Plumbing in Food Establishments

Health & Code Working Together

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Work Well with Others!

Together Everyone Achieves More!

- **Identify the *"Authority Having Jurisdiction"* immediately (aka Code Official)**
  - ***Building Official***
  - ***Fire Marshal***
  - ***City Manager***
  - ***Mayor***
- ***Go introduce yourself!***
  - ***Building Official***
  - ***Inspectors in your jurisdiction***
  - ***City Attorney***

Know Your Codes!

...or at least where to find them

- **Texas Food Establishment Rules (TFER) – *aka Texas Administrative Code***

  Title 25, Part 1, Chapter 228, Subchapter E, Rule 228.15 (a) A plumbing system and hoses conveying water shall be constructed and repaired with approved materials **according to the Plumbing Code.**

- **… Rule 228.146** (a) Approved system and cleanable fixtures. (1) A plumbing system shall be designed, constructed, and installed according to the Plumbing Code.[P]

- International Codes Online (IRC, IBC, IPMC, etc.)
  - Free Link to Codes: https://codes.iccsafe.org/
  - https://www.ci.independence.mo.us/userdocs/ComDev/2018%20INTL%20PLUMBING%20CODE.pdf

- Texas Constitution & Statutes
  http://www.statutes.legis.state.tx.us/

- ***Check your City Ordinances or State Law. Verify what Code Year you are under.***

Adopted Codes vary by State

- **Arkansas, Kansas, Nebraska, and Oklahoma** use the International Plumbing Code (IPC) established by the International Code Council. (ICC)
- **Iowa & Missouri have adopted the Uniform Plumbing Code (UPC)** developed by the International Association of Plumbing and Mechanical Officials.
- **Louisiana has adopted the Louisiana State Uniform Construction Code (LSUCC)** developed by the Louisiana State Uniform Construction Code Council .
- **Texas adopted both the Uniform Plumbing Code (UPC) AND the International Plumbing Code (IPC) .**

Internet Search Example
– What Plumbing Code has the state of Texas adopted?

2018 International Plumbing Code

SECTION 102
APPLICABILITY

[A] 102.1 General.

Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

[A] 102.2 Existing installations.

Plumbing systems lawfully in existence at the time of the adoption of this code shall be permitted to have their use and maintenance continued if the use, maintenance or repair is in accordance with the original design and hazard to life, health or property is not created by such plumbing system.

[A] 102.2.1 Existing buildings.

Additions, alterations, renovations or repairs related to building or structural issues shall be regulated by the *International Existing Building Code*.

[A] 102.3 Maintenance.

Plumbing systems, materials and appurtenances, both existing and new, and parts thereof, shall be maintained in proper operating condition in accordance with the original design in a safe and sanitary condition. Devices or safeguards required by this code shall be maintained in compliance with the edition of the code under which they were installed.

The owner or the owner's authorized agent shall be responsible for maintenance of plumbing systems. To determine compliance with this provision, the code official shall have the authority to require any plumbing system to be reinspected.

2018 International Plumbing Code (IPC)

[A] 102.9 Requirements not covered by code.

Any requirements necessary for the strength, stability or proper operation of an existing or proposed plumbing system, or for the public safety, health and general welfare, not specifically covered by this code shall be determined by the code official.

[A]**CODE OFFICIAL.** The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

[A]**APPROVED.** Acceptable to the code official.

2018 International Property Maintenance Code (IPMC)

Equipment must be installed per Manufacturer's Instructions.
--No Residential equipment for Commercial use.

[A] 102.5 Workmanship.

Repairs, maintenance work, alterations or installations that are caused directly or indirectly by the enforcement of this code shall be executed and installed in a *workmanlike* manner and installed in accordance with the manufacturer's instructions.

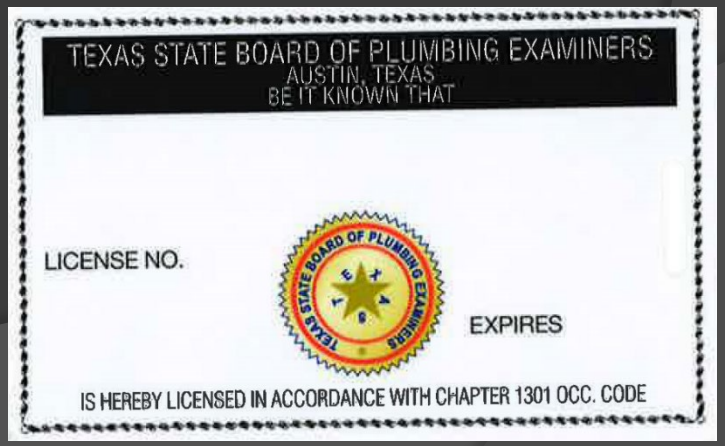
Inspections

- **Grandfathered in?… No such thing when it causes a hazard to life, health or property!!**
- **Always Err on the Side of Safety**
- **Manufacturer's Specifications - many installations refer to them. Double check them if there is any doubt.**

Plumbing Licenses

- **Texas State Board of Plumbing Examiners**
  4 Types of Licenses in Texas
  - *Apprentice is only a registration.*
  - Tradesman Plumber-Limited,
  - Journeyman Plumber
  - Master Plumber
  - Plumbing Inspector
- **You have the right to see their License card! Ask for it!**

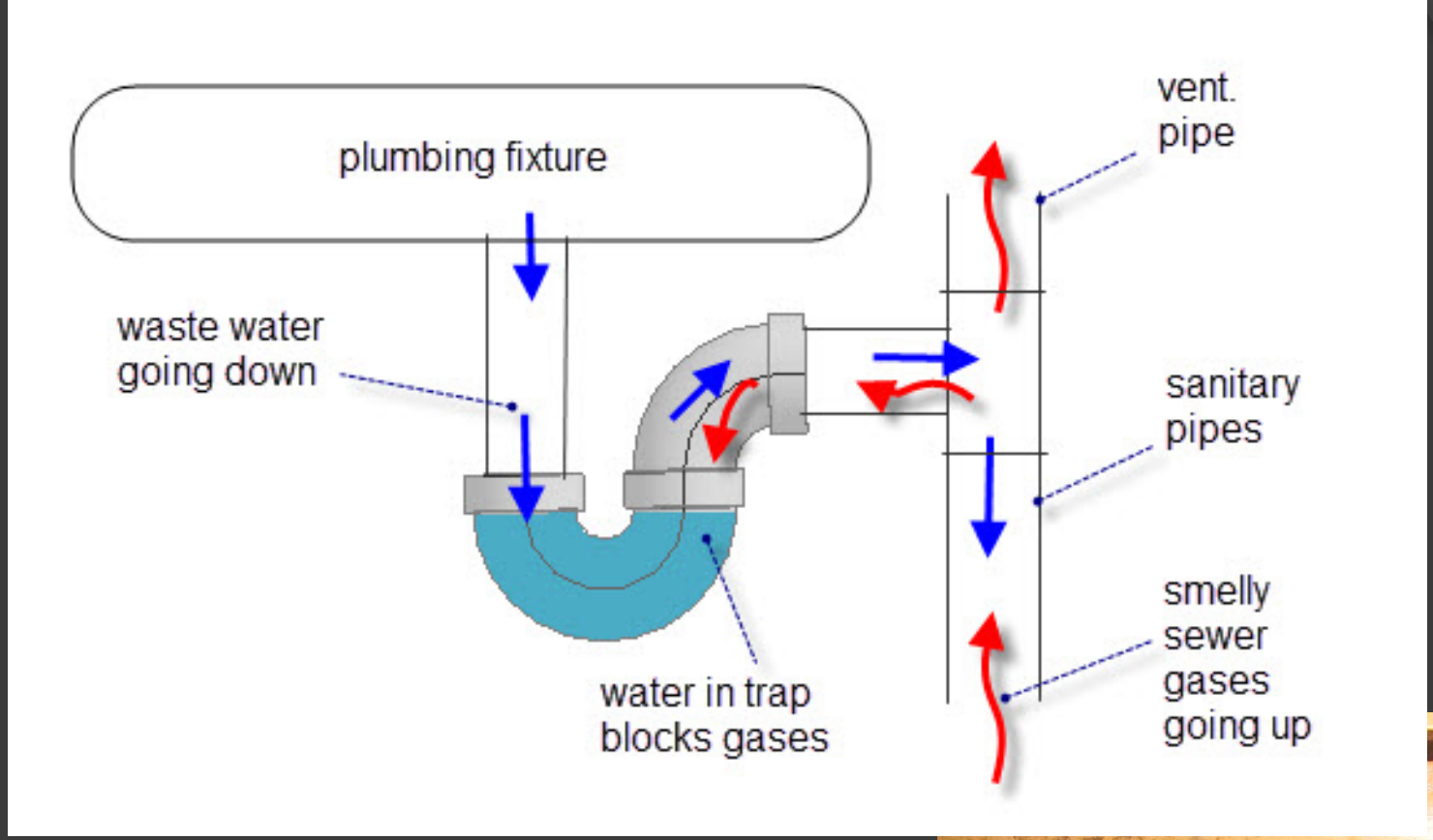
https://tsbpe.texas.gov/



Common Plumbing Concern

Bad Sewer Odor

- ***Dry P-Trap under floor drain***
- ***Grease Trap malfunctioning or not serviced regularly.***
  - ***Inspect when empty to see if all pipes are present, and in good working condition***


plumbing fixture
vent.
pipe
waste water
going down
sanitary
pipes
smelly
sewer
gases
going up
water in trap
blocks gases

APPENDIXF
RODENTPROOFING

SECTION F101
GENERAL

F101.1 General.

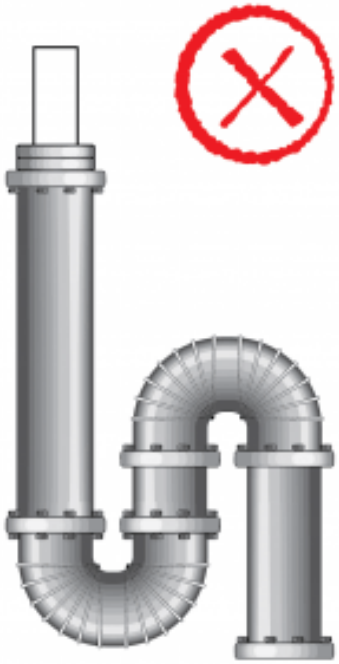
Buildings or structures and the walls enclosing habitable or occupiable rooms and spaces in which persons live, sleep or work, or in which feed, food or foodstuffs are stored, prepared, processed, served or sold, shall be constructed in accordance with the provisions of this section.

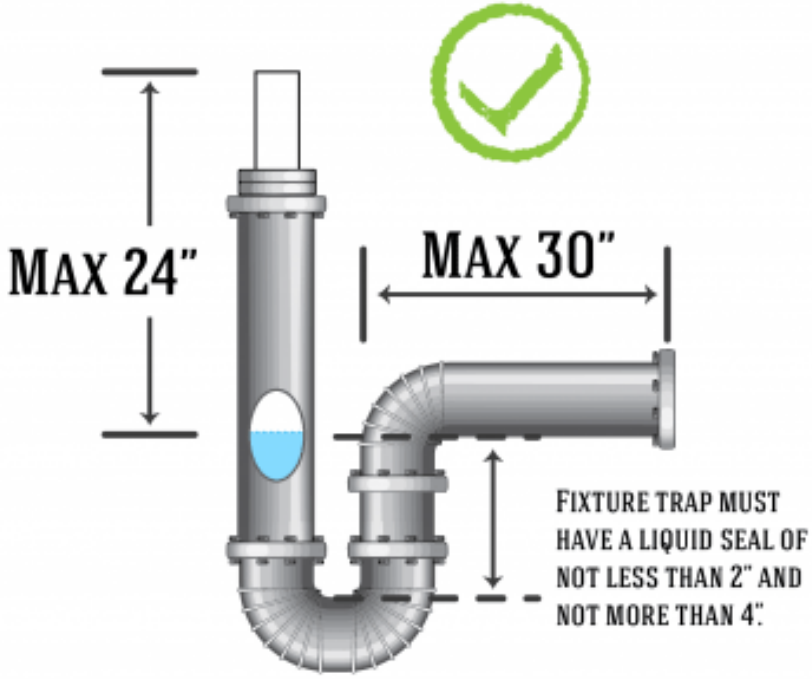
F101.3 Foundation and exterior wall sealing.

Annular spaces around pipes, electric cables, conduits or other openings in the walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or noncorrosive metal.

IPMC 304.14 Insect screens. Every door, window and other outside opening required for ventilation of habitable rooms, **food preparation areas**, **food service areas** or any areas where products to be included or utilized in food for human consumption are processed, manufactured, packaged or stored, shall be supplied with approved tightly fitting screens of not less than 16 mesh per inch (16 mesh per 25 mm) and every swinging door shall have a self-closing device in good working condition. Exception: Screens shall not be required where other approved means, such as air curtains or insect repellent fans, are employed.

S-TRAP VS. P-TRAP





S is for **STINKY**!!

P provides Perfect Protection

"Accordion Style" pipe is illegal. Pipe must be smooth piping that will not allow for clogs and debris buildup; must be "self-scouring." **IPC Section 1002.2** Design of traps. Fixture traps shall be self-scouring.

What is under a Floor Drain/Sink?

A P-Trap

Floor Drain Trap Primer

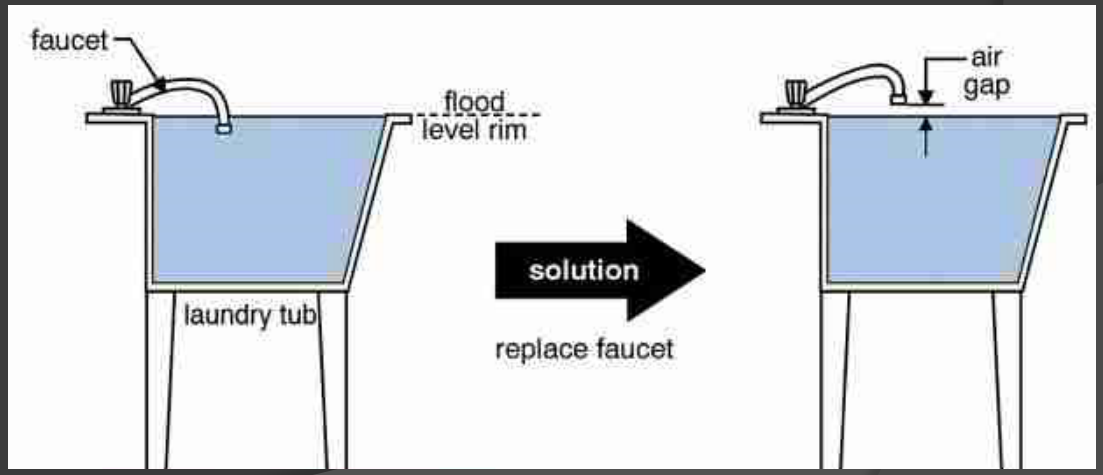
Easier Fix for older facilities


RINSE
SANITIZE

Cross Connections

- RULE §228.149 (b) Prohibiting a cross connection. (1) A person may not create a cross connection by connecting a pipe or conduit between the drinking water system and a nondrinking water system or a water system of unknown quality.

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 (see "Backflow").



Cross Connections

- Definition – any arrangement of pipes, fixture or fittings that allows connection, directly or indirectly, between potable water and any non potable source.
  - **Air gap** is the best protection – often overlooked in kitchens
  - Indirect waste pipes get stepped on or extended by someone to mitigate splashing
  - Hoses and spray wands at dish pits often are too long and reach below the flood rim of the fixture
  - Acceptable air gap is generally 2 times the pipe diameter at the discharge opening and not less than 1”, reference the appropriate local code
  - Most Common offenders – mop sinks, dish sinks, ice maker drains, chemical injectors

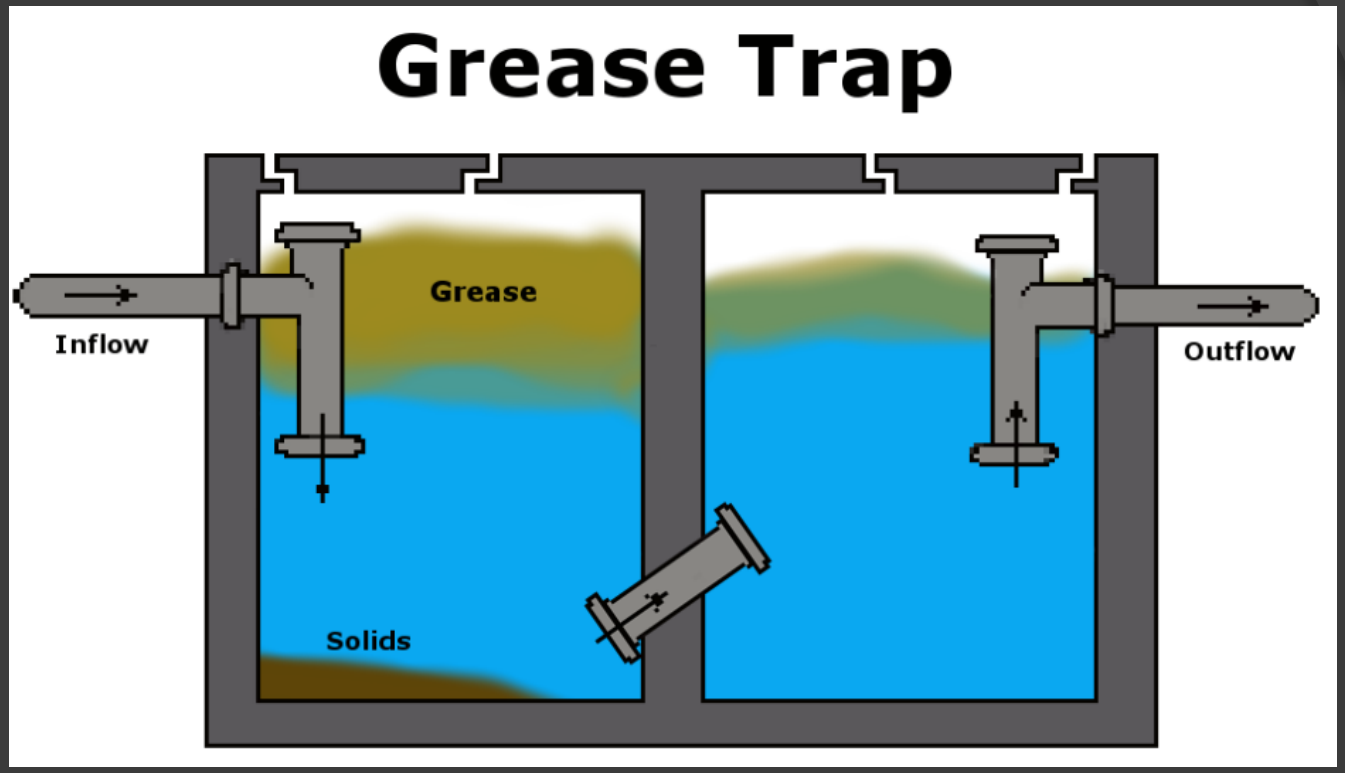
Grease Interceptors

- Use as part of a Fats, Oils and grease (f.o.g.) control program to prevent discharge of waste components that could cause sewer blockages
- Installed where required by local AHJ, typically restaurants, school kitchens, hospital and similar facilities
- Sized and located according to codes adopted by local AHJ
- Shall be readily accessible for inspection and maintenance
- Should only receive effluent from kitchen, dish room and related areas – toilet facilities or other human waste discharging fixtures shall not pass through grease interceptors

Grease Interceptors

- **Why do we need them?**

Grease Interceptors (aka Traps)




GOSLYN

What lines go through Grease Traps?

Per the International Plumbing Code

1003.3.1 Grease interceptors and automatic grease removal devices required.

A grease interceptor or automatic grease removal device 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, prerinse sinks; soup kettles or similar devices; wok stations; floor drains or sinks into which kettles are drained; automatic hood wash units and dishwashers without prerinse sinks. Grease interceptors and automatic grease removal devices shall receive waste only from fixtures and equipment that allow fats, oils or grease to be discharged. Where lack of space or other constraints prevent the installation or replacement of a grease interceptor, one or more grease interceptors shall be permitted to be installed on or above the floor and upstream of an existing grease interceptor.

1003.3.2 Food waste disposers restriction.

A food waste disposer shall not discharge to a grease interceptor.

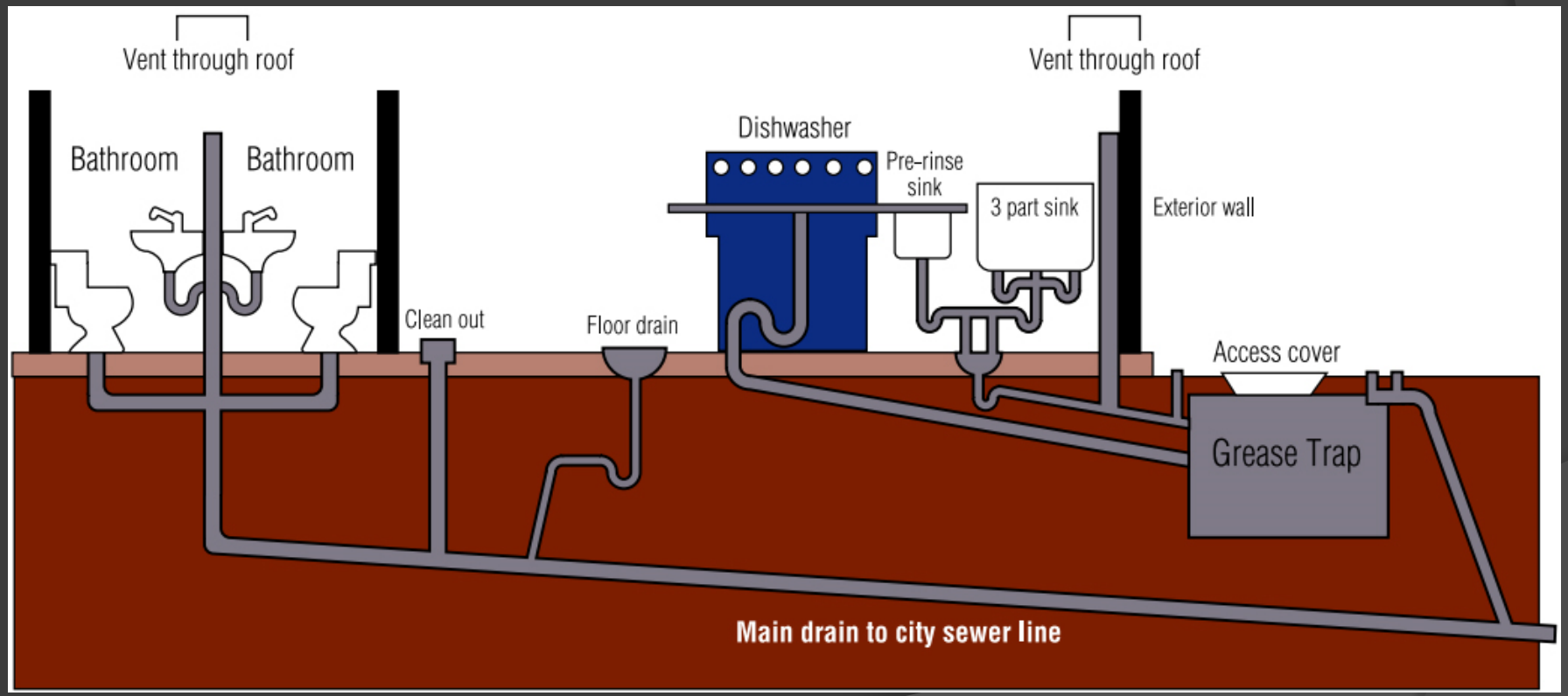
1003.3.3 Additives to grease interceptors.

Dispensing systems that dispense interceptor performance additives to grease interceptors shall not be installed except where such systems dispense microbes for the enhancement of aerobic bioremediation of grease and other organic material, or for inhibiting growth of pathogenic organisms by anaerobic methods. Such microbial dispensing systems shall be installed only where the grease interceptor manufacturer's instructions allow such systems and the systems conform to ASME A112.14.6. Systems that discharge emulsifiers, chemicals or enzymes to grease interceptors shall be prohibited.

Grease and Sanitary Sewer Lines

Under the Slab…

- ***There are 2 sets of plumbing lines.***
- ***The sanitary sewer goes straight to the Sewer Main.***
- ***The Grease Lines go through a grease trap/interceptor before connecting to Sanitary Sewer.***



- RULE §228.147 (c) (2) Toilets, urinals and showers may not be used as a service sink for the disposal of mop water and similar liquid waste.

Fats, Oils and Grease (FOG)

- The EPA estimates that at least 10,350-36,000 sanitary sewer overflows occur per year in the USA, with approximately 47% of the backups being grease-related.

- **What happens when fats, oils and grease are poured down the sink?**
  - When warm fats, oils, and grease are poured down the sink or flushed down the toilet they may not travel very far through your pipes before they begin to form large, nasty conglomerations with other debris and chemicals and stick to the walls of your pipes.

- **The results of FOG buildup in pipes include:**
  - Severe reduction in pipe flow capacity
  - Complete blockages
  - Slow drains
  - Sewage backups
  - Contact with disease carrying bacteria
  - Unnecessary costly repairs
  - Contamination of water sources

- Used cooking oil and grease is valuable.
  - Some restaurants and businesses choose to partner with state-licensed grease collection companies who provide free cooking oil and grease collection services in order to use it to make biodiesel.

This is NOT a Grease Trap!!!

Cooking Oil Storage Container

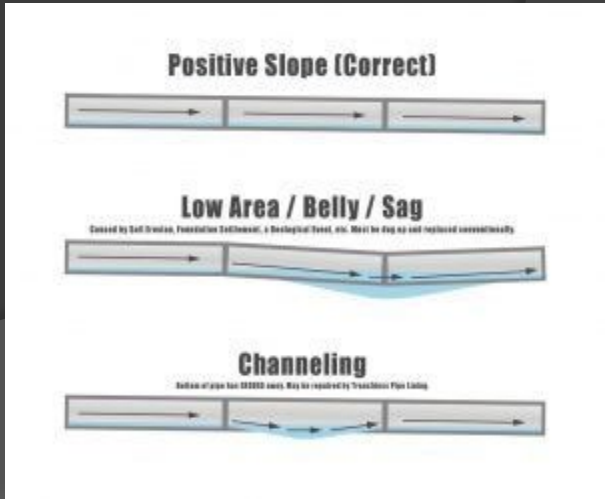
What NOT to Do to Alleviate FOG Buildup

Figure B – The bottom of this pipe has rotted away from long-term water flow and from chemical drain cleaners that were used to alleviate FOG buildup.

Figure C; shows the differences between positive slope piping versus Channeling.

In Figure B, the horizontal pipe's bottom is completely gone. This is called "channeling" and occurs when water flows over the bottom of the pipe over a long period of time.

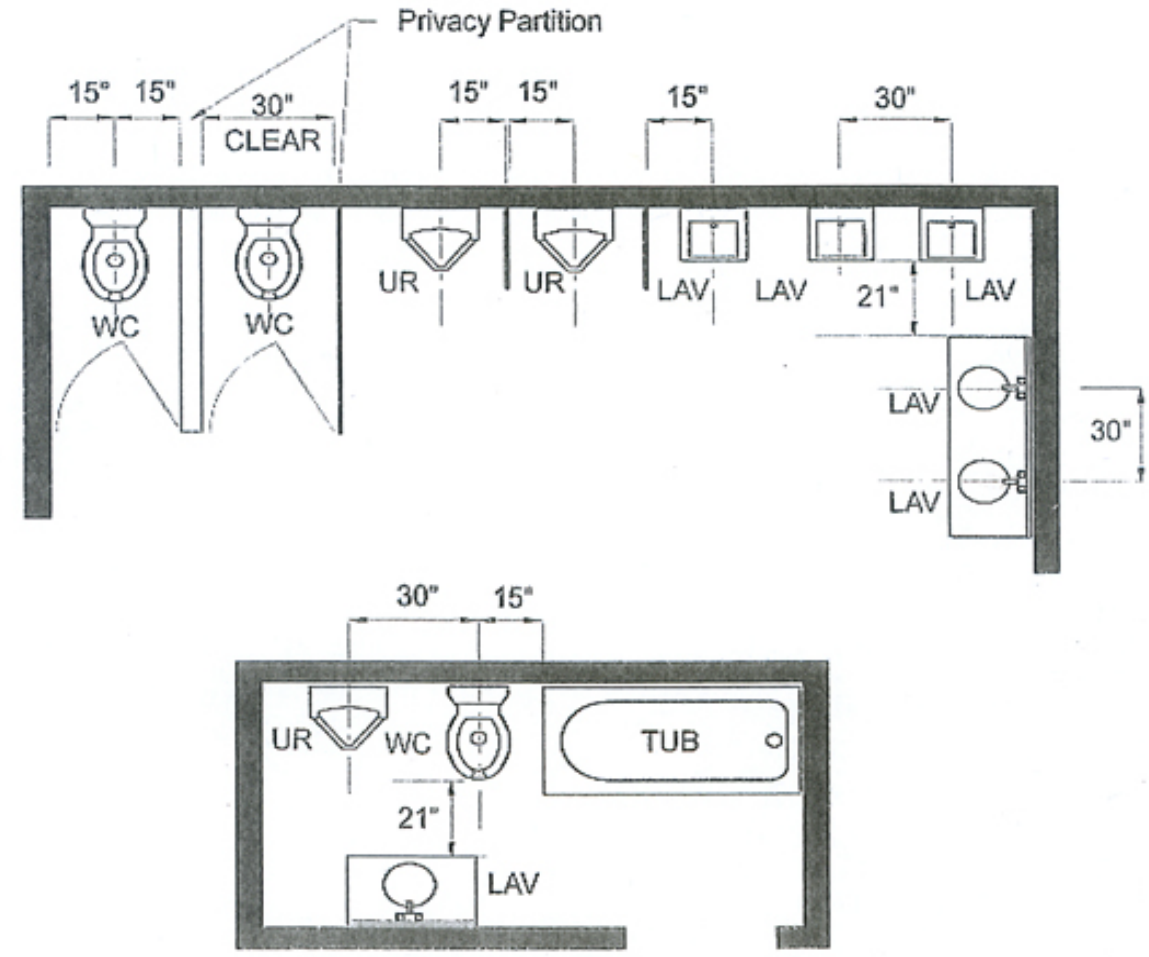
When slow drains become a problem due to the buildup of grease, individuals will pour chemical drain cleaners down the sink. **<u>This is one of the worst things that can be done</u>**. Chemical drain cleaners are highly corrosive and will accelerate corrosion.



Types of Pipes

- PVC pipe
  - plastic plumbing pipe primarily used to transport high pressured water.
  - only made to handle cold water, as hot water will cause the pipe to warp.
  - generally white in color, though a few varieties are gray.
- CPVC
  - is PVC pipe that has received an extra chlorination.
  - comes in a distinctive yellow color, and can handle both hot and cold water.
  - more flexible with substantially thinner walls than PVC pipe
  - has the same outer diameter as copper pipe, which increases it's range of uses.
- PEX pipe
  - also known as cross linked polyethylene pipe,
  - shares the same outer diameter as copper, and can be used for both hot and cold water
  - has a much higher heat resistance than most other plumbing pipe, and is often used in water-based heating systems.
  - comes in a creamy white color, as well as red and blue which is used to denote hot and cold pipes respectively.
- Copper
  - especially resistant to corrosion, and can withstand high temperatures.
  - come in three different sizes – type M, L, and K.
  - Type M has very thin walls, while type L is of medium thickness, and type K is the thickest of the three.
- Stainless steel pipe
  - less commonly used than other metal pipes, as it is more expensive and harder to find.
  - primarily used in marine environments because it can withstand salt water, which would erode most other metal pipes.
- Galvanized pipes
  - used in homes for years, typically to carry water in and out of the house.
  - galvanized coating prevents rusting, and gives a dull gray appearance.
  - Use is diminishing, as it is being replaced by PEX pipe, which is less expensive and just as durable.

Clearances



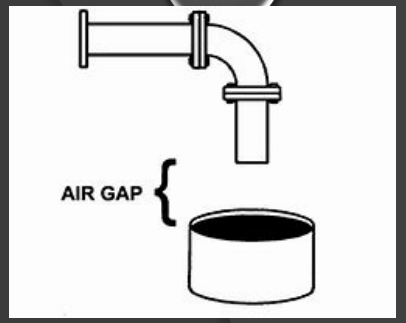
425.2 Water closets for public or employee toilet facilities.

Water closet bowls for *public* or employee toilet facilities shall be of the elongated type.

425.3 Water closet seats.

Water closets shall be equipped with seats of smooth, nonabsorbent material. Seats of water closets provided for *public* or employee toilet facilities shall be of the hinged open-front type. Integral water closet seats shall be of the same material as the fixture. Water closet seats shall be sized for the water closet bowl type.

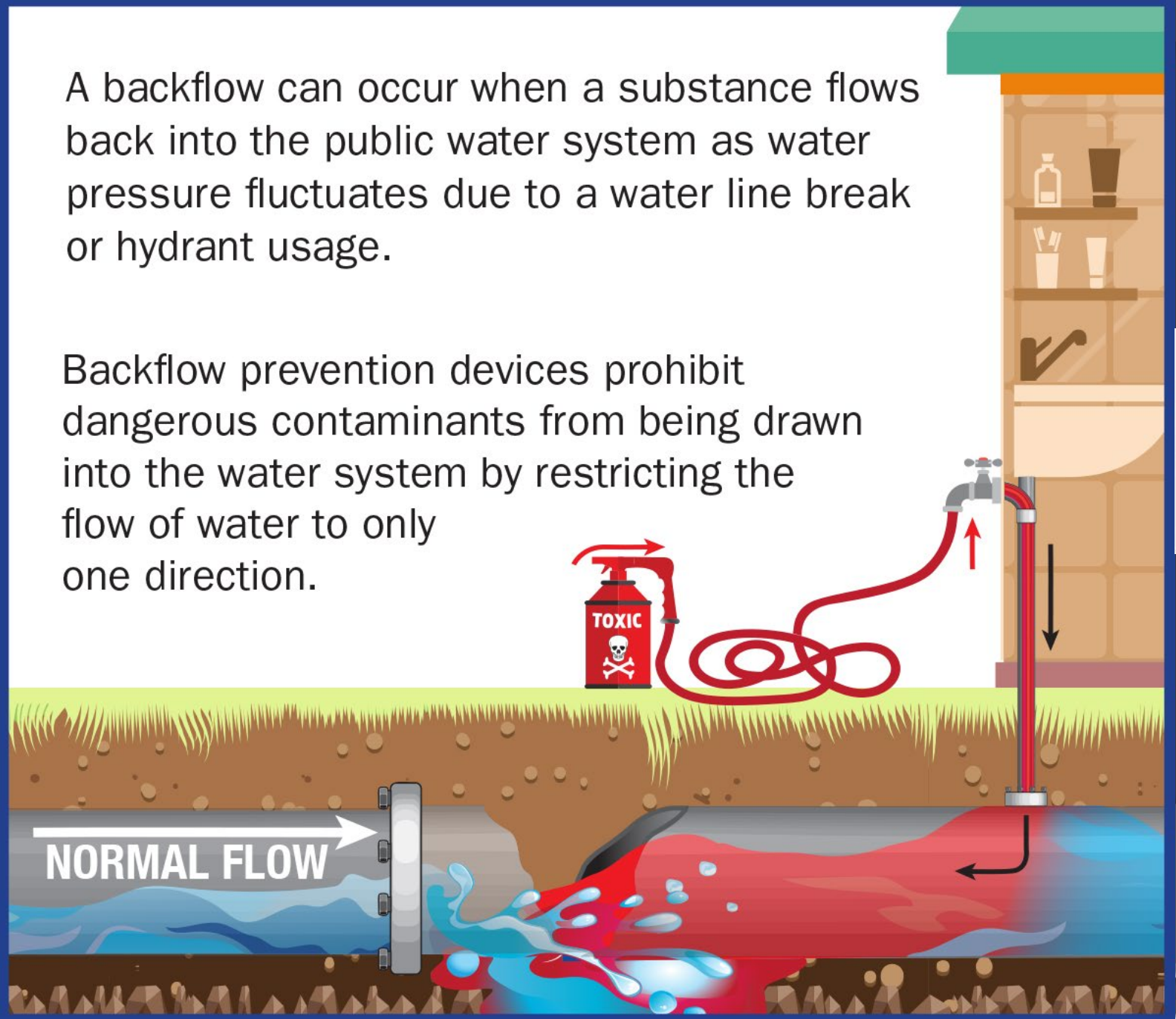
Backflow Prevention



- Air gap - is best, physical break between potable system and potential source of contamination. Simple but effective.
- Backflow Devices – untestable, effective when installed properly
  - Hose Bibb vacuum breaker, atmospheric vacuum breaker, certain check valve devices
  - Common issues to look for – device installed where an assembly is needed
- Backflow Assemblies – are testable
  - RPZ, dcva, and pvb are some examples
  - Chosen based on degree of hazard and design requirements
- In foodservice – pay close attention to the piping downstream of the backflow assembly serving a carbonated beverage machine, this piping must be constructed of materials not affected by carbon dioxide gas

A backflow can occur when a substance flows back into the public water system as water pressure fluctuates due to a water line break or hydrant usage.

Backflow prevention devices prohibit dangerous contaminants from being drawn into the water system by restricting the flow of water to only one direction.



Carbonated Beverage Machines
Copper Poisoning Hazard

The Issue

- Acidic liquids from beverage dispensers, such as carbonated liquids, can back up (backflow) into a copper water line or pipe.
- The acidic liquids can dissolve the copper, which can then get into the beverage.
- People can experience nausea, vomiting, diarrhea, and stomach cramps if they drink beverages poisoned with copper.

The Fix

Dual Check Valve with Intermediate Atmospheric Vent

•An ASSE Standard 1022 approved backflow prevention device has two check valves, with a vent between the valves.
•When there is no liquid flowing through the backflow preventer, both check valves remain closed.
•When the beverage dispenser is turned on, both check valves open to allow the liquid to flow through. The closed valves keep liquid or gas from flowing back through the machine.
•If the primary valve fails, the secondary valve remains closed and the leaking gas or liquid escapes through the vent between the valves.
•**Some devices are enclosed within the dispenser unit, while others are easily visible from the back of the dispenser.**

One example of an ASSE Standard 1022 approved backflow prevention device. Devices may vary in appearance. Devices should be labeled ASSE 1022.

Guidance for Restaurant Owners/Managers

- Ensure the backflow preventer is properly installed and maintained
- Regularly inspect the backflow prevention device vent for leakage or plugging
- Instruct staff to immediately report any leakage or plugging in the backflow prevention device
- Instruct staff to never plug the backflow prevention device, especially if it is leaking
- If the backflow prevention device is leaking or plugged, stop using the beverage dispenser immediately and replace the device
- Consider using a service contract that specifically includes regular replacement and/or maintenance of the backflow preventer

608.17.1.1 Carbonated beverage dispensers.

The water supply connection to each carbonated beverage dispenser 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 of the device and the piping downstream therefrom shall not be affected by carbon dioxide gas.


U.S.
CRAFTMASTER

Questions?

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THANK YOU FOR ALL THAT YOU DO!!