



Subsurface Drainage

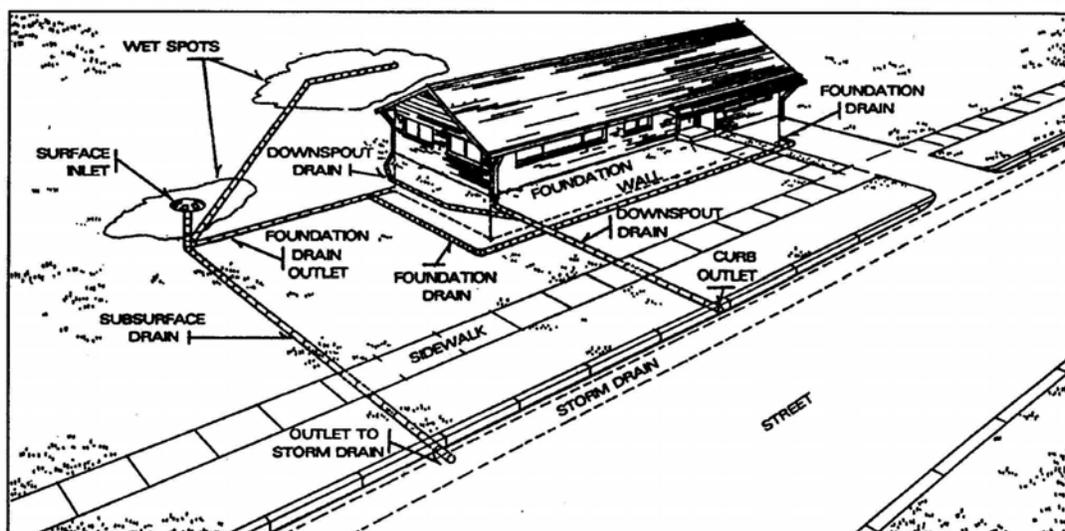
Subsurface drainage usually uses buried perforated or slotted hollow pipe called drain tile. Excess water in the soil enters and is carried away by gravity. In urban areas, these pipelines drain excess water from foundations and lawns.

Tiles are made of concrete, clay, perforated plastic, or other materials designed for subsurface drainage. The size of tile needed will depend on the area to be drained. Most landscape areas around the home use four to six inch (inside diameter) pipe.

Soil characteristics determine the type of subsurface drain to be installed. Soils vary from region to region as well as from municipality to municipality and are classified according to their characteristics. For example, a soil classified as Bennington is usually a wet soil with a strong ability to hold water; it contains clays that expand when wet and shrink when dry and the water table is close to the surface. This soil will be wet most of the time, no matter what you do. Consult the Franklin County Soil Survey and an experienced contractor to determine what soils are on your land before installing any type of structure or subsurface drainage tile.

The outlet of your tile system is extremely important. It should be a storm drain, retention pond, or stream. Connecting to an existing tile is not recommended because some systems are old and failing and may be exceeding capacity; this can result in flooding on your property or a neighbor's land. Currently the best practice to minimize the impacts on surrounding neighbors is to direct tile drainage to a free flowing outlet. If you happen to intercept a tile you must reconnect that tile so that drainage proceeds as it did before. 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 an agreement with neighbors to get to a proper outlet.

Typically, drainage surrounding a house should look like the figure below. The tile surrounds the house and outlets at one end. This would transport water away from the house foundation.



Tile Basics:

Use gravity flow subsurface tile systems whenever possible. They do not require energy input, are inexpensive, and are also the simplest. Use a minimum of 1 inch slope per 100' of tile length.

When contemplating intercepting a field tile always assume the tile carries water, even if it is currently dry or half full of dirt. If, when doing any type of construction, you cut through an existing field tile you must reroute the tile (with the same size) around the area and reconnect it.

Tiles will work for years with very little care. Some clay farm tiles have been working for more than 80 years. Caring for tiles on your own lot is your responsibility, but the outlet for your drain may require some form of community organization for maintenance. Many community groups, like Homeowners Associations, maintain tile drains. If you are planning to connect or alter any community maintained drain, you must get permission from the proper authorities.

Your tile outlet should be to a free flowing outlet; for example a natural stream, drainage way, open ditch or tile, that may not be on your property. Maintenance for tile outlets may be more complicated if it is off your property. A maintenance easement is one way to allow access to keep tiles in good working order. A tile outlet should be checked at least twice each year.

Tiles that are designed to lower the water table must have joints, holes or slits which allow entry of ground water. Tree and shrub roots can enter at these points in search of moisture and may eventually block the tile. Water loving trees, like willows and maples can be especially troublesome. Here are some ways of keeping roots from blocking tile lines:

1. Solid plastic tile can be used to pass through existing tree and shrub areas.
2. Trees and shrubs planted later should be located away from tile lines.
3. A minimum of six inches of AASHTO #57, limestone gravel, around a tile will help discourage roots.
4. Inspection-breather vents can be placed above the surface and provide a place to visually check to see if the system is working.

Other Important Notes:

- For a better understanding of how water moves please see our Rainwater and Surface Drainage fact sheets.
- If you have problems with your basement, please refer to our Wet Basement fact sheet.
- This is for background information please contact a qualified technician or contractor project design and implementation.

References and Resources:

- Cuyahoga and Lake Soil and Water Conservation District and USDA, Natural Resources Conservation Service, [Improper Drainage: A Homeowner's Nightmare.](#)
- Ohio State University Extension, Fact Sheet AEX-320-97, "Understanding Agricultural Drainage." Web site: ohioline.osu.edu, Phone: 462-6700.
- Pennsylvania Department of Environmental Protection, [Guidelines for Surface Drainage Around the home.](http://www.dep.state.pa.us/dep/deputate/enved/Can_Do/drainage.htm) www.dep.state.pa.us/dep/deputate/enved/Can_Do/drainage.htm

The Franklin SWCD and NRCS Field Office strive to serve all people equally.

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