Case Study

Flood Protection

Simmons Pointe Trip Wall | Mount Pleasant, SC | June 2009

Project Partners:

Contractor: Cape Romain Contractors

Engineer: Earthsource Engineering, CMI Limited Co.

Owner: Simmons Pointe HOA

Max Depth:
16 ft 4.8 m

Products:
AlumiGuard™ PZH-159, PZM-16
ArmorWare™ SC-9, SC-15

Background

Simmons Pointe, a waterfront residential community near Charleston, South Carolina, needed a long-term flood control solution. FEMA remapped Mt. Pleasant and determined Simmons Pointe to be in a "high-risk flood zone". As a result, the community's mandatory flood insurance premiums were scheduled to increase from $40,000 to over $400,000 a year.

Flood Protection

Why CMI

Tides Condominiums, another residential community in Mt. Pleasant, installed a similar flood wall using CMI's AlumiGuard™ sheet piling and cap. Simmons Pointe researched Tides' success and found their wall required very little maintenance, had a long service life and had the ability to handle heavy loading. Simmons Pointe chose AlumiGuard for its strength, aesthetics, and its ability to be customized to include a flood gate for easy waterfront access when needed.

Performance

The 6-foot (1.8 m) cantilevered flood wall prevented FEMA from reclassifying this community as being in a special "high-risk flood zone." The Simmons Pointe trip wall protects the condominiums from floods while it saved the community at least $360,000 in flood insurance premiums every year for its projected 50-year lifespan. The marine-grade aluminum sheet piling and accessories was ideal for the warm, saltwater coasts of South Carolina. Aluminum's high strength-to-weight ratio provides proven flood protection, yet also makes it an easy piling to handle and drive. Additionally, aluminum gets only mildly warm even in strong sun, and it does not corrode in saltwater. In fact, aluminum naturally develops a chemical defense system when exposed to the elements, needing little or no maintenance over its long lifespan.

Installation

Earthsource Engineering designed a trip wall made with over 1000 ft of AlumiGuard. A crew of four drove the AlumiGuard sheet piling with a vibratory hammer and 30,000 lb. crawler crane. The soils ranged from sandy clays to high PI (Plasticity Index) organic clays. The aluminum sheets provided the necessary rigidity for quick installation and were driven up to 16 ft deep at a rate of 175 LF a day.

Environmental restrictions required several old oak trees to be kept intact along the proposed flood wall line. In addition, South Carolina's Ocean and Coastal Resource Management would not allow trenching to discover (and thereby avoid) tree root systems along the path of the proposed flood wall. As a solution, engineers decided to go around the trees and use small sections of concrete panels supported by "H" steel beams. This approach avoided disturbing the root systems and preserved the heritage oaks. The installation crew attached coated-concrete sections to the already installed concrete panels. Then they installed the aluminum caps on the AlumiGuard section of the wall.

CMI's engineering team designed and welded an aluminum flood gate which provided pedestrian access to the waterfront property when pinned open. When a storm surge threatens, the gate closes securely, protecting the community from severe flooding.