



LA-16 NON-ROCK ALTERNATIVE TO SHORELINE PROTECTION

Project No. 2012-28

Location: Iberia Parish, LA

Contract Value: \$917,225

Completion Date: 2014

Owner/POC:

National Resources Conservation Service
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Project Specific Disciplines

- Design Build Services
- Coastal Engineering
- Geotechnical Engineering
- Structural Engineering
- Scour Analysis
- Hydrodynamic Modeling

Intellectual Property Statement:
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Royal performed design-build services for a shoreline protection demonstration project for the Natural Resources Conservation Service (NRCS). The goal of this project is to test a non-rock alternative to shoreline protection that can be supported by low bearing-capacity soils and attenuate wave energy – thereby reducing, eliminating, or reversing shoreline erosion – over a twenty-year design life.

To meet the objectives of the NRCS for this project, Royal developed a concept for a series of pile-supported panel structures to serve as non-rock breakwaters. The breakwater panels are perforated to allow tidal exchange, while still providing a barrier for dissipating wave energy. To initiate design, Royal utilized the wave data provided by NRCS and calculated water levels so that a coastal process analysis could be performed to determine wave forces. To assess how these structures will perform in the marine environment under wave attack, Royal performed site-specific three-dimensional numerical modeling of the structures with the software code Flow3D to evaluate wave energy transmission through the panels, total wave force on the structure, and estimated scour

depths around the piles. Critical system parameters were optimized with the numerical model, including the panel porosity, wall spacing, and the submergence depth of the panels within the water column. Additionally, Royal performed the structural engineering for the panels, connections, and supports to achieve both a structurally sound and easily constructible product. The majority of the structures were preassembled to reduce the amount of time required for field installation.

The wall panels for this system were constructed of marine-grade ultra-high molecular weight polyethylene (UHMW-PE) and encased within pre-fabricated steel jackets for connection to circular steel pile supports. All steel components are coated with marine-grade polymer coating for corrosion and UV resistance. All member, connection, and foundation elements are designed to resist lateral impact from the 90th percentile design wave over a 20-year design life.

The U.S. patent for this product is pending, under the ownership of Integrated Shoreline Solutions, LLC.

