Town of Brighton
Drainage Systems Information

Roof Drainage

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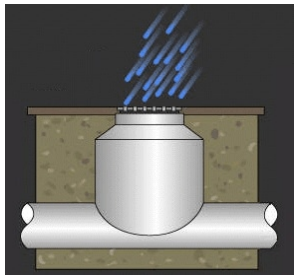
Dry Wells



Town of Brighton
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Introduction

With the many drainage problems the Town investigates, the majority of problems occur when rainwater is not properly conveyed from roofs to areas away from the house foundation. This pamphlet will help the reader understand the important issues concerning this problem, and provide solutions.

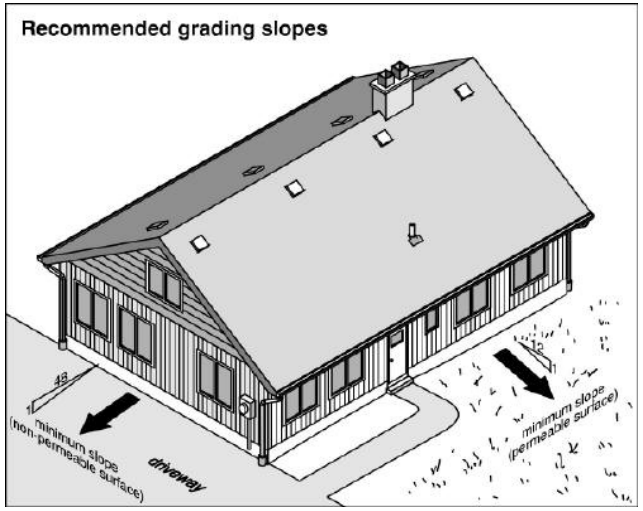
Proper Roof Drainage Can Prevent Wet Basements

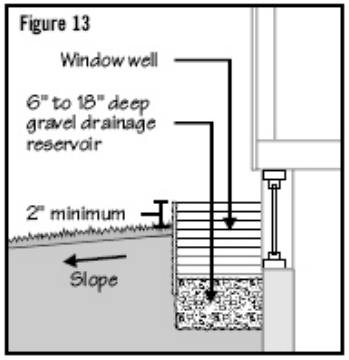
Controlling water above ground often can prevent water from getting into basements. Saturated soil increases the soil pressure on the basement walls, which can lead to cracks, shifts, collapses and other structural problems.

Start by looking to the roof. An inch of water on 1,000 square feet of roof amounts to about 623 gallons of water. Getting all that water away from the house is a big first step to preventing basement problems.

Proper Ground Slope Around Your Home

Just as the roof is sloped to shed water, the ground around your home should be sloped, too. The soil next to the house frequently settles, so water runs toward the house rather than away from it. Surface levels should slope away from the foundation wall at a rate of one inch per foot (1/12) for at least the first six feet, if possible. Topsoil can usually be added to accomplish this (never sand, gravel or wood chips, as these are very porous). In some cases, it is desirable to place an impermeable material under the soil next to the wall to ensure that the water flows away from the house. Walkways should have a slight slope to drain water away from the structure

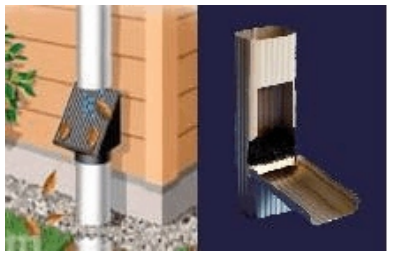




NOTE: Do not place soil higher than the foundation wall. Soil levels higher than the foundation wall can cause water damage to siding and house walls. Soil contact with siding promotes rot and creates an ideal environment for pests. Water damage to house walls can be costly to repair. Ideally, soil surfaces should be kept 6 to 8 inches below siding, if possible. *Be sensitive to drainage patterns at the rear and side lot lines of your property - you are not allowed to collect and cast drainage to your neighbor's property. This includes grading and gutter downspout discharges.*

Are Your Gutters Clean?

Leaves and debris on the roof can clog gutters, downspouts and underground conductors, causing gutters to overflow near the foundation, or underground conductors to back-up water towards the problem area(s).

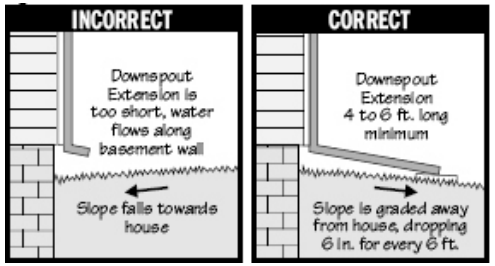


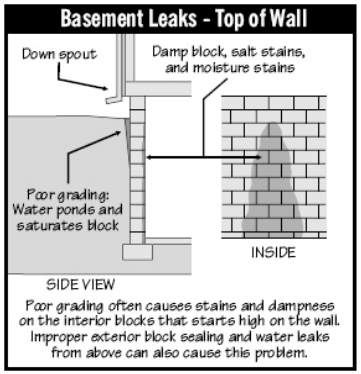
DOWNSPOUT FILTERS

Clean your gutters and downspouts regularly to maintain proper roof drainage. Trim shrubs and trees away from roof and exterior walls. Do not flush debris into underground conductors. Downspout filters are available to separate leaves and debris from the rainwater, keeping conductors clean. If you suspect clogged or damaged conductor pipes, call a licensed plumber to clean and inspect your system. You can obtain a list of licensed plumbers from the Department of Public Works (784-5221), or the Sewer Department (784-5282).

Downspout Discharge

Downspouts that drain too close to the house foundation can overload basement walls and foundation drain systems. Discharge downspouts at a point several feet (8' or more, if possible) away from the foundation wall to mitigate existing drainage problems. Redirecting roof water away from the perimeter wall is sometimes effective, but may not totally solve the problem. *Be careful to direct downspout discharges away from side and rear property lines. You are not allowed to collect and cast drainage to your neighbor's property.* A more permanent solution, if feasible, is to install underground conductors to the street storm sewer system. This system can, in most cases, be extended to provide yard drains to intercept surface drainage in problem areas. If you already have an underground conductor system that has been abandoned, it is highly recommended that you hire a plumber to clean and inspect the system, making any necessary repairs to restore the system to good working order.





Dry Wells

In some cases there is no public storm sewer in close proximity to tie into. Where simple grading to convey drainage to the public street cannot be done, and where storm sewers are not available, a dry well may be the solution. A dry well is nothing more than an underground receptacle to receive storm water drainage. A dry well is a passive structure. Water flows through it under the influence of gravity. A dry well receives water from one or more entry pipes or channels at its top. A dry well works contrary to a wet well - instead of drawing water from the surrounding soil out of the well, water is taken to the well to infuse it into the surrounding soil.

The dry well has two functions. First, the dry well provides storage capacity for roof and surface water to collect. Second, the dry well aids in getting the drainage water to percolate into the surrounding soil by providing an expanded surface area underground. The dry well penetrates the soil well below grade where, in the case of heavy soils, may provide access to more pervious soil layers capable of absorbing water more quickly than the heavier surface soils.

The difference between various dry well systems is involves the ways to contain the stone and run drain pipe(s) to it.

One method commonly used to construct a dry well does not involve a formal structure. . Simple dry wells like these consist of a pit, sometimes lined with soil fabric, and filled with crushed stone , gravel, rip-rap, rubble, or other similar material. Drain pipes are led into the dry well, and the pit is then covered with topsoil. This method is used frequently because of its relatively low cost. However, this method of constructing a dry well is undesirable for many reasons. Such pits do not have much storage capacity because their interior volume is mostly filled by stone. The pipes will have a tendency to clog, because once debris reaches the end of the pipe at the dry well, it has no place to go, and will block flow into the dry well. Once the system is rendered inoperable, there is no way to clean or otherwise maintain the system other than digging up the pit and making repairs to the pipes and other parts of the system. It is because of these deficiencies that this type of system cannot be recommended.

The preferred way of constructing the dry well is to use a permanent underground chamber with an easily removable access lid or grate at ground level. This type of dry well discharges the water through a number of small exit openings distributed over a larger surface area, along the sides and bottom of the dry well. This allows the homeowner to access the inlet pipes for cleaning and provide an access point to clean debris from the dry well thereby keeping the system in good operational order. It also makes it easier to add pipes to the system in the future. The other advantage to this type of system is the allowance of a large air space in the chamber itself that affords additional water storage over buried pit systems.

When a dry well is above the water table, most of its internal volume will contain air. Such a dry well can accept an initial inrush of water very quickly, until the air is displaced. After that, the dry well can only accept water as fast as it can dissipate water. Some dry wells deliberately incorporate a large storage capacity, so that they can accept a large amount of water very quickly and then dissipate it gradually over time, a method that is compatible with the intermittent nature of rainfall.

Typical Drywell Chamber - This tank is designed to allow water to flow out all sides and also the open bottom. Several feet of stone are placed below and around the tank as well.

Dry wells must not be used where their installation would create a significant risk for basement seepage or flooding, cause surficial flooding of groundwater, or interfere with the operation of subsurface sewage disposal systems and other subsurface structures. Such adverse impacts must be assessed and avoided in the design of the system.

Pretreatment of storm watercan extend the functional life of a dry well. While generally not a significant source of runoff pollution, roofs can nevertheless be the source of particulate and organic matter and, during site construction, sediment and debris. Therefore, roof gutter guards or filters and sumps or traps (equipped with clean-outs) in the conduits to a dry well should be included wherever practical to minimize the amount of sediment and debris that can enter the dry well.