

CASE STUDY Gormanston & Dalkey Footbridge Works

LOCATION: CLIENT: DATE: Gormanston Railway Station, Co Meath; Dalkey DART Station, Ardeveehan Road, Dalkey, Co Dublin Irish Rail January 2022 - January 2023



Introduction

Global Rail Services Ltd was appointed Main Contractor and PSCS by Irish Rail (IE) for this multi-disciplinary rail project. The works included the installation of two precast concrete (PCC) lifts, associated precast concrete stairs and footbridges at Gormanston & Dalkey stations. The bridge structures were encapsulated on both sides and on the roof. All enabling, utilities and services works were carried out by Global Rail Services and their approved specialist subcontractors.

Project Deliverables

Global Rail Services supplied and installed new footbridges spanning live operational railway lines at Gormanston and Dalkey Stations. Works also included the construction of an access/haul road through a 3rd party property at Gormanston Station and installation of a temporary crash barrier and temporary surface at Dalkey Station.

Works that were near the live operational railway were completed under a full possession of the railway. These works included the installation of all PCC structures and installation of the new PCC This project was completed as part of Irish Rail's Accessibility Programme. The objective of the programme is to improve accessibility across the Irish Rail network in line with the priorities set out in the Accessibility Project Feasibility Report 2014, and the prioritised Track Crossing Report as completed in 2019 following consultation with the National Transport Authority (NTA), the Accessibility User Group and internal stakeholders.

footbridges. The installation of new service ducting and platform drainage on the existing platform was completed within a green zone where possible or under Lookout protection and as a last resort under a full track possession.

Service ducting, platform drainage and gullies/chambers, fencing, signage, line marking, public lighting and rail signals were installed for the full length of the worksite and tied into the existing systems in full co-ordination with Irish Rail Signalling, Electrical & Telecoms (SE&T) & Building & Facilities (B&F) representatives.

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Global Rail Services also supplied and installed all structural steel for the both footbridges and stairs including all roof works, rainwater goods, handrails and non-slip surfaces.

The project also covered the supply and installation of sealed lift shaft canopies including vulcalucent panels and roller shutter doors.

New public lighting was installed by Global Rail Services covering all areas of both stations on new public lighting poles and new platform furniture was also supplied and installed as a part of the works.

The contract also required a significant amount of specialist enabling, temporary and permanent installations across both stations to be delivered in order to complete the works, this covered:

- Traffic and pedestrian management
- I Full site timber hoarding

Challenges and Solutions

Gormanston

Due to the location of the new foundations for the footbridge and stairs at Gormanston, there was a requirement to install significant temporary works along the platform to maintain the integrity of the platform and allow it to remain open and operational for the duration of the works. A full height timber hoarding was installed for the length of the worksite on both platforms to create a safe working zone and minimise impact to passengers. Track monitoring was installed and maintained for the duration of the temporary works in line with IE's standard during excavation works.

A piling platform was the first activity to take place along with integrity testing prior to breaking down of the piles to formation and the excavation works. The excavations involved the installation of several trench boxes and sheet piles along the length of the excavations (circa 60m) as the depth of the foundations fell within the track support zone. This created a green zone working platform and allowed for the vast majority of the work to progress during normal working hours while keeping the railway platform fully operational.

Dalkey

Works at Dalkey were particularly challenging, due to the extremely limited access to the worksite and limited availability of a site compound. This was while working in close proximity of the OHLE and in an environment with a large number of sensitive stakeholders. The existing station and rail line historically carved

- Temporary fencing
- O Numerous trench box installations
- O Precast column temporary supports
- O Edge protection of roof structures
- O Handrailing
- O Permanent fencing
- Deep excavations including management of groundwater
- O Formwork
- ① Lift shaft core scaffolding
- O Lift shaft external scaffolding
- Earthing metallic structures within the Overhead Line Equipment (OHLE) envelope
- O Crash barrier
- Security gate and fencing

through a 60 degree embankment overlooking the sea. Upon initial ground investigation, granite was encountered at 2m below surface level, thus requiring a methodology review. An additional complexity was also located during the excavation of Ardeveen Road with the existing strategic gas mains and HV ESB cables needing to be exposed and traced prior to the commencement of works.

Rock anchors, soil nails, king post walls and numerous other designs were reviewed and explored, by Global Rail Services, in close collaboration with IE Structural Engineers, which provided for the design of a reinforced concrete structure as a permanent solution. This meant that the excavation methodology had to be limited to between five and ten metres at a time in length to maintain the slope stability in line with Global Rail Services temporary works design. Trench boxes were lifted in using road mounted cranes, along with machinery, and access platforms and routes were created into the works site and monitored closely throughout the works. Excavations were up to five metres below road level.

Upon completion of a section of retaining wall, the area was then backfilled and the excavation moved on to the next section. This process was repeated several times until works were safely out of the ground.

All stakeholders and residents were consulted and informed throughout the works, which was managed via engagement of an experienced stakeholder management consultant, Gary Keegan.



Benefits

Global Rail Services has over twenty years experience working in fully operational railway stations and working adjacent to live railway lines. Project teams have been developed and established from similar complex projects, including a larger footbridge installation and platform upgrade at Limerick Junction railway station. This provides full awareness of the engineering issues that could be encountered during an installation of this type and the solutions that can be delivered.

The company also has its own in-house civils, mechanical and electrical divisions, which enable a fully co-ordinated project across disciplines in order to deliver projects on time and within budget in close co-operation with the client - Irish Rail. We have established relationships with key specialist subcontractors and engaged them throughout the project lifecycle to provide project

Testimonials

Colin Grimes, Irish Rail Senior Project Manager, Design & Construction, Network Enhancements Division of Capital Investments, commended Global Rail Services on the high quality of workmanship and safe execution of both Dalkey and Gormanston Stations.

"The key to the success of the project was co-ordination and early stakeholder engagement. An extremely difficult piece of engineering well thought out, planned and executed. Well done to all involved." surety. Capability, cost, and previous performance to comply with the project programme was also taken into account when awarding any specialist works.

Through experience, Global Rail Services was able to work proactively with Irish Rail to maximise the opportunity to create green zones of working and thereby minimise track possessions and provide unrestricted working were possible to remove the need for operational closures.

All works were planned well in advance in line with the construction programme and were discussed and reviewed within the weekly site meeting with all relevant stakeholders. The success of the traffic and pedestrian management measure that were put in place were also crucial for the successful completion of the works.

Ray Robinson, Irish Rail Manager, Structural Design Section, Network Enhancements Division of Capital Investments, commended Global Rail Services on the successful completion of works. Specifically the challenging nature of the works in Dalkey Railway Station.

"Working in an extremely compact construction site, contending with OHLE restrictions, a working railway station and a 60 degree slope on a granite rock embankment. The temporary works designs, implementation and design co-ordination was due to great teamwork between all parties. Well done."