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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

UNDERWATER INSPECTION & REPAIR



Project: Quay Pier Underwater Inspection & Evaluation Including Repair Design

Location: Delaware River Water Corporation (DRWC)
Philadelphia, Pennsylvania

Description: On March 16, 2006, the Quay Pier along the Delaware River located in Penn's Landing was struck by a tanker causing extensive damage to the pier. Since *W.J. Castle, P.E. & Associates, P.C.* had previously performed the inspection and repair of several piers for DRWC, CASTLE was requested to perform an emergency underwater inspection of the pier to determine the extent of the damage. The concrete seawall had been crushed inward with exposed and bent rebars. One of the 18" square concrete piles had broken off and was lying along the channel bottom. Two other piles at this location were cracked, shifted with spalling and cracking at the pile cap, leaving only one pile supporting the damaged end of the bent. Numerous spalls and cracks were found on the surrounding pier bents. CASTLE designed a temporary repair system to support the damaged pile bent and performed the construction management for the installation of the system. *Hydro-Marine Construction Co., Inc.* performed the emergency underwater repairs required to stabilize the pier. These repairs were completed by July 2006. Design of the permanent pier repairs included installation of four 14" diameter concrete filled steel pipe piles with steel beam caps. A 20'-0" section of concrete seawall was replaced in kind and doweled into the existing concrete. Also, the timber waler and timber fender piles in that 20'-0" section were replaced. Upon completion of the permanent repairs, the deck was restored to the original condition. Due to insurance issues, the permanent repairs were not started until January 2007 but were completed by May 2007. All construction inspection and management was performed by CASTLE personnel.

In 2009, this project received the "Project Excellence Award" in the Small Project Category by Coasts, Oceans, Ports, and Rivers Institute (COPRI).

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