Case Study - Spherical Bearings

A40 GREENFORD ROUNDABOUT FLYOVER - TEMPORARY WORKS & BEARING REPLACEMENT

Project Brief

Temporary works and bridge jacking.
Design, manufacture and installation of 24 no. replacement free and guide spherical bearings.

Project Team

Client: London Highways Alliance (Transport for London, FM Conway & AECOM JV)
Main Contractor: FM Conway Ltd.
Sub Contractor: USL Ekspan

Background Information

Greenford Flyover in west London, carries the dual three-lane carriageway A40 Westway Avenue over the A4127 Greenford Road roundabout. The bridge is a 7-span cast in-situ concrete structure, comprising of six sets of three intermediate circular columns. The bridge deck articulates on 24 no. spherical bearings - 3 no. are located on each abutment bearing shelf and 1 no. on top of each column.

The existing bearings, due to the ageing structure and its constant high traffic volumes entering London, were excessively worn. A bearing inspection carried out by USL Ekspan in 2014 highlighted similar findings as well as issues with the original bearing installation. USL Ekspan were contracted by FM Conway to deliver a full bearing replacement.

USL Ekspan's Workscope

The bearing replacement for the support sets (3 columns per support) and abutments were undertaken in 3 phases. USL Ekspan's programme of works for each phase included: design and installation of temporary works; bridge jacking on the east and west abutments; installation of super props and jacking at the columns, enabling the bridge deck to be lifted 2mm, to allow hydro-demolition removal of the old bearings.
USL Ekspan designed and manufactured EN1337 compliant free and guided spherical bearings. Following installation of the new EN1337 bearings, the final process of works involved de-jacking the structure and removal of temporary works.

With Greenford Flyover located on one of London's primary routes into the Capital, USL Ekspan's temporary works and jacking operations in conjunction with Mabey Hire's were carried out during night works, an ideal time for reduced loading/traffic volumes, hence allowing this route to remain open throughout the renewal scheme.

This technically complex project was safely and successfully completed ahead of the client's proposed deadline - attributed to the high-tech hydraulics and monitoring systems used, and efficient communication and collaboration within USL Ekspan's own site team and that of associate external contractors.

Temporary works and jacking of bridge column during bearing installation

Bonding of top of bearing to the bridge structure

Spherical bearing installed

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