

# Museum Park Large Vessel Mooring Facility, Florida

waterfront & marinas



**M**useum Park is planned by the City of Miami as a waterfront revitalization of the 40-acre park in downtown Miami on Biscayne Bay. Coastal Systems is part of the multi-disciplined consultant team led by Cooper Robertson and Partners to design approximately 24-acres of Park space. The \$45M Park will incorporate a waterfront promenade and baywalk along with fountain, terrace, and plaza elements. The Park program includes a large vessel mooring facility within the FEC slip to accommodate a variety of vessels including tall ships up to 350 feet long. One of the design vessels for the facility is the USCG *Eagle*, which is a 295-foot long tall ship. The mooring facility consists of 16 dolphin structures that provide approximately 750 linear feet of berthing along the existing bulkhead.

Coastal Systems performed a ship mooring analysis to evaluate a variety of vessels in conjunction with wind, tidal current, wave, and berthing loads. Mooring hardware was specified, and fender systems engineered for the facility. The dolphins are supported by 65-foot long, 24-inch square concrete piling. To avoid excess noise and vibrations along the adjacent bulkhead structure from conventional pile driving operations, the piles were installed by drilling a 36-inch diameter preformed hole with a continuous flight auger to the design pile tip elevation. The hole was then grouted in a similar manner as an augercast pile, and the 24-inch precast pile inserted. A diesel hammer was then utilized at a low energy rating to drive the piles in the grouted hole to the required tip elevation. This installation approach provided significantly higher tensile and lateral capacity for the pile-supported structure. A 10' x 10' x 4' reinforced concrete cap was designed for the fender system and the bollard. Coastal Systems worked with the Project architect to integrate the architectural finishes of the structures with the adjacent Baywalk and other Park elements.

Environmental permits were processed for the dolphin structures through the U. S. Army Corps of Engineers, South Florida Water Management District and Miami-Dade Department of Environmental Resource Management. The permits were processed to provide the City with flexibility to accommodate two 350-foot long vessels, or up to a maximum of seven 100-foot long vessels in accordance with the County's Manatee Protection Plan restrictions.

Construction plans and specifications were prepared, and Coastal Systems assisted the City in the bidding process. Construction administration services were provided to ensure the facility was constructed in conformance with the plans, specifications and permits.



**Client:** City of Miami

**Location:** Miami, Florida

**Date of Completion:** 2011 (Est.)

**Construction Cost:** \$1.4M



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