PROJECT CASE STUDY 2025

Northampton Gateway

Strategic Rail Freight Interchange

SEGRO / WINVIC

Completed Easter 2025

FENIX RAIL SYSTEMS



The Background

SEGRO decided to build and invest in an intermodal rail-road interchange at Northampton Gateway Rail Freight Interchange (NG-SRFI). The facility was designed to receive intermodal containers from UK ports and other rail freight interchanges as well as also bulk commodities. Facilities would be provided on-site for unloading and loading rail vehicles for forwarding to other rail freight interchanges, and shipping products to customers on-site and into the surrounding area by road.

The Mission

Fenix Rail Systems was approached by Winvic and their client SEGRO to deliver an innovative train facility control system for the NG-SRFI, connected to the Northampton Loop of the West Coast Main Line and the interface to the mainline 1990s Solid-State interlocking (SSI).



The Project

The project provided an intermodal rail-road interchange, receiving trains of intermodal containers from UK ports and other rail freight interchanges and bulk commodities. Facilities were provided for loading and unloading rail vehicles for forwarding to other rail freight interchanges, and shipping products to customers on-site and into the surrounding area by road.

Northampton Gateway will ultimately handle a maximum of sixteen daily trains (in and out). Initial demand, however, requires the facility to accommodate four trains per day (in and out) and consequently, the facility will be constructed and commissioned in a phased manner to reflect the growth in demand.

Two Phases have currently been planned. Phase 1 comprised the following and Fenix Rail Systems delivered all signalling detailed design and train control systems including installation, integration, testing and commissioning and O&M training.

Reception Lines 2 and 3

Intermodal Lines 2 and 3

North Headshunt

South Headshunt

Cripple Siding

Aggregate Siding

Terminal Control Centre and all site facilities

While Phase 2 will involve the addition of:

Reception Line 1

Intermodal Line 1

3 additional sidings

The Network Rail signalling in the affected area is controlled from the Northampton workstation at Rugby SCC by a WS3A SSI-type interlocking. The Network Rail signalling equipment is locally controlled via TFM’s from Roade SSI. The signals are four-aspect Dorman LED type and AzLM-type axle counters are utilised for train detection.

The Challenges

The project came with several challenges that Fenix resolved. The mainline connections and NG-SRFI reception roads had to comply with mainline signalling standards with SIL 4 signalling systems and equipment as they were signalled for 40 mph running, whilst the rest of the facility had to be designed to depot signalling standards and 5mph running to provide the required permissive working and operational flexibility.

As the facility computer-based interlocking (CBI), PINMOVIO from Pintsch, was only certified to a European safety level AK5 (former German Standard DIN V 19250), similar to Safety Integrity Level SIL 2 of the CENELEC standards, it didn't provide the required level of safety for the reception roads and mainline interface. Fenix therefore developed a hybrid CBI / route relay interlocking (RRI) solution with the RRI controlling the mainline interface and reception roads and the CBI controlling the rest of the facility, with both CBI and RRI interlockings controlled by a single VDU workstation / HMI.



The Design Process

GRIP 4 – Single Option Development

Fenix Rail Systems produced the core document requirements for the scheme, based off the GHD high level requirements

Grip 5 – Detailed Design

Fenix Rail Systems produced the detailed design, including the equipment layouts, calculations and wiring diagrams.

Grip 6 – Construction Testing and Commissioning

Fenix Rail Systems worked with the Principal Contractor Winvic for their client SEGRO to deliver the project, which was installed and commissioned successfully. Fenix Rail Systems completed full hand back and training including operator and maintenance staff over a 2-week period. The final records were updated and completed and returned to the client.

Grip 8 – Project Formal Close Out

Fenix Rail Systems formally closed out the project, returning the Health and Safety file and completing lessons learnt with our client Winvic on behalf of SEGRO.



The Solution

The NG-SRFI is controlled by a hybrid CBI / RRI. The signals are NR standard LED type and the point machines are Wolber 400V AC three phase machines in the CBI area with NR standard HW2121 point machines in the RRI area. Pintsch-type axle counters are utilised for train detection in the CBI area, with the RRI area employing Frauscher axle counters. Trains are controlled in and out of the mainline via a slotting arrangement between the mainline signaller and the intermodal controller.

A sequence of releases and slots control and authorise train movements between the facility and mainline.

The Result

Fenix designed and implemented the complete solution in Easter 2025, controlled from the Terminal Control Centre (TCC) by a VDU operated by the Maritime person-in-charge (PIC), with an operational interface to the NR Rugby Signalling Control Centre (SCC). The solution was a complete success and has provided an innovative, cost-effective and above all safe environment to operate trains on a 24hr basis. The installation and commissioning was undertaken under a multidisciplinary worksite and environment. Complete collaboration was achieved by planning and implementing a robust strategy and planned site activities. During implementation, the worksite was classed as a construction site and therefore enabled easy access which progressed the installation at a steady state, meaning possessions of the main line were minimalised allowing normal service to work around the facility build.

Key Achievements

This highly complex project had its challenges however despite these, Fenix managed to deliver a high quality, safety-conscious design and delivery; no incidents, accidents, or close calls were reported during the site works. All design work was completed within budget. Procurement and delivery of the signalling hardware was organised on a ‘just in time ‘basis, this reduced the amount of storage required onsite, making the whole process more efficient and productive. Fenix worked in partnership with several companies to achieve a successful outcome. Fenix completed full integration of the system into the existing infrastructure.

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Case Study 2025

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Thank you

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TRAIN CONTROL AND SIGNALLING