



Chronic drainage issues along a Florida roadway were alleviated by incorporating naturally vegetated GEOWEB channels to prevent erosion (left). Four years after installation, vegetation in the channel is healthy and dense (right).

NATURAL SOLUTIONS

VEGETATED GEOCELLULAR CHANNELS SHORE UP EMBANKMENTS,
MITIGATE FLOODING CONCERNS.

CONCRETE OR GABION CHANNELS are commonly designed for stormwater conveyances with concentrated flows — especially in areas prone to heavy rainfall events and flooding. However, hardscape channels are being replaced by more natural solutions — such as geocellular vegetated channels — that allow stormwater infiltration and create more aesthetically-pleasing environments.

Presto Geosystems' cellular confinement system — GEOWEB — is used for multi-layered channels, built as retaining walls that can withstand high flows for short durations and allow vegetation in the system's outer fascia. An important aspect of multi-layered channels is that they have a relatively small horizontal footprint and allow for steep embankments for additional flood storage.

According to Presto Geosystems, GEOWEB channels perform well in soft-soil environments because their relative flexibility allows them to tolerate reasonable differential settlement without loss of integrity. They also are highly adaptable to landscape contours and curves.

The outer cells typically are filled with topsoil and vegetation but can also be designed with concrete or grouted-rock infill for hard-armoring to provide greater resistance where heavier flows are expected.

Following are two applications of geocells.

Case 1: Channel erosion and drainage-related flooding

Chronic drainage issues along a Florida roadway were alleviated by incorporating naturally vegetated GEOWEB channels to prevent erosion, allow for higher stormwater volume, and reduce potential for flooding.

A newly planned channel design consisted of box culverts and open areas to allow for more volume to help alleviate the flooding potential. The GEOWEB channel system was selected to meet the needs for both erosion protection and natural aesthetics.



A two-stage channel for additional water storage incorporated GEOWEB vegetated channel for bank stabilization and protection to an area prone to flash flooding.

Four years after installation, the vegetation in the channel is healthy and dense — protecting the channel side slopes from erosion that previously limited stormwater volume and contributed to flooding, while stabilizing the desired natural vegetation. With the drainage project completed, flooding problems have been eliminated.

Case 2: Flood impact reduction and streambank repair

A 10-mile watercourse in Indiana was prone to flash flooding that reached streets within a business park. The banks of the creek were heavily overgrown and difficult to maintain, contributing to flash flooding. An analysis of the watershed helped to determine improvements in two phases.

Phase 1 included constructing three offline overflow ponds upstream of the business park. Phase 2 included constructing a two-stage channel for additional water storage and incorporated GEOWEB vegetated channel for bank stabilization and protection to the area prone to flash flooding. The GEOWEB solution was selected because it allowed for steep (0.5:1) slopes and would allow a small horizontal footprint for extra flood capacity.

Information provided by Presto Geosystems (www.prestogeo.com).