



OVERVIEW: Chickamauga Greenway Slope Stabilization - Chattanooga, Tennessee

When the embankment at Chattanooga's North Chickamauga Greenway became unstable, the Tennessee Valley Authority (TVA) approached the City of Chattanooga with a proposal to complete a bank stabilization demonstration project. The Greenway, located near the confluence of North Chickamauga Creek with the Tennessee River, had been greatly affected by the hydropower generation at the TVA Dam just downstream. Over the years, water level and flow direction constantly and rapidly changed. Water elevations could vary as much as three feet (.91 meters) in a short period of time. The toe of the 20 to 25 foot-high (6.09 to 7.62 meters) bank had eroded because of increased volumes and peak flows of water during storm events – due to urbanization and overland flow from an existing parking lot. The bank had become inherently unstable, causing several large trees and portions of a split rail fence to fall into the creek. The existing parking lot at the top of the slope was also threatened.

Considering the original slope prior to site preparation was 1:1 and consisted of many potential failure plains, the project engineer decided to design an embankment consisting of three unified slopes. The lower, or base, slope was cut at 2:1 from below the waterline to the anchor trench, which rose to six feet (1.82 meters) above the lowest known water level. This slope was then smoothed and top-dressed with 1/2-inch (#57 Limestone rock) drainage stone. A middle or bench, slope was cut just above it to 10:1. Finally, the upper slope was cut to 2:1, which rose to the parking lot. The top two slopes were protected with turf reinforcement matting.

The City Engineer and TVA decided to use ArmorFlex *Articulated Concrete Block* mattress system to protect the subgrade against high velocity water flows. With 5,184 square feet of ACBs installed, the bank would receive the stability it needed. Open-cell block was selected for the slope to allow vegetation to grow to the waterline and provide the release of hydrostatic pressure from within the embankment.

Since 1998 the ACBs have successfully withstood several rainy seasons, water surges and generally every type flow event imaginable provided by the watershed. As a result of the ACB installation, the nearby parking lot is protected and the bank has maintained its stability. With its new look, the site provides an important added benefit. While the general public utilizes the Greenway on a daily basis for walking, jogging, hiking, picnicking, fishing and canoeing the esthetically pleasing site allows for safe, easy access to the water.



PRODUCT:	ArmorFlex Class 30s and 45s Articulating Concrete Block Mats
AMOUNT:	5,184 Square Feet
DATE:	Fall 1998
OWNER:	City of Chattanooga, TN
ENGINEER:	City of Chattanooga: J.D. Wilkinson, Jr., P.E.
CONTRACTOR:	City of Chattanooga
SUBMITTED BY:	David Kees
DATE:	March 2004



