

GABION WALLS AT AHMEDABAD VADODARA EXPRESSWAY

AHMEDABAD-VADODRA, GUJARAT, INDIA

Mass Gravity Retaining Walls

Problem

The Ahmedabad-Vadodara Expressway (called as National Expressway 1-NE1) is India's first Expressway which was constructed under the Golden Quadrilateral project.

The total stretch was 93Km out of which 43 to 45 km involved filling work. The work was executed in two stages- Phase 1 and Phase 2. The Phase 1 was from Ahmedabad to Nadiad (Km 0 to Km 43.4) and the Phase 2 was from Nadiad to Vadodara (Km 43.4 to Km 93.3). The total project consisted of 9 minor bridges, 100 culverts, 20 canal crossings, irrigation pipelines and provision of other logistics for the expressway. During the construction, Maccaferri was approached for the protection of slopes, abutments, wing walls, and median walls of culverts, spill cone protection works etc.

Since the existing soil at the site was black soil which is of expansive nature, the structures built above it experienced high shrinkage and swelling characteristics. Therefore, the structure above it had susceptibility for settlement. Because of their high clay content, black soils develop wide cracks during the dry season, but their iron-rich granular structure makes them resistant to wind and water erosion. They are poor in organic content yet highly moisture retentive, thus responding well to irrigation.

Solution

Maccaferri provided gabions for the wing walls and culverts since that was the most preferred solution because of its flexibility and free draining nature.

Gabions were used as toe wall in abutment for soil retention. It was also used as wing walls in culvert. Gabions used were (in m)- 1.5x1x1, 2x1x1, 3x1x1, 4x1x0.5, 2x1x0.5 & 3x1x0.5.

The Maccaferri solution was adopted for the following advantages:

- 1) Speed of construction.
- 2) Cost-Effectiveness.
- 4) Flexibility.
- 5) Environmental Friendliness: In this project, gabions were preferred for its aesthetics appeal because it helped to establish vegetation along the slopes.

Even though there was severe destruction in this expressway during the flood in 2005, structure did not show any signs of destruction. Vegetation has grown along the structures proving that integration with nature has occurred.

Client: National Highway Authority of India

Designer / Consultant: Maccaferri / CES, Halcrow Trans Infra (UK)

Contractor: LGE & C-NCC (JV)

Products used (Qty.)

- Gabion 1,502 cum

Date of construction: 04/2003 - 09/2004



Photo 1: During construction



Photo 2: During construction



Photo 3: Gabions filled with rock and geotextile underneath



Photo 4: Completed gabion wall for culvert protection



Photo 5: Completed structure

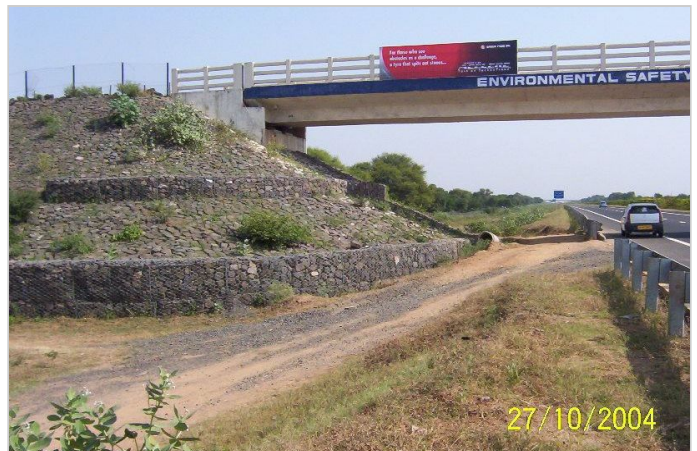
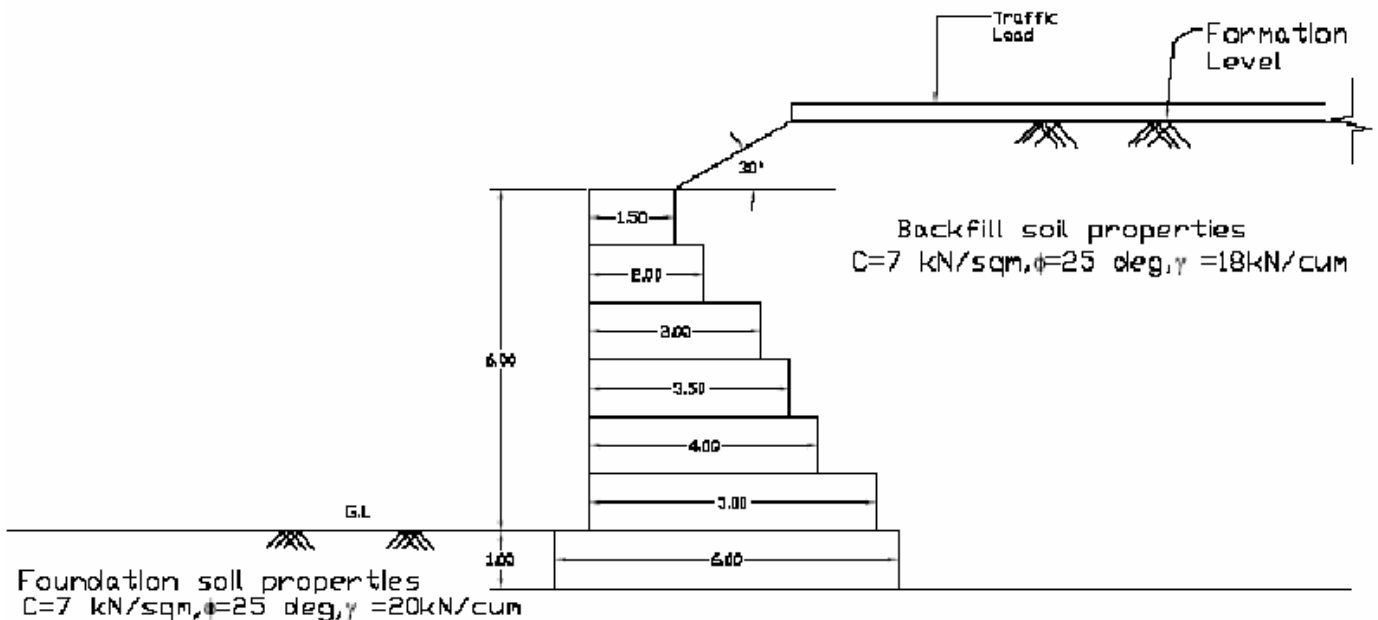


Photo 6: Completed structure



INDICATIVE SECTION FOR 6+1m HIGH WALL

Cross sectional drawing

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