



RESIDENTIAL GUIDE FOR SOILS, DRAINAGE, AND EROSION CONTROL



“TO HELP HOMEOWNERS HELP THEMSELVES”

DREAM HOME OR NIGHTMARE?

The purpose of this resource guide is to provide educational material to residents, builders and developers. It provides information on soils and soil limitations, residential drainage and water management, in addition to providing lists of questions important when purchasing a new or existing home.

The single biggest investment that the average person will make during their lifetime will be the purchase or construction of a home, but keep in mind that your dream home could turn into a nightmare as looks can be deceiving. What appears to be a lovely wooded homesite in summer or times of dry weather may actually be a swamp in the springtime.



Having knowledge of your soils can save you time and money as there are many different types and each have preferred uses and limitations. Some soils are well drained and are ideal sites for homes with basements. Other soils are heavy clay with high ground water tables that can cause septic system failures and flooding in homes with basements.

We have seen or heard almost every problem imaginable. It doesn't matter who you are; anyone can make mistakes about drainage and erosion. This guide will give you excellent information that can be used when purchasing a new property or solving problems with your existing home. It will identify and answer most drainage questions and help you control erosion on your building site. This is important in order to maintain soil fertility, protect the quality of our water, and will help you establish a healthy lawn and landscape.

THE INFORMATION CONTAINED HEREIN MAY NOT FIT ALL SITUATIONS AND LOCAL ORDINANCES, BUILDING CODES AND OTHER REGULATIONS MAY ALTER OR LIMIT THEIR USE.

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ITEMS TO BE CONSIDERED...

When building on a lot or purchasing an existing home, the following items should be considered:

Soil: Soil is the very basis for our existence. Of course, it provides a growth medium for food and fiber, but in the context of this guide, it can be friend or foe to a homeowner. Soils vary greatly as to suitability for, or hazards to houses. Diligence, education and careful consideration should be given to soils when contemplating purchase of a lot or an existing home. Other factors to consider in the context of building or buying should be: drainage, topography, water table, percolation, erosion, and flooding.

Water Table: This is the depth, measured from the soil surface at which underground water is encountered. This depth is extremely deceptive, because the water table depth can vary dramatically, depending on the season of year, and rainfall.

Topography and Grading: The house structure's main floor should be built to an elevation of at least 1 foot above the lot. The soil should slope away from the house at a 5:1 slope, for a minimum of 10 feet.

Septic Systems and Basements: The soil survey will provide limiting information on: septic tank absorption fields, shallow excavations, dwellings with and without basements, local roads and streets, and lawns and landscaping.

Hillside Seepage: This is the movement of water through the soil laterally. Seepage adversely affects any specified use potential. Measures required to remedy this hazard require both artificial surface and subsurface drainage. If the topography does not lend itself to these measures, remedy is nearly impossible.

Flood Hazard Areas: Maps containing this information can be found online or at your local planning and zoning department.

Flood Insurance: This is administered nation-wide by FEMA, through private insurance agencies.

Existing Easements, Rights of Way and Drainage Encumbrances: If the lot or existing home is in a subdivision, this information will be shown on the plat. If the house is not on a platted lot, a deed search would be necessary, which is found at the local Recorder's office.

SOILS

Many factors affecting urban/suburban living are hidden within the soil beneath our feet, therefore, particular attention should be given to soil conditions when purchasing property or building a home.

Soil is often referred to as “dirt”. Dirt is what we sweep off the kitchen floor and should not be confused with SOIL, a valuable natural resource. Soil supports our homes and roads; grows our food, flowers, trees, and grass; and filters our septic waste. Soil can severely affect living conditions and thus should be thoroughly investigated before making a decision on where you are going to call home or build a business. The investigation should start by contacting your local Soil and Water Conservation District office, by obtaining a copy of the “Soil Survey of the County”, or by visiting USDA’s Soil Survey website at <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. The soil survey contains valuable information that will identify soil types, conditions, and limiting factors specific to your parcel of land, and its maps and supporting data can be used to:

- ◆ Evaluate areas for construction of houses, schools and commercial buildings.
- ◆ Determine the kind of soil material that must be excavated for basements and other underground structures.
- ◆ Estimate the capacity of soils to bear loads and anticipate required changes in design or compensating measures.
- ◆ Locate sources of sand and gravel, topsoil, and fill material.
- ◆ Determine adverse soil properties, such as flood hazard, high water table, seasonal wetness, and shrinking and swelling. (PHOTO: Shrinking and swelling of the soil cracked the walls and foundation of this house. Soil surveys help you anticipate such soil hazards).
- ◆ Identify areas that require surface and subsurface water control.
- ◆ Determine the suitability of soils for septic tank absorption fields.

Use of the soil survey and review of soil properties should prove helpful to you in wisely selecting the lot or home of your dreams.

When purchasing or making changes to any property, consideration should also be given to erosion or loss of soils due to runoff. Soils that are not protected by plant cover are very vulnerable to erosion when precipitation occurs. As mentioned earlier, silt from runoff, is a major factor in the pollution of our streams and rivers.

WELLS & DRAINAGE

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 to have a well drilled. Wells must be located at least 50 feet away from the septic field, and a licensed well driller must be used.

Drainage

Land and its ability to absorb or shed water is critical to property investments, and a home represents the largest investment many families will make in a lifetime. Whether you plan to build on a small city lot or 40 acre rural estate, good drainage is vital. It is difficult to put a price tag on good drainage since it is one thing we expect when we purchase a home.

Unfortunately, potential homeowners give little or no thought to drainage when buying or building a house, at least not until a problem arises. However, those who have lived with poor drainage will quickly attest that it should be the number one priority in selection of a home or homesite. The average new home buyer or builder gives a lot of thought to the house floor plan and room arrangement, but often little thought to drainage. Yet much of the enjoyment of living in a newly purchased or constructed home can be completely negated by the headaches of poor drainage. Drainage and flooding problems in and around a house can be a costly and damaging nuisance, so it is critically important to be mindful of these issues.

Most drainage features around a home are hidden, whether good or bad. Few potential buyers know what to look for. If sold during a dry period, wetness symptoms may not appear until next spring. A new house is no more exempt from drainage problems than an older one. It is much more difficult and often impossible to completely correct drainage problems for an existing home. After the home is built, drainage improvements are invariably a compromise resulting in something less than the ideal solution. However, to the degree they can be implemented, the same basic needs and principles of drainage apply to an existing home, as for new construction.

SURFACE DRAINAGE AROUND THE HOME

- ◆ The ground elevation around a home should be a minimum of 18 inches higher than the street.
- ◆ The soil around the house should be graded so it slopes away from the house at least 6 inches in the first 10 feet.
- ◆ The front half of the house and lot should be graded to drain to the street and the back half of the house should be graded to drain to side and rear yard swales.
- ◆ 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 mowable side slopes and 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.
- ◆ 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 downspouts. Slotted tile will allow water next to the foundation when installed above ground and roots will grow into it when installed below ground.
- ◆ Some lots end up with low areas that pond water. In some cases, filling the low area 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.
- ◆ 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.
- ◆ 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, would need to have a swale installed in the front yard to divert surface water away from the front of the house and into a rear or side yard swale.

SUBSURFACE DRAINAGE - NON REGULATED TILE & REGULATED DRAINS

Most soils in west central Indiana have a high water table. This means that ground water may be within a foot of the ground surface during a portion of the year, and that subsurface drainage may be required to lower the water table. Subsurface drainage can be a non-regulated (private) tile or a County Regulated drain that is perforated or slotted tile, pipe or conduit buried underground that allows excess water in the soil to enter and flow from one point to another. When subsurface 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, it should be 36-42 inches below the ground surface, and the size of tile needed will depend on the area to be drained.

Non-Regulated Tile

Non-regulated tiles are normally considered private tiles. Some are old clay farm tiles that have been working for over 100 years, and others are newer tiles installed by landowners on their property to assist in drainage of the site. Maintenance for such tile is the responsibility of the landowner. It is important to note that even old private tiles still act as vital conduits for drainage and are important to repair. If not maintained, homeowners may experience drainage problems with their septic system or water retention in crawl spaces or basements. Please note it is always important to check with your local County Surveyor when you are unsure if a broken tile on your property is a non-regulated (private) tile or a County Regulated drain. While the county does not maintain records of private tiles, they may have knowledge of the location of private tiles that have been connected to County Regulated drains.

Regulated Drain

A regulated drain is an open drain or tiled drain; or a combination of the two. An open drain is commonly referred to as a creek or ditch. Tile drains are subsurface conduit installed beneath the ground surface to collect or convey water. Tile today is made of rigid or flexible plastic with older tiles being made of clay and concrete. The County Surveyor is the technical authority on the maintenance of regulated drains, whether open or tiled. Normally, a yearly drainage assessment is charged to property owners benefited by the drain therefore monies are collected by the county to maintain such drains.

Tiles and open drains have the ability to take water away from home sites; therefore it is very important to keep them maintained and notify the proper authorities when one is aware of broken tiles on their property. Maps indicating the location of County Regulated drains can be found online or in the office of the County Surveyor .

TILE OUTLETS & MAINTENANCE

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 have to seek permission, purchase an easement or work out some agreement with neighbors to get a proper outlet. Be sure to locate all underground utilities before beginning any excavation.

Use gravity flow subsurface tile systems whenever possible. They require no energy source and are simplest and least expensive to maintain. A gravity flow system should have a minimum slope of one inch per 50 feet of tile length. Animal guards should be placed at the end of all discharge pipes.

Tile drains work for years with very little care; however, since tile installations are designed to lower water tables, they must have joints, holes or slits which allow entry of groundwater. Tree and shrub roots can enter at these points in search of moisture and may eventually block the tile. Water loving trees such as willows and maples can be especially troublesome. Below are maintenance recommendations that include prevention of root blockage :

- ◆ Breather vents to the surface can be placed on tile lines to visually check to see if a tile is working;
- ◆ A minimum of six inches of clean #8 gravel and a geotextile sock around a tile will help to prevent silt and roots from clogging the tile;
- ◆ Solid plastic tile can be used to pass through existing tree and shrub areas; and
- ◆ 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.

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 house or septic field and then reconnect it. Always make sure the tile has proper grade to allow proper drainage.

Always remember to “Call Before You Dig” (Dial 811) prior to excavating for any project!

SUMP PUMPS & FLOOD HAZARD AREAS

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 back-up 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 also be installed to prevent water back-up from the overloading of the drainage outlet during heavy rain storms.

Several options are available to deal with water from your sump pump. Some jurisdictions allow you to discharge to a nearby storm sewer. You should seek permission and complete the installation properly to avoid problems later. There are “drywell” tank systems that store water underground, and allow it to percolate into the surrounding soils. Rain gardens can be a good choice as well, allowing water-tolerant plants to filter the water before soaking into the ground. On a larger property, an infiltration trench is another eco-friendly option. It is basically an excavated area lined with filter fabric, filled with stone or pea gravel and covered with permeable pavers or pervious concrete. Water then percolates through the porous surface, into the infiltration bed and then dissipates into the surrounding soils.

Sump pumps should be used solely for the discharge of groundwater or other storm waters and are connected to a storm drainage channel or 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 onsite septic absorption system or a sanitary sewer system where possible.

Special Flood Hazard Areas (SFHA):

Special Flood Hazard Areas (SFHA) means those lands subject to inundation by the regulatory flood, within the jurisdiction of a county. These areas are identified as such on Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (FEMA), and can be viewed at the Soil & Water Conservation District or County Surveyor’s office. County Building Departments or other local authorities may require a landowner to contact agencies such as the Indiana Department of Natural Resources and the U.S. Army Corp of Engineers to determine if a potential home site is within a Floodplain area before permits are issued or building can begin. Construction within the SFHA can violate a counties floodplain ordinance and their participation in the FEMA program which provides financial relief to residents affected by flood damage.

EASEMENTS, SWALES & DITCHES

Drainage & Utility Easements

Easements have been established on County Regulated drains which allow 75 feet on both sides of a tile or open drain for maintenance of such drain by the County Surveyor. Within platted areas, easements are granted to reserve areas for storm pipes or conveyances required to control and direct runoff to the appropriate stormwater best management practice (BMP). State law prohibits the construction or placement of structures, i.e. homes, garages, trees, fences within the easements without prior approval from the County Drainage Board, the County Surveyor, or other proper authorities. Remember as a land/home owner, you are responsible for observing all drainage codes.

There are additional easements shown on subdivision final plats reserved for the non-exclusive use of public and private utility companies, such as cable TV & broadband, gas & electric, water & sewer. While the owners of lots with platted easements hold title to the property, there are stipulations that limit any structure within the easement, including fences, patios, decks, driveways, walkways, landscaping and trees without the prior approval of the jurisdictional authority and/or the Homeowner's Association.

In most cases, it is the homeowner's responsibility to preserve and maintain the piping or conveyance in working order on their own lot, however, many stormwater ponds and other BMPs are placed in "common areas" of the development and are the responsibility of the Homeowner's Association Board. This Board collects assessments on each lot to perform maintenance on BMPs that benefit all homeowners collectively.

Swales and Ditches

It is common for residential subdivision lots to have swales for drainage. Swales can be located adjacent to the street in a front yard and also in side or back yards. They are best kept in grass mowed to a height of 4" or less. A grass swale helps reduce sediment, nutrients and other pollutants from entering the storm sewers by filtering and slowing the water, allowing more runoff to percolate into the soil. You should expect water to collect in the swale after significant rainfall, and dissipate within 12-24 hours. Front yard swales may also have a properly sized culvert installed to allow construction of a driveway. These drainage swales should not be filled, tiled or altered without written authorization from the proper authority.

Ditches and swales along public roadways are generally under County Highway or City Street Department control. Adjacent property owners must have a permit to do any work within the right-of-way. If you live on a private road, your ingress/egress easement usually contains details regarding your rights and privileges.

PERVIOUS SURFACES & DRAINAGE DO'S & DON'TS!

Pervious Surfaces

Grassed and landscaped areas are considered “pervious” surfaces since they allow water to soak into the soil. “Impervious” areas are roofs, driveways, walks, and other non-porous surfaces that shed water, creating runoff. It is important to direct roof downspouts AWAY from your home’s foundation to be absorbed into the yard since water can collect in your crawlspace or seep into your basement. There are several types of downspout extenders, bubblers, and other devices to assist in getting rainwater away from your foundation. You can also choose a rain barrel device to collect roof rainwater or maybe install a rain garden to capture the runoff from impervious areas.

Drainage Do's and Don'ts!

- ◆ Keep all drainage swales open and clear of debris. DON'T MODIFY THEM!
- ◆ COMMUNICATE! Talk to neighbors about drainage issues in your neighborhood.
- ◆ Ask questions BEFORE changing the drainage around your home. Check with your Homeowners Association, the County Drainage Board, or the City Engineer prior to making changes.
- ◆ CALL BEFORE YOU DIG! Dial 811 and have utilities located on and around your lot before digging anywhere on your property.
- ◆ DON'T assume you can do as you please on your lot. Most platted areas have covenants and restrictions that have been created by your Homeowner's Association.
- ◆ BE CAREFUL when directing runoff towards your neighbor. You could be held liable in civil court if it's proven you damaged your neighbor's property.
- ◆ ALLOW RUNOFF TO SOAK INTO THE GROUND. By doing this, less water is sent downstream for others to manage and fewer nutrients and other pollutants are being carried off your lot.
- ◆ NOTIFY someone if an inlet is plugged or water backs up repeatedly in the same location. Contact a Homeowners Association board member, the County Surveyor, or the Street Department!

NEW SEPTIC SYSTEM CONSTRUCTION

NOTE: IT IS ILLEGAL TO HOOK A SEPTIC SYSTEM TO A DRAINAGE TILE.

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 have access to a sanitary sewer. As a general rule, most homes and businesses in rural areas have had to rely on septic systems to treat their sewage. A stop at the County Health Department prior to making a binding purchase agreement on a parcel of land or starting building construction can save a potential homeowner time and aggravation. There have been instances where individuals purchased property and were subsequently denied the privilege of building because they could not obtain a septic permit.

If municipal sewage service is not available at your site, identifying 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. 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 are needed. When applying for a septic permit, you may need the following: a Soil Scientist's report, architectural or engineering blueprints of the structure, a plot plan, and a septic system design. Contact the Health Department for an up to date checklist which explains in detail what is required.

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 could be denied or revoked.

Septic failures can generally be attributed to three main factors: a seasonal high water table, soil permeability, or depth to a limiting layer (bedrock or glacial till). The most common cause of failure is a high water table. This limitation can be overcome using a perimeter drainage system if an adequate outlet is available.

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. Permeability is adversely affected by compaction from traffic, and soils which are too compact or too porous may not be suitable for septic systems.

Depth to a limiting layer affects the amount of soil available for absorption of septic effluent. If the limiting layer is close to the surface, a septic system may not be allowed or an alternative to a conventional system may be required.

EXISTING SEPTIC SYSTEMS & MAINTENANCE

Existing Septic Systems

When purchasing an existing home with a septic system, it is wise to have the soils checked to assess whether the soils are conducive to septic systems. Other questions to ask are:

- ◆ Where is the septic field located?
- ◆ Is there a plot plan and septic system design for the home?
- ◆ Is the size of the system adequate for the size of the home?
- ◆ Has a perimeter drain been installed for the septic? Where is it located? Where is the outlet? Is it functioning properly?
- ◆ Is there good surface drainage off of the septic field?
- ◆ Are there any indications of septic leaching in the yard?
- ◆ When several faucets are on and the toilet is flushed, does it flush properly?
- ◆ When was the last time the tank was pumped?

Septic System Maintenance

Proper maintenance, in addition to good site location and proper installation, 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 should not be placed over the septic field.

Limit water entering the tank. Use water-saving fixtures. Avoid long showers, frequent baths, and excessive toilet flushing. Fix toilet float valves, leaks and dripping faucets. Use only full loads in the dishwasher and clothes washer.

Do not put materials down drains that will clog the septic tank such as fats, grease, feminine products, or paper towels. Do not put toxic substances in drains or use chemicals to clean your system. They may interfere with the biological action in the tank, clog the drainfield, or add toxic chemicals to groundwater. Pump the solids from the tank when necessary, usually every 5 years or more often if you use a garbage disposal.

Inspect the drainfield regularly. Soggy or very green areas indicate that the wastes are backing up to the ground surface rather than sinking down into the ground. If you have questions or concerns about your septic system, contact the County Health Department.

EROSION CONTROL

Sediment is the number one surface water pollutant by volume. Once considered only a farming problem, we now realize that unprotected new construction sites 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. In addition, cleaning these areas cost taxpayers thousands of dollars each year. The home builder and developer often spend hundreds 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/or 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 stone-filled geo-textile bags or silt fence material.

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 piles.

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 gutter 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.

EROSION CONTROL & BANK STABILIZATION

Erosion Control (Continued)

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 drainage swales have adequate fall in elevation before completing the final grading. Seed or sod bare areas according to recommendations. Fertilize, lime, and water as needed. Mulch newly seeded areas and keep the soil moist until the grass is two inches tall.

Step 7: Remove temporary erosion control measures. Once the sod or vegetation is well established, remove remaining temporary control measures.

Bank Stabilization Practices

The purpose of a bank stabilization practice is to protect the stream bank as well as private property from erosion. There are many forms of stabilization that can be used such as vegetative, geotextile products, timber or concrete retaining walls and stone riprap. You might speak with your local County Surveyor, Soil & Water Conservation District or the Natural Resources Conservation Service to help determine what method of stabilization may best meet the need. Stabilization projects may require the approval of the Indiana Department of Natural Resources, the U.S. Army Corp of Engineers and local government entities. Please note that counties do not normally maintain existing stabilization practices unless they were installed by the county as a part of drain maintenance.

For more information on erosion control, bank stabilization, or best management practices, please consult the Indiana Storm Water Quality Manual at <http://www.in.gov/idem/4899.htm> or contact the Indiana Department of Environmental Management by calling (800) 451-6027. Additional drainage information can be found online as well in the Indiana Drainage Handbook at <http://www.in.gov/dnr/water/4893.htm> or by calling the Indiana Department of Natural Resources at (877)-928-3755. Copies of both of these publications may also be available for viewing in your Soil and Water Conservation District office and your County Surveyor's office.

CHECKLIST FOR PURCHASING AN EXISTING HOME

Also review the “Checklist for Building on a Lot” found on page 18.

- ◆ Do the grass, trees, and shrubs look healthy? Dead grass could mean a wet spot where water stood.
- ◆ Is the ground elevation around the home is 18 inches higher than the street?
- ◆ Does the ground around the house slope 6 inches in the first 10 feet away from the house?
- ◆ Do the downspouts have drains that take the water at least 10 feet away from the house?
- ◆ Are there swales in the yards to carry the surface runoff water to a proper outlet?
- ◆ Have adjacent drainageways been analyzed and are there any known flooding problems in the area?
- ◆ Do the heat ducts have water in them and is there any sign of mold growing on the walls?
- ◆ Does the crawl space show signs of wetness, mold or rotted wood and do the closets smell of mildew?
- ◆ Does the crawl space have a footing drain and/or a sump pump?
- ◆ Does the basement show signs of dampness or water marks on the walls and floor?
- ◆ Have the appliances in the basement been raised off the floor to prevent damage if flooded?
- ◆ Does the sump pump work properly and have a proper outlet?
- ◆ Is the sump pump is outside, or if inside, is there is a battery back-up system?
- ◆ Is there is no evidence of heaving and excessive moisture on concrete floors, porches, walls and paint?
- ◆ Have you asked nearby property owners if they are aware of any drainage problems around the house or in the neighborhood?

CHECKLIST FOR PURCHASING AN EXISTING HOME (CONTINUED)

- ◆ Is municipal sewage service available?
- ◆ Has the assessed cost been included in the price of the property?
- ◆ Are sanitary sewers and storm sewers connected?
- ◆ Will sanitary sewers back-up and flood the basement?
- ◆ When was the septic tank last cleaned or pumped?
- ◆ Has the home been designed with the soil limitations in mind?
- ◆ Is the heating system adequate or can it be economically adapted to other fuel sources?
- ◆ Are there cracks in the foundation walls or basement floors?

CHECKLIST FOR BUILDING ON A LOT

Also review the previous list entitled "Checklist for Purchasing an Existing Home".

- ◆ Has the home been designed with the soil limitations in mind? What soil limitations, if any, need to be overcome?
- ◆ Will the lot be wet and soggy during several months of the year because of a seasonal high water table?
- ◆ Are slopes stable and does the soil have adequate load bearing strength?
- ◆ Will bedrock interfere with the basement, septic system, or other below ground installations?
- ◆ Does the soil have shrink-swell or frost action characteristics that can cause foundations and retaining walls to weaken or collapse?
- ◆ Can a permit for onsite sewage disposal be obtained from the County Health Department?
- ◆ If onsite sewage disposal is necessary, will the system be adequate or require perimeter drains or a non-conventional system?

CHECKLIST FOR BUILDING ON A LOT (CONTINUED)

- ◆ Has the sewage disposal absorption field been fenced off to exclude construction traffic?
- ◆ Have you given consideration to low water usage utilities and toilets?
- ◆ Is there a plan to control erosion during and following construction?
- ◆ Has a permit been obtained from the County Highway Department for the installation of a driveway?
- ◆ Has the driveway been located and a stone base installed prior to construction for delivery of building materials?
- ◆ Can the lot be landscaped without scalping or excessively covering the root systems of desirable trees?
- ◆ Are there trees or other landscape features you wish to have saved? Have you fenced the area off (out to tree's driplines) to protect root systems from compaction damage resulting from heavy equipment?
- ◆ Will the topsoil provide for a good lawn, garden, in addition to tree and shrub establishment?
- ◆ Has a building permit been obtained from the County Building Commission?
- ◆ Has a permit been obtained from the County Surveyor's office prior to outletting a subsurface drain into a road side ditch or before working within a public right-of-way?

NOTE: THIS GUIDE IS FOR GENERAL REFERENCE. PLEASE BE ADVISED THAT SPECIFIC QUESTIONS OR ISSUES MAY REQUIRE TECHNICAL, SPECIALIZED OR LEGAL ASSISTANCE.

**THIS PUBLICATION WAS A COOPERATIVE
EFFORT OF THE FOLLOWING AGENCIES
WHO ARE AVAILABLE TO ASSIST YOU:**

Tippecanoe County Soil & Water Conservation District

www.tippecanoe-county-swcd.org

PH: 765-474-9992

Tippecanoe County Surveyor's Office

<http://www.tippecanoe.in.gov/department/?structureid=11>

PH: 765-423-9228

Boone County Soil & Water Conservation District

<http://boonecounty.in.gov/Default.aspx?tabid=436>

PH: 765-483-4449

Montgomery County Soil & Water Conservation District

PH: 765-362-1194