

Cementation

SKANSKA

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Tring Platforms

Client

Balfour Beatty Projects Ltd

Main Contractor

Cementation Skanska

Engineer

Mott MacDonald

Scope of Works

Site surveys and ground investigations; design and construction of platform extensions and realignments; drainage works; fencing, platform furniture, signage and public address systems; cable ducting, lighting and power supplies.



The platforms at Tring Station were required to be extended to accommodate Silverlink's 12 car trains. The contract carried out by Cementation for Balfour Beatty Rail Projects required the demolition, extension and remodelling of all five platforms at the station.

Construction

Construction of the works was split into two distinct sections; platform extension using piled foundations and the modular pre-cast Stepsafe system and realignment of existing platforms using traditional construction. All of the work on the existing platforms had to be executed during night time possessions, weekend possessions or blockades of the fast lines, slow lines or loop. In contrast a large part of the foundation and preparatory works of the extension was possible during normal running of the railway. This benefited the project by allowing greater flexibility

on the programme, reducing resource congestion during blockade works and reducing the level of scarce skilled labour required.

Stepsafe - Extension Works

The initial site works after the topographic and geotechnical site surveys described earlier involved the establishment of safe green zones within the area of the platform by the erection of Vortok fencing. Method statements were formulated to allow the safe construction of about 95% of the 300mm diameter piles during normal traffic hours using a mini-piling rig, as shown below. Special measures were taken to guarantee the pile was within tolerance by the use of a ring frame guide. To reduce congestion in the work zone the grout plant was established remotely in a compound area. Grout was pumped to the piles in flexible tremmie pipes under the existing tracks.



A second gang followed on building the pile extensions which incorporated a Macalloy bar cast in to anchor the crosshead of the Stepsafe system to the foundation. In this case disposable formers were used to produce a very high standard of finish. A rubber membrane was then applied to the top of the pile extension to take out the final tolerance and to minimise vibration between the pile extension and the crosshead.

Erection of the Stepsafe beam units had to be undertaken during possessions as it involved the lifting of large concrete units close to the tracks. To minimise risk and to improve the team's confidence a trial erection of the system was performed at RMC's yard at Shap. The crossheads and longitudinal beams were lifted in from road-railers from the adjacent tracks. Once the crew were familiar with the system they were able to erect one bay per hour, which comprised of one



crosshead and four longitudinal beams. Slab units were placed either by road railers or by a large crawler crane. A benefit of this system is that copers and tactiles can be placed, without the need for highly skilled labour, as a separate operation after erection of the main structure.

Realignment of Existing Platforms

This section of the works involved the realignment, recoping and resurfacing of platforms 1, 2 and 4, whilst on platforms 3 and 5, the riser walls were rebuilt to new alignments prior to recoping, installing new tactiles and resurfacing. This work was highly labour intensive and required a high degree of out of hours working. As a consequence short term planning control was very detailed and required the cooperation of the whole site team to make it work.



The Stepsafe system has proved to be very successful and the anticipated benefits of pre-fabrication and modular construction have been realised. The relatively simple erection process has reduced the need for handling formwork, fixing reinforcement and pouring concrete with the associated requirement for delivery access and unsocial hours for supply plant operation.



Construction of the platforms to achieve the 8 car extensions and realignment of the existing platforms was completed on programme at the end of June 2004 and the full 12 car extensions on schedule during August 2004.