



# Collier Soil and Water Conservation District

Gazetteer

July 2013

## Drainage

- Water is the No. 1 cause of damage to the homes we live in.
- Excessive water around and under the footprint of the home can produce a host of unwanted consequences — fungal growth and structural damage.
- To protect your home, the soil around the home should slope away from the foundation on all sides.
- Typically, the recommended slope is one inch per foot for at least six feet away from the home.
- This rule of thumb is not always possible for hard surfaces like drives and walks. However, with these impervious surfaces, water can keep moving away from the home even if the slope is less.
- With the passage of time, shrubs and household outdoor pets can change the slope around the home.
- Homeowners should annually review the grounds to ensure the gardening activities, installation of mulch or raised beds—and the comfortable place your dog likes to rest on—have not created a low spot or a slope, which is pitched toward the home.
- If the lot slopes toward a home, a swale or a shallow ditch should be installed to prevent surface water from flowing against the foundation.
- A swale should carry surface water around the home and away on the surface of the soil, or to a catch basin that will carry the water via an underground drainage pipe.

## The Use of Retention Ponds in Residential Settings

Collier County has a lot of impervious surfaces—mainly artificial structures such as pavements (roads, sidewalks, driveways and parking lots) that are covered by impenetrable materials such as asphalt, concrete, brick and stone—and rooftops. Water itself is an impervious surface!

If a pond is full, every drop of additional rain that falls will flash because the surface is more impervious than asphalt at that point. The same is true for soil when the watershed/water table rise to or are above the surface area.

Retention ponds capture stormwater runoff and serve two primary functions:

- First, they retain the runoff before releasing it into primary, secondary or tertiary canals at flow rates and frequencies similar to those that existed under natural conditions. The flood volume held in a retaining pond reduces the impact on adjacent and downstream stormwater systems.
- The second benefit of the retention ponds is that they provide pollutant removal through settling and biological uptake.

Ponds remove 30-80% of sediments, bacteria, greases, oils, metals, total suspended solids, phosphorous, nitrogen and trash. They are one of the most effective tools at providing primary, secondary and tertiary canal protection and pollutant removal and are considered to be the first level of water quality and quantity control.

Two common classifications of retention ponds are either "wet" or "dry." Wet ponds, known as retention ponds, continually have a pool of water in them called dead storage. Dry ponds, detention ponds, do not have dead storage and dry out between storms. Retention ponds are more effective than dry ponds because the permanent pool of water found in the wet ponds is more efficient at removing particle pollutants.

They do this by absorbing energy from inflow of the stormwater as it enters the pond, preventing scour material from settling to the bottom and exchanging new incoming stormwater with previously captured water. This provides extra time between storms for pollution to settle.

Aquatic vegetation, often associated with wet ponds, such as grasses and plants are able to establish themselves in the permanent pool of wet ponds thus providing extra pollutant removal. These aquatic plants and grasses serve as an extra filter in the pond. They assimilate dissolved pollutants and, by biological uptake, transform pollutants into less toxic materials. Microorganisms often establish themselves in wet ponds and aid in the breakdown of pollutants.

The county is very concerned about holding and storing water for long periods of time or until it ground absorbs, evaporates or transpires and is currently looking at ways to reduce nitrogen and phosphorus and is conducting a nutrient removal test using a floating mat from BeeMats.

- A French drain can also help get water into the ground where it can quickly disperse. The drain can be as simple as a huge hole dug and filled with rock, or it can be as sophisticated as a system of interior foundation drains that feed into a sump pump and exterior flow system.
- Gutters and downspouts are also important means for getting water away from your home's foundation, especially when the structure does not have substantial overhang.
- For gutters to function properly, they must be firmly attached to the eave of the roof; all seams must be sealed and the gutters must slope toward the downspout with a slope of one inch in 17 feet.
- A good rule of thumb: One downspout should not drain more than 35 feet of gutter. The gutters must be clean to prevent clogging. The downspouts need to be extended away from the home a minimum of four feet, with six feet being preferred.
- When downspouts are connected to underground drains, it is very important to keep all debris out of the gutters, downspouts and underground drains.
- Air-conditioning units can also create unwanted, waterlogged areas.
- Consider extending your unit's drain pipe to direct extra water away from the foundation and to a gardening area where moisture-loving plants can drink it up.

**Contact Us:**

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Over the past twenty years BeeMats has been conducting experiments to devise a system that provides the benefits of vegetated littoral shelves without having to deal with the problems associated with changing water levels. Using interlocking mats, combined with aquatic plants in perforated pots, they suspend a simulated shallow water environment.

This not only takes care of fluctuating water levels, but also produces oxygen, takes nutrients and pesticides out of the water and provides habitat for wildlife utilization.



Beemats patented floating plant mat consists of puzzle cut mats held together by nylon connectors. These mats may be assembled in any size or shape.

After the mats are connected, plants are inserted into pre-cut holes. The plants may be any species of emergent aquatics. The mat shown here is attached to anchors off shore.

Plant removal is KEY! As plants grow, excess nutrients in the water are stored in their tissues. If not removed periodically, the nutrients will reenter the water as the plants die.

The Beemats system provides an easy way to remove the entire plant and replant the

mats to increase nutrient removal. This is what separates Beemats from other floating systems.

**Beemats Motto: Increased biomass equals increased nutrient removal!** You're invited to watch nutrient removal and natural pond improvements as you drive south from Immokalee Road on CR 951—Collier Boulevard—to 7th Avenue NW. Google Map Location is: [26.241007,-81.688615](#).

Retention ponds are beneficial for providing stormwater abatement and the removal of pollutants from stormwater. Florida began requiring stormwater treatment in the 1980's and more than 2,400 ponds have been designed and built in Collier County to help meet this need.

Though these ponds are frequently small, as a whole, they help provide better water quality in Big Cypress Basin. The islands are attractive and is dictated by pollutant removal.

Let us know your impressions after looking at the demonstration site.