VARIOUS STRUCTURES AT ANANDPUR SAHIB CANAL AT NH-21

KURALI, PUNJAB, INDIA

Vertical Walls with Concrete Facing Panels

Problem

The various structures- 1 ROB, 1 flyover and 3 canal bridges were planned to be constructed across the Anandpur Sahib canal, at Kurali-Kiratpur section of NH-21 in Punjab. The approach ramp for the various structures needed to be constructed using reinforced soil (RS) wall concept.

The foundation soil for one of the canal bridge at Km 47+650 was found to have inadequate bearing capacity to bear the load of the RS walls. Soil investigation reports revealed that the subsurface soil primarily consisted of yellowish brown clayey silt of medium plasticity upto 2m depth. Beyond 2m depth, soil was of low plasticity comprising of yellowish brown sandy clayey silt till about 4m, followed by reddish brown clayey silt of medium plasticity up to a depth of 12m. Ground water table was also encountered at a depth of 5.5m.

Solution

Reinforced soil wall with concrete panels as facia and Paraweb as reinforcement was selected as the best solution. Three types of panels were used as facia- the standard panels were T-shaped, some of the top panels were cruciform-shaped of varying height and the bottom panels used were half panels. Some special end panels and corner panels were also utilized. The connection between the panels & facia was done by galvanized toggles and loops. The connection between the panels & facia was done by galvanized toggles and loops. PVC dowels were used to connect different types of panels.

ParaWeb® strips are planar structures consisting of a core of high tenacity polyester yarn tendons encased in a polyethylene sheath. It is one of the first ever soil reinforcing material used in the world market and came into use from 1977 The approach ramp of few of the structures was having a number of curvatures, putting forward a challenge in front of the designers & construction team. Thus, a special arrangement for Paraweb layout in curvature was provided at site for execution.

The ground improvement scheme was recommended to treat the weak soil for canal bridge at CH:47+650. The complete area of the approach ramp was excavated up to a depth of 2.8 m below existing ground, and was filled back with a suitably backfilled soil of shear properties $\Phi = 30°$, and $\gamma = 18$ KN/cum.

Client: NATIONAL HIGHWAYS AUTHORITY OF INDIA
Designer / Consultant: M/s. ICT Pvt. Ltd.
Contractor: M/s. BSC- C and C– Kurali Toll Road Ltd
Products used (Qty.)
- MacRes 40,000 sqm

Date of construction: 01/2009 - 11/2010

Photo 1: During construction— excavation


Photo 2: During construction— installation of Paraweb

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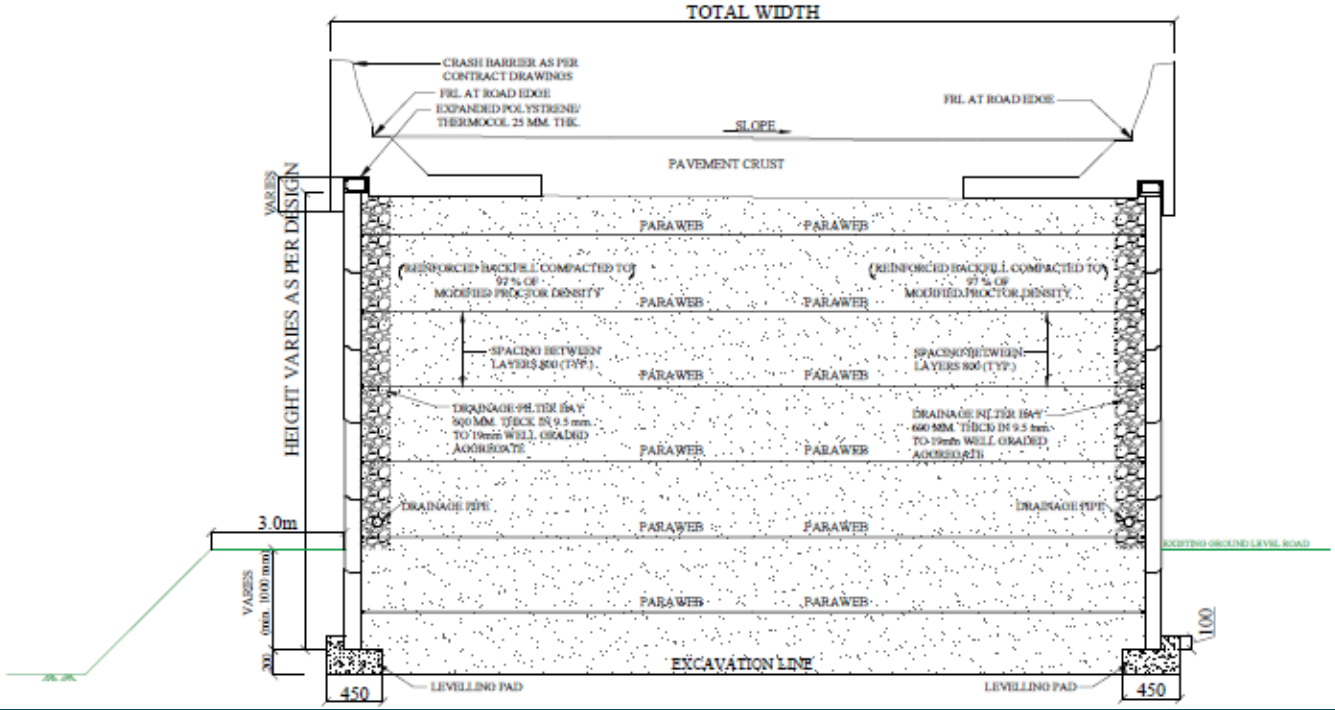
Photo 3: Construction of RS wall at curvature

Photo 4: Compaction by baby roller in area close to wall

Photo 5: Closing RS wall near abutment

Photo 6: Complete approach ramp of RS wall



Typical cross section of wall

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