

REINFORCED SOIL WALL AT JAGATPURA RAILWAY CROSSING JAIPUR, RAJASTHAN, INDIA

ENVIRONMENTAL/REINFORCED SOIL WALL

Product: Paraweb

Problem:

Jagatpura Railway Over Bridge (ROB) Project was envisaged for removing bottleneck in approach to Jagatpura at the Railway level crossing No. 215/T and smoothen the traffic on the particular main road linking Jagatpura with rest of the city.

In order to avoid extensive foundation improvement schemes, Reinforced soil wall was selected as the solution in stead of conventional Reinforced concrete solutions. The cost of the conventional solution considered was high and the authorities wanted to have a system which is very flexible and simple to construct and to achieve overall economy.

Solution:

Reinforced Soil Wall with concrete panels as facia and Paraweb as reinforcement was selected as the best solution for the above problem. Paraweb is a flat strip version of a high strength, low weight, non corrodible cable called Parafil. It is one of the first ever soil reinforcing material used in the world market and came into use from 1977. It comprises polyester yarn encased in tough and durable polyethylene sheath. Paraweb is available in different grades of strength varying from 30 KN to 100 KN and the roll lengths are of 100m.

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 & facia was done by galvanized toggles and loops. Polypropylene dowels were used to connect different types of panels.

R S Wall Details:

Maximum Height of Wall: 13.5 m
Backfill Materials : Phi=32 degree
Total wall area : 8500 Sqm.

Client name:

Jaipur Development Authority, Jaipur

Main contractor name:

Harish Chandra (India) Ltd

Consultant:

IIT Delhi and Consulting Engineering Group, Jaipur

Products used:

PARAWEB

Construction info:

Construction Start:	Feb 08
Construction end:	May 08



Photo 1. Construction of leveling pad



Photo 2. Initial Stage of panel erection



Photo.3,4 Erection & Laying of Facia Panel

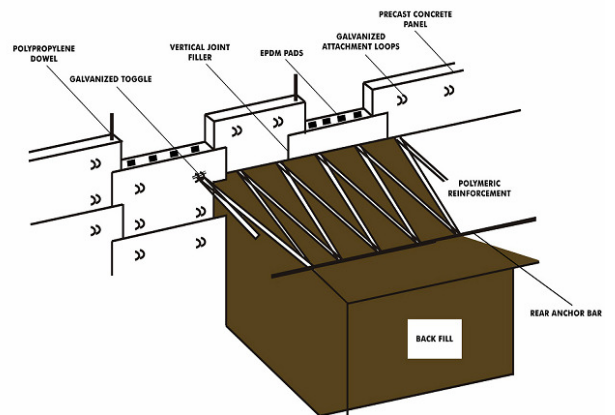


Photo.6 Laying of paraweb

Photo.5 Components of paraweb reinforced soil wall

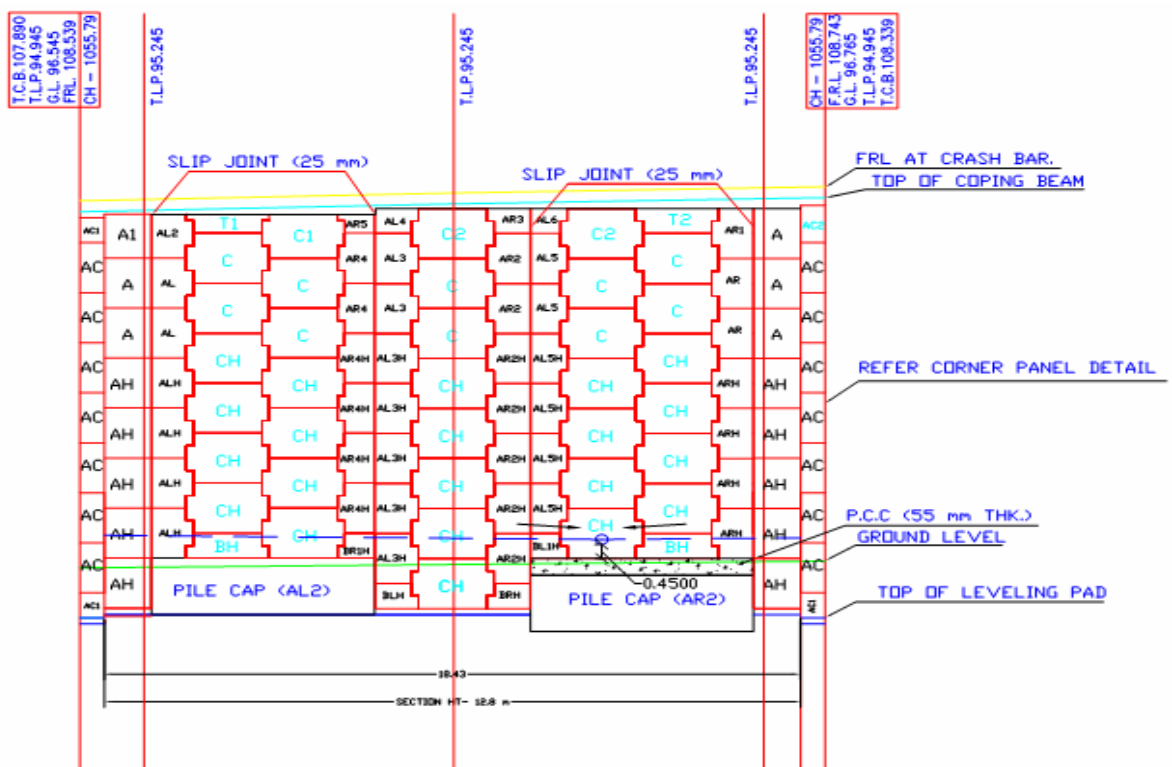


Diagram.1. Cross sectional details of reinforced soil wall



Photo. 6,7 Completion of Panel Erection

Project Details

Cost of the Project	2910 Lacs
Total Length of the Bridge	1008 m
Railway Span	50.0 m nominal
Bridge Approach Slope	1:30 (V:H)
Design Speed	60 Kmph
Clearance from Railway Track	6.525 m
Vertical clearance from main Road	5.5 m
Vertical Clearance from Service Road	5.0 m minimum
Cross Section	7.5 m carriageway , 1.2 m median and 1.5 m footpath
Service Road	10.5 m service road on either side

Advantages of RS System:

1. Settlement behavior: Due to inherent flexibility, RS wall can tolerate greater settlement as compared to normal RCC bridge abutments. Of course the tolerable settlement shall also depend on the superstructure as well. A simply supported bridge can tolerate a differential settlement of 1 in 300. RS wall with discrete panels with open joints of 20mm all around can tolerate differential settlement of 1 in 100.

2. Speedy Construction: Reinforced Soil Wall can be completed within a shorter time frame along with the approach embankment. RCC wall require elaborate shuttering and staging arrangement.

3. Aesthetics: The RS wall can be provided with a pleasing aesthetic finish using suitable rubber forms or fiber glass patterns in the moulds of pre-cast panels. This is becomes expensive for normal RCC bridge abutments.

4. Seismic Performance: Performance of RS walls in seismically active zones has clearly demonstrated that these structures have higher resistance to seismic loading as compared to rigid concrete structures.

5. Economy: In addition to all the advantages stated above, the direct cost comparison between RCC wall and ParaWeb™ reinforced RS wall indicate that RS wall shall be economical by 30 to 40% as compared to RCC.



Photo.8. Completed structure



Photo.9. Completed structure

Present Status of the Project

The ROB was inaugurated on 3rd May, 2008. The work of Service Road is presently held up due to non removal of structures falling in Road alignment owing to Hon. High Court Stay Order on removing the structures.