Crewe Green Link Road

Best Practice Case Study

Project data

Client: Cheshire East Council

Location: Linking the A5020 and A500 near Basford East

Main Contractor: Morgan Sindall plc

Completed: April 2015

Tonnage: 492te

Project overview

The Crewe Green Link Road (South) scheme is a new dual carriageway running north-south between the Weston Gate roundabout on the A5020 Weston Road and the A500 Hough-Shavington bypass. Construction required the provision of a new rail bridge to carry the existing Crewe to Derby railway line over the new carriageway.

The Crewe Green new bridge, was assembled in an area 45m from its final position, adjacent to the live rail line. Upon completion the bridge was transported on an SPMT and installed into its final position during a 54 hour line closure.

The completed bridge consists of two lines of main girders approximately 40m long, 10m wide and 3m deep at the central section. The main girders lines are linked by 67 fabricated cross girders. The bridge was fully assembled upon temporary supports allowing the reinforced concrete deck, ballast and rail tracks to be completed prior to jacking up the bridge, transporting and installation into its final position using SPMT (Self Propelled Modular Transport).

Scope of Cleveland Bridge work

The preparation of detailed drawings, the supply of steel materials, fabrication, blast treatment and delivery to the assembly area. The main girders were delivered as six sections with the heaviest being 55te. These were offloaded and assembled using a 200te mobile crane.

A temporary works scheme was developed and supplied allowing the bridge to be fully assembled on CBUK trestles at height to allow access for the SPMT jack up operations. The fitting of the permanent bearings was carried out by Cleveland Bridge. Following this, the main girders were assembled supported on Cleveland Bridge trestles and stools, situated on the abutment reinforced concrete cill beams. The joints between the main girders were tented off, welded and the linking cross girders bolted into position.

Project highlights

The project involved significant discussion between Cleveland Bridge and Morgan Sindall during the design and provision of the temporary works scheme to ensure that it was suitable for both the construction phase and to accommodate the jacking up and transportation operations carried out by ALE. The fabrication programme was accelerated allowing site assembly to commence in January 2015.

Site assembly was carried out within programme, with phased handovers allowing deck construction to commence during the CBUK assembly period.

Project challenges

The reinforced concrete abutment cill beams were to be linked to the completed bridge and lifted as part of the SPMT operations. This increased the total weight of the bridge to 2000te. Concerns were raised that the permanent bearings could be damaged during transportation and Cleveland Bridge were asked to assist. Temporary supports were designed and supplied allowing the bridge to be supported immediately above, but 20mm higher then permanent bearings, allowing transportation to take place without the requirement for grouting of the bearings. This successfully prevented damage to the bearings during final installation.

In the weeks leading up to the jacking operation, concerns were raised about the possibility of the bridge and cill beams becoming unstable during the jack up and transport operation with a real potential of causing serious damage. At a very late stage, Cleveland Bridge developed and supplied a temporary restraint scheme as a solution to any potential problem. The restraints were accelerated through detailing and fabrication prior to being site welded in position to avoid the possibility of delay to the installation programme.

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