

HOW TO DESIGN YOUR BATHROOM PLUMBING





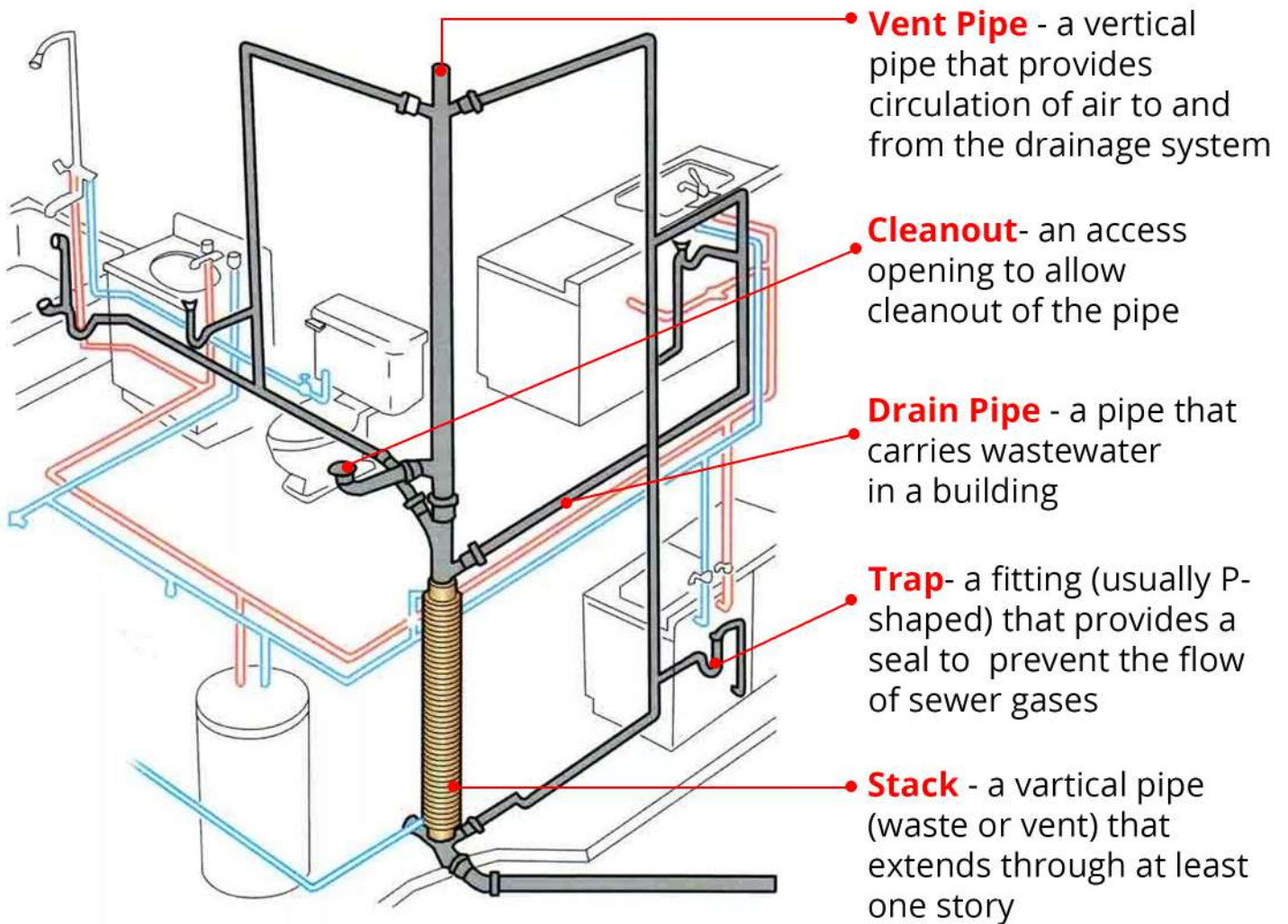
Bathroom plumbing is very important part of your bathroom functioning. Carefully designed and perfectly installed, it benefits you with many years of trouble free bathroom experience.

In this guide we will walk you through the intricacies of flawless bathroom plumbing design. This way we will hopefully help you to avoid many plumbing problems with your bathroom in future or make it possible to solve them easy and not damaging your bathroom design.



DESIGNING PLUMBING DRAINAGE

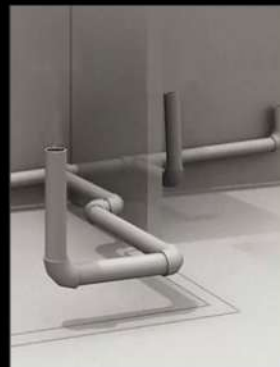
BASIC PRINCIPLES OF DESIGNING PLUMBING DRAINAGE



Keep the drain as short as possible



Avoid any bends in a drain pipe layout



Slope drain pipes properly

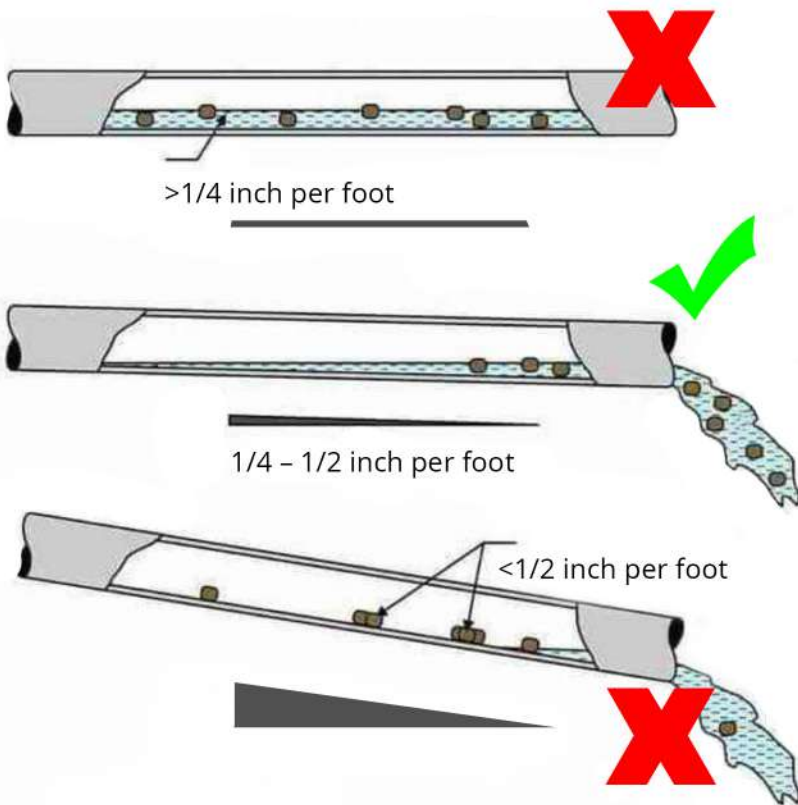


Use right sized drain pipes

DRAIN PIPE SLOPE

PLUMBING CODES

To design and install drain pipe route as a horizontal line is one of the biggest mistakes. Levelled drain pipe have no nature means to accomplish its task and rid you of sewage. Gravity is the powerful tool in plumbing, but it simply can't work with completely levelled drain pipe.



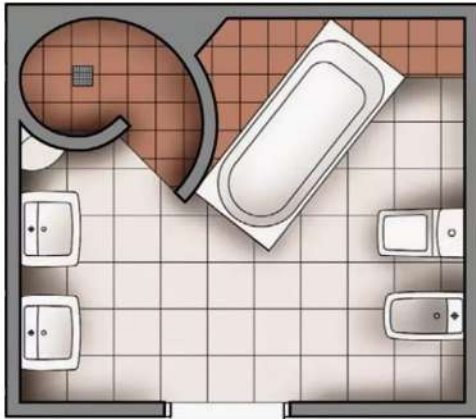
A DRAIN PIPE SHOULD BE SLOPED OR VERTICAL.

The normal slope here is 1/4 - 1/2 inch per foot. Usually slope of 1/4 inch per foot is considered to be enough as it enables water to drain down under the gravity and carry away all solids

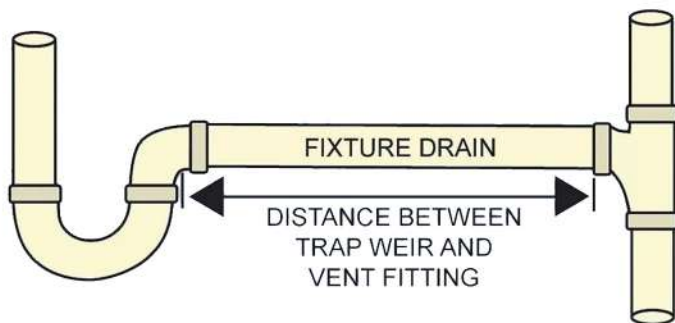
If the drain pipe slope is less than 1/4 inch per foot, the pipe keeps your sewage inside it and gets clogged

If the drain pipe slope is more than 1/2 inch per foot, water runs down too fast and doesn't carry solids away

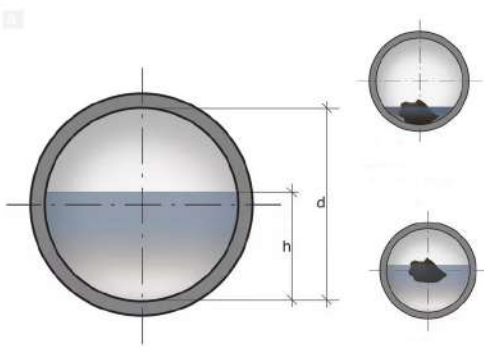
HOW TO CALCULATE THE SLOPE OF YOUR DRAIN PIPE



1 Plan the drain route



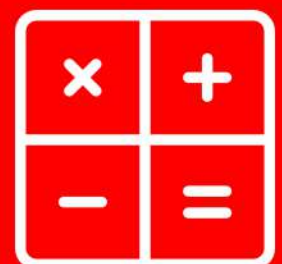
2 Measure the distance between the fixture P-trap and the waste stack



3 Multiply the desired slope ratio by the measured distance

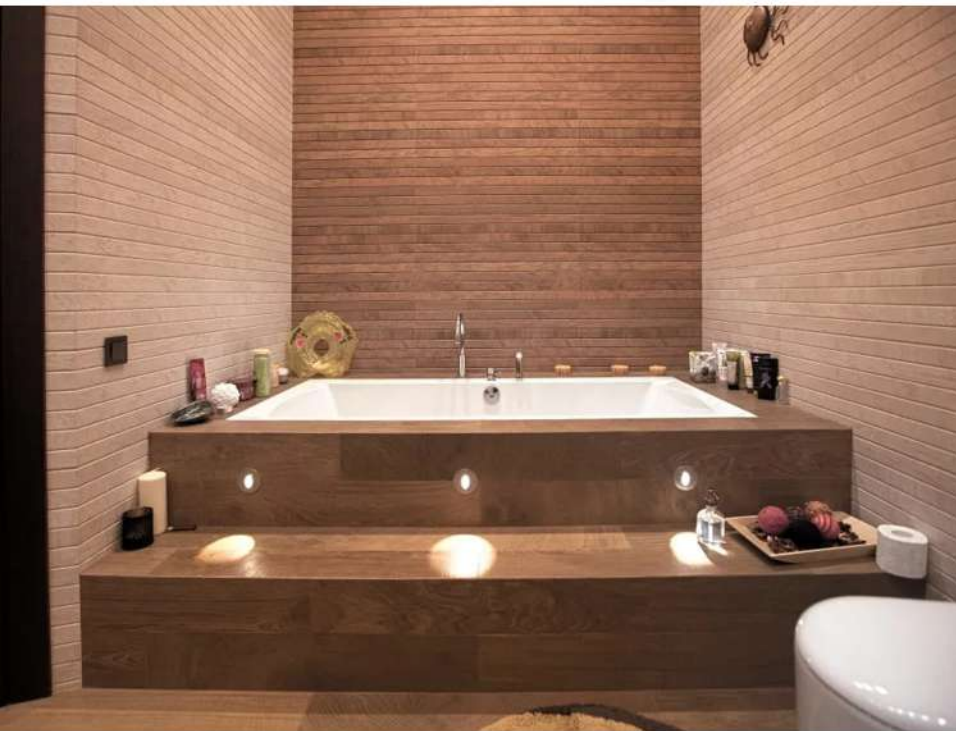
AN EXAMPLE OF THE DRAIN PIPE SLOPE CALCULATION:

The distance between the fixture trap and the waste stack is 5 feet. Then, the slope of your drain pipe should be $1\frac{1}{4}$ - $2\frac{1}{2}$ inch. To clarify, the connection of the drain pipe to the waste stack should be $1\frac{1}{4}$ - $2\frac{1}{2}$ inches lower than its connection to the trap.



WHAT IF I CAN'T GET RECOMMENDED SLOPE?

If your waste stack fitting is located the way you can't get the recommended slope, you have at least two options:

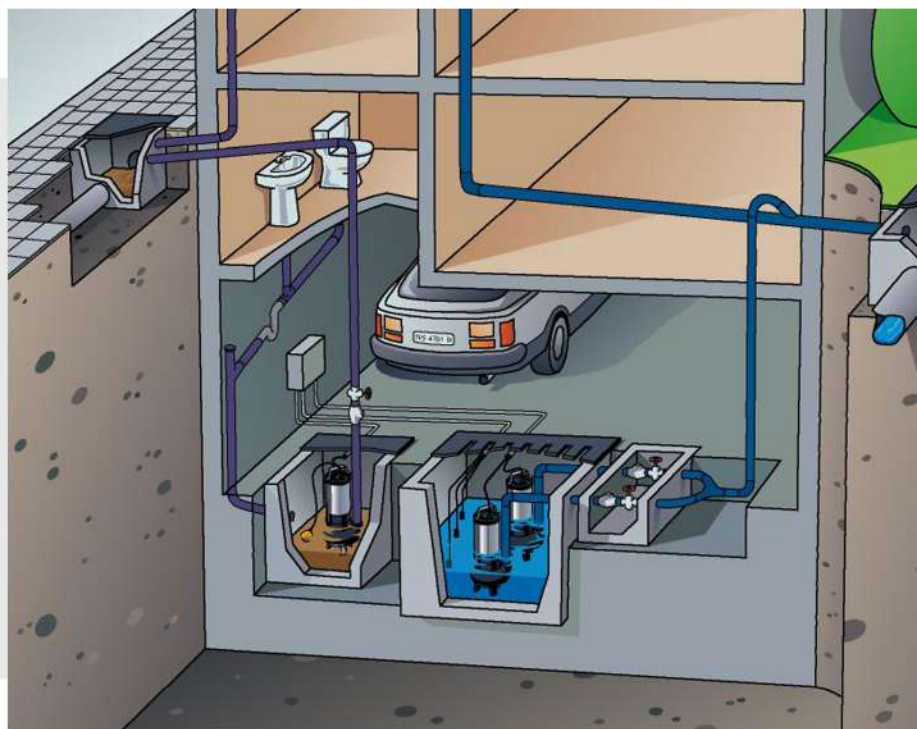


1

You can create an extra void by raising the floor or building a plinth to locate your shower, tube, or toilet. Thus, you will get the desired slope

2

You can use a sewage ejector pump to force your waste water, solids, and sewage goes out of your fixture to the city sewer lines. This is common for organizing drainage system in basements



DRAIN PIPE SIZE AND TYPE

WHY IT IS IMPORTANT

Selecting right sized drain pipes for your bathroom drainage system is crucial for its effective functioning.



If you use pipes of smaller diameter than necessary, your drainage system risks being insufficient:

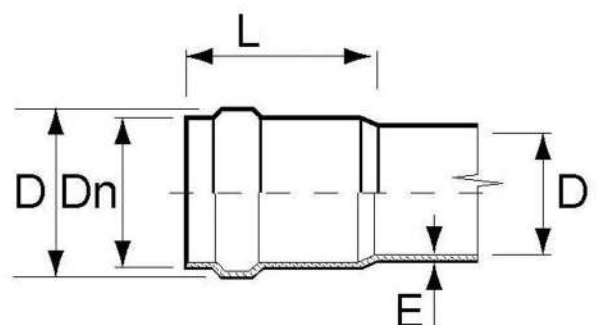


- It is slow to deliver waste water, solids, and sewage from your fixtures to the public sewer or septic tank
- It easily gets clogged with solids, hairs, and other debris

If you use pipes of larger diameter than necessary, your drainage system is also insufficient.



- In an oversized pipe water pressure is too low to flow away solids
- So, they pool inside the pipe to clog it, or cause an unpleasant smell

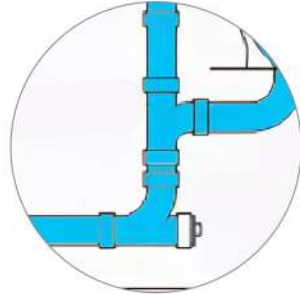


PLUMBING CODES

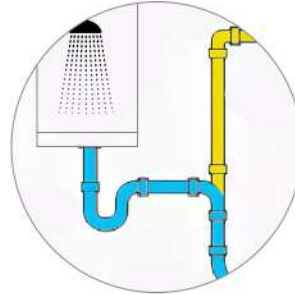
The recommended drain pipe diameter varies depending on the fixture it leads away from or to:



Soil pipe from a toilet - 4"



Primary drain pipe - 4"



Drain pipe from showers/baths - 2"



Drain pipe from hand basins - 1 1/4"



DRAIN PIPES: FLEX VS RIGID

In some cases, flex pipes are the best option to avoid leaks in the future.

We recommend installing a flex drain pipe when connecting your shower tray with the main drain. A flex pipe adjusts its position under your weight when you are taking a shower and stays intact while rigid pipe may split.

DESIGNING WATER PLUMBING



WHAT TYPE OF WATER SYSTEM HAVE YOU GOT?

Understanding the type of water system implemented in your home is essential for designing your bathroom plumbing. It determines:

Tap and shower types to install in your bathroom

Need and possibility of using a pump



DIRECT WATER SYSTEM

In direct water system you get cold water right from the rising mains and, typically, use combi boiler for your hot water needs. In other words, there is no any storage tank for cold or hot water.

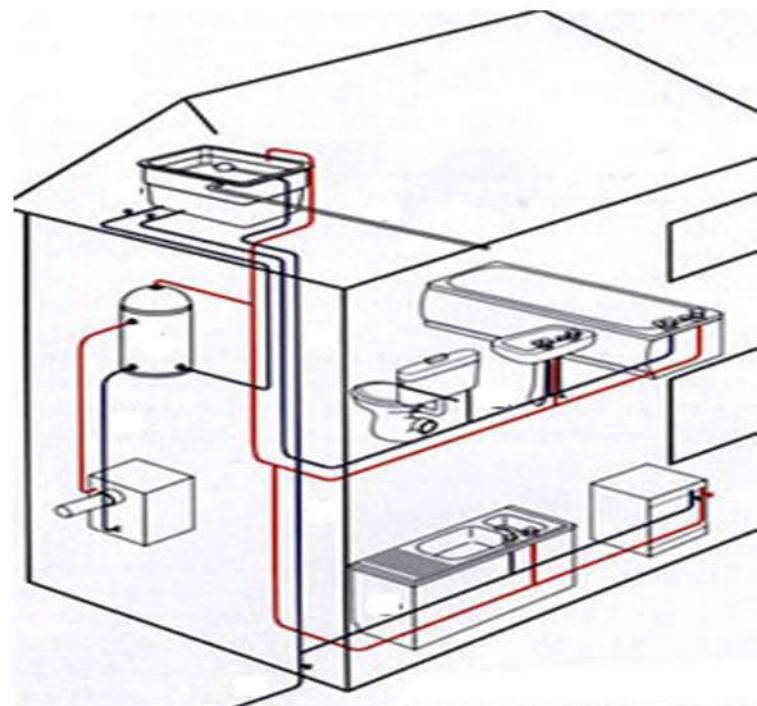
This system is also called as high pressure water system and is used in modern houses. In this case you can't (and don't need) to install a pump to create more pressure.

INDIRECT WATER SYSTEM

In direct water system some cold water comes to your kitchen taps directly but other part goes to a water storage tank. Hence, you get cold water for your washing needs from the tank.

This system is also called as **low pressure or gravity fed water system** and is most common in our country.

In this case you may need to install a pump to create more pressure. Usually, the pump is required if bathroom is not much lower than tank location or water pipes run too long distance from the tank to your bathroom facilities.



WATER PIPE SIZE

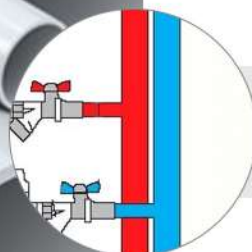
WHAT TYPE OF WATER SYSTEM HAVE YOU GOT?

Water pipes should be right sized. If you have got too small lines, you will suffer from reducing water pressure as the amount of water will be too

Typically, you need following pipe dimensions for your bathroom supply lines:



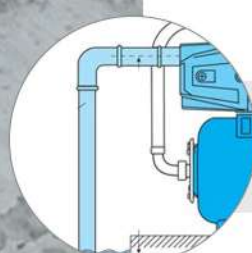
For a toilet, sink, shower, or tube - 1/2"



For a trunk water line - 3/4"



For a water heater (to and out of) - 3/4"



From a well pump to a pressure tank - 1"

PIPE ISOLATION AND ACCESS



Combine individual stop valves on every pipe with the master stops for you service lines. This way you will get possibility to isolate your pipes for future maintenance and repair needs.

Access panels are other things you need. Design they location so that you will have got easy access to your stop valves.



It is also wise to install access panels in places your pipes are likely to get clogged. This way you can get your pipes to repair or unclog them.