Canary Wharf Station (Crossrail project)

Best Practice Case Study

Project data

Client: Crossrail

Main contractor: Canary Wharf Contractors Ltd

Completed: April 2013

Tonnage: 900te

Project overview

Canary Wharf station is part of the Crossrail project and incorporates an underground rail station, an above ground retail park and a roof top garden development.

Scope of Cleveland Bridge work

Cleveland Bridge's scope of work varied slightly on each element, for example the design of connections was not required in each element, but included preparation of drawings, site surveys, supply, fabrication, application of surface protection – including in tumescent paint for some elements – and erection of steelwork, which involved both bolted and site welded elements. Cleveland Bridge were also responsible for supply and fitting, including grouting, of bearings for the elevated walkway, Upper Bank Street Bridge and Park Level +1. Several of the elements also involved supply and fitting of metal decking.

Fabrication

Most of the steelwork was fabricated in the Darlington facility, with the majority of the components being of beam and column type steelwork. Cleveland Bridge's scope of work also included a number of fabricated plate girders. The material for support legs for the elevated walkway was fabricated into the finished components at Darlington works. Each set of legs had to be delivered to site in 2 halves due to the size and weight of the structures.

Installation of steelwork elements

Lift link bridge and elevated walkway – these structures formed part of the access from North Colonade and Adams Place into the new Crossrail station. The lift link bridge was a series of stiffened box girders, which were supported on steel columns and bearings cast into concrete shelves. The columns were erected and the bearings cast in, and then the box girders were manoeuvred into position. The elevated walkway was a steel framework which sat on three sets of tubular legs and bearings at both ends of the walkway. The legs were supplied in two halves and had to be carefully aligned and then site welded into position. The framework comprising of shop welded plate girders and rolled sections were assembled at ground level into manageable sizes for erection by a 50te crane, this was due to both limitations on lay down assembly areas and access for the crane, these frames were bolted onto the legs and spliced to form the walkway.

Upper Bank Street South bridge – the new road bridge, a series of fabricated plate girders, were lowered into position supported on one end by cast in bearings, and at the other by temporary works framework whilst a concrete support beam was cast in.

East and West buttresses – the steel framework at both ends of the station structure was a rolled section which was bolted to steel supports that Cleveland Bridge site welded to a series of cast in embed plates. The erection of this steelwork involved both working at height and over water and involved the use of large cranes. After completion of the framework, metal decking was fitted to allow the concrete deck to be progressed.

Park Level +1 – Large beams and plate girders supported on steel columns and bearings cast into pockets within the concrete structure which would form the roof for the road tunnel which runs through the structure. Metal decking was then fitted onto the beams for concrete slab installation.

Park mezzanine pavilion steelwork (East and West) – the completed structures were to provide framework for leisure facilities on the roof of the station structure. Both structures were a basic assembly of columns bolted onto the roof using cast-in holding down bolts and beams which were erected using tower cranes. Metal decking was fitted after completion of the structures.

Completion of works

Work started on site in the summer of 2012 starting with the Lift Link Bridge. Each element of the works was running almost sequentially and was complete in April 2013.

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