

## OUT ON A LIMB

### 'Drainage'

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A basic question with any design is where is the rain water going to? Gravity tells us that water will not run up hill. So if the drainage is downhill, how do I control where it goes. If there is no drain inlet, the best thing you can do is not let the water concentrate. A little trickle over time turns in to a ditch. Spread it out so that it sheet flows off the property or in to an adjacent wooded area. Sod does a good job of absorption and slows the flow however we must remember when it has rained for a long period the ground becomes 100% saturated and hence the runoff will become 100%.

Many times the basic problem is in the subgrade. When the builder prepares the lot, he cuts down all of the trees and grades it level or on a slight grade for ease of building the house. You know those nasty old trees do get in the way. When the house is finished, they try to achieve drainage with the topsoil. If it is good topsoil, the water will drain through to the subgrade where the water sits causing sub drainage problems although the surface looks like it should drain.

There are two different kinds of drainage problems, surface and subsurface. Many times I see people try to solve surface drainage problems with subsurface solutions. For example, surface water should not be handled with French drains (a ditch with a perforated pipe in the bottom, filled with drainage gravel) because the water must percolate through the ground to get to the drain field. Many times in heavy clay soils, the ground water can't get to the drain although it is only four feet away. If you see standing water and it looks 'oily' then you have subsurface ground water seepage. On 'frog choking' rains the water will over run a French drain as if there was no drain system at all. Subsurface drains are for saturated soils and are intended to work long after the rain event is over. Many times I see water standing on top of a French drain which means that the drain is not working. Causes are the subsurface drainage has been installed too shallow and the pipe is crushed, the pipe is not on an even sloped grade, the pipe has a high spot trapping the water behind or the end of the pipe is covered over and the water is backing up in the pipe. If there are existing sub drainage problems, many times French drains are installed too shallow and the problem just runs under them.

There are times water could be directed to a dry stream bed and flow the water to the street. For surface water, many times there is no good place to take it. We have proposed a big gravel sump where the water is piped in and as it fills up it slowly overflows to the surface and runs over land. In the old days we would try to pick the water up and disperse to the drainage system as soon as possible. Now we try to hold the water (retention) on site as long as we can and disperse it slowly into the drainage system to help alleviate flooding downstream. Sometimes we construct retention basins to hold the water, releasing it in a small pipe to an outlet. More expensive solutions are underground retention, storing water in a large sump basin or a series of pipes releasing the overflow water after the rain event is over. Garden ponds can somewhat be used to retain water on site to a point of overflow. Every little bit helps. I don't recommend directing drainage to the pond as nitrates will be washed in creating algae growth and a dirty pond. Popular today are 'bio retention' or rain gardens where we purposely hold the water and attempt to filter it through gravel and moisture loving plants (infiltration) such as Northern River Oats, Japanese Iris, Virginia Sweetspire, Southern Waxmyrtle, Bald Cypress and Sweetbay Magnolia, just to name a few.

Boring narrative for potentially serious problems.