

## CUT SLOPE STABILISATION NEAR A HOSPITAL AT PONDA, GOA, INDIA

PONDA, GOA, INDIA

### Soil Nailing

#### Problem

Ponda is a small town centrally located in North Goa. The strata found in the region is comprising of lateritic soil due to which the cut slopes are highly prone to slides. The site near the hospital used to face the problem of slip failures. The cut slope face was vertically cut. A pipeline of diameter 0.75 m was passing over the vertical cut. The soil had very low shear strength parameters.

#### Solution

Considering the need to protect the vertical cut, soil retention works with soil nailing was suggested for the above problem. The height to be retained was approx. 12m and available base width was approx. 4m. Soil nailing technique, in which in-situ soil/strata is reinforced by the insertion of slender reinforcing elements called soil nails was used. Soil nails made of steel were installed into a pre-drilled hole and then grouted simultaneously and inserted using a displacement technique. A flexible facing (gabion units) was used on the surface of the slope. Soil nailing with gabion facia was found to be the best feasible solution considering the site constraints. Frictional soil as structural fill was filled up in the gap between the gabion facia and vertical cut. Concrete base was provided at the bottom of the gabion facia.

Soil nail walls exhibit numerous advantages such as:

- Requires smaller ROW than ground anchors as soil nails are typically shorter.
- Less environmental impact.
- No need to embed any structural element below the bottom of excavation.
- Rapid installation with less construction material.
- Performs well during seismic events owing to flexibility of the system

**Client:** Goa State Infrastructure Development Corporation Ltd (GSIDC)

**Designer / Consultant:** Maccaferri (Designer)/ Dr. A R Katti

**Contractor:** IVRCL

**Products used (Qty.)**

- |              |               |
|--------------|---------------|
| - Gabion     | Not available |
| - Anchor Bar | Not available |

**Date of construction:** 05/2008 - 07/2008



Photo 1: Photograph showing the vertical cut near hospital building



Photo 2: Site photograph - before construction





Photo 3: Site photograph - during construction



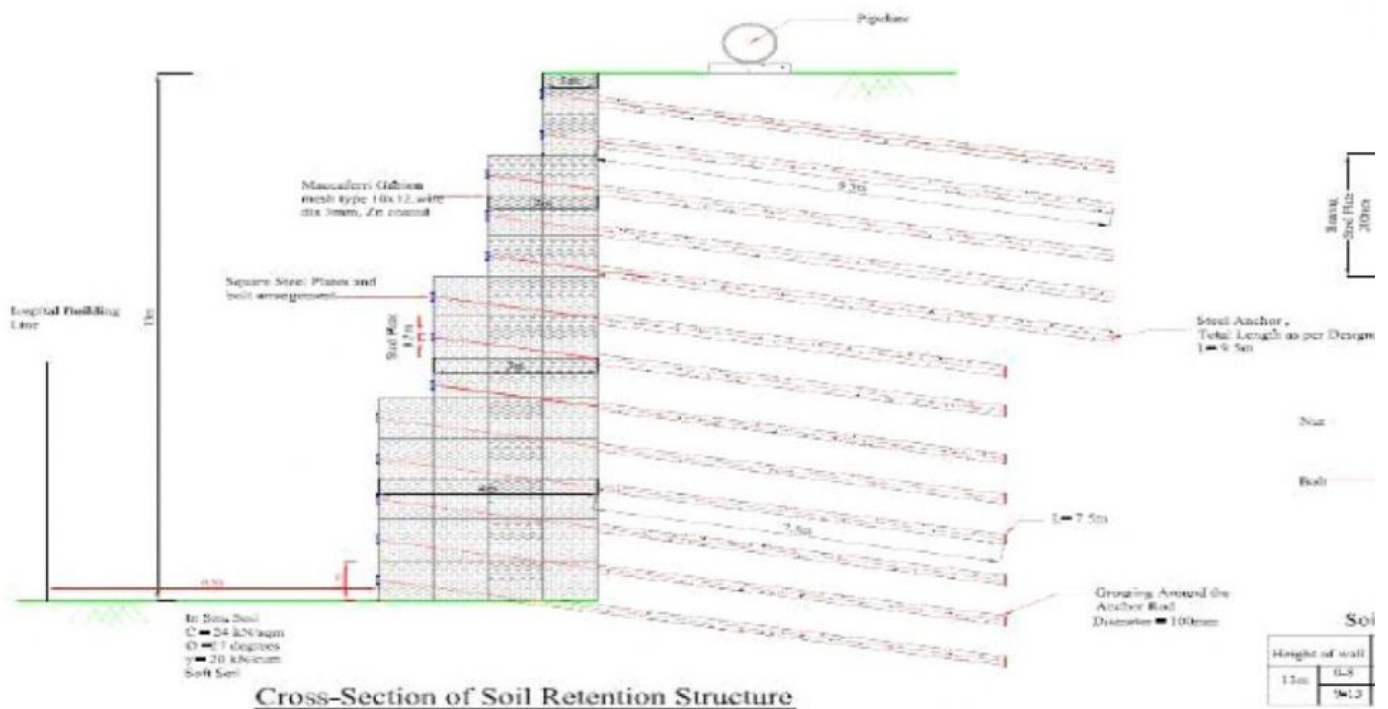
Photo 4: Photograph showing the gabion boxes filled with stones



Photo 5: Photograph showing after construction view May 2008



Photo 6: Photograph showing after construction view May 2008



## Cross sectional drawing

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