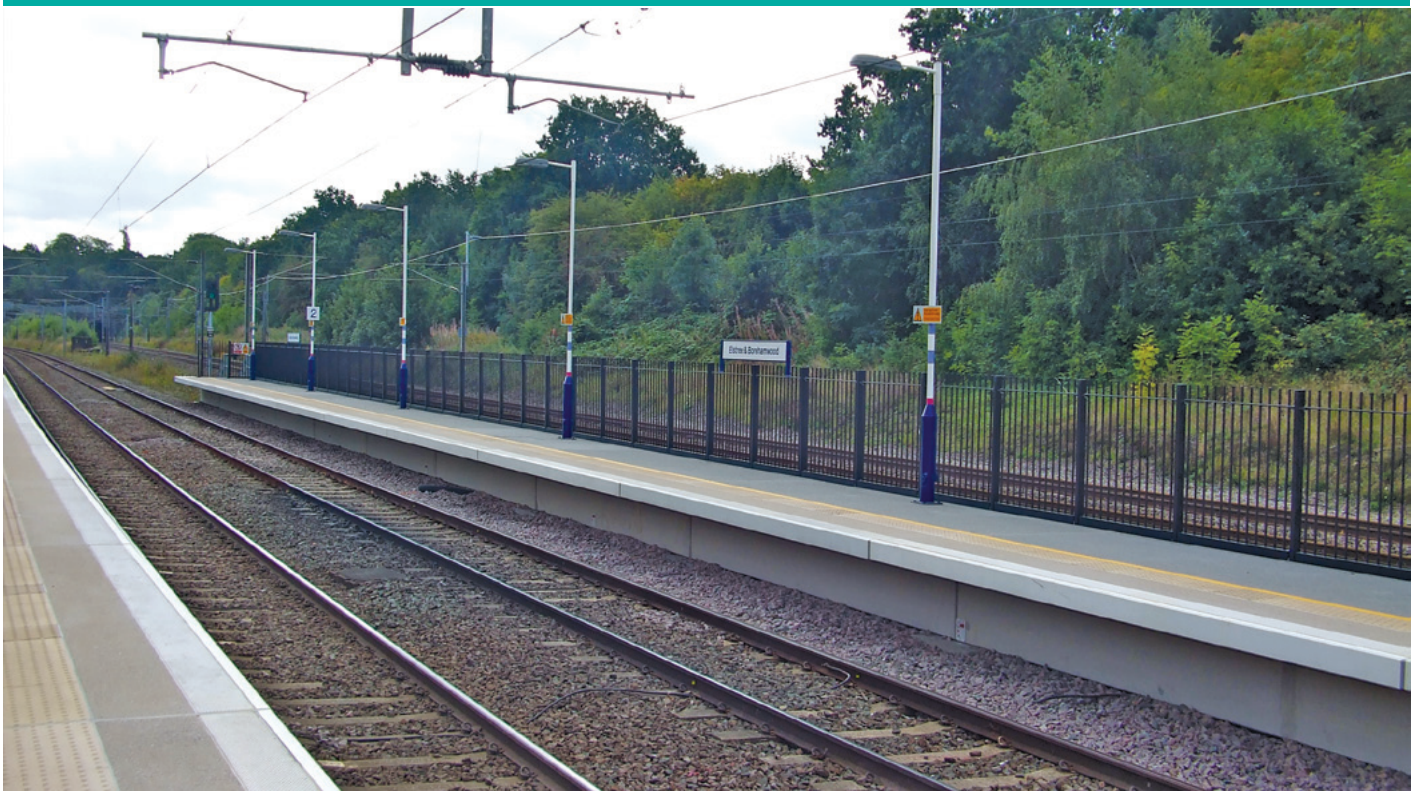
CASE STUDY: Carillion – Thameslink Modular Platform Extension



SECTOR TYPE:
Infrastructure - rail

LOCATION:
Bedford Station, Bedfordshire

CLIENT:
Network Rail

PRINCIPAL DESIGNER:
Tata Steel

PRINCIPAL ENGINEER:
Carillion

PRINCIPAL CONTRACTOR:
Carillion

CONTRACT VALUE:
£4 million

CONTRACT DURATION:
58 weeks (completion of all disciplines: civils, signalling, track, OHLE and M&E)

The Project

The aim of the Thameslink Programme is to increase passenger capacity at stations between Bedford and Brighton through central London. In order to reduce the problems of overcrowding and discomfort during peak times, the programme will increase the number of trains, each with a greater capacity of 12 cars.

As part of the programme, the platforms at Bedford Station required extensions to accommodate the introduction of these 12 car trains. It also involved significant adjustments to the associated rail infrastructure such as alterations to overhead line electrification and signalling equipment.

Carillion was initially contracted to deliver GRIP Stages 3 and 4, option selection and single option development, followed by detailed design and construction from February to July 2011. However, it challenged convention and decided to innovate and revolutionise the delivery process by using Hering Bau modular precast platform units – a first for the UK – and reclaimed steel tubular piled foundations. This halved the build time, improved sustainability and greatly reduced the risk to the safety and wellbeing of its employees.

The precast concrete platforms are built under factory conditions, resulting in a high level of accuracy and quality. This also significantly reduces the risk typically associated with the construction of in situ platform extensions, as the environment in the factory is easily controlled and poses fewer hazards than working near or on the line. The modular platform units are delivered to site in sections and assembled onto the precast beams and piles.

The Green Construction Board

The Benefits

The innovative approach to design and installation resulted in significant benefits in line with Carillion's Sustainability Strategy 'Positive Outcomes'.

- **Reduced carbon and waste** – carbon emissions were reduced as fewer journeys and less manpower were required to transport materials. Less waste was also generated as everything was specified and built in a factory environment. The method avoided the use of approx. 320 tonnes of concrete. The estimated volume of excavated material avoided was 115m3, which equates to an approximate saving of 15 lorry movements. The steel piles used for the piled foundations were sourced from reclaimed steel tubes which had previously been used in the North Sea offshore drilling sector.
- **Reduced safety risk** – developing the platforms in a factory environment and using the unique pile foundations reduced the number of man hours spent on track and in hazardous working environments. This meant a significant reduction to the level of risk to employees' safety and wellbeing. No major accidents or incidents occurred during development or installation of these platforms.
- **Time saving** – Carillion delivered 93m of platform surface in a 27 hour possession, work which would usually take three months. The Civils build programme, including the foundations, beams, slabs, fencing and lighting, was completed in around eight weeks. Overall the disruption to the train operators and end consumer was reduced.
- **Design** – all facets of station platforms were designed into the Hering Bau modular precast platform units, so the lighting columns, fence, trash screen brackets and drainage systems were all built in. Not only did this improve quality and reduce time in the build but it also means that the platforms are aesthetically pleasing and are free from design errors which can occur when working around existing infrastructure.
- **Life cycle cost** – often innovation means an initial increased cost to the project but reduced overall project life cycle cost. The prefabricated platforms and piles had an increased development cost but saved money in installation and maintenance as they were much faster to install and removed the need for remedial works (this also meant a quicker hand back).
- **Cost** – installing platform extensions using an off-site prefabrication method, compared to traditional methods, generates significant efficiencies in regard to possession costs (both the management and the compensation due to train and freight operating companies for closing the operational railway). For example, it costs Network Rail approx. £4,000 to manage a possession worksite in staff and other costs. When installing a prefabricated platform, compared to a traditional in situ platform, much fewer possessions are required resulting in a saving of £157,500.

The Process

The modular approach to the platform extension was achieved by Carillion using lessons on a previous platform installation at the Elstree/Borehamwood project, which was delivered as part of Thameslink KO1 and also involved a modular build. However, for the Bedford project, Carillion was able to incorporate improvements to the design which resulted in significant additional reductions in concrete and waste, as well as further cost savings. The Bedford project also overcame the challenge of poor ground conditions using the piling method and modular precast system to deliver within limited track access.

Key Learning Points

Whilst this method of working was a first for Network Rail and over-ground stations in the UK at the time, it is now considered best practice. Precast platforms are now being considered on projects in Scotland, on the £2 million platform project in Peterborough and for the multimillion pound development at London Bridge Station.

End User Feedback

"Carillion successfully delivered the modular precast platform extension at Elstree & Borehamwood to programme and budget as part of our Outer Areas works on the Thameslink Programme. The method was further developed to include the piling system for delivery of the platform extension at Bedford Station. This innovative approach, the first of its type on this Network Rail Route, made a significant contribution to supporting our sustainability objectives; reducing materials usage and associated carbon emissions, reducing health and safety risks and impacts to our line-side neighbours."

Damien Gent, Network Rail,
Senior Project Manager TLP Outer Areas

Carillion was awarded one of the TLP coveted Green Rivet Awards for its sustainable approach to this project.

For more information on
The **Green Construction Board**
visit **www.greenconstructionboard.org**
or email **green.board@bis.gsi.gov.uk**