HOMEOWNER REPAIR GUIDE

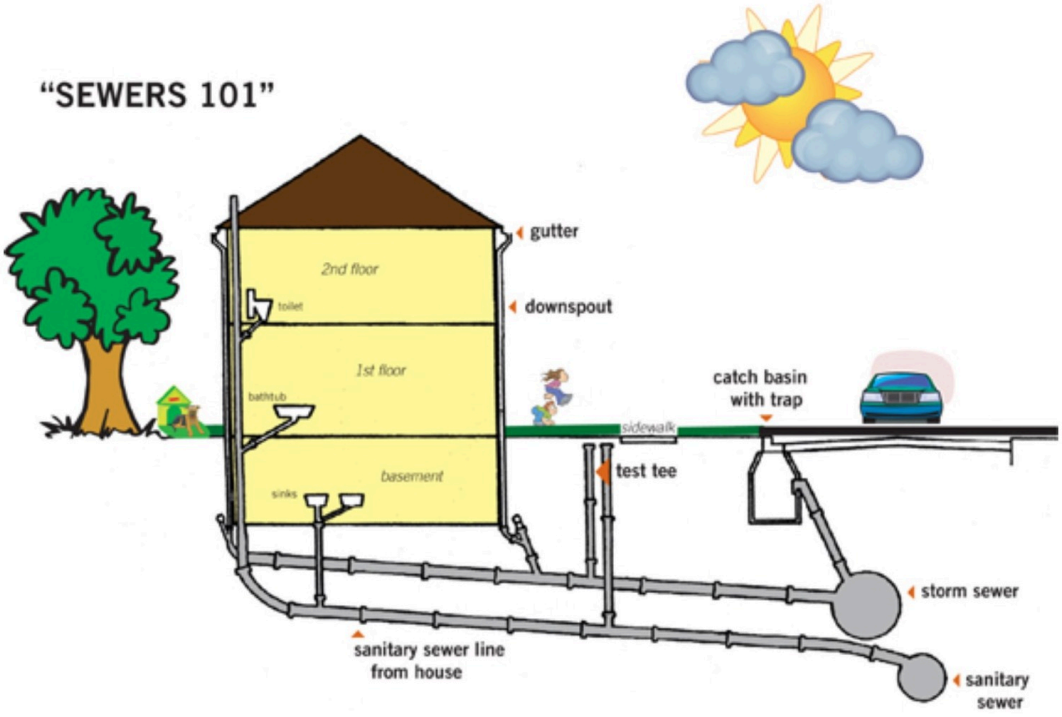
FOOTER DRAINS

And your storm sewer system

If you like to dig, replacing downspout or footer drains is the hobby for you. These drains form your storm sewer, the system of drain pipes buried around the perimeter of your house. They are designed (at least in theory) to carry ground water away from your foundation and basement walls, so you can have a relatively dry basement.

HOW THE SYSTEM WORKS

Traditionally, a storm sewer consists of a series of 4-ft. long clay pipes, 4” in diameter, laid end-to-end in a bed of gravel and slanting about 1/4” per foot. Footer drains encircle your home at the level of your basement floor or slightly below it. They slope from the high point at the back of your house toward the front, where the pipes running along either side of the house meet and extend out to the street. There, they eventually connect with the main storm sewer under the pavement. Along the way, your downspout drains (which also surround the house, but higher up along your basement wall) and driveway drain usually connect into this system.

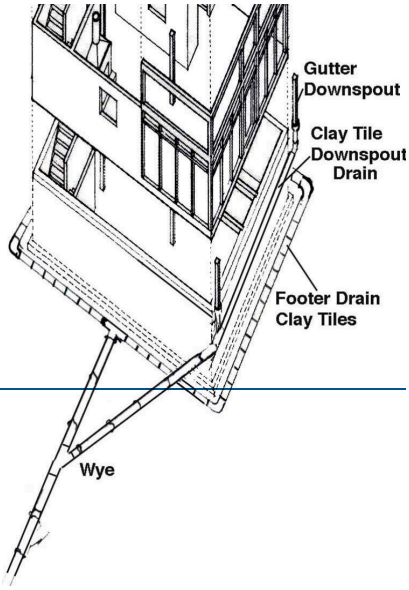


Sewers 101: downspouts and footer drains feed the storm sewer; fixtures inside the house feed the sanitary sewer

WHEN THINGS GO WRONG

It would be easier to list what goes right with this system than what goes wrong. When it is working right, you don't even know it is there; when it is malfunctioning, however, the water that seeps down to the storm sewer can't be carried away from the house. So, it seeks other places to go—usually through the foundation walls into your basement. If a footer drain is not working properly, water will usually seep into your basement at the foot of the wall. If the problem is a downspout drain, the seepage will appear higher on the wall, but below the outside grade level.

What can keep your storm drains from working properly? Pipes can break during the heaving of the ground in the winter. (The pipes may even have broken when the dirt was filled in, back at the time of original construction.) Tree roots can block the pipe; since the pipes simply lie end-to-end in the ground, roots can penetrate between them, or through any small cracks in the tile. Pipes can become blocked from leaves or other debris washing down from the gutters or driveway drains. Dirt that has sifted down over the years may have packed the pipes.



Footer drain and downspout drain clay tiles meeting at a wye

MAINTENANCE

Maintenance is cheaper than replacement. It usually consists of keeping gutters free of leaves; putting a root killer such as Root-X (a brand of copper sulfate) into your downspouts and/or driveway drain four times a year to prevent roots from blocking the pipes; and using a sewer snake to keep the lines clear or to open clogged drain lines.

REPLACING A DRAIN

Replacement is a last alternative, but one you'll need to undertake if the drain cannot be cleared with a snake.

> **PERMIT**
> This is usually a permit job, so be sure to check with your Building Department about their requirements.

1 LOCATE UTILITY LINES

Before you start to dig, locate the gas, water, and underground electric lines that come through the foundation. You must take care to keep from cutting through them.

2 FIND THE PROBLEM SECTION

Then, if possible, locate the part of the sewer line that needs replacement—usually through the process of elimination. If, for example, you put a garden hose in the front downspouts at full blast for ten minutes or so, and no water backs up, then you are probably clear from that point to the street. But, if water backs up quickly from a hose inserted into a rear downspout, then your problem is probably in the downspout drain between the rear downspout and the front one that was clear.

3 EXPOSE THE DRAIN

Once you have located the problem area, dig down and expose that drain. After the pipe is exposed, try running a snake through it again. (You may have better luck with the snake operating in a straight line.) Even if the snake doesn't clear the pipe, you can use the snake cable to determine where the blockage is. Push the cable in until you reach the blockage, and mark that point on the exposed cable with tape. Then, pull the cable out, lay it on top of the ground, and use it to measure to the point you'll need to dig down to the clogged pipe.

4 REPLACE AND TEST

When you have the drain exposed, you can remove the broken or clogged pieces. It's usually easier to replace them with plastic pipe, using "no-hub" rubber adapters to connect the plastic to the clay pipe. You'll want to leave the hole open for one or two good rains, just to make sure the drain is working. When you are sure the system is operating properly, bury the pipe in gravel (to about two feet above the pipe); then, fill in dirt on top.

TRENCH SAFETY

When working below the ground, there's always a safety issue—the possibility that the trench may collapse on you. To minimize the risk, pile the dirt you dig two feet or more away from the edge. If the trench is longer than four feet, you should have a ladder every 4 feet. If the ground is at all unstable, shore it up with upright 2 x 10's lining the walls and braced in between with 4 x 4 beams to hold back the sides.

Nevertheless, if you take the proper precautions and don't mind hard labor, you can save thousands by doing this job yourself, rather than hiring someone else.

Home Repair Resource center

Home Repair Resource Center empowers homeowners to maintain their homes for sustainable and diverse communities.

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