

# Plugging Home Drains to Prevent Sewage Backup

Prepare early. For homes in areas of the country prone to flooding or heavy rain, taking a few steps to prepare for water levels that could result in sewage backing up into a home makes sense.

## WHY PLUG DRAINS

For homes in areas of the country prone to flooding or heavy rain, taking a few steps to prepare for water levels that could result in sewage backing up into a home makes sense.

Sewage can enter a home in a number of ways:

- Sewage can flow back into homes if community treatment plants are flooded or even part of the sanitary sewer system is flooded.
- In locations where the storm water and sewer systems are connected, rapid and excessive storm drainage can cause water and sewage to back up into your home. Check with your city officials to determine if your sewage system is connected to storm sewers.
- Septic systems in rural homes can back up into the home if the system is covered by water.

To reduce the possibility of sewage backing into a home, homeowners will need to seal areas where sewage can flow in during periods of excessive rains or flooding. Sewage not only can damage building components and carpeting, it also has high concentrations of bacteria, protozoans and other pathogens that can pose serious health risks. Water will seek the lowest level, so if the level of sewage or floodwater is higher than the drains in the home, such as those in the basement, a backup can occur.

## PERMANENT PROTECTION

Many new homes are constructed with backflow or backwater check valves in the main sewer line that reduce the potential for sewage backup into the home. The check valves contain a flapper that allows flow in only one direction. Check valves should be inspected annually to make sure they are free of debris and working properly. If your home has a backwater check valve, the point to access it usually is found in the floor near the main sewage cleanout. **(Figure 1)**



*Figure 1. Backwater check valve.*

Occasionally, slice or knife valves are installed in homes. The valves generally are accessed through a holdout in the basement floor and can be turned off and on easily in the event of flooding or sewage backup. Once closed, a slice valve will not allow sewage flow in either direction, so toilets and water cannot be used in the home. **(Figure 2)**



*Figure 2. Knife valve.*

A backwater valve can be installed in an existing home. Have a licensed contractor install an interior or exterior backwater check valve in your sewage system. If you do not have a backwater valve, plugs with backflow devices can be installed in floor drains. These plugs have a ball or float that will stop water or sewage from backing up into a home while permitting water to flow into the drain. These plugs can be left in place year-round.

### **WHEN TO PLUG DRAINS**

Determining if and when to plug toilet, shower and washing machine drains depends on a variety of factors. If you live in an area that has a high potential for flooding and water levels are expected to be above flood stage, obtain the correct size plug needed for the drains in your house. Do not wait until flooding is imminent; plugs may not be available.

Look through lower levels of the home, especially the basement, and determine what is connected to the sewer system. Showers, bathtubs, sinks, washing machine drains and toilets can be potential inlets for sewage into a home. If bathrooms in lower levels of the house are not needed, the drains could be plugged in advance.

Before heading to the hardware store to purchase drain plugs, remove floor grates or plumbing fixtures, measure the diameter of the pipe so you know what size you will need. Each home and drain can be different, so do not assume your home has a standard size for each application.

### **PLUGGING DRAINS IN FLOOD SITUATIONS**

When local officials have warned residents to plug drains or if you plan to evacuate due to the potential for flooding, plug all drains in lower levels of your home.

### **TYPES OF PLUGS**

A number of different plugs are available for use in plumbing situations.

## TEST BALL

Test balls conventionally are used for pressure testing plumbing systems but can be used in emergency situations to seal drains. The ball is inserted into the pipe and inflated with air to the prescribed air pressure. Once inflated, the ball will not allow water to flow in either direction. **(Figure 3)**



*Figure 3. Test ball.*

## TWIST PLUG

The twist plug is inserted into the pipe and the wing nut twisted until the plug is tight. Twist plugs come in a variety of sizes and work well with floor, shower, and toilet drains. They can be plastic or metal. **(Figure 4)**



*Figure 4. Twist plug.*

## PRESSURE PLUGS

Conical-shaped rubber or wooden plugs can be used to plug drains. These plugs will be smaller in diameter than the pipe to be plugged on one end and larger than the pipe on the other end. The plugs are forced into the pipe and may need to be braced to prevent pressure from pushing them out. **(Figure 5)**



*Figure 5. Pressure plug.*

## BACKFLOW VALVES

These are permanent plugs that can be installed in floor drains. The plugs have a ball or float that closes off when a backflow occurs. When sewage begins to back up in the pipe, the ball or stopper will float up and seal off the pipe. These valves can be left in place year-round but should be checked at least annually to ensure they are working properly. **(Figure 6, 7, 8)**



*Figure 6. Floating backflow valve. Figure 7. Floating backflow valve. Figure 8. Floating backflow valve.*

## THREADED CAPS

The plumbing fixture is removed, and the correct size threaded cap is installed on the pipe. **(Figure 9)**



*Figure 9. Threaded caps.*

## INSTALLING DRAIN PLUGS

Once the decision is made to begin plugging floor drains, make sure to use the proper type of plug for the correct situation. Overtightening plugs potentially can break the pipe.

## FLOOR DRAINS

If floor drain grates are removable, install drain plugs. Backflow float valves can be installed in floor drainpipes that only allow flow in one direction. These plugs work well in homes with new furnaces that have condensation drains leading into a floor drain. The float valve will keep sewage from seeping into the home and the furnace can continue to drain. **(Figure 10)**



Figure 10. Floor drain.

Test balls, twist plugs or pressure plugs can be installed to seal floor drains but will not let water flow in either direction. If plugs are not available, a flexible rubber ball that is just larger than the pipe diameter can be used in an emergency but will need to be braced in place.

If the floor drain grate cannot be removed, a piece of inner tube that is larger than the hole can be used to plug the drain. Place the inner tube on the floor surrounding the drain and cover it with a piece of plywood or solid board to hold it in place. Particle board will not work because it can deteriorate and crumble when wet. The seal needs to be held in place by bracing it against the ceiling. To avoid damaging the ceiling, place a 2- by 4-inch board or piece of plywood parallel to the ceiling. Then wedge a vertical 2- by 4-inch board between the board covering the inner tube and the board parallel to the ceiling. (**Figure 11**)

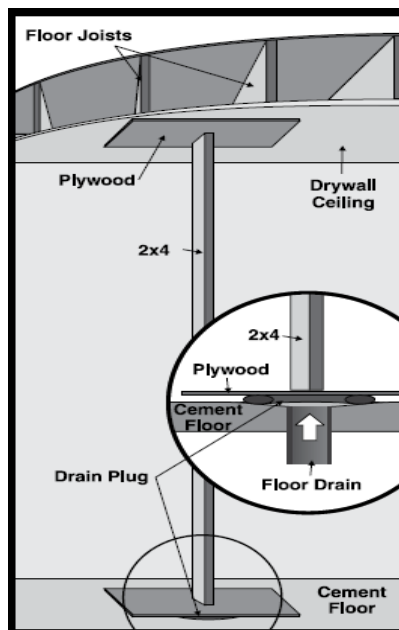


Figure 11. Drain plug bracing.

## TOILETS

Basement toilets in potential flooding areas should be removed and the drainpipe should be plugged. Follow these steps to plug toilet drains: **(Figure 12)**



*Figure 12. Toilet.*

1. Turn off the water supply to the toilet, using the valve behind or underneath the toilet. Turn it clockwise until it stops.
2. Remove the water supply line from the toilet.
3. Press the plunger to flush the toilet to empty the water tank.
4. To remove as much water as possible from the bowl, pour a bucket of water into the bowl as fast as possible without spilling. This will cause the water to swirl, and most will drain out of the bowl.
5. On either side of the base of the toilet, you should see decorative covers over the two bolts; remove those first and then remove the nuts holding the bolts in place.
6. The toilet may have been sealed to the floor with caulk or other adhesive; this may need to be cut loose with a utility knife before the toilet can be removed.
7. Once removed, clean up the remaining wax ring that sealed the toilet to the flange holding the toilet in place.
8. A plug then can be installed in the sewage pipe. These drains often are corroded which can cause difficulty when plugging. Cleaning the opening of the drain or plugging with wooden pressure plugs may be required.
9. To replace the toilet, remove the plug, install a new wax seal and reinstall the toilet. **(Figure 13)**



*Figure 13. Wax ring.*

## SHOWERS

Shower drains come in a variety of types and sizes, so plugging them depends on the specific type. If the shower drain grate can be removed, simply place a proper sized drain plug into the drainpipe and tighten until snug. Some shower drain grates are not removed easily, so the drain needs to be covered with a material that will prevent sewage from leaking in if a backup occurs. These drains can be covered as described above with a thick piece of rubber or inner tube and then secured with a board or plywood. The seal needs to be held in place using the method described for bracing floor drain seals. **(Figure 14)**



*Figure 14. Plugging shower drain.*

## WASHING MACHINES

Washing machine drains can be plugged by removing the washing machine drain hose from the drainpipe and then placing the correct diameter plug in the drain pipe. **(Figure 15)**



*Figure 15. Washing machine drain hose.*

## SINKS

Sinks can be plugged by placing a plug in the sink drain and overflow, but the preferred method is removing the drainpipe from below the sink and placing a threaded cap on the drain outlet. **(Figure 16)**



*Figure 16. P trap under sink.*

## **BATHTUBS**

Sealing bathtubs depends on the drain in the tub. If an access panel was installed for the bathtub plumbing, remove the drainpipes and install threaded caps or drain plugs. If no access to the internal plumbing is available, place a twist plug in the drain.

To plug the overflow, remove the overflow cover and install a properly sized drain plug. You may need to purchase an automotive or marine plug since the overflow drain is shallow. **(Figure 17, 18)**



*Figure 17. Marine/automotive plug.*



*Figure 18. Marine/automotive plug.*

## **FOOTING DRAINS**

A potential area for problems and leaking could be backflow from the sewer pipe collecting water from the footing drain. Some older homes have footing drains that lead to the sewer system. **(Figure 19)**

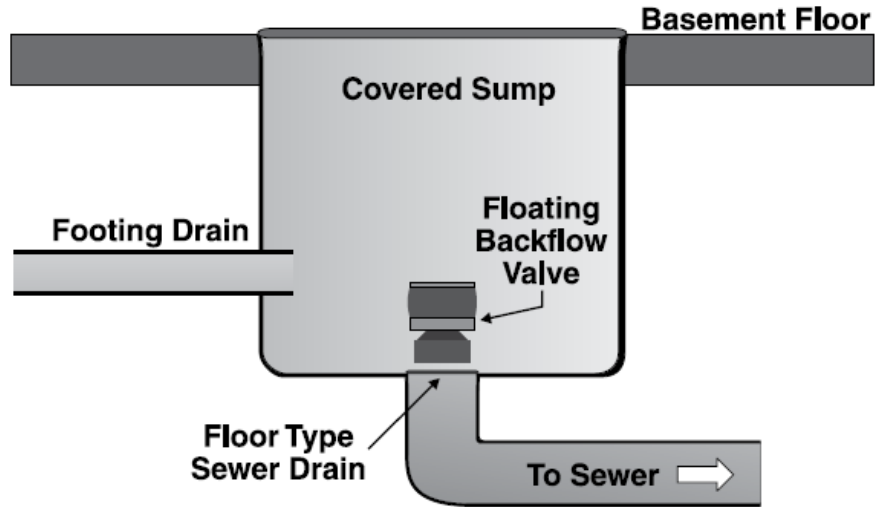


*Figure 19. Footing drain.*



If the sewer backs up, sewage can back up through the drain hole.

The best way to plug them is using a backflow valve that will permit the water from the footing drain to enter the sewer but stop sewage from backing up into the drain. Frequently they are corroded, so you might need a wedge plug. **(Figure 20)**



*Figure 20. Footing drain.*

This information is meant to provide a starting point for individuals to protect their homes from flood damage. Homeowners assume responsibility for adapting any information provided in this publication to their specific conditions. This guide is not intended to replace the advice and guidance of a licensed plumbing professional. Source: <https://www.ag.ndsu.edu/publications/disasters/preparing-a-home-that-will-be-flooded>