

READING VIADUCT - ELEVATED RAILWAY

READING, BERKSHIRE, UNITED KINGDOM

Vertical Walls with Concrete Facing Panels

Problem

Maccaferri believes that Reading Viaduct is the first reinforced soil, a discrete concrete panel-faced wall constructed in the UK, supporting live railway tracks.

The longest concrete viaduct in the UK carried its first train on 4th January 2015. Costing £45 million, this 2,000m long structure, west of Reading train station was designed to ease the bottleneck which had troubled the railway system for years.

The viaduct means that passenger train services no longer have to queue outside the station waiting for slower freight trains to pass through.

Installation of the viaduct required long approach ramps to be constructed to raise the line approximately 6.0m at both ends. Working to within 15m of the existing operational rail line meant that conventional earthwork ramps were not feasible so Maccaferri was brought in, by main contractor Balfour Beatty, to design and construct reinforced soil retaining wall solutions, compliant with the tender design proposed by Network Rail Consulting Engineers, Atkins.

Solution

To fit tight space constraints, Atkins conceived the solution, in their tender design, of vertical, reinforced soil walls (RSW) with discrete concrete panels to one side of the ramps with a 1:2 slope on the other. To provide a suitable foundation for the train-loaded ramp/RSW structures, ground improvement was necessary, owing to the variable nature of the existing soils.

Atkins proposed vibro concrete columns (VCC), with a geogrid reinforced Load Transfer Platform (LTP) to transfer the embankment loads and ensure settlement would be kept within the acceptable limits for live rail traffic. Balfour Beatty Ground Engineering designed and installed the VCC arrangement, consisting of approximately No. 2,300, 450mm diameter, 7.2m length columns, to the three ramp walls totalling 705m in length. Coffey Geotechnics Ltd, designed the LTPs, using ParaLink ultra-high strength geosynthetic geogrid. These geogrids are utilised in the LTP design to absorb, spread and dissipate applied loads vertically downwards into the piled ground, increasing the capacity of the soil to span or arch over the inter-pile space.

Client: Network Rail

Designer / Consultant: Atkins

Contractor: Balfour Beatty

Products used (Qty.)

Date of construction: 03/2014 - 01/2015

[Google Maps](#)

[Google Earth](#)



Load Transfer Platform with Paralink - March 2014



Compacted fill placed over Paralink LTP - April 2014



MacRes panels and Paraweb - East ramp during construction



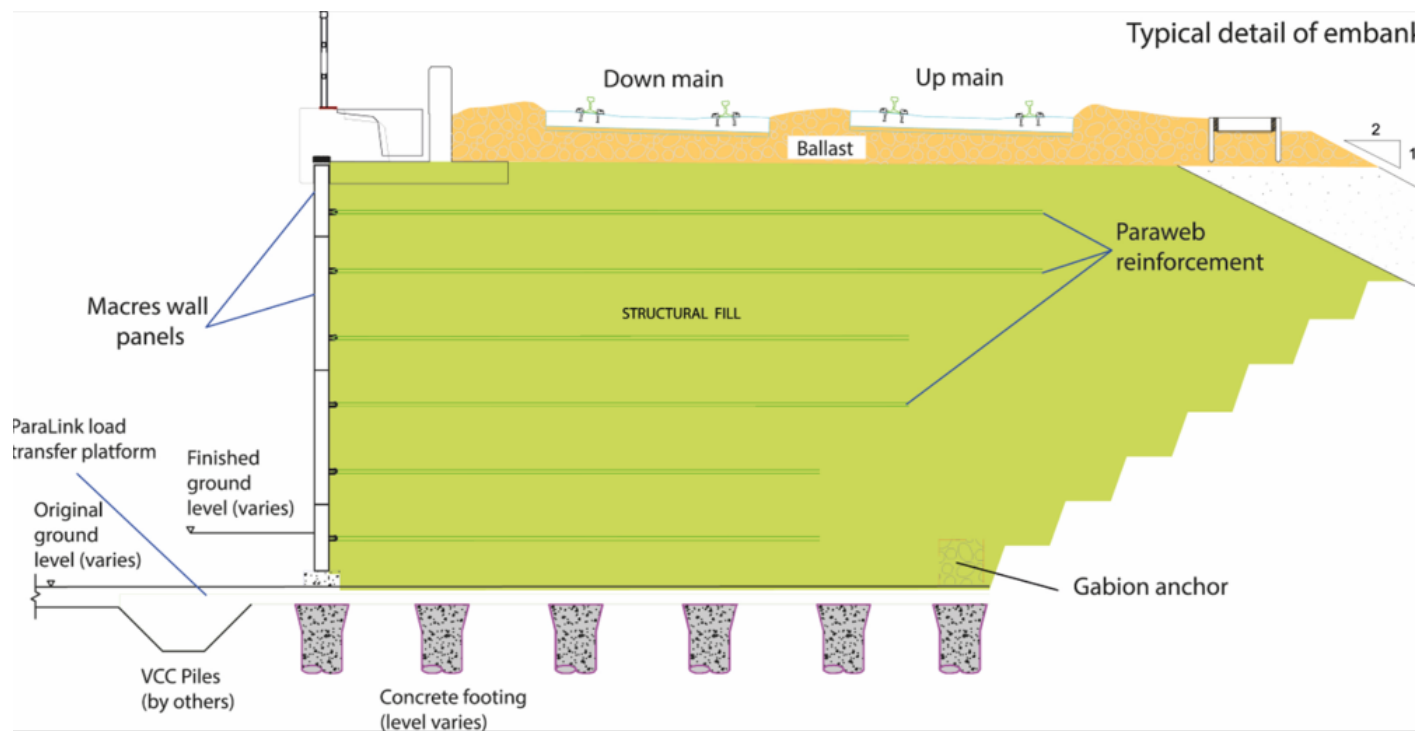
West ramp complete - November 2014



Aerial view of East ramp



Aerial view of West ramp



West ramp: typical embankment section