

## **New Homeowners Guide to Stormwater Management**

Many people tell us that they think all stormwater is captured in the streets and carried off by the underground system of inlets and pipes. This is, to put it simply, not the case. Stormwater systems are designed to keep roads passable for most of the time and to prevent water damage to a building or residence. When rain falls faster than the storm water system is designed and built to handle, the storm water may be expected to flow and rise in the streets and yards for a short period of time. In Shelby County, most systems are built to contain the rainfall produced by a 10-year storm. (See Note 1 below for further information.)

The same regulations that provide for design of systems for the 10-year event also require a "100-year check". This means that subdivision plans are reviewed to ensure that the lots are graded in such a manner as to enable the construction of a house in which the finished floor of a house will be placed above the flow height produced by a 100-year rainfall. This makes flooding from rising waters very improbable if the house or building has been built in compliance with the elevation plans. However, some houses are built below this level so it is prudent to have this checked by a licensed Civil Engineer before making a purchase if you are in doubt. The plat that is included with the deed may have finished floor elevation (FFE) depicted if it was considered necessary due to local topographical conditions during design and review. The finished floor is often referred to as the heated or living floor. This does not include the garage floor for example, so it is wise to carefully consider the location of the house before storing valuables on the floor of the garage. Swimming pools are also not considered in the design process by the government reviewers. A pool can be placed in such a manner that it could receive storm water if its location is not carefully reviewed as well.

Many home buyers use the rule of thumb to never select a house that is below the street level. While this is a good warning check, some wonderful buys can actually be below this level if the finished floor is high enough above the yard elevation and the lot and adjacent lots continue to slope away so any stormwater can flow around the house and continue downhill to an inlet or stream. Also, one should remember, that if there is a need to rely on an inlet to protect the property, it must be kept free of obstruction. This is especially true during the fall season when leaves notoriously block yard and street inlets causing significant, albeit, brief flooding in yards and streets.

When selecting a house or property, try to visualize rising water and where it could go. Look in all directions; if the ground levels surrounding the area are high, then the presence of nearby low points that are lower than the floor level of the house under consideration must be verified. Even if inlets are present, they could become blocked or there may be a storm greater than 10-year design level. Either situation could cause rising waters that must be kept lower than the floor levels. Think of a bathtub. Sometimes the water is coming in so quickly that it begins to rise even before the drain plug is inserted. This is similar to the effect produced by a rainfall of 11-years or higher in intensity or with leaves completely blocking the drain. This is like placing the plug in the bathtub. Without an overflow, the waters will rise quickly. This is why it is important to ensure that the high ground in the prospective neighborhood has overflows other than the front door of the potential future home. If there is any doubt, we recommend inspection by a licensed Civil Engineer prior to any financial commitment.

A more frequent damage causing problem is the intrusion of rushing as opposed to rising storm water into a house. Since several storms each year can be expected to exceed the capacity of the drainage system, large and deep flows can be experienced in some yards. This water can get to be several inches deep (it is unusual to get up to as much as a foot in depth). For this

reason, current regulations require the finished floor elevation of homes to be built 10 inches or higher above the surrounding ground and the ground is to be sloped away from the house for a minimum of two percent (2%) in all directions away from the foundation wall or slab. If this is not the case, additional thought is recommended. Some houses were built before this regulation was in place and some have been changed by landscaping or a similar activity to the point the effective FFE is only a few inches above the ground. This can result in the storm water rushing into the house and entering in the spaces under doors or seeping in through the sides of the house at the foundation with the same temporary but damaging effect of a flood. Just a few minutes of an intrusion of an inch or so of water can cause extensive damage to carpets, furniture, drywall, etc. It is a good idea to insist on having a licensed Civil Engineer to evaluate flooding potential.

I hope you have found this information to be useful. Again, please contact our office at (901) 222-7705 if you can use additional information. We are not able to assist in the selection of a new home by performing inspections but we can try to answer some of your questions.

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### Shelby County Engineers: Notes:

1. The year designation is derived from a statistical amount expressed in inches of rainfall occurring in one hour. Curves based on rainfall frequency and amounts have been produced that can be used by engineers to estimate the flow in cubic feet per second (CFS) which can then be used to size the various structures in the system. This information provides a criterion for use by municipalities and engineers in design of storm water systems. However, the term "10- year storm" can be misleading since storms in excess of this amount occur every year. Statistically, a 10-year storm has a 10% chance of occurrence in every year. When this is exceeded, the streets, yards, etc. effectively become part of the drainage "system".

2. Storm water Systems built over 30 some years ago were built to the two cubic feet per acre criteria. The acre referred to is the acreage of the drainage basin supplying the point in question. This criterion is generally less rigorous than the 10-year measure so storm water problems are more frequent in such neighborhoods.