



The Castle Group  
Innovation in Action™

W.J. Castle P.E. & Associates  
Hydro-Marine Construction  
Simplified Bridge Systems

*Sets the Standard for*  
*Structural & Marine Engineering, Construction, & Design/Build Services*

## BULKHEAD DESIGN



**Project:** Bulkhead Design/Build

**Location:** Bay Head Yacht Club  
Bay Head, New Jersey

**Description:** *W.J. Castle, P.E. & Associates, P.C.* was retained to design a new bulkhead to replace the existing structure located at the Yacht Club. Detailed drawings were developed and submitted to the Yacht Club for approval. After the design and permits were completed, *Hydro-Marine Construction Co., Inc.* performed the installation of the bulkhead. The design included steel soldier piles spaced every 8'-0" with timber lagging. The timbers were marine grade treated and made into sections clamped together with 1/2" diameter galvanized rods. Angles pre-welded to the soldier piles acted as a guide to install the timber sections, making installation much easier and faster. The timber lagging was embedded approximately 3'-0" below the channel bottom and supported on shelf angles. By using in-house personnel for all engineering, permits, design, and construction, the time and costs for the project was significantly reduced. The bulkhead was approximately 130 feet long and construction was completed within four weeks in 2005-2006.

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