Repairs

FREYSSINET
SUSTAINABLE TECHNOLOGY

# Concrete Repair & Cathodic Protection

## R171 Bromford and R177 Witton Viaducts

**Client**
Highways England

**Principal Contractor**
Interserve

**Works Commenced**
January 2015

**Works Completed**
July 2016

The R171 Bromford and R177 Witton viaducts are two of a number of viaducts forming the Midland Link Motorway Viaducts (MLMVs). Constructed between 1969 and 1972, it comprises of 21km of elevated motorway with 1200no. cross beams and 3600no. columns.

During the mid-1980s, corrosion started to occur on the structures due to de-icing salts leaking through deck expansion joints onto cross beams. Initial preventative measures, such as placing gutters beneath the expansion joints, were implemented during the mid-to-late 1980s and repair works took place in 1990. Concrete repair and cathodic protection schemes were on-going based on calculated intervention dates for each cross beam. The repair contract commenced in January 2015 and comprised of 8no. cross beams.

Freyssinet was appointed as a specialist contractor for the works, which involved removing sections of concrete to be repaired by saw-cutting and hydrodemolition. Repairs were carried out as necessary to reinforcement steel, and the areas re-instated using flowable concrete, with some beams repaired under a supported condition.

An Impressed Current Cathodic Protection (ICCP) system was installed on 13no. bents over 4no. locations. The ICCP was designed as a 3no. zone system - zone 1 being a ribbon mesh primary anode with a spray applied conductive overlay, and zone 2 and 3 a ribbon mesh anode with non-conductive repair mortar overlay.

Technical issues which prevented traffic management being installed to the off slips threatened to cause delays to the programme and Freyssinet's installation of the CP system. However, successful cooperation between all parties resolved the situation, and the works were re-sequenced. This enabled Freyssinet to begin installation works ahead of programme by utilising concrete curing periods when there was no other activity taking place in the work area.

The designers also re-sequenced the concrete repair works, so that as far as practical, whichever half of each beam needing least repair was concentrated on in initial repair stages and would be complete in advance of the other half of beam, which freed up nearly 50% of CP installation work to be done before completion of concrete repairs.

Freyssinet's in-house hydrodemolition team was engaged to remove the damaged concrete, This contributed to the success of the new programme, as when concrete surface hydro-prep was required for overlay material, the team was able to mobilise immediately, taking advantage of short durations of concrete curing time, all the time pulling back the programme and offering the client savings in both time and money.

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