



Design of the Colne Valley Viaduct, a 3.4km-long HSR Viaduct in a Highly Sensitive Area

Héctor Beade-Pereda, Martin Knight

Knight Architects, High Wycombe, United-Kingdom

David Smith, Tomás García

HS2 Ltd, London, United-Kingdom

Contact: h.beade@knightarchitects.co.uk

Abstract

The article describes the process followed to develop the Specimen Design of the Colne Valley Viaduct (CVV), a circa 3,4km-long structure carrying the high-speed rail (HSR) line connecting the British cities of London and Birmingham (HS2 Phase 1). This viaduct, due to its scale and the sensitivity of the site being crossed (the first large green area to the west of London) will be the most important and delicate bridge in the whole route. The design was developed following a continuous stakeholder engagement process, achieving exceptionally strong support. It does responds to the scale and visual character of the different areas of the valley (watercourses, lakes, meadows, woods, and villages), to the user experience along and below the structure, and to the environmental sensitivity of the location, becoming a fitting addition to the landscape and a beacon through its elegance.

Keywords: bridge; viaduct; specimen design; aesthetics; contextual design; holistic design; high speed railway; concrete; lake; reflection; arch.

1 Introduction

The Colne Valley Regional Park (CVRP) is the first large green area (111km²) to the west of London. The combination of water courses (River Colne and Grand Union Canal), lakes, meadows, and woods, makes the area highly valuable and environmentally sensitive in terms of landscape and wildlife. The valley will be crossed by a 3,4km-long viaduct carrying the HS2 Phase 1, the high-speed rail line connecting London and Birmingham.

Knight Architects was responsible, working with Atkins and commissioned by High Speed Two Limited (HS2 Ltd. the company developing and promoting the UK's new high-speed rail network), for the Specimen Design of this challenging viaduct. This Specimen Design, will be a reference for the

work of the contractor awarded the design and build contract of the line stretch including the viaduct (and two tunnels).

1.1 Design expectations

The CVV will be the most important structure along the HS2 Phase 1 route due to its scale, visibility, and the sensitivity of its site. The UK Parliament set ambitious aspirations for the design: “(...) *the Colne Valley viaduct will be the most significant visible engineering feature of the HS2 Phase One route (...) Having argued against a viaduct, local people deserve that its design be respectful and respectable (...) Sympathetically and imaginatively designed, the viaduct can become a suitable symbol for the country's future HSR network.*”