

# Your Building's Sewer Pipe



In *RainReady*<sup>SM</sup> communities, better water management means that homes, schools, and businesses are prepared for rain—whether too much or too little. RainReady programs keep residences secure and dry, services running, and rivers and lakes clean.

Sewer systems collect wastewater from inside our buildings and carry it to treatment facilities that are often many miles away. When functioning properly, both privately and publicly owned sewer pipes are inconspicuous to most people. When they fail, sewers can back up into homes, businesses, yards, and streets. They can also dump untreated sewage and polluted stormwater across the landscape, sometimes ending up in rivers, streams, and lakes.

Such flooding and pollution pose financial and health risks for entire communities, and they are often preventable. It is the responsibility of the property owner to maintain and repair the private sewer pipe that connects a building to the public main line under a street. By having your building sewer checked or encouraging your municipality to inspect building sewers throughout the community, you are helping to tackle a problem that can otherwise damage homes and communities with unwanted and unsafe water.



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## COMBINED SEWER SYSTEMS AND SEPARATE SEWER SYSTEMS

There are two main types of sewer systems: *combined* and *separate*. In combined systems, wastewater from inside buildings joins the stormwater that has landed on impermeable surfaces and been collected by storm drains, and both are carried in the same pipe to a treatment facility. If the capacity of these pipes is exceeded, which often occurs during large rain events, they overflow into nearby streams, rivers, and lakes. The health and ecological dangers of Combined Sewer Overflows (CSOs) make these systems undesirable, but they serve millions of people across the country (generally in older towns and cities), and they are expensive to divide into two separate systems.

In separate sewer systems, sanitary wastewater and stormwater have their own pipes. Sanitary wastewater collected from inside buildings is carried directly to a treatment facility, while the water collected by storm drains is discharged into nearby streams, rivers, and lakes. Although they are preferable to combined sewers, separate sewer systems are not without problems. For example, even though sanitary sewer pipes are designed to carry only sanitary wastewater, various malfunctions and illegal practices can cause them to exceed their intended capacity. This leads to hazardous, untreated sewage flowing backward into homes and other buildings or pouring out of manholes.

## PROBLEMS AND SOLUTIONS FOR YOUR BUILDING SEWER PIPE

If the capacity of your building's sewer pipe is exceeded or the pipe is blocked, it can back up and flood your home with untreated sewage. Even if your own building sewer doesn't back up and discharge sewage into your home, contributing too much water to the sanitary sewer system will increase the risk that your neighbors will experience backups. It's not uncommon for a significant proportion of building owners in a community to have problems with their building sewers, each contributing to the flooding of the others.

There are a few notable problems that can cause building sewers to malfunction.

**Sump pumps, foundation drains, or gutter downspouts** that are connected to your building sewer can allow excessive stormwater and groundwater to enter the pipe, often sending wastewater back into your building and possibly others. Although it was once common to connect these devices to sanitary sewer lines, doing so is generally illegal or discouraged nowadays, and all three should be disconnected. Discharges from sump pumps, foundation drains, and downspouts can be rerouted to storm sewers or backyards—ideally ones with rain gardens, rain barrels,

or underground cisterns designed to retain stormwater as it infiltrates into the soil.

**Roots, grease, tree roots, and other blockages** can obstruct the flow within a building sewer pipe and create pressure that sends the wastewater back into the building. A skilled plumber can use a video camera to examine your pipes and ensure that they are free of blockages. If tree roots are obstructing your pipes, the plumber can destroy them mechanically, or you can use chemical root destroyer to kill them.



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**Cracks and leaks** in a building sewer can allow groundwater to enter and exceed the sewer's capacity, sending wastewater back into the building and possibly others. Since sanitary sewer systems are generally designed to handle only wastewater, the addition of any stormwater or groundwater can exceed the capacity of the sewer lines. A skilled plumber can use a video camera to locate cracks and leaks and recommend further action to correct the problem.

### OTHER OPTIONS FOR PREVENTING SEWER BACKUPS

In addition to having your building sewer checked, there are many other technologies available for protecting your building from problems caused by sewer backups. Some will work better than others for your situation, so it's important to research the costs and benefits of each. Here are a few examples:

**Floor drain plugs** are cheap, easily installed, and may effectively prevent sewage backflow through the floor drain, which is generally a building's lowest opening to the sewer system. However, if they are not removed in time, floor drain plugs can also prevent floodwater from leaving a building through the floor drain since they stop water from flowing in either direction. Furthermore, they do not prevent sewage backflow from entering buildings through their next lowest openings, such as bathtub drains.

**Standpipes** are inexpensive, open-ended pipes that are inserted into the floor drain with a water-tight seal. They can hold sanitary sewer backflow water that rises above the level of the drain in order to prevent flooding. Unlike drain plugs, standpipes equalize water pressure above and below the drain, which minimizes the possibility of foundation cracking. Unfortunately, standpipes often do not have enough capacity to prevent major backups.

**Overhead sewers** are an effective but more costly option for homes with bathroom or laundry plumbing that is below the flood level (e.g., in a basement). An ejector pump, which appears and acts much like a sump pump, is installed in the floor below the flood level. It receives wastewater from the basement toilet and pushes it upwards through a pipe that meets with wastewater draining from higher levels of the building. Due to the force of gravity, the building sewer then drains all of the building's wastewater downwards to the municipal sewer pipe, effectively reducing the risk of backups.

**Backwater valves** are one-way flaps installed within your building sewer that automatically close during backup events and prevent any wastewater from re-entering your building through the pipe. They can be either installed from inside your building or through a temporary hole that is dug in your lawn to reach the pipe. Backwater valves require regular maintenance to ensure that they are working properly and are free from the buildup of debris that may clog them.

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