

Munyon Island, Florida

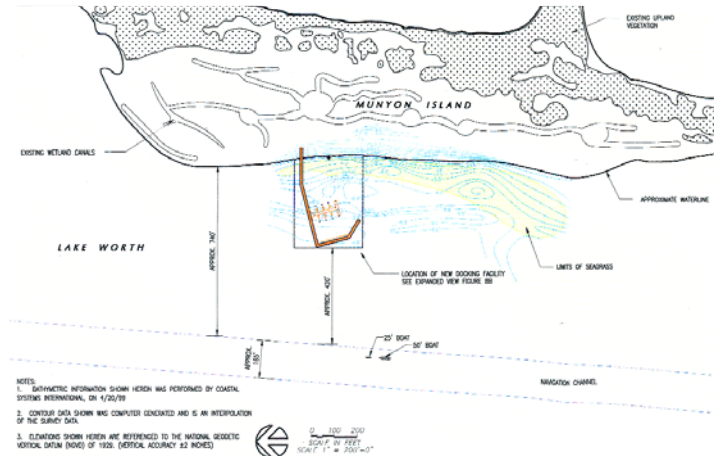
marine environmental



Coastal Systems International Inc. designed the docking facility planned for the John D. MacArthur Beach State Park on Munyon Island in Palm Beach County. A preliminary design report was prepared for Palm Beach County based on hydrographic and marine resource surveys conducted by Coastal Systems. Three alternatives including different dock layouts and wave attenuation structures were evaluated based on construction budgets. Coastal Systems was then retained by DEP (Department of Environmental Protection) Parks to complete the final engineering design and prepare construction documents for the selected option. The final design consisted of a pile-crib breakwater for wave attenuation attached to the shore on the west side of the island with a 30-slip floating dock facility. The pile crib breakwater serves three purposes; 1) approach pier for public access to the floating docks, 2) wave attenuation for boat wakes and 3) habitat for marine resources.

A statistical analysis was conducted to provide wave characteristics (height, period) for the design of breakwater with respect to the selected 25-year coastal storm return period. Wave forces were calculated for the structural design of the piles, caps, and slabs that support the pier structure. Wave transmission studies were also conducted to specify characteristics and geometry of the rock to be placed in the crib for optimum wave attenuation for the docking facility. A geo technical investigation was conducted for the design of the pile-supported structures. Designs and details for structural precast pile, caps, and slabs were developed due to the remote island construction. Fiberglass grating was specified to span concrete slabs along the pile-crib structure to provide a composite design, to relieve uplift pressures from wave action during coastal storms, and to provide light penetration for sea grass. The design provided ADA structures, as well as a slip for landing craft to transport maintenance vehicles on and off of the island.

Coastal Systems has been retained by the Florida DEP to perform pre-construction seagrass surveys and to perform monitoring and reporting of the adjacent seagrass beds for five years as required by the environmental permits issued by the South Florida Water Management District and the U.S. Army Corps of Engineers.



Design Concept



Shoreline Conditions

Client:	Florida Department of Environmental Protection
Location:	Palm Beach County, Florida
Date of Completion:	2004
Construction Cost:	TBD

