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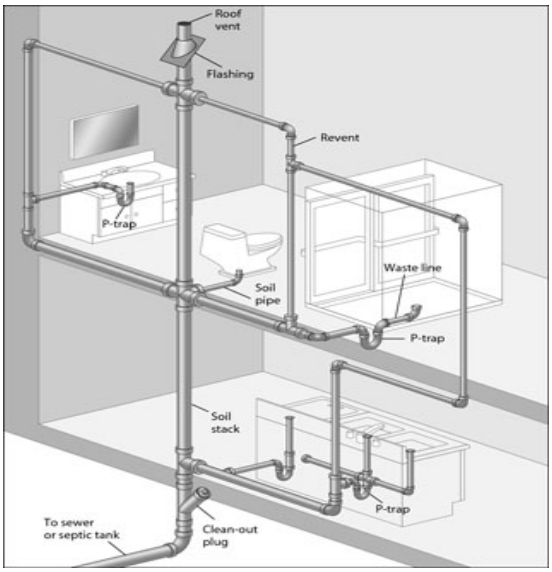
# How Does My Sewer Work?

*An informational sheet from Aqua Flow Plumbing*

In older homes each branch drains usually connect together on each level and then again in the basement of the home. At this junction the combination of drains is referred to as the **building (main) drain**. When the building drain exits the home, it is known as the **building sewer drain**. The building sewer pipe then leaves the property and connects to the municipal sanitary sewer line carrying the water and waste away from the home to be processed at the sanitation district.




## Tree Roots Grow

A common problem with older building sewer lines is tree roots. Tree roots grow into the joints and connections of older sewer pipe and once inside the pipe the water and waste products in the sewer allow the roots to grow at an accelerated rate. Every time you flush the toilet, you are feeding and watering the roots in your sewer line. As the roots grow larger they form a “dam” effect in the pipe so that any solids in the sewer cannot pass thru the pipe and clog the pipe preventing water from draining.

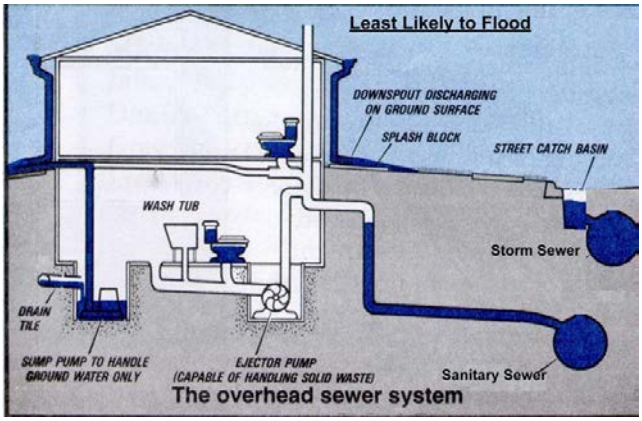

## Pipe Size Matters

Most older homes have sewer lines that are six inches in diameter. Most homes have an interior clean-out of either three or four inches in diameter which only allows a partial cleaning of the sewer line. A properly sized clean-out on the outside of the home allows full access to properly clean the sewer line and also keeps the mess outdoors when removing the roots. Having a full size outside clean-out is the first step in preventing sewage back-up in a home.

## Flood Prevention Options

When heavy rains flood the city sanitary sewer line the extra water that cannot pass thru the piping starts to fill the branch piping of all of the building sewer pipes until the water reaches each home. The water then spills out thru the lower drains and plumbing fixtures in homes, flooding the basements and crawl spaces with a combination of rainwater and sewage.

***Overhead Sewer*** The best solution to this problem is called the overhead sewer. To install an overhead sewer, the plumbing in the upper levels of the home are disconnected and a new building drain is installed thru the foundation wall to the outside. A new outside clean-out is installed and the new drain line is connected to the existing building sewer pipe. The remaining drain lines in the basement are then rerouted to an ejector basin. In the ejector basin either an ejector pump or grinder pump is installed to pump the waste water up to the new overhead building drain to leave the home. This can be a problem in homes that already have a finished basement



because to install an overhead sewer the floors and walls needs to be opened up to install the new plumbing pipes for the new overhead sewer system.

In homes where opening walls and floors is not an option, the next choice would be a complete flood control system.

***Flood Control System*** A basic flood control system includes the following:

- Backflow valve(s),
- Overflow tee
- Pump system with check valve
- New clean-out

To install this system the building sewer needs to be located in the yard and the piping needs to be dug up and exposed. Then a section of the existing sewer line is removed, an overflow tee is installed followed by a backwater valve(s) and then a new clean-out.

A sewage pit is installed next to the overflow tee with a sewage ejection pump. The drain line from the pump is then connected back into the sewer line past the backwater valve. A manhole is constructed around everything to allow access to the pump and valve to service the equipment. After inspection, the entire area is backfilled with dirt back to grade with a new steel lid on the top of the manhole. A new electric line needs to be installed in the manhole to power the pump system. A complete flood control system is the second best option in protecting a home against sewage back-up damage.

***Backwater Valve*** A backwater valve is an inexpensive alternative to a complete flood control system. A backwater valve functions by the use of a flapper or one way door that allows water to leave the home and prevents water from returning to the home in case of a municipal sanitary sewer line stoppage or back-up. Once a backwater valve is closed water will not enter a home, nor will it be able to leave until the valve is opened. Once a backwater valve is installed on a building sewer line the drain can no longer be cleaned due to the flapper in the valve so the addition of a clean-out before and after the valve is required during installation. If any solids that do not disintegrate or decompose quickly are flushed into the building drain there is the possibility they could be caught on the flapper of a backwater valve preventing it from closing 100 percent when the system is needed, for this reason a backwater valve needs to be accessible for maintenance.

Backwater valves can be installed inside or outside the home. Backwater valves come in several styles to accommodate different levels of cost and protection. If space is available in the basement, the ideal backwater valve will also include a manual shut-off in addition to the flapper. The handle is turned to force the flapper into the closed position to prevent any debris from allowing the flapper to close 100 percent.

If the building drain is too deep in the basement floor or if space is not available in the basement, an outdoor style backwater valve can be installed. This style valve has an additional riser attachment that allows the valve to be installed and removed from the surface.

## Flood Prevention System Maintenance

Every type of sewer back-up protection does require some form of maintenance to ensure the system will function properly when called upon. Any system that involves a pump of backwater valve should be checked at least once a year. Even with a sewer back-up prevention system water can still enter the home is a sump pump or battery back-up pump is not functioning or available.

## Other Flood Prevention Options

***Battery Back Up*** To keep your basement as dry as possible consider installing a battery back-up sump pump in addition to your sewer protection. Battery back-up pumps come in several different styles and options. There are also battery packs that are available to power your existing house powered sump pump should you lose power during a storm. It is important to consider the gallons per minute of discharge, battery life and cost when choosing a style of sump system.

**There is no perfect fit to every household and all factors should be considered before choosing a system.**