Addressing Drainage Problems Around Your Home

About 20% of the land in the United States is affected by excess water that can damage homes and property. The good news is that there are signs a homeowner can look for, situations to avoid, and solutions that reduce drainage problems. If you are faced with a drainage problem, you should first identify which problem you have . . .

Is your basement wet?
This is the most serious drainage problem, but there is action you can take to remedy the situation:

- First, investigate the problem by checking your gutters and downspouts. Downspout water should be directed away from your house and must be free of leaves and debris.

- Second, grade the ground adjacent to the foundation walls so that it directs water away from the house.

If these solutions are in place but you still have a wet basement or a sump pump that never stops running, you may have a more complex problem. The Public Works Department offers a free home inspection program. Water/Sewer personnel will visit your residence and offer additional suggestions to remedy identified problem areas. If you are interested in a home inspection, please contact the Water/Sewer Department, at 810-4650 to schedule an appointment.

If controlling surface water does not help, the problem may be below the surface - a high water table, spring or seeps, or an abandoned subsurface agricultural tile that is draining water from other areas and directing it to your foundation. This dilemma can be dealt with by redirecting the water to new subsurface drains.

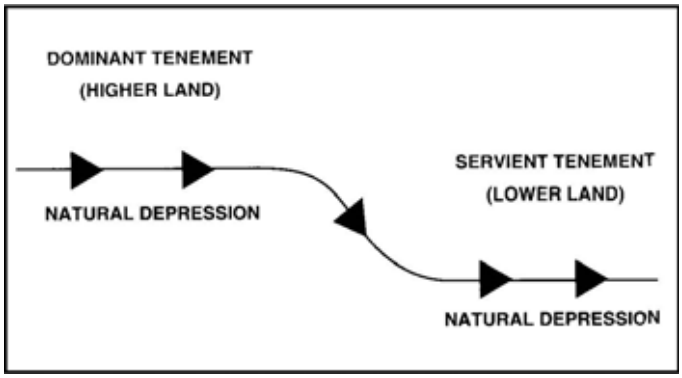
Does your yard flood or pond at times?
There are many instances where yards are "designed" to carry the storm water runoff overland (naturally or by manmade swales) toward a nearby stream or creek. Also, if your home is in a floodplain, it is at risk for flooding if the stream overflows during heavy or prolonged rainfall or rapid snowmelt.

The important step in these instances is to insure that you have taken precautions to protect your **home.** You may never totally eliminate the potential for flooding, but you can reduce flood damage.

Do trees, shrubs and plants grow poorly?
This nuisance can often be overcome with various inexpensive measures such as soil modification, relocating the plants, or selecting different plant material.

A Review of Illinois Drainage Law

The basic principle of the law of natural drainage is that landowners take whatever advantages or inconveniences of drainage nature places upon their land. One of the most important principles of Illinois drainage law is that the owners of lower ground are bound to receive surface water that naturally flows onto it from higher ground. The following diagram illustrates this principle.



Where the natural flow is from one tract across another tract, the higher land is the *dominant tenement*, and the lower land is the *servient tenement*. Owners of dominant tenements have legal rights to have water drain off their lands. Owners of servient tenements have the duty of not obstructing the natural flow.

A landowner has no right to obstruct the flow of surface water. Under Illinois law, the owner of lower land ordinarily has no right to build a dam, levee, or other artificial structure that will interfere with the drainage of higher land. In fact, the willful and intentional interference by an owner of lower land is considered a petty offense and is punishable by a fine. This is in addition to private lawsuits that the owners of affected properties may file.

Under Illinois law, private landowners have certain rights to improve the drainage on their land.
Landowners can:

- Widen, deepen and clean natural depressions that carry their surface water.
- Straighten out channels on their own property and accelerate the movement of surface water so long as they do not change the natural point of entry or unreasonably increase the flow of water onto lower land.
- Drain ponds or standing water in the direction of their overflow.
- Tile their property to expedite the flow of water **so long as they do not** unreasonably increase the flow, change the point of entry on lower land, bring water from another watershed, or connect their tile to the tile of other owners without consent.
- Expedite the flow of surface waters through natural lines of drainage by either open or closed drains into a watercourse or stream.

Because of the effect on surrounding lands, *landowners must not:*

- Dam or obstruct a natural channel so that the escape of surface water from higher land is retarded or the channel is shifted.
- Divert water to lands that do not naturally receive this drainage.
- Change the point of entry of surface water on lower land.
- Bring in water from another watershed that would not have flowed across lower land in a state of nature.
- Pollute any waters that pass from their land through the property of others – whether surface or underground water, streams or diffused waters.
- Connect their own tile with another owner's tile lines or with roadway tile lines without consent.
- Accelerate the flow of water unreasonably, or with malicious intent, to the material damage of lower land owned by others, even though the flow is accelerated through natural channels.

The City and other public agencies have constructed storm water facilities that are designed to expedite the drainage of storm water, but not to eliminate all flooding. To encourage public agencies to build these facilities, Illinois law limits the liability of governmental bodies for flooding damages. An exception exists when there is a known defect in the facilities and the agency's failure to correct the defect is a direct cause of flooding damage. Storm water facilities that are merely undersized are not defective.

What Causes Drainage Problems?
The soil we rely on as a foundation for our homes and property is a complex natural system. When left alone, the deep, rich prairie soils of Illinois can effectively handle normal and excessive amounts of water. But when the natural soil structure is disturbed and a high percentage of the soil surface that once absorbed water is covered with impervious surfaces and the surrounding landscape is severely altered, then the natural environment cannot cope on its own. In some newer subdivisions, all of the topsoil and part of the subsoil material is removed during construction. Only a thin layer of topsoil is returned to the site—just enough to support the shallow root system of your lawn.

These sites usually have severe problems with soil droughtiness and surface runoff. The topsoil is too thin to hold adequate amounts of water and the subsoil has been so densely compacted that it cannot allow excess water to infiltrate into it. You can overcome these common limitations and restore the health and functionality of soil resources on your property by: a) adding more topsoil, b) aerating and composting the soil, and c) using deep-rooted, drought-resistant grasses and plants.

The Seasonal High Water Table
A water table can be defined as the upper surface of ground water or the level below which the soil is saturated with water. This level may fluctuate by several feet throughout the year, depending on soil conditions, landscape, or weather. In lawn areas affected by a high water table, a small excavated pond, a wetland garden, or collection of water-loving plants may be a suitable remedy. Transform the nuisance wet area into an attractive landscaping feature. Provisions of the federal Clean Water Act or state and local laws may apply to persons who propose to alter any wetlands or to dredge, dig, or fill in wetland or floodplain areas. For clarification or information, contact the Engineering Section (810-3554) prior to any earthmoving activities.

Surface Ponding

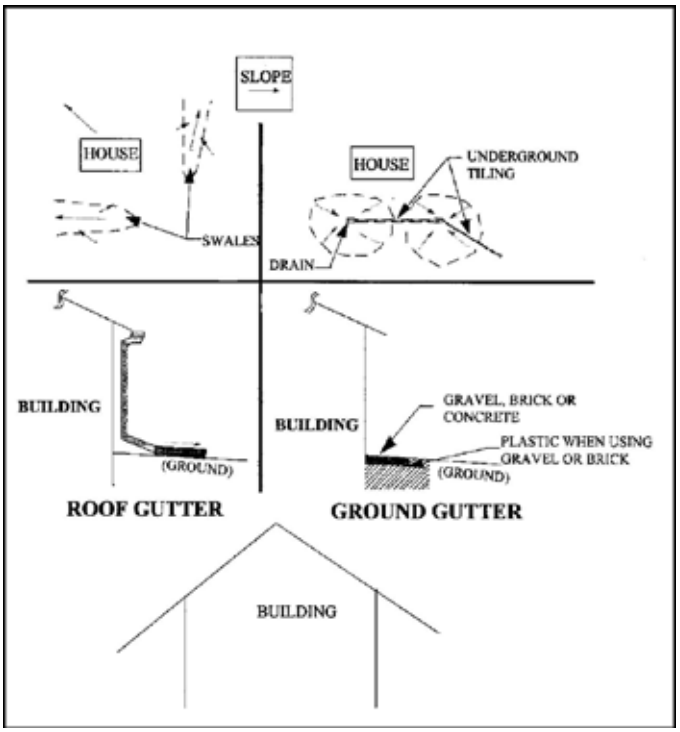
If a significant amount of surface water ponds on your lawn or driveway for long periods, install small diversions or swales to channel off the water. In developed residential areas, these practices are usually installed near property lines in back of or alongside houses. Before doing so, however, contact the Engineering Section (810-3554). City personnel can review your plans so you can better avoid impermissible diversions of storm water.

For low flows of surface water, redirect water to landscaped yard areas with thirsty trees and shrubs. Be sure not to direct water onto someone else's property! If only small amounts of surface ponding occur for short periods, drains may not be needed. Consider solving the problem by planting the area with water-loving native grasses or trees.

Even in upland areas, a continually wet basement or flooding can occur if the house is built in the path of a natural drainageway, in a depressed area, or if the site is lower than the surrounding area. A drainageway or low area may look fine in dry seasons, but it can carry runoff water in wet seasons. In developed areas where the landscape has been greatly modified, runoff has increased and natural drainageways are often blocked or altered. If man-made drainageways or storm sewers are not built to carry this additional seasonal water flow, nearby homes may flood or experience surface ponding. Runoff from areas as small as one acre can cause flooding. Measures to remedy this kind of nuisance usually require the cooperation of several homeowners.

Grade the yard so that surface water drains away from the house. A minimum grade of one foot in 100 feet is generally adequate. When filling in low areas, use the most permeable soil available. Save the topsoil and spread it over the newly filled and graded areas to help establish vegetation. To reduce soil compaction, limit construction traffic or use track equipment whenever possible on the lawn. Be sure to contact the Engineering Section (810-3554) for drainage regulations prior to beginning any grading work.

Installing roof gutter and downspouts to control roof water may prevent ponding in low yard areas. Down-spouts can empty into outlet spreaders that discharge water in a thin layer over a grassy area.



Springs and Seeps

On many sites, natural springs and seeps occur due to existing geology and landscape characteristics. Water may flow seasonally, throughout the year, or may flow into or around homes constructed over or near a spring or seep. For protection, install subsurface drains at least four inches in diameter surrounded by 6-12 inches of gravel or sand. Place gravel along the outside of the base of the foundation wall. Be sure to install an adequate gravity or pump outlet for the drain tile. This subsurface drain can divert seep or spring waters before they reach the structure.

Springs and seeps also affect lawn areas. You can install subsurface drains to collect groundwater and divert it. Typically, subsurface drains are made of plastic but older drain tile may be made of clay, concrete, or metal. Drain tiles work for years with very little care. Some old clay farm tiles have been working for over 80 years. Caring for the tile on your own lot is your responsibility. Many community groups, such as homeowners' associations, maintain tile drains. Be sure to contact the Engineering Section (810-3554) for approved materials and permit requirements prior to completing any work.

Slow Soil Permeability

If the soil has a dense layer, especially a layer of clay or a severely compacted layer, water flow through the soil may be restricted and cause ponding. If this layer is

near the surface, use a soil aerator of deep-rooted native grass to increase infiltration and reduce surface ponding. Most lawn grasses have short root systems that only venture down a few inches. These shallow root systems dry out quickly and must be watered often. Native grass species with much deeper root systems thrive in dry weather and offer avenues for excess water to infiltrate deep into the soil rather than into your basement! For larger wet areas, install subsurface drains about four inches in diameter at a depth of two to five feet. Use sand and gravel to backfill the drain trench to within one foot of the ground surface. Use topsoil to fill the surface layer.

Be sure to contact the Engineering Section (810-3554) for approved materials and other drainage regulations prior to beginning any work. Restrict foot traffic during wet periods because even on well-drained soils, this can compact the soil and reduce permeability.

Improving Surface Water Quality

All water runoff eventually ends up in the rivers or lakes. The route the water takes determines the quality of the rivers and lakes. One route for water flow is through seepage into the ground and then to surface waters. This route cleans and purifies the runoff naturally. Water also travels a more direct route by storm water drains or sewers. If water goes through the storm water drains, it does not receive any treatment. If liquid or debris goes down the storm water drain with the water, then it also goes directly to the surface water.

Getting Started

In most cases, the private property owner is responsible for maintaining the portion of the drainage system that is located on their property and solving localized drainage problems on their private property. There are many ways you can improve drainage on your property. Some approaches are simple and inexpensive while others are more complex and costly. If you plan to contract out the work, be sure to get more than one estimate and carefully evaluate different alternatives. Be sure to contact the Engineering Section (810-3554) for approved materials and other drainage regulations prior to beginning any work.

Remember to call:

Engineering Section 810-3554

- for drainage regulations prior to beginning any grading work
- for approved materials and permit requirements
- prior to installing a swale to divert water or any earthmoving activity

Water /Sewer Department 810-4650

- for a free home inspection to help identify problem areas and receive helpful suggestions

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