

Pudding Mill Lane Portal Bridges



Best Practice Case Study



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Project data

Client: Crossrail

Location: Docklands Light Railway, London

Main Contractor: Morgan Sindall plc

Completed: Early 2016

Tonnage: 653te

Project overview

The Pudding Mill Lane Portal Bridges forms part of the £14.8 billion Crossrail Project to construct a new railway connecting existing rail networks in East and West London. The project comprises the construction of a tunnel portal and a new elevated Docklands Light Railway station at Pudding Mill Lane, plus associated structures to bring the subterranean railway into the above ground existing rail network.

Scope of Cleveland Bridge work

CBUK scope was in two elements. The first being the CRL Northern Outfall Sewer (NOS) Bridge, a half through trapezoidal box girder bridge. This bridge comprised of two box girders (North and South) each of which, due to size and weight, were fabricated in two sections and then butt welded together at site before erection. Due to the location of the bridge, site installation could only be carried out during a possession.

The second element was CRL Marshgate Bridges which consisted of three 'U' type underbridges with walkways, which included the CRL Eastbound Bridge, CRL Westbound Bridge and the NR Electric Line Bridge. Each bridge was supplied in shop assembled units with walkway sections provided loose, and were fitted onto the bridge structure prior to installation.

Fabrication

All steelwork was fabricated and painted in CBUK's Darlington facility. The steelwork was prepared using CBUK profiling equipment, T&I machine and Saw and drill line with substantial amount of shop welding. All the components were trial assembled to check for fit up and any alignment issues before painting and transport to site. The NOS bridge specification required the use of weathering grade steel. Each MGL Bridge was fabricated as a unit which comprised of two sides and a low deck forming a 'U' type section.

Installation of Steelwork Elements

The NOS structure was sent to site on several wagons due to the size and geometry of the structure. The girder elements were assembled adjacent to the final bridge location so that the welded splices could be completed prior to lifting into position. Each half of the girder was supported on trestles and packs were used to achieve alignment. An LTM1500 mobile crane was used to lift the half girders from the wagons onto the trestles, all work was carried out on day shifts and under control of permits. Encapsulated scaffold towers were used to provide access and ensure continuity of welding i.e. the activity was not weather dependant.

After completion and acceptance of all post installation activities the girders were erected. The final lifting operation onto the permanent location was carried out during a nightshift possession. The permanent bearings were bolted onto the girders prior to installation. Site welding was completed over a period of dayshifts which then allowed for the follow on activities such as rebar installation and concrete works to proceed.

The MGL bridges were assembled with the walkway and handrail panels during the possession windows. The completed assembled structures were then transported to the designated area in the correct sequence and ready for lifting using LTM1160 and LG1550 cranes. Suitable packs were inserted at bearing locations to ensure correct levels were achieved. The bearings were then grouted in position outside of the possession windows.

