BIDSTON MOSS VIADUCT – MERSEYSIDE

Client:
Highways Agency

Person of Reference:
Simon Ellison (P.M for Costain)
07799435865

Main Contractor:
Costain Ltd

Completed:
March 2012

Contract Value:
£25 Million

Tonnage:
600te

Bottom Flange Strengthening

The Bidston Moss Viaduct carries the M53 motorway over the A554 and a railway line, before taking traffic into the Kingsway Tunnel under the River Mersey. It is used by 50,000 vehicles each day as a major route to and from Liverpool.

In 2009, work began on site to both strengthen and refurbish this 730-metre long viaduct, successfully completed in 2012 – on time and under budget. Cleveland Bridge played a vital role in this projects success, with some of the company's involvement detailed below:

Top Flange Strengthening

In 242 locations, 32,500 shear pins were installed into the top flange of Bidston Moss Viaduct. This was done by accurately locating the position of existing transverse rebar on the outside of the box girders and accurately transferring this information as a map onto the internal flange. Holes were subsequently drilled through both concrete and steel to tolerences of 0mm-0.15mm.

Bottom Flange Strengthening

In 38 locations, a composite concrete floor was added to the bottom flange of this structure, involving the installation of 4,250 shear studs (19mm diameter, 100mm in length). This also involved the welding of 180m of existing angle to the internal webs, the removal of 1,000 existing bolts and the drilling of 1,850 new holes for placing steel reinforcement.

Box Girder Corner Welding

In 147 locations, 3,900m of existing box corner welds were strengthened from a 6mm leg length to an increased 10-14mm leg length.

Continuation Straps to existing longitudinal angles

In 231 locations, 35mm thick continuation straps were fitted to give a continuation of the longitudinal angle stiffeners. This involved the fitting of 18,000 TCB bolts as well as the drilling of 54,000 holes.

Bottom Flange Doubler Plates

In 49 locations bottom flange doubler plates were secured into position with some 2,350m of 6mm fillet weld.

Longitudinal Web Stiffening

In 262 locations, 5,720 new horizontal and vertical web stiffeners were fitted, requiring 9,500m of weld. A further 600m of weld was generated to secure 500m of temporary stiffeners, which when removed required NDT testing to ensure there had been no damage to the existing plate.

Web Doublers

In 88 locations, approximately 800 web doublers and infill plates were required, composed of 12mm plate, 1m long. These were initially bolted into place (In total 78,000 bolts were used) and subsequently welded, with 3,850m of weld used in total.

As well as this steel strengthening work, CBUK undertook design development with both Amey and Costain, as well as Coordinating with Denholm and Costain regarding access and blasting.

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