BUILDING WITH THE LAND

A homebuyers guide to soils, drainage, and erosion control

MARION COUNTY SOIL & WATER CONSERVATION DISTRICT
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WWW.MARIONSWCD.ORG

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The Marion County Soil and Water Conservation District (SWCD) is a unit of state government, supported primarily by the City-County Council with some funds from grants & state government. The SWCD was established to provide technical assistance to Marion County residents and land users concerning the proper management of soil, water and other related natural resources. We work closely with local government, community organizations and residents on such items as water quality and drainage issues, soil erosion and sedimentation control, green space and wildlife habitat, conservation planning and education.

For on-site assistance with your natural resouce needs contact us at

https://marionswcd.org/contact/

Introduction

The Marion County Soil & Water Conservation District (SWCD) office has assisted many homeowners, farmers, developers and engineers in correcting drainage and erosion problems. We have seen or heard about almost every problem imaginable. Our expertise goes beyond book information and identifies specifics as they relate to Marion County. These problems affect every income and education level. This manual should identify and answer most drainage and erosion questions concerning building or buying a home or homesite. Additional information can be found on our website, and individual assistance can be requested by contacting us. (https://marionswcd.org/contact/)

The single biggest investment the average person will make during their lifetime will be the purchase of a house. What looks like a lovely wooded homesite in the summer months or other times of dry weather may become a swamp in the springtime.

How to Use this Resource Guide

The purpose of this resource guide is to educate Marion County residents, builders and developers on the use and limitations of the soil in our county. This information is critical as much of the land left to be developed has severe limitations due to the soil. There are 19 general soil types in Marion County. Some soils are well-drained. If they are not too steep, they are ideal sites for homes with basements, and septic systems usually work well in them. Other soils are heavy clay and have seasonally high ground water tables, which cause septic system failures and flooding in homes with basements.

This guide will also help you to control erosion on your building site. This is important in protecting the quality of our water and will help you establish a healthy lawn.

Spend some time reviewing the information in this guide. You will find it extremely helpful as you look for a home or solve problems in your existing home. With this guide and information from the Web Soil Survey you will be on your way to making wise land use decisions.

Note: This guide contains proven methods of residential drainage and water management when installed properly with substantiated products. Local ordinances, building codes and other regulations may alter or limit their use.

Soils

Soil is often referred to as "dirt", but dirt is the stuff that is swept off the kitchen floor. It should not be confused with SOIL, the valuable resource that supports our homes and roads, grows our food, flowers, trees, and grass, and filters our septic waste. Soil can severely affect our living conditions and should be thoroughly investigated before making a decision on where you are going to call home. The investigation should start by contacting the Marion County Soil & Water Conservation District for assistance and reviewing a copy of the Soil Survey of Marion County. The Soil Survey contains information on conditions and limiting factors of a soil type within Marion County. The majority of Marion County soils are best suited for agricultural production. Table #1 shows the major limiting factors for urban uses. Soils are placed in 3 or more classes according to their limitations or suitability for certain uses. They are rated for the uses expected to be important or potentially important to users of soil survey information.

The purpose of the ratings is to help engineers, planners, and others understand how soil properties influence behavior when used for engineering purposes. Ratings are confirmed by those familiar with that soil and by the experience of users. Ratings for proposed uses are given in terms of limitations and restrictive features, suitability and restrictive features, or only restrictive features. Only the most restrictive features are listed. Other features may need to be treated to overcome soil limitations for a specific purpose.

Soils are rated in their "natural" state, that is, no unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. In rating soils for engineering uses, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most degrees of limitations. Most of these practices, however, are costly. The owner may be willing to live with a few limitations, provided the use does not violate community codes or regulations. The final decision in selecting a site for a particular use is a personal one and generally involves weighing the costs for site preparation and maintenance.
Below are some definitions which will assist you in using Table 1:

Slight is the rating given soils that have properties favorable for the use. The degree of limitation is minor and can be overcome easily. Good performance and low maintenance can be expected.

Moderate is the rating given soils that have properties moderately favorable for the use. This degree of limitation can be overcome or modified by special planning, design, or maintenance. During some part of the year, the expected performance of the structure or other planned use is somewhat less desirable than for soils rated slight. Some soils rated moderate require treatment, such as artificial drainage, extended septic tank absorption fields, or some modification of certain features of the soil. For these soils, modification is needed for those construction plans generally used for soils of slight limitation. Modification may include specially designed foundations, extra reinforcement of structures, sump pumps, and the like.

Severe is the rating given soils that have one or more properties unfavorable for the rated use, such as steep slopes, bedrock near the surface, flooding, high shrink-swell potential, a seasonal high water table, or low strength. This degree of limitation generally requires major soil reclamation, special design, or intensive maintenance. Some of these soils, however, can be improved by reducing or removing the soil feature that limits use, but in most situations, it is difficult and costly to alter the soil or to design a structure so as to compensate for a severe degree of limitation.

Soil Limitations

General Soil Type*	Homes w/o Basements	Homes w/ Basements	Septic Systems	Ponds	Erosion Hazard	Area of Concern	Comments
Brookston	Severe: ponding, drainage needed	Severe: ponding, drainage needed	Severe: ponding, perimeter drain needed	Moderate: seepage	Slight	Hydric soil, may contain wetland areas	Responds well to tile drainage
Crosby	Severe: wetness	Severe: wetness	Severe: wetness, perimeter drain needed	Slight to Moderate	Slight		
Eel	Severe: floods	Severe: floods	Severe: floods & wetness	Moderate: Seepage	Slight	Floodplain, Water Quality	Best left as green space or farmland
Fox	Moderate: Shrink - Swell	Slight to Severe: slope	Severe: Poor filter	Severe: Seepage	Slight	Porosity: Water Quality	Protect Ground Water
Genessee	Severe: floods	Severe: floods	Severe: Flooding	Moderate: Seepage	Slight	Floodplain, Water Quality	Best left as green space or farmland
Gessie	Severe: floods	Severe: floods	Severe: Flooding	Moderate: Seepage	Slight	Floodplain, Water Quality	Best left as green space or farmland
Hennepin	Severe: Slope	Severe: Slope	Severe: Slope & percs slowly	Severe: Slope	Severe	Equipment Limitations	Construction Limits Setbacks Needed
Martinsville	*Moderate:* Shrink/Swell	Slight	Slight to Moderate	Moderate to Severe	Slight		
Miami	Moderate to Severe (Slope)	Slight to Severe (Slope)	Moderate: Percs Slowly	Moderate to Severe (Slope)	Slight to Moderate		
Ockley	Moderate: Shrink/Swell	Moderate: Shrink/Swell	Slight	Severe: Seepage	Slight	Low Strength	
Rensselaer	Severe: Ponding	Severe: Ponding	Severe: Ponding	Moderate: Seepage	Slight	Hydric Soil: May Contain Wetlands	

General Soil Type*	Homes w/o Basements**	Homes w/ Basements	Septic Systems	Ponds	Erosion Hazard	Area of Concern	Comments
Shoals	Severe: Flooding, Wetness	Severe: Flooding, Wetness	Severe: Flooding, Wetness	Moderate: Seepage	Slight	Floodplain, Water Quality	Best left as green space or farmland
Sleeth	Severe: Wetness	Severe: Wetness	Severe: Wetness	Severe: Seepage	Slight		Responds well to tile drainage
Sloan	Severe: Flooding, Wetness	Severe: Flooding, Wetness	Severe: Flooding, Wetness	Moderate: Seepage	Slight	Floodplain, Water Quality	Best left as green space or farmland
Treaty	Severe: ponding, drainage needed	Severe: ponding, drainage needed	Severe: ponding, perimeter drain needed	Moderate: seepage	Slight	Hydric soil, may contain wetland areas	Responds well to tile drainage
Westland	Severe: Ponding	Severe: Ponding	Severe: Ponding	Severe: Seepage	Slight		
Whitaker	Severe: Wetness	Severe: Wetness	Severe: Wetness	Moderate: Seepage	Slight		

*These are general soil type (series) descriptions. Each soil type or series can differ in texture of the surface layer and in the slope, stoniness, or some other characteristic that affects use of the soils by man. Due to the scale of the soil survey map, small inclusions of other soil types may be present. This data does not eliminate the need for onsite investigations and testing. Therefore, on-site soil testing on the proposed building location is highly recommended but the Web Soil Survey can give you a general idea of what soil types are in the area.

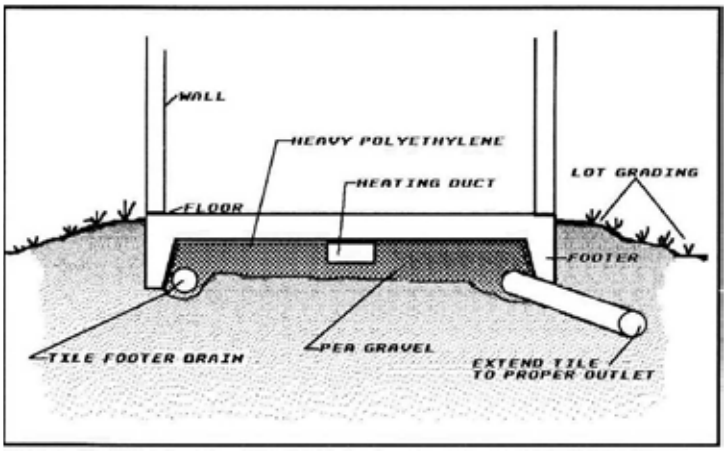
*** Note: In the Marion County Soil Survey some soil units are listed under urban land (i.e. Brookston part YbcA). These areas have been disturbed by development and may or may not have the same characteristics of the original soil. Limitations for these soils may be more severe due to compaction, filling or other conditions.

Building Site Considerations

The type of building construction you plan should be influenced by soil conditions and has a bearing on the degree of drainage you will need to provide. For instance, building a basement in a depressional soil with a high water table may be asking for trouble even though corrective measures are applied. In the case of a dry site with sand and gravel underneath and no seasonal high water table, you are free to choose the type of construction best suited to your needs.

Types of Home Construction

Concrete slab, crawl space, shallow basement (bi-level or multi-level) and full basement are the common types of residential construction. Earth shelter homes need special drainage designs. The deeper the construction goes into the soil profile the more likely it will be for you to encounter drainage problems.

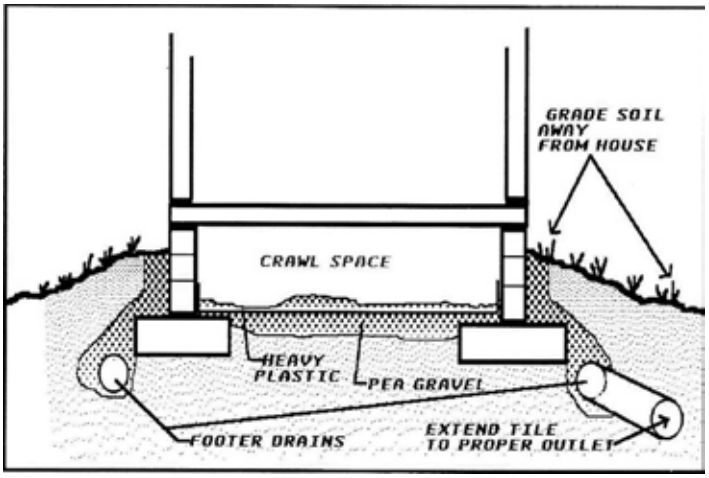


Concrete Slab

It is recommended to install subsurface drainage under slab construction. This prevents the water table from getting up near the slab and into floor heat ducts. Under the slab there should be a minimum of 2 inches or more of pea gravel or sand to stop capillary water movement. This should be topped with a double sheet of 6 mil. polyethylene plastic or other suitable moisture vapor barrier direcctly under the slab.

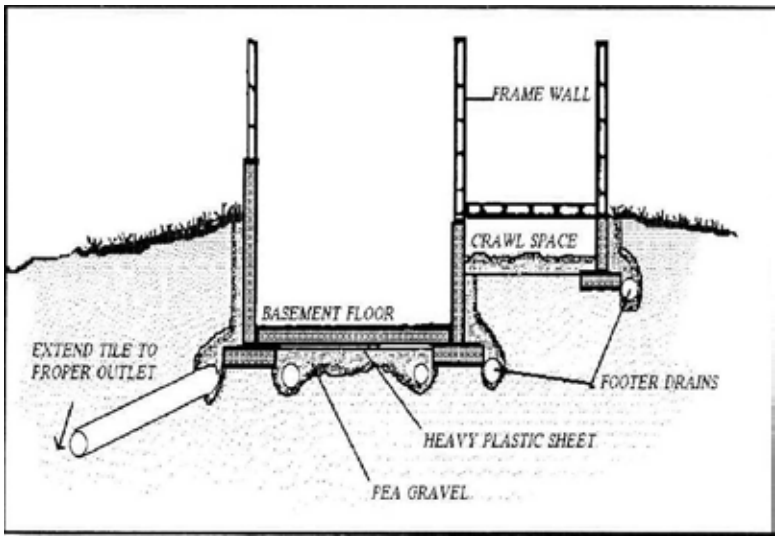
Crawl Space

The majority of homes are built on a crawl space. A cavity is provided under the house for access to utilities. Although proper drainage of crawl spaces may be less essential than for a basement, they can end up wet or dry depending on proper drainage planning. Crawl spaces are usually partly above and partly below the original ground line, but in most cases a majority of the crawl space is below ground line. Because the ground water table can be within a foot of the surface in poorly drained soils, it is easy to understand why crawl spaces can be wet. The diagram below shows the proper way to protect a crawl space from wetness. A tile should be placed outside and below the footing and backfilled with clean #8 stone or pea gravel. It is recommended that the inside surface of the crawl space be topped with a layer of pea gravel. To avoid dampness in the crawl space, add a heavy sheet of 6 mil. polyethylene plastic or equivalent moisture barrier on top of the finished crawl space all the way out to the foundation walls. Some builders prefer to add a protective layer of pea gravel on top of the plastic.



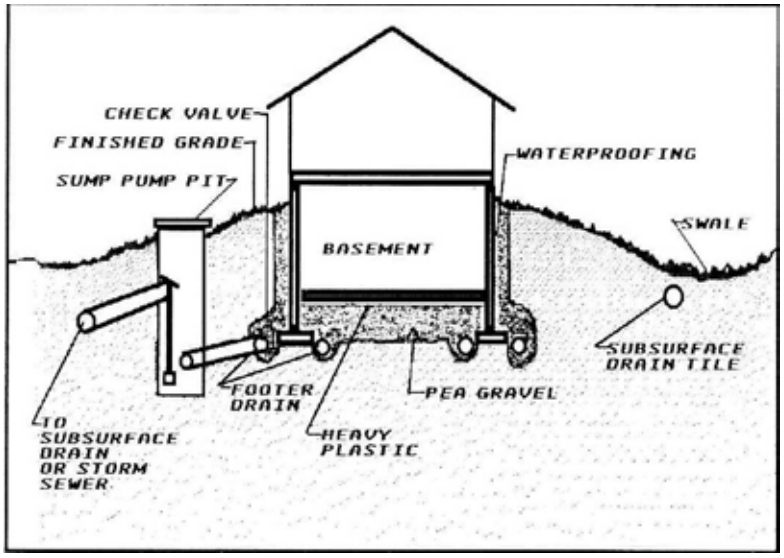
It has been our experience that many homes would have better surface drainage if the foundation was elevated one row of concrete

blocks higher. This would reduce the excavation of the crawl space and provide more slope away from the house. If not stockpiled at the time of construction, topsoil often needs to be purchased for final grading around the house.



Shallow Basements

Bi-level and multiple-level homes can have the lowest floor level one-half below and one-half above ground, and may be considered shallow basements. They are usually located at lower elevations in the soil profile than crawl spaces. Consequently, drainage problems are more likely than with crawl spaces, but usually not nearly as severe as for full basements. Tile drainage around the foundation footing is nearly always necessary except in very well drained soils. As shallow basements are not generally too deep in the soil, gravity flow tile outlets are often possible.



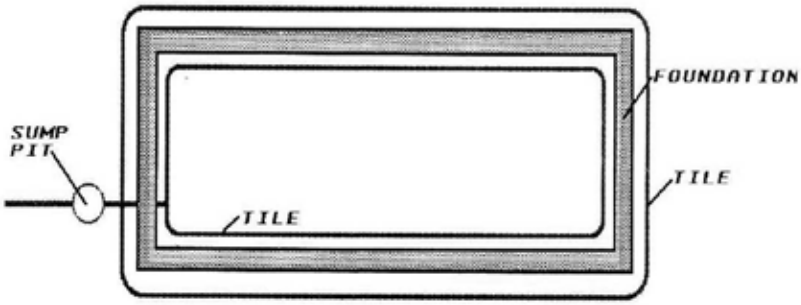
Full Basements

This type of construction requires the deepest excavation into the soil profile, perhaps 8 feet or more, and as would be expected, causes the most drainage problems. In poorly drained soils without drainage, the ground water table exerts great pressure on the deeper basement walls and floor. The ground water is trying to equalize the pressure by entering the basement. The result is a damp or wet basement.

Basement floors have been known to literally explode upward to relieve this pressure. Concrete block basement walls sometimes collapse, though this usually happens during or just after construction with settling of fresh soil backfilled against the outside basement walls or when proper structural supports were not used.

Tile Installation for Basements

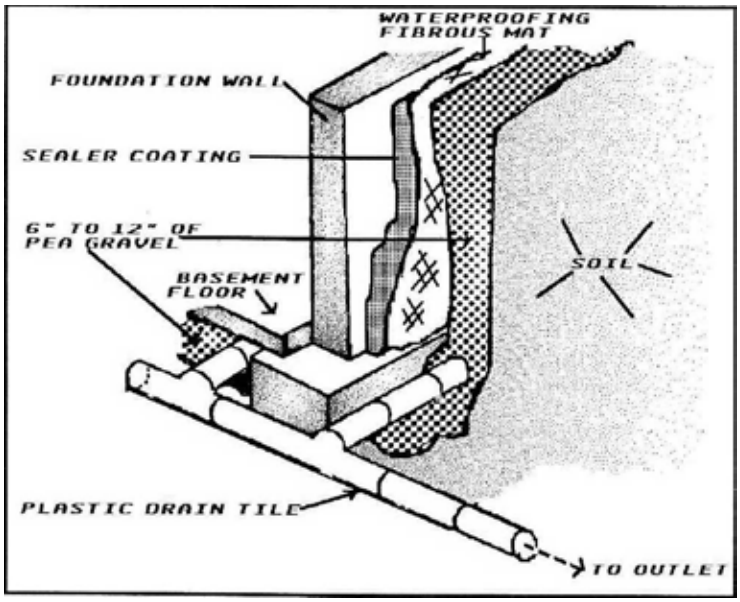
There are some key elements when constructing shallow basements or full basements. Once the footing has been installed on the inside and outside of the footer. The footing drains then outlet either to a gravity drain or to a sump



HOW TO AVOID A FLOODED BASEMENT: INSTALL THE SUMP PIT ON THE OUTSIDE OF THE BASEMENT WALL AND DO NOT INSTALL FLOOR DRAINS.

pump pit. Floor drains should not be connected to the footing drain. This prevents back-up water from entering the basement if there is a failure in the drainage system outlet.

The tile on the inside of the footer should be backfilled to the level needed to support the concrete floor. Then install a double layer of 6 mil., polyethylene plastic or equivalent on top of the pea gravel to prevent dampness of the concrete floor. The floor is then poured on the plastic.



Water-proofing

On the outside of the foundation and wall, backfill over the footer drain with pea gravel. Then water proof the basement walls before backfilling against them with a core of pea or clean gravel 6 to 12 inches wide to the surface of the soil. Installing more than 12 inches (width) of pea gravel could be harmful to the basement walls and/or plantings next to the home.

Damp-proofing vs. Water-proofing

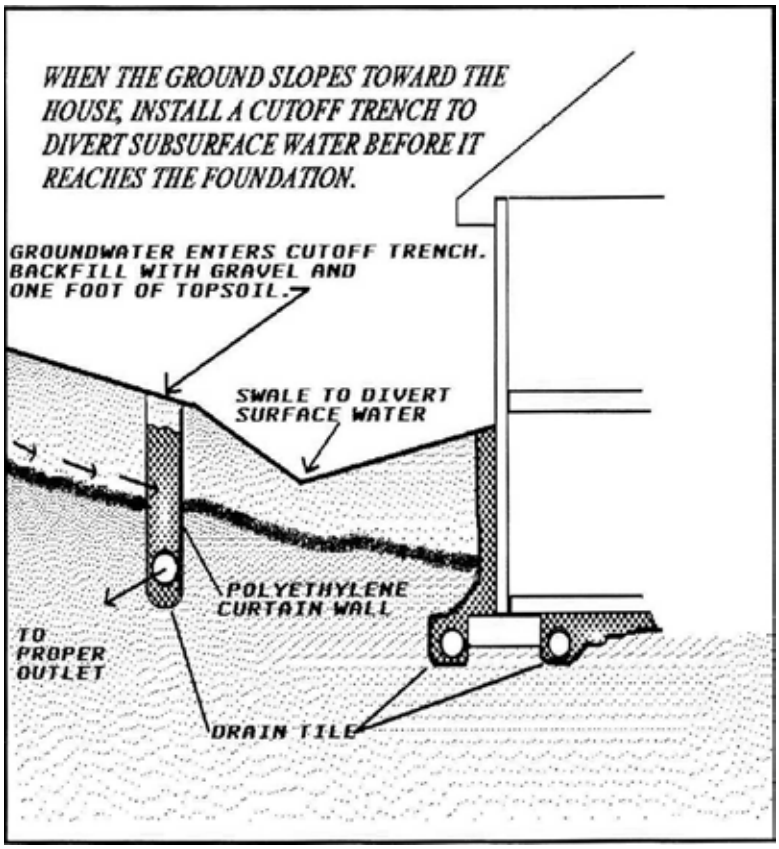
Damp-proofing is merely applying a thin layer of liquid tar to the outside of the basement wall. This is sufficient for crawl spaces or where the soils are extremely well drained and dampness would not be a problem. Water-proofing typically involves not only a layer of tar, but also some other layer(s) of fibrous materials. Check with your contractor about the best current methods for water proofing your concrete or block wall.

Earth Homes

This type of residential construction presents many of the same drainage problems as do full basements, sometimes more so. Earth homes should have an individual drainage design tailored to their own specific site and construction details. They should be built only where gravity type subsurface drainage is available. Drainage designs for this type of home should be much like those for full basements.

Hillside Seepage

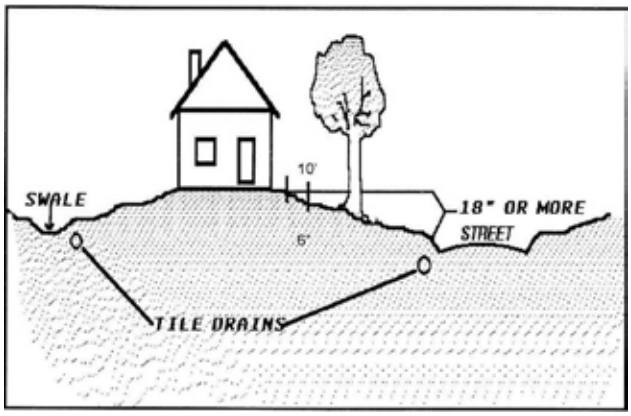
The sketch below illustrates how to properly divert hillside seepage water away from a foundation. Seeps commonly occur on steep sloping soils where glacial till is below the topsoil.



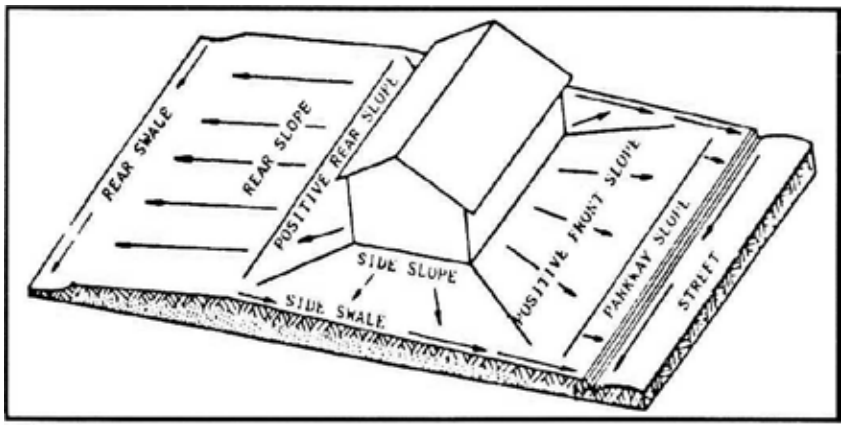
Guidelines for Surface Drainage

1) The ground elevation around a house should be a minimum of 18 inches higher than the street.

2) The soil around the house should be graded so it slopes away from the house at least 6 inches in the first 10 feet.



3) The front half of the house and lot should be graded to drain to the street and the back half of the house and lot should be graded to drain to side and rear yard swales.



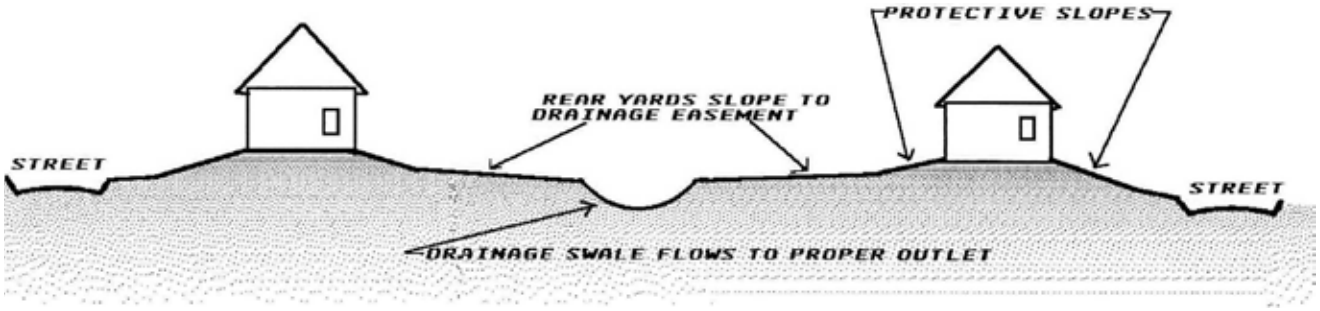
4) All lots should have some form of swales on the property to take surface water away from the house. Swales are generally "V" shaped with side slopes that are easily mowed and have a minimum slope of 12 inches per 100 feet. (Swales not having the minimum slope should have a subsurface drain the length of the swale to keep them dry.) In soils with adequate drainage, bioswales can be an excellent method for stormwater management and improving water quality. See the section on green infrastructure for more information.

5) All downspouts should be extended on top or below the ground at least ten feet from the house. Ideally all downspouts would be extended below ground to the nearest swale. It is best to use solid plastic tile for extending down spouts because slotted tile will put some water next to the foundation when installed above ground and roots can grow into it when installed below ground. Downspouts should drain so the water does not drain toward the neighbors property.

6) Some lots end up with low areas that pond water. In some cases regrading or filling with a little more topsoil will eliminate that problem. But in many instances filling will only move the problem somewhere else. In that situation it is recommended that subsurface tile be run under the ponding area to dry it up.

7) Avoid filling in existing drainage channels and roadside ditches. Filling in these channels usually creates wetness problems on someone else's property and/or damages the adjacent road surface.

8) Remember, the above recommendations work for most typical or ideal lots. In some cases a lot may have special characteristics that need extra thought, planning and design. For example: a lot that is very rolling with a front yard that slopes toward the house instead of away. A solution to this would be to install a swale in the front yard that would divert surface water away from the front of the house and take it to a rear or side yard swale. Also, the ground around the house should be a minimum of 18 inches above the top of the swale and should be sloped toward that swale.



Green Infrastructure Options for Homeowners

Green Infrastructure can have many benefits for homeowners and the environment. Here is an overview of a few options. More information can be found on our website.

1) Bioswales are drainage swales which are planted with native plants to provide erosion control and help to filter out fertilizer and pollutants before the water reaches a pond or stream.
2) Rain Gardens are depressional areas planted with native species which act as mini retention areas to decrease the amount of runoff leaving a yard. They also act as a filter for water quality. Rain gardens need an adequate outlet for overflow and work best in soils which drain fairly well.
3) Rain barrels collect runoff from the roof and store it to be used for watering later. Overflow from the rain barrels should be directed away from the foundation.
4) Pervious pavement has several options for homeowners wanting to decrease the amount of water leaving their home site. Permeable pavers, permeable concrete and porous asphalt are beneficial options for driveways and patios.
5) Green roofs decrease the amount of runoff coming off of roofs by installing planting material and a variety of plants to the roof of buildings. Green roofs are becoming more common on commercial buildings but need special engineering for the added weight.

Visit our website for additional information on environmentally friendly options for homeowners - https://marionswcd.org/

Subsurface Drainage

A subsurface drainage tile is a perforated or slotted hollow pipe that is buried underground and allows excess water in the soil to enter and flow from one point to another. Many soil types in Marion County have a seasonally high groundwater table. This means that ground water may be within a foot of the ground surface during a portion of the year. When tile is installed lower than the water table and flows to a proper outlet, the tile will lower the water table to the approximate depth of the tile. Ideally a tile should be 36 inches below the ground surface. Tiles installed shallow are much less effective.

Tile can be made of concrete, clay, flexible or rigid perforated plastic, or other materials designed for subsurface drainage. The size of the tile needed will depend on the area to be drained. However, for use around the home a size of six inches (inside diameter) is usually sufficient.

The outlet of a tile is the single most important component of a drainage system. A proper outlet is another working tile, storm sewer, pond or open ditch (creek. river, etc.). Once you have identified a proper outlet for your drain tile, a plan should be devised to install the tile. Remember, as a landowner, you are responsible for observing all local and state drainage codes. You may also have to seek permission, purchase an easement or work out some agreement with neighbors to get to a proper outlet. Be sure to locate all underground utilities before beginning any excavation. Call 811 or make an online request.

Gravity Flow Outlets

Use gravity flow subsurface tile systems whenever possible. They require no energy source and are simplest and cheapest to maintain. A gravity flow system should have a minimum slope of one inch per 50 feet of tile length. Animal guards should be place at the end of all discharge pipes that discharge into a pond, open stream or ditch. Long stretches of tile will need vent pipes.

Intercepting a Field Tile

If you cut through an existing field tile when you dig for your crawl space, septic system, or basement, always assume the tile carries water, even if it is currently dry or appears to be clogged with sediment. Re-route the tile (with the same size) around the structure or septic field and then reconnect it on the other side of the structure.

Tile Maintenance

Tile drains can work for many years with very little care. Some old clay farm tiles have been working for over 100 years. Caring for the tile on your lot is your responsibility, but the outlet for your drain may require some form of community organization for maintenance. A drainage maintenance group may be an organized watershed group, a homeowners association, or a city owned or county regulated drain (Legal Drain). If you are planning on connecting to or altering any community maintained drain, you must first get permission from the proper authorities. For example, contact the Department Public Works (DPW) for information and the Department of Business & Neighborhood Services (BNS) for permits concerning county regulated drains. Maintenance for other tile outlets may be more complicated. If your outlet is a natural stream, drainageway, private open ditch or tile you will have to negotiate the use of the outlet. A maintenance easement is one way to allow access to keep a tile outlet in good working order. A tile outlet should be checked at least once or twice each year.

Root Blockage

Tile installations designed to lower water tables must have joints, holes or slits which allow entry of groundwater. Tree and shrub roots can also enter at theses points in search of moisture and may eventually block the tile. Water loving trees such as willows and maples can be especially troublesome. Here are some ways of keeping roots from blocking tile lines:

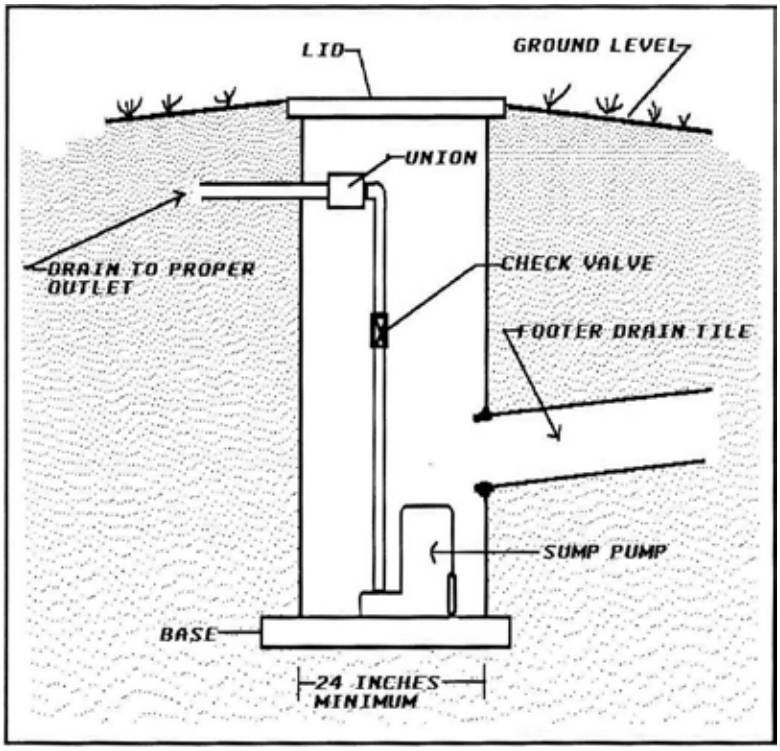
- Solid plastic tile can be used to pass through existing tree and shrub areas.
- Trees and shrubs planted later should be located away from tile lines. Take into consideration the size of the plant at maturity. A rough guideline for trees is the root system will extend out at least as far as the tree canopy, and often beyond it.
- A minimum of six inches of clean #8 gravel and a geotextile sock around a tile will help discourage roots.
- Inspection/breather vents to the surface can be placed on the tile lines to visually check to see if the tile is working. They can also provide access to sections of tile which may become clogged. Schedule 40 PVC with holes drilled into it can be used instead of corrugated plastic. It can be cleaned (Roto-rootered) out as needed through the vent pipes.

Sump Pumps

In some situations the lowest floor level (i.e. basement) or crawl space may be lower than the closest proper outlet. A sump pit and pump will then be needed to lift the water up to the outlet. Since this type of system needs electricity to operate, it is advised that a battery backup and alarm system also be installed if the sump pit is inside the basement or crawl space. It is recommended that the sump pump and pit be installed outside the basement wall, so if the sump pump fails, water will not flood the basement. Check valves should be installed to prevent water back up from the overloading of the drainage outlet during heavy rainstorms.

Sump pumps should be used solely for the discharge of groundwater or other storm waters. They should be connected to a storm drainage channel or a storm sewer. A permit from BNS is required to connect a tile into a storm sewer.

Special ejection pumps should be used to discharge floor drain flow or other sanitary sewage. These pumps should be connected to the on-site septic absorption system or a sanitary sewer system.



Septic Systems & Wells

New Construction

Since the development of municipal sewage treatment facilities, most people in cities and towns have taken sewage disposal for granted. However, many areas of the county do not yet have access to a sanitary sewer. These areas have to rely on septic systems to treat their sewage. As many of the soil types in our county have severe limitations for septic systems, it is imperative to check with the County Health Department before making a binding purchase agreement on a parcel of land or starting construction. There have been many instances where individuals have purchased property and later found that they could not build because it was not conducive to a septic system

If municipal sewage service is not available, locating the best location for a septic field should be the first phase in your home building plans. A soils investigation will need to be done by a certified private soil scientist for the septic permit application. A listing of approved soil scientists is available from the Health Department. Once the soils report is received by the Health Department they can determine if the site is appropriate for a septic and if any special requirements (i.e. a perimeter drain or a non-conventional system) are needed.

When applying for a septic permit you will need to include the following: a Soil Scientist's report, a complete set of architectural/engineering blue-prints of the structure, a plot plan, and a septic system design. Contact the Health Department for a copy of the pre-construction checklist which explains in detail what should be included in each report. In some instances you may also need a drainage permit.

It is of utmost importance that the septic field be located and fenced off before any construction begins. If equipment or vehicles run over and park on the septic site it may compact the soil so that the site is no longer usable for a septic system and your permit will be denied or revoked.

Septic failures can generally be attributed to three main factors:

1) a seasonal high ground water table
2) lack of soil permeability
3) depth to a limiting layer such as bedrock or massive glacial till

In Marion County the most common cause of failure is a high groundwater table. This limitation can usually be overcome using a perimeter drainage system if an adequate outlet is available. On new construction, the tile system must be able to drain by gravity. For a repair, the Health Department may allow the use of a sump pump to drain the water to a proper outlet.
NOTE: It is illegal to hook a septic system to a drainage tile.

Permeability is the rate at which water enters and passes through the soil. The amount of gravel, sand, silt and clay in a soil and the relative tightness or looseness of the arrangement of these particles largely influence the permeability of the soil and the size of the septic tank absorption field that would be needed. Soils which are too compact or too porous may not be suitable for septic systems. Permeability is adversely affected by compaction from traffic.

Depth to a limiting layer, the third factor in how well a septic system works, affects the amount of soil available for absorption of septic effluent. If the limiting layer (usually glacial till in Marion County) is close to the surface, a septic system may not be allowed or an alternative to a conventional system may be required.

Existing Systems

When purchasing an existing home with a septic system it is wise to have the soil checked. This will help assess whether the soil type is conducive to septics. Other questions to ask are:

1) Where is the septic field located?
2) Is there a plot plan and septic system design for the home?
3) Is the size of the system adequate for the size of the home?
4) Is there a perimeter drain for the septic'?
    a. Where is it located?
    b. Where is the outlet?
    c. Is it functioning properly?
5) Is there good surface drainage off of the septic field?
6) Are there any indications of septic leaching in the yard? Very green grass over the fingers?
7) When several of the faucets are turned on and the toilet is flushed at the same time, does it flush properly?
8) When was the last time the tank was pumped?

Basic Maintenance

A sanitary sewer is usually the best way to dispose of sewage. Septic systems are a temporary solution with a limited life span. Proper maintenance in addition to good site location and proper installation however will ensure the longest life span possible for your septic system.

It is recommended that trees and shrubs not be planted over the septic system as roots often grow into tile lines and plug them when dosing systems are not used. Buildings, driveways, and sidewalks also should not be placed over the septic field. Do not drive or park vehicles over the septic field.

Pump the solids from the tank when necessary, usually every 2-3 years and more often if you use a garbage disposal. Limit water entering the tank. Use water saving fixtures. Avoid long showers, frequent baths, and excessive toilet flushing. Promptly fix toilet float valves, leaks and dripping faucets. Spread clothes washing over the entire week. Use only full loads in the dishwasher and clothes washer. Do not put materials that will clog the septic tank such as fats, grease, or paper towels down drains. Also do not put toxic substances in drains or use chemicals to clean or "sweeten" (accelerate) your system. They may interfere with the biological action in the tank, clog the drain field by flushing sludge and scum into the field, or add toxic chemicals to the groundwater.

Inspect the drain field regularly. Soggy areas or very green grass indicate that the wastes are backing up to the ground surface rather than sinking down into the ground.

If you have questions or concerns regarding your septic system contact the Marion County Health Department at 317-221-2147.

Wells

In some areas of the county public water supply is not available. If you plan to build a home in one of these areas you will need a permit from the Marion County Health Department to have a well drilled. At this time in most areas there will be little difficulty in receiving a permit. A licensed well driller must be used and some mortgage companies require that a sample be taken. Wells must be located at least 50 feet away from the septic field. It is recommended that the well be chlorinated once or twice a year. Samples of the water can be submitted to the Health Department after treatment.

Erosion Control

Sediment is the #1 surface water pollutant by volume. Once considered only a farming problem, we now realize that unprotected new construction sites can contribute more sedimentation per acre by volume than an agriculture field. Erosion not only creates water quality problems, it clogs drainage-ways, creeks, ponds, and storm sewers. Cleaning these areas out costs taxpayers thousands of dollars each year. Homebuilders and developers often spend thousands of dollars for the replacement of washed out streets, replacement of undercut pavements, sidewalks, and utilities, and cleaning out or replacement of clogged storm sewers and culverts. In addition, fertile topsoil is frequently eroded from the site making it difficult and expensive to establish lawns and gardens.

There are many conservation and site management practices that can be used to reduce or eliminate erosion and sedimentation hazards. These practices can generally be installed at little or no extra cost to the contractor or homeowner, and they make the contractor's job easier and more profitable.

Step 1: Evaluate the site Identify vegetation to be saved. Protect trees and sensitive areas. To prevent root damage, place a plastic mesh or snow fence barrier around sensitive areas and around the drip lines of trees you wish to save. Do not grade, burn, place soil piles, or park vehicles near trees or in areas marked for preservation.

Step 2: Install perimeter erosion and sediment controls Identify the areas where sediment-laden runoff could leave the construction site, and install perimeter controls to minimize the potential for off-site sedimentation. It's important that perimeter controls are in place before any other earth-moving activities begin. Protect down-slope areas with vegetative filter strips and/or silt fence. Install a gravel drive and restrict traffic from any other areas of the lot. Protect storm sewer inlets which are nearby or on the site with stone-filled geotextile bags or silt fence material. Projects disturbing more than one acre will require a Construction Stormwater General Permit.

Step 3: Prepare the site for construction Salvage and stockpile the topsoil, temporarily seed the stockpiles with annual rye or winter wheat and/or place sediment barriers around the perimeter of the piles. This is an important step as subsoil often resists water infiltration, has severe nutrient deficiencies, and is susceptible to compaction.

Step 4: Build the structure(s) and install the utilities Make sure all contractors are aware of the areas to be protected. Install downspout extenders as soon as the gutters and downspouts are installed.

Step 5: Maintain the control practices until construction is completed and the lot is stabilized Inspect the control practices at least twice a week and after each storm event. Make any needed repairs immediately and clean up any soil tracked or washed off-site.

Step 6: Re-vegetate the building site Redistribute the stockpiled topsoil to a depth of 4 to 6 inches. Ensure that there is positive drainage away from the house and drainawge swales have adequate fall in elevation before completing the final grading. Seed or sod bare areas according to recommendations. Fertilize and lime according to soil test results and water as needed. Mulch newly seeded areas and keep the soil moist until the grass is two inches tall.

Step 7: Remove remaining temporary control measures once the sod or vegetation is well established

For more information on erosion control and examples of practices refer to the Indiana Storm Water Quality Manual. This publication is available from the Indiana Department of Environmental Management https://www.in.gov/idem/stormwater/resources/indiana-storm-water-quality-manual/

Information on establishing and maintaining healthy turf can be found at https://turf.purdue.edu/home-owner-publications/

Permanent Seeding Recommendations

Lawn & High Maintenance Areas Mix

Seed Species	Rate / Acre	Optimum Soil pH
4 way blend turf type Tall Fescue	100 lb/ac	6.0 to 7.5
Creeping Red Fescue	50 lb/ac	6.0 to 7.5
Perenial Ryegrass	45 lb/ac	6.0 to 7.5
White Dutch Clover	1.5 lb/ac	6.0 to 7.5

Critical Area Native Seeding Mix

(Sun to part-shade - additional nurse crop recommended + wildflower mix for pollinators)

Seed Species	Rate / Acre	Optimum Soil pH
Big Bluestem	48 oz/ac	6.0 to 7.0
Side-Oats Grama	16 oz/ac	6.0 to 7.0
Prairie Sedge Species	4 oz/ac	6.0 to 7.0
Canada Wild Rye	32 oz/ac	6.0 to 7.0
Virginia Wild Rye	24 oz/ac	6.0 to 7.0
Switch Grass	12 oz/ac	6.0 to 7.0
Little Bluestem	32 oz/ac	6.0 to 7.0
Indian Grass	32 oz/ac	6.0 to 7.0

Checklist for Purchasing an Existing Home

Before you make an offer, use this checklist to help identify potential drainage problems:

_____ 1) The grass, trees, and shrubs look healthy. Dead Grass could mean a wet spot where water stood.

_____ 2) The ground elevation around the home is 18 inches higher than the street.

_____ 3) The ground around the house slopes 6 inches in the first ten feet away from the house.

_____ 4) The downspouts have drains that take the water at least 10 feet away from the house.

_____ 5) There are swales in the rear and side yards to carry the surface runoff water to a proper outlet.

_____ 6) Adjacent drainageways, creeks, and/or rivers have been analyzed and there are no known flooding problems in the area.

_____ 7) A home with a slab foundation has no water in the floor heat ducts and no mold growing on the walls.

_____ 8) A home with a crawl space was constructed as suggested in this guide.

_____ 9) The crawl space shows no signs of wetness, mold or rotted wood and closets do not smell of mildew.

_____ 10) The crawl space has a footing drain and/or a sump pump

_____ 11) A home with a shallow or full basement was constructed as suggested in this guide.

_____ 12) The basement shows no signs of dampness or water marks on the walls and floor.

_____ 13) The appliances in the basement have not been raised off the floor to prevent damage if flooded.

_____ 14) The sump pump is outside, or if inside, there is a battery backup system.

_____ 15) The sump pump has a proper outlet.

_____ 16) There is no evidence of heaving and excessive moisture on the concrete floors, porches, walls and paint.

_____ 17) Nearby property owners have told you they know of no drainage problems with the house or neighborhood.

Checklist for Building on a Lot

While looking at property and house floor plans, use this checklist to help avoid drainage problems:

_____ 1) The home has been designed with soil limitations in mind.

_____ 2) Before construction of a home on a lot where there are no sanitary sewers, fence off the area where the septic system will be located. Permit no traffic on this area to prevent soil compaction, which could prevent the area from being used.

_____ 3) For any trees that are to be saved, fence around the trees out to at least the drip line to protect root systems from compaction damage from any equipment. Also fence off any sensitive areas you wish to protect.

_____ 4) Install a stone base for the driveway before starting construction and instruct all deliveries to be made only using the driveway.

_____ 5) Review the previous list called "Check List for Purchasing an Existing Home?. Be sure the designers have included the recommendations listed in this guide.

_____ 6) Prepare a plan to control erosion during and following the construction phase.

_____ 7) Check the conditions of the drainage along the public road., Check with the Department of Business and Neighborhood Services to see if a driveway culvert will be required, what size and type.

The Marion County Soil Survey can be accessed at https://websoilsurvey.nrcs.usda.gov/app/.

Contact the Marion County Soil & Water Conservation District for on-site assistance.

NOTES

Marion County Soil & Water Conservation District
(317)786-1776
www.marionswcd.org