapter 10 of the IPC)

1003.1 Where required.

- Interceptors and separators shall be provided to prevent the discharge of oil, grease, sand and other substances harmful or hazardous to the building drainage system, the public sewer, the private sewage disposal system or the sewage treatment plant or processes.

1003.2 Approval.

- The size, type and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturer's instructions and the requirements of this section based on the anticipated conditions of use. Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator.

1003.3 Grease interceptors.

Grease interceptors shall comply with the requirements of Sections:

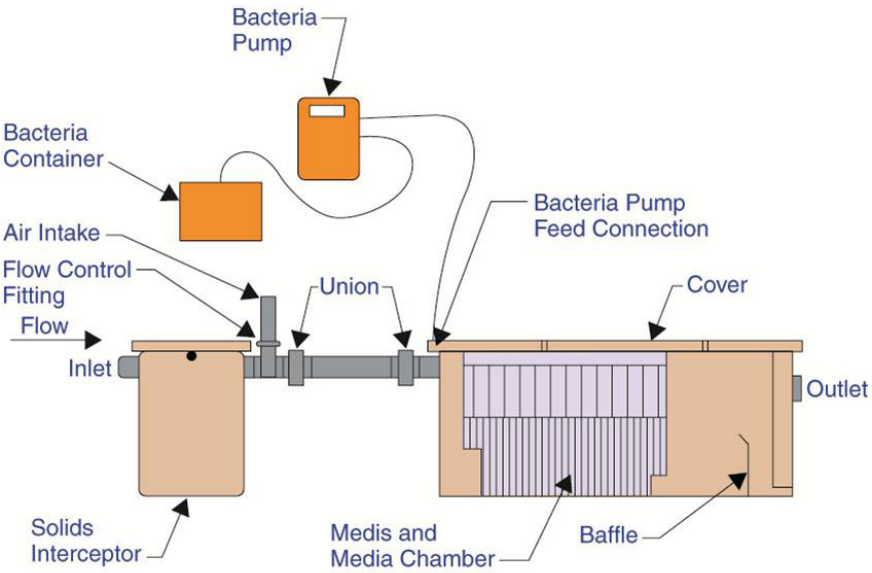
- 1003.3.1 Grease interceptors and automatic grease removal devices required.
- 1003.3.2 Food waste grinders.

1003.3.1 Grease interceptors and automatic grease removal devices required.

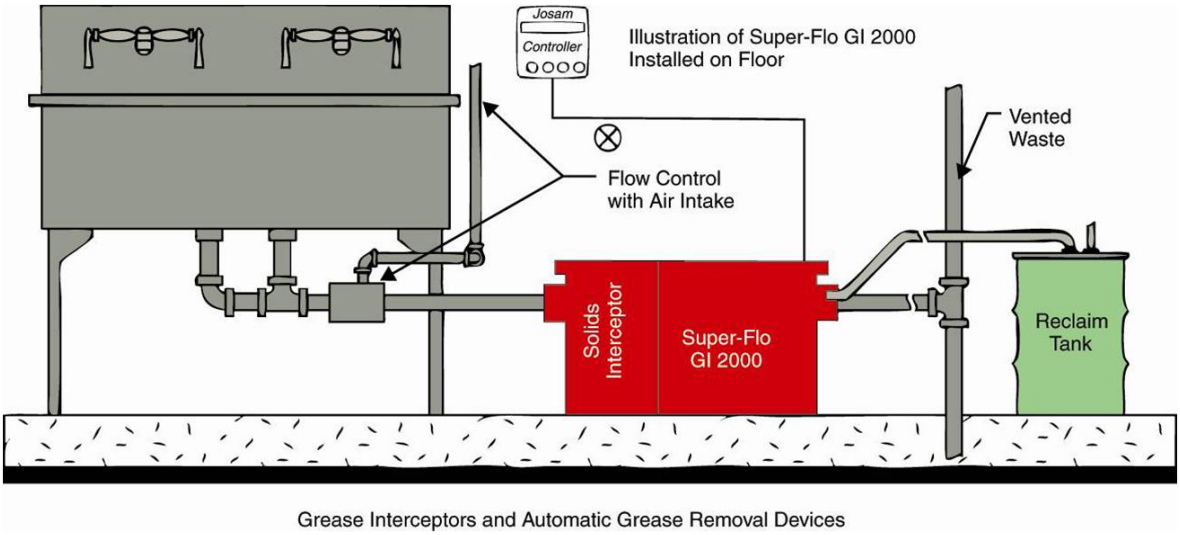
- Grease interceptors and automatic grease removal devices shall be required to receive the drainage from fixtures and equipment with grease-laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, school kitchens, bars, factory cafeterias and clubs.

Fixtures and equipment shall include:

- pot sinks
- pre-rinse sinks
- soup kettles or similar devices
- wok stations
- floor drains or sinks into which kettles are drained
- automatic hood wash units
- dishwashers without pre-rinse sink



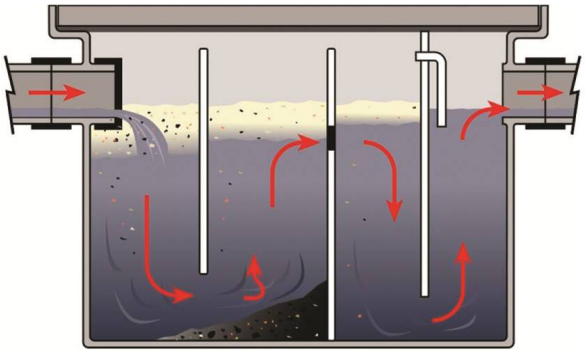
Bioremediation Grease Interceptor



Grease Interceptors and Automatic Grease Removal Devices

1003.3.1 Grease interceptors and automatic grease removal devices required. (cont.)

- Grease interceptors and automatic grease removal devices shall receive waste only from fixtures and equipment that allow fats, oils or grease to be discharged



Grease Interceptor

1003.3.2 Food waste grinders.

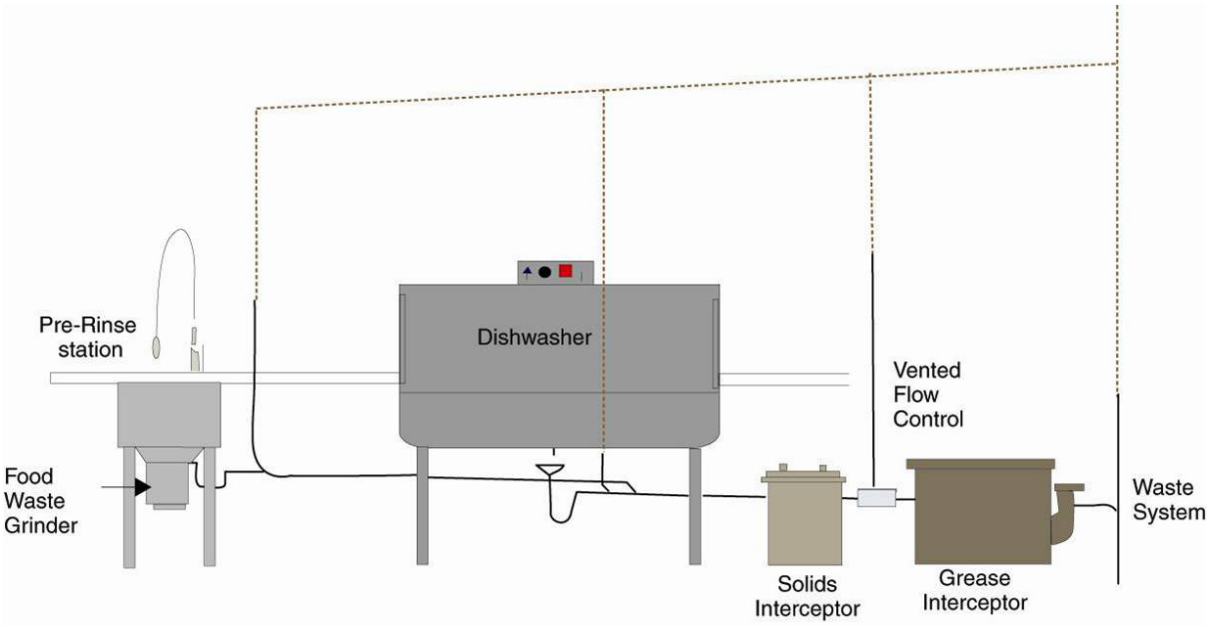
- Where food waste grinders connect to grease interceptors, a solids interceptor shall separate the discharge before connecting to the grease interceptor. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste grinder. Emulsifiers, chemicals, enzymes and bacteria shall not discharge into the food waste grinder.

1003.3.3 Grease interceptors and automatic grease removal devices not required.

- A grease interceptor or an automatic grease removal device shall not be required for individual dwelling units or any private living quarters.
  1003.3.3 Grease interceptors and automatic grease removal devices not required.

Grease interceptors shall comply with the requirements of Sections:

- 1003.3.4 Grease interceptors and automatic grease removal devices.
- 1003.3.4.1 Grease interceptor capacity.
- Rate of flow controls.



Food Waste Grinder with Solids Interceptor

1003.3.4 Grease interceptors and automatic grease removal devices. (cont.)

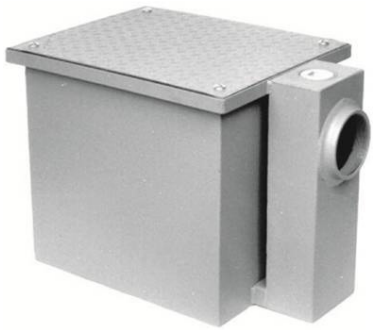
1. A grease interceptor or automatic grease removal device shall be sized in accordance with PDI G101, ASME A112.14.3 Appendix A, or ASME A112.14.4.
2. Grease interceptors and automatic grease removal devices shall be designed and tested in accordance with PDI G101, ASME A112.14.3 Appendix A, or ASME A112.14.4.
3. Grease interceptors and automatic grease removal devices shall be installed in accordance with the manufacturer's instructions.

Exception: Interceptors that have a volume of not less than 500 gallons (2 m^3) and that are located outdoors shall not be required to meet the requirements of this section.

Exterior grease interceptors have a volume of not less than 500 gallons (1893 L) and are located outdoors. Interior grease interceptors are used indoors and are not made for large volumes. The installation of an exterior interceptor could possibly be prohibited depending on the size or approval from the health department.

1003.3.4.1 Grease interceptors capacity.

- Grease interceptors shall have the grease retention capacity indicated in Table 1003.3.4.1 for the flow-through rates indicated.

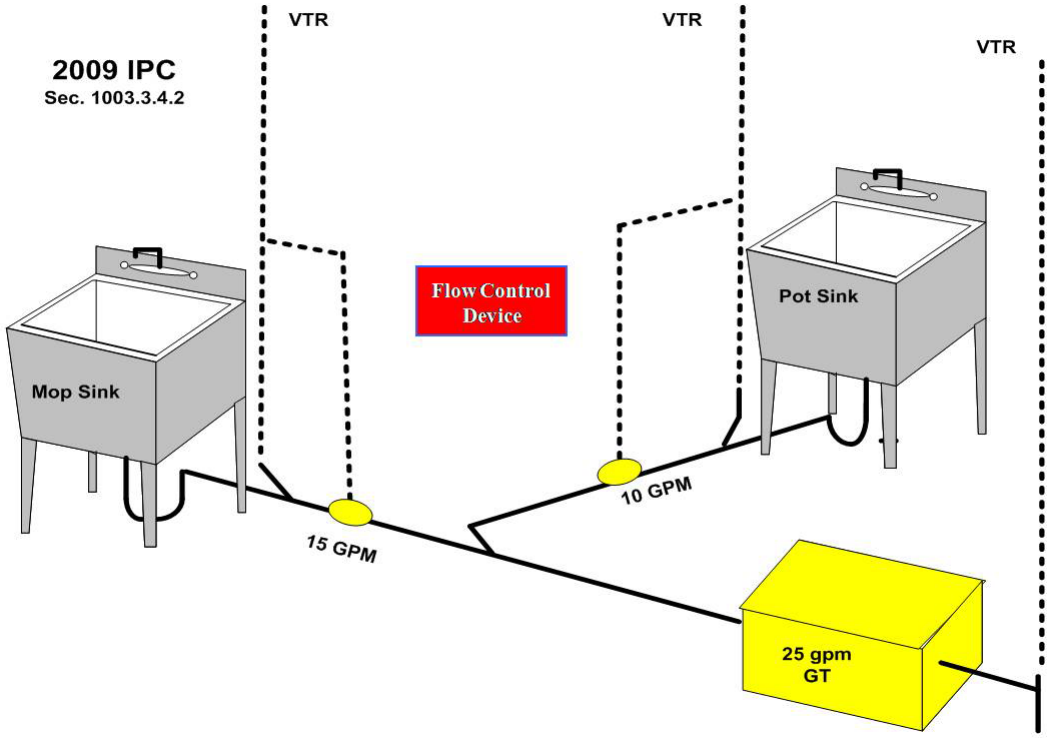


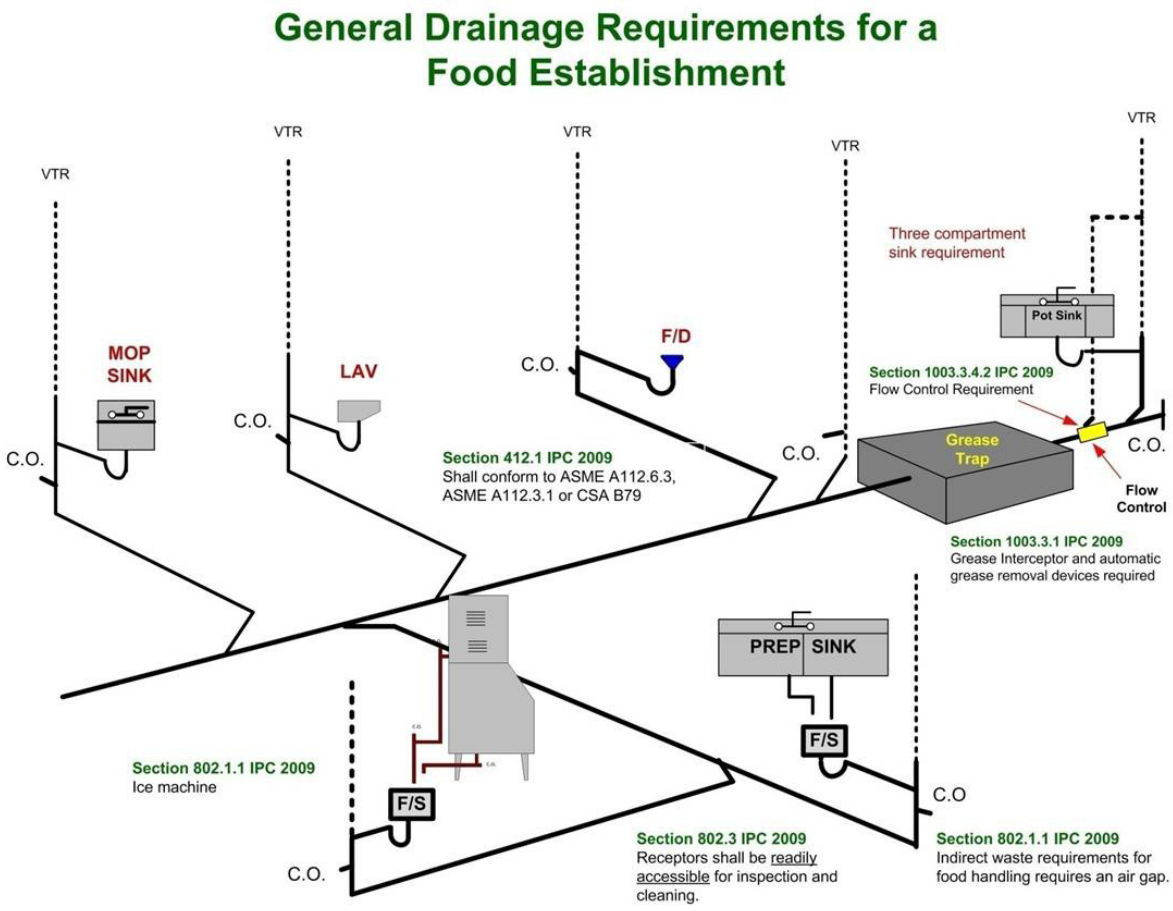
JOSAM Steel Grease Interceptor
Conforms to PDI-G101

1003.3.4.2 Rate of flow controls.

Grease interceptors shall be equipped with devices to control the rate of waterflow so that the waterflow does not exceed the rated flow. The flow- control device shall be vented and terminate not less than 6 inches (152 mm) above the flood rim level or be installed in accordance with the manufacturer's instructions.

1003.3.5. Automatic grease removal devices.





1003.3.5 Automatic grease removal devices.

- Where automatic grease removal devices are installed, such devices shall be located downstream of each fixture or multiple fixtures in accordance with the manufacturer's instructions. The automatic grease removal device shall be sized to pre-treat the measured or calculated flows for all connected fixtures or equipment. Ready access shall be provided for inspection and maintenance.

Table 1003.3.4.1 Capacity of Grease Interceptor

TOTAL FLOW-THROUGH RATING (gpm)	GREASE RETENTION CAPACITY (pounds)
4	8
6	12
7	14
9	18
10	20
12	24
14	28
15	30
18	36
20	40
25	50
35	70
50	100
75	150
100	200

Procedure for Sizing Grease Interceptors

Example:

- Determine the cubic content of the fixture by multiplying length x width x depth.
- A sink 48 inches (1200 mm) long by 24 inches (610 mm) wide by 12 inches (305 mm) deep.
- Cubic content 48 x 24 x 12 = 13,824 cubic inches.
- A sink has a capacity of 60 gallons as determined by multiplying its inside dimensions in inches (L x W x D) and dividing by 231 (1 gal. = 231 cu. inches).
- 13,824 ÷ 231 (1 gal. = 231 cu. inches) = 59.8 or 60 gallons.
- Typically, a sink or fixture is seldom filled to capacity because dishes, pots and pans displace 25 percent of the water; therefore, 75 percent of the actual fixture capacity should be used to establish the drainage load.

Drainage load in gallons =
59.8 x 0.75 = 44.85 or 45

Flow rate in gallons per minute (gpm) =
45 ÷ 1 = 45 gpm drainage load in minutes

- A flow control device is installed to limit the discharge from the sink to 50 gpm; therefore, the rating of the grease inteceptor should be 50 gpm.

PDI G101 Table 1

PDI Size Symbol	4	7	10	15	20	25	35	50	75	100
Flow Rate GPM	4	7	10	15	20	25	35	50	75	100
L/min	15	26	38	57	77	95	132	191	230	378
Grease Capacity Pounds	8	14	20	30	40	50	70	100	150	200
Kg	3.6	6.4	9.1	13.8	18.2	22.7	31.8	45.4	68	90.8

Table 1: Certification Standard Flow Rates and Grease Retention Capacity Ratings for Grease Interceptors

	Flow Rates		**Grease Retention Capacity Rating**		**Recommended Maximum Capacity of Fixtures Connected to Interceptors**	
	(GPM)	L/S	(lbs)	(kg)	(Gallons)	(L)
For Small Domestic Use	4	0.25	8	3.6	10	37.9
	7	0.44	14	6.4	7.5	66.2
For Large Domestic, Commercial, And Institutional Use	10	0.63	20	9.1	25.0	94.6
	15	0.95	30	13.6	37.5	141.9
	20	1.26	40	18.2	50.0	189.3
	25	1.58	50	22.7	62.5	236.6
	35	2.20	70	31.8	87.5	331.2
	50	3.16	100	45.4	125.0	473.1

Recommended PDI Size Grease Interceptor

			Recommended PDI Size Grease Interceptor	
Fixture Compartment Size (inches	**Number of Compartments**	**Drainage Load (gallons)**	**1 minute Drainage Period**	**2 minute Drainage Period**
18 x 12 x 6	1	4.2	7	4
16 x 14 x 8	1	5.8	7	4
20 x 18 x 8	1	9.4	10	7
18 x 16 x 8	2	15.0	15	10
20 x 18 x 8	2	18.7	20	10
30 x 20 x 8	1	15.6	20	10
24 x 20 x 8	1	18.7	20	10
22 x 20 x 12	2	22.9	25	15
22 x 20 x 12	2	34.3	35	20
24 x 24 x 12	2	44.9	50	25
22 x 20 x 12	4	68.6	75	35
24 x 24 x 12	4	89.8	100	50

Table 5

Fixture Outlet or Trap Size	Drainage Fixture Unit Value	GPM Equivalent	PDI Size Grease Interceptor
1-1/4	1	7.5	10
1-1/2	2	15.0	15
2	3	22.0	25
2-1/2	4	30.0	35
3	5	37.5	50
4	6	45.0	50

Sizing Summary

Steps	Formula	Example
1	Determine cubic content fo fixture. Multiply length x width x depth.	A sink 48'' long by 24'' wide by 12'' deep . Cubic content 48 x 24 x 12 = 13,824 cubic inches.
2	Determine capacity in gallons. 1 gal. = 231 cubic inches.	Content in gallons. 13,824/231 = 59.8 gallons
3	Determine actual drainage load. The fixture is normally filled to about 75 % of capacity with water. The items being washed displace about 25% of the fixture content, thus actual drainage load = 75% of fixture capacity.	Actual drainage load 0.75 x 59.8 = 44.9 gallons.
4	In general, good practice dictates a 1 minute drainage period; however, where conditions permit, a 2 minute drainage period is acceptable. Drainage period is the actual time required to completely drain the fixture. Flow rate = Actual Drainage Load/ Drainage Period	Calculate flow rate and drainage period 1 minute period 44.9/ 1 = 44.9 GPM Flow Rate 2 minute period 44.9/2 = GPM Flow Rate
5	From Table 1 select Interceptor which corresponds to the flow rate calculated. Note: Select next larger size when flow rate falls between two sizes listed.	Select Interceptor. For 1-minute period - 44.9 GPM requires PDI size 50. For 2-minute period - 22.5 GPM requires PDI size 25.

For SI: 1 inch = 25.4 mm, 1 gallon per minute = 3.785 L/m, 1 foot per second = 0.305 m/s.

COMMERCIAL KITCHEN Q&A

1. Why are separators and interceptors required?

_____

_____

_____

_____

_____

_____

_____

2. Grease interceptors shall comply with what sections?

_____

_____

_____

_____

_____

_____

_____

3. List the fixtures and equipment that must have an automatic grease removal device.

_____

_____

_____

_____

_____

4. A grease interceptor or automatic grease removal device shall be sized in accordance with_____.

   a. PDI G101, ASME A112.14.3 Appendix A, or ASME A112.14.4

   b. Sections 1003.3.1, 1003.3.2, 1003.3.3, and 1003.3.4

   c. Section 1003.3.4.1

   d. the manufacturer's instructions.

Indirect/special Waste

Chapter 8 of the IPC

802.1 Where required.

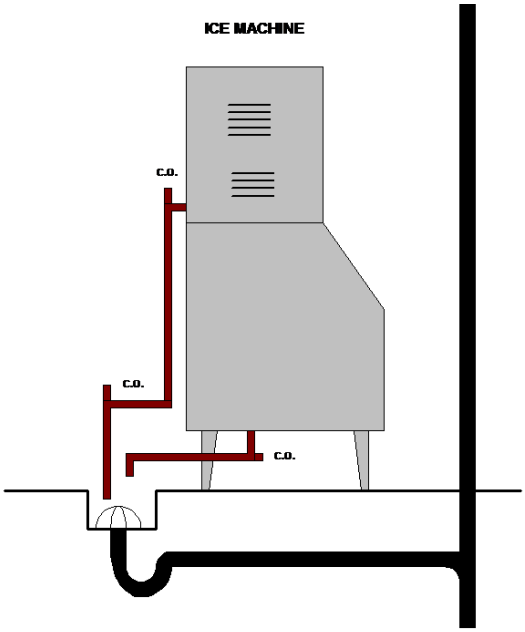
- Food-handling equipment and clear-water waste shall discharge through an indirect waste pipe as specified in Sections 802.1.1 through 802.1.8.
- All health-care related fixtures, devices and equipment shall discharge to the drainage system through an indirect waste pipe by means of an air gap in accordance 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.

Section 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.

Section 801.2 Protection.

- All 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.



An Approved Installation

A drain line carrying melted ice drippings to an indirect waste receptor would be considered not-contaminated. No connection may exist between this drain line and any other piping that may contain contaminated waste products. The purpose of an indirect drainage system is to prevent this type of cross-contamination. To combine the two drains is to defeat the very thing you are trying to protect.

Unapproved Installation of an Ice maker

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.

802.1.5 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.

802.1.7 Commercial dishwashing machines.

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

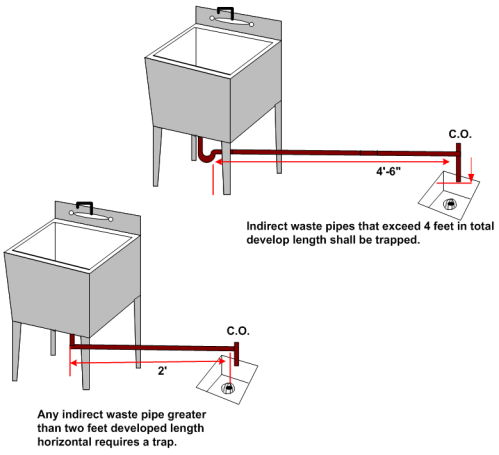
802.1.8 Food utensils, dishes, pots and pan sinks.

- Sinks used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans, or serviceware used in the preparation, servicing or eating of food shall discharge indirectly through an air gap or an air break or directly connect to the drainage system.
- The waste from a commercial dishwashing machine must discharge by means of an air gap or air break to prevent sewage from backing up into the dishwashing compartment in the event of a stoppage in the drainage system In accordance with ASSE 1004, the minimum drain connection is 1.5 inches (38 mm) nominal size.

A Typical Commerical Dishwasher

802.2 Installation.

- All indirect waste piping shall discharge through an air gap or air break into a waste receptor or standpipe. Waste receptors and standpipes shall be trapped and vented and shall connect to the building drainage system. All indirect waste piping that exceeds 2 feet (610 mm) in developed length measured horizontally, or 4 feet (1219 mm) in total developed length, shall be trapped.



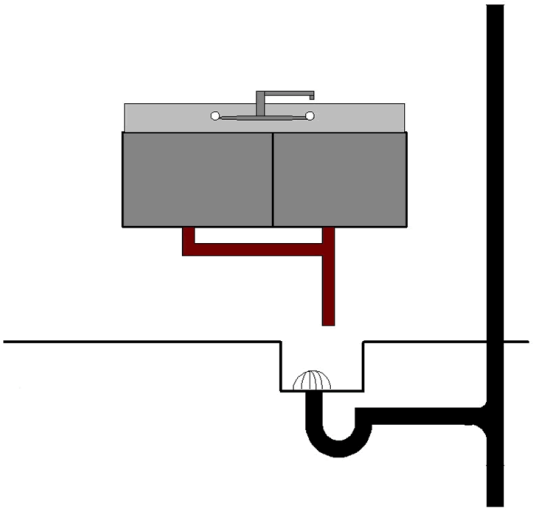
Trapping of Indirect Waste Piping

802.2.1 Air gap.

- The air gap between the indirect waste pipe and the flood level rim of the waste receptor shall be a minimum of twice the effective opening of the indirect waste pipe.

802.2.2 Air break.

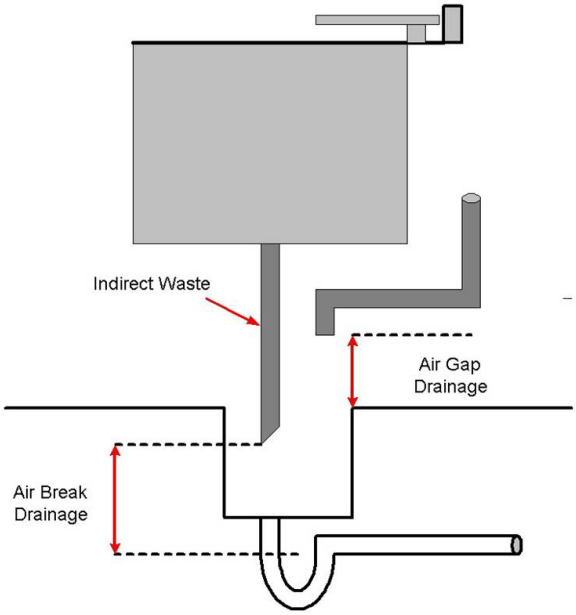
- An air break shall be provided between the indirect waste pipe and the trap seal of the waste receptor or standpipe.



Waste Receptor

802.3 Waste receptors.

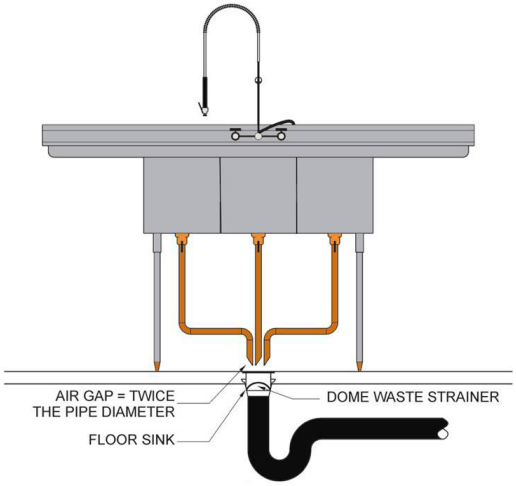
- Every waste receptor shall be of an approved type. A removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall be installed in ventilated spaces. Waste receptors shall not be installed in bathrooms or toilet rooms or in any inaccessible or unventilated space such as a closet or storeroom. Ready access shall be provided to waste receptors.



Example of Air Gap and Air Break

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.



Typical 3 Compartment Sink Installation for a Commercial Food Service Area

- An air gap is the most desirable method of backflow prevention and commonly used on the device.

Ice Cream Dipper Well

- The air gap shall be the greater of the two – a minimum of 1 inch or twice the diameter of the supply pipe.

Water Fill to Steam Kettle

802.3.2 Open hub waste receptors.

- Waste receptors shall be permitted in the form of a hub or pipe extending not less than 1 inch (25.4 mm) above a water-impervious floor and are not required to have a strainer.

803.1 Wastewater temperature.

- Steam pipes shall not connect to any part of a drainage or plumbing system and water above 140°F (60°C) shall not be discharged into any part of a drainage system. Such pipes shall discharge into an indirect waste receptor connected to the drainage system.

INDIRECT / SPECIAL WASTE Q&A

1. Where are indirect waste pipes required?

   _____

   _____

   _____

   _____

   _____

   _____

   _____

2. True or False. A drain line carrying melted ice drippings to an indirect waste receptor would be considered contaminated.

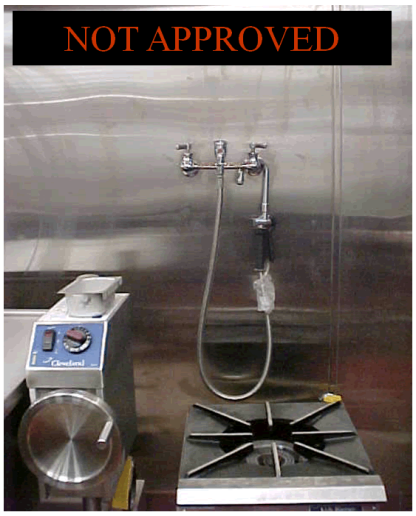
3. Freezers in food service establishments shall be indirectly connected to the sanitary drainage system by_____.

   a. a floor drain
   b. an air gap
   c. a drain line
   d. combining two drains

Water Supply And Distribution

Chapter 6 of the IPC

Correction involves either the removal of the valve or the installation of a pressure vacuum breaker.



Water Using Device

Soap dispensers must be a minimum of 6 inches above the highest point of contamination.

- Section 413.4 All food waste grinders shall be provided with a supply of cold water.

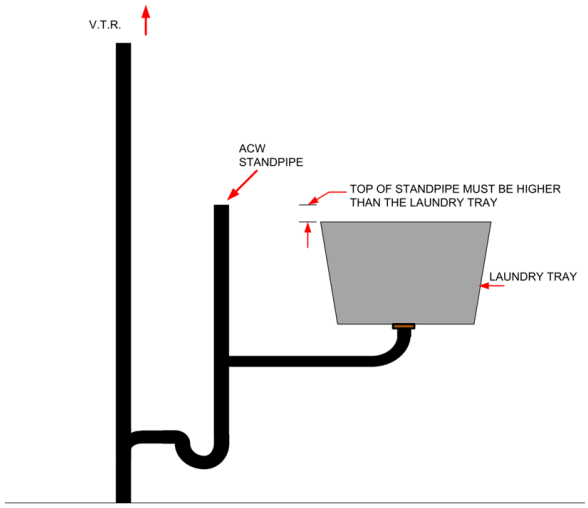
Typical Pre Rinse Station with Approved Backflow

Typical Food Waste Grinder Installation

Differences In The IPC And IRC

In Section P2601.1 it is made clear that the installation of plumbing, appliances, equipment and systems not addressed by the IRC Shall comply with the applicable provisions of the IPC.

Section P2706.2.1 of the IRC allows a laundry tray waste line to connect into a standpipe for the automatic clothes washer drain. The IPC does not mention this in Section 415.



Approved Laundry Tray Installation

IRC Section 2709.2.3 is an additional option given for the construction of a shower receptor. This option is not mentioned in Section 417.5.2 of the IPC.

Section P2717.2 of the IRC requires the dishwasher waste line to rise and be securely fastened to the underside of the counter before connecting to the sink tailpiece. The IPC Section 802.1.6 allows the waste line of a domestic dishwashing machine discharging into a kitchen sink tailpiece or food waste grinder connect to either an air gap or the waste line shall rise and be securely fastened to the underside of the sink rim or counter.

IRC Section 2712.7 does not require hinged open front seats to be equipped on water closets as does Section 420.3 of the IPC.

The IRC Section 2801.7 requires water heaters in Seismic Design Categories D0, D1 and D2 and townhouses in Seismic Design Category C water heaters to be anchored or strapped in the upper one-third and in the lower one-third of the appliance to resist a horizontal force equal to one-third of the operating weight of the water heater, acting in any horizontal direction, or in accordance with the appliance manufacturer's instructions. The IPC Section 502.4 refers the reader to the IBC which in turn will refer to standard ASCE 7.

The IRC Section P2903.5 requires the flow velocity of the water distribution system be controlled to reduce the possibility of water hammer as does the IPC Section 604.9. However, it does not state in the IRC that a water hammer arrester be installed where quick closing valves are utilized. This is only found in the IPC.

IRC Section 3103.1 gives a minimum distance of 6 inches (152 mm) that a vent must terminate through a roof or 6 inches (152 mm) above the anticipated snow accumulation, whichever is greater, except that where a roof is to be used for any purpose other than weather protection, the vent extension shall be run at least 7 feet above the roof. The IPC does not give a minimum required distance.

The IRC shows a fixture unit value of one for a bar sink in Table P3004.1. The IPC Table 709.1 doe not list a bar sink.

The IRC Section 305.1 Exception 2 allows a ceiling height of 6 feet 8 inches (2032 mm) in front of and over the toilet, bath and shower fixtures. The IBC Section 1208.2 requires 7 feet (2134 mm) with some exceptions.

Air Admittance Valves

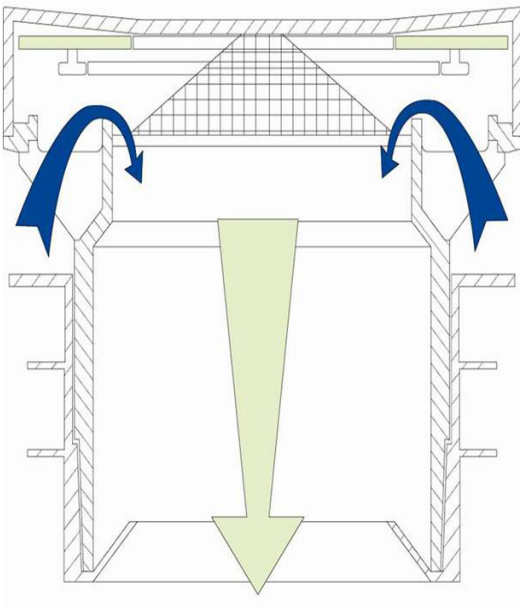
IRC Section P3114

Is an air admittance valve a mechanical vent?

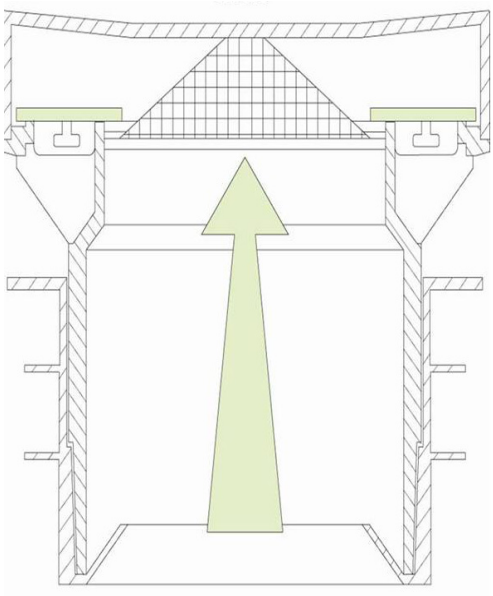
- No; there are no springs or mechanical devices such as gears to lose tension, jam or break over time.
- Natural Forces
  - Negative Pressure (opens)
  - Gravity (closes)

Air Admittance Valve

Air admittance valves are designed to open when a fixture is discharging to allow air to enter the system. It is designed to close by gravity when there is no flow in the system to prevent the escape of sewer gas into the building.



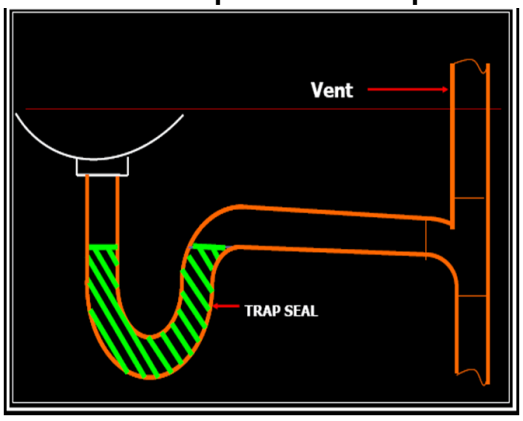
Open View of Air Admittance Valve



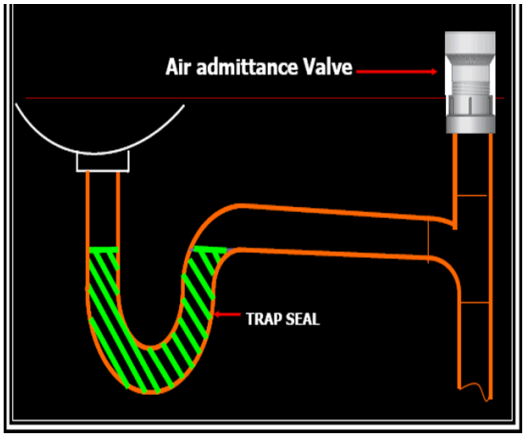
Closed View of Air Admittance Valve

The ultimate function of air admittance valves is to protect the fixture trap seal from siphonage which prevents sewer gases from entering the building.

Both installations protect the trap seal:

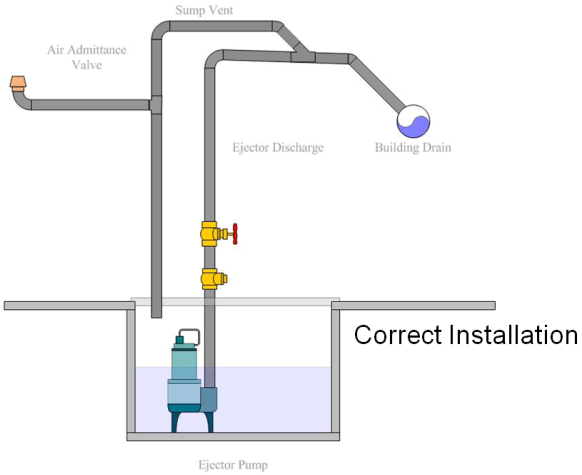


Tray Seal Protected by Vent



Tray Seal Protected by Air Admittance Valve

- Individual and branch-type air admittance valves (ASSE 1051).
- Stack type air admittance valves (ASSE 1050).
- Air admittance valves shall be installed:
  - as per the manufacturer's instructions.
  - And after the DWV testing that is required by Section P2503.5.1 or P2503.5.2 has been performed.
- The following venting methods allow the vent to terminate with a connection to an air admittance valve:
  - Individual vents
  - Branch vents
  - Circuit vents
  - Stack vents
- Individual and branch air admittance valves shall be located a minimum of 4 inches (102 mm) above the hori¬zontal branch drain or fixture drain being vented.
- Stack-type air admittance valves shall be located a minimum of 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 a minimum of 6 inches (152 mm) above insulation materials where installed in attics.
- Air admittance valves require
  - Access to be provided.
  - To be located in a ventilated space that allows air to enter the valve.
- The air admittance valve shall be rated for the size of the vent to which the valve is connected.
- Within each plumbing system, a minimum of one stack vent or a vent stack shall extend outdoors to the open air.
- Air admittance valves without an engineered design shall not be used to vent sumps or tanks of any type.



An Acceptable Engineered Design

Answer Key

Permits (Page 14)

1. The code official is responsible for processing applications and issuing permits for the installation, replacement, addition to or modification of plumbing systems in accordance with the code.

2. The code official has the authority to seek the opinion and advice of experts. A technical report from an expert can be used to assist the code official in the approval process.

Commercial Kitchen (Page 24)

1. to prevent the discharge of oil, grease, sand and other substances harmful or hazardous to the building drainage system, the public sewer, the private sewage disposal system or the sewage treatment plant or processes.

2. 1003.3.1 , 1003.3.2, 1003.3.3, and 1003.3.4
3.
    a. pot sinks
    b. pre-rinse sinks
    c. soup kettles or similar devices
    d. work stations
    e. floor drains or sinks into which kettles are drained
    f. automatic hood wash units
    g. dishwashers without pre-rinse sinks.

4. PDI G101, ASME A112.14.3 Appendix A, or ASME A112.14.4

INDIRECT / SPECIAL WASTE Q&A (Page 29)

1. All health-care related fixtures, devices and equipment.

2. False. A drain line carrying melted ice drippings to an indirect waste receptor would be considered not-contaminated.

3. B. an air gap.