

## Case Study: Jetty Construction and Slope Protection

**Mattress Engineering: Proserve**

**Contractor: COPISA Guatemala**

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Fig 1. (North view) *Toyo* dredging in progress

A newly constructed piled jetty at Puerto Quetzal, Guatemala requires berth scour protection to combat against vessel scour action to the slope and wave zone beneath the jetty.

The 350m long berth is to accommodate Panamax type vessels with drafts up to 15.0 m and installed powers in excess of 70,000 kW. Concrete mattress has proved to be a more practical and cost effective solution than the use of rock armour to protect the vulnerable sand bed.

The fabric formwork mattress has been engineered by Proserve to securely seal around the 500+ piles supporting the jetty deck. After dredging and preparation to the required slope, the mattress system is laid and filled. 59 N° mattresses are to be installed as single panels, typically 6.05m to fit between pile rows and each 55 m in length, each panel locking to the adjacent with zipped ball and socket joints.



Fig 2. Pile-seal sample

COPISA chose a land based construction method mainly to reduce the project delivery time. After construction of the reinforced concrete piles and platform, the sand infill is being removed to low water level by excavation under the platform. The remaining submerged sand strata was removed by dredging pumps handled by purpose made barges. The soft sand has proved highly suitable for excavation using *Toyo* submersible slurry pumps.

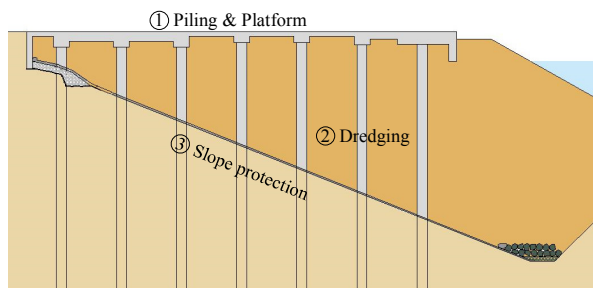


Fig 3. Land based wharf construction sequence

Constant thickness (CT150) mattress is being used for the extent of the slope which is subject to propeller action and bow thrusters during berth and unberthing (Fig 4.). The upper section, exposed to wave action, is an open-hole mattress (OH220) for increased permeability to allow for effective wave rundown. A rock falling edge apron protects the mattress toe and sides from underscour.

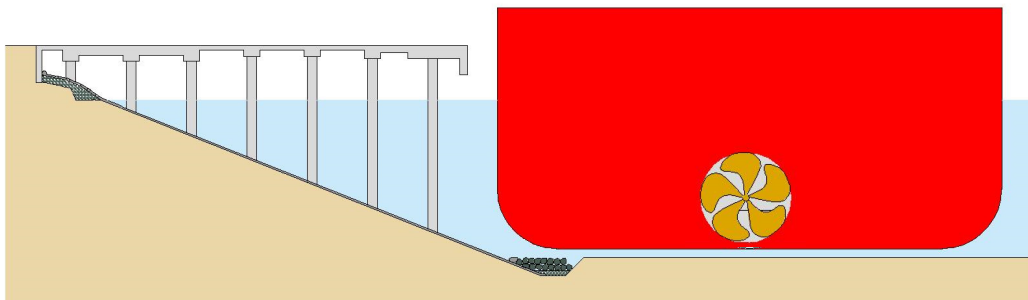


Fig 4. Typical section (Vessel: MSC Danit)