Stormwater Literature

Commonly Asked Questions When a Sewer Backup Occurs

1. Will a backwater valve stop my basement from flooding?

A backflow prevention device is not a single solution. There are several reasons why these valves will not prevent basement flooding. The following attachment entitled "Backwater Valves – Be Sure You Have the Facts (A Backwater Valve Disclaimer)" describes the benefits and limitations of backwater valves.

2. When my basement backs up what should I do and who should I contact?

Step #1. Report your problem right away.

Contact the Environmental Services Division of Public Works at 394-0392. People are on staff to respond to emergencies 24 hours a day, 365 days a year. They will need your name, address, phone number and a brief description of what has occurred. A crewman will be dispatched to check the City sewers and other City factors that can contribute to a sewer backup. They will assure that the City main sewer is functioning properly and will help you identify if you need to call a sewer cleaning service. More than 9 out of 10 service requests for backed up sewers are the result of obstructions in the homeowner's building sewer running from their home to the City sewer main. When this occurs the homeowner is responsible for having it cleaned.

Step #2. Take photographs and make a list of those items that were damaged. This information will be needed for your insurance company.

Step #3. Begin the clean up process. See the enclosed attachment titled: "My basement flooded. What do I do?". This information goes through the process of clean up and the precautions that the homeowner should take.

Step #4 Contact your homeowner's insurance company to file a claim. This will start the process moving. Provide them with the pictures and list of damage.

Step #5 If you believe that the City of Superior was the cause of your flooding, then you may file a claim with the City of Superior through the City Clerk's Office at 715-395-7369. Provide them with copies of your pictures and a list of damage. A review board will go over each claim to determine if the sewer back up was caused by a deficiency in the City's sewer main, by factors beyond the City's control, or by other factors.

3. **When my basement backup occurred, I noticed that when the water went down, it drained really fast. Does the City have a valve or gate that they open to release the water? Or is there a pump that needs to be turned on before my basement could drain?**

   No. The system is designed to receive all the flow that the sewer pipes can transport. It is a simple gravity system. The problem occurs when a flash flood hits that fills the sewers and runs on top of the ground. Sewers are not designed or intended to address floodwater conditions. Under flash flood conditions, they can overload and back up onto streets and into basements. As soon as the flooding is over, the sewers should drain very rapidly. If there is an obstruction or blockage in the system, then you will likely see the sewer main drain very slowly.

4. **I have never had a problem with my basement flooding. During the last rain, it did. What is going on?**

   Major rain events such as a flash flood can overload the collection system resulting in backups where there were no problems in the past. There can also be situations where problems exist in a homeowner's building sewer but do not become evident until the flow increases enough to make it obvious. You should call the Environmental Services Division of Public Works and request a free Stormwater/Surface Water Survey. This survey will look at all surface water related factors that may be contributing to flooding in and around your home. They can make recommendations for improvements and you may even qualify for funding through the City's Stormwater Flood Control Program.

5. **Who is responsible to keep the sewer clean between my house and the sewer main?**

   As mentioned in Question 2 above, more than 9 out of 10 service requests for backed up sewers are the result of an obstruction in the homeowner's building sewer running from their home to the City sewer main. When this occurs the homeowner is responsible for having it cleaned. It should be cleaned and inspected once every 3 to 5 years. By following a regular maintenance program, you can help to ensure that your sewer does not back up during normal rain events.

   Defective building sewer pipes and connections are the single greatest source of sewer system backups. It is for this reason that the City is implementing its Stormwater Flood Control Program. In the next few years the City will also be starting its Stormwater Management Program intended to look at how we can address long term flooding and sewer system back ups.

6. **Who is responsible for repairing my sewer?**

   The homeowner is responsible for the cost of repairing their building sewer up to and including a defective connection with the City main.

Backwater Valves – Be Sure You Have the Facts

(A Backwater Valve Disclaimer)

Do backwater valves protect basements from flooding?

The answer rests with you, the homeowner.

1. Backwater Valves (BWVs) do prevent basement flooding but there are no guarantees. See the precautions listed below.
2. Be absolutely sure that a reputable firm installs the BWV.
3. Be absolutely sure that the BWV is well built, durable and functions properly.
4. DO NOT install a BWV until you have separated all stormwater connections from your sanitary connections and then installed a sump pump for the stormwater.
    - One house can drain stormwater at a rate of 50 to 70 gallons/minute. If you do not separate your drains, and the backwater valve closes, this water will be forced directly into your basement.
5. Even when you separate all stormwater connections from your sanitary connections, and install a sump pump and a quality BWV by a reputable contractor, your basement can still flood. You need to be aware of the following precautions:
    - If your home is located in or near a natural underground drainage basin that has been filled in for development, then a sump pump may not keep up with the groundwater flow during major rain events even when the BWV is functioning properly.
    - It is the homeowner's responsibility to maintain and service the BWV. Refer to the manufacturer for maintenance instructions and schedule.
    - When you have a power failure, stormwater can flood your basement even when the BWV is working properly because the sump pump needs electricity to operate.
    - You will not know when the BWV is working until water starts backing up in the lowest drain. Further use of your plumbing may also contribute to sewage backing up into your basement.
    - If you are having problems with your building sewer leading from the house to the sewer main, then the backwater valve will not work.
    - A backwater valve will not prevent flooding from surface water entering the basement through windows or cracks in the walls.
    - If you install a BWV in your house, you need to know that it could move the problem to your neighbor's basement.

My basement flooded. What do I do?

DISCLAIMER

The City does not intend any of the suggestions in this publication as medical advice. For specific health advice on possible and suspected problems from exposure to flooded housing, consult a medical specialist with current expertise in this area.

For serious house problems, consult a trained renovator or professional who specializes in flood clean up. The City assumes no liability for any damage, injury, or expense that may be incurred as a result of the use of this publication.

RISKS-DISEASE

Infection and Disease

When sewage is carried by floodwater, take special precautions. The risk of infection is very real and the dangers are significant. Treat every bit of material as though it were seriously contaminated. Do not try to save carpets, clothing, and bedding that have been exposed to sewage. Even after surfaces are dry, they may carry the live bacteria and cause infection.

People with cuts or open sores should never handle water and materials contaminated with sewage. The risk of infection is too great.

Personal Protection

When surfaces are wet and water is being splashed about, you can be exposed to bacteria in the water droplets that reach your face. Once surfaces dry or become dusty you risk inhaling mold spores and fungi that fly free when these surfaces are disturbed. To prevent disease or poisoning, wear a face mask that can prevent inhalation of fine droplets or dust.

There are three different categories of masks available for use during a clean up, each with its own advantages and disadvantages:

- A comfort mask, such as the 3M #8500, is inexpensive, disposable and easy to put on, but it seldom fits well enough to give really good protection. A comfort mask is the **minimum** protection that you should use. It should be changed every few hours or if it becomes soiled or wet.
- A half-face dust-mist respirator, such as the 3M 38710, should be worn if there is visible misting or dust about. Take care to ensure that it fits well, because leaks prevent good protection.
- A full-face respirator is recommended in very poor conditions, such as when sewers are backed up. These respirators are hot and uncomfortable and may limit the amount of work you can get done, but they may prevent serious infection that could have worse consequences, so wear them for your own protection.

Future Concerns

- A major health concern after flooding or other water damage in homes is the growth of molds, bacteria, and other biological contaminants. Some persons may be allergic to or develop allergies or asthma-like symptoms from exposure to these contaminants.
- The growth of mold and bacteria is often associated with a musty odor and or evidence of mold growth on the walls.
- It is important that items in a home contributing to mold and bacterial growth be cleaned and dried as soon as possible.

RISKS - INJURY / OTHER

Appliances and Electrical Equipment

Do not go into a flooded basement until the electrical utility has shut off the power to your house at the utility pole or substation. Do not reconnect house power until the utility inspects your house and declares it safe.
Do not use flooded appliances and other electrical equipment (such as outlets and switch boxes or fuse/breaker panels) until they have been inspected and passed by the electric utility or an electrician approved by the utility.

If they were in any way submerged, do not use larger appliances (washing machines, dryers, dishwashers, etc.) until they are repaired.

Light fixtures and sockets left dirty after a flooding sometimes can cause shocks and equipment damage.

Connections in wiring of lights and small appliances can be wet and soggy even after the cover tape looks dry. Be sure they are dry! Don't just hope they are.

Furnaces and Water Heaters

You will need heat, but not hot water, as soon as you can get it. Don't use flooded furnaces and water heaters until they have been serviced and certified safe by a trained repairperson. Don't take any shortcuts.

Injury Avoidance/Physical Hazards

Surfaces are slippery and things are much heavier when wet. Do not try to move large or heavy objects by yourself. Unfortunately, injuries, especially back injuries, are a common side effect of cleaning up after a flood.

Avoid wading in water without proper foot protection. Broken glass, metal fragments, and other debris may be submerged in the flooded area.

ACTION PLAN

In deciding what to do and when, follow this list, carrying out actions at the top of the list first.

1. Disinfect water and materials as soon as possible, to prevent further growth of microbes.
2. Clean out mud and other debris.
3. Scrap all materials that cannot be saved, then bag and tag them. Have them transported to the correct disposal site, according to local regulations. These materials could become toxic.
4. Wash and rinse all fabrics and furniture that will be sent out for cleaning, then dry and ship them to cleaners as soon as possible.
5. Wash and rinse all surfaces, then disinfect them.
6. Dry all surfaces, then materials, as quickly as possible.
7. Dry the air by:
   - Dehumidifier or
   - Heat even in hot weather
8. Check for contamination, and correct when found.

CLEANING

Remember the golden rule of clean-up work:
Wash your hands thoroughly and often!

Human Waste Precautions

- *If sewage disposal in your house is not working, use facilities at an alternate site.*
- *Sewage may backflow from your septic or municipal system through floor drains into basements. Disinfect this area with a chlorine solution. If this has happened, anything that cannot be cleaned should be discarded.*

Cleaning with Chlorine bleach

Chlorine Bleach is an effective disinfectant for most bacteria and fungi (molds) but the chlorine gas it releases during use is damaging to lungs, as well as to skin and other tissues. Use the bleach with care and have adequate cross ventilation. Wash surfaces and floors with a household chlorine bleach solution. Use ¼ cup of bleach per gallon of water as a standard cleaning solution. The bleach solution should stay in contact with the affected surface for at least 15 minutes before rinsing off with clean water.

This sometimes requires a rewipe when drying takes place rapidly. If mold is already present use 1 ½ cups of bleach per gallon of water or approximately ½ gallon of bleach in 5 gallons of water.

Bleach is no longer effective when the chlorine smell disappears. Bleach leaves no residue and no long-term protection.

Use only liquid chlorine bleach. Bleach that has a scent added to improve the smell is fine for clean up. Do not use dry bleach or any bleach that does not contain chlorine.

Only individuals who are necessary for cleanup should be in the affected areas. Persons with respiratory health problems (e.g., asthma, emphysema) should NOT perform the clean up. Children and pets should not be allowed in these areas. When using a bleach solution, open windows to provide ventilation. Boots and rubber gloves should be worn at all times. In cases where rigorous splashing of contaminated water may occur, a dust mask and eye protection should also be worn.

Cautions with Bleach

Be careful of fumes. Use adequate ventilation. Wear eye protection and rubber gloves. Do not mix bleach with other household chemicals, especially ammonia or toilet bowl cleaner: the chemical reaction can create a poisonous gas. Do not use bleach on aluminum or linoleum.

Bleach adversely affects the colors of many surfaces and can destroy organic fabrics.

Chemical Decontamination

Decontaminate in two steps: first, as soon as possible, treat standing water with dilute solutions that do not seriously bleach colors; second, disinfect all materials brought back indoors, as well as indoor surfaces. This second cleaning is best done when the surfaces are clean and water free but still damp, so that bleach is drawn deep into materials.

Almost all disinfectants that are used for decontamination are toxic to humans. Select and use them with great care, with due allowance for their toxicity and their possible effects on occupants and workers. Only chlorine bleach can be recommended as an effective disinfectant for decontaminating surfaces and materials.

Another disinfection solution, 160 proof Ethyl alcohol, is also effective. It can kill both bacteria and molds, but its use is highly restricted. It also is much less effective when diluted

Items to be Saved, Discarded, or Professionally Cleaned:

Carpets

You cannot successfully clean flooded carpets without professional help. Carpet pads cannot be saved and must be removed and discarded. They will be very heavy to move and will likely disintegrate during removal. Remove all bits that remain as they store water dirt and microbes.

Only very expensive carpet is worth saving when they have been contaminated with soil or sewage.

Wet Insulation

Board insulation, such as Styrofoam and urethane can also become saturated. Urethane and extruded Styrofoam become saturated more slowly than bead board type Styrofoam.

Given time, all of these insulation material wick water up above the high water mark. It can reach 1-2 feet above the high water mark in a few days. For that reason remove the insulation above the obvious high water mark.

Beds, Bedding and Clothes

Do not save mattress or box springs.

Pillows cannot be safely cleaned and dried either.

Only experts can clean silks and woolens when contaminated. Decorative cottons are also at risk since they might not survive excessive bleach without fabric damage.

Well-worn clothing may not warrant the time and effort required for adequate cleaning.

Valuable Papers

If you cannot clean them within the first day or so, wrap and freeze them until you can get to them. Rinse them clean, and towel dry by blotting. Wrap carefully in freezer bags and freeze. **Because of possibility of contamination do not store these bags with bags that contain food.**

Sort Contents and Discard Debris

You have three types of contents. They should go to three different places.

- *Items you want to save:*

  Move to a safe dry place such as the second story or outside.

- *Items you don't want to save:*

  Put these things outside until your adjuster comes to confirm your losses. Take pictures or videotapes and list each item for the record.

- *Garbage:*

  Get rid of food and anything else that could go bad. Don't let garbage build up. In the case of a potential claim, let your insurance agent know you need to get rid of potential health hazard materials such as food quickly.

Should I throw them out?

Usually
Foam Rubber
Large carpets,
Upholstered chairs
Books, paper products

Always
Food
Cosmetics
Medicines and medical supplies
Stuffed animals
Baby toys
Mattresses, pillows
Carpet padding

Always remember
If in doubt, throw it out

Further Information

Your insurance agent/adjuster

Douglas County Health Department 715-395-1304

Douglas County Extension Service 715-395-1363

City of Superior Plumbing Inspector 715 395-7285

Wisconsin Department of Health and Family Services

http://www.dhs.wisconsin.gov/flood/index.htm

Document developed jointly by the Environmental Services Division of Public Works and the Douglas County Health Department as a service to our customers.

Dealing with Surface Water and Sump Pump Discharges

The City of Superior, WI City Ordinance Chapter 30, Article II, Sec. 30-20, j) states:

> "No person shall make connection of roof downspouts, foundation drains, areaway drains, or other sources of surface runoff or groundwater to a building sewer or building drain, which in turn is connected directly or indirectly to a public sanitary or combined sewer".

This ordinance creates a need for suitable alternatives on how to deal with the rainwater. The most common method is to have a sump pit into which the water from the foundation drains can flow. This water is then pumped out to the yard and must be discharged in a manner that does not create a nuisance for others or does not adversely affect property.

The more time that water can be retained on the surface without running into the sewers, the better off we are. The extended retention time increases evaporation, allows for less erosion of topsoil, and also allows any undesirable materials (such as grass clippings, leaves, and fertilizer) to stay at their source instead of going into the sewer system. Increasing the retention time of rainwater is important because treating wastewater is expensive, both monetarily and environmentally. Another critical benefit of slowing down runoff is that it allows time for the sewer system to handle the increased flow so that basement flooding does not occur.

We live in a geographical location where the soil type is almost exclusively red clay. Clay does not allow for the efficient absorption of the surface water. Actions taken that may improve this absorption and protect your basement include:

Soil aeration via means of a plug cutter: A plug cutter is a mechanical device consisting of a drum with spaced protuberances that cuts small holes in the turf as it gets pulled across the lawn. The small holes allow water to penetrate the hard packed surface (clay) and thus increase the absorption rate and the amount of water that can be retained. It also allows the grass roots to develop and makes for a greener and healthier lawn. This is a good short-term solution but must be done every couple of years because the holes have a tendency to fill in.

Landscape design: Where the sump pump will discharge must be carefully thought out ahead of time. The discharge area must be such that it cannot flow back to the foundation. The flow should be carried far enough out into the yard so it cannot seep back in along the foundation walls. The foundation walls can be further protected by installing plastic sheeting (6-12 mil thick) sloping away from the house and covered with gravel.

Consideration should be given to water sensitive trees and shrubs. Certain types of trees are susceptible to root rot and standing water should be avoided in their vicinity. Creating a terracing effect that allows water to drain from around the tree trunk area and into a lower green grassy area is recommended.

Whenever possible establish drainage away from your home and gradually toward the street or alley. Do not drain into your neighbor's yard. This can cause flooding to their property.

Homeowner Flood Prevention and Maintenance Guidelines

These guidelines are intended to advise homeowners of practices that could prevent or reduce the damage caused by sewer backups during periods of severe rain events. This information is intended for residential homes with gravity sump pits. It is not intended for use by commercial, industrial or special use buildings.

New installations, additions and alterations shall conform to the Comm 82.20 Subchapter II plan review and approval process. New residential homes should conform to the Department of Commerce plumbing standards for design, construction, installation, supervision and inspection.

Flood Insurance:
Devices and piping arrangements can reduce the possibility of customer sewer backups but there are still no guarantees. For this reason the owner/customer could purchase a homeowner policy endorsement to provide some coverage for loss due to sewer backups available through their insurance carrier. Be aware of the policy limitations. In unfinished basements it is always a good practice to keep property elevated off the basement floor.

Roof Gutters and Downspouts:
Roof gutters and downspouts should discharge to the ground away from the building foundation in a direction as not to drain back toward the building and will not cause problems to surrounding property. If downspouts are connected to vertical piping at the building foundation it should be disconnected and daylighted a distance away from the building and the pipe should be filled with concrete.

Grade Around the House:
Grade around the building foundation should slope away from the building and not have any ponding at or near the building foundation.

Basements Windows:
Building basements with windows sills that are lower than surrounding grade should be raised or removed to prevent water from entering the basement during heavy rain or surface flooding. Another option is to install watertight or glass block windows.

Gravity Sump Pit:
Older homes with basements have a gravity sump pit that is located at the lowest point in the basement. It has a removable cover that, when removed, is approximately one (1) foot deep with pipes entering in from the sides that may have water draining from either foundation drains or old gutter downspout piping. The water discharges at the bottom of the sump pit which should have water in the bottom of it. (See attached figure 1.) This standing water prevents sewer gas/odor from entering your home. It simply is a curved pipe that traps water in it. Over time dirt and debris build up and cleaning is required. It is important to remove dirt and debris and keep the trap open to drain properly. If it is not open and draining properly during rain events, ground water can fill the sump pit and cause the excess water to spill out onto your basement floor. The gravity pit water drains into the sewer system.

Precautions and Clean up from a Sewer Back-up:
During major rain events that exceed the design capacity of the sewer system, surcharging may occur resulting in sewer water back flowing into your basement through the gravity sump pit. If this does occur there are some precautions that can be taken. To minimize clean up you can place an old rug over the sump pit cover and place a heavy weight (like cement blocks) over the rug to prevent solids from entering your basement. When the water has receded remove and dispose of the rug. Use bleach to disinfect surfaces that came in contact with the sewer water. Whenever you are in contact with wastewater wear protective clothing such as disposable groves, eye protection and boots. Wash your hands before touching your eyes, nose or mouth. (See attached "My Basement Flooded. What do I do?" from the Douglas County Health Department.)

Submersible Pumps:
Submersible sump pumps are used to remove water from the sump pit to reduce or eliminate property damage and basement flooding. They are recommended only for storm drains and not for combined sewer drains. The sump pump must be properly sized with a float switch and a full flow check valve. The pump discharges water through a gravity sump pipe to a point outside and away from the building. The discharge piping should be of equal size as the discharge on the pump to provide full capacity at the rating of the pump. A large size screen should be placed between the pump and the discharge pipe at the bottom of the pit to prevent large solids from entering the pump and being discharged outside. The electrical outlet that the pump is connected to must be a separate circuit.

During times of heavy rain events the size and capacity of your pump and piping arrangement may not keep up with the rate that water is entering your basement. Electrical outages will also prevent the sump pump from removing water from your basement. The addition of a sump pump does not normally require a building permit if it is not altering the building's existing piping. Electrical cords and piping should be placed with care to prevent tripping or injury.

Backwater Valve:
Installing a backwater valve requires a building permit and must be installed by a qualified plumber and inspected to insure that it is being installed properly. The building sewer should be inspected for proper operation and documentation of the current condition should be submitted before a permit or work is started in order to insure a proper working system. During heavy rain events, a backwater valve that is properly maintained stops water and sewage from backing into your basement from the sewer system. A separate stormwater sump and submersible pump are needed to discharge water from the foundation drains and other clear water sources to the outside away from your house. (See Figure 2. Typical Gravity Sump Pit Piping Arrangement.) This arrangement is permanent and can remain connected during cold weather. This still does not guarantee that your basement will not flood during times of heavy rain events. Electrical outages will prevent the sump pump from operating. As a result, stormwater from your foundation drains could enter your basement through your stormwater sump pit.

When the backflow valve is closed due to surcharging of the sewer main, water use in the house will cause back-ups and damage because the water will not flow into the building sewer pipe and away. Also poorly maintained backwater valves will not seat properly causing leakage around the seal and water to back-up into the building causing damage. Backwater valves need to be cleaned and inspected yearly. (See Figure 4. Typical Backwater Valve.)

The Only Guarantee:
- Sanitary sewers are typically designed to contain the minimum of a 5-year rain event which is measured in inches of rain over a set number of hours. (*)
- Storm sewers are typically designed to contain the minimum of a 10-year storm. (*)
- Sewers are not designed nor intended to address floodwater conditions.
- No matter how much money is spent, the City can never guarantee sewer backups will not happen when extreme weather conditions exist such as in the case of flash flooding.

The only guarantee against flooding is to <u>not</u> have a basement and to live on a hill that is not in a flood plain. All other alternatives carry some degree of risk.

* The term, 5-year storm or 10-year storm, refers to the greatest amount of rain, within a specific time frame, that falls in a 5 or 10-year period. Civil Engineers obtain these figures from government published tables and utilize them when planning sewer systems.

FIGURE 1 :

CONTRIBUTING FACTORS TO BASEMENT FLOODING

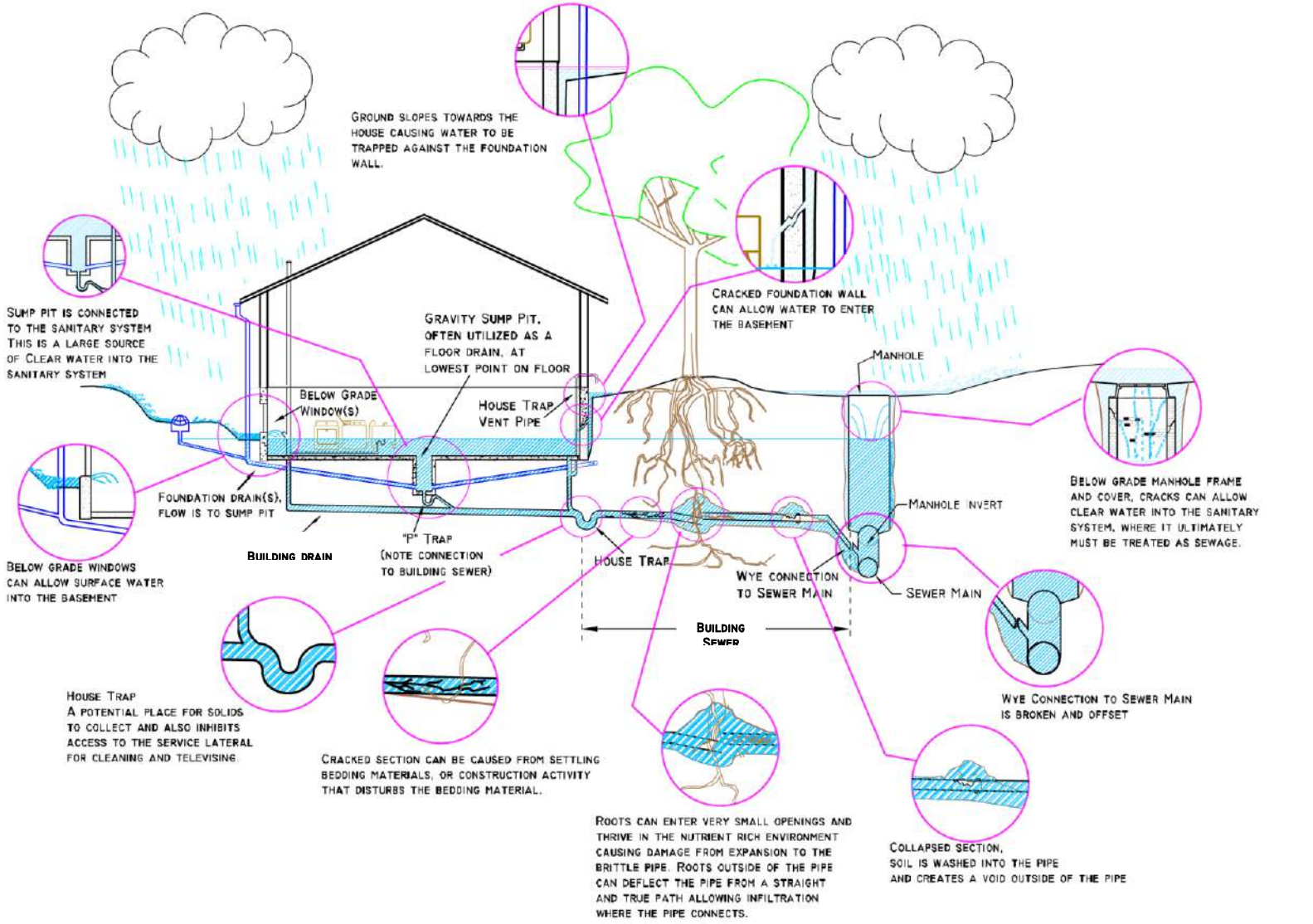


FIGURE 2 :

Typical Gravity Sump Pit Piping Arrangement

Before SFCP

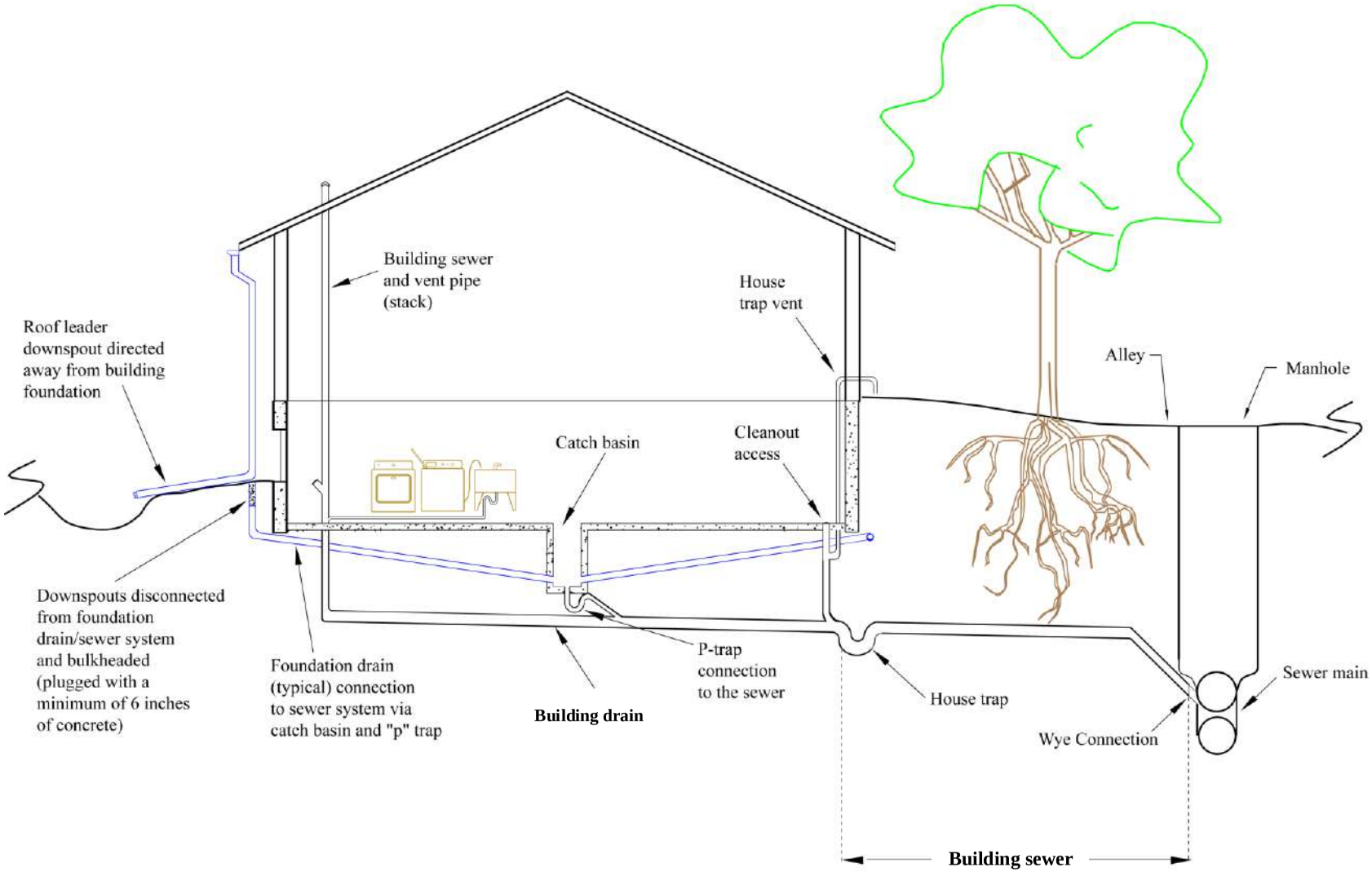


FIGURE 3 :

Typical Backwater Valve Installation

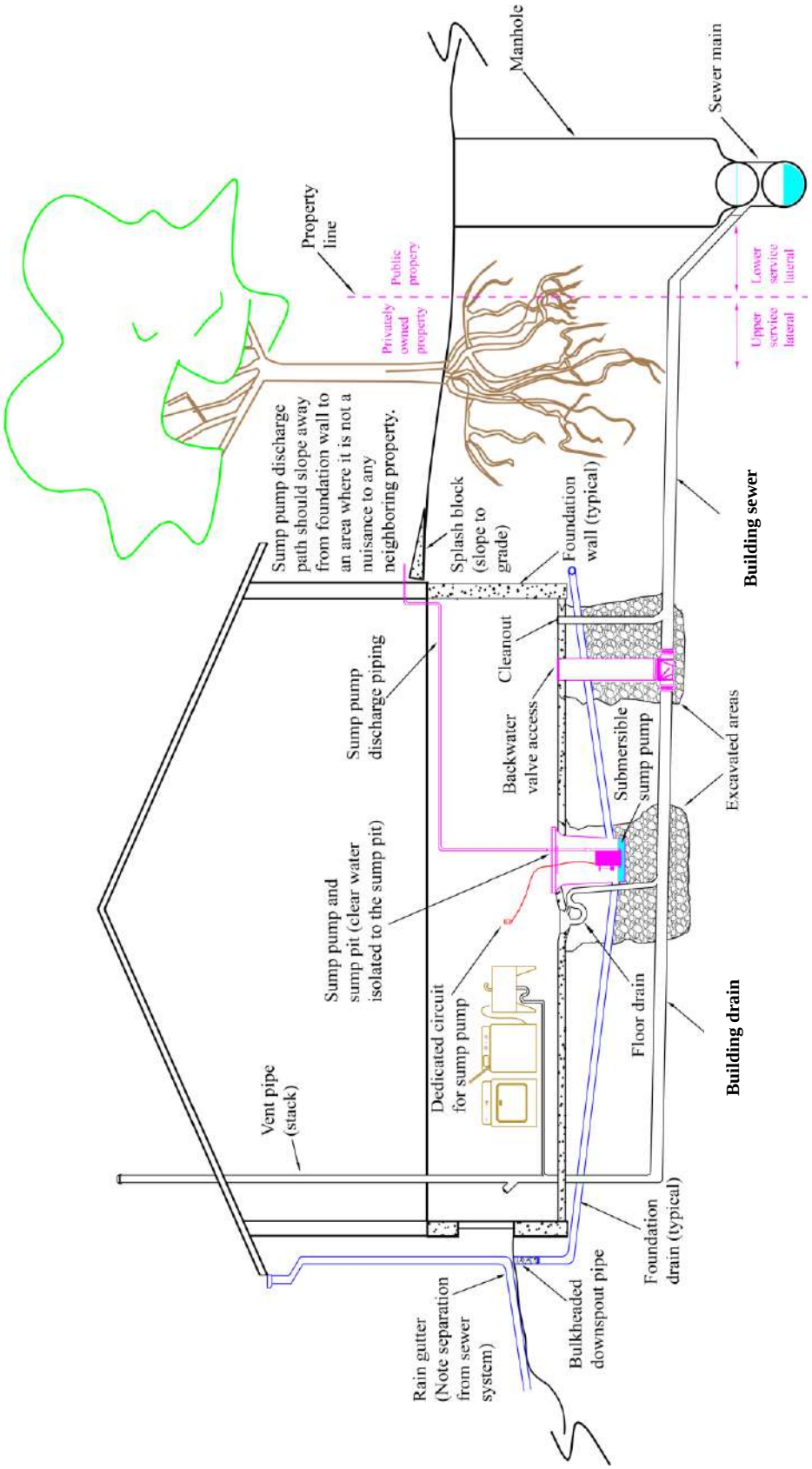
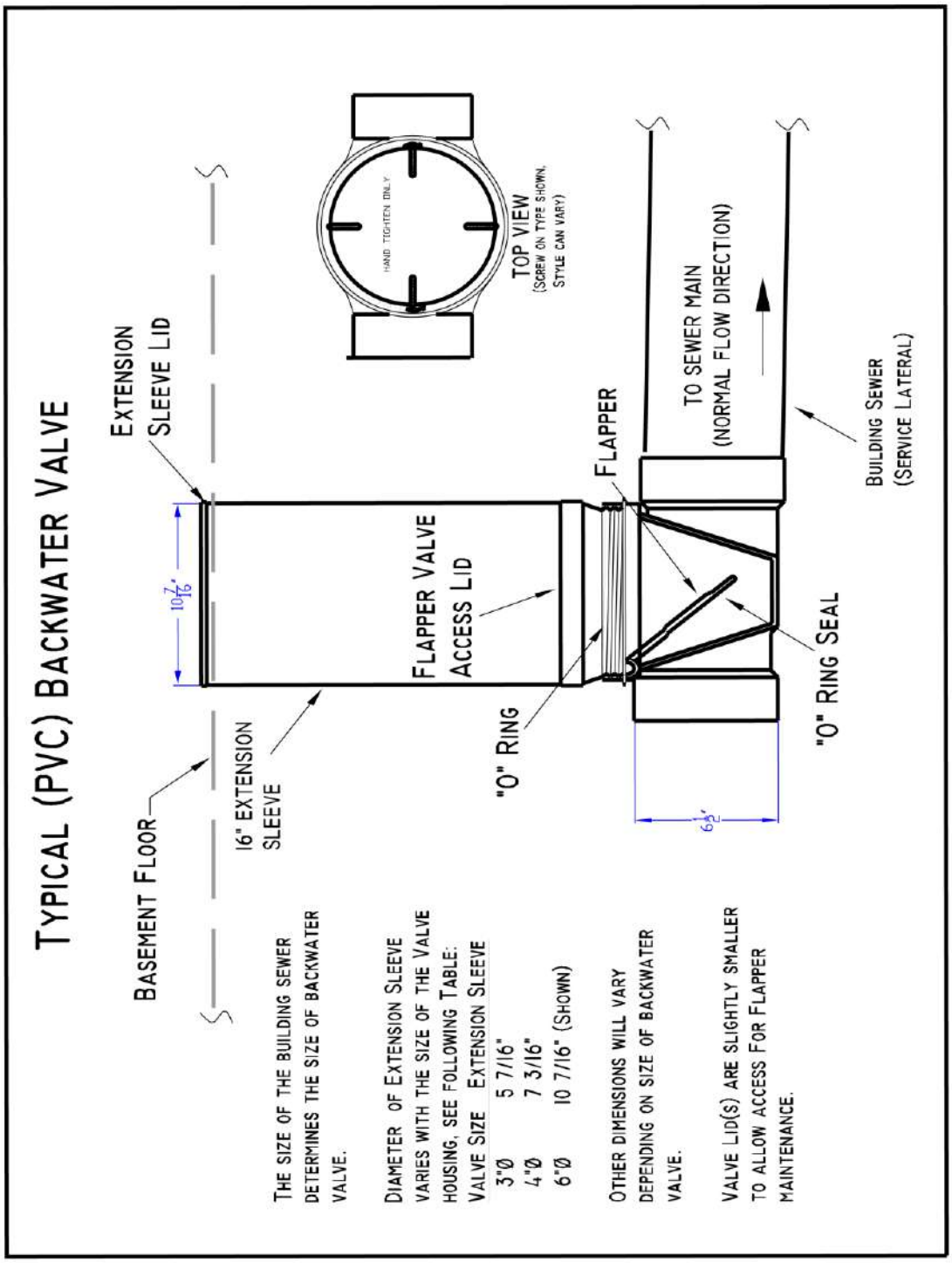


FIGURE 4 :


TYPICAL (PVC) BACKWATER VALVE
EXTENSION SLEEVE LID
BASEMENT FLOOR
16" EXTENSION SLEEVE
FLAPPER VALVE ACCESS LID
"O" RING
FLAPPER
TO SEWER MAIN (NORMAL FLOW DIRECTION)
BUILDING SEWER (SERVICE LATERAL)
"O" RING SEAL
HAND TIGHTEN ONLY
TOP VIEW (SCREW ON TYPE SHOWN, STYLE CAN VARY)
THE SIZE OF THE BUILDING SEWER DETERMINES THE SIZE OF BACKWATER VALVE.
DIAMETER OF EXTENSION SLEEVE VARIES WITH THE SIZE OF THE VALVE HOUSING, SEE FOLLOWING TABLE:
VALVE SIZE EXTENSION SLEEVE
3"Ø 5 7/16"
4"Ø 7 3/16"
6"Ø 10 7/16" (SHOWN)
OTHER DIMENSIONS WILL VARY DEPENDING ON SIZE OF BACKWATER VALVE.
VALVE LID(S) ARE SLIGHTLY SMALLER TO ALLOW ACCESS FOR FLAPPER MAINTENANCE.