

Thorndell Viaduct Reconstruction, West Sussex



Client

Bam Nuttall for Network Rail

Project Description

The 153 year-old wrought and cast iron viaduct crossing the River Arun flood plain at Thorndell in West Sussex was reconstructed to a design in modern reinforced concrete. The new viaduct carries two ballasted railway tracks, is 53m long and has 6 structurally continuous spans.

The key feature of the design was a unique foundation solution that could be constructed without disruption to the railway. Two parallel rows of piles constructed out-with the viaduct footprint overcame poor ground conditions and facilitated an advance off-line deck preassembly using a combination of precast and in-situ concrete.

Demolition and reconstruction in August 2015 was completed within a 76-hour railway possession.

Cass Hayward Role(s)

- Feasibility study for strengthening original structure and options study for reconstruction (for Network Rail)
- Outline design for D&C Tender
- Detailed design for construction including value engineering and track design
- Design and checking of bridge deck in temporary installation stages
- Site attendance during implementation

Project Statistics

- Construction cost £5.5m
- Completed August 2015
- Installation blockade of the tracks – 76 hours
- New bridge deck installed by trailers weighed 1467 tonnes

Special Features

- Poor ground conditions with soft alluvium up to 13m deep below the low-lying wet site
- Two rows of piles with continuous pile cap beams were constructed alongside the railway with interconnecting transverse beams under each new pier to form a piled grillage foundation.
- The transverse beams and piers were located to avoid interference with the existing trestles
- The new bridge deck was constructed using part depth precast soffit units to eliminate the need for falsework on the poor ground and speed construction
- The completed deck with ballast and track ready on top was driven into its final position using heavy duty Self Propelled Modular Trailers

Awards

- ICE Wales Cymru – Designed in Wales Award