

**ROB FOR CONNECTIVITY BETWEEN MUNDRA AND NH 8A
MUNDRA, GUJARAT, INDIA**

Basal Reinforcement

Problem

Mundra Special Economic Zone, located in Kutch District of Gujarat, is one of the largest SEZ in India. A ROB was proposed over the railway line that cuts across the connectivity road between Mundra and NH 8A. The approaches of ROB were proposed to be retained by ParaWeb® reinforced soil wall system. However, foundation soil comprising primarily of sandy silt with clay was found to have inadequate load bearing capacity to bear the load of retaining walls.

Keeping in mind the high water table and high consolidation settlements, a ground improvement technique was required to improve the bearing capacity of soil, reduce post construction settlement and also facilitate the process of implementation. Thus, considering all these factors, stone column technique with a geosynthetic raft was adopted.

Solution

The stone column technique, also known as vibro-replacement or vibro-displacement, is a ground improvement process where vertical columns of compacted aggregate are formed through the soils to be improved.

Primary purpose of soil improvement by stone column technique is to increase the bearing capacity of foundation soil and reduce post construction settlement.

Stone column derives its support from lateral resistance provided by the surrounding soil, which is caused by:

- bulging of the uncemented stone column under the load.
- resistance due to surcharge effect.
- bearing support offered by intervening soil.

The geosynthetic raft is ParaLink®, which is a monoaxial array of geosynthetic strips having unidirectional strength ranging from 100 to 1350 KN/m. The purpose of providing ParaLink® as basal reinforcement is to ensure proper distribution of the load from the superstructure to the stone columns and reduce differential settlements.

Ground Improvement details:

The area is recommended to be excavated till the founding level where the stone columns are installed.

Stone columns:

- South side - entire zone including the reinforced and unreinforced section was improved by stone column technique.
- North side - owing to relatively better quality of soil, stone columns were provided only under reinforced soil.

ParaLink® was laid throughout the entire zone.

Client: M/s Mundra Port & Special Economic Zone Ltd
Designer / Consultant: M/s. Multimedia Consultant Pvt. Ltd

Contractor: M/s. Chetan Engineers

Products used (Qty.)

- ParaLink 27,000 sqm
- MacRes 4,456 sqm

Date of construction: 04/2009 - 06/2010



Photo-1: Installation of stone column



Photo 2: Placement of sand and geotextile



Photo 3: Laying of Paralink®



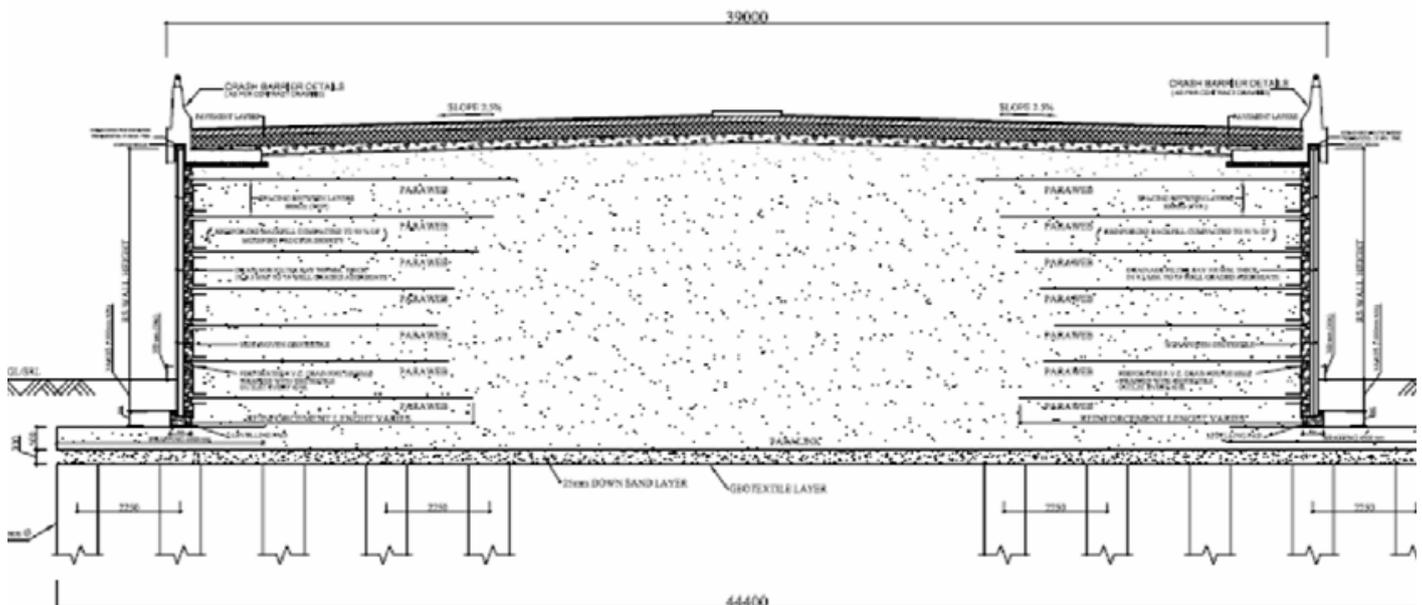
Photo 4: RS wall under construction



Photo 5: Completed construction



Photo 6: Completed structure after 3 years



TYPICAL CROSS SECTION OF REINFORCED SOIL WALL FOR PARALINK LAYING - NORTH SIDE

NOTE :-
1) ALL THE DIMENSIONS
2) REINFORCEMENT LAY

Typical cross section drawing—North side

MACCAFERRI ENVIRONMENTAL SOLUTIONS PVT. LTD
D40, MIDC Ranjangaon, Tal-Shirur, Dist. Pune - 412 220
Tel: +91 2138 393000 , Email: info.in@maccaferri.com