

El Portillo Beach Resort, Dominican Republic

coastal engineering



Coastal Systems was retained to evaluate the planning and design of a lagoon to enhance the proposed development located along the north-central coast of the Samna peninsula in the Dominican Republic. The development consists of villas and flats placed along the beach along with an interior lagoon system. The lagoon meanders through the development site around a large central island and two other small islands, and the lagoon receives fresh water from a natural wetland located to the south of the El Portillo airport.

Coastal Systems performed field investigations to collect data required as boundary conditions for the numerical modeling. The MIKE-21 hydrodynamic (HD) numerical modeling software was utilized to simulate the lagoon hydraulics. The unstructured flexible mesh (FM) facilitates detailed modeling of channels and lagoons of varying sizes. The circulation was simulated to evaluate flushing and the resulting water quality within the proposed lagoon system. Simulations of the lagoon hydraulics were completed for normal and high discharge conditions, and the depths of the canals and lagoons were optimized from the modeling results.

To further evaluate water quality, the dispersion module (AD FM) of the MIKE-21 HD model was utilized. This module refines the estimate of the lagoon flushing time and identifies areas of stagnant water that need to be optimized. The lagoon and canal system design was coordinated with the land planners to meet the objectives of the development master plan, and the system designed for the effects of the wetland flow and the discharge into the ocean. A coastal engineering report was prepared summarizing the numerical modeling results and reviewing the lagoon system options.

Working with the land planners and the developer, Coastal Systems prepared construction plans for the lagoon system. The plans included details for the lagoon layout, shoreline stabilization, and earthworks. Coastal Systems also provided services to assist the development team with the lagoon system construction administration.



Lagoon Flow Pattern

Client: Promotores Desarrollo El Portillo

Location: Samana Bay, Dominican Republic

Date of Completion: 2009

Construction Cost: N/A

