

Temporary Support Installation, Bearing Installation and Jacking

QMC Viaduct, NET2 Nottingham Tramway



FREYSSINET
SUSTAINABLE TECHNOLOGY

Client
Taylor Woodrow / ALSTOM
Joint Venture
Consultants
Mott MacDonald
Value
£720,000
Works Commenced
July 2013
Works Completed
March 2014

The QMC Viaduct carries a tramway over the A52 Clifton Boulevard and through the grounds of the Queen's Medical Centre in Nottingham.

In July 2013 Freysinet were appointed by Taylor Woodrow to undertake the following at the QMC Viaduct:

- Design of a safe and economical temporary work system to land 22m long prestressed, precast beams, weighing up to 40tonne safely onto insitu abutments and piers, stretching over a length of 400m
- Installation of around 150tonne of temporary steelwork and temporary bearings
- Installation of temporary bracing system during placement of the precast beams
- Design and installation of jacking system, jacking the deck to remove temporary works
- Installation of permanent bearings
- Dejacking of bridge decks upon completion
- Welding of taper plates and bearing top plates followed by weld test procedures
- Approval testing of cementitious grout materials
- Site trials on placing methods of the grout products
- Concrete repairs
- Corrosion protection to permanent works.

An alternative method of temporary support has been introduced at QMC Viaduct. We installed the temporary support steelwork directly onto the piers and abutments. This innovative method proved to be quick and efficient, saving time in comparison with the traditional method of propping off the foundation. We also had to incorporate the requirement of the formwork and falsework the framework contractor needed to construct the end diaphragms and bridge decks.

During the design of the temporary works, Freysinet encountered a few challenges that needed to be overcome. This included the different inclines, cambers and overall curvature of the structure followed by the beam articulation in the temporary placing stages, the jacking stages and the permanent stage. The most challenging item was to stop the beams from sliding on the steep inclines that we overcame by an unique stop angle bracket system.

We undertook the following works in regard to the A52 steel bridge as part of the same works:

- Design and installation of a temporary support system
- Design and Installation of temporary bearings
- Design and installation of the jacking system
- Installation and grouting of permanent bearings.

Freysinet developed a concept to enable the placing of the A52 steel bridge on temporary supports. The 1060Tonne Bowarch Bridge was constructed on site before being transported to its final destination. 800Tonne temporary bearings were installed on pairs of jacks supported by jacking plates and grout plinths. The permanent bearings were installed to the A52 steel bridge by securing the top plate to the underside of the A52 main girder, allowing the bearing to hang into position.

Once the bridge was positioned, the bridge was jacked off the temporary bearings to the correct height and the permanent bearings were grouted followed by dejacking once cured.

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