SIGNAL HOUSE GROUP LIMITED

THE RAILWAY RESIGNALLED

COLLIS ENGINEERING LIMITED | SIGNAL HOUSE LIMITED | COLLIS CIVIL ENGINEERING

The Signal House Group offers an unrivalled service in Railway Engineering focusing on Rail Signalling works. Our group capabilities are such that we can offer the industry a turn-key service, providing end to end supply of resources. Signal structure projects can be managed from initial site survey and GI, through design and manufacture, including foundation works, and finally offering installation. This complete service is offered through a single point of contact and is delivered through a comprehensive set of in house resources.

Collis Engineering Ltd is the specialist structural and mechanical engineering arm of Signal House Group and is an industry leader in the design and supply of railway signalling structures, location platforms and signalling points components.

Signal House Ltd is the specialist electrical engineering company within the Signal House Group, with a particular focus on the design and development of LED railway signalling equipment. Signal House are a Network Rail approved supplier of line-side LED signal heads.

Collis Civil Engineering provide the on site presence of Signal House Group. With specialist capabilities including sub and super structure installation, full site surveys and an industry leading structure refurbishment package.

RIQC

RISQS Reg No. 93535

RISQS Reg No. 93394

CE

COLLIS
ENGINEERING
LIMITED

Collis Engineering Ltd was founded in 1970, and specialises in mechanical and structural applications for railway signalling and other projects.

Our in-house design department offers a specialist service in the design and drawing of signalling superstructures and the production of superstructure calculations. Standard Network Rail documentation (Forms 001, 002 and 003) are always completed to accompany any superstructure design and fabrication work.

The dedicated and skilled team of engineers offer a variety of services, including:

- The design and fabrication of railway signalling support structures
  - Hinged Lightweight Signal Posts
  - Signal Posts
  - Cantilevers
  - Gantries
- Hinging Antenna Mast
- Mechanical Signalling
- Embankment Platforms
- Points Fittings
- Bespoke Engineering Projects

Our Technical Sales staff have vast experience of the railway signalling industry in the UK. Their specialist knowledge means that even the most complex of problems can be overcome or most obscure of products can be identified and replicated.

HINGED LIGHTWEIGHT SIGNAL POST

The Collis Engineering Ltd Hinged Lightweight Signal Post is an innovative solution designed to remove complexity and expense from the design, manufacture and installation of signal posts. Additional benefits include the ability to accept any signal head, removes the requirement for on-track plant and the Health and Safety advantage of not working at height.

Network Rail has approved two versions of the Hinged Lightweight Signal Post; the standard version and a heavyweight alternative to enable a greater number of signalling arrays to be accommodated.

The Collis Engineering Ltd Hinged Lightweight Signal Post is offered as both a straight post or an offset post to account for possible viewing obstructions.

· Straight Post – to replicate a 912mm signal post.

· Offset Post – to replicate dimensions up to and including a standard 1500mm signal post platform.

The operation of the structure utilises an integrated spring mechanism; this controls the raising and lowering process ensuring minimal effort is required from the users.

The post design is protected under a Registration of Design, No. 4024724, awarded by the United Kingdom Intellectual Property Office.

SIGNAL POST

Collis signal posts are based on three main sizes of platform; 912mm, 1262mm and 1500mm. Other platform sizes may be used when circumstances dictate.

Superstructure design calculations and drawings along with Forms 001, 002, 003 documentation are available as part of our design package.

The standard post is supplied complete with a ladder top safety gate, an adjustable ladder bottom bracket which allows a +/- 75mm vertical adjustment, a signal ID plate and its associated bracketing. All structures conform to the latest NR, HSE and HMRI standards. Foundation bolts are available as an option.

Collis Engineering Ltd also offer an 'ergonomic' signal post where the signal head is placed on a stool mounted to the platform enabling the maintainer to work from an ergonomically friendly position.

CANTILEVERS

Cantilever signal structures are used when there is insufficient space in the ’10 ft’ or either cess to allow a signal post to be used; or when land take issues preclude the use of a double legged gantry.

The Collis Engineering Ltd standard cantilever is based on a single leg design. Each cantilever is supplied complete with a ladder top safety gate, an adjustable ladder bottom bracket allowing +/- 75mm vertical adjustment, a signal ID plate and its associated bracketry.

Structures conform to the latest Network Rail, HSE and HMRI standards. Cantilevers are supplied in a hot-dip galvanised finish with all surfaces above and including the boom painted black in accordance with Network Rail specifications. All cantilevers are pre-install tested at Collis Engineering Ltd to ensure compatibility of parts. Foundation bolts can be supplied as an option. Cantilevers for use on electrified lines are supplied with dropper cages (painted black).

GANTRIES

Gantry structures are used to span multiple track widths signalling each individual line (where necessary).

The Collis Engineering Ltd standard gantry utilises a twin column leg design supporting a double beam bridge section. It is supplied with a ladder at one end only, complete with a ladder top safety gate, an adjustable ladder bottom bracket giving +/- 75mm of vertical adjustment, signal ID plate and its associated bracketing.

Structures conform to the latest Network Rail, HSE and HMRI standards. Structures are supplied in a hot-dip galvanised finish with all surfaces above and including the boom painted black in accordance with Network Rail specifications. Foundation bolts can be supplied as an option. Gantries for use on electrified lines are supplied with dropper cages (painted black).

Our design package for gantries includes a specific Form 001/002, a general arrangement drawing, structural calculations to a category 2 check and a separate specific Form 003.

EMBANKMENT PLATFORMS

Collis Engineering Ltd is also a supplier of trackside platforms (typically for use with locations cabinets and cases). Our platforms are manufactured using a modular design ensuring that the customer obtains the correct solution for the situation.

Our standard single module houses a full or half size location cabinet and is supplied with handrails fitted to the outside of the platform. Double and triple platforms are available for large cabinets or other uses.

All platforms are supplied with a design package comprising Network Rail Forms 001, 002, 003 and loading calculations.

Collis have developed an Embankment platform suitable for areas susceptible to flooding. The flood prevention platform is a standard structure mounted on top of custom height stilt legs, with an enclosed cable troughing. This style of platform ensures that the equipment being supported is positioned above flood water levels; should flooding occur the potential damage is kept to a minimum, resulting in much lower repair costs. Flood prevention platforms have been installed at Hinksey, Westerleigh, Cowley Bridge and Bridgewater.

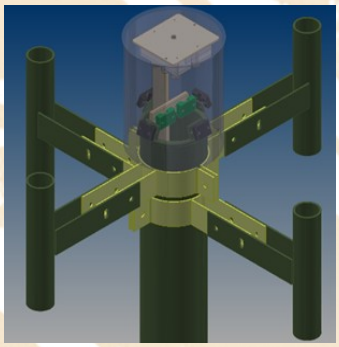
HINGED ANTENNA MAST

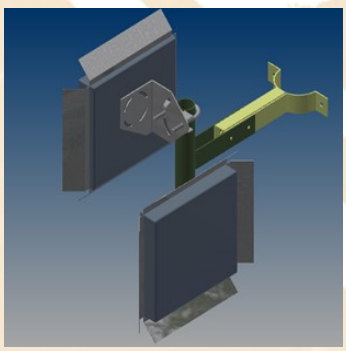
Designed for the future requirement of the Digital Railway and WiFi enhancements, the Collis Engineering Hinged Antenna Mast provides a maintenance free, easy to use structure to support a variety of radio antennas.
Available as standard in 4.5m and 6m heights, the structure folds to ground level to enable easy maintenance of the installed equipment, without the need to climb the structure or utilise a MEWP.

The structure has been designed to reduce the requirement for heavy on track plant at installation stage. Foundations can be either concrete or piled solutions and can be installed by a single team using hand held equipment.

The post design is protected under a Registration of Design, No. 4044450, awarded by the United Kingdom Intellectual Property Office.

This product is being provided as part of the 4LM project, for London Underground.

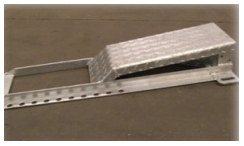


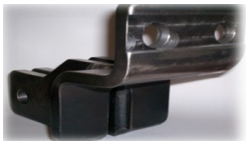


POINTS OPERATING EQUIPMENT

Collis Engineering Ltd is a major manufacturer and supplier of Point's fittings and infrastructure components to the UK railway market.





Our full list of components is too extensive to list here, however, can be viewed on request.

LOOKOUT PLATFORM

The Lookout Platform has been developed in accordance with Network Rail to provide a modular stand for site lookouts to be placed into a position of safety to undertake their tasks.

The platform is delivered to site in kit form and can be assembled using hand tools only. Adjustable legs have been provided to suit embankment installation and an adjustable step is used to account for uneven ground.

Yellow handrails provide a distinctive appearance over other trackside platforms.

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Signal House Ltd has a long and proud history in railway signalling dating back to 1885. Our products now are based around the same themes as back then, conveying information to train drivers.

Signal House Ltd is now a specialist in the supply of railway signals to the UK and overseas markets. Our products feature LED technology, offering significant whole-life maintenance cost savings for railway authorities.

Our dedicated and experienced Technical Department takes great pride in delivering the right solution when 'off the shelf' standard products are not suitable.

The range of products available through Signal House includes but is not restricted to:

- LED Colour Light Signals
- LED Miniature (Stencil) Route Indicators
- LED Banner Repeater Signal
- LED Miniature Banner Signal
- LED Banner Retrofit Kits
- Colour Light Signals
- Terminal Blocks

LED COLOUR LIGHT SIGNAL

Signal House Ltd is approved by Network Rail for its range of LED Colour Light Signals.

The SHL range of LED colour light signals is designed for use with multi-aspect signalling systems and is available in the full range of case sizes to accommodate 1, 2, 3 or 4 individual aspects.

Purchase of LED Colour Lights for the Network Rail controlled infrastructure is via the Network Rail issued framework agreement for the supply of LED signal head materials (SYN02).

LED Colour Light Benefits;

The use of LED technology creates massive whole life cost benefit through high reliability and improved asset life.

The signal head is comprised of independently replaceable aspects, meaning that replacement is only required for the aspect that has failed.

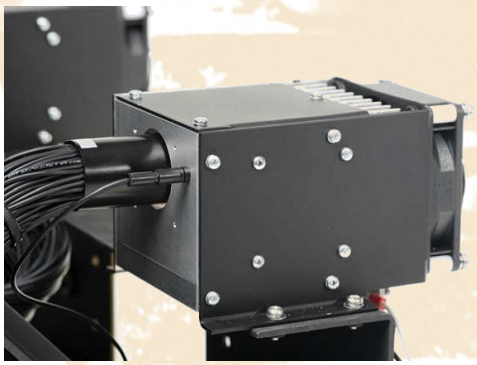
The Signal head is capable of mimicking 'first filament failure'; this occurs when the optical output reaches a certain level. This gives a warning that the aspect requires replacement within a 3-6 month period. This means aspects are only replaced as and when required rather than on a predetermined schedule.

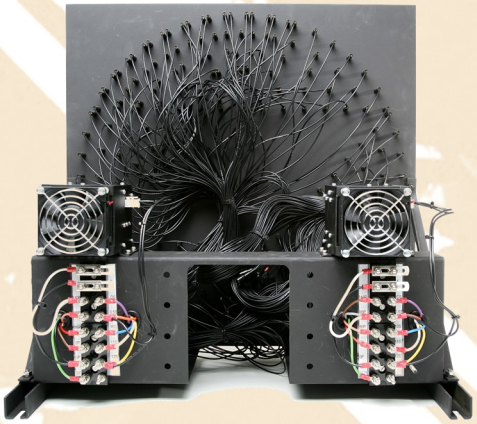
LED BANNER REPEATER SIGNAL

Signal House Ltd has approval for the LED Banner Repeater Signal. Like the LED main line colour light signals, LED Banner Repeater Signals are supplied under the terms and conditions of the Network Rail Synergy Contract SYN02 for UK use.

The LED Banner Repeater Signal has been issued catalogue number 086/001287.

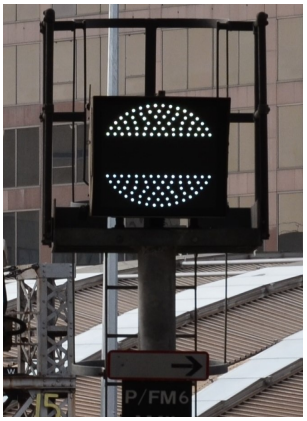
The LED Banner Repeater Signal utilises the revolutionary technology of the LED illuminator - an LED replacement for standard quartz halogen lamps. The LED illuminator gives the maintainer significant long life benefits when compared with standard illumination and is also available as a retro fit unit to most existing signals.





LED RETRO-FIT BANNER KIT

Before Retro-fit



After Retro-fit

The Signal House Retro-Fit LED Banner Kit is the latest product to utilise the Signal Houses LED Illuminator. The kit allows the user to convert a traditional, pre existing halogen lamp lit banner signal to an LED equivalent. By removing the existing light boxes, the illuminator can utilise the fibre optic leads to create an LED Banner signal.

Engineers are capable of completing the retro-fit in under 1 hour ensuring minimal disruption to network services.

The LED Illuminator provides the low cost, maintenance free advantages associated with LED technology, while extending the life span of traditional halogen lamp banner signals.

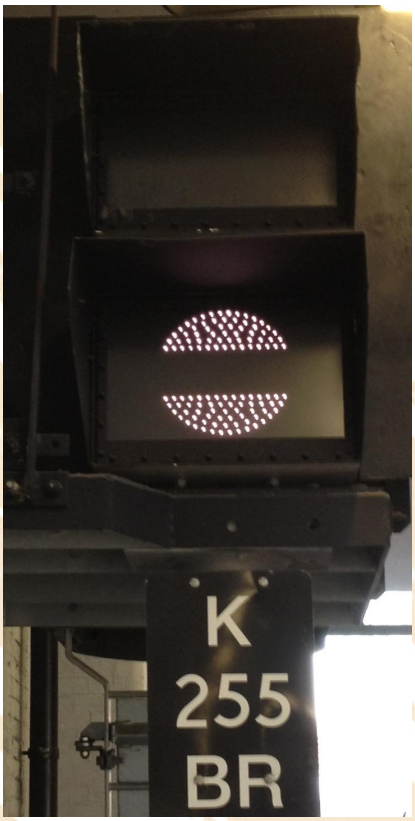
- Network Rail Approved
  PADS— 0086/001348
- Signal House 2 ON 1 OFF Banner.
  086/001348
- Signal House 2 ON 2 OFF Banner.
  086/001352
- Howells 1 OFF 2 ON Banner
  088/008838
- Westinghouse 2 ON 1 OFF Banner
  (On Trial)
- The installation process is considered a signal maintenance function.
- A Signed off Network Rail SMTH procedure exists — *TI-WSX001*
- Kit uses a specially designed 55 Watt Illuminator to mirror 55 Watt Halogen lamp it is replacing.
  086/001349

LED MINI BANNER SIGNAL

Following on from the success of the Signal House Ltd LED banner repeater signal and the existing demand for fibre-optic miniature banner repeater signals; Signal House has developed the LED miniature banner signal.

The LED miniature banner signal combines our knowledge of LED lighting and fibre-optic technology. The utilisation of the LED illuminator creates another signal using a standard, stockable, low cost replacement part which will be attractive to maintainers.

The LED miniature banner is available in two types - the first with 1 ON 1 OFF for new projects and the second being a 2 ON 1 OFF for use as a maintenance replacement to take account of existing wiring.



LED MINIATURE ALPHANUMERIC ROUTE INDICATOR - STENCIL

The approval includes OFF indicators, CD/RA indicators and other bespoke indicators to display customer requirements within the required specification. The approval covers both single sided and double sided indicators.

The Signal House Ltd LED miniature route indicator combines our knowledge of fibre-optic light guides with our new LED illuminator lamp unit. The LED illuminator has been specifically designed to replace quartz halogen lamps. The LED illuminator has an expected minimum life of 5 years and is a standard spares product used in all Signal House LED indicator units.

The high reliability and long life of these units makes them an excellent choice for all route indicator requirements especially for remote or inaccessible locations.

Product approval has also been granted for miniature casing (300mm x 300mm) indicators, and for combined alphanumeric/miniature banner signals.

LED MINIATURE ALPHANUMERIC ROUTE INDICATOR – STENCIL. 815MM CASE.

The 815mm wide MARI is a special unit designed for bigger stencil displays.

Typical displays would read OFFUP / OFFDN and CD/RA OFF, however bespoke displays are available.

A maximum of 4 indications are available in an 815mm case and no more than 5 characters cross the display.

Terminal Blocks

Signal House Ltd is a major supplier of various industry standard terminal blocks and other associated signalling components.

Our range of terminal blocks is covered by the Planwell Trademark. The range includes terminal blocks comprising 5 pin, 10 pin and 12 pin, ceramic fuse holders and disconnection links.

Protective terminal block covers are also available on request.

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Our skilled Civil Engineering workforce is capable of managing a project from beginning to end through a vast array of in house skills and capabilities. In the modern railway environment, where cost effectiveness is essential in running a successful project, Collis Civil Engineering can offer a high quality service utilising many years of industry knowledge with excellent value for money.

A skilled and dedicated team of engineers offer a variety of services:

- Project management, including possession planning and management.
- Geotechnical surveying.
- Topographical surveys
- Piled and Helical pile foundation design,
- Mass concrete foundation design.
- Complete foundation system installation.
- UTX Design and installation
- Refurbishment of existing structures to updated standards.
- Specialised teams for all types of structural erection.

Recent projects in the South West and on the Midland Main Line have utilised different aspects of Collis Civil capabilities all with great success. The work in the South West has consisted of structure and life extension for a number of signal posts that suffer from an arduous climate. Works on the Midland Main Line included the substructure and design and installation for lightweight posts and location platforms.

SITE INVESTIGATIONS

An adequate ground investigation is essential to the timely and cost effective execution of a civil engineering project. It is well documented that ground conditions are one of the major reasons for contractual claims and disputes and that typically only 2% or less represents the cost of the site investigation against the total project cost.

Site investigation is covered by BS5930: 1999

Site investigation is usually carried out in 3 stages:

1. Desk Study
2. Site Survey
3. Ground Investigation

The results of all the site investigation, desk top study, reconnaissance and laboratory results will be bound together in a full report to be passed to the design engineers. With this information an appropriate and accurate foundation design can be achieved..

Site Survey

Collis Civil Engineering Division prides itself on providing early and up-front assistance to clients on railway civil engineering projects. Our qualified civil engineers with many years experience in the railway environment. Their experience allows us to offer comprehensive assistance for a multitude of types of site surveys for railway.

Site Survey (cont.)

The list below gives a brief indication of our capabilities:

- Topographical surveys
- Overhead Line Electrification (OHLE) surveys
- Structural surveys and evaluation
- Site assessments
- Signal sighting committee assistance

On Site Ground Investigation.

All of the information from the desk top study and the site reconnaissance alongside the type of project, determines the amount of ground investigation to be carried out. Normally this will involve the excavation of boreholes and trial pits. The number carried out at the site will be planned to enable the sites basic geological structure to be determined.

In-situ testing will involve the sinking of a number of boreholes around the site. It is essential that the investigation is taken to the adequate depth; this will depend on the project, but will include all strata liable to be affected by the structure.

A cable avoidance tool (CAT) survey is undertaken at the exploratory hole locations, and prior to the sinking of the boreholes, inspection pits will be hand dug in order to identify the presence of any services that may or may not have been identified at the desk top study stage.

The method of investigation will depend upon access, equipment and type of ground, to determine this there are two main ground techniques.

Trial Pits

These are normally hand excavated to depths of up to 1.2 metres. These provide detailed information and allow for careful examination of the surrounding area to search for underground services that may not be shown on a buried services report. All results are recorded and photographs will be taken at differing intervals.

Boreholes

The sinking of boreholes will require the use of auger or percussion equipment. Most rigs are fitted with road wheels and when folded down can be easily towed to site on a trailer.

The rig is set up over the proposed new location and steel soil sample tubes are driven in to the ground using a 50kg hammer rotating on a chain over a stroke of 500mm. The maximum depth is typically approximately 50 metres and their advantage over trial pits is that many can be sunk in a single shift to a greater depth. On completion of the investigation, the steel rods are recovered by means of the use of a probe extractor.

CONCRETE FOUNDATIONS

Collis Civil Engineering offer both cast in situ and precast concrete foundations suitable to support all of the products we offer. These include:

- **Concrete pile caps**
- **Mass concrete Base**
- **Raft Foundation**
- **Concrete Barrel Foundation**
- **Pre cast concrete base**
- **Extension of existing foundations**

With experience in both manual and mechanical excavation, the most suitable method for a particular site can be selected.

Formwork and temporary work solutions are also available and can be designed and installed whether it is for a basic 1m x 1m x 1m concrete block or a complex bespoke concrete foundation.

PILED FOUNDATIONS

Helical 'Screw' Piles

The Collis screw pile system is a foundation based on helical piling where a designated number of piles are 'screwed' in to the ground to a designed depth and torque.

The piles are then connected via a transfer plate allowing the structure to be installed.

The screw piling system cuts a clean path through the ground to minimise any disturbance or heave, meaning that the in-situ properties of the ground remain largely unchanged.

The system offers significant benefits for installation, mainly cutting the number of site visits and allowing the sub and superstructure to be erected in a single possession whilst utilising the same on-track plant.

Mini Piles – Hand Driven

The mini piling solution is a similar process to the Volute pile system, with the main difference being the diameter of the pile and installation method.

The mini piling method allows the work to be undertaken without on track plant. If the site is remote, the equipment and segmental pile sections can be manually handled onto a trolley and pushed to site. Once at site, trial holes will be dug and the first section of pile placed into the excavation. The rig will then be manually lifted onto the top of the pile and secured. 2 operatives will hold the rig stable as piling commences.

A leaver arm will be attached to the rig and be secured behind something solid, such as the rail, the ballast shoulder or another suitable structure to resist the body of the rig from rotating once driving commences.

Additional pile segments will be added until the required depth is achieved.

Usually for a standard signal post a group of 4 piles is used with a steel grillage to span the piles and provide a mounting plate for the post.

STRUCTURE INSTALLATION

Collis Civil Engineering also specialises in the installation of railway structures. Our Project Engineers are highly experienced in project management, and offer a full range of skills to install large structures such as gantries, cantilevers, signal structures, location platforms and semaphore structures.

Project Management, including possession planning and management, is offered.

The expertise of supplying steel structures from Collis Engineering Ltd, combined with our specialist foundation design and installation service provision and structure installation from our Civil Engineering Division ensures that the Signal House Group can provide a complete design, supply and installation service 'under one roof'.

Recent project successes for Collis Civil Engineering include structure installation at Gravesend, St. Pancras to Sheffield LSI, Sundon, Gosberton and North Staffordshire.

STRUCTURE REFURBISHMENT

Typically, signalling structures have been designed with a life of around 40 years. Over the life of that structure it is likely to see a host of changes in standards – be that via the British Standards for wind loading (BS6399), changes to Railway Group or Network Rail Standards or changes to H.S.E or H.M.R.I guidance. It is uneconomical to assume that every change in standards and health and safety legislation should result in old structures being replaced for new.

Collis Civil Engineering has seen an upturn in activity regarding modernisation of old structures for health & safety purposes. Typically, such work has included the supply and installation of new ladders, hand railing, non-slip flooring complete with toe boards, replacement OLE nettings, refurbishment of dropper cages, including new ladders, backboards, flooring and netting. By replacing these items and then offering our additional site painting expertise, the signals on the structure can be maintained in a safe with the asset life being extended.

Again a full turnkey service is provided from initial site surveys and report recommendations, through to design, supply, and installation of the new required parts and repainting of the complete structure by our ICATS approved painters.

CASE STUDY – HINKSEY FLOOD ALLEVIATION

Incidents of flooding in the Hinksey area required a long term, practical solution. Collis Civil Engineering were contracted to elevate 5 location platforms . This required the design, manufacture, substructure installation and superstructure installation of the raised location platforms, Including all cable management and appropriate ladder access.

All work undertaken exclusively utilised in-house resources.

CASE STUDY – WATERLOO GANTRY

Collis Engineering and Collis Civil Engineering were contracted to supply a 35m, OLE compliant signalling gantry for the Wessex Capacity Project at London Waterloo Station. The structure was required to support 7 signal dropper cages and would require 3 support legs.

The contract included all structural design work, including 3D modelling, fabrication, and structure installation.

CASE STUDY – DROITWICH MECHANICAL SIGNALS

Collis Civil Engineering were contracted by Network Rail to undertake the refurbishment and replacement of a number of mechanical signals at Droitwich Spa.

Structure DS71 has been replaced and relocated to allow for better visibility for the drivers. DS9/DS11 undertook a full refurbishment consisting of a new working platform, hand railing and access ladders.

As part of the refurbishment DS9/DS11 was fully re-painted. The new steel work and paint ensures the life expectancy of this structure has been extended for many years.

All works undertaken were completed on time and to budget.

MICHAEL EVANS & ASSOCIATES LTD

Civil and Structural Engineers & Design Consultants

Michael Evans and Associates is a professional team of highly experienced engineers who operate in a variety of civil and structural engineering environments, including, residential, commercial, industrial, railway infrastructure, site analysis and coal risk assessments.

Our project experience includes working with local and nationwide organisations on both singular and large scale developments.

Our policy to guarantee all works undertaken are supervised by a chartered engineer ensures the highest standards are consistently met.

Formed in 1995, the company has continued to grow and develop, and in 2017 the organisation was acquired by Signal House Group Ltd.

Michael Evans & Associates Ltd is a open minded company calling upon the imagination of experienced technical staff to provide innovative and cost-effective solutions to suit our clients needs.

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