• Introduction
• Our company
• Project lifecycle
• Our capabilities
• Our experiences (example projects)
• Previous (team member) experiences
INTRODUCTION

Who we are – Railway Signalling Engineers

National projects from our HQ in Stratford-Upon-Avon together with our international companies Fenix Australasia and Fenix South East Asia

OUR SERVICE

Professional Service Specialists in Turnkey Rail Signalling Engineering

- System Definition
- System Requirements
- System (Scheme) Design
- Detailed Design
- Procurement
- Construction / Installation
- Testing & Commissioning
- Mentoring
- Training
- Project Engineering
- Project Management
- Signal Sighting
- Turnkey Signalling Solution
- Consultancy Services/Signalling Specialist
- Independent Checking Engineer

Mission

To deliver a turnkey signalling solution which is safe, cost-effective and non-disruptive through knowledge, experience and collaboration to our international clients
Award shortlisting: ‘Most Interesting Thing We Saw’ award at the Most Interesting Awards 2016, Rail Exec Gala

Awards Shortlisting: ‘Signalling & Telecommunications’ award at the UK Rail Industry Awards 2018

Awards Shortlisting: ‘Excellence in Technology’ award at the National Transport Awards 2017

Awards Shortlisting: ‘Excellence in Technology and Innovation’ award at the Scottish Transport Awards 2017

Awards Shortlisting: ‘Signalling & Telecommunications Person or Team of the Year’ award at RailStaff Awards 2017
SUMMARY OF CAPABILITIES

MANAGEMENT + SYSTEMS
- Compliance and Quality Management
- Dedicated Document Control Resources
- In-House Information and Communications System Manager

EXPERIENCE
- Practical experience in more than 15 countries
- Expert, multi-functional team with a combined track record in rail signalling engineering
  - With a wealth of experience in Europe, Australasia and the Far East

RESOURCES
- IRSE licensed signalling principles designers & designers
- IRSE licensed tester-in-charge & signalling testers
- IRSE licensed principles testers
- Signalling CAD draughtsman
- Signal sighting chairman
- Contractor's engineering manager
- Professional head of signalling
- Independent checking engineer

SKILLS
- Design, installation and testing
- Project engineering and project management
- Mentoring & consultancy

SYSTEMS
- Traditional relay-based signalling systems
- Computer-based signalling systems
- Communication-based signalling systems (ETCS and CBTC)
- Depot signalling systems
- Signalling principles
- Interfacing of different systems e.g. computer-based to relay-based
PROJECT LIFECYCLE

1. Output Definition
2. Feasibility
3. Output Selection
4. Single Option Development
5. Detailed Design
6. Construction, Test and Commission
7. Scheme Handback
8. Project Close Out

Outline Signalling Design
- RRI Relay Room/Location Case
- Power Calculations
- Circuit Design
- TPWS Design
- CBI Application Data and Associated
- ATP Wayside Design
- Architecture/Circuit Design

Detailed Signalling Design
- Axle Counter Application Data
- Signal Box/Control Panel
- Bill of Materials
- Modifications
- IDC Participation
- Power Calculations
- CBI Mechanical & RRI

Single Option Signalling Development

Implementation Programme
- Works Delivery – Construction
- Test & Commission Handback

Project Management and Project Engineering
Consultancy

On behalf of the Infrastructure Owner:

- Consultancy
- Independent Advisor/Signalling Specialist
- Independent Checking Engineer
OUR CAPABILITIES

GRIP 1-2 Output Definition and Feasability

- Development of signalling system requirements based on owner/operator requirements
- Development of implementation methodologies for system rollout
- Advice on standards and procedures

Development of signalling systems
OUR CAPABILITIES

GRIP 3 Option Selection

- Condition survey and correlation reports.
- Outline Project Specification (OPS).
- Signalling Scheme Plan.
- Detail of control and interlocking assumptions.
- Identification of non-compliances and ways to manage them.
- Option Selection Report.
- Scheme Plan risk assessment.
- Signal Sighting chair, forms, sighting and reports.
- Signal spacing charts and calculations.
- Aspect Sequence Charts.
- IDC/IDR participation.

Site surveys
OUR CAPABILITIES

GRIP 4 Single Option Development

- Final Project Specification (FPS)
- Assessment of Signalling Systems before Design
- Alterations Report
- Signalling Scheme Plan (updates from GRIP 3)
- Scheme Plan risk assessment (updates from GRIP 3)
- Signal Sighting forms, sighting and reports (updates from GRIP 3)
- Draft Signalling Design Specification
- SAT/SORA
- Testing & Commissioning Strategy
- Level Crossing Surveys including Ground Plans

Level Crossing survey
OUR CAPABILITIES

GRIP 5 Detailed Design

- Signalling Design Specification
- Fringeworks Specifications
- Stage Plans
- HAZID (signalling system only)
- Signalling Scheme Plan
- Signal Sighting forms, sighting and reports
- Section C Notices
- Location Area Plans
- Bonding Plans
- Cable Plans (Main and Detailed)
- Control Tables / Mechanical Locking Charts
- Route Lists

BR930-type safety relay

Fenix
UK & IRELAND
OUR CAPABILITIES

GRIP 5 Detailed Design

- RRI Relay Room / Location Case Circuit Design
  - Free-wired
  - Geographical

- CBI Application Data and associated architecture/circuit design
  - SSI
  - VHLC

- Signal Box / Control Panel Modifications

- Power Calculations

AWS and TPWS
OUR CAPABILITIES

GRIP 5 Detailed Design

- TPWS Design
- ATP Wayside Design
  - ATP Plan
  - ATP Code Tables
  - ATP Application Data (EBICAB 800/900 and L10000/12000)
- Axle Counter Application Data
- Bill of Materials

Mosaic Control Panel
OUR CAPABILITIES

GRIP 6 Procurement, Construction and Installation

- Materials receipt and delivery to site
- Management/supervision of factory assembly and pre-wiring
- Management/supervision of site construction and installation

Two-Aspect Signal
OUR CAPABILITIES

GRIP 6 Test & Commission

• Management of pre-testing and commissioning – Mod 1 Tester in Charge
• Mod 2 Principles Testing for RRI and CBI systems
• Mod 3B Function Testing - Interlocking
• Mod 3C Verification Testing – Interlocking
• Mod 4 Function Testing – Wayside Equipment
• Mod 5 Test Assistant
OUR CAPABILITIES

GRIP 7-8 Scheme Handback & Project Closeout

• As-built records
• O&M Manuals
• O&M Training
• Commercial and technical project close-out

System in operation
OUR CAPABILITIES

Other capabilities

- Signalling Contractor’s Responsible Engineer (CRE)
- ERTMS-ETCS Consultancy
- Technical Mentoring
- Independent consultancy
- Gauging Reports
- Bridge/Impact Assessments
- Omincom Review and Desktop Studies
- Temporary Speed Restriction (TSR) design.
- Technical analysis/preparation of documents.

ERTMS-ETCS Level 1
• Troubleshooting.

• Assistance with Type Approval

• Tactical intervention on design, delivery, test and commissioning.

• Independent mentoring for fringework design programmes.

• Signal Sighting Chair.

• Project and Contract Management – PMBOK

Installation of 4' point machine
PREVIOUS EXPERIENCES

Banbury Light Maintenance Depot
- Industry First – 2015 to 2017

Project overview...

Fenix UK & Ireland has successfully completed the final stages of the Banbury Depot project. The operation involved the design the first Pintsch Tiefenbach interface of its kind in the UK. The unique interface enables the depot control system to link directly to the NR infrastructure and allows the Tiefenbach System to interface with any type of UK interlocking, saving the requirement for NR-type approval.

The project overcame significant challenges throughout the lifecycle of the project, including wildlife, scope changes, inclement weather and multiple stages which were incredibly complex.

Using the Tiefenbach interlocking technology and Conventional Dorman signals, Banbury Depot now utilises a number of firsts for signalling technology in the UK.

Fenix developed a unique system design that interfaces the Zone Green DPPS with the Tiefenbach System, providing complete integrity between the two separate systems. Banbury Depot now boasts trailable four-foot point machines – German technology which is another UK first.

Craig Purcell, Group CEO of Fenix Rail Systems, said: “I am delighted to see the outcome of our team’s hard work on the Banbury Depot signalling system. It has led to a plethora of expressions of interest, underpinning the system as a must-have signalling solution for depot control in the 21st Century.”

Key Facts...

- Design
- Testing
- Installation
- Commissioning
- Industry First
- Complex System Integration
- International Relationships and Training
- 9 Day Blockade
Project overview...

Fenix UK & Ireland was responsible for TIC activities for the Gospel Oak to Barking electrification (GOBE) project.

Network Rail identified that introducing a 25KV overhead line electrification to run electric trains between Gospel Oak and Barking would provide the opportunity to enhance performance, efficiency and reliability of passenger services. Fenix provided Testing services to the project throughout its life cycle, Fenix providing our TIC and Signalling Installation Head Geoff Clark to manage the Testing and commissioning elements for our client.
PREVIOUS EXPERIENCES

M73/M74 Motorway Improvement Project – Quick solution 2015

Project overview...

This project highlights the agility of Fenix UK & Ireland in being able to react quickly and provide a successful solution within stringent timescales.

We were called in by Carillion and MPI at short notice to provide a design for the M73/M74 Motorway Improvement Project (Railway Interface Works) in Scotland. Within a very demanding time frame, the team from Fenix managed to obtain source records – identifying and resolving a number of deficiencies within them – in order to produce and issue the design to the site installation and testing teams, enabling the works to be successfully commissioned.

The success of the project was down to the flexibility and hard work of the design team, which had to work overtime in order to meet the deadline.

Key Facts...

- Design
- Testing
- Commissioning
- Flexibility
- Team Working
- Quick Response
- Technical Assistance
Fenix UK & Ireland delivered the first part of a major RETB (radio electronic token block) upgrade project in the West Highlands of Scotland. The upgrade was made necessary by OFCOM’s decision to reallocate the operating frequency in this region for digital TV throughout Europe. The project, commissioned by Network Rail and led by telent (telecoms services), required changes to be made to the frequency of the base stations. However, the wider implications included the development, modification and renewal of depot, engineering and trackside equipment to provide a fully operational communications system.

Fenix was responsible for all the signalling and testing works in the project. The company initially completed trials at two sites. Subsequently, work was completed at 19 sites on the West Highlands Line, totalling 165 miles. This included modifications to the TPWS (Train Protection Warning System) power supplies to enable the change of frequency.

Various challenges needed to be overcome along the way. Many of the locations were extremely inaccessible, requiring a journey of around five hours in a 4x4 between each and the winter weather conditions contributed further to these difficulties.

Success of the first phase of the project was thanks to the close collaboration between the signalling and telecommunications disciplines, and the teams at Fenix and Telent worked very effectively to achieve this. 2016 will see the Far North Lines, totalling 230 miles, upgraded for the frequency change and the interlocking at Inverness upgraded.
Signalling Engineering training – for UK Tier 1 Civil Principal Contractor – 2015

Project overview...

As a technical specialist in rail signalling, the core team at Fenix know all too well that signalling aspects of an infrastructure project can have a significant impact upon the successful delivery of a project without careful consideration and understanding.

Projects are becoming larger in scale and value and the challenge for principal contractors is ever-increasing in terms of complexity and the number of Engineering disciplines involved in any particular scheme.

During a number of lessons-learnt workshops for projects which encountered or narrowly avoided delivery challenges, a leading tier 1 buildings and civils framework contractor identified lack of signalling knowledge as a reoccurring issue within their business.

Fenix delivered a one-day workshop at the client’s premises for a selected group of their staff from all disciplines to introduce the basics of signalling engineering and how it interfaces with the delivery of a major infrastructure project. The session outlined the fundamental constraints and considerations which may seem relatively straightforward to the outside world.

The underlying principle of the day was to understand that, unlike many other engineering disciplines, signalling often cannot be quantified in units due to its complexity. Following the first session, the client has booked further workshops for their staff.
**PREVIOUS EXPERIENCES**

**Bellenden & Westdown Bridge Renewals**

**Project overview...**

The Bellenden Road Underbridge upgrade replaced the existing 12-metre single span deck with two new Network Rail standard U decks, which were 66 tonnes each.

The Westdown Road Underbridge project also centred on the replacement of the existing 12.5-metre bridge with two new Network Rail standard U decks, which were 74 tonnes each. It included the replacement of new station platforms.

Both projects included the reinstatement and re-tamping of the tracks before reopening to rail traffic.

Fenix UK & Ireland was responsible for initial survey of the impacted S&T cable routes and trackside equipment; powering down and making safe signalling equipment prior to the works; the subsequent support and protection during the works; and the reinstatement of the signalling system upon completion.

Fenix’s S&T staff worked in collaboration with the multi-disciplinary team throughout the works, assisting with the detailed planning to ensure there was minimal disruption to the railway network. This required quick thinking and proactive action on site by the Fenix team to resolve a number of technical issues that arose during the works.

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**Key Facts...**

- Planning
- Survey
- Commissioning
- Collaborative Working
- Minimal Disruption
- Proactive Action
Brantham Depot GRIP 3

Project overview...

Fenix UK & Ireland was responsible for providing consultancy to Abellio and Taylor Woodrow, followed by production of GRIP 3 Output Selection for the implementation of an innovative depot control system solution for Brantham Depot.

This involved carrying out a gap analysis between the UK depot’s standards and requirements and the requirements satisfied by the product supplier’s current products.

Following an earlier project at Banbury Depot, the team was able to apply the lessons they learnt there to this work, enabling a much quicker completion of the consultancy and GRIP 3 phases.

The consultancy work was carried out at Fenix’s headquarters in Stratford upon Avon, the Network Rail office in Stratford (where discussions were held with Abellio) and in Tiefenbach’s premises in Sprockhövel, Germany (where discussions were held with their product experts).
THANK YOU

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