DfMA Approach
A303 Sparkford

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Knowledge/Case Study Type:

- Health, Safety and Wellbeing
- Quality, Efficiency & Improvement
- Environment, Sustainability & Carbon
- Engineering & Design

Key Points:

This case study has been written to summarise the work done to date by Galliford Try in relation to the additional design work undertaken for the A303 scheme to maximize efficiencies and make use of precast solutions which help demonstrate the delivery of Galliford Try's commitments, no 20 (BCR > 30%) and 45 (review standard specification for DFMA).

Description

Development of one highway improvement schemes on A303 through PCF Stages 5, carried out as part of the Regional Delivery Partnership, Lot 4 – Southwest.

Action

As Galliford Try took over the A303 scheme at stage 5, the design for the scheme was already produced and the BCR of 30% was already agreed by the previous Delivery Integration Partner who took the scheme from stage 3 to stage 5.

With one year delay in the DCO approval, it became challenging to deliver the scheme.

Galliford Try and their Design Partner Sweco reviewed and improved the existing design making it more efficient through extending the utilisation of existing chambers in the drainage system and the maximisation of off-site production, precast and 'plug and play' solutions within the scheme.

The optimised drainage network in the newly implemented design had a total of 184 chambers removed and only 15 new chambers added.

Galliford Try used off site precast solutions for:

- W5 Beams at Hazelgrove bridge
- Bridge copes for both bridges
- Watertight manholes with perfect base used scheme wide
- Precast Head walls used scheme wide

The implementation of these solutions was carried out within the constraints on the scheme, including the Preferred Route Announcement, Client Open for Traffic and Start of Works dates, site access constraints and scheme budget.

Result

For the streamlined drainage network, at an average cost of £2,250 per chamber, the efficiency realised is of £380,250.

Precast solutions gave us overall an increased speed of installation by removing construction and curing time securing an overall higher quality of products delivered.

Precast copes: Elimination of temporary works associated with in situ construction of copings and reduction in amount of work at height.

Precast manholes: Reduction in confined space working, e.g. as associated with in situ benching)

Use of off-site construction: Reduced interface with live traffic, reduced customer disruption. improved construction safety and ability to meet key dates for scheme delivery.

Transfer

i) PCF Stage 3 is the key stage of the design development for confirming preferred solutions associated with structures and highways elements. It is important to ensure that all parties involved in the construction process are 'bought in' to the decisions made at this stage. If the project is taken over at PCF Stage 5, there is substantial design re-work and delays in later PCF Stages. Delays and rework can still happen due to changes in project personnel, supplier selected and/or organisational approaches during the lifecycle of a project.

ii) When inheriting design solutions and/or construction methodologies from others, it is important that any fundamental scheme buildability problems are identified and resolved as part of the contract award due diligence process, and not as part of the PCF Stages. This also applies to any fundamental changes of proposed solution (and noting that the two can be intrinsically interlinked). This issue can affect any subsequent decision to adopt offsite / offline production, design standardisation and/or precast techniques.

iii) The nature of the RDP schemes is such that scheme budget constraints take ultimate priority over the National Highways Imperatives of Customer, Safety and Delivery. In some cases, this can preclude the use of precast solutions and/or offline or offsite construction techniques, and their associated benefits in relation to the Imperatives.

iv) The Preferred Route Announcement for each scheme, and associated scheme specific constraints, can restrict the ability to adopt wider standardisation across a series of schemes awarded to one Main Contractor. For example, standard bridge designs. Larger programmes of work, e.g. HS2, LTC, may offer greater scope for implementing such approaches.

v) If the scheme is taken over at PCF Stage 5, any commitments made on scheme delivery, including the realisation of 30% BCR savings should be reviewed with the client and rephrased to ensure commitment targets reflect status quo.

Please contact Galliford Try for further information.