

# CONSTRUCTION OF GEOTEXTILE REEF AT THE COAST OF MIRYA BAY

## RATNAGIRI, MAHARASHTRA, INDIA

### Breakwaters and Groynes

#### Problem

Mirya Bay is located on the West Coast in Ratnagiri District, Maharashtra. The beach situated on the Northern Part of the Bay had been subjected to severe erosion and consequently accretion happened on the southern part at Mirkarwada Bandar.

#### Solution

In order to mitigate the problem of erosion, Maharashtra Maritime Board (MMB) proposed the construction of a multipurpose submerged geotextile reef at the Northern shoreline of Mirya Bay. The total length of the proposed reef was 255 m and shall be constructed by installing sand filled geotextile containers on the sea bed under water.

Various methods for submerged reef construction were considered during the planning phase of the project. A conclusion was made based on the most sustainable and feasible conditions prevailing at the project site and a soft solution with a section based approach for reef construction was selected.

In order to ensure efficient and effective deployment of the Geomat and geotextile tube (MacTube), the Multipurpose Reef was divided down into 8 different sections (Section A to I).

#### Components of the Reef system:

An artificial reef can be defined as any solid man-made structure which has been submerged in the natural environment. They may be purposely placed to alter local hydrodynamics. Coastal protection reefs are constructed as multipurpose structures, i.e. besides the main function to protect the coast from erosion, they also maximize secondary objectives such as to widen beach for recreation purpose by beach nourishment using sand.

The reef comprised of the following components:

1. MacTube.
2. Geomat Construction Sequence The sequence of construction for the submerged reef shall be divided into the following processes:
  - Initial Survey and Layout (including temporary fixing arrangements).
  - Fabrication of Geomat (Land based activity).
  - Placement and positioning of Geomat on sea bed.
  - Placement of MacTube on installed Geomat.
  - Filling of MacTube.

#### Achieved Benefits:

- Beach formation.
- The system posed characteristics of sustainability and eco friendliness.
- Ease in the installation, hence time consumed is less.
- Versatile and flexible in nature.

**Client:** Maharashtra Maritime Board

**Contractor:** Maccaferri Environmental Solutions Pvt. Ltd.

#### Products used (Qty.)

- MacTube Coastal	67 no
- Geosynthetic Accessories	Geomat- 5,225 sqm

**Date of construction:** 03/2013 - 01/2016

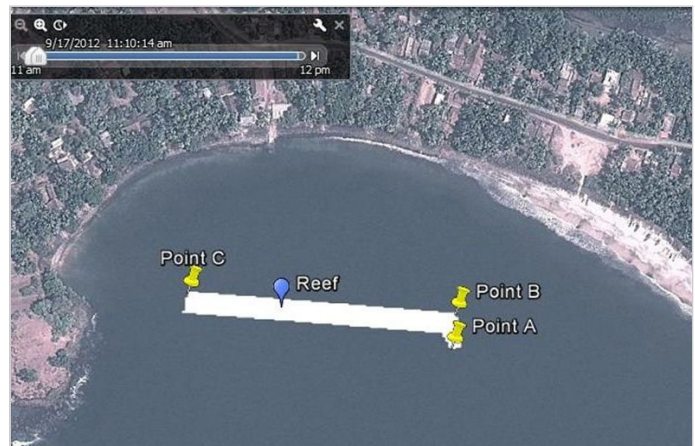


Photo 1: Proposed reef location



Photo 2: Barge for transporting the geomat and geotextile tube to the reef



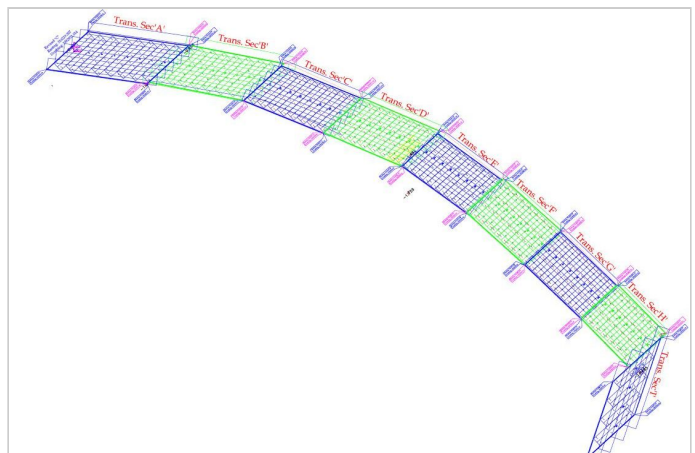
Photo 3: Placing of geotextile tubes



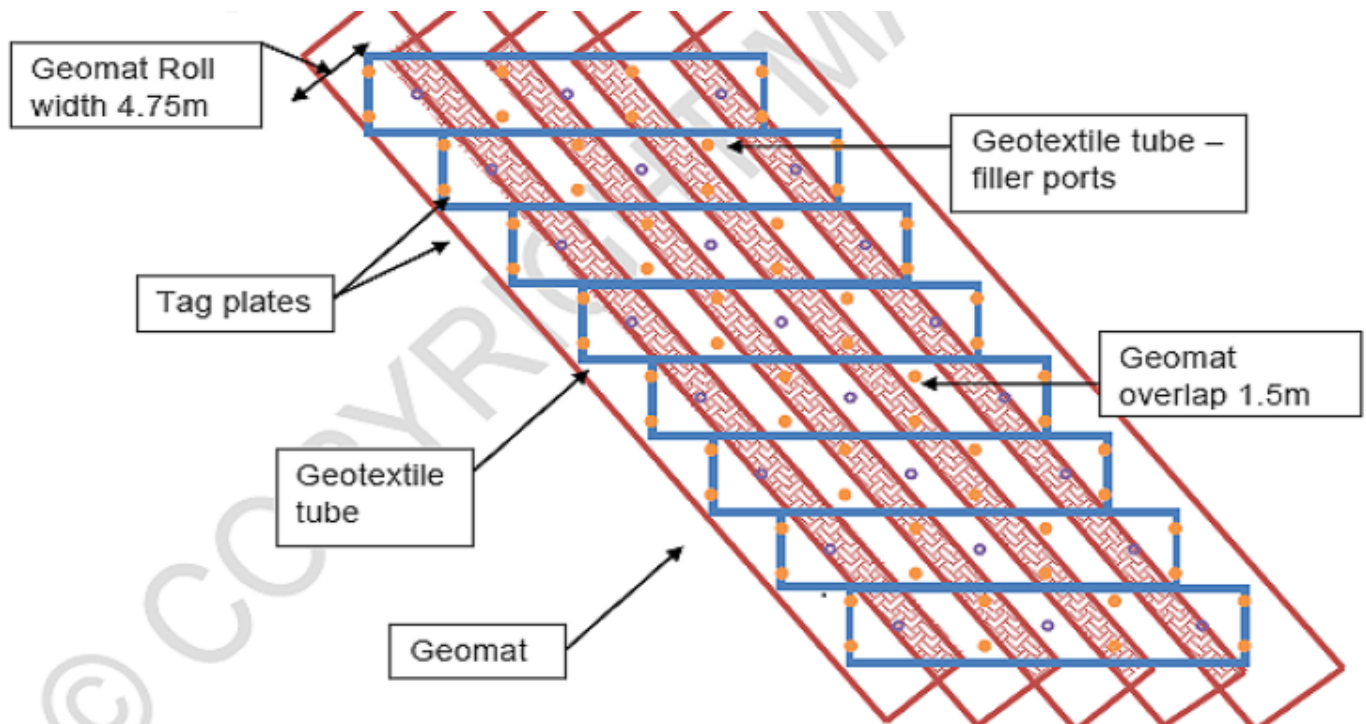
Photo 4: Closing of filler ports



Photo 5: Completed installation of geotextile tubes



Drawing 1: Plan of submerged reef structure



Drawing 2: Details of one section (arrangement)