

Project Reference

Coastal Erosion Protection



Environmental
Solutions

MACCAFERRI



Project Reference : Cebu City Coastal Road, Philippines
Application : Coastal Erosion Protection
Grade : Rock WX100/100 Geotextile

Overview

The province of Cebu is located 570kms, Southeast of Manila. To improve transportation within Cebu City the Department Works and Highways constructed a new coastal road linking North and South Cebu island and bypassing the city center.

The alignment of the coastal road cuts through the sea and land reclamation works were required for the road platform. To protect the slope of the reclaimed land from the scouring action of the sea, a armour rock protection system was required.

The armour protection system consisted of a knitted high strength polyester geotextile filter together with secondary and primary armour rocks.

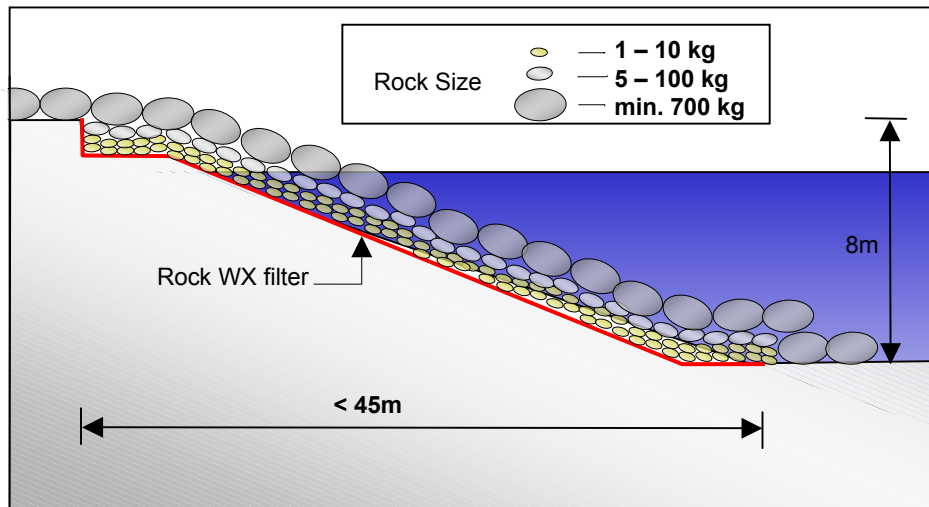


Figure 1. Typical cross sectioned of armour rock protection system with woven knitted geotextile filter.



Figure 2. Cutting of geotextile using a heated hot blade.

Construction Methodology

An initial topographical survey was carried out to measure the profile of the slope in the water. To ensure that the profile meet the design requirement of 1V : 4H, a cut and fill method was used. Slope gradients exceeding the 1V:4H were trimmed by the use of a hydraulic water jet. Uneven surfaces were filled from a sand winch and bucket crane.

The knitted geotextile filter was precut with the aid of a hot blade to the required length (< 45m) based on the water depth and topographical survey. Each panel was labeled so that the length was sufficient for the respective depth. The geotextile filter are then coiled into a steel bar and unrolled along the slope into the sea bed with the aid of 4 underwater divers.

Revetment consisted of two secondary layers of stone with a weight 1- 10kg and 5 –100 kg respectively. The secondary armour rock layers ensured that the geotextile filter is in intimate contact with the underlying soil to ensure internal soil erosion does not occur. The rock used for the primary armour layer consists of a minimum weight > 700 kg. Underwater camera was used during the installation of the primary rock layer to ensure that the final armour rocks protection system profile meet the design requirements.



Figure 3. Stringent control using sieving to ensure secondary armour rock gradation meets the requirements.



Figure 4. Dumping of secondary armour rock onto seabed.

A total quantity of about 38,000m² of Rock WX100/100 knitted high strength polyester geotextile was supplied to the project.



Figure 5. Overview of high strength woven geotextile filter with armour rock protection system.