

Cape Hatteras, NC

Relocation of Cape Hatteras Lighthouse



Cape Hatteras Lighthouse.

Services Performed:

- Shore Protection
- Foundation Design
- Structural Analyses
- Expert Assistance

Year of Completion: 1992

Construction Cost: \$30M

Client: U.S. National Park Service

Cape Hatteras occupies a unique position in early maritime history of America, because of its extension eastward into the Atlantic Ocean where it deflects the Gulf Stream out into the deep ocean. The confluence with the southward trending coastal currents has created an extensive series of sand banks, with underwater shoals extending several miles to sea.

This Cape is notorious for the many ship wrecks, from the early days of the Spanish explorers to the early part of this century.

A lighthouse built in the early 1800's was swept away in 1870. The coast had eroded under the violent onslaught of hurricanes. A new lighthouse was built in 1874, some 1500 ft inshore. Now once again the seas threaten. Hurricane Hugo in 1990 washed away the protective beach and destroyed the corroded steel sheet pile groins. The waves now lap at the shallow foundations.

The lighthouse is of brick construction, founded on a timber raft just below the ground water line. Extensive investigations have been made as to the best way of saving this National Historic Monument. Concepts included a massive stone and concrete revetment, and, alternatively, dismantling and re-erecting the lighthouse inshore.

The National Research Council, which is sponsored by the National Academies of Engineering and Science, was asked by the National Park Service to study the matter and recommend solutions. These have now been implemented successfully.

Based on its recommendations, the U.S. National Park Service made a decision to move the lighthouse intact, to a new location half a mile inland.

The moving involved reinforcing and tying together of the brick structure, insertion of heavy girders underneath the

tower, cutting it loose from its timber raft, and jacking it up.

The lighthouse weighed 2500 tons and has a high center of gravity. Stability will have to be provided by external framing-

Then the tower was slid along a prepared skidway to its new location and jacked down onto its new pile-supported foundation.

Complicating the construction operations are the ecological and environmental aspects of the site, which must remain undisturbed as far as possible.

Ben C. Gerwick, Inc. furnished personnel, and technical input for the National Research Study and subsequent consultation on implementation to the National Park Service.