

The Ordsall Chord, Manchester, UK – digital delivery of design

Brian Duguid BEng (Hons) FICE; Jason Hyde BEng MSc CEng MICE

Mott MacDonald Limited, Altrincham, Cheshire, United Kingdom

Howard Pullan MEng CEng MICE

AECOM, Altrincham, Cheshire, United Kingdom

Contact: brian.duguid@mottmac.com

Abstract

The Ordsall Chord is a new railway link which for the first time connects all five of Manchester's city centre railway stations. It involves extensive and varied structures supporting nearly 700 m of track, many of which are highly complex geometrically to satisfy architectural requirements.

The design across all engineering disciplines has been undertaken using extensive state-of-the-art Building Information Modelling (BIM). Federated 3d models produced by all disciplines are integrated in a common data environment, compliant with UK government BIM Level 2 requirements.

The level of detail developed for the civil and structural engineering design is unprecedented for a transport infrastructure project in the north of England, with modelling in many cases down to the level of individual reinforcement bars. Software interoperability issues have been encountered and resolved.

Early involvement of both the main contractor and steel fabrication subcontractor has allowed conventional roles and processes to be challenged. The design models and drawings have been produced on the designer's behalf by the steelwork subcontractor, although the structural designer still owns these deliverables. For one structure, drawings were dispensed with entirely and this structure was built directly from the 3d model, prepared in collaboration between fabricator and designer.

Adoption of these methodologies has supported successful delivery of structures with challenging geometric interfaces between steelwork, concrete, and existing brickwork arches. This has reduced programme and safety risks during fabrication and installation, and will provide a platform for enhanced management of the structural assets in the future.

Keywords: Building information modelling; bridges; steel fabrication; collaboration; reinforced concrete.

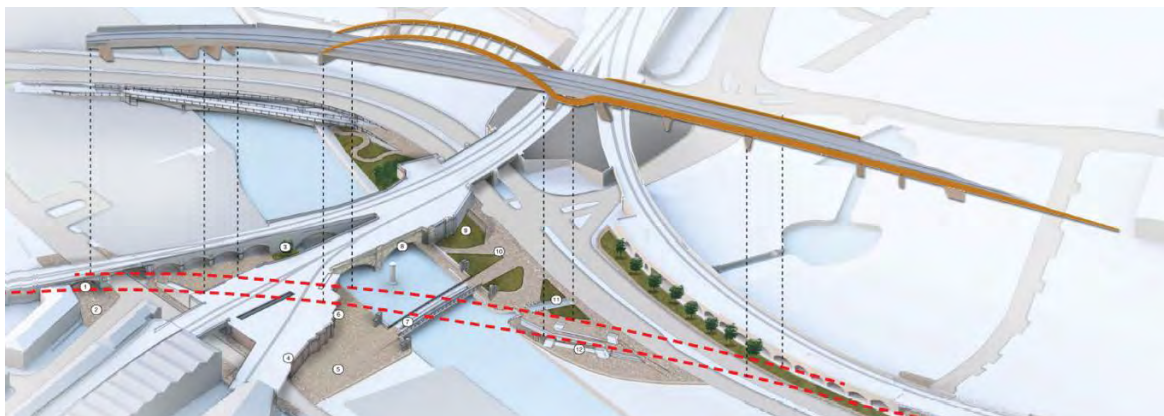


Figure 1: The Ordsall Chord