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A536 Congleton Link Road, Cheshire

Building bridges in Congleton

£90m
/ Project value

July 2018
/ The project commenced

April 2021
/ Scheduled completion

The design and construction of a range of bridge structures were major components of our A536 Congleton Link Road project – a £90m infrastructure scheme that is helping to deliver "economic and social regeneration" to the town of Congleton in Cheshire. Our five-phase, sequenced programme of works, split into five mainline zones in order to meet the agreed sectional completion dates, began in February 2018. Collaborative working, particularly with our design partners, was central to the successful delivery of the bridge portfolio. This was evident in our solution to de-risk the construction of the River Dane Bridge, which was re-designed from a three-span structure to a two-span 87m structure. This reduced the temporary works requirements as well as the health, safety and environmental risks of river working at the toe of a steep escarpment.

The brief

Cheshire East Council awarded us an NEC Option A contract for the Congleton Link Road project. Among the scope of works was the design and build of three overbridges and three underpasses.

"Our solution to de-risk the construction of the River Dane Bridge is just one example of the technical competency that greatly enhanced the entire Congleton project."

Alastair Lewis
GRAHAM Contracts Manager

"As Cheshire East Council's largest ever infrastructure project, Congleton was always going to be an extremely complex scheme, and the design and build of the various bridges and underpasses were key elements of our programme. Every structure had to be carefully developed and sequenced in line with the objectives of the overall project."

Alastair Lewis
GRAHAM Contracts Manager

The challenges

In developing the Giantswood Lane Over Bridge (a single 17m span bridge with a semi-integral precast concrete deck, supported on reinforced concrete piled abutments), we achieved an optimum solution that incorporated a semi-integral bridge with 900mm diameter bored piles. Originally fully integral, we redesigned it as a semi-integral structure for efficiencies. The 35 degree skew angle and poor ground conditions posed problems for the design of this insitu bridge. Therefore, we optioneered the piled foundation solution for the optimum layout after the specimen design was taken forward. We identified that the original 750mm diameter piles would need to be increased to 1,200mm, with the anchor wall retained. Through a process of design rationalisation, we reached an optimum solution of a semi-integral bridge with 900mm diameter bored piles while eliminating the retaining wall. This remained cost neutral to the client.

The solution

The River Dane Bridge carries the Congleton Link Road over the River Dane. We constructed a continuous 87m span in two span, steel-concrete composite bridge deck (£1m steel package of three pairs of beams), supported on bored cased piles, insitu concrete piers and abutments. It includes reinforced earthwork wingwalls, with steps to the river. An 850-tonne crane was used to lift the steel girders into place, the heaviest load of which weighed 135-tonnes. The bridge beams were fabricated using weathering steel to reduce maintenance requirements and were bolted in pairs and lifted onto the concrete foundations. The heaviest load of 135 tonnes was lifted once the beams had been fitted out with formwork to reduce working from height issues. During the design phase, we improved the safety risk by designing out an insitu concrete pier. When we completed the resurfacing of the bridge deck, material earmarked for other areas of the scheme was transported over the bridge, rather than vehicles travelling through the town – a strategy that was welcomed by the local community.

Other notable structures

- **Loach Brook Bridge:** This carries the Congleton Link Road over Loach Brook. It is a single 25m span bridge with a fully integral precast concrete deck that is supported on reinforced concrete wall piled abutments.
- **Chelford Road Overbridge:** Carrying the Chelford Road over the Congleton Link Road, it is a single 15m span bridge with a fully integral precast concrete bridge deck that is supported on reinforced concrete piled abutments. It has 200m long contiguous piled wing walls and retaining walls. It carries watermain, sewer, telecoms and power utilities.
- **Eaton Underpass:** A shared use footpath under the Congleton Link Road, it is a concrete box structure (30m long, 30m wide, 3.7m high) with reinforced concrete headwalls and 50m splayed wingwalls.
- **Manchester Road Underpass:** This carries the shared use Eaton Footpath under Manchester Road. It is a concrete box structure (28m long, 30m wide, 3.7m high) with reinforced concrete headwalls and 60m splayed wingwalls.

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