

Slope Protection Under Piled Quays

Contractor: COPISA, Guatemala

Diver: CIOMAR, Spain

2016

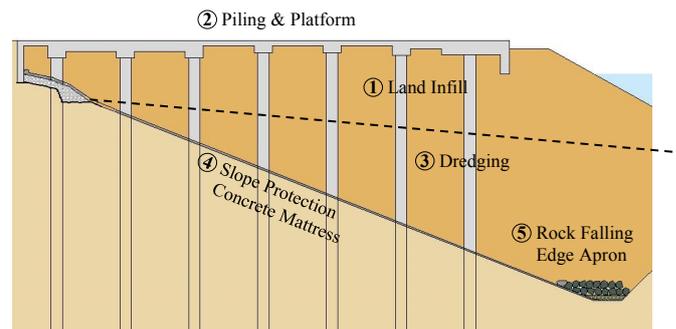
See B175 for general project case history

Concrete Mattress Installation

‘LAND INFILL’ METHOD

The piles, beams and platform slab were constructed from land using the ‘land infill’ method in order to save project delivery time. This allowed the quay to be constructed in some 20 months time from initial piling to vessel visit.

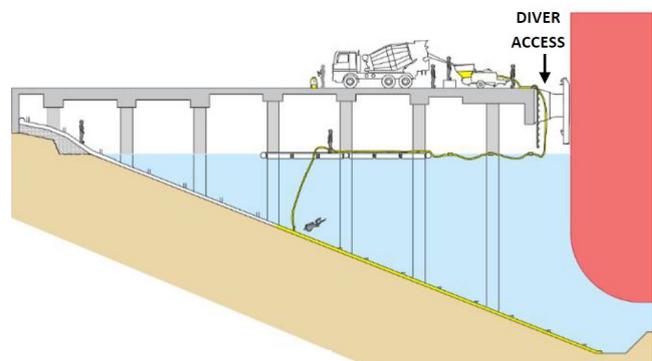
Both the land infill material and natural strata were a reasonably consistent medium sand. Piles were 1.2 m Ø reinforced concrete cast insitu. Excavation under the platform down to mid tide level was by excavators and the underwater slope was dredged with Toyo pumps handled by purpose made barges. Final slope preparation is by diver handling of a smaller Toyo pump to reduce and infill levels to specified slope tolerances of ± 0.45 m.



Land Infill Wharf Construction Sequence

INSTALLATION & FILLING

The insitu concrete mattress system was selected as it can readily be installed under the platform and was cost effective. Panels of mattress fabric are pulled out to each bay, fixed around piles and zipped to neighbouring panels. This typically takes some 3 hours. A 2:1 sand:cement micro concrete is supplied by ready mix wagons and used to pump fill the panels from the bottom upwards using 63 mm Ø grout hose. Purpose engineered pile seals are used to create a sand tight seal around piles. Mattress filling typically takes 6-8 hours for a 340 m² panel.



Mattress Filling with Moored Vessel

OPEN HOLE MATTRESS

Open hole mattress is used in the wave zone. This comprises a 220 mm thick concrete mattress with 90 mm Ø open holes at 1 m c/c to create permeability. This is laid over a bedding stone layer and sand-tight geotextile. The bedding stone and geotextile is installed immediately after excavation to provide temporary protection before mattress is laid. The mattress can be readily laid over undulating surfaces, as shown.

