

Yews Lane Bridge Replacement

Client: Network Rail

Location: Cheshire

Value: £750k

Duration: 9 Months



In Brief...

Barhale were awarded this design and construct project by Network Rail to replace the railway bridge along Yews Lane in Helsby, Cheshire. This occupation bridge provides the only access route to Hope Farm. Having failed its capacity assessment there was a need for it to be replaced due to the weight limits imposed. This stopped vehicles in excess of 6 tonnes accessing the farm, creating problems with feed and livestock movements.

The scope of work comprised demolition of the existing bridge, design, fabrication and installation of the new structure. Design was undertaken by our sub-consultants, Crouch Waterfall and Partners whilst all other key elements were delivered in-house, including fabrication of the new steel deck at our fabrication workshop in Walsall.

Customer Benefits...

- Barhale's alternative design proposal resulted in a reduction in out-turn cost from £1.5 million to £750k by the use of a steel deck design, as opposed to the Fibre Reinforced Polymer design, which was originally proposed by Network Rail.
- We liaised regularly with all three adjacent landowners, ensuring they were aware of the progress of the works and were able to deal with any issues that arose promptly
- Works programmed to suit local farmer; the only regular user of the bridge
- The farmer and his family were relocated to a hotel for the duration of the main weekend possession. Feed deliveries were stockpiled in advance to ensure livestock welfare
- Constructed a temporary footbridge for use of local residents whilst works were on-going

Innovations...

Barhale offered a significant cost saving of 50% to the client through the use of a steel deck design as opposed to the CFRP design proposed by Network Rail. Due to the single source supply chain, the CFRP design was inefficient in terms of costs and procurement periods, thus the steel deck design became a far more effective and lean alternative.

Health and Safety...

A temporary bridge was erected during the works. Also to prevent any foot interface issues from occurring, pedestrians were escorted across the temporary bridge whilst work was in progress.

Customer Care...

Barhale advised residents in the area in advance of the work and provided a 24 hour helpline number for third parties that were affected. We worked closely with the local farmer who was the primary user of the bridge and the occupants of the farm were put up in a hotel when the replacement bridge was erected overnight. Barhale ensured the new bridge was painted blue as opposed to the standard Network Rail colour of dark green to fit in with the local history of the site.



Existing occupation bridge pre-demolition following stripping of road surface



New deck span in place

Environment...

Barhale staff worked hard to minimise their environmental impact. The sections of hedgerow that needed to be removed to create access to the track were surveyed for nesting birds and nearby water courses were checked for newts and reptiles. The scrap cast iron and steel from the old bridge was recycled and the waste brickwork was used by the farmer to upgrade access tracks to two outbuildings. All plant used was supersilenced and site noise management plan/survey was carried out. Consultation with the local council EHO concluded that because of the methods employed and mitigation measures taken Section 61 consent would not be required.

Technical Features...

The original bridge deck carried a narrow, rural access track over the railway. Two tracks ran under the central span of the bridge with grassed cutting slopes below the outer spans. The overall span of the bridge was in the region of 32m and the original structure comprised main cast iron girders over the three spans. Masonry jack arches spanned between the main girders, which were supported on masonry abutments and intermediate piers.

The bridge was replaced with a new continuous three span bridge supported onto the existing substructure and fabricated using open steel sections. New precast concrete cill beams formed part of the design at both abutments and at the two piers. The replacement bridge was fabricated, assembled and tested within a workshop facility by our BCS team and a trial lift was carried out within the workshop prior to stripping and shipping to the painters. This gave the team confidence that the structure was dimensionally correct and it allowed the lifting frame attachments to be checked and trimmed.

The fully painted deck span was delivered to site in small sections and assembled within the compound area adjacent to the crane position and the deck waterproofing applied. The total weight of the completed structure, including parapet units and bearing units totalled 60 tonnes, the decision to lift such a heavy span in one unit, was driven by the relatively short possession regime available.

The demolition and installation of the new replacement bridge was undertaken during a 54 hour OROR possession. A 1,000 tonne mobile crane was set up in the adjacent compound area, this was used to lift out the original bridge structure and then lift the 4 No PCC cill units and the new deck span into position.