

Neighborhood Drainage Guide

Many people tell us that they think storm water systems are designed to capture all storm water in the streets to be carried off by the underground system of inlets and pipes. This is, to put it simply, not the case. Storm water systems are designed to keep roads passable for most of the time and to prevent water damage to buildings and residences. When rain falls in larger amounts or 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 Russellville, most systems are built to contain the rainfall produced by a 10-year storm. (See Note 1 below for further information.)

The same protocols that provide for design of systems for the 10-year event also contemplate 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, if you are in doubt, it is prudent to have this checked by a licensed Civil Engineer before making a purchase.

In some areas such as known flood plains, proximity to streams, or other topographical conditions, the plat that is included with the deed may depict a finished floor elevation (FFE). 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 storm water 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 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 more quickly than the drain can handle and it begins to rise even before the drain plug is inserted. This is similar to the effect produced by a rainfall with an intensity of 11-years or higher or 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 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, the best homes are those with a finished floor elevation of 10 inches or higher above the surrounding ground which then slopes away from the house in all directions from the foundation wall or slab. If this is not the case, care in selection of the house is recommended. If the effective finished floor of the house is only a few inches above the ground, storm water may be able to rush into the house by entering in the spaces under doors, down a driveway into the house or garage or seeping in through the sides of the house at the foundation with the same

brief 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.

We hope that you have found this information to be useful. Again, please contact our office at (479) 968-2406 if you need 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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Notes:

The year designation is derived from a statistical amount expressed in inches of rainfall occurring over time. 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".

Keywords:

Home flooding
Flood or stormwater damage
New house or home buying, selection or purchasing
Rainfall
Water levels
Finished floor elevations