

CASE STUDY

Port of Manzanillo

Deepening and Stabilization of Major Port – Colima, Mexico

HISTORY

The Port of Manzanillo, the second largest port in Mexico by cargo volume handled, is the most vital port on the Pacific Ocean coast. It serves as the main entry point for goods going to, and from Mexico City, the largest city by population in North America.

PROBLEM

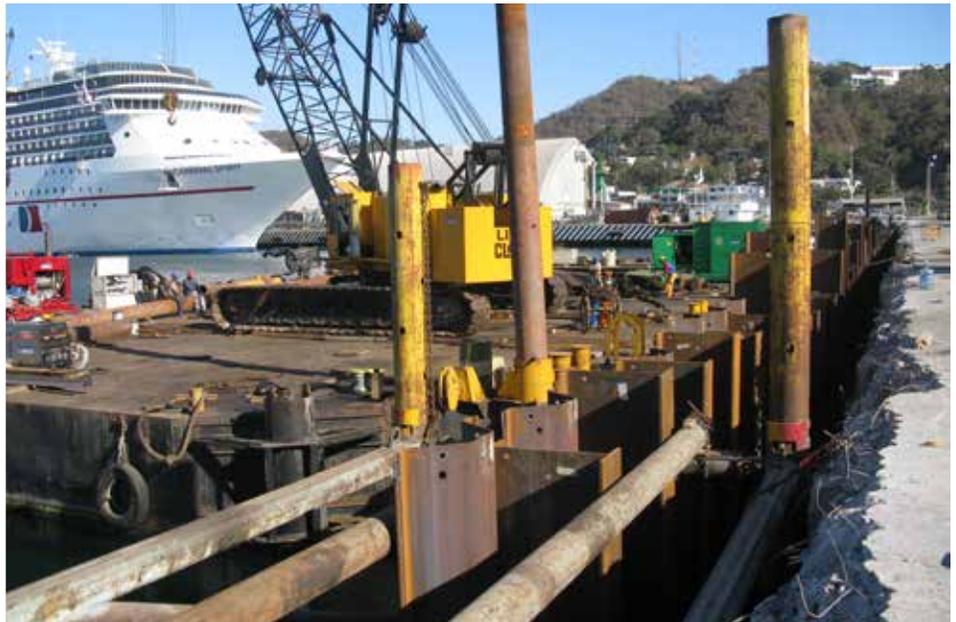
The Port Authority of Manzanillo (API) wanted to modernize the port infrastructure, starting with the deepening of the access channel to keep up with the increase in cargo volumes as a product of the extensive trade with major partners in the Pacific Ocean, including China and the United States.

As it existed, the port was unable to receive PostPanamax generation cargo ships, the first of a new class of ships that exceeded 32.2 meters wide (at 105 feet, it is the width of the Panama Canal) with capacities that reached 6,600 TEU. Initially, the access channel of the Port of Manzanillo was 105 meters wide at the bottom with a dredging level to negative 16 meters (negative 52.5 feet) from the mean low-water mark – or low tide.

SOLUTION

The project was divided into several stages, beginning with the expansion of the access channel in 2008, then proceeded to deepening of the berthing at the Band “A,” “B,” “C” and “D” docks.

In the first step, the width of the access channel was extended from 105 meters (344 feet) to 165 meters (541 feet) while maintaining the same dredged level (negative 16 meters).



The next phase of the project adapted the existing structure of Band A, which was built in the conventional way with its base on slabs and the girders supported on reinforced concrete piles. Its original design operated at the dredging level of -12 meters (39 feet). The concrete structure of Band A was reinforced and a steel sheet pile system was constructed.

Retaining the existing soil and rockfill that confine the dock and storage yard, the sheet pile ensured stability when the new dredged level of operation was taken down to negative 16 meters.

The technical team at API Manzanillo carried out construction of the retaining wall, which

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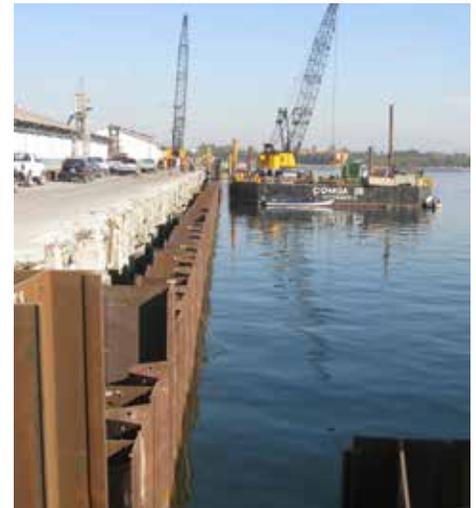
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combined sections of HZ 975D-14/AZ 18 (Grades S430/S355 GP) provided by Skyline Steel at lengths of 25.6 meters (84 feet) and 22 meters (72 feet), respectively.

During the construction, the HZ/AZ sheet pile system was driven into the ground with relative ease through deposits of medium to very dense silty sands. For this purpose, an ICE 66 vibrohammer, operated from land side, was utilized.

A length of 494 meters (1,620 feet) were covered with sheet piles, including the dock front and corners, which represents an estimated 3,500 metric tons of steel.

The port, with the expanded access channel, is a large part of Mexico's plan to improve its stock among ports in Latin America. After anticipated completion of the overall port expansion in 2012, the port would have an annual capacity of two million TEUs, an increase of 100 percent over its previous capacity.



PROJECT PARTNERS

Owner

Integral Port Administration
Manzanillo, Colima, Mexico

Contractor

Constructora Manzanillo (COMSA)
Manzanillo, Colima, Mexico

PRODUCTS

3,500 tons of HZ 975D-14 / AZ 18 in
Grades S430/S355 GP sheet pile