CASE STUDY:

Early Contractor Involvement

Project:
Lichfield Bridge

Client:
Staffordshire County Coucil

Partner/Associate:
Galliford Try

Contract Value: **£3m**

Length of Project: **10 months**

Completion date:
October 2015

Background:
Over 15 years of discussion between local authorities and a developer culminated in a plan to develop a prime business site within the city of Lichfield, Staffordshire. Access to the site required an existing bridge over the West Coast Main Line (WCML) to be replaced, as it was inadequate for the intended use of the development.

Objectives:
To create access to and enable development of a prime modern business park in Lichfield.
It was necessary to replace Network Rail (NWR) owned and maintained bridge No. 98, carrying Burton Old Road over the West Coast Main Line (WCML). To avoid a years delay, the first objective was to gain NWR permission and procure/ secure sub-contractors for the demolition of the existing bridge deck and abutments within a 54 hour rail possession over Christmas 2014. The second objective was to build a replacement bridge where half of the business site would become inaccessible by any established access.

The project was jointly funded by Staffordshire County Council (SCC), with Liberty Property Trust UK Limited as the fund for the Business Park and Stoford Developments (SD) as their developer who had been working on project feasibility with Lichfield District Council for over 15 years.

Network Rail were heavily involved as it owned the bridge which needed to be transferred to SCC. SCC/NWR would then enter into a Two Party Overbridge Agreement, which would effectively allow SCC to construct the new bridge (subject to NWR technical checks and approval process) over the WCML and ultimately retain ownership and liability.

Galliford Try was initially selected using MSF2 to provide Early Contractor Involvement (ECI) services in August 2014, and joined the other stakeholders to work on finding solutions. Stakeholders worked intensively together to not only surmount the challenges, but also realise substantial project savings through the ECI process.

Railway possession
Although at the time of the ECI process the professional relationship with NWR was progressing well and the Christmas 2014 possession had been booked and secured, NWR had concerns that due to the delay in appointing a contractor, the availability of Overhead Line Equipment (OLE) and other specialists, that would be required to enable the bridge to be efficiently and safely demolished, would be limited. NWR was prepared to consider a demolition strategy which did not involve the lowering of the OLE, however, this increased the contractual risk between SCC and Galliford Try and the contractual/commercial risk throughout the project. It also would have required an additional Christmas 2015 possession to demolish the outstanding elements. The lowering of the OLE would be the only methodology which would allow the bridge to be completely demolished, thereby negating a further Christmas possession over the WCML.

Galliford Try deployed its rail specialists to work with NWR and SCC to find solutions: firstly drawing on supply chain partners to secure the NWR approved specialists to dismantle the structure within the busy Christmas window: secondly satisfying the prerequisite NWR safety procedures in extremely short timescales and lastly, working with supply chain to make proposals, giving NWR confidence in allowing the lowering of OLE during demolition.

Outcomes:
The primary objective was met and both the bridge and abutments were removed. The railway line was handed back to NWR with time to spare, which not only saw a significant amount of risk removed from the overall project, but saved the client, funder and developer a significant amount of capital and time

Bridge No. 98 over the West Coast Main Line (WCML) before demolition

Galliford Try and Network Rail discuss collaborative working

> "The Midlands Highway Alliance provided the perfect opportunity for us to collaborate with stakeholders and make this challenging project the success that it is."
>
> Gary Morris, Framework Manager Galliford Try.

Engineers perform a quality control check prior to a concrete pour

Land locked site

Working areas north of the bridge were bounded by the elevated A38 trunk road and the railway line, effectively isolating this part of the site once the bridge was removed. Two level crossings into the site could not be improved for use by construction traffic and the use of both crossings was strictly prohibited and prescribed within the many legal agreements in place between SCC and NWR. This meant that once the bridge was removed, all resources required to build the north abutment would have to be established within a land locked area prior to demolition and throughout construction (a period of up to nine months).

The team worked hard to try and find other options for access. A new temporary slip road and access ramp off the A38 was refused by the Highways Agency. Through its work on WCML widening, Galliford Try investigated the presence of historic haul routes provided for that project and one was identified as suitable. SD and SCC negotiated with landowners to secure a wayleave allowing the haul route to be extended into the land locked site. They then designed an alignment, undertook the environmental and ecological surveys, and secured planning permission for the 2.5km haul route. Galliford Try detail-designed the 2.5km of road sufficient to carry all construction traffic across the arable land. The combined efforts of all involved enabled the site to be unlocked and negated the costly process of isolating the resources required to build the north side works (which was estimated to be in excess of £1m and would have made the project financially unviable).

SCC supported SD and Liberty to enter a separate build contract with Galliford Try for the haul route and introduced protection clauses within the overarching site implementation agreement.

Value Engineering

ECI provided a unique environment to explore and refine a number of Value Engineering (VE) options. One of these options was born out of a need to solve a particular problem. The existence of an old high pressure strategic 450mm diameter water main was the source of significant construction risks. The team expanded to include officers from South Staffordshire Water (SSW) to review the complex and high risk interface between the high pressure water main and the retaining walls required to all four corners to the new bridge over the WCML.

The solution reached was to revise the alignment of the highway. It resulted in a slight re-design/reduction of the bridge width and angle of skew, and a change in length for the retaining walls. In addition, the team designed out the retaining wall to the north east corner of the bridge and replaced it with an embankment, which removed the major risk interface between the retaining wall at the greatest height and the high pressure water main. SD secured the land from the landowner and a transfer agreement was established between SD and SCC.

The ECI process resulted in a significantly reduced SSW diversion cost, and avoided licence agreements and work on private land, which would have caused further complications.

SSW was then able to complete the diversions which directed the water main away from the works and enabled the project to progress as planned, programmed in line with the works information.
Further savings were made through contractor designed reinforced earth retaining walls which replaced the original reinforced concrete designs, reducing direct and future costs of these features.

Efficient working meant the ECI team were able to make significant financial savings. SCC designers routinely worked through weekends to provide information for budget assessment by Galliford Try, and to gain agreement from NWR and SSW for the proposals. SD equally moved quickly to negotiate with third parties and sanction changes.

Finances:

£1,791,382

Total savings made

Lowering overhead line equipment
£110,000

Changes to highway alignment
£275,032

Alternative access arrangements
£991,350

Design out water main diversion
£100,000

Re-design retaining walls
£40,000

Changes to reinforced earth walls
£275,000

Key lessons learnt

- Strong project management and leadership are important to ECI success. The SCC project manager set clear goals and remained proactive in driving the team throughout the process.
- The ECI team should expand to include additional stakeholders as required. As the significance of the water main diversion became apparent, inclusion of SSW to work with the team to explore options and find the optimal solution was necessary. This ensured that all stakeholder perspectives and priorities were weighed together and a balanced solution was found.
- Decision makers need to retain close involvement within the ECI team. The speed required to achieve the results was only possible by people with authority making timely decisions.
- Investment in ECI should be proportionate to the potential to gain value from the process. SCC committed to fund GT throughout the ECI process. This was in recognition that the level of contractor resource required to surmount the challenges could not reasonably be provided otherwise and project success was the paramount consideration.