

Vegetation for Stabilization

Canal restoration project leaders choose an erosion control system that looks natural, protects a Florida ecosystem

By *Brian Baker*

The South Florida Water Management District (SFWMD) is the world's largest water control system, protecting more than 6 million people that live in the agency's 16 counties from severe flooding associated with prevalent tropical storms and hurricanes.

The SFWMD is not only responsible for supplying freshwater to South Florida residents, it manages their water quality as well. Additionally, the agency is charged with operating and maintaining approximately 1,800 miles of canals and levees, 25 major pumping stations and approximately 2,200

water control structures of various sizes.

It comes as no surprise, then, that after the storms and hurricanes of 2004 and 2005 ravaged South Florida—clogging waterways with debris, damaging water control structures and causing severe erosion along canal banks—the SFWMD was responsible for repairing miles of damaged canals. With many canal banks stressed beyond their limits and rehabilitation of the most critical banks imminent, the SFWMD had an enormous and daunting task ahead of it.

Repair Plans

One of the many canals that needed repair, West Palm Beach Canal C-51, stretches 42 miles from Lake Okeechobee to the Atlantic Ocean. As part of the Central and Southern Florida Project for Flood Control and Other Purposes, C-51 is SFWMD-owned and a major source of storm water discharge through the S-155 control structure to Lake Worth Lagoon.

Because of the canal's importance to area storm water management, the SFWMD had to repair and rehabilitate the damaged



The SFWMD achieved a natural post-construction look on canal C-51.

portion as quickly as possible before future storms caused additional impairments. The area of C-51 that needed repair—approximately 20 miles west of West Palm Beach—is agricultural, covered in sugar cane fields and wetlands used for additional flood control.

Before the project got underway, the SFWMD identified a number of issues that needed to be addressed and overcome. First, the canal runs parallel to State Road 98/441, which meant the SFWMD would have to perform repairs with very little right-of-way (ROW). The agency also found that providing permanent protection for the bank was critical, as further erosion would mean not only the loss of valuable ROW but also the potential loss of a usable, state-owned and maintained highway. Plus the SFWMD wanted to use vegetation to reinforce the shoreline to protect the ecosystem and give the finished project a natural look so as not to inhibit the natural ecosystem and wildlife.

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Canal Bank Restoration

As work commenced, it became obvious that not much could be done to improve the limited ROW situation; the crew had to make do with the tight space when driving between workstations. Making matters more difficult was the fact that the large machinery required for rebuilding the canal slopes and the accompanying crew trucks required State Road 98/441 to serve temporarily as a one-way street.

Florida’s unpredictable weather and harsh work environment—from extreme heat and torrential rains to the canal being occupied with wildlife including alligators and water moccasins—further hampered the crew’s ability to get work done quickly and safely. In spite of these conditions, the SFWMD had a job to do and awarded Globetec Construction the contract to begin repairing the C-51 canal banks, the first phase of the restoration project.

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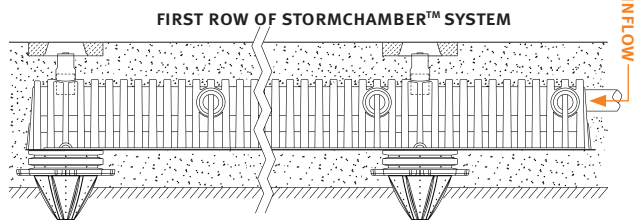
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Specializing in earth excavation and repair, the Globetec Construction team typically divided into groups of one to four people to conduct canal repairs. The work began in spring of 2006. With the help of two or three backhoes, workers built the canal slope back up to its original configuration by taking earth from the area adjacent to the top of the canal, when needed, to limit the amount of earth and soil in transport. Once the canal banks were rebuilt, the reconstructed slopes were compacted and smoothed, and the bottom of the canal was trenched out in preparation for an erosion control product installation.

Finding the Right Erosion Control System

As Globetec finished more of the rebuilding phase, the SFWMD had to determine the erosion control system that would be put in place to protect the canals from future storms. The group wanted to establish a reinforced but natural-looking environment—not one filled with articulated concrete block, rock and stitch-bonded composite turf reinforcement mats (TRMs).

To prevent future storms from wreaking havoc on the newly rebuilt canal and to leave the canal looking natural, National Erosion Control's (NEC) Lowell Barden was contracted to provide alternative applications for immediate, long-term erosion protection, vegetative reinforcement and water quality enhancement.



Workers installed approximately 55,000 sq yd of TRMs in about 60 days.

NEC has years of experience when it comes to long-term erosion protection that is environmentally friendly. When the company won the bid to do its share of the repairs, Barden chose to utilize Landlok 300 TRMs manufactured by Propex. The agency approved Barden's recommendation because the mats offered flexibility and thus the ability to maintain contact with the subgrade, resulting in rapid seedling emergence and minimal soil loss under high-flow conditions.

The portion of C-51 that utilized the woven TRM measures approximately 55,000 sq yd. An additional 4,000 ft of shoreline is protected with articulated concrete block. NEC crews, made up of three to five people depending on the area of the slope being covered, installed the Landlok 300 with a No. 4 stone at the bottom of the canal. The initial goal was to have the TRM installation completed in 90 days, but the work was done in about 60 days.

"I've had some opportunities to work with this product before, so I know how to get it installed quickly," Barden said. "Because there's no heavy machinery required for installation, my crews were really able to get in there and get the job done."

Work on C-51 has been completed. Numerous other canal repairs were released for bid throughout the end of 2006 and early 2007. Much of the work is the same—rebuild and reinforce with Landlok 300—as the SFWMD continues to restore the canal systems before the next big storm damages them further. **SWS**

Brian Baker is public relations manager for Propex Geosynthetics. Baker can be reached at 423.424.3075 or by e-mail at bbaker@johnsgroup.com.

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