

GEOWEB®

CANAL SHORELINE STABILIZATION

OWNER:

City of Opa-locka
Opa-locka, FL

PROJECT ENGINEER:

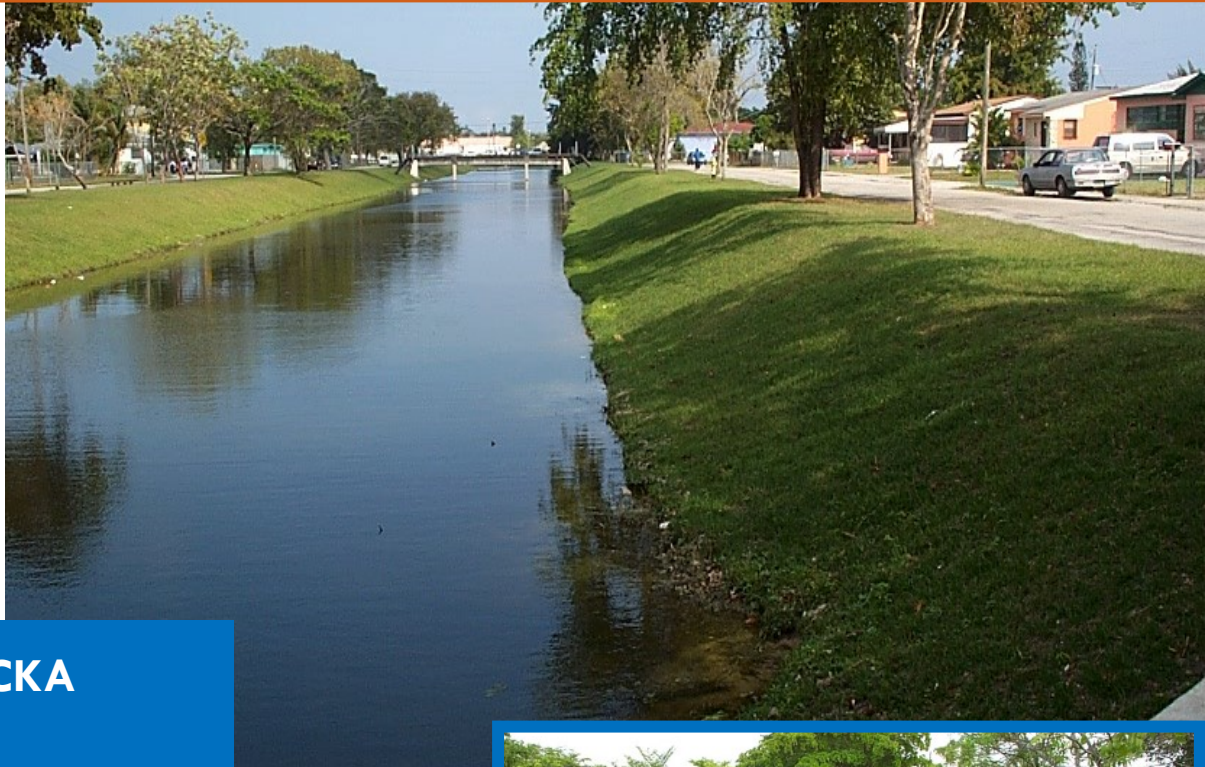
Post, Buckley, Schuh &
Jernigan

CONTRACTOR:

Subaqueous Services

MATERIAL SUPPLIER:

R.H. Moore & Associates
Tampa, FL



CITY OF OPA-LOCKA

Opa-locka, Florida

EROSION OF A STORMWATER CANAL

Caused by Flooding & Poor Soils Precipitates an Erosion Prevention & Stormwater Mitigation Plan.

Information Excerpted from Erosion Control magazine

PROJECT BACKGROUND

The city of Opa-locka, Florida had experienced significant flooding throughout much of its 4.2 square miles for many years. Larry Larson Jr., Vice President with erosion and sediment control firm R. H. Moore & Associates explains the problem: "This is due, in part, to the geographic location of the city, which was developed on a flood plain. Several factors have contributed to the flooding of the city's low-lying areas, including a limited plan of action to manage surface water runoff conditions and no regularly scheduled canal cleanup plan to prevent obstructions that impede flow. The canal system that surrounds the entire city had been experiencing severe erosion resulting in sediment laden canals, which reduced the volume for stormwater runoff, as well as harming the water quality. It was clearly determined by city managers that the canals would have to be dredged and the side slopes protected from future erosion."



A COMMON COASTAL PROBLEM

Larson Jr. describes a problem common to Florida's coastal communities. "Florida canal embankments are being eroded during storm events with undermining occurring at the waterline caused by wind and boat-generated wave chop," he says. "When undermining occurs at the toe, the slopes begin to slough off into the water. Slopes steeper than 2H:1V normally start sliding under saturated conditions until the soil reaches a point of equilibrium. Florida is especially susceptible to this type of erosion due to our sandy soils."

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ESCALATING CANAL PROBLEMS

In 2002, a hurricane that struck south Florida wiped out most of the Opa-locka canal at the water line, resulting in steep 2-foot drop-offs in places. This presented a serious danger to residents who fish along the canal's banks. Because the sand in this part of Florida is very fine, it "turns into soup and washes away," Larson says. Layers of soil keep falling into the canal, causing these hazardous drop-offs. Worse still, tall weeds began sprouting, presenting ideal hiding places for the area's alligators.

Because of the city's proximity to the Atlantic Ocean, the Opa-locka canal experiences wave chops, for which a 4H:1V bank slope is generally required. In addition, the water level within the canal fluctuates quite a bit—lower in the winter and higher in the summer.



FINDING A SAFE, VIABLE SOLUTION

A decision had to be made regarding which of many solutions would be best suited for stabilization of the canal. Larson explains some of the factors considered. "We looked at many types of products for this canal, from soft-armor bioengineering solutions to hard armor such as articulating block and gabions. The Presto GEOWEB system was chosen based on the velocities of the canal and the overall aesthetic the city wanted to achieve. They wanted to give these canals a sort of linear park along both sides and a place that area residents could use as a park with access to the water without the fear of hidden alligators. The GEOWEB system solved that problem."

GEOWEB 3D CONFINEMENT INFILL OPTIONS

The GEOWEB soil stabilization system is designed for either intermittent or continuous levels of low-to-high water flow. The 3D system acts like a flexible form confining a variety of infill materials in typical applications such as swales and drainage ditches, stormwater diversion or containment channels, process water channels, culvert outfalls, and spillways.

The various options for infill material were particularly useful for this project. The GEOWEB system offers a unique erosion protection for canal side slopes; you can fill the cells with rock or concrete to about one foot above the mean high water line. The choice between rock and concrete is based on the velocities and wave attack encountered. Above the mean high water line, you can fill the cells with soil and sod or seed directly over the filled cells. A rock infill below and sod above was chosen for the Opa-locka project.



RESTORING THE CANAL

More than 5 miles of the Opa-locka canal system was restored in this manner, although severe storms pose a constant threat. "The canal was designed to meet certain criteria based around a 25-year storm event," Larson says, "but designing to meet hurricane-force conditions is almost impossible. This area may never be hit again by the type of storm that did all the damage, but, on the other hand, we may get hit four times in one year like we did back in 2004."

-500,000 sf of GEOWEB was installed.

**Request a FREE
Project Evaluation**

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