

Commercial Kitchens
&
Food Service Facilities
Plumbing Code Requirements

** Code references based on the 2009 Edition of the International Plumbing Code*

Main Topics

Indirect Waste Piping and Receptors

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Indirect Waste

Indirect/Special Waste – Chapter 8 – '09 IPC

Definition:

- Indirect waste pipe: A waste pipe that does not connect directly with the drainage system, but that discharges into the drainage system through an *air break* or *air gap* into a trap, fixture, receptor or interceptor.

Where Indirect Wastes are Required

Section 802.1 '09 IPC

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.

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.

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.

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 in *developed length* measured horizontally, or 4 feet in total *developed length*, shall be trapped.

(Developed length means the length of pipe measured along the centerline of the pipe and fittings.)

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.

*****The Air Break is not to be used for fixtures and equipment used for food preparation, food handling or food storage. For these applications an Air Gap must be used.**

Definitions:

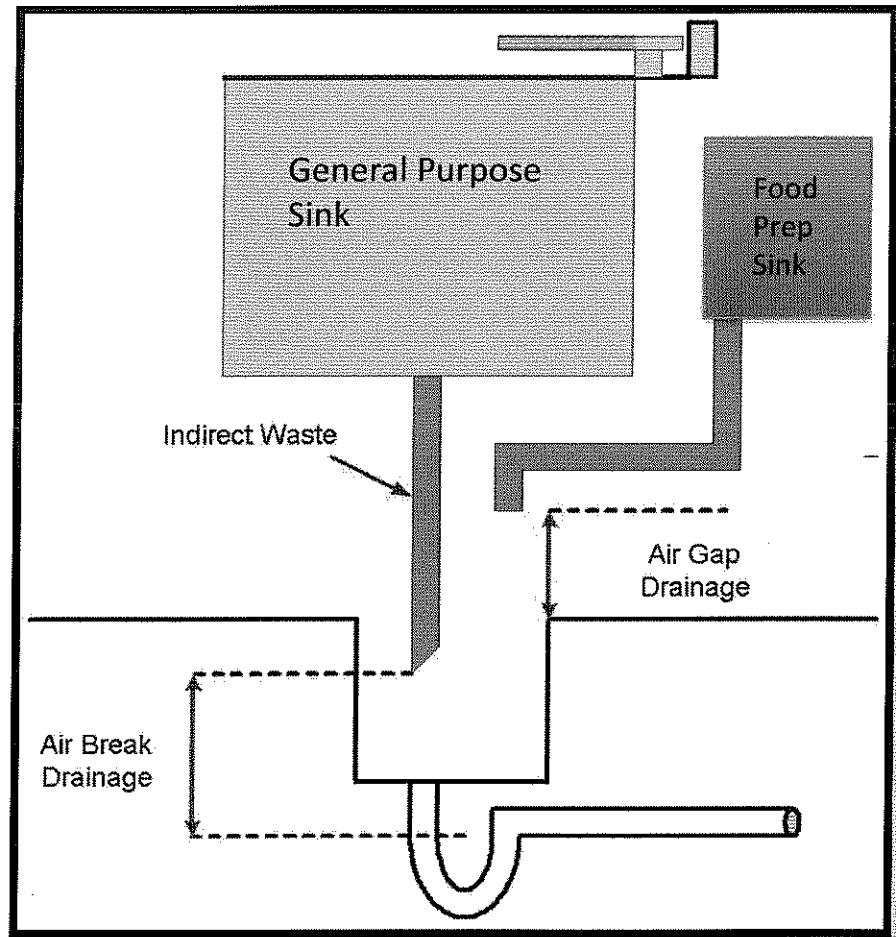
- Air Gap (Drainage System): The unobstructed vertical distance through the free atmosphere between the outlet of the waste pipe and the *flood level rim* of the receptacle into which the waste pipe is discharging.
- Air Break: A piping arrangement in which a drain from a fixture, appliance or device discharges indirectly into another fixture, receptacle or interceptor at a point below the *flood level rim* and above the trap seal.
- Flood Level Rim: The edge of the receptacle from which water overflows.

Difference between Air Gaps and Air Breaks.

In this illustration the Indirect Waste pipe from the sink in the drawing is terminating in the waste receptor with an **AIR BREAK**. (to the left- not approved for food prep.)

The second pipe (from another sink to the right) is illustrating what the pipe would look like if it terminated in the waste receptor with an **AIR GAP**. (required for food prep)

The **waste receptor** illustrated here is a floor sink.



Section 802.3 Waste Receptor – '09 IPC.

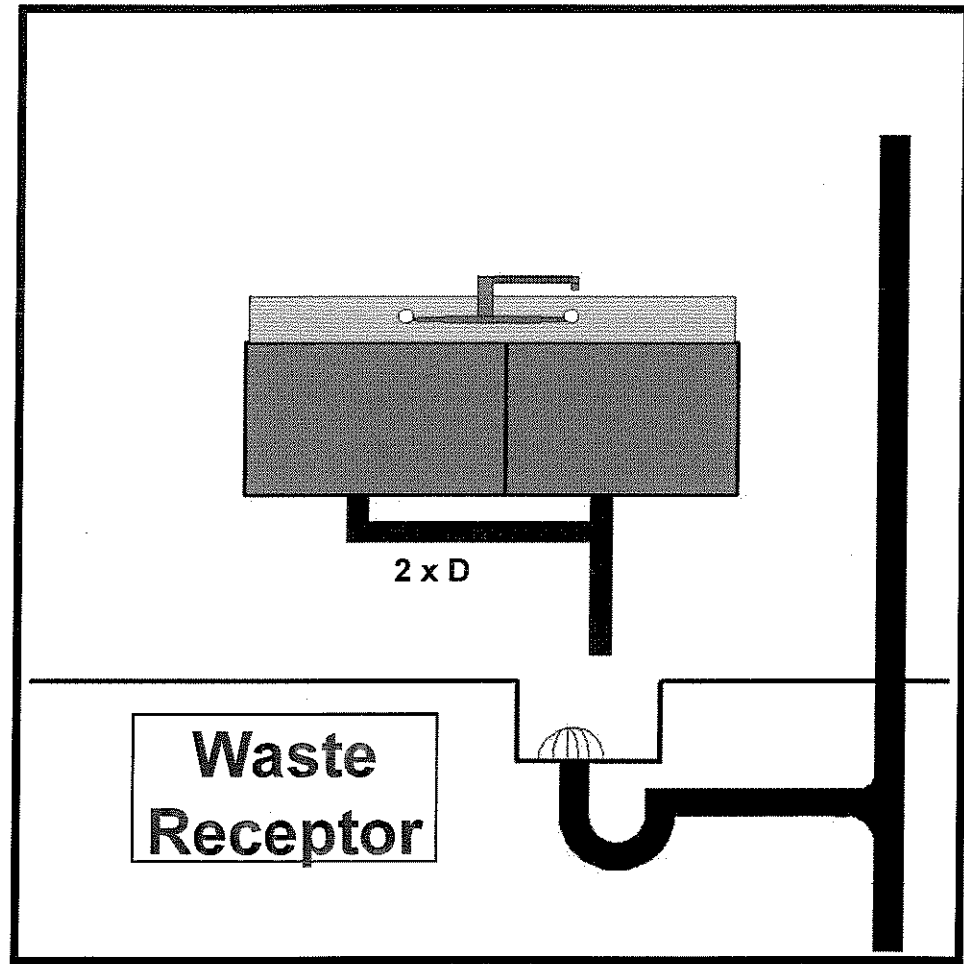
Every waste receptor shall be of an approved type. A removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall be installed in ventilated spaces. Waste receptors shall not be installed in bathrooms or toilet rooms or in any inaccessible or unventilated space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

The use of fittings, such as increasing couplings, as a waste receptor should be avoided. They are rarely sized appropriately and do not fit the code description of a waste receptor. All waste receptors are required to be approved by the code official.

Floor sink as waste receptor.

Waste Receptor

This illustration shows a food prep sink with an indirect drain equipped with a code compliant air gap (2X diameter of waste pipe) into a waste receptor, in this case, a floor sink.



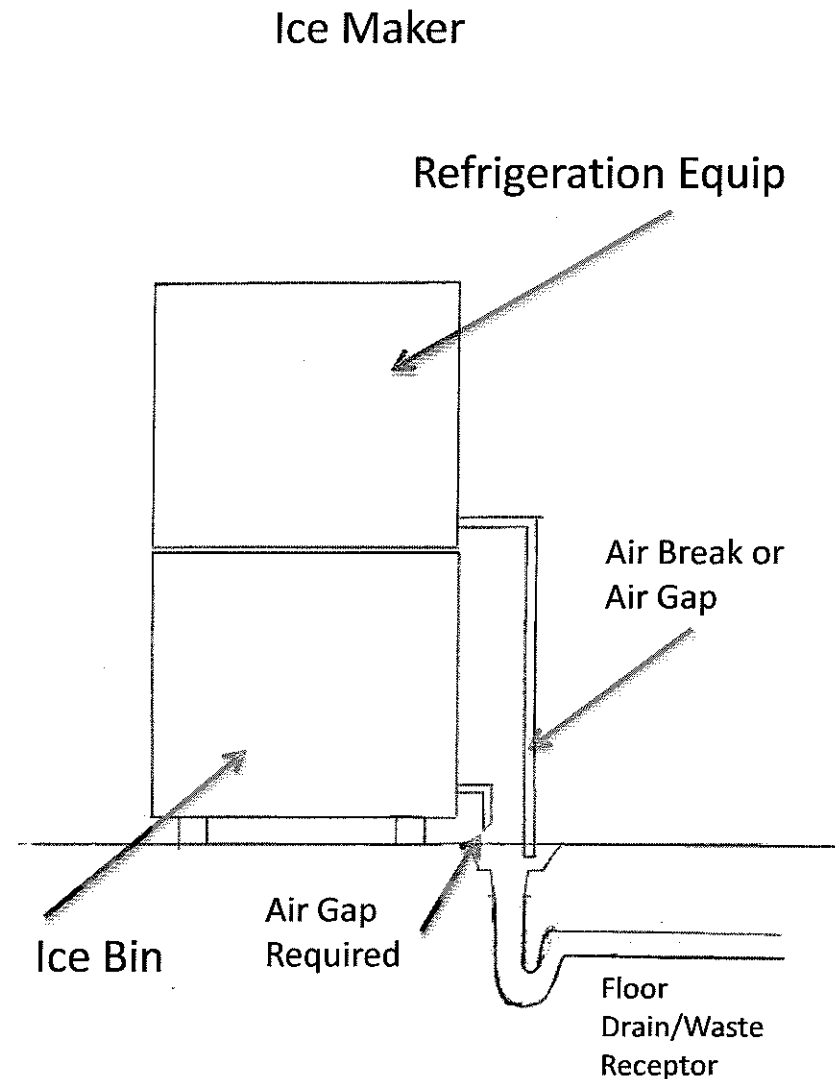
Correct Installation

Ice Maker Drains

The ice in the bin is either considered potable water or food therefore requires an air gap.

The condensation drain coming from the refrigeration equipment is normally accompanied by a nasty slime and must NOT be communicating with the drain from the ice bin. The drains MUST be separate, not tied together.

The refrigeration drain does not require an air gap. An air gap or air break are both acceptable since there is no potable water or food associated with that drain.



Section 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.

Section 802.3.2 Open Hub Waste Receptors

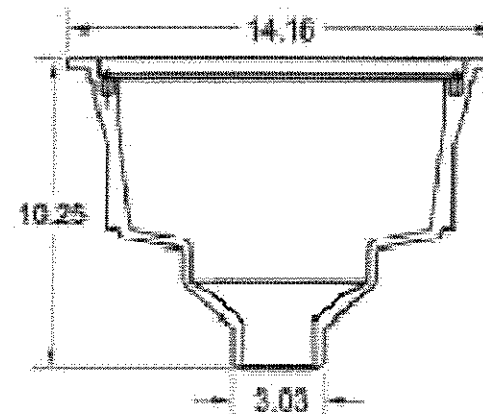
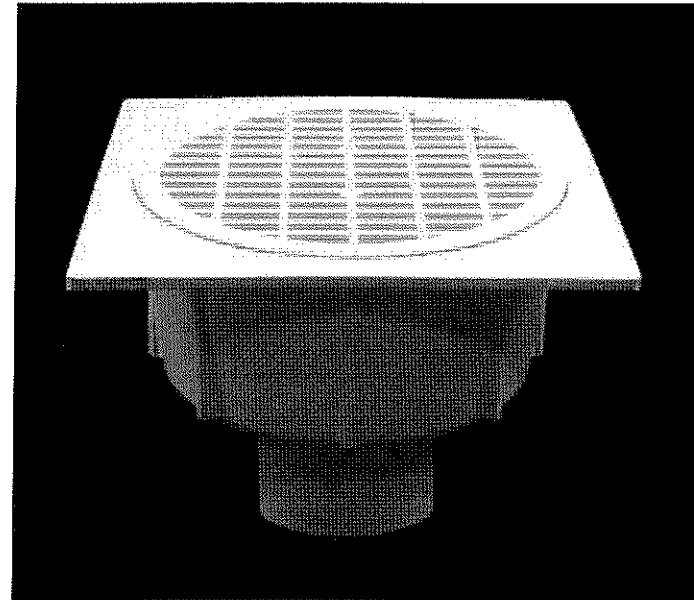
Waste receptors shall be permitted in the form of a hub or pipe extending not less than 1 inch (25.4 mm) above a water-impervious floor and are not required to have a strainer.

Hub waste receptors are typically used to provide waste receptors for refrigerated cases such as those found in supermarkets.

Floor Sink as a Waste Receptor.

The item in the picture to the right is referred to as a floor sink. It is similar to a floor drain as it is installed flush with the floor, but has a much larger chamber to receive the indirect wastes and does have a strainer as called for in the plumbing code in addition to the grate.

The receptor pictured is a PVC floor sink which can be obtained at a reasonable price. The grate can be cut or a funnel can be installed to eliminate the possibility of splashing.



Funnels for Indirect Waste Receptors

A funnel is one way to eliminate the splashing. The funnel is installed by fastening it to the grate of the floor sink (or in some instances the grate of a floor drain).

The indirect waste pipe is installed so that it terminates inside the funnel. In this way the air gap is maintained, but the chance for splashing is eliminated. Some food service inspectors do not approve of this installation as it is possible to collect debris inside the funnel.

One should verify that this would be permitted in the jurisdiction where the work is being done. And restaurant owners should be advised to maintain the grate in a clean condition to avoid build up of debris.

NICKEL CONDENSATE FUNNEL

863 Series

SPECIFICATION:

Sioux Chief 863 Series cast nickel condensate funnel shall be used where necessary on floor drains. Funnel shall be designed to receive drips, condensate lines or waste water from indirect waste lines. Funnel shall prevent splashing and direct waste into floor drain. Funnel shall be tapped 10x24 and attach from underside of strainer with two concealed screws which fit through wires in strainer to create a vandal-resistant installation.

Item Number

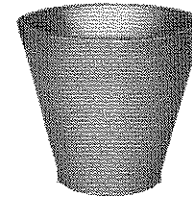
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MATERIALS:

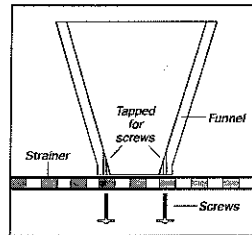
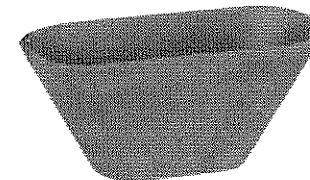
FUNNEL: Cast nickel
SCREWS: Stainless steel, washer-head

INSTALLATION:

Funnel is tapped 10x24 to accept the two included fastening screws. Secure from underside of strainer for a vandal-resistant installation.

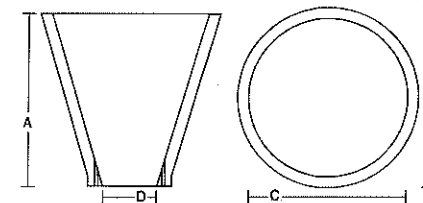


863-FN
863-FNO
shown



DIMENSIONS:

Overall Height	Round funnel:	A: 4"
	Oval funnel:	A: 4"
Top O.D.	Round funnel:	B: 4 5/16" (round)
	Oval funnel:	B: 9 1/8" x 3 21/32"
Top I.D.	Round funnel:	C: 4" (round)
	Oval funnel:	C: 8 5/8" x 3 5/32"
Bottom I.D.	Round funnel:	D: 2" (round)
	Oval funnel:	D: 2" x 4 1/2"



Create Item Number Below

863-A

e.g. 863-FNO = Cast nickel funnel - oval pattern

A Optional Funnel Type

- FN = Round pattern - cast nickel
- FNO = Oval pattern - cast nickel

Floor Sink

This floor sink is being used as the indirect waste receptor for a food prep sink. There is an appropriate air gap. In this case either the grate will be cut or a funnel will be installed to prevent splashing.

Note the versatility of having the floor sink with regards to adding other indirect wastes or moving the food prep sink to a different location.



Connections to Potable Water

- All connections to potable water must be made so that there is no possibility of contaminating the potable water supply. This can be accomplished in a number of different ways, depending on several factors, including using the appropriate backflow prevention device for the degree of hazard associated with the potential contaminant.
- Devices known generically as backflow preventers can be used to protect potable water connections but must be matched appropriately to the situation.
- A condition where possibility of contamination exists is referred to as a **cross connection**. All cross connections must be protected.

Definitions

- **Cross Connection:** Any physical connection or arrangement between two otherwise separate piping systems, one of which contains potable water and the other either water of unknown or questionable safety or steam, gas or chemical, whereby there exists the possibility for flow from one system to the other, with the direction of flow depending on the pressure differential between the two systems.
- **Backflow:** Pressure created by any means in the water distribution system, which by being in excess of the pressure in the water supply mains causes a potential backflow condition.
 - The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply from any source except the intended source.

Connections to Potable Water systems for Food Service Cleaning/Sanitizing Chemical Dispensers

International Plumbing Code Section 608

Protection of Potable Water Supply

- **608.1 General.** A potable water supply system shall be designed, installed and maintained in such a manner so as to prevent contamination from non-potable liquids, solids or gases being introduced into the potable water supply through cross-connections or any other piping connections to the system.
- **608.2 Plumbing Fixtures.** The supply lines and fittings for every plumbing fixture shall be installed so as to prevent backflow.

Connections to Potable Water systems for Food Service Cleaning/Sanitizing Chemical Dispensers

- **608.3. Devices, appurtenances, appliances and apparatus.** 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 connect to the water supply system shall be provided with protection against backflow and contamination of the water supply system. Water pumps, filters, softeners, tanks and all other appliances and devices that handle or treat potable water shall be protected against contamination.
- **608.5 Chemicals and other substances.** Chemical and other substances that produce either toxic conditions, taste, odor or discoloration in a potable water system shall not be introduced into, or utilized, in such systems.
- **608.6 Cross Connection control.** Cross connections shall be prohibited, except where approved protective devices are installed.

Pertinent Code Sections

- **608.13.6 Atmospheric-type vacuum breakers.**These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height.
- **608.15 Protection of potable water outlets.** All potable water openings and outlets shall be protected against backflow in accordance with Section 608.15, 608.15.2, 608.15.3, 608.15.4, 608.15.4.1, or 608.15.4.2.
- **608.15.4 Protection by a vacuum breaker.** Openings and outlets shall be protected by atmospheric-type or pressure type vacuum breakers. The critical level of the vacuum breaker shall be set a minimum of 6 inches above the flood level rim of the fixture or device. Fill valves shall be set in accordance with Section 425.3.1. Vacuum breakers shall not be installed under exhaust hoods or similar locations that will contain toxic fumes or vapors. Pipe –applied vacuum breakers shall be installed not less than 6 inches above the flood level rim of the fixture, receptor or devices served.

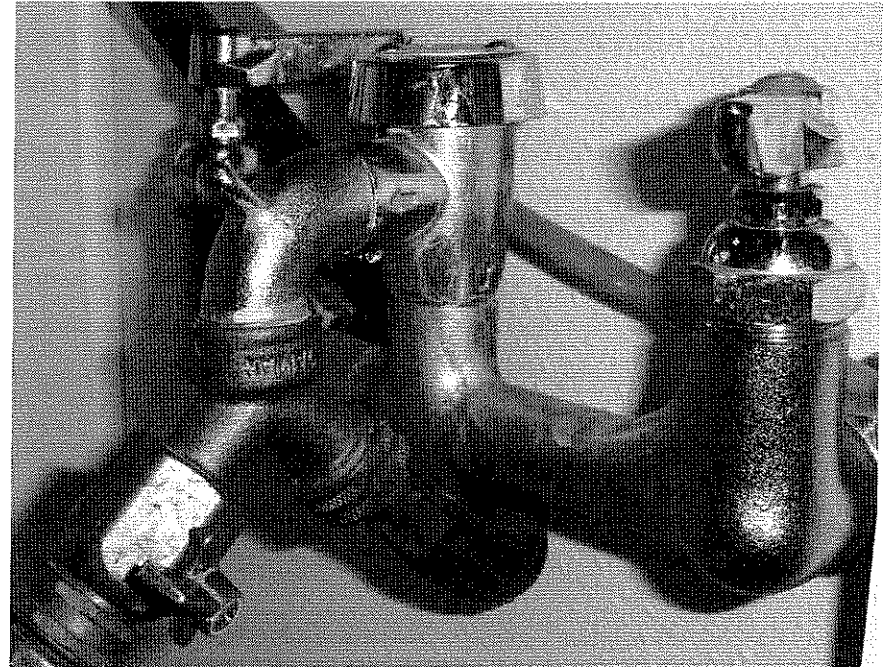
Incorrect Installation of chemical dispensing water supply.

An atmospheric vacuum breaker pictured to the right is permitted to be subject only to atmospheric pressure. There can be no valves downstream of the device. This causes line pressure to be applied to the device making it ineffective.

**NO VALVES PERMITTED
DOWNSTREAM FROM AN
ATMOSPHERIC VACUUM BREAKER.**

608.13.6

Incorrect Installation

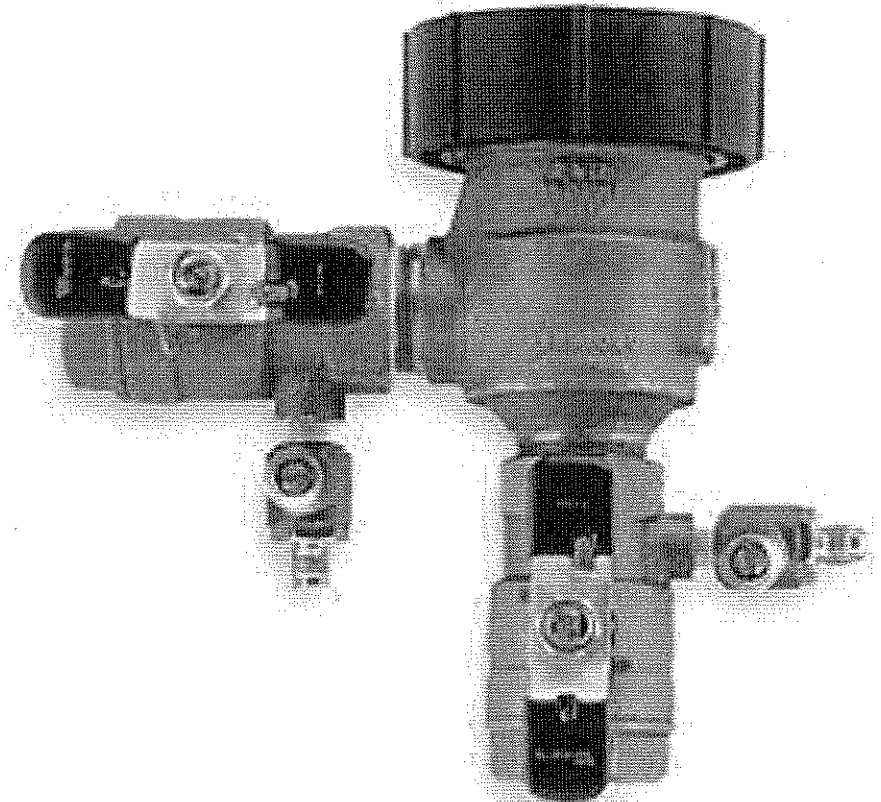


Pressure Vacuum Breaker

Pressure Vacuum Breaker

The pressure vacuum breaker is intended to protect when continuous pressure is applied. It may be installed with valves downstream.

This is an appropriate device for a cleaning chemical dispensing system.



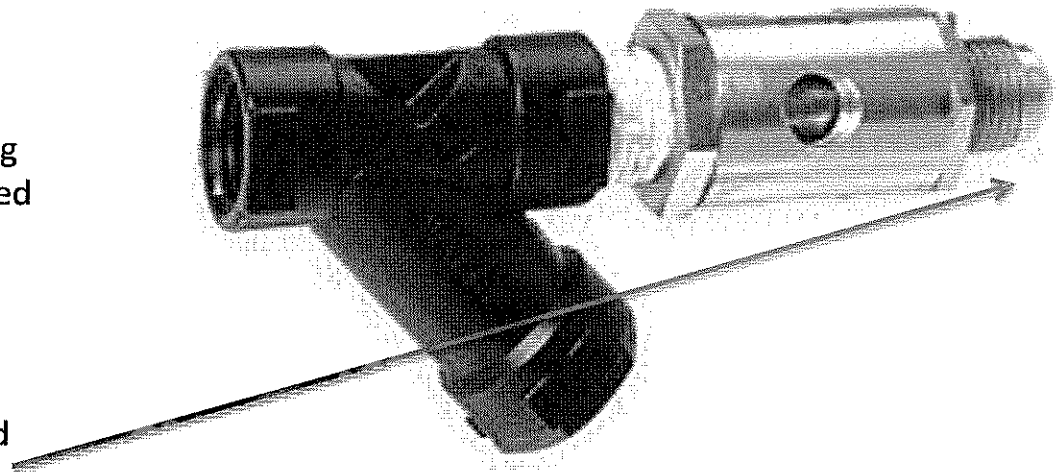
Soda Dispensing Equipment

ASSE 1022 Device

608.16.1 Beverage Dispensers. The water supply connection to beverage dispensers shall be protected against backflow by a backflow preventer conforming to ASSE 1022 or by an air gap. The portion of the backflow preventer device downstream from the second check valve and the piping downstream therefrom shall not be affected by carbon dioxide gas.

No copper or brass is permitted downstream from this device. When CO₂ and copper are in contact a toxin is created that makes people sick for 24 hours. Only stainless or plastic pipe and fittings may be used downstream.

Dual Check Valve with Intermediate
Atmospheric Vent
ASSE 1022



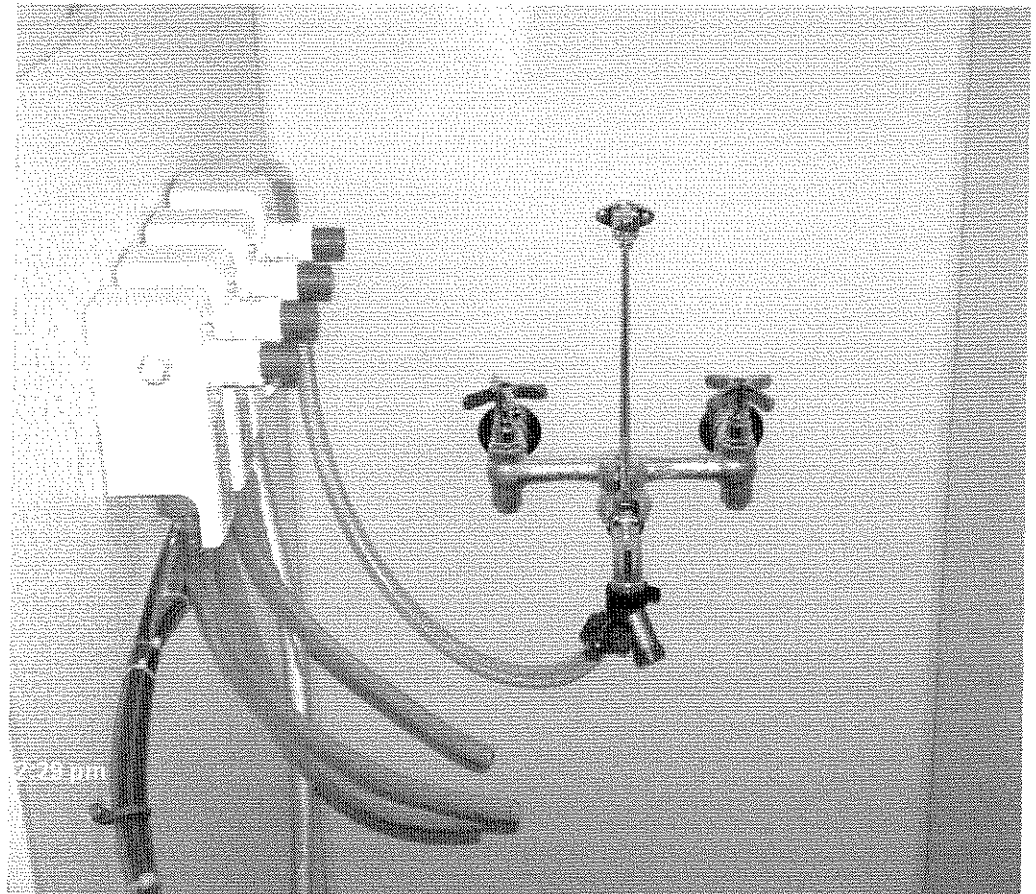
Pertinent Code Sections

- **608.16.7 Chemical dispensers.** Where chemical dispensers connect to the potable water distribution system, the water supply system shall be protected against backflow in accordance with section 608.13.1(air gap), 608.13.2(RPZ), 608.13.3(BPF w/intermediate atmospheric vent), 608.13.7(double check valves for continuous pressure), or 608.13.8(spill proof vacuum breakers ASSE 1056).
- **608.16.10 Coffee machines and noncarbonated beverage dispensers.** The water supply connection to coffee machines and noncarbonated beverage dispensers shall be protected against backflow by a backflow preventer conforming to ASSE 1022 or by an air gap.

Chemical Dispenser Code Violations At The Mop Sink

While there is an atmospheric vacuum breaker on the mop sink faucet, it will NOT protect in this installation because it is subject to full pressure due to the valves downstream. The water connection must be properly protected at the connection to the potable water.

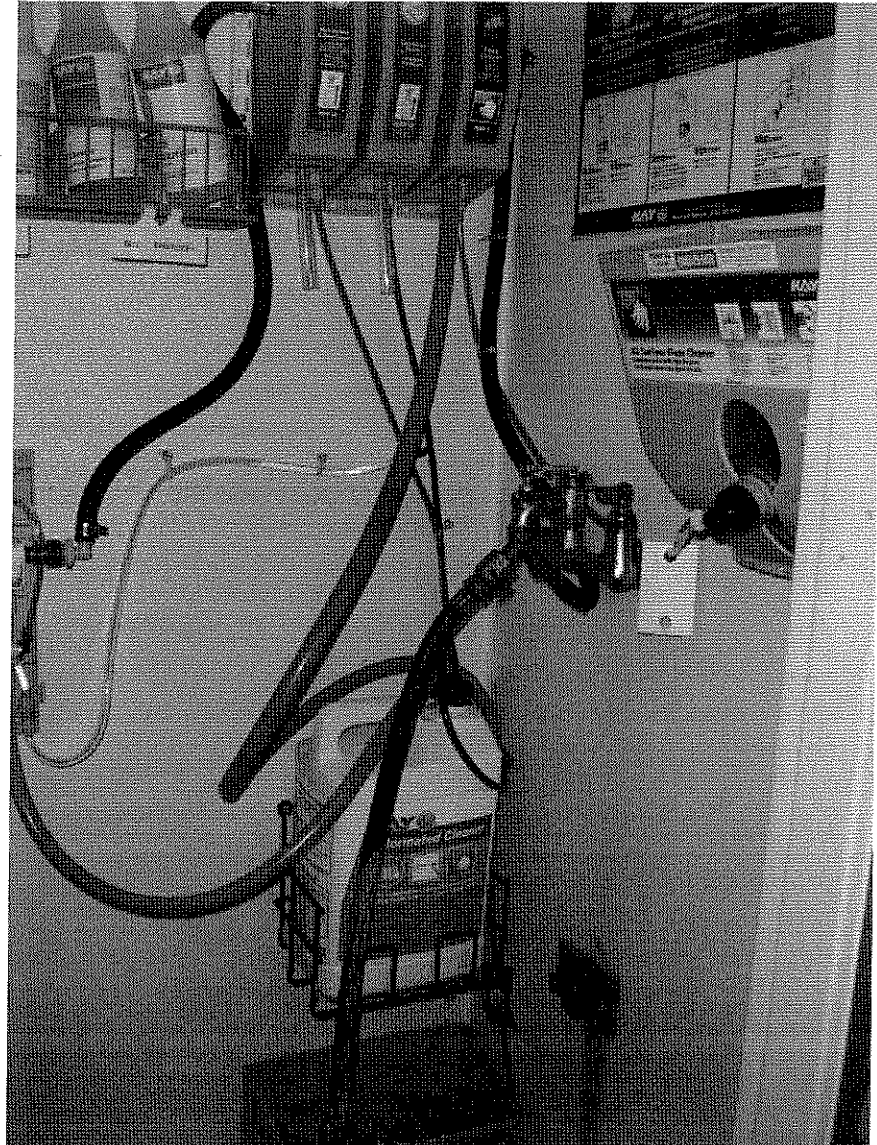
Incorrect Installation



Incorrect Installation

More plumbing code violations at the mop sink.

These systems have been installed this way for years. Efforts are being made to bring these installations into code compliance.



Code Compliant water supply to cleaning chemical dispenser.

In this installation a Reduced Pressure Zone (RPZ) backflow preventer is being utilized to provide protection to the potable water supply.

The RPZ is one of the more versatile protective devices. While costly, it is one of the most protective devices available.

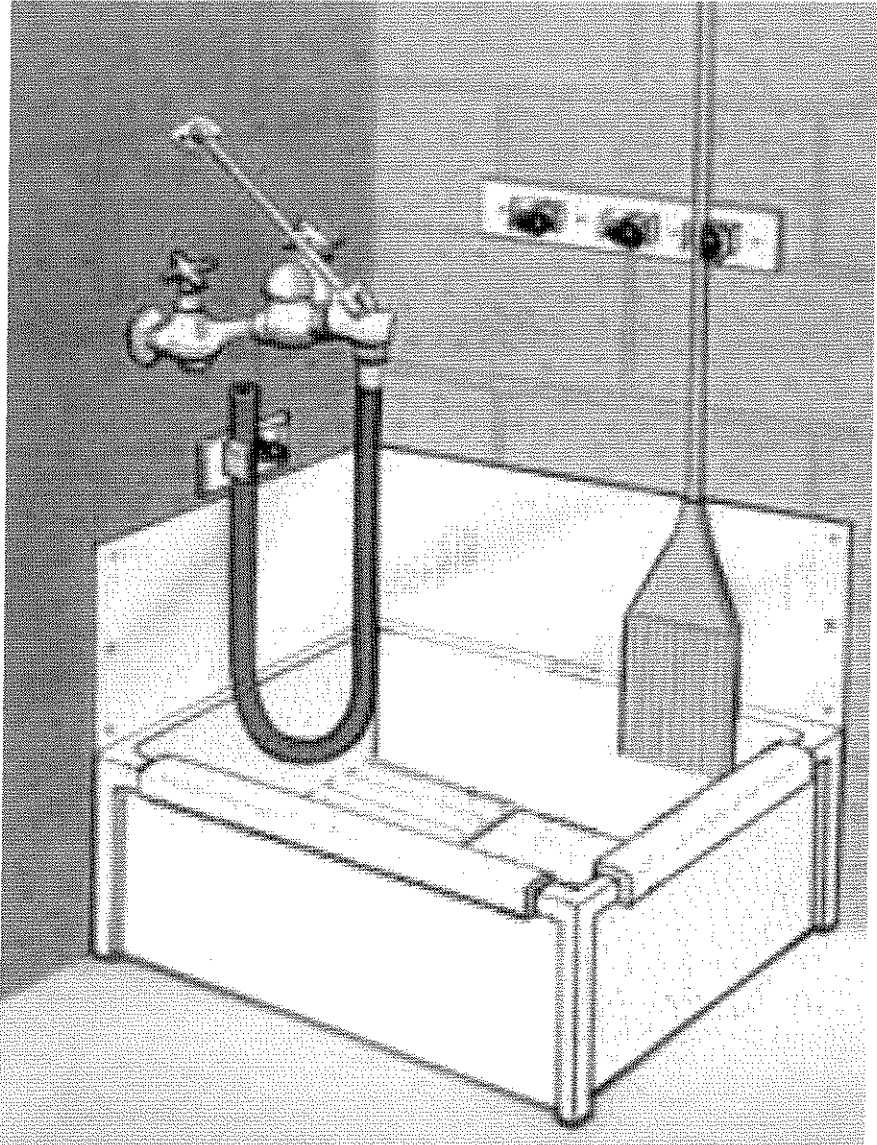
Correct Installation



Correct Installation

Mop basin faucet with atmospheric vacuum breaker in compliance.

Note that the mop basin faucet and it's atmospheric backflow preventer are being used as intended. The vacuum breaker is subjected only to atmospheric pressure as intended and the hose is open-ended causing only non-continuous pressure.



Incorrect Installation

Code violations at the 3-bay sink.

This connection has NO protection or backflow prevention device to protect the potable water.

Questionable fittings and piping do not comply with code requirements.

Connections to potable water and installations of backflow preventers should only be done by a licensed NH Plumber.

