Transpennine Route Upgrade – Huddersfield Viaduct

Reuse of the Old

Sonam Norbu, Aiken Harrap, Will Spencer

Ove Arup & Partners Limited, Leeds, UK

Contact: sonam.norbu@arup.com

Abstract

Huddersfield viaduct is a Victorian masonry arch structure with a number of metallic spans. It is a grade II listed structure of varying condition that needs to be strengthened and modified to fulfil the requirements of the Transpennine Route Upgrade. This structure will accommodate additional tracks as well as portions of the amended platforms and electrification infrastructure. Line speeds are to be increased to 100mph on the Fast lines and 75mph on the Slow lines.

This paper describes the design challenges that have been overcome through a mixture of modern analysis techniques combined with traditional engineering design and judgement to develop the solution presented. The proposed works are as follows:

- Span 1 is to be replaced with a modern steel deck to accommodate the new station layout.
- Span 4 is strengthened and re-articulated.
- Span 5 is to be infilled to deal very weak masonry.
- Span 29 is to be reconstructed using prestressed beams.
- The masonry spandrel walls are to be stabilised using inclined anchors to tie back to the masonry piers.
- The masonry arches are to be repointed and repaired where necessary.

Challenges have arisen from working within the confines of an old historic site that continues to serve a busy operational railway. It is a credit to the project that the majority of this structure has been saved from reconstruction to be reused and upgraded to serve the modernised railway.

https://doi.org/10.2749/manchester.2024.0302
Distributed by structurae