

# **DRAINS**

## **Basic Drain Systems**

All buildings, if built to U.S. Standard Plumbing Code have 3 drainage systems.

[Below are most common systems, there are many variances]

**Sanitary Sewer** – Takes water/sewage from the structure to the sewer main at the street.

**Storm Sewer** – Takes Rain water from gutters, driveway drains, roof drains and other external drainage to the Storm main at the street.

**Vent System** – Vents are required for all Sanitary Sewer systems, as they are closed systems and will not drain without being vented. [think water in a straw with your finger on one end], Storm Sewers do not require vents, and can often be used as a vent. Although there are some rare storm systems that have seperate vents. [you've probably seen the large upside down "J" pipes on some sidewalks before, many of those are vents]

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## **Drain Types**

There several different types of drains, the guide deals primarily with roof drains, but does have some information on other types.

Roof drains styles are:

**Primary** - Standard roof drain, available from the major manufacturers with a threaded side outlet.

**Overflow** - Same as standard with a waterdam system to control water on the roof, available from the major manufacturers with a threaded side outlet. Overflow drains are to be piped into a seperate drain line from the Primary. They only get used in heavy rains when water height on the roof reaches the level of the waterdam. There are several reasons engineers design these into buildings, but retaining water on the roof is a common insulating method in certain areas.

**Dual Outlet Drains**, Are usually No Hub drains with 2 outlets. They are a combination Primary drain and Overflow drain in a single drain. Only manufacturers currently making them are Zurn & Froet. [This is the only type of roof drain Froet makes].

**Scupper Drain**- Used at the perimeter of the roof.

**Promenade/Deck** - Used on decks and parking garages.

**Gutter/Cornice/Parapet Drain**- Smaller style drain usually used in gutters and tight areas.

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**Parapet Scupper Sleeve** - Basically a pipe that goes through the roof wall [also called the parapet] and acts as a downspout nozzle on the exterior of the wall. Not very common any more.

**Downspout Nozzle [often called a "Cow's Tongue"]** - Attaches to a pipe going through the parapet wall and drains into a downspout pipe.

**Insert Drain [Retro Drain]** - Aluminum, Copper, Stainless Steel and PVC. Fits directly into pipe. Attaches using a manufacturer supplied rubber expansion seal or O-Ring/Gasket. Available in regular, scupper and gutter drains. There is another style that use a simple push in system to connect, made by Modi, which is a PVC insert drain. It's really more of a temporary/emergency repair drain.

**Green Roof Drain** - Relatively new, basically a standard drain with a perforated stainless steel covering that allows it to be buried in dirt, used on roofs where they have gardens and grass for insulation. Becoming more common.

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## **Main Factors for Drains**

### **Material types:**

Cast Iron, Plastic, Bronze, Copper, Aluminum and Stainless Steel.  
Knowing type can help I.D. Bowl size and type [insert drain or standard].  
Most PVC drains are 8" [some 10"] bowls.

### **Outlet sizes:**

Outlet size 1-1/2" [floor drains], 2", 3", 4", 5", 6", 8", 10" & 12".  
Knowing outlet can also help I.D. Bowl size. 8" bowls are only 2-4"  
[there is one 6" Wade exception].

### **Bowl sizes:**

8", 10", 12" & 15" These are not exact, they can vary by fractions, and up to an inch or so, per manufacturer. Insert Drains Usually have 16"+ flanges, but most do not have an actual bowl [also called a sump].

### **Outlet types:**

**No Hub**, the most common and recommended for roof drains, uses a rubber coupling to connect.

**Threaded [IP]**, self descriptive.

**Inside Caulk**, a poured Lead Joint. Not very common any more, size availability may be limited.

**Push Lock Gasket / Neo Lock**, called different names per manufacturer. Attaches using a rubber gasket and pushing pipe into drain. Not recommended for roof drains by manufacturers and will void warranty. Primarily used for floor drains.

**Solvent Weld Joint [PVC Glue Joint]**, self descriptive.

For roof drains it is recommended to stub pipe out from drain and use a rubber coupling to allow for building expansion & contraction.

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**Insert Drain [Retro Drain]**, fits INTO pipe and uses a manufacturer supplied rubber expansion seal or O-ring/Gasket to create a connection.

**Copper Sweat**, uses a solder joint, copper or bronze only.

## **Domes/Tops**

Domes are also often called "Cages", "Bird Cages" or "Baskets". Available materials are: PVC, Cast Iron, Aluminum, Galvanized and Bronze. The major manufacturers have Stainless Steel, and Stainless Steel Perforated & Mesh covers for Green Drains. The major manufacturers also have Flush Grates/Tops for most of there standard drains. Promenade/Deck drains only have Flush Grates, and are usually square, the Flush Grates for standard drains are round to replace the dome.

## **Mounting Options**

There are several ways to mount a roof drain. Not all require a seperate device to secure the drain to the roof. Generally the person installing the drain needs to provide this information.

But standard methods are as follows:

**No mounting device** is often a concrete roof, or the roof has been built in a manner to accept the drain bowl. Threaded drains do not usually use one either, as the threads secure the drain.

**Topset Deckplate** is called different names by each manufacturer [Topset is Zurn]. It is a flat plate designed to bolt directly to the underside of the roof drain bowl or some are attached to the bowl with small clamps. It is the least expensive and most efficient way to mount a roof drain.

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**Underdeck Clamp**, is a clamp, or set of clamps, that attaches to the underside of the drain and draws it down tight to the deck. Usually when using just an Underdeck Clamp, it's a concrete roof, or roof was built to accept the drain bowl.

**Sump Receiver**, is a flat plate designed to accept the drain, similar to the Topset, but does not bolt to the bowl. Usually used in conjunction with an Underdeck Clamp. Otherwise drain will free float and become a potential leak spot. Some Sump Receivers have clips available separately, but they really don't secure the bowl and are pretty much an obsolete method.

**Sump Receiver & Underdeck Clamp**, Is a combination of the two above methods. Although still somewhat common, it is more expensive and time consuming than using a Topset Deckplate, which does both jobs.

Most of the major manufacturers offer many variations of the above that serve a variety of purposes, mostly to raise or lower the drain bowl for particular applications. Which can be done other ways too. [to follow].

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## **Common Options**

There are literally hundreds, if not thousands, of possible variations and options available from the major manufacturers.

The following are the most common:

**Internal or External Waterdam**, both serve the same function. They hold water on the roof until it reaches the height of the waterdam. This is used for an Overflow drain One goes under the dome, one goes outside of it. The internal range from 1-4" in height [1" increments] External are usually only made in 2" [most common height specified on jobs], though some manufacturers do make 3 & 4". They replace the regular drain ring that comes with the drain.

**Static Extension**, A solid ring that raises the height of the drain bowl. Usually to accommodate for insulation or concrete. There is normally a gasket between the extension and the bowl. They are mostly available in 1-4" [1" increments], but can be stacked.

**Adjustable Extension**, A mechanical extension that raises the height of the drain bowl. They have a minimum and maximum height and cannot be stacked on each other, but can be used with a Static Extension. [the Adjustable Extension usually goes on the drain first].

**Stainless Steel Perforated Extension**, Raises bowl height similar to a Static Extension, but is perforated to allow drainage between the finished roof and the drain bowl, yet prevent rocks and debris from getting into the drain. Green roofs and thick graveled roofs use these mostly. They come standard 1-4", but can be custom made to any height.

**Stainless Steel Perforated Gravel Guard**, Is a Perforated Stainless Steel ring that attaches around the existing drain ring that prevents rocks and debris from getting into the drain. It is standard at 4", but custom heights can be ordered. Used on Green & Graveled roofs.

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## **Manufacturers**

### **Current major manufacturers:**

**Froet** - Cast Iron Dual Outlet Drains [15" bowls]

**Josam** - All standard duty Cast Iron Drains [8,12 & 15" bowls]

**Jay R. Smith** - All standard duty Cast Iron Drains [8,12 & 15" bowls]

**Wade** - All standard duty Cast Iron Drains [8,12 & 15" bowls]

**Zurn** - All standard duty Cast Iron Drains [8,12 & 15" bowls]

### **Next Level [considered "light duty"]:**

**Mifab** - Most Drains, [8" & 15" bowls]

**Watts** - Most Drains, [8" & 15" bowls]

**Marathon** - PVC and Insert Drains, Copper Drains [8" & 16"+]

**Olympic** - Insert Drains & Aluminum non-Insert [16"+ bowl]

**Sioux Chief** - PVC & some Cast Iron [8" bowls]

**Plastic Oddities** - PVC [8" bowls]

**Portals Plus** - PVC & Insert Drains [8" & 16"+]

**Modi** - PVC Insert Drains

**Thunderbird** - Copper Drains

**Frank Pattern** - Cast Iron [8" bowl]

**Canplas** - PVC [8" bowls]

**Zurn Light Duty** - Cast Iron, PVC & Stainless Steel Insert Drain.