Black Rabbit & Peppering Bridges

Client :
Network Rail

Designer :
Atkins

Location :
West Sussex

Date :
2009

Over the August bank holiday weekend, BAM Nuttall successfully replaced two bridges over the River Arun, work which formed part of a £6.2 million investment to upgrade the railway for passengers using the Arun Valley line.

Both bridges - one known as Peppering Bridge and the other Black Rabbit Bridge - are located between Arundel and Amberley stations, about 1.5km north of Arundel in low-lying and flood-prone farmland. The area borders two sites of special scientific interest (SSSI) and they are contained within a site of nature conservation importance (SNCI). Close liaison was maintained with the Environment Agency and Natural England whilst planning the project.

The bridges, half-a-mile apart, were identical twin structures. Each had three spans with intermediate concrete piers and brick abutments. The materials used for their construction were the same as was their geometrical layout. They comprised wrought iron outer main girders and a replacement steel I-section centre girder with under-slung cross girders carrying longitudinal timbers; these supported the flat-bottomed track. Both structures were under strength for the route, requiring restrictions for certain types of traffic and it was decided that the most viable option was renewal of the superstructures whilst retaining the existing abutments and piers.

The two new superstructures have a life expectancy of 120 years. Both decks consist of three spans of U-type composite steel and concrete. Six spans were required per bridge, each one carrying a single track. The 12 steel decks were transported to site by road so that the concrete deck could be cast and the structures painted before installation. Each deck then weighed approximately 40 tonnes.

A 1,200- tonne Sarens fixed jib road-mobile crane was used for Black Rabbit Bridge whilst a similar 800-tonne crane took the strain at the Peppering site since it could be positioned closer to the structure. Substantial temporary works were installed for both cranes.

During a 76 hour weekend possession the existing bridges were removed and each bridge had its six replacement decks installed plus new cills, pier blocks and ballast walls, backfilled behind the abutments and waterproofed. The tracks and ballast were reinstated, walkways added and cables slewed back into new routes. S&T and HV testing/ commissioning were completed and the line was handed back within the allocated time. The whole project was completed without mishap, delay or accident.

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