

Case study of Application of Geotextile tube in the construction of Reclamation Dyke in Eco-sensitive zone.

Keywords: Reclamation Dyke, Dredged fill, Geotextile Tube, Artificial Island, Geo-composite

The Addu Development Project (ADP) was formulated to transform Addu City (south of Maldives archipelago) into a fully functional city, a thriving economic and a tourist hub apart from making an effort to decongest Male. In order to preserve and protect the natural coral & marine ecosystem, a one-off ~ 228 Ha land reclamation and shore protection project was proposed to create residential, commercial, and tourist infrastructure. Within this scope, it was proposed to undertake Dredging, Reclamation and Shore Protection Works to reclaim lagoons to form 3 artificial Islands covering ~ 25 Ha, where the private sectors would be invited to develop resorts. The project was awarded subsequently to Van-Oord, Netherlands on EPC basis.

The design water level considered as HAT + Sea level rise as 1.17m MSL and the island reclamation fill was proposed to be built up to minimum (+)1.6m MSL. In the absence of natural rock in the vicinity, the traditional rubble and concrete systems of construction of reclamation dyke was ruled out and sand filled Composite Geotextile tube technology was adopted as a system of choice. A two-tier stacked 11m circumference Geotextile Tube system with scour protection apron was designed & installed for all the lagoon resort islands.

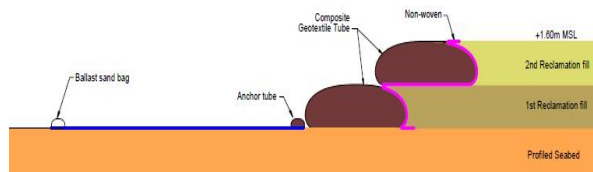


Fig 1. 2-tier stacked Geotextile Tube Reclamation Dyke

This 3 layered Specially Engineered needle punched Composite material comprising of high tenacity composite PP woven Geotextile sandwiched between a sand-coloured abrasion resistant Nonwoven textile outer layer and another Filter fabric inner layer was indigenously manufactured and fabricated to site specific designs.



Fig 2 Tube Filling under progress

The key challenges of installation of this system for Van-Oord was the dredged material compositions, availability (without disturbing the natural habitats) apart from the need to collaborated with coral specialists on the relocation of coral and associated flora and fauna prior to construction work. The additional challenge was maintaining pumping pressure due to extra long dredge lines.



Fig 3. Island #2 completed

The project was successfully completed using all local fill material in record duration of 12 months