



## PROJECT PROFILE

# Angels Gate Lighthouse

Assessment and Rehabilitation Design | Los Angeles, CA



### CLIENT

Cabrillo Beach Boosters

### BACKGROUND

Since 1913, the Angels Gate Lighthouse has welcomed mariners safely into the Los Angeles Harbor, which, with the adjoining Port of Long Beach, forms the busiest container port in the United States. The lighthouse is located at the end of a 10,000-foot breakwater about two miles offshore. Perched on a concrete pedestal approximately 14 feet above sea level, the historic lighthouse is one of only a few "wave-washed" lighthouses on the Pacific Coast. Its precarious position relative to the wind-swept surf spray and occasional storm surges of seawater left the steel, concrete, and stucco-clad structure in poor condition.

Under the stewardship of the United States Coast Guard (USCG) and the Port of Los Angeles, \$1.8 million was allocated to the Cabrillo Beach Boosters (CBB) to lead an engineering study and rehabilitation project for the lighthouse. CBB, a non-profit organization dedicated to community improvements and preservation of historic resources in the Los Angeles Harbor area, retained AECOM as the Project Management firm, who in turn retained WJE in the fall of 2010 to lead the engineering assessment and prepare rehabilitation construction documents.



### SOLUTION

The WJE team found widespread corrosion and deterioration in all elements of the lighthouse, with higher levels of distress noted at the lower levels and in the south and southeast exposures, which face the ocean and harbor channel. The minimally reinforced concrete foundation pedestal was in fair condition despite high levels of chloride. The exterior stucco was in fair condition with hairline cracks throughout and areas of more severe cracking and spalling due to corroding steel framing members. Lastly, WJE found the cast iron ornamental elements to be heavily corroded, loose, broken, or missing.



WJE's exterior rehabilitation work included detailed drawings for the removal of severely deteriorated elements and replacement with in-kind and architecturally appropriate elements. The exposed steel surfaces were cleaned, refurbished, and metalized to provide superior corrosion protection. Horizontal surfaces also received a traffic-bearing coating for added weather protection. Stucco surfaces were repaired and resurfaced. Lastly, window and glass elements were repaired and resealed to provide weather protection.

WJE served as the architect-of-record for the lighthouse rehabilitation work. Preliminary engineering studies were initiated in 2010, and construction was completed in February 2012. The project stands to be recognized for a number of local preservation awards.