MACCAFERRI

CASE HISTORY

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REINFORCED SOIL WALL FOR ROB FOR JNPT DRY PORT AT JALNA

PARBHANI MANMAD SECTION OF NANDED DIVISION OF SOUTH CENTRAL RAILWAY MAHARASHTRA, WEST, INDIA

Vertical Walls with Concrete Facing Panels

Problem

Indian Port Rail Corporation Ltd. (IPRCL) proposed the construction of ROB along with approach road for JNPT dry port at Jalna between Parbhani - Manmad section of Nanded division of South Central Railway in state of Maharashtra. Difference between finished road level and ground level was found to be in the range of 15.2m. Since ROW was available, it was decided to go with partial height walls with 2.0m high surcharge. The cost of the conventional RCC wall solution considered was high and the authorities wanted to have a system which is flexible, simple to construct and achieves overall economy.

Solution

Reinforced Soil (RS) wall system (MacRes) with concrete panels as facia and ParaWeb as reinforcement was selected as the best solution for the above problem. Paraweb comprises of polyester yarns encased in tough and durable polyethylene sheath. Paraweb of strengths varying from 30kN to 100kN were used in the project.

T shaped panels with corrugations were mainly used as facia panels and bottom panels were half panels. Some special end panels and corner panels were also used. The connection between the panels and facia was done by a cavity connector system.

Analysis was carried out as per the guidelines set by IRC-SP102:2014 wherein external stability analysis covers the basic stability of the reinforced soil structure as a unit, whilst internal stability analysis examines the effectiveness of the geosynthetic reinforcement to hold the reinforced soil mass together so that the geosynthetic layers and soil function as a monolithic block. RS Wall was checked for global stability, external stability and internal stability while considering the angle of internal friction of both reinforced and retained fill as 32 degrees.

As non uniform ground was observed at site, a uniform bed with well compacted filled up soil was first prepared with a compaction of 95% of modified proctor’s density, followed by construction of a levelling pad and erection of panels. RS wall was built in a time period of 10 months and handed over to the IPRCL and is serving its intended purpose very well.

Client: Indian Port Rail Corporation Ltd (IPRCL)

Designer / Consultant: Maccaferri / RCC (Infra) Consultants Pvt Ltd

Contractor: Progressive Civil Construction Co Pvt Ltd

Products used (Qty.)

- ParaWeb 2,00,093 RM
- MacRes 10,601 sqm

Date of construction: 05/2019 - 03/2020

Photo 1: T-shaped panels being erected with the help of Hydra

Photo 2: Bed being prepared for ParaWeb reinforcement laying

Photo 3: RS wall constructed in a curve

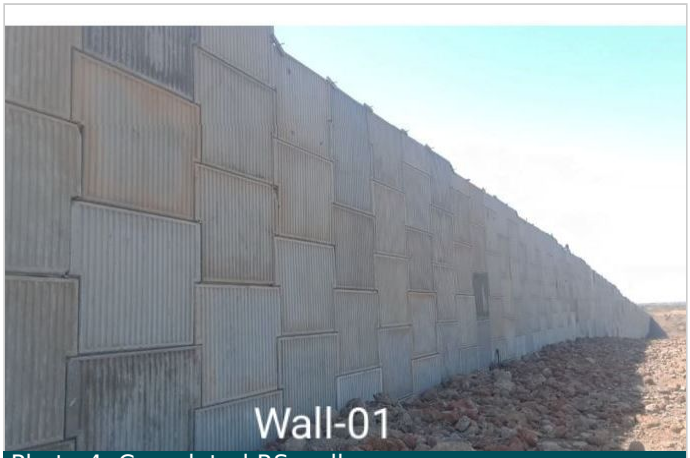
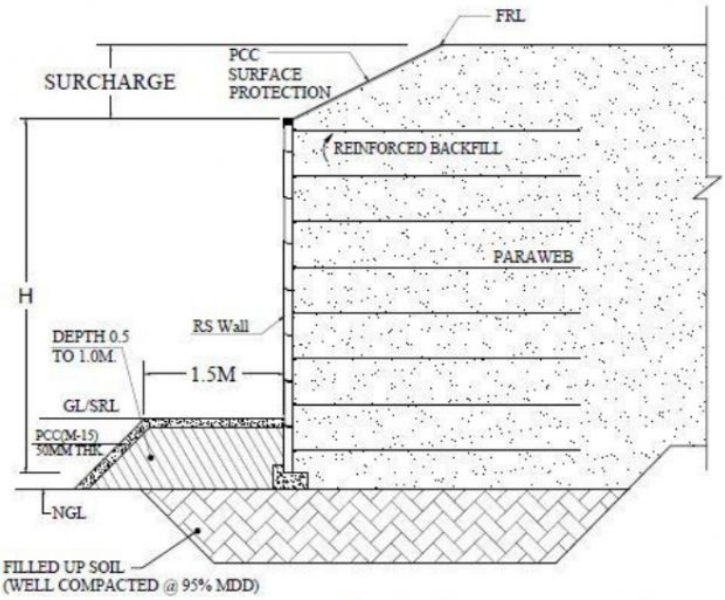


Photo 4: Completed RS wall

Photo 5: Completed structure



TYPICAL ARRANGEMENT FOR EXTERNAL BERM

Typical cross-sectional drawing

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