Annex 2

A38(M) Aston Expressway Tame Valley Viaduct

Implementation of Structural Management Strategy

1. The management strategy for the viaduct was approved through the following reports;

   1.1. 'A38(M) Tame Valley Viaduct - Approval of Full Business Case for Implementation of Management Strategy' submitted to the former Cabinet Committee (Procurement) on 2nd August 2011

   1.2. 'A38(M) Tame Valley Viaduct Management Strategy - Implementation of Phase 2' submitted to Cabinet on 19 May 2014

2. A summary of the three-phased management strategy is provided in the following sections;

   2.1. **Phase 1 – Monitoring, Inspection, Assessment and Design;** This phase involved the development and installation of a system of continuous live monitoring, detailed surveys, non-destructive testing, rigorous assessments and detailed strengthening design to enhance the carrying capacity of the entire viaduct to current standards.

   2.2. **Phase 2 – Trial Span strengthening, Design Refinements, Testing, Contract Documentation and Stakeholder Liaison;** Given the complex nature of the viaduct and its intricate construction details, location, economic importance and the estimated overall cost of the scheme, the aim of this phase was to;

      i. Identify aspects of the existing construction, including latent defects, which could not be quantified from non-destructive testing, inspections and historic construction drawings through undertaking part strengthening of one of the substandard spans of a viaduct on a trial basis and incorporating the experience gained and lessons learnt to refine and improve the final strengthening design of the viaduct;

      ii. Enhance buildability, improve safety during both the site works and post strengthening routine maintenance of the structure;

      iii. Develop the procurement and project risk management strategy identifying the most appropriate form of contract for the works;

iv. Prepare a comprehensive project cost estimate including risk evaluation to achieve a high level of cost certainty;

v. Establish the funding mechanism and resources to cover the City Council's contribution towards the scheme;

vi. Engage with the affected stakeholders including;

- Network Rail to establish their specific requirements for the scheme;
- Environment Agency and development of a flood risk assessment;
- Police and emergency services;
- Liaison with businesses and landowners affected by the works to determine mitigation measures and compensation levels where appropriate;
- Identification of alternative temporary parking and storage for businesses affected by the works;
- Securing suitable contractor site compound and storage during the execution of the works;
- Liaison with the statutory undertakers;
- Coordination of works with programmed activities within the City.

vii. Prepare contract documents incorporating the requirements of third parties / stakeholders identified as part of the engagement process.

2.3. **Phase 3 - Delivery of Site Works;** This phase, which **is the subject of this FBC**, involves the implementation of the full structural strengthening scheme including;

i. Strengthening of the steel box girders carrying the viaduct deck to enhance their carrying capacity and overall longevity;

ii. Painting of the entire external and internal surfaces of the steel box girders;

iii. General refurbishment of the viaduct's deck components, piers and abutments;

iv. Supporting the delivery of the above activities including;

- Testing and investigatory work,

- Preparation of the business case required by DfT to confirm allocation of the LGF grant funding,
- Procurement and contract award and
- Site delivery, project and commercial management.

Outcome of Phases 1 and 2 of the Management Strategy;

3. **Outcome of Phase 1– Monitoring, Inspection, Assessment and Design;**

3.1. A continuous live structural monitoring of the viaduct has been put in place, extensive site surveys and tests have been undertaken and detailed structural assessments and strengthening design to enhance the structure's live load carrying capacity to current standards have been completed.

4. **Outcome of Phase 2 – Trial Span Strengthening, Design Refinements, Testing, Contract Documentation and Stakeholder Liaison;**

4.1. The trial span strengthening works which consisted of part strengthening of a span followed by painting was completed in May 2015. The lessons learnt from these works have enabled further optimisation of the entire strengthening design from a technical, commercial, safety and buildability perspective. This has led to robust and tangible improvements in the final engineering solutions, project delivery and overall financial risk management.

4.2. Additional testing regime identified as a result of the trial span works will assist in confirming the extent of the defective structural components present, hence, leading to improved overall project risk management and cost certainty.

4.3. A detailed cost estimate based on construction activities, stakeholder requirements, operational risks, cost inflation and uncertainties within the construction industry has been developed. This has been used to establish the funding mechanism and financial resources required by the City Council to cover its contribution towards the scheme. A copy of the cost estimate has been provided in Annex 5.

4.4. A delivery strategy for the implementation of the viaduct strengthening works was also developed. This strategy, intended to inform the basis for the Council's approach to the procurement and delivery of this major strengthening scheme, has been used to inform the procurement strategy set out in Annex 3.