**WATER CONTROL STRUCTURE**

**BACKGROUND**
Seabrook Harbor, known for its farming and fishing operations, was settled back in the 1600's and sits along the Atlantic coastline. Despite yearly dredging of the Blackwater River which runs north of the harbor, sedimentation and erosion were threatening economic activity and property in the area. The threat to property was both from erosion and an increased risk of flooding. The river was continually encroaching into the harbor causing increased tidal flows which systematically elevated the rate of silt building up in the harbor.

**PROJECT SCOPE**
The U.S. Army Corps of Engineers (USACE) conducted studies on how to most efficiently solve the problem. It was determined that the main focus would be to repair the breach between the shore and the sand flats. To achieve this goal, the construction would need to divert the river away from the town. Engineers decided the best method to re-route the river would be to construct a permanent coffer-dam like structure on the north side of the harbor. And, at the same time dredge the river to encourage the natural flow of water away from the town. The dredge spoils were utilized as fill between the double walled structure. The walls were anchored by using a tie-back system which incorporated 18” x 2.25” rods with connecting turnbuckles on 6’ centers and two 10” channels all of which were galvanized steel. The project was funded by the National Shore-line Erosion Control Development and Demonstration Program authorized by Congress. Only 12 other projects had been funded under this program which was created to encourage innovative solutions. The project was deemed worthy primarily due to the use of UltraComposite™ sheet piling instead of steel.

**PERFORMANCE**
To complete the design, hydro-dynamic models were built and studied to compare with theoretical solutions and calculations. Testing results led engineers to specify 17’ and 27’ sheets. UltraComposite™ UC 30 was driven 15’ - 20’ into the ground to protect against potential scour. CMI’s composite sheeting is the only FRP sheeting manufactured in an ISO Certified Facility. After many years of service and monitoring, the project has successfully achieved its goals by reclaiming the clam flats and diverting the river to its previous course. The walls, which by design are completely under water during high-tide, have put an end to the shoreline erosion and periodic flooding of the town. Fishing, clamming and recreational activities are thriving once again. In addition, the harbor is only scheduled to be dredged every five years instead of yearly which is saving the local community and the state millions of dollars.

**CONSTRUCTION**
To drive the UltraComposite™ UC 30 sheets, Reed & Reed Construction used an ICE 216 vibratory hammer hanging from a crane. 160 sheets or 240 feet of bulkhead was completed everyday. Initially, construction was delayed as a non-ISO Certified sheet piling product failed to meet USACE quality standards. To endure the rigors of installation, only sheets manufactured under the strict ISO controls can be trusted to have reliable and consistent strength and durability. Subsequent to changing suppliers, Reed & Reed was able to complete the job in accordance with the required contractual time frame.

**WALL SPECIFICATION**
UC 30
Date: March 2005
Owner: Pinellas County Board of County Commissioners
Contractor: Reed & Reed Construction, Inc.
Engineers: USACE, New England District

<table>
<thead>
<tr>
<th>Depth</th>
<th>17-27ft.</th>
<th>5-8m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>3,200ft.</td>
<td>975m</td>
</tr>
<tr>
<td>Wall Area</td>
<td>73,000ft²</td>
<td>6,782m²</td>
</tr>
</tbody>
</table>

Physical properties are defined by ASTM testing standards, The Aluminum Association Design Manual, The Naval Facilities Design Manual DM 7.2, and The US Army Corps of Engineers General Design Guide: PVC Sheet Pile and/or standard engineering practice. The values shown are nominal and may vary. The information found in this document is believed to be true and accurate. No warranties of any kind are made as to the suitability of any CMI product for particular applications or the results obtained there from. Crane Materials International is a Crane Building Products® company. CRANE MATERIALS INTERNATIONAL products are covered by one or more of the following U.S. Patents and International Patents: 4,674,921; 4,690,588; 5,292,208; 5,145,287; 6,000,883; 6,033,155; 6,053,666; D420,154; 6,575,667; 7,059,807; 7,056,066; 7,025,539; 7,393,482; 5,503,503; 5,803,672; 8,230,277; 1,945,040; USA; 1,934,237 and other patents pending. ©2005-2015 Crane Materials International. All Rights Reserved. CMI 8-15

Crane Materials International (CMI) manufactures innovative products which provide value added sustainable solutions for the construction and engineering communities.

The double walls were supported by anchoring to each other using galvanized channel, tie rods and turnbuckles.

Initial supplier and material problems were overcome when the contractor switched to UltraComposite™ sheets.

Many years after installation, the clam flats are thriving and the community has been spared from destructive shoreline erosion.

UltraComposite™ sheet piling is driven with conventional pile driving equipment.

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