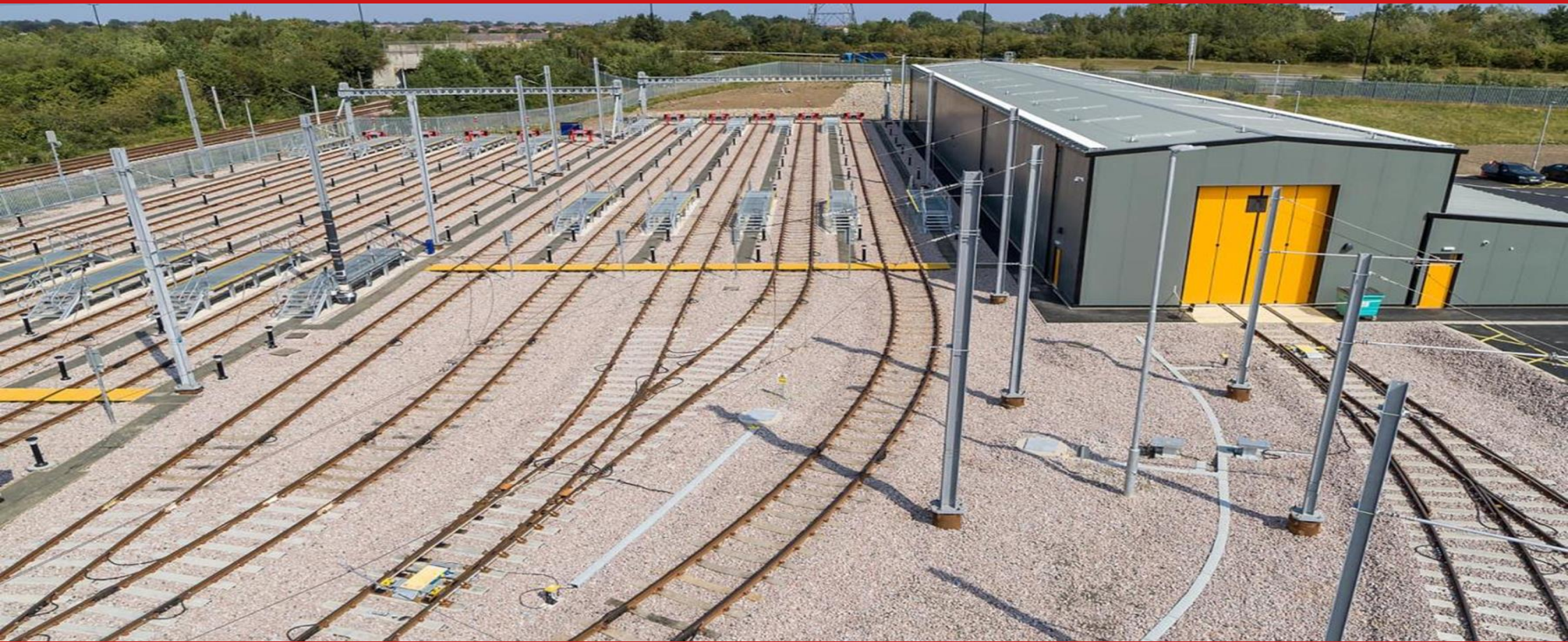


# Howdon Depot for Nexus



**Case Study 2021**

# GRIP 4 - 8

## The Background

Howdon Depot is a new rolling stock depot on the Tyne and Wear Metro in the city of Newcastle between Percy Main Metro Station and Howdon Metro Station. The depot has been built as a temporary measure to enable the building of a brand-new depot at Gosforth. The existing Gosforth depot will be replaced over a number of stages, so therefore the Howdon temporary depot is designed to stable, inspect and clean a minimum of ten 65m long trains of the new fleet of EMUs and existing Class 599 Metro Cars. Each is driven by 1500Vdc OLE traction supply. The depot also includes a workshop facility which shall be protected by a Depot Personnel Protection System (DPPS). The principal contractor, Buckingham Group Contracting Ltd. (BGCL) were requested to employ Fenix to complete the works as described below.

## The Mission

Fenix Rail Systems were selected to provide a solution for a point operation system that would enable the operator to direct trains safely in and around the facility. Fenix also designed the interface together with signalling modifications to the mainline, including new signals, track circuits, turn outs and crossover. The existing reed track circuit arrangements were altered, and interlocking modifications were implemented into the existing Wallsend interlocking.



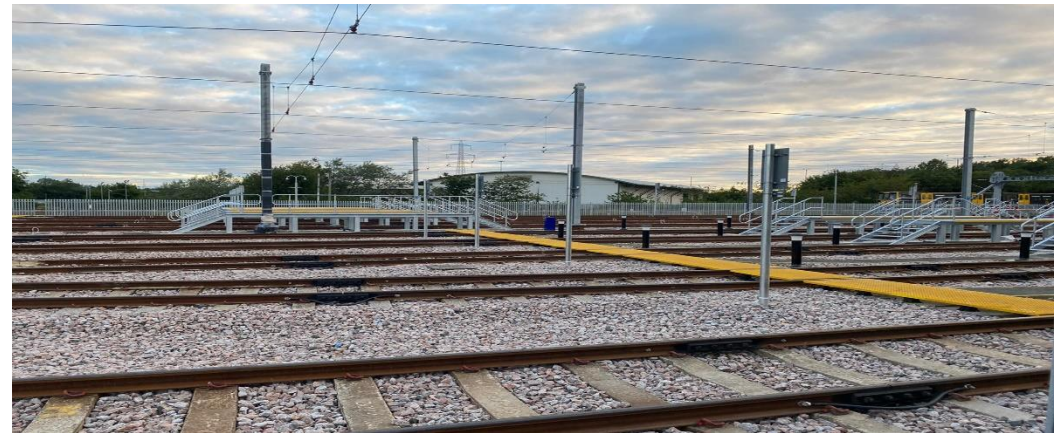
# The Project

The client, Nexus, chose a bespoke, modified Tie-FenLock 200 Depot Control System (DCS) for the depot, as they were to also employ the same technology at the main depot at Gosforth. The intention was to integrate and standardise all their depot control systems with the latest technology available.

At Howdon the operator is responsible for the train movements, points are controlled from a point setting control system via a VDU located in a control room, however, at Gosforth a fully interlocked system, the Tie-FenLock400 will be implemented at a later date.

Trains are controlled in and out of the mainline via a slotting arrangement between the mainline signaller and the depot controller. In order for a train to enter the depot, the mainline signaller requests a slot from the depot controller; once given, the mainline signal protecting entry to the depot can be cleared for the move. In advance of this, the depot controller will have set up the points within the depot to bring the train to the require destination road.

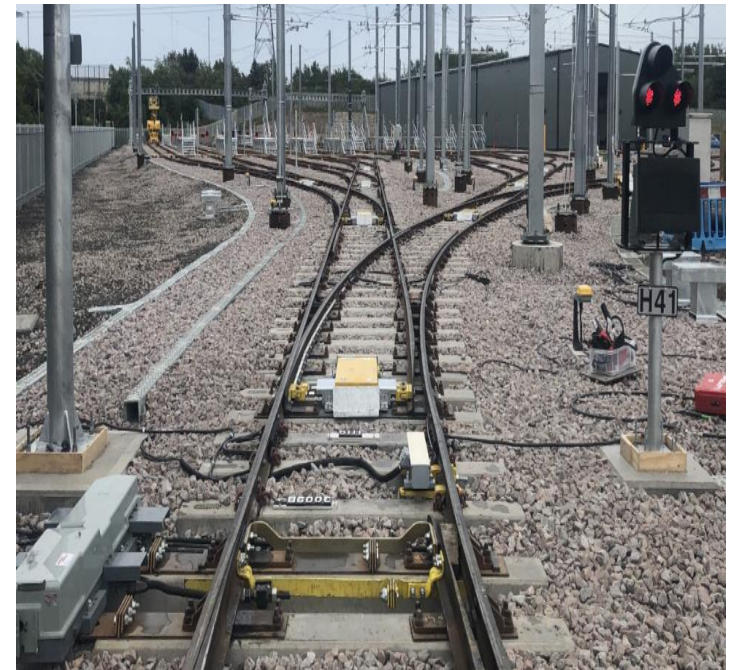
The operator is responsible for all train movements within the depot and therefore provides point setting via the VDU to enable the train to arrive, depart and move within the depot in a safe manner.



The system also boasts a modular design philosophy which is created from high grade industrial components, thus increasing the availability of spare parts and reducing maintenance costs. The system is constantly performing self-checks on the circuits and faults are reported to the operator via the VDU, which can then be investigated quickly and efficiently, reducing any downtime. The system can be modified and upgraded at any time with minimal hardware or software changes.

# Scope of Works – Produced

- Developed the mainline scheme from GRIP 4 concept through to GRIP 8, including installation, testing, commissioning, and project close out.
- Developed a detailed design for the depot including the technical interface between the mainline and the depot for safe movement of trains in and out of the depot.
- Cost effective solution, reducing maintenance costs and maximising efficient working of the depot.
- Modifications to the existing mainline interlocking to enable full integration of existing relay-based interlocking with that of a computer based interlocking (CBI) used within a depot.
- Control tables, interface specification and project specifications to enable the detailed design to commence.
- Conduct interdisciplinary design checks (IDC) with the principle contractor and associated disciplines.
- Produce full detailed signalling design as per the Network Rail (NR) GRIP process with cognisance to Nexus signalling principles.
- New maintenance panel depicting new depot between Percy Main Metro Station and Howdon Metro Station.



**Howdon Depot Entry**

# Scope of Works – Provided

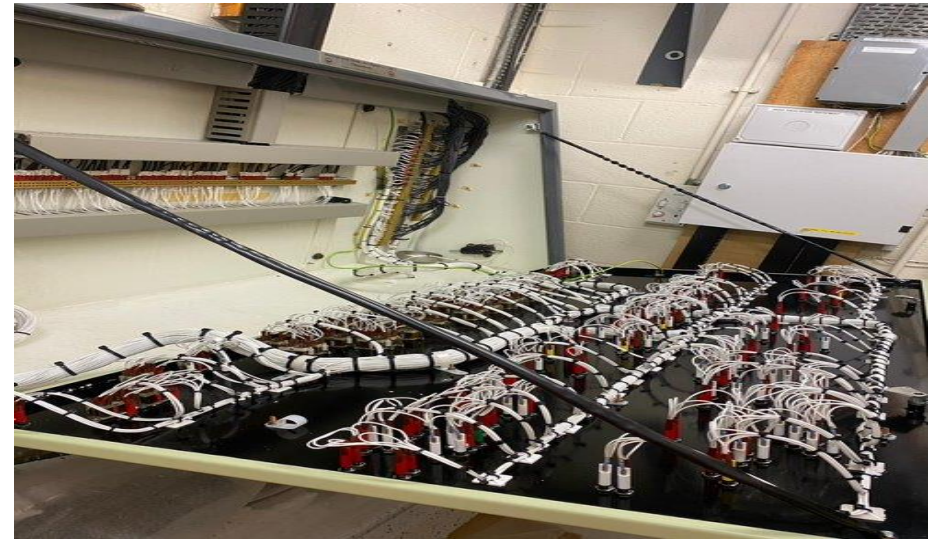
- Detailed interlocking design for mainline amendments and alterations to enable the depot to be integrated into the existing interlocking using existing Nexus records.
- Tie-FenLock 200 System with modifications to accommodate the bespoke client requirements.
- Central control of points.
- Interface to Mainline, communicated via slotting arrangement to the depot.
- 11 Trailable Point machines within the depot.
- 3 x HW points for the mainline depot entry.
- 1 crossover, 1 turnout, 6 location cases, points controller cabinet.
- Design of mainline location cases and signalling power supply.
- The system enables monitoring of movements within the depot.
- Installation, testing and commissioning to NR standards



**Exit to Mainline**

# Standard Equipment Types

- Trailable 400-volt 3 phase AC Point Machines
- Control cabinet consisting of:
  - Points controllers
  - Position light indicator drives
  - Power supplies
  - Monitoring equipment



## Replacement of the Existing Maintenance Panel

- Point Position Indicators (PPI) for each depot turnout
- Interface to Mainline Interlocking via human communication
- Mainline relay based interlocking alterations, relays, Reed track circuits, HVI track circuits, HW points, Fenix points, entrance / exit mosaic panel, alterations and induci magnets (unique to Nexus Infrastructure)

# The GRIP Process

## **Grip 4 – Single Option Development**

Fenix Rail Systems planned the core document requirements for the scheme, based off the Arcadis Scheme Plans (for NR).

## **Grip 5 – Detailed Designed**

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 Buckingham Group to deliver the project, which was installed and commissioned successfully.

## **Grip 7 – Scheme Handback**

Fenix Rail Systems completed full handback and training from all operatives including operator and maintenance staff over a 3-day period. The final records were updated and completed and returned to Nexus.

## **Grip 8 – Project Formal Close Out**

Fenix Rail Systems formally closed out the project returning Health and Safety file completing lessons learnt with our client Buckingham Group.

# The Results / Key Achievements

## The Result

The Installation and Commissioning were undertaken under a multidisciplinary work site and environment. Fenix achieved successful completion with minimal disruption to other disciplines working onsite. Complete collaboration was achieved by planning and implementing a robust strategy and planned site activities. During implementation the work site was classed as a construction site and therefore enabled easy access which progressed the installation at a steady state, meaning possessions of the mainline were minimalised allowing normal service to work around the depot build.

## Key Achievements

High quality, safety conscious designs and expert advice were delivered and no incidents, accidents or close calls were reported during the site works. All design work was completed on time and within budget. Procurement and delivery of the signalling hardware was organised on a 'just in time' basis, this reduced the amount of storage required on site, 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.

## Client Testimonial

*Metro Development Director, Neil Blagburn, said: "We now have a dedicated facility to welcome the new Metro trains from 2022. Howdon is also a vital satellite depot for up to a quarter of the current fleet while we build the new main depot at Gosforth.*

*Howdon depot, which has been built from scratch in just over a year, it's a real credit to the team.*





# Fenix

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**THANK YOU**

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