

Tower and Electronics Hut Foundation Repairs

United States Coast Guard



Project Description

Project Type

Material Testing and Design

Location

Sabine Pass, Texas

Estimated Construction Cost

\$225,000 USD

Date of Service

2011 - 2012

The Texas Point Tower and Equipment Shelter were constructed for the USCG Marine Safety Unit in Port Arthur, Texas in July of 2005. It is one of six remote sites of the US Coast Guard Marine Safety Unit that maintains a Vessel Traffic Service that monitors vessel traffic in the Port Arthur, Beaumont and Sabine waterways in Texas. The facility is located on the Gulf Coast of Texas in Port Arthur.

The facility consists of a 170 foot high latticed tower atop a 15.5 foot high braced steel frame platform and an equipment shelter atop a 16.75 foot high braced steel framed platform. Both structures are founded on piles that support structural slabs. In 2008 cracking of the concrete foundations was reported and have increased in magnitude as reported by Coast Guard personnel. The Coast Guard tasked Appledore Marine Engineering Inc. (AMEI) with the inspection and the design of repairs concepts to address the structural deficiencies and provide a temporary repair to the foundation slabs. The work included a petrographic analysis of the concrete and a peer review of the original design to determine the cause of cracking. Ultimately the cause of cracking was determined to be related to expansion of the concrete and minimal vertical reinforcing. Three repair alternatives were developed for the Coast Guard's consideration. The alternatives included life cycle cost estimates as well as identification of pros and cons for each scenario. Construction plans and specifications were prepared for the selected alternative. The cost of final construction was significantly less than estimated in the concept study due to refinements made in the final design simplifying construction in this remote location.



600 State Street, Suite E
Portsmouth, NH 03801
Phone: 603-766-1870
Email: nelwood@appledoremarine.com
www.appledoremarine.com

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