

SPENCER
Design

MULTI- DISCIPLINARY DESIGN TEAM

PROVIDING PACE & AGILITY TO
COMPLEX MULTIDISCIPLINARY
ENGINEERING PROJECTS



Bridge

Build

Civil

Design

M&E Services

Rail

SPENCER
British Engineering

WE ARE SPENCER GROUP



T Hopkins

Tony Hopkins
Engineering Manager (Engineering)
tony.hopkins1@thespencergroup.co.uk

The Spencer design team are a set of enthusiastic professionals who share the same goal. To deliver a solution to be proud of, the multi-disciplinary team comprising Civil, Structural, Architectural, Mechanical, Electrical and Building Services work closely together to entwine all aspects of the design solution.

Working in a number of industry sectors the team is able to pull together the knowledge and learning to allow the depth of the team to be enhanced.

Unlike a traditional consultant Spencer Design work hand in hand with the construction team to ensure that the design solution considers, safety, buildability and cost effectiveness in all of our proposals.

With direct access to the client we are able to understand and target the most appropriate and effective solution on their behalf.

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EARLY CONTRACTOR INVOLVEMENT



Gary Robson
Engineering Manager (Rail)
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I have a wide-range of experience of the management and delivery of multi-disciplined schemes in Rail and other sectors. I am involved in all stages of a project's pre-construction lifecycle, from concept design through to detailed design development, including value engineering, robust feasibility budgets and detailed cost stages, and on to final handover to our construction delivery teams.

I firmly believe that significant value can be realised, on behalf of our clients, by adopting Spencer Group's robust, mature and highly effective ECI (Early Contractor Involvement) processes. In this way we are able to deliver optimum investment value for our clients by evolving and developing the most appropriate technical solution for their projects.

This ECI approach yields optimum cost & programme certainty and significantly reduces project risk when compared with traditional procurement routes.

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ELECTRICAL DESIGN



Phil Gibbs
Engineering Manager (Electrical)
phil.gibbs@thespencergroup.co.uk

I have a broad range of experience in the Building Services Engineering having progressed from Apprentice Electrician to my current role. Whilst my background is electrical I have a thorough understanding of mechanical services and control systems from many multi-disciplinary roles.

With over 20 years in the Rail industry I have extensive experience in Depot and Station related schemes with new build, refurbishment & repurposing of existing facilities. I have acted as Contractors Responsible Engineer (Design) for over 15 years in the rail industry. I thoroughly enjoy the challenges encountered in keeping existing facilities fully functional whilst introducing new and replacement services. I enjoy being involved with projects from inception to final handover and take great pride in working with the Client and end users to provide a high quality product within the budget whilst also improving on functionality, safety and efficiency throughout the lifecycle.

The Spencer Group culture of collaboration and partnering creates long lasting working relationships, with the ability to provide real time, open book accounting on target price contracts to give Clients the comfort that Spencer Group are easy to do business with.

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BUILDING DESIGN



A Baker

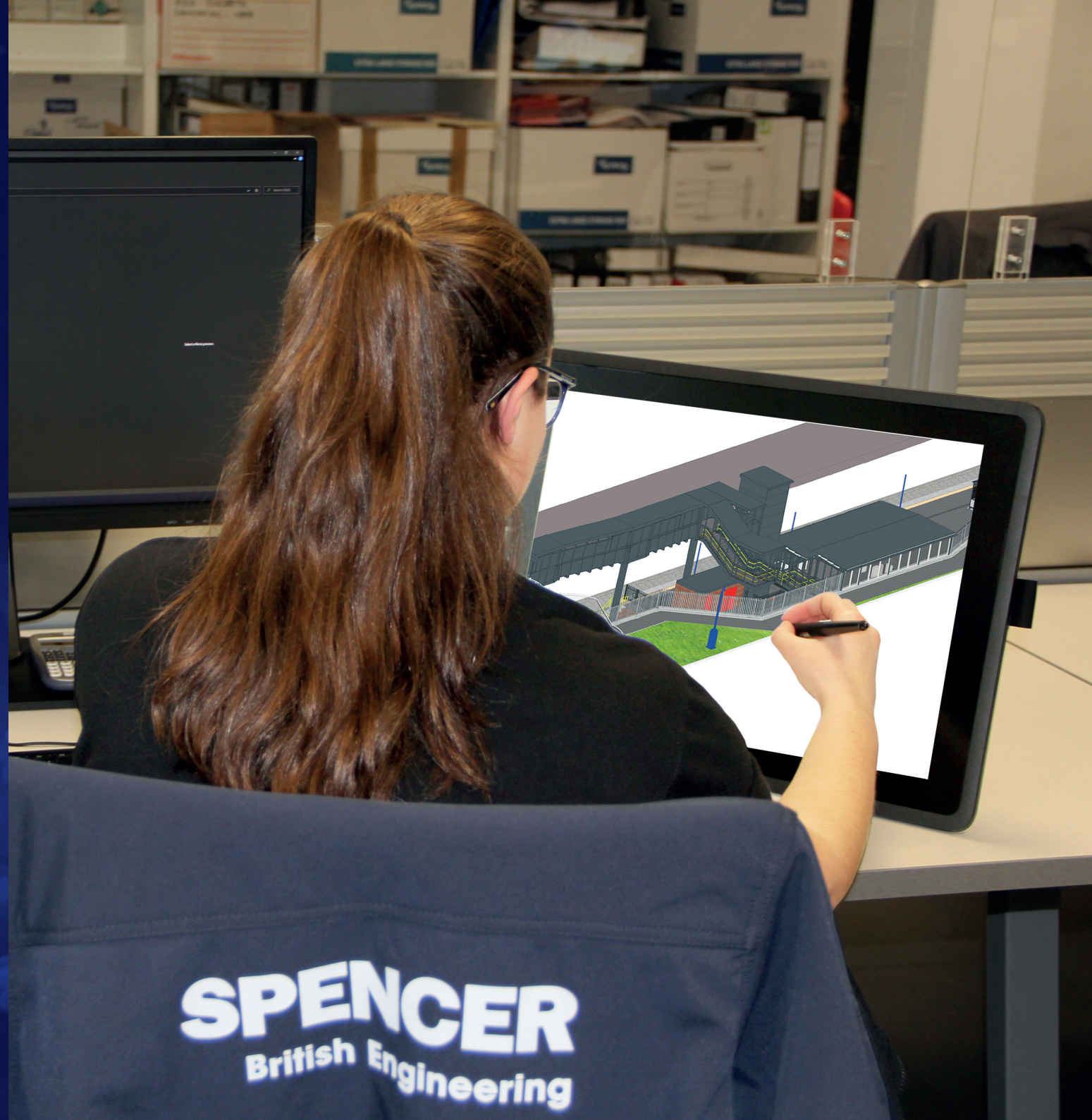
Andy Baker
Project Manager (M&E) - Mechanical
andy.baker@thespencergroup.co.uk

I am responsible for the design of mechanical building services, working within a multi-disciplinary team here at Spencer Group. I have over 30 years of building services experience, 15 of which have been working within the rail industry. This includes HVAC, renewable energy solutions, firefighting services, potable and non-potable water, domestic hot & cold water, above ground drainage, gas, depot services (CET, Ad-Blue, oils & lubricants, fuel, sanding, fume extract and compressed air).

My responsibilities include producing Mechanical building services design documentation, comprehensive drawings, detailed design specifications, calculations, risk assessments, site surveys and reports. Designs are produced in accordance with the Rail Standards, Building Regulations, Statutory Regulations, HSE, British & European Standards and recognised Codes of Practice, good practice guides such as CIBSE and BSRIA.

Further managerial experience includes reviewing and verifying content, standard and quality of design produced by design teams and supply partners carrying design responsibility. My roles within this capacity include Mechanical Services design CRE (Contractors Responsible Engineer) and CEM (Contractors Engineering Manager).

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MECHANICAL DESIGN



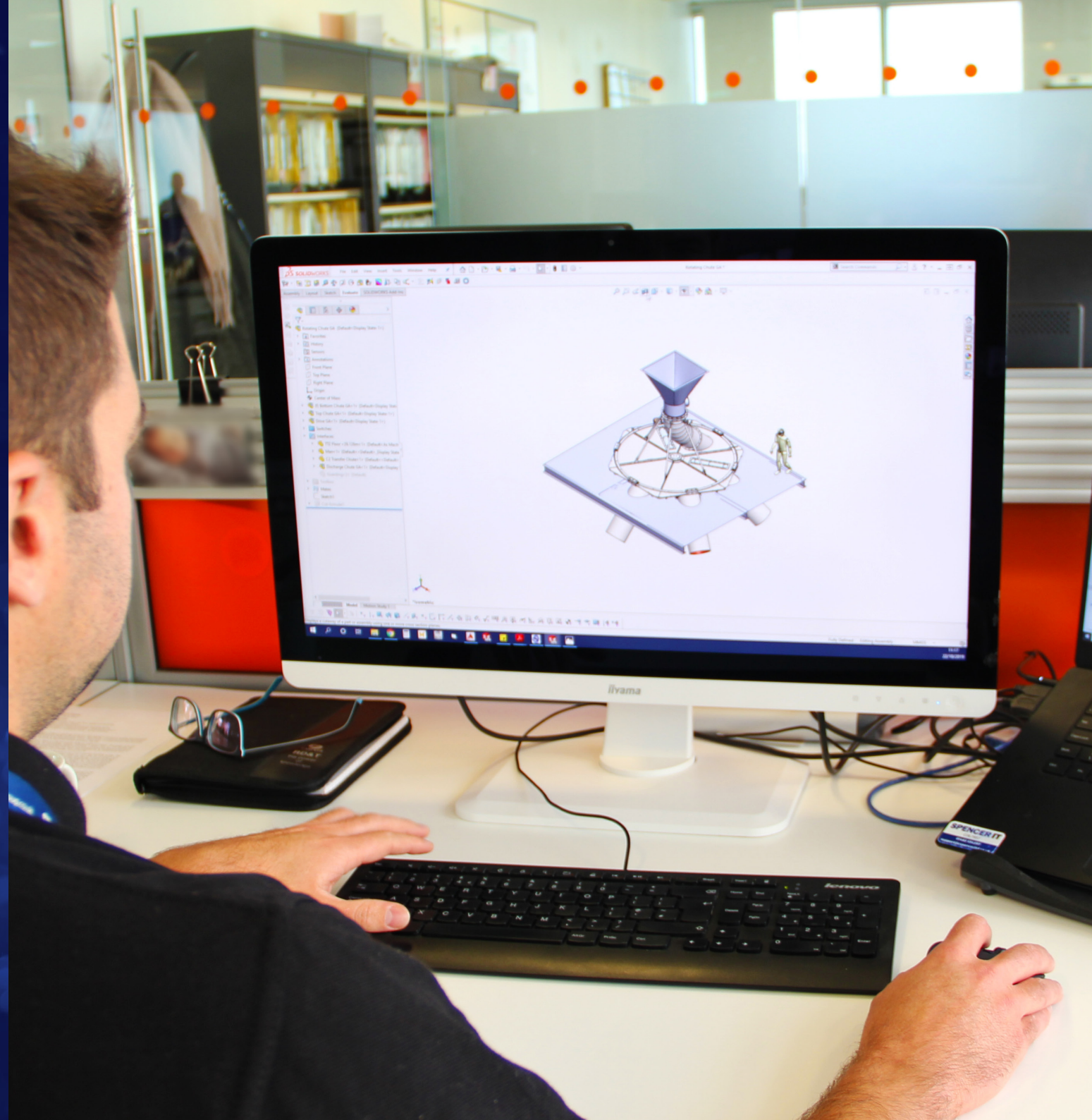
Chris Kirkby
Principal Engineer (Mechanical)
chris.kirkby@thespencergroup.co.uk

Our in-house Mechanical Design team provide specialist design support to projects for the Bridges and Industrial sectors. We have strong capabilities in 3D modelling and Finite Element Analysis, being able to produce complex, bespoke designs from concept through to detailed design and eventual commissioning.

Our team of engineers and technicians have a broad range of experience, covering the design of moving machinery, materials handling equipment, static structures and temporary works.

Some of our standout achievements include the design of a ATEX certified rotating chute for handling biomass at the Port of Tyne; the design of a new underdeck maintenance gantry for Kessock Bridge in Scotland; the design of the complete temporary works for Slipforming the secondary lining to 5 shafts on the Thames Tideway project in London.

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CONCEPTUAL DESIGN

Spencer Group have in-house capability to undertake conceptual design and feasibility studies prior to FEED & Detail design. The team has a wealth of experience in materials handling, heavy industrial and energy projects as well as undertaking Grip stage 2 work for rail projects including depots, stations and AFA schemes. Our disciplines cover Civil, Structural, Architectural, Mechanical, Electrical, Controls & Instrumentation and Process engineering.

We construct projects as well as designing them and as a result our conceptual design work can offer the added value of more accurate budgetary cost estimates and schedules at the earliest opportunity. Our clients don't have to wait until a scheme is underway before involving us, we can work collaboratively with them from the outset to check if a scheme is viable or not.

At the concept stage Spencer Group will set the basis of the study with the client, including but not limited to; operational capacities, process technologies and site and plant location options. We produce high level documentation such as Block Flow Diagrams (BFD), Process Flow Diagrams (PFD) and overall plant layout options, in addition to considering items such as power and utilities consumption.

ABP Border Control Post - Hull



Energy Works



Union Chain Bridge





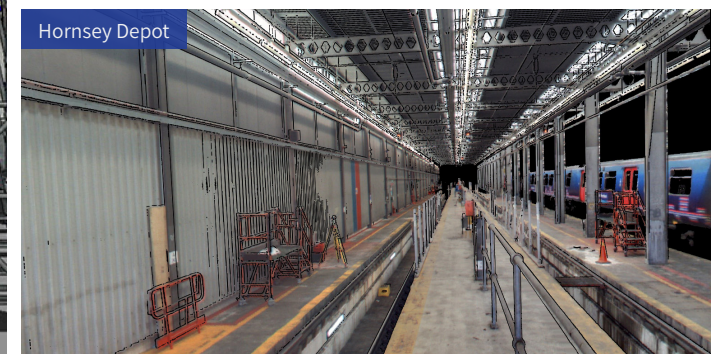
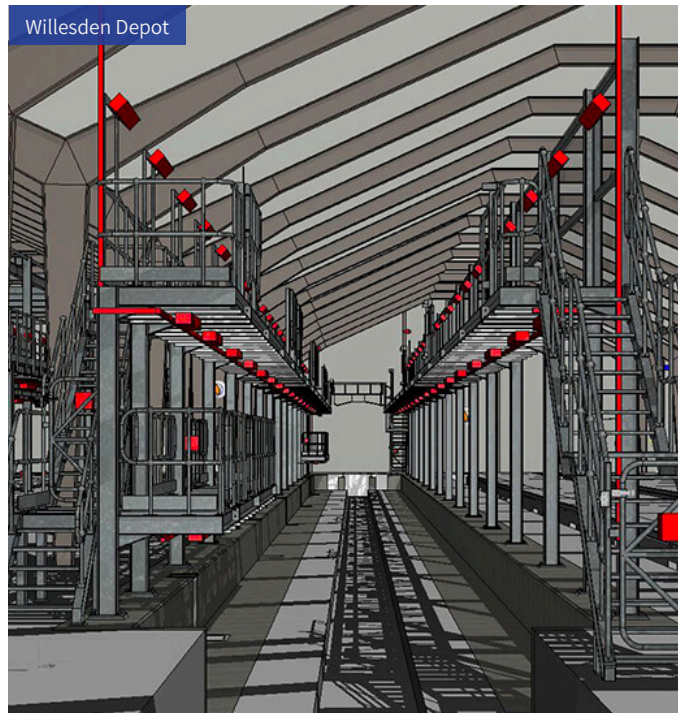
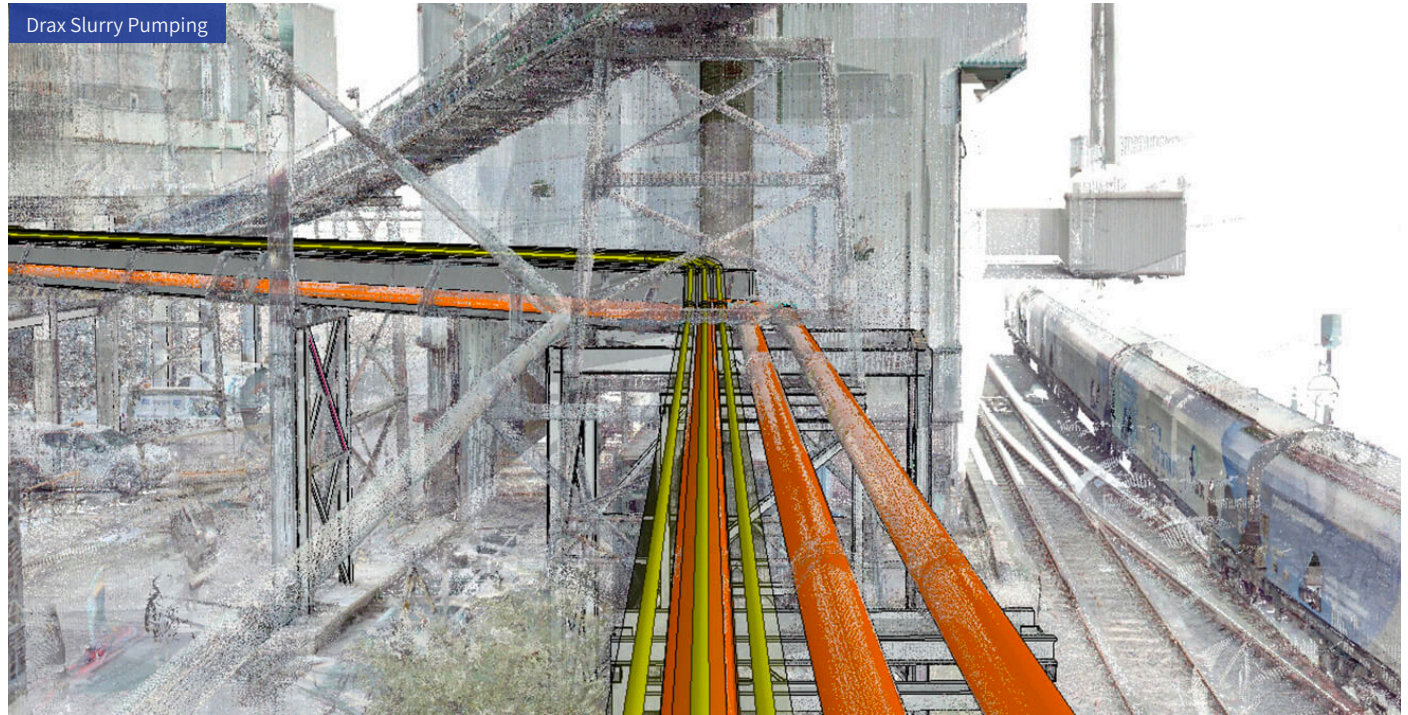
FRONT END ENGINEERING DESIGN

Spencer Group's in-house design team allows us to take a project from start to finish with a fully holistic approach to the design & build, which works best when we are involved right at the start.

Our commitment to Front End Engineering Design (FEED) enables us to ensure that every aspect of the project is optimised to client requirements before the detail D&B starts, avoiding significant changes in the execution phase, saving our clients the pain of increased costs and delays to their project completion.

Working closely with the client all the way through the project, we'll make sure that the initial specifications set out in the scope of works are cost effective, safe and buildable. We'll engage in collaborative work with all of the stakeholders on the project to make sure we're on the same page, that resources are allocated intelligently, and that our goals are understood by all. Finally, we'll review and maintain this structure throughout the project, to ensure the minimum of change and risk for all parties. That holistic approach from the D&B being under one roof results in much greater efficiencies during the project and develops a collaborative partnership with the client from day one.

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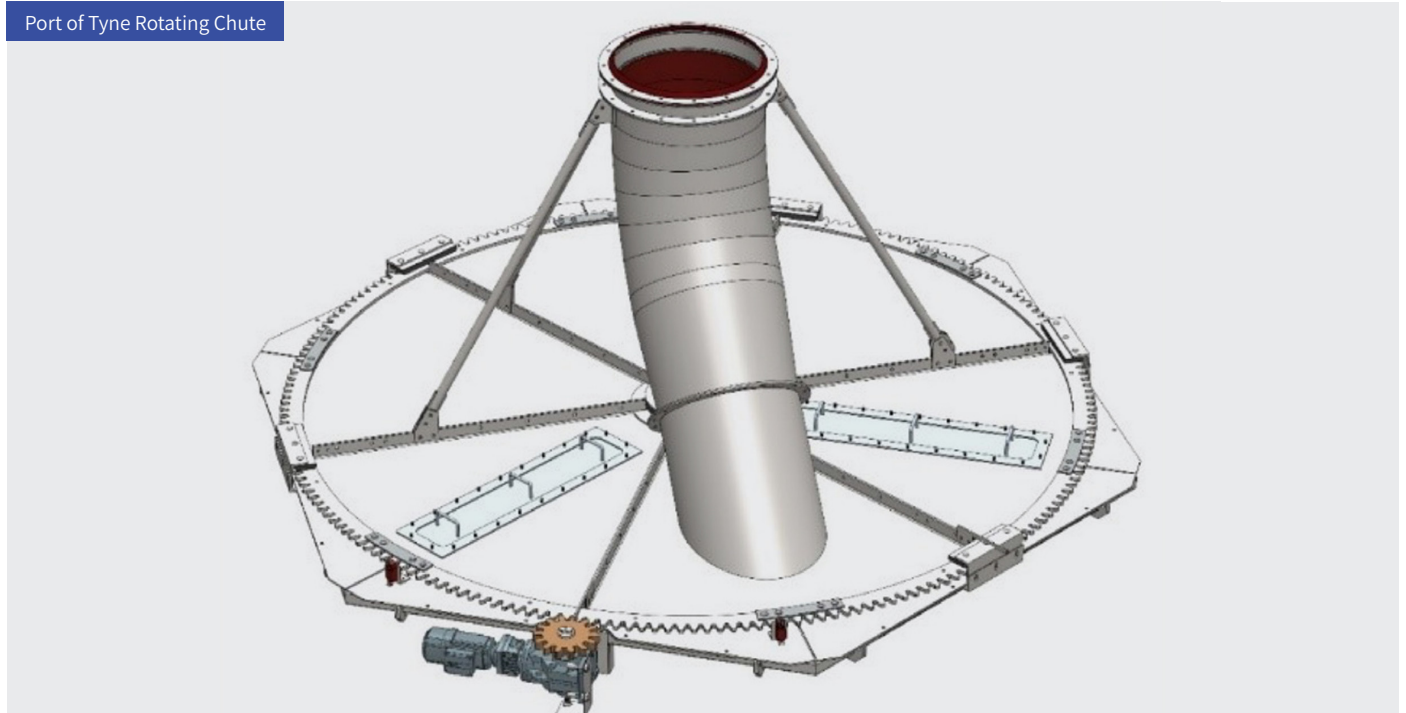


DETAIL DESIGN

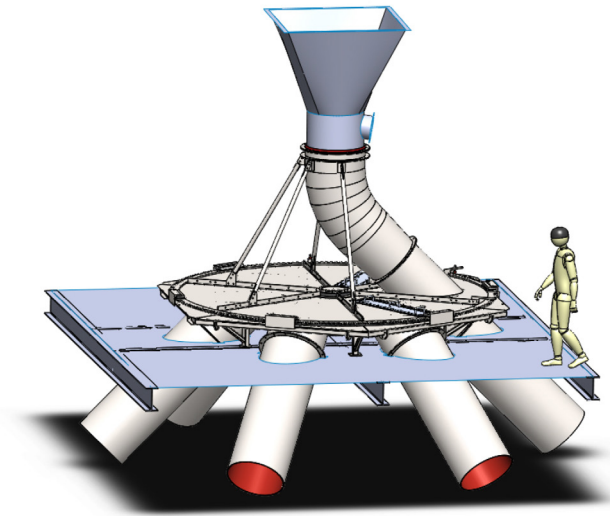
Spencer Group's in-house design team produce 75% of the detail design work that we build. We challenge conventional thinking, providing our engineers with a platform for innovation and continuous improvement, looking to add value throughout the project life cycle from concept design to commissioning and eventual de-commissioning. Our designs are based on developing workable solutions with the construction and procurement teams for buildability, safety and quality in addition to getting the best cost solution.

Spencer Group utilise the latest CAD software, from Structural Analysis, including Non-Linear FEA, using the latest Eurocodes to plant modelling with proprietary software and manual calculation from first principles. Our deliverables, such as construction drawings and material schedules are produced from 3D models using Bentley AecoSIM, Solidworks and Revit. We import laser scans to ensure site constraints are modelled effectively in our federated models and we are able to provide animations to make our models show the construction sequence when required. The whole philosophy around our design is that we will work collaboratively with all stakeholders throughout the design process with an integrated flow of data through our adoption of BIM processes.

Port of Tyne Rotating Chute



Port of Tyne Rotating Chute



Three Bridges Control Centre



Three Bridges Control Centre





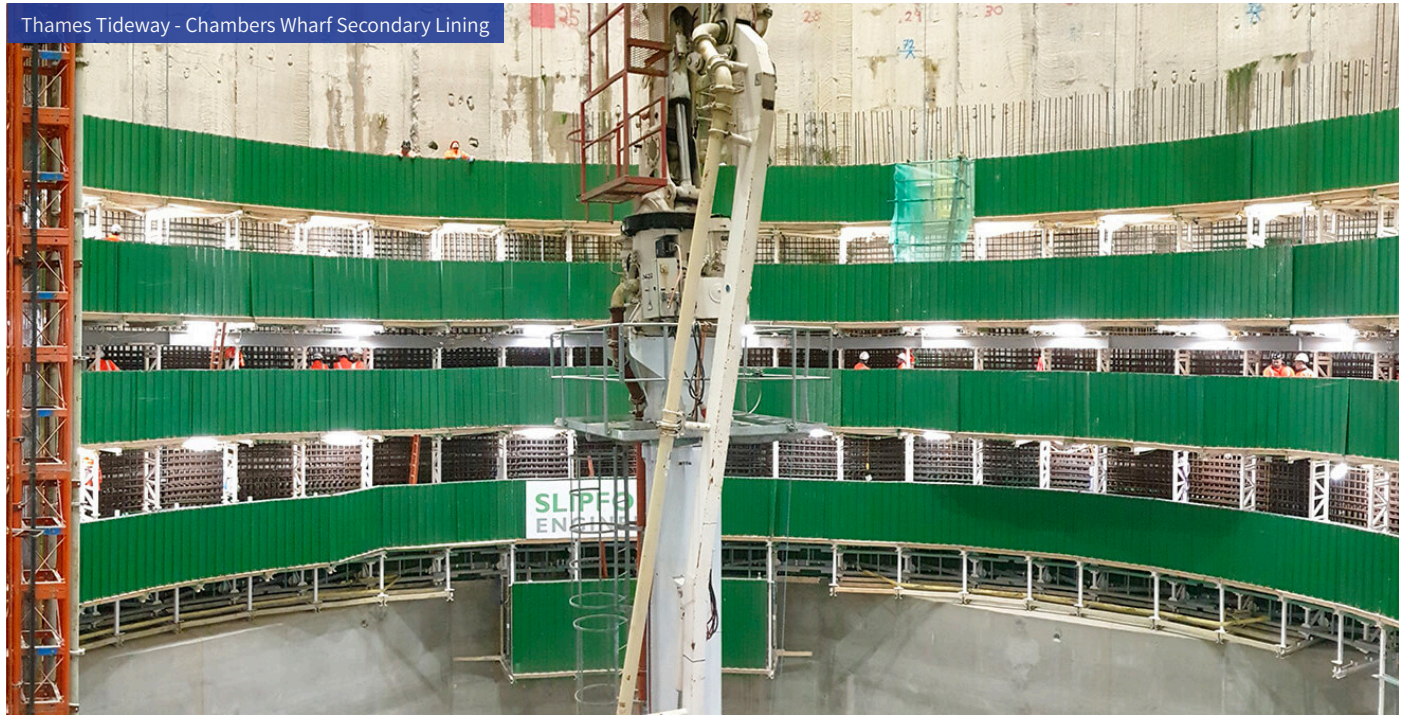
TEMPORARY WORKS

Spencer Group temporary works are managed with the same diligence as permanent works by the Temporary Works Coordinator (TWC) in accordance with BS 5975 and BS EN 12812 and in collaboration with the Temporary Works Designer (TWD). They will also work in collaboration with the permanent works designers and constructors to ensure buildable solutions are integrated into the permanent designs.

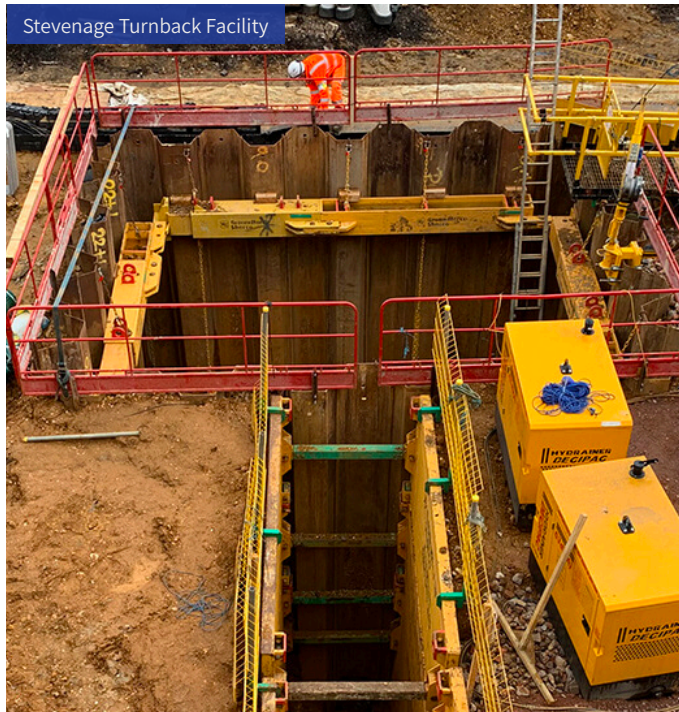
Our design department are specialists in temporary works. We undertake day to day solutions such as piling mats, sheet pile retaining walls, falsework and propping, but in addition to this we design bespoke rigs such as those used for slipforming, we are currently working with Thames Tideway on a second single sided slipform for a 50m deep shaft in central London after successfully delivering the first. We design temporary moveable access gantries to paint the and inspect the underdecks of bridges, as well as permanent ones and are currently looking at designing our own bespoke Spencer Access System instead of using proprietary kit as we have done with our slipform rigs.

We are experienced in the execution of temporary works designs to BS5975, all our slipform works are undertaken in accordance with this.

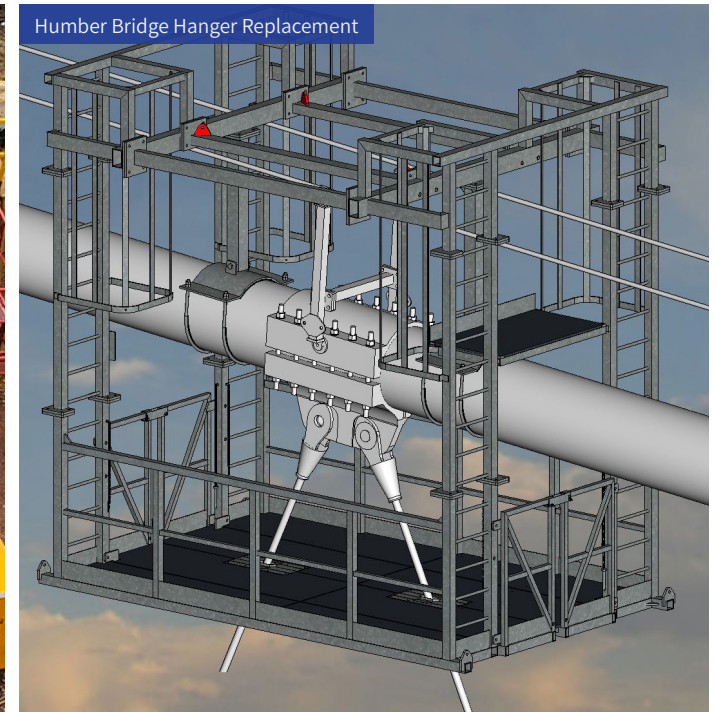
Thames Tideway - Chambers Wharf Secondary Lining



Stevenage Turnback Facility



Humber Bridge Hanger Replacement





BUILDING INFORMATION MODELLING (BIM)

In compliance with ISO19650 standards, Spencer Group have developed a standardised suite of Project Information Requirements (PIR), that have been specifically designed to be flexible enough to complainant specific employers' requirements, or are sufficiently comprehensive to be used as set of stand-alone documentation.

With a solid ProjectWise common data environment foundation, the heart of all information produced by and for Spencer Group both internally and externally is consistency. This is controlled with built in robust checking and approval workflows. The CDE is controlled by Spencer Groups' own inhouse ProjectWise development team, and is dictated to ensure the highest levels of collaboration between project stake holders.

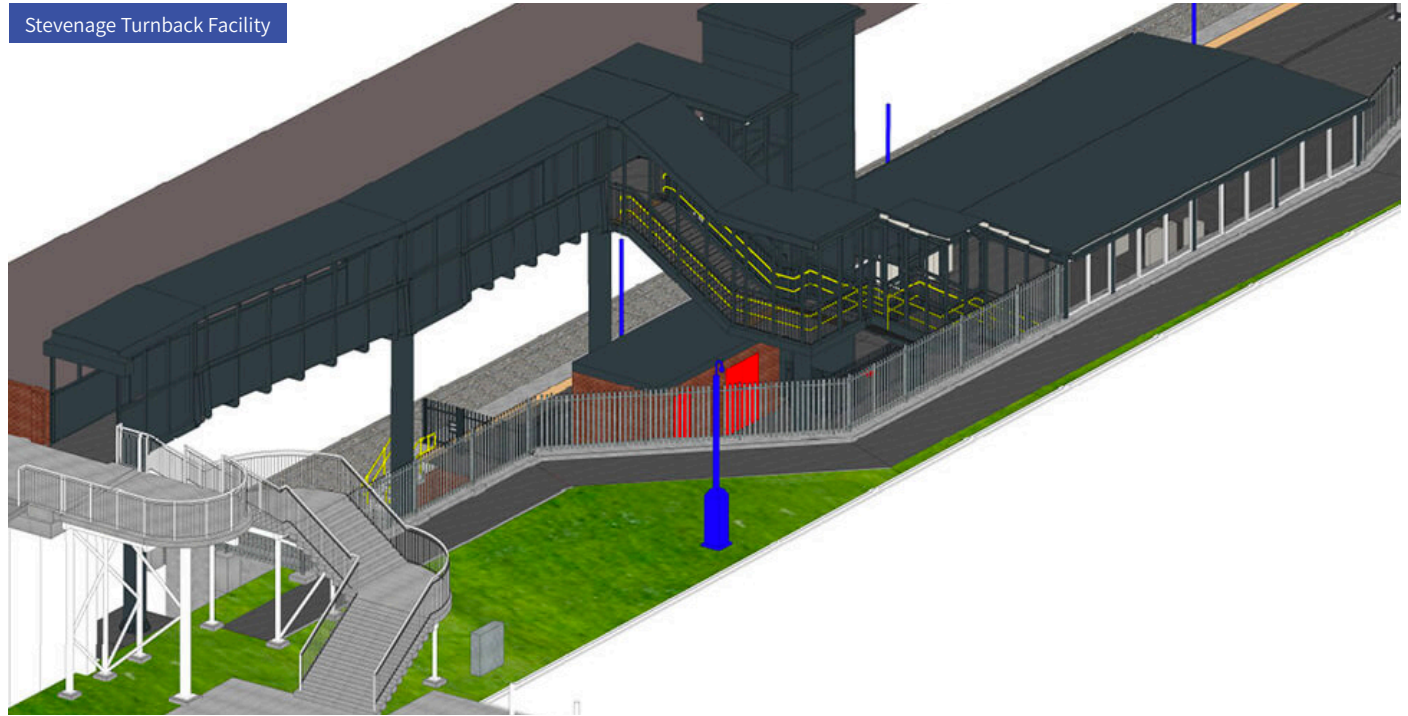
The Project Information Model is the responsibility of all those involved in a Spencer project, from concept to hand over to facilities management. Under the guidance of the project BIM manager, all teams leverage consistent information contained within the model, as well as furnishing it with their own structured data for others to use.

The Spencer Group Digital Twin development is the focus of the project prior to construction. Based on modelled survey information, the development of the project is coordinated, quantified and planned digitally and collaboratively. The result of the comprehensive digital twin is a safer and more reliable construction period, where costly clashes and delays are avoided.

Utilising modelled AR, construction teams can quickly report issues, document progress and publish commission certificates digitally, and by publishing as built information into the Project Information Model, the potential of Facilities Management by the end user is opened.

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Stevenage Turnback Facility



Union Chain Bridge Restoration





BUILD

Buildings of a commercial nature are usually of a simple and efficient design with added varying degrees of specification in the building envelope and internal fit out works. As the specification of commercial buildings can be subject to corporate identity or Client company image, the benefits for added value are limited to the structural frame and foundation elements. At the Spencer Group we excel in identifying and delivering innovative value engineering solutions which have minimal or no impact of the building material specification.

Thanks to a collaborative approach with our Clients, their representatives and the design team, we work hard to establish the requirements of an individual project and protect the building specification and materials that are important to our Client.

Commercial buildings have a variety of end uses ranging from simple offices to more complex control centres with integrated and specialised M&E installations. At the Spencer Group, we have an in-house M&E design capability which can offer a range of services from reviewing consultant designed installations to identifying value engineering potential, to providing bespoke full M&E designs. We see this as a unique attribute to the Spencer Group which can provide true value in terms of capital expenditure and the running cost of our Clients buildings.

Three Bridges Control Centre

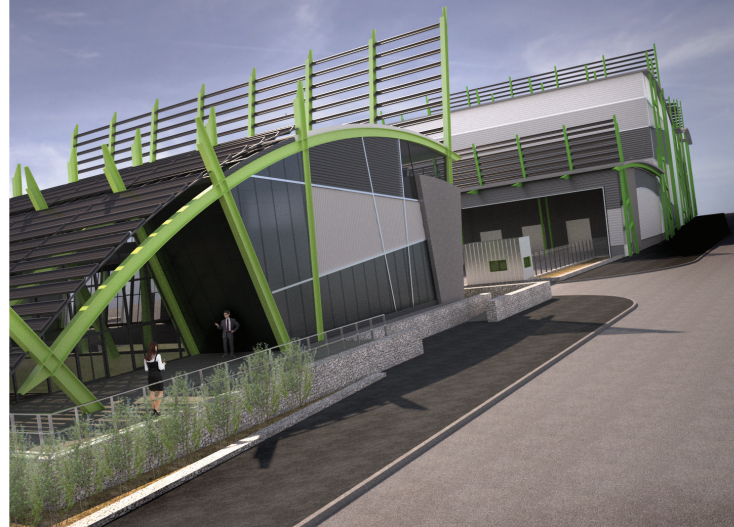


Thames Valley Control Centre



Thames Valley Control Centre

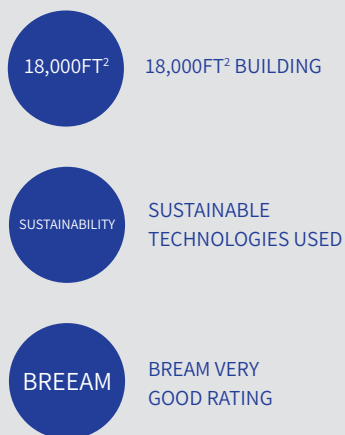




PROJECT DETAILS

Client	Energy Works Hull
Duration	8 months
Location	Hull

KEY STATS



ENERGY WORKS - ENERGY ACADEMY

Spencer Group was appointed to provide an academic learning centre as part of the overall development of Energy Works, an Energy from Waste (EfW) project built on a brownfield site in Hull. The Energy Academy formed part of a joint venture with the University of Hull and was completely independent to the main development of Energy Works. Other than one control room that interfaced with the rest of the Energy From Waste Power Station, the rest of the building including parking, infrastructure and access/egress was completely independent to the main development.

PROJECT SCOPE

Spencer Group was to provide an academic building through a design and build contract that consisted of learning facilities inclusive of laboratory's, Research and Development rooms as well as associated offices and welfare. Specialist process drainage and ventilation was required to accommodate the laboratory and R&D rooms.

Sustainable technologies such as Solar PV, underfloor heating, storm water attenuation and rain water harvesting were used.

PROJECT OUTCOME

The design of the building had to also provide access to the main plant control room and had to remain completely independent to the academic building and not impact operations of either party.

The Academy was designed to BREEAM very good standard, and had to be built within 8 months.



PROJECT DETAILS

Client	Network Rail
Duration	31 months
Location	Rochester

KEY STATS

£26M	£26M STATION FACILITY
300M	SECTION OF 17M LONG SHEET PILES INSTALLED
ZERO	DISRUPTION TO EXISTING SERVICES

ROCHESTER STATION

Spencer Group was responsible for delivering all of the civil engineering elements throughout the £145m East Kent Phase II programme. The project included the construction of three new platforms, each long enough to accommodate the latest 12-car trains (compared to the previous maximum of ten), a new canopy and construction and fit-out of the new Rochester station.

PROJECT SCOPE

Rochester Station is at the heart of the £145 million East Kent Phase II programme to upgrade a 33-mile stretch of East Kent's railway network, which was last renewed in 1959. The new £26 million facility, which replaces the old Victorian station a mile away, was built around an operational railway, close to the centre of Rochester in Corporation Street.

The station is of modern design incorporating the latest high specification finishes, M&E and telecoms for PA, CCTV, CIS monitors etc. with ticket gating.

To the rear of the new building, one of the biggest challenges of the project was the construction of an 850-tonne pedestrian subway, forming part of the new station at Rochester. It was built 'off line' and adjacent to the existing rail embankment, then installed during a 96-hour blockade over the Easter period.

PROJECT OUTCOME

The construction of the new station has given rise to a modern facility which is bright and fully step-free, offering a pleasurable passenger experience.

The station and its underpass are key to the new 1,500 home development, as it will allow residents to take a quick stroll between the riverside and town centre or easily catch a train and be in London in 35 minutes.

This project was described as an industry model for collaborative working and won three industry awards: Best Collaboration at the 2014 Network Rail Partnership Awards, Most Interesting Major Infrastructure Project at the Rail Expo Awards and Engineering Innovation from the Institute of Civil Engineers in 2015.



CIVIL

From small-scale projects to major infrastructure, Spencer Group's civil engineering experience is vast and varied.

We work closely with our customers to design and build structures from the ground up. Our highly skilled construction teams work with our in-house designers to plan projects with precision, to allow our works to be as seamless and cost effective as possible.

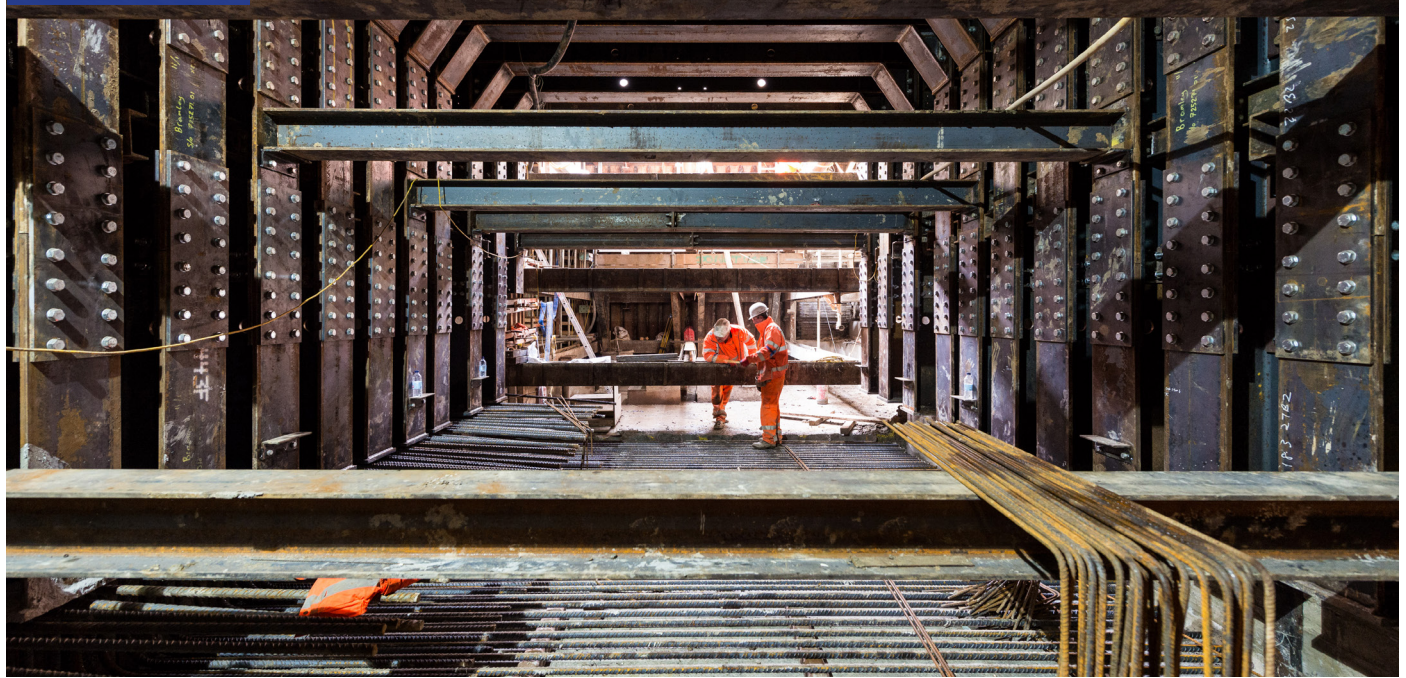
We specialise in large, complex schemes and pride ourselves on proposing alternative and innovation solutions. Through utilising our in-house design team, we can ensure the buildability of a project, and manage the risk for our clients.

Our experience over the last three decades has included everything from storage facilities and substations to marine engineering and ground enabling works. Our expertise in this industry is supported by teams that specialise in structural, mechanical, rail and marine engineering.

Collaboration is a fundamental element of any project and we have developed industry-leading processes to ensure that every stage of the project is as transparent as possible in order to facilitate more efficient ways of working. From our supply chain partners to our clients, honesty and approachability are of paramount importance.

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Finsbury Park Phase 2B



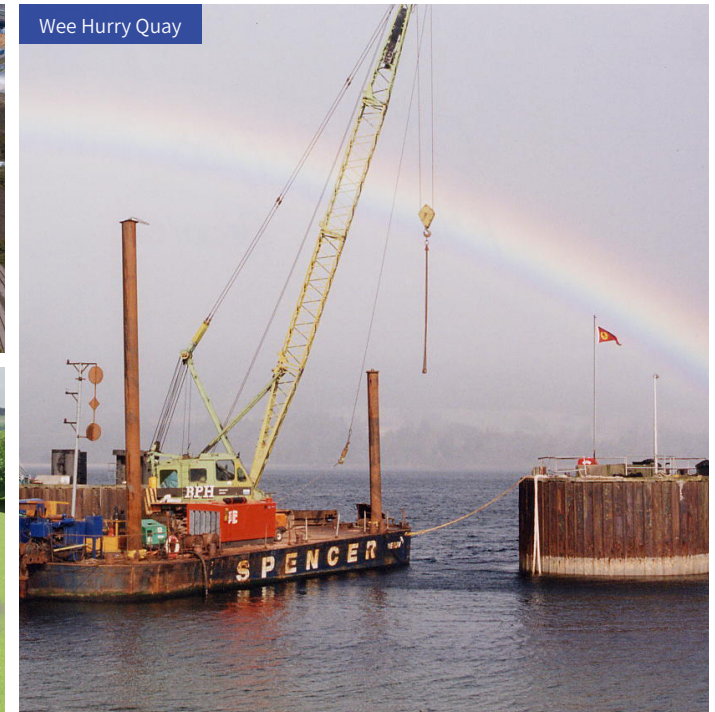
Border Control Post - Immingham

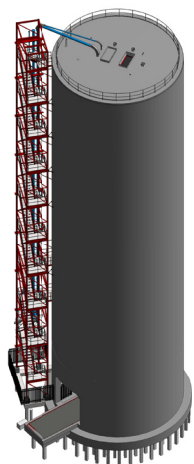


Border Control Post - Immingham



Wee Hurry Quay





PROJECT DETAILS

Client	Damac Group
Duration	11 months
Location	Hull

KEY STATS

52M HIGH SILO

6,000M³ CAPACITY SILO

10 SILO SLIPFORMED
IN 10 DAYS

DAMAC CEMENT SILO - HULL

Spencer Group and partner Slipform Engineering collaborated to engineer and deliver a new 6000 tonne cement handling facility to our Client's soaring construction industry demand. The 52m (171ft) high silo was constructed on William Wright Dock in Hull to provide a greater cement handling capacity for bulk powder import and transport specialist Damac Group.

PROJECT SCOPE

Spencer Group were appointed to design and build a cement silo capable of holding circa 6000T of cement pumped off a ship berthed at William Dock in Hull.

The scope included the installation of 230 pre-cast concrete piled foundations due to the silo being located between the dock side and the Humber Estuary. The piles were driven 25m down into the bedrock.

Once the Piles were installed and cut to level, Slipform Engineering constructed a 1m thick reinforced concrete base. Following the curing period the 15m diameter Silo was continuously slipformed to a height of 52m using an innovative temporary works access platform.

Upon completion of the slipforming works and removal of the access platform and shutters, the pre fabricated steel roof structure was installed using a 500 tonne crane to lift into final position. Once connected to the silo walls concrete was poured and finished in-situ to complete the roof.

An external galvanised staircase provides access to the roof and viewing platforms at 2 levels on the silo.

New drainage, a water main diversion and new surfacing around the operational area of the silo have been constructed to tie into the existing.

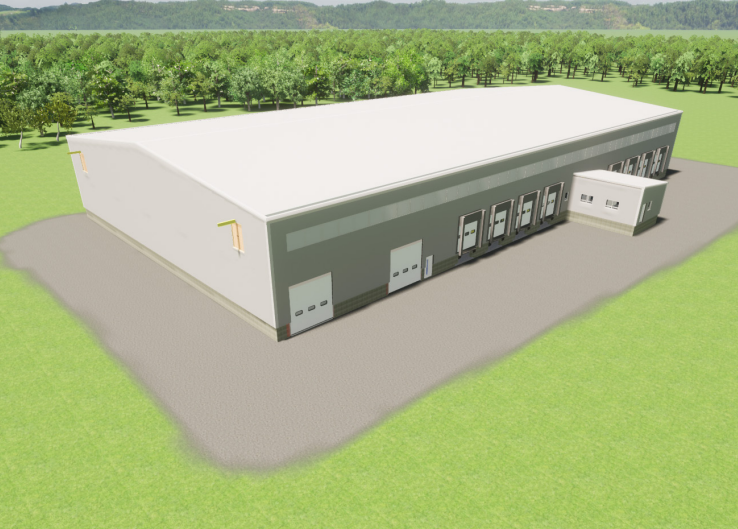
PROJECT OUTCOME

A collaborative partnership between Spencer Group and Slipform Engineering ensured the silo construction was slipformed in one continuous concrete pour in just 10 days, with the structure rising over 5m in height per day.

The project was handed back to the Client 1 month earlier than required, for a mechanical handling system to be installed by Silo Services Ltd. This will transfer the cement onto trucks in a loading bay directly beneath the silo.

The new concrete storage facility provides our Client (Damac Group) with a greater cement handling capacity for bulk powder imports.

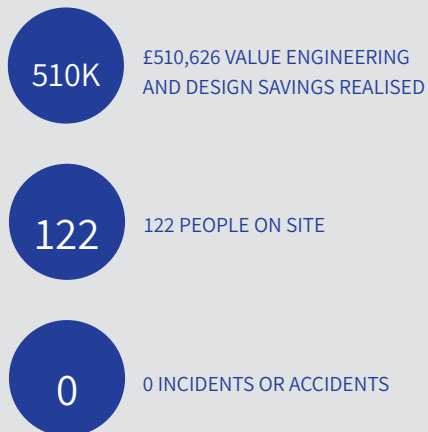
Concrete arriving via ship berthed at William Dock in Hull will be distributed by Damac Group using their fleet of specialist bulk powder tankers for construction works across the UK.



PROJECT DETAILS

Client	ABP
Duration	13 months
Location	Port of Immingham

KEY STATS



ABP BORDER CONTROL POST - IMMINGHAM

Spencer Group were appointed by Associated British Ports (ABP) to design and construct two border control post facilities at the ports of Hull and Immingham, required as a consequence of Brexit. A collaborative working partnership was formed between ABP and Spencer Group, ensuring rapid progress was made on the project to meet the challenging deadline imposed by the government. The construction of a 5.3 acre facility at the Port of Immingham, with a total floor space of 40,957 sq ft (3,805 sq m) was completed within 10 months of contract award.

PROJECT SCOPE

The project comprised the Design and Construction (D&C) of a new Border Control Post facility at the Port of Immingham, Queens Road site. The key elements of this industrial civil engineering and building scheme include the D&C of a Main Border Control Building, with a smaller associated Border Control Officers building, inclusive of a modular administration building.

Following contract award, ABP requested that Spencer Group challenge the concept designs and offer alternative value engineered solutions that would reduce cost and potentially project programme.

Solutions proposed by Spencer Group included:

- Raising the building level by 1200mm to reduce exported materials
- The introduction of a symphonic drainage system, removing multiple down pipes and gullies
- Reducing the number of piles by more than 55%
- Swapping the conventional distribution boards, containment and cabling arrangement, for a busbar trunking system.

PROJECT OUTCOME

The value engineering and design solutions adopted on the project allowed the 5.3 acre facility to be designed and constructed in only 10 months.

After lifting the building levels, Spencer Group utilised a steel grid system with precast planks distributed over key support steels, transferred through piles within the floor area. This design solution achieved a reduced pile requirement of 235 piles, removing 306.

Providing a flexible solution to the LV distribution, allowed for a quicker and easier installation compared to conventional arrangements and it also permits future expansion with minimal disruption to operations.

By working collaboratively with ABP and the supply chain, the value engineering and design solutions saved ABP £510,626.



RAIL

As one of our core disciplines, our story in the rail sector has been one of constant innovation and engineering excellence, allowing us to tackle challenges that others just can't manage. From the drawing board all the way through to delivery, our clients can expect the dedication of a team of lifelong rail professionals, combined with the skills of our in-house designers and planners who take the ordinary and make it extraordinary.

From local networks to projects of national importance, from light rail to heavy rail, we've worked on every aspect of the rail industry from signalling to OLE, from track to bridges and stations to depots. What makes the Spencer approach special is our commitment to self-delivery: whatever a project's needs, we have the capability to deliver it inhouse, specialising in complex and multi-disciplinary works across a diverse range of sectors. We connect the dots to ensure the project delivers – from start to finish.

Our approach adds value by accessing our full range of skills to deliver a 'right first time' approach. From the original 3D models to the last coat of paint, our designers and engineers constantly work with our clients and planners to identify risk and mitigation measures before they become a problem. More than that, we save time and money; taking issues of height and access, to possessions, and solving them through simple logistical planning and engineering expertise.

SPENCER
Design



Cambridge Sidings



Stevenage Turnback Facility





PROJECT DETAILS

Client	Network Rail
Duration	12 months
Location	Kent

KEY STATS

90K	90,000 WORK HOURS
120M	120M OF PLATFORM EXTENSIONS
982M	982M OF TRACK INSTALLED

GRAVESEND STATION

The remodelling of Gravesend Station was the final part of the Kent Train Lengthening Programme. Spencer Group was commissioned to add an extra bay platform to accommodate the large number of commuters to London. This needed to be long enough for 12-car trains, which also meant extending the existing two platforms.

PROJECT SCOPE

The construction phase of the project was primarily delivered over a 15-day blockade. In addition to building a new platform and extending the existing two platforms, the team also removed the existing footbridge and water tower and constructed a new AfA-compliant footbridge with lifts serving all platforms.

The Spencer team took a collaborative approach to the project; both internal and external stakeholders worked alongside the project team, which also developed positive and productive relationships with multiple partners.

A number of precautions were put in place to reduce or remove the likelihood of accidents, and the team even hired ex-Gurkha officers to control all entry and exit areas to the site and manage all access control on the busy town centre site over the Christmas period.

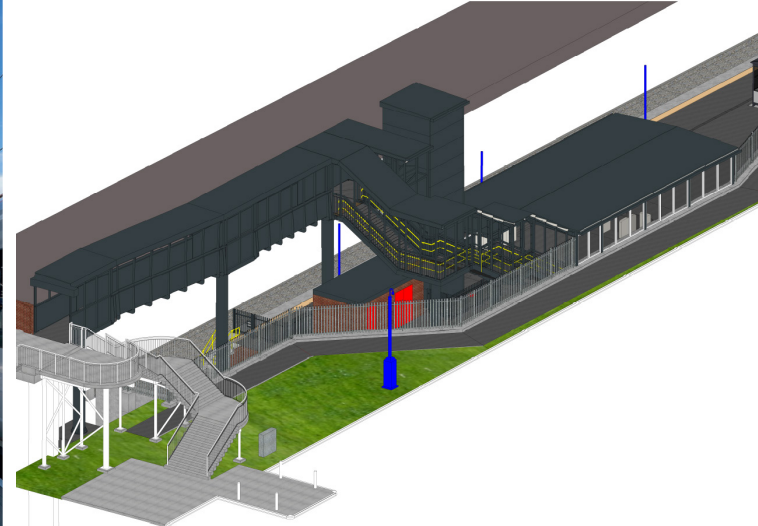
PROJECT OUTCOME

This challenging multi-disciplinary project was completed on budget and on time in some of the worst winter storms ever seen in the south of England, due in large part to detailed planning and design in order to maximise prefabricated components and remove as many wet trades as possible. This included a bespoke platform trestle design in precast concrete with a factory finished top surface.

Spencer planned meticulously for the safety of everyone involved, including installing the footbridge prior to the

main blockade in order to de-risk the project, resulting in not a single report of an accident being made throughout the length of the project. The heritage aspects of the station, including a historically significant bridge, were preserved, whilst simultaneously ensuring 'Access for All' by installing lifts on all platforms.

The improvements have unlocked capacity in Kent, with considerably more space and seats for passengers on a busy commuter route in and out of London.



PROJECT DETAILS

Client	Network Rail
Duration	24 months
Location	Stevenage

KEY STATS

127M	NEW 127 METRE PLATFORM
1	COMPLETED 1 YEAR AHEAD OF SCHEDULE
1.6	MILES OF ELECTRIFIED TURNBACK LINE

STEVENAGE TURNBACK FACILITY

A two-year project, Stevenage Turnback Facility was a complex scheme involving civil, structural, M&E, P-way and OLE elements. We worked in collaboration with Network Rail, Govia Thameslink Railway and other project stakeholders to successfully deliver the scope of works twelve months ahead of the planned completion date.

PROJECT SCOPE

Spencer Group were appointed as the Principal Contractor and Principal Designer to extend the existing Down Hertford Loop into Stevenage Station and provide a turnback facility serviced by a new single platform sufficient for a 6-car set based on Class 717 coach lengths.

The scope of works included over a mile of new plain line P-way with a switches and crossings unit connection into the East Coast Main Line, along with associated new OLE structures and equipment, signalling, lineside cable troughing, bonding, electrification and power, M&E, retail telecoms services and associated

civil and structural engineering activities, such as earthworks to embankments, piling, drainage, RC works and structures. The scheme also included the design and construction of a new station entrance, stairs and lift.

Within the station and passenger areas, we designed and constructed a new 127m turnback platform to accommodate a 6-car set Class 717 vehicle, including a 5-metre safe distance between the train and the buffer stop. In addition, 41m of passive provision was made for the future extension of the platform to accommodate 8-car sets.

PROJECT OUTCOME

The project was achieved by removing risks early through our 'Safe by Design' process. To prevent slippage of the programme, we erected two new portal structures for OLE at the southern end of the site. This activity had to be completed within a 72-hour blockade. To de-risk the task, we brought in a large mobile road crane and built large supporting bases to ensure the works could be achieved in the available window of 24 hours.

The completed project facilitates faster and more frequent commuting services between Hertford and Stevenage.



BRIDGES

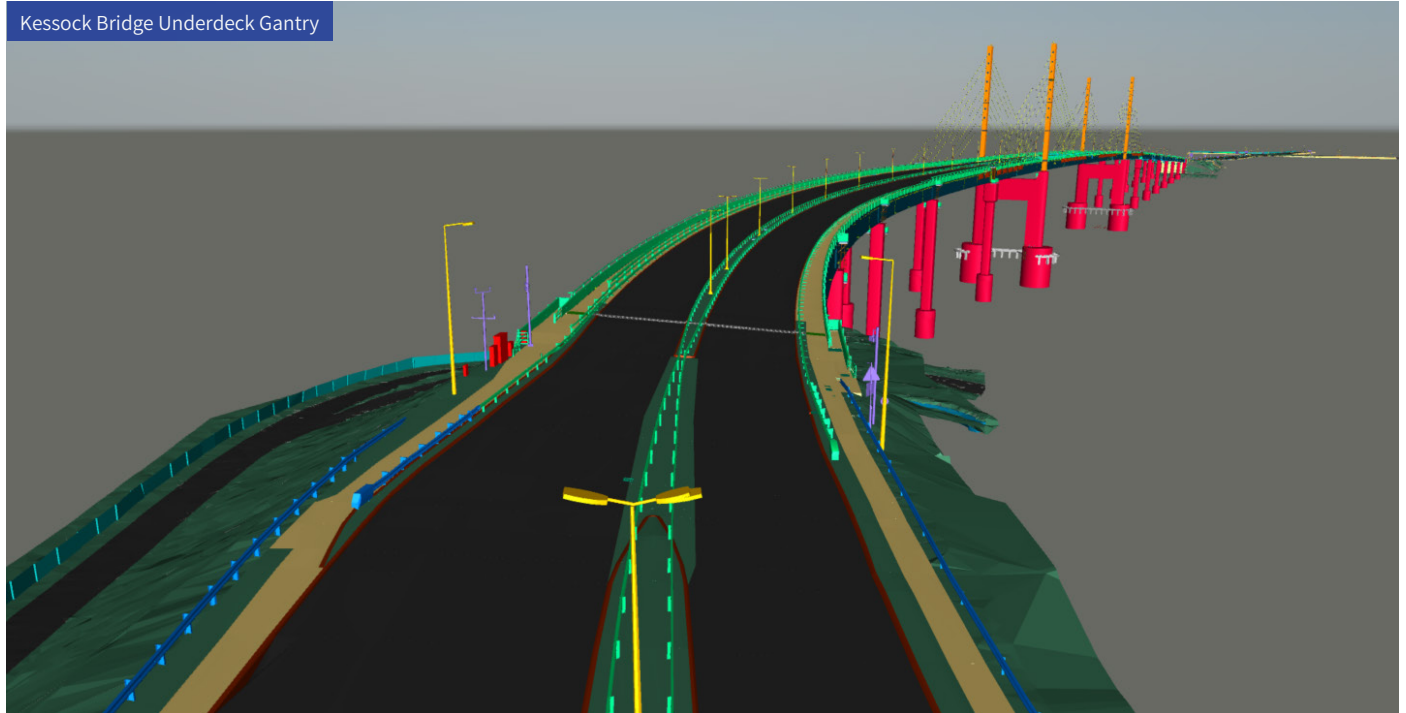
Joining communities across the world, our work on some of the world's largest and most impressive bridges has seen us achieve many industry firsts; from our patented cable crawler, which allows our engineers to work at height and keep the bridge operational, to our retro-fit dehumidifying process which is prolonging the life of suspension bridges across Europe.

From innovative design and build projects to advanced maintenance and asset management, our robust capability serves not only individual structures but also key elements of larger schemes such as rail projects and highways.

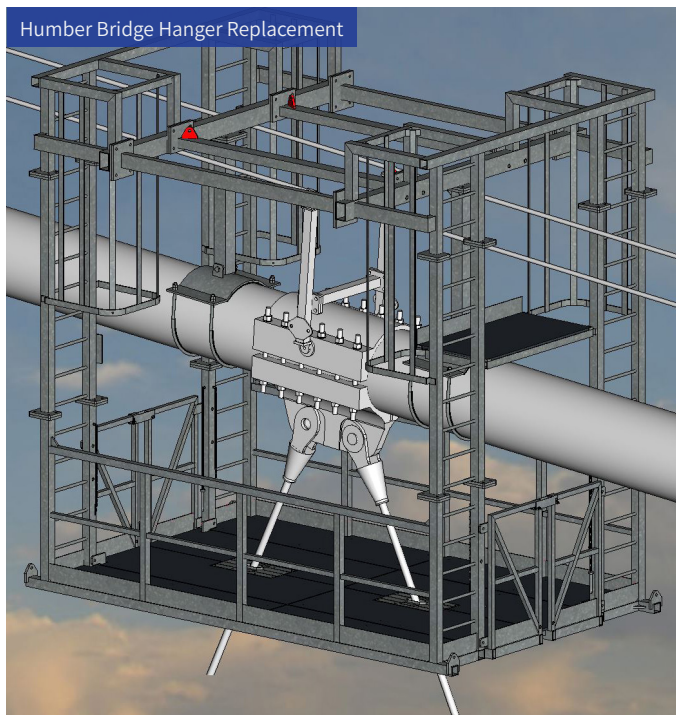
We have developed pioneering temporary works and permanent solutions ranging from small railway bridges to long span structures.

The teams' vast experience demonstrates our capabilities of delivering safe static and moving structures on highways, rail, waterways, pedestrian and cycle-way crossings. Our unique approach to access, strengthening, refurbishment and renovation provides innovation and minimises disruption for stakeholders.

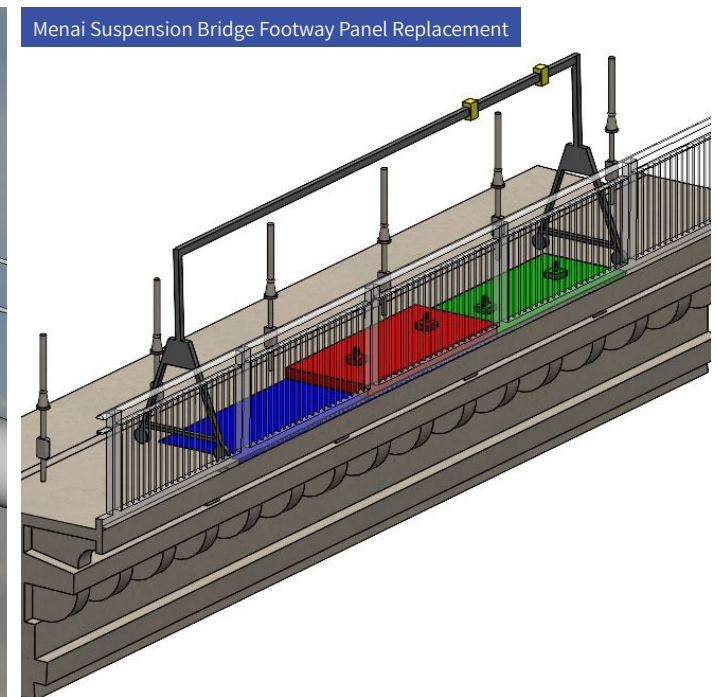
Kessock Bridge Underdeck Gantry

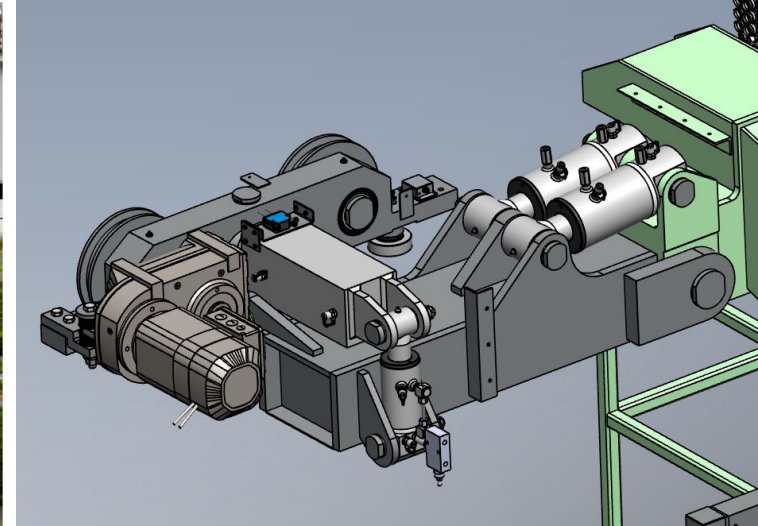
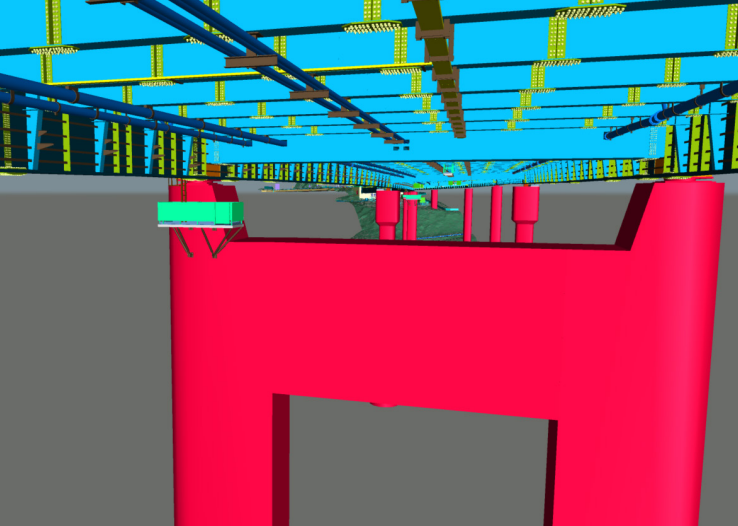


Humber Bridge Hanger Replacement



Menai Suspension Bridge Footway Panel Replacement





PROJECT DETAILS

Client Bear Scotland
Location Inverness, Scotland

KEY STATS

- 1KM** LENGTH OF GANTRY TRAVEL
- 3** GANTRY ARTICULATES AROUND THREE AXES
- 160MM** GANTRY GROWS IN LENGTH DUE TO CHANGE OF RAIL GAUGE

KESSECK BRIDGE UNDERDECK GANTRY

The existing underdeck access gantries on the Kessock Bridge had reached the end of its operational life. A more refined and robust version was required. The Spencer Group were awarded the contract by BEAR Scotland and Transport Scotland to fully design, build, install and commission a new under-deck motorised gantry that could be used year-round to maintain the bridge for the client. The new access solution would need to allow access to the entirety of the under-deck area and outer faces of the main girders, as well as providing a solution for emergency escape from the gantry in all locations on the bridge.

PROJECT SCOPE

The new gantry would be required to articulate around the geometry of the bridge in order to run freely along each span, providing access to the under-deck of the bridge as well as the piers and the exterior of the bridge utilising specially designed scissor lifts on each end of the gantry.

The scope included upgrades to the gantry parking area at the North side of the bridge to allow gantry to be safely stored and maintained when not in use. The gantry can be jacked up from the bridge utilising specifically designed jacking frames, permitting a detailed inspection of the

load bearing components of the gantry, prolonging its operational lifespan and maximising its availability.

In addition, improvements to the gantry infrastructure have been installed in the form of dedicated gantry charging points along the length of the bridge at selected piers, to ensure the gantry can be plugged in to electrical supply when not in use, ensuring optimum maintenance and prolonging its operational life.

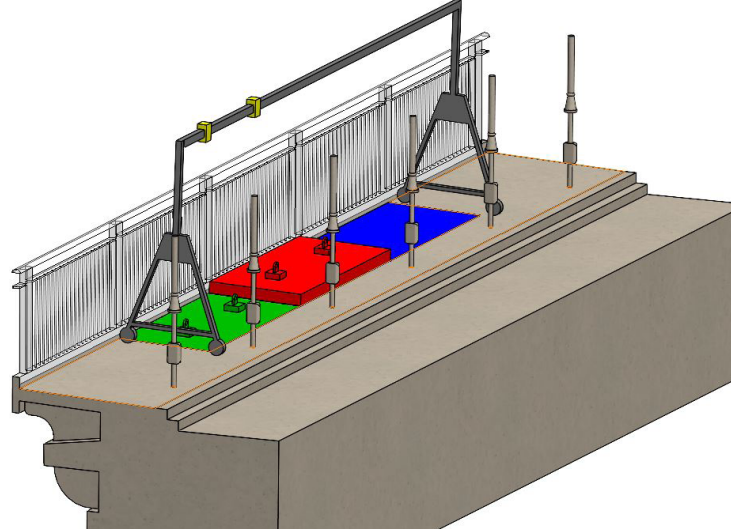
PROJECT OUTCOME

The gantry is one of the most complex designs of this type of equipment known, which demonstrates Spencer Group's competency in multi-disciplinary engineering, by combining mechanical, structural and electrical expertise.

Spencer Group's in-house mechanical design team designed the gantry from concept to detailed design. An innovative design feature of the gantry includes hydraulic 'span compensator' cylinders (rams) which the full weight of the gantry structure is suspended from.

Each of the rams is connected to a piston accumulator system, which provides a constant force onto the rams to assist with skew control and anti-crabbing when traversing along the runway rails. Full information and feedback is provided through the HMI control screen, providing the operator with complete control of the gantry functions.

The gantry was factory acceptance tested, site acceptance tested, commissioned and handed over to the client by Spencer's in-house bridges delivery team.



PROJECT DETAILS

Client	UK Highways A55 Ltd
Duration	12 Months
Location	North Wales to Anglesey

KEY STATS

73

FOOTWAY PANELS
REPLACED

1

ROBUST ENCAPSULATION
SYSTEM DESIGNED

1

SPECIAL PURPOSE PANEL
LIFTING SYSTEM DESIGNED

MENAI SUSPENSION BRIDGE FOOTWAY PANEL REPLACEMENT

Spencer Group were initially appointed by the client to review proposed options for construction methods of replacement footway panels, through an early contractor involvement process. As part of the review, our team proposed an alternative method of panel manufacture by suggesting off-site pre-cast units over the clients originally proposed in-situ poured concrete. This was delivered by carrying out accurate surveys of each individual panel, resulting in significant quality improvements to the construction whilst eliminating many of the environmental hazards associated with in-situ poured concrete on site above the Menai Strait.

PROJECT SCOPE

Following the success of the ECI phase, Spencer Group were awarded the subsequent construction works as the Principal Contractor to replace 73 concrete footway panels on the approach spans of the bridge.

Each footway panel was dimensionally surveyed accurately from both above and below the panel, utilising specialist rope access techniques. Every panel was custom manufactured off-site and inspected before installation to within +/- 2mm tolerance on width, length and squareness.

An A-frame lifting arrangement was adapted which enabled the replacement of the 1.2T panels in one operation, eliminating the requirement to traverse the frame during lifting operations and allow a panel to be replaced with a single day shift.

A lightweight innovative bespoke debris capture system was provided which slides along the length of the approach spans below footpath level, coinciding with panel replacement operations. The system sealed to the bridge along the length and sides of each panel to contain construction materials.

PROJECT OUTCOME

By the end of March 2021, all 37 panels were replaced on the West footpath with 100% success rate, which is a huge credit to the whole project team.

The A-frame lifting arrangement and carefully thought through methodology hugely improved safety and control of the lifting operations.

As a result of the success of the project and excellent collaboration between the whole project team, the project was recognised by winning the Bridges Management Award at the 2021 Bridge Design & Engineering Awards.

The Bridges Awards celebrate the sheer ingenuity, project management and cooperative skills of the people behind the design, construction and maintenance of pedestrian, highway and rail bridges in the UK.

Kerry Evans (Operations Manager of the A55 DBFO on behalf of UK Highways A55 Ltd) collected the prestigious award for the project which involved a collaborative partnership between UK Highways A55, WSP and Spencer Group.

SPENCER
Design



M&E

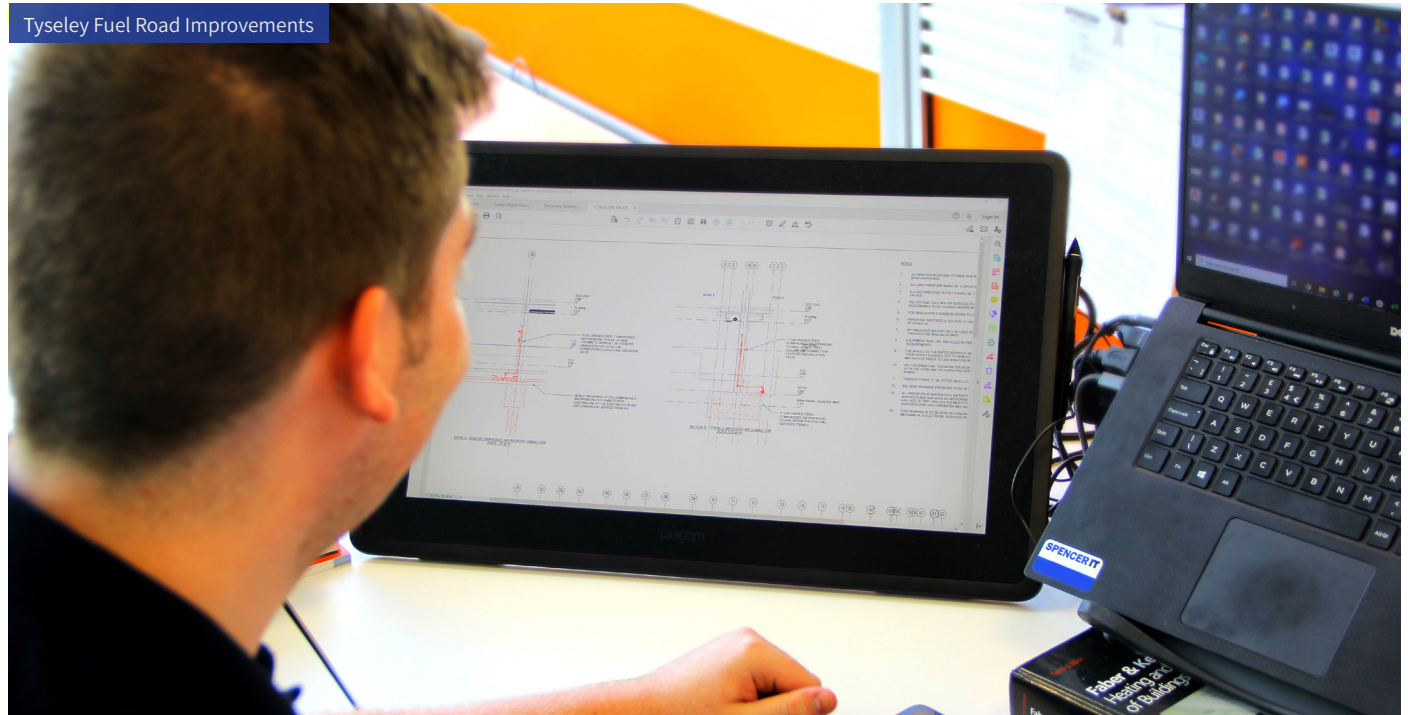
Our multi-skilled and widely experienced M&E professionals have been at the forefront of key innovative projects for three decades, from major rail maintenance projects and signalling control centre work, to state-of-the-art refurbishments and extensions.

Our designers work in unison with our construction delivery teams, focusing on value engineering and optioneering right from the start. Whether we are delivering stand-alone M&E services as part of an overall construction project (working alongside other client contractors) or we're combining our in-house design M&E and Civils/Building skills within existing assets, we can cater for any client requirement.

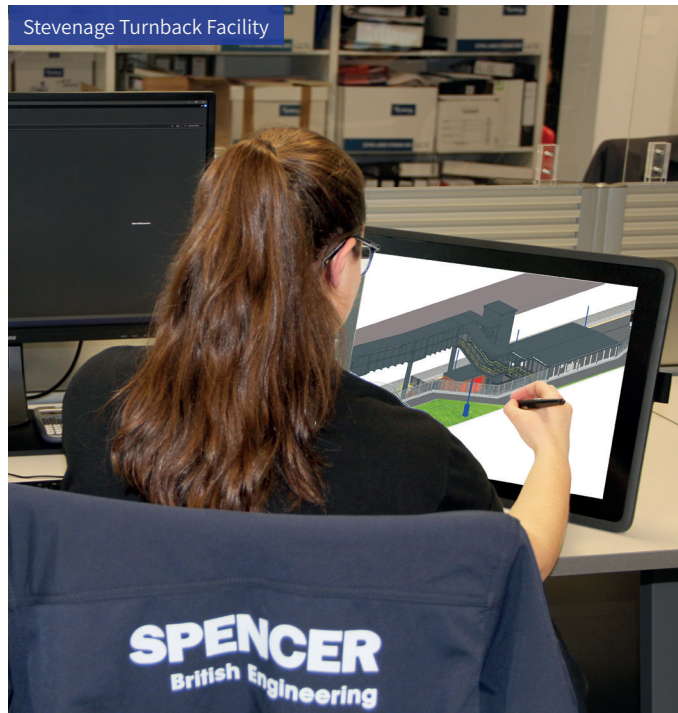
We support our client's through optioneering, early contractor involvement, buildability, programme optimisation, cost analysis and value engineering to ensure we deliver the best value-adding solution available. We are well versed to operating in onerous, safety critical environments, alongside other contractors within confined areas and busy operational work sites.

SPENCER
Design

Tyseley Fuel Road Improvements



Stevenage Turnback Facility



Tyseley Fuel Road Improvements





PROJECT DETAILS

Client	Northern Rail
Start Date	June 2022
End Date	January 2023
Duration	33 weeks
Location	£2.1 million

KEY STATS

8

AUTOMATED CET
SYSTEMS INSTALLED

1

OFFICE ACCOMMODATION
MODERNISED

1

ENERGY SAVING LIGHTING
CONTROL SYSTEMS INSTALLED
THROUGHOUT DEPOT SHED

MANCHESTER INTERNATIONAL DEPOT

The depot was originally built in the early 1990's as part of a plan to operate Eurostar international train services from Manchester to Europe. This was seen as uneconomical and was never implemented. The depot was sub-let from 2018 – 2021 to train manufacturer CAF. The 30 year old train depot required substantial modernisation to ensure the depot was a safe and compliant operational facility.

PROJECT SCOPE

The Manchester International Depot Upgrade required Spencer to take the project from GRIP stage 3 Option selection through to GRIP stage 8 project close out. A full dilapidation survey was undertaken for the building structure, roof, fittings and fixtures, M&E building services including fire alarm, depot protection, heating, ventilation and air conditioning to both office and shed. This allowed the client to bring the depot back into operation providing a comfortable, modern environment. As part of option selection, return of investment calculations were produced to provide the client with a payback period and cost savings for replacing the existing lighting with new LED lighting including daylight dimming and absence detection. The client

also required the installation of a fully automated CET (Controlled Emission Toilet) system to allow for the safe and hygienic disposal of toilet waste from the train onboard toilet retention tanks to the sewer. This included fully automated tanking and flushing water systems.

The office block was refurbished including kitchen renewal, toilet IPS panels and heating, ventilation and air conditioning.

The external lighting throughout the depot was replaced with the latest energy efficient lighting and control systems providing presence detection and dimming to increase cost saving. 200m of maintenance/driver walkway

lighting bollards were installed to provide safe access and egress. New painted walking routes, upgraded car parking areas including disabled parking and an external security office were provided.

The existing depot protection system was upgraded to include a new SCADA system, key exchange and personnel log on/off panels. The existing incandescent lamp signals were upgraded with replacement LED units providing enhanced signal recognition.

PROJECT OUTCOME

Spencer Group successfully modernised and enhanced the reliability of the depot by implementing various upgrades to align the depot to the latest Network Rail

standards and provide a safe modern train servicing facility. The improvements to the depot focused on energy and environmental upgrades to ensure future energy savings for years to come. The works were staged to ensure all high level works in the maintenance shed were completed on schedule and handed back to allow the re-energisation of the OLE.

The depot upgrade was completed on time, safely and to the clients budget. Training was provided on all aspects of the upgrades including the CET system and Depot Protection. Hand back completed the process providing a transition from Spencer to client.



PROJECT DETAILS

Client	West Midlands Trains
Duration	19 months
Location	Birmingham

KEY STATS

2

CANOPIES
REPLACED

2

PIT EXTENSIONS

1

NEW SERVICE GANTRY
OVER NETWORK RAIL
INFRASTRUCTURE

TYSELEY DEPOT FUEL ROAD IMPROVEMENTS

Spencer Group have been appointed by West Midlands Trains to upgrade the existing fuel roads 13, 14 and 15 at Tyseley Depot. Enabling works include installing a temporary fuelling and CET system to road 12 to allow disruptive works to take place, one road at a time. The project scope involves improvement to the fuelling on Roads 13, 14 & 15 including capital plant, maintenance pit extensions/upgrades and the replacement of Road 13/14 and 14/15 canopies. We are also providing additional M&E services including; coolant, oils, screen wash, mobile sanding, CET, compressed air, lighting, shore supplies, depot protection interlocking, train access gantires, and associated power supplies.

PROJECT SCOPE

The project scope involves the upgrade to existing fuel Roads 13, 14 and 15 at Tyseley Depot including the installation of temporary fuelling and CET to Road 12. Fuel point improvements – extend and repair to Roads 14 and 15 rail pits.

Improve and extend the fuelling to 4 cars on Roads 13, 14 and 15. Remove the old, extend and replace the existing Road 14/15 canopy. Remove the old and replace the existing Road 13/14 canopy, leaving skeleton ends.

Install additional piped services for antifreeze (coolant), oils and screen wash.

Install additional piped services for CET, compressed air and washing lances. System of nose end access at both ends of the Fuel Point Roads.

Provide mobile sanding bowsters and bowsters for oils and coolant. Install associated power supplies and provide Shore supply x8 16amp sockets.

Drains improvements to associated areas. Sheet piling to Roads 14 and 15 pit extensions. Access improvements to on-site fuel tanks and mitigation of existing site issues - removal of walking route trip hazards.

Spencer Group's site team volunteered to rebuild an old large, eroded planter at the nearby Tyseley Station whilst carrying out the Tyseley Depot project.

SOCIAL VALUE

The volunteering work, on behalf of the West Midlands Train volunteer group, involved rebuilding structures within the 24m x 1.8m planter whilst also donating top soil to refill the planter once completed for flowers and plants to be planted.

