

CASE STUDY:

Early Contractor Involvement

Project:
Old Flatts Bridge
Substructure Repairs

Client:
Rotherham Metropolitan
Borough Council

Partner/Associate: **Eurovia**

Contract Value: **circa £3.5m**

Length of Project: **12 months**

Completion date:
September 2015

Background

Old Flatts Bridge, near to junction 33 of the M1, carries the A630 Sheffield Parkway over rail lines and is the only dual carriageway with access to Sheffield.

A Principal Inspection of the bridge identified some major structural problems. The bearings were badly corroded, movement gaps at the free and locked ends were closed, the span between faces had shortened by 216mm and the resulting compression had cracked the curtain walls at their base.

If remedial work was not carried out, the structure would have had to have a weight restriction applied or a full closure. As the only dual carriageway with access to Sheffield, the socio-

economic impact would be significant.

It was also identified that rail closures would not be possible and the use of traffic models identified the need for four lane traffic flows throughout the working day.

From the start it was evident that the project would be complex and technically challenging. We needed to refurbish a single 22.86m clear span bridge, on an arterial route, causing as little disruption to the road and rail network as possible.



Aerial view of Old Flatts Bridge

Objectives

There were many technical and structural objectives and challenges including; containing the abutments from sliding, transforming the deck from fixity to floating, exchanging bearings, carrying out repairs to movement gaps, hydro demolition adjacent

to live railway lines, sheet piling, temporary jacks, bridge supports and deep excavations.

The objective of maintaining arterial road and rail routes during such extensive structural works required innovation and collaboration.

The concept of retrofitting to an existing structure, whilst also maintaining the full use of that structure throughout, brought considerable innovation in temporary works and construction methodology.

Key achievements

Solution to the traffic management issue

During the extensive period of Early Contractor Involvement (ECI) a complex traffic crossover arrangement was meticulously planned and interfaced to ensure that efficiency and value were both achieved. This successfully maintained traffic flow during daytime hours. There was no disruption and we were able to maintain access to and from the city centre mitigating any adverse economic impact.

No weekend rail possession

A close liaison with Network Rail during the ECI phase allowed us to carry out the works without taking possession of the railway lines. During ECI the proposed methodology was discussed and a plan of action put in place.

Collaborative working

The extensive temporary works that were required on Network Rail property and on the A630 were planned in the ECI phase with a team of specialist supply

chain partners. With this team established, we engaged with third parties which included the Environment Agency (EA), Highways England (HE) and Sheffield City Council in addition to Network Rail and adjacent landowners.

Robust programme and timeline

The programme of works and an agreed target cost were produced through the ECI period and the project was completed four weeks early, within budget.

Aerial view of the M1 (left) and A630 Sheffield Parkway (right) showing the difficult and strategic nature of the project



Temporary jacks in place to support the bridge deck. Netting in place to protect Network Rail lines from debris during the works



Finances

The original target cost was £3,491,429 which incorporated the substantial savings made during the ECI period. The savings were driven mainly by alterations to temporary works designs and construction sequence methodology. The changes led to savings totalling more than £800,000.

In addition, the detailed involvement of Eurovia during the ECI period helped to minimise contract change and resulted in the final target cost being within 2.5% of the original.

Through an effective and jointly engineered risk mitigation approach and by instilling a collaborative approach to cost reduction throughout, the project was delivered 8% below the adjusted target price.

Looking to the future

Good practice examples include the formulation of a robust programme of works with input from all the supply chain partners. A number of specialist subcontractors were involved in the development of the original works programme. This included early identification of a temporary traffic management subcontractor to design layouts, temporary works designers and bridge bearing designers as well as manufacturers and a number of other trade subcontractors.

By identifying potential pitfalls at the ECI stage, the team jointly mitigated substantial areas of risk which gave the project a degree of certainty on programming and target cost figures. The lengthy ECI period facilitated this process, which led to a temporary and permanent design that was achievable, functional and effective.

Engaging with third parties at an early stage allowed us to secure approvals for key activities such as traffic management where complex crossover arrangements were required. The successful relationships allowed us to carry out works on the A630 and meet specific deadlines within the programme. These included line blockages or possessions to carry out essential work adjacent to railway lines and access to the underside of the bridge.

The concepts used to carry out the works, both above and below the deck, have been shared across the industry where practical.

Best practice outcomes from the project, which was seen as extremely successful, were collated and formalised in a 'Post Project Review' meeting which was held in February 2016. The report, which resulted from

the review, has been cascaded across all parties to the Midlands Highway Alliance, including 21 Local Authorities and six highways contractors. In addition the team from Rotherham Metropolitan Borough Council and Eurovia have formally presented key project best practice at the Medium Schemes Framework Community Board meeting in March 2016.

The project was awarded a Certificate of Excellence in the 2016 ICE Yorkshire and Humber Awards in recognition of the permanent and temporary works designs used and the use of innovative approaches to minimise risk and maximise project benefit.



"The detailed involvement of Eurovia during the ECI period helped to minimise the contract change and resulted in the final target cost being within 2.5% of the original."

Kevin Graham, Framework Manager, Eurovia



Traffic was moved to narrow lanes to allow works to continue above and below the deck concurrently