MACCAFERRI

CASE HISTORY

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CUT SLOPE STABILISATION ALONG NEAR KHANDALA TUNNEL PUNE CORRIDOR

KHANDALA, BORGHAT SECTION OF MUMBAI –PUNE EW, MAHARASHTRA, INDIA

Reinforced Soil Walls and Slope Reinforcement

Problem

Mumbai-Pune Express way (officially known as Yashwantrao Chavan Expressway (YCEW)) is India's first six-lane concrete expressway in Maharashtra connecting the financial capital of India with state cultural capital, Pune. Built along the Sahyadri mountain ranges through passes and tunnels, it is recognized as one of the dangerous expressways prone to a series of rockfall and landslides causing a heavy damage to infrastructure, traffic disruptions and causalities specially during monsoon season. In site near the Khandala tunnel portal (Pune Corridor), problems of slope stability has been observed.

Solution

After conducting thorough investigation and taking into consideration the observations of geological experts and geotechnical engineers, Maccaferri has offered cut-slope stabilisation measures with soil nailing (continuously threaded anchors (CTA) of 32mm dia) and Gabion facia along the identified stretches of the express way. Non-woven geotextile is used as filter media behind Gabion facia. Different types of solutions like PCC wall, RCC wall, Masonry wall, Gabion walls, Reinforced Soil Walls, Soil Nailing with Shotcrete facia, Soil Nailing with Flexible facia like gabions, high strength steel wire meshes are considered as option for the stabilization of cut slopes. Owing to very less space availability, it was not feasible to provide full height PCC wall, RCC Wall, Masonry wall, Gabion gravity walls and Reinforced Soil Walls. Therefore it is required to propose slope stabilisation measures with nailing. The selection of the facia was done taking into account the project requirements and location. Shotcrete facia does not allow for effective drainage of the strata even after providing weep holes. Also it is very difficult to properly execute the shotcreting operation on high slopes. Hence nailing with Gabion facia has been propsoed which shall allow free drainage of the insitu strata and gabion facia shall prevent toe erosion.

Global Stability analysis has been carried out for arriving at the solution using 'SLIDE' software.

Client: Maharashtra State Road Development Corporation Limited(MSDRC)

Designer / Consultant: Maccaferri Environmental Solutions Pvt. Ltd.

Contractor: Maccaferri Environmental Solutions Pvt. Ltd.

Products used (Qty.)

- Gabion 1072 Cu.m
- Anchor Bar 1077 RM(CTA)

Date of construction: 10/2015 - 10/2016

Figure 1-Intial Site Condition

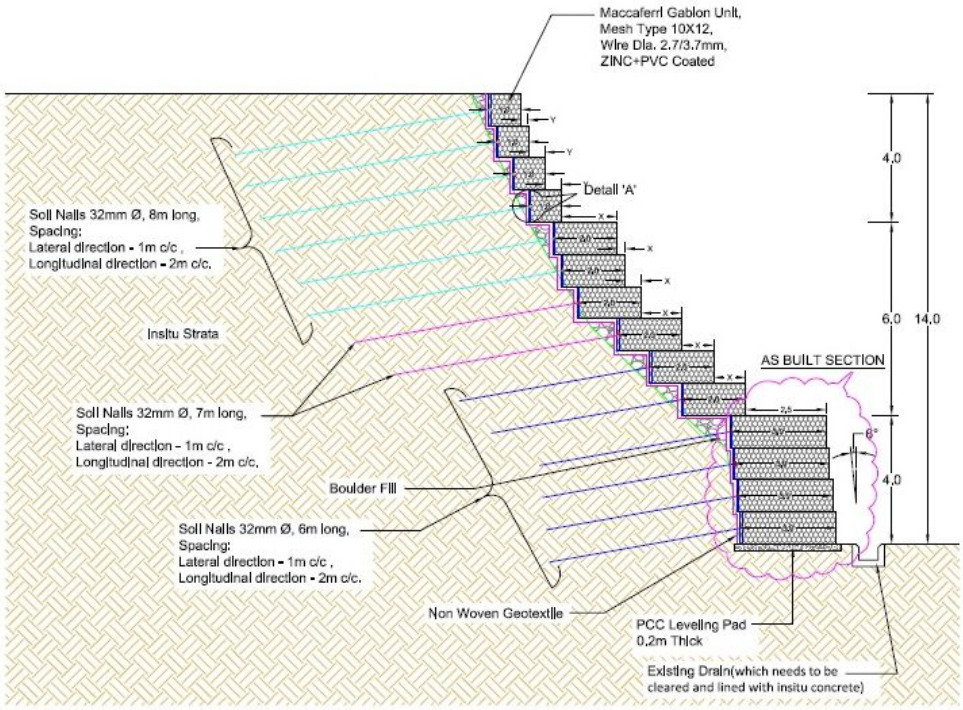
Figure 2-PCC base preparation(left), Drilling of bottom nail (right)

Figure 3-Bottom Gabion row completed (non-woven geotextile visible behind)

Figure 4-Placement of boulders for fill

Figure 5-Nail installation of intermediate nail rows

Figure 6-Soil Nailing with gabion facia



Typical Cross-section-14m high

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