

ENERGY & INFRASTRUCTURE



WHO WE ARE

SES Engineering Services (SES) is recognised as one of the leading M&E partners in the UK, delivering for a wide range of customers by creating environments that our clients can excel in. The drive for excellence and innovation is part of our DNA, maintaining SES as the design and build contractor of choice in the built environment.

Nothing is more important to us than the safety of our people and everyone we come into contact with. We operate a no compromise approach and our record of keeping people safe is second to none in the industry.

As a market leader, SES delivers building services that are derived from an exceptional level of technical authority. We deliver bespoke design-led solutions and optimise productivity for the whole construction team, by maximising offsite manufacture in our prefabrication facility, Prism. We are committed to the 'art of pre-construction'. Our designers, engineers and production teams are committed to reducing on site hours, and delivering our solutions in a safer, greener, more professional and efficient way.

Our in-house design capabilities linked with our Building Information Modelling (BIM) and Building Physics Modelling (BPM) teams are happy to work from first principles or work in collaboration with existing design teams to create the right and optimised solution for our customer's needs. We are a thinking business and our philosophy is to use design and technology to evolve solutions, environments and performance.

The energy and infrastructure sector forms an integral part of the SES business, by bringing together our BIM level 2 capabilities and offsite technologies to deliver an outstanding engineered solution.

As a business, SES sees the benefits in carrying out Lessons Learned Workshops from project design stage through to final handover to the client. Capturing these lessons and disseminating through the business, avoids general pitfalls such as a decrease to the planned duration of the project, providing superior engineered solutions, reducing costs and delivering enhanced customer needs.

We create spaces where people are able to work, thrive and successfully evolve in an ever changing energy world.





WHAT WE DO

We deliver bespoke mechanical and electrical services, providing whole life solutions based upon a client's requirements and aspirations. Our early engagement on projects consistently leads to a reduction in project costs and programme delivery.

TECHNICAL ENGINEERING & DESIGN

We have vast experience with MEP design and build projects with well over 50% of our projects being D&B. Our capability and expertise allows us to deliver projects from concept stage with a focus on developing safe, best value, low environmental impact solutions for our customers.

A unique part of our business is our engineering management team who work with our customers and pre-construction teams to create innovative, affordable and value driven solutions. Our commissioning, compliance & quality team then ensure that every project has a Smart Landing.

DIGITAL ENGINEERING

Building Physics Modelling (BPM) is one of the most upcoming attributes of Digital Engineering in the construction sector. With the industry emphasis on carbon reduction, SES has invested heavily in building modelling software and an in-house building physics engineering team.

Building Information Modelling (BIM) forms an integral part of our service solution. The ISO 9001 accredited in-house team brings a practical, commercial and collaborative approach to ensure all technical aspects and risks of a project are managed fully.

Virtual Reality (VR) is the latest three dimensional computer generated environment which creates the illusion of reality, allowing project teams to detect clashes, understand structures and installation principles.

OFFSITE BUILDING SOLUTIONS

Prism offers a modern, innovative and forward-thinking solution that presents an accurate and affordable option to labour intensive, time consuming on-site production and assembly.





KONE CRANES

125t

MTS

OUR OFFERING

Working in the energy and infrastructure arena, SES spans the following sub sectors:

- Biomass conversion of existing coal fired power stations
- Centralised energy centres and district heating networks
- CHP facilities
- Dedicated gas or biomass fired power stations
- Energy from waste facilities
- Waste treatment facilities
- Inter-connector stations

Over the past few years SES has acquired significant knowledge in the energy sector. We can therefore use this experience by assisting our customers, whether it's a developer, end user or principal/EPC contractor, with early feasibility studies. This study can initially take the form of:

- Advising on the general MEP requirements for a project
- Providing very high level cost advice with MEP and architectural input
- A full study with detailed cost advice with matching contractor proposals, fire strategy, MEP programme and detailed division of responsibilities documents.

We see this as a unique offering within the MEP world as it assists with affordability, generates the best technical engineered solution and reduces risk to the project. Following the feasibility stage, and prior to starting on site we fully design the MEP services directly into the BIM model, thereby reducing risk with early clash detection pre-construction thereby reducing cost and programme impact.

We then use our experienced project management teams, programmers, supervisors and in-house operatives to successfully complete the installation on site. Finally, we commission and test our own MEP installation, prepare maintenance manuals and as fitted drawings.

Our MEP scope offering within the energy sector provides the Incoming water services, sanitaryware, domestic water, drainage, mechanical ventilation, cooling, BMS, fire detection & suppression, lighting, small power, containment, earthing/lightning protection, ICT, CCTV, access control, DDA and sustainability.





ENERGY



POWER

ENERGY FR



OM WASTE

WASTE

POWER

The power generation sector is an essential service industry that uses technologies ranging from the mature steam turbine to pioneering marine current turbine solutions. Originally the primary fuel used to generate our power was either coal or nuclear. These aging power stations are now coming to the end of their working life and are therefore either being converted to biomass, decommissioned or used as back-up supply.

To replace these aging plants, technology has developed over the past decades with power generation changing to wind, solar, tidal, gas, hydro and more recently bioenergy, all of which reduce the carbon footprint of the power sector.

SES' offering in the power sector is as follows:

- Biomass conversion of existing coal fired plants
- Centralised generation and mains distribution
- Dedicated biomass
- Energy from waste (Wood chip, RDF or MSW)
- Gas fired CCGT
- Gas fired CHP

SES pioneered the biomass conversion of the UK coal fired power stations by successfully delivering the Drax Ecostore & Boiler Distribution System projects. These schemes involved upgrading the existing rail infrastructure, biomass offloading, onward conveying, screening/ferrous removal, storage, reclaim, sampling and pneumatic transfer to the mills. This project was the first of its kind in the world as biomass had never been stored or handled in the required volumes. This therefore came with various technical challenges for SES with fire detection and suppression methods, temperature/gas monitoring, level monitoring and nitrogen purging.









ENERGY FROM WASTE

With the initial introduction of the landfill tax in 1996, the UK has had to reduce its dependence on landfill by looking to deal with it by other means. The ethos of generating energy from waste and also using its thermal output is nothing new, with some European countries plants operating for decades. The UK pioneered the incineration of waste with a Destructor at Nottingham in 1874, however due to the recent taxes levied on waste to landfill that has increased the number of energy from waste plants this sector provides here in the UK.

The fuel used can be in many forms:

- Municipal Solid Waste
- Refuse Derived Fuel
- Waste Wood
- Waste Food
- Others – Straw, Poultry litter, Tyres

The standard practice is to take the fuel and either incinerate it, or more recently use gasification to produce steam to generate electricity and depending on the plants location to industry or cities, use the thermal output for district heating. Another use is Anaerobic Digestion from food waste to produce methane, which can either be used to run a CHP or alternatively it can be injected into the UK gas network.

SES has been successful in the delivery of two waste wood plants at Margam, Port Talbot and Teesside, Middlesbrough where both plants generate 40MWe. We have also successfully completed the Polmadie Recycling Centre in Glasgow. This facility comprises a Materials Recovery Facility (MRF), three gasification units that use the dried waste from the MRF to power a steam turbine, Anaerobic Digestion of the organic waste from the MRF which feeds either a gas fired CHP or injected directly into the gas network.

WASTE

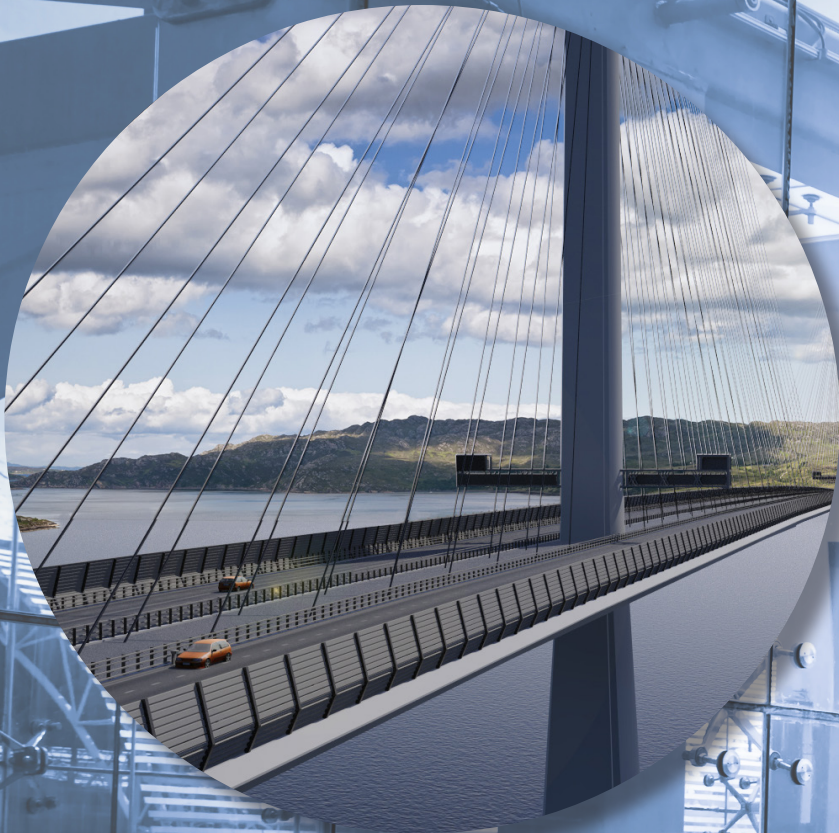
The introduction of the landfill tax in 1996 meant the UK had to reduce its dependence on landfill by looking to deal with its waste by other means. This has seen an increase in the number of domestic household waste recycling centres across the UK, where waste can be segregated into general waste, plastics, wood, glass, household appliances, green waste, metals, oils and fabrics. Once segregated it can either be forwarded on for direct processing and reuse or sent to a mechanical biological treatment (MBT) facility such as green waste for compost, fertilizer or as a fuel for incineration.

The introduction of the landfill tax has also meant the construction of MRFs where large quantities of waste is collected from household, industrial or commercial premises and tipped into a receiving hall. From here it is either mechanically or manually sorted for recyclable materials such as plastic, paper, metals, glass, organics which can be used for anaerobic digestion or remaining as solids for production of Refuse Derived Fuel (RDF) for incineration.

SES successfully completed Greater Manchester Waste which covered twenty separate sites across the Manchester area. These covered domestic household recycling centres, MRFs and MBTs. These facilities and others deal with 1.1 million tonnes of waste produced each year.







INFRASTRUCTURE

AVIATION



TION

RAIL

INFRASTRUCTURE

Infrastructure shapes our lives. Transport links get us where we need to be, energy systems power our homes and businesses, and digital networks allow us to communicate. Infrastructure provides us with clean water, takes away our waste and helps protect us from the elements. It is vital to improving our quality of life and integral to the creation of vibrant new places to live and work.

Here, at SES we fully understand the impact the build process has on any project, especially within the Infrastructure sector.

Our offering starts with pre-construction with feasibility studies, through to the design and installation.

Our BIM capability plays an important role, with the MEP designed directly into a centrally held and co-ordinated model, which includes all of the structural, architectural and process services.

SES has acquired a wealth of knowledge in the sector and therefore understands the process, scope and its demarcation, thereby reducing risk, which is paramount to the successful delivery of any infrastructure project.





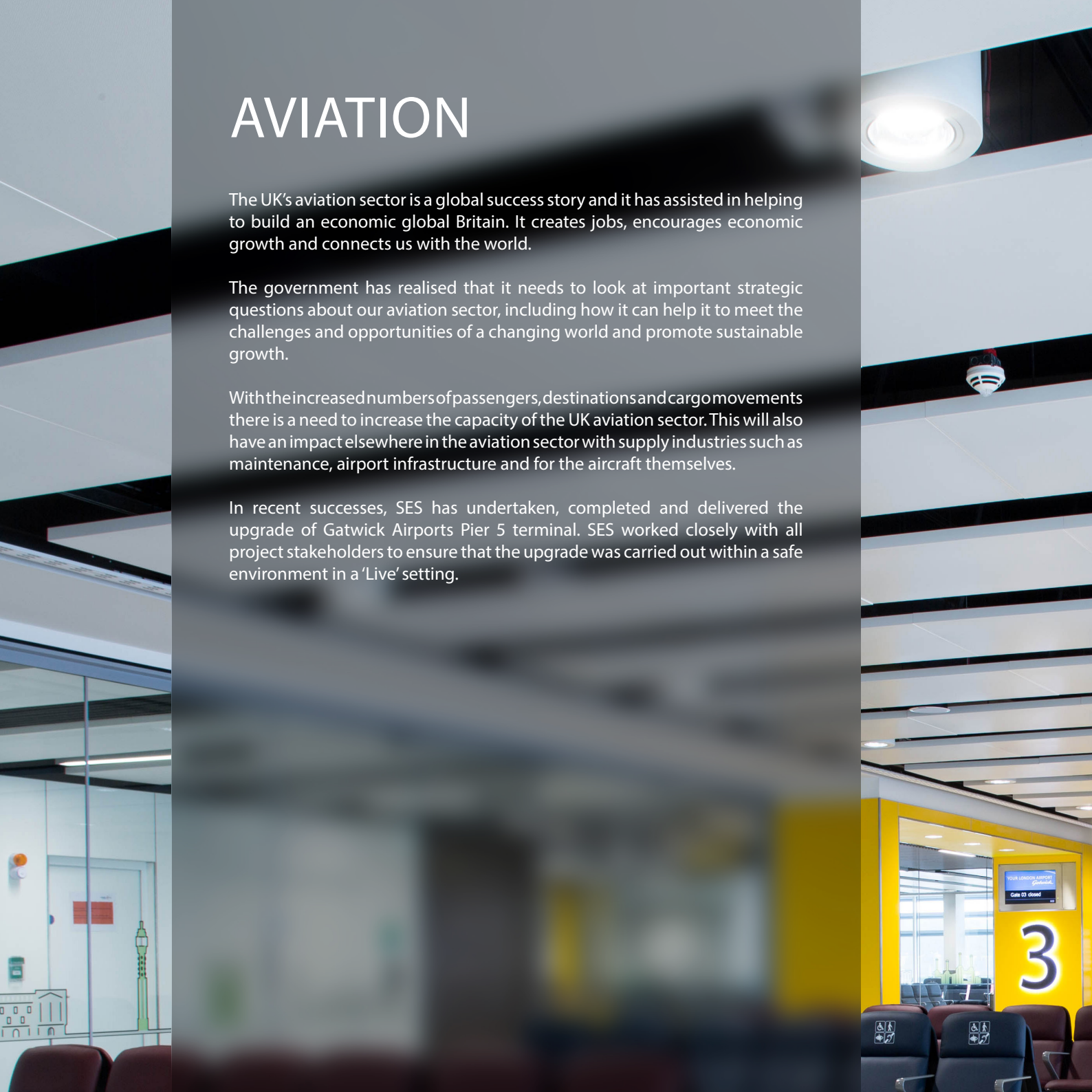
AVIATION

The UK's aviation sector is a global success story and it has assisted in helping to build an economic global Britain. It creates jobs, encourages economic growth and connects us with the world.

The government has realised that it needs to look at important strategic questions about our aviation sector, including how it can help it to meet the challenges and opportunities of a changing world and promote sustainable growth.

With the increased numbers of passengers, destinations and cargo movements there is a need to increase the capacity of the UK aviation sector. This will also have an impact elsewhere in the aviation sector with supply industries such as maintenance, airport infrastructure and for the aircraft themselves.

In recent successes, SES has undertaken, completed and delivered the upgrade of Gatwick Airports Pier 5 terminal. SES worked closely with all project stakeholders to ensure that the upgrade was carried out within a safe environment in a 'Live' setting.





An aerial view of a modern railway station. The station features a large, curved glass roof and a platform with a paved surface. A red and white train is visible on the tracks. The surrounding area includes green grass, trees, and a parking lot with several cars. The overall scene is bright and clear, suggesting a sunny day.

RAIL

Britain's railways are crucial to our economic future, and we have seen significant growth in passenger numbers in the 20 years since its privatisation. This growth brings challenges, and the impact of disruption can be immediate, significant and wide-ranging.

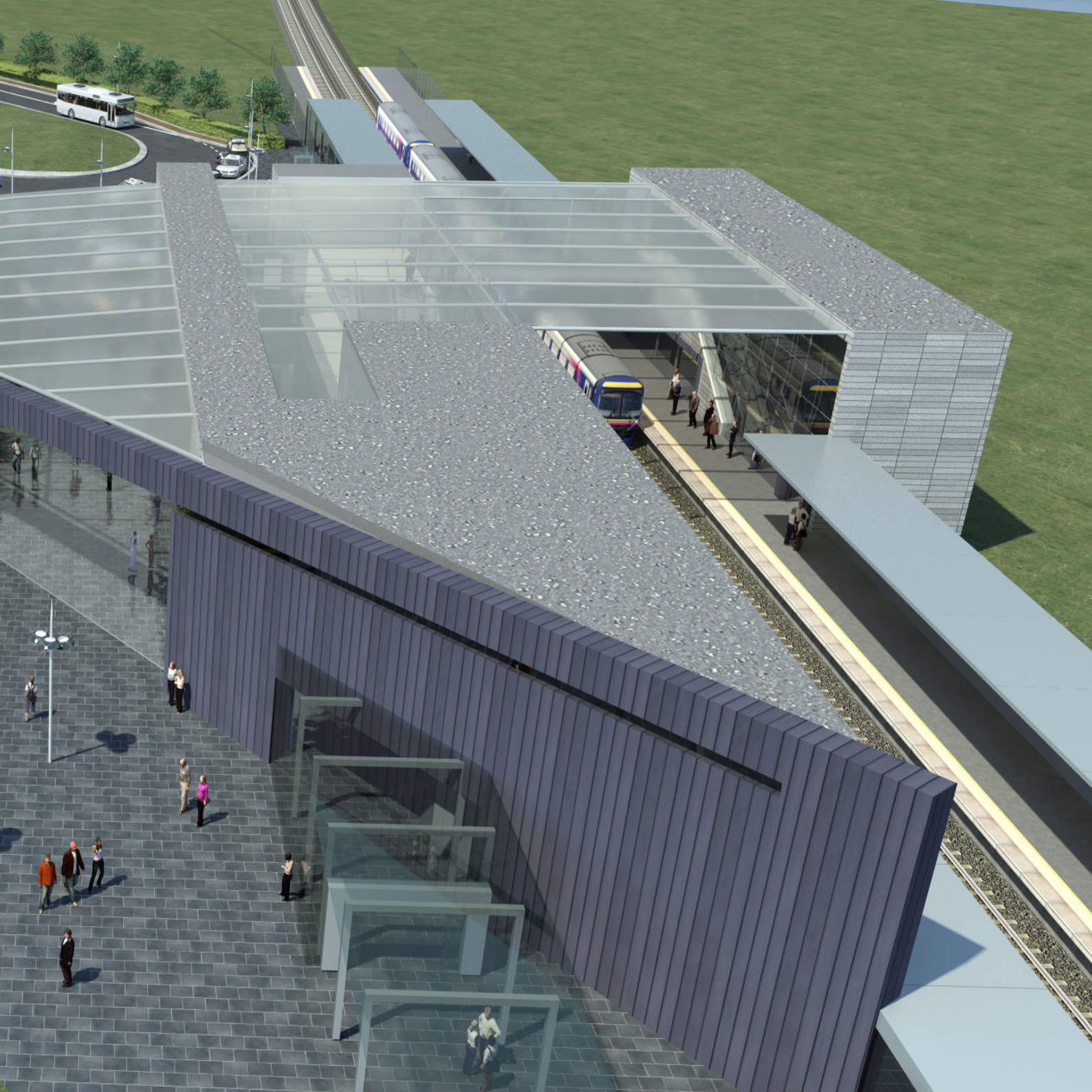
Our railways need to adapt and change in order to be able to cope with the growth that they have already experienced, and that which lies ahead. The government therefore is spending billions to ensure that we have upgraded, well managed and sustainable transport connections for the future.

This has seen investment in electrification of key areas of the network and Crossrail. This will be followed by the 'High Speed Railway' and Crossrail 2.

SEScan offer bespoke solutions for transport links and ongoing redevelopment plans in and around the transport sector, with the utilisation of our offsite pre-fabrication and BIM technologies.

In this arena SES has successfully completed station upgrades at Edinburgh Waverley, completed the new build Edinburgh Gateway station (GOGAR) in Glasgow and delivered the new Hitachi train facility in Darlington.

SES is fully accredited to work within the rail industry through the Achilles Rail Management requirements.



TRACK RECORD - ENERGY



DRAX POWER STATION

Client: Shepherd Construction

M&E Value: £62m

Addressing climate change and the transition to low carbon energy is a defining priority for the 21st century. At Drax Power Station in Yorkshire, an expert team from SES Engineering Services helped realise that vision by supporting the UK's largest ever coal to sustainable biomass conversion. Complex solutions were delivered in this challenging live environment, which included the creation of four biomass storage domes with an unprecedented 450,000m³ of white wood pellet, a screening building, sampling building and interconnecting fuel conveying systems.

ELEMENTS OF THE PROJECT:

- HV/LV infrastructure network
- Fire detection & suppression to the storage facility and conveyor system
- Nitrogen generation and inertion provision
- SCADA control system
- Dust mitigation measures

KEY FACTS:

- By prefabricating 35% of all of the building services via SES' offsite manufacturing facility, Prism were able to maintain the fast track programme, whilst greatly reducing the inherent risks of working at height and working within a live power station environment
- 1.7km of pipework fitted on modules at Prism
- 13km of electrical containment fitted on modules at Prism
- 700 module, frame and setting out drawings
- 2,286 prefabricated bracket assemblies





E.ON

Client: E.ON Connecting Energies

M&E Value: 20m+

E.ON Connecting Energies (E.ON) selected SES to deliver M&E design and installation services on the largest combined heat and power (CHP) project to be undertaken by E.ON in the UK. The scheme comprises design, supply and installation of new power, steam, low temperature hot water (LTHW) and chilled water generation plant. Specialising in integrated energy solutions, E.ON provides tailored solutions in energy efficiency including on-site generation, virtual power plants and battery storage for industrial, commercial and public sector customers.

KEY FACTS:

The new energy centre is capable of generating in excess of 9MWe electricity and 30MWt steam for drinks processing. The project comprises of:

- 2 No. 11kV 4.5MW natural gas-fired CHP units
- 1 No. 4.5MW Rotary Uninterruptible Power Supply (RUPS)
- 3 No. gas-fired 15T/hr package steam boilers
- 2 No. containerised 2.5MW standby diesel generators
- 1 No. 16T/hr waste heat recovery boiler (WHRB)



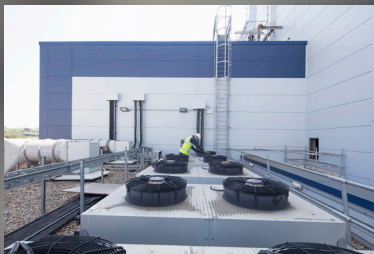
MARGAM GREEN ENERGY

Client: Interserve Construction with Babcock Wilcox Volund
M&E Value: £6.4m

Margam Green Energy Plant is a £160m energy from waste plant and will generate 40MWe of electricity by using recycled wood chip as the fuel supply. SES has been appointed to fully design, install and commission the mechanical, electrical and public health services including the fire detection and suppression measures and external services.

KEY FACTS:

- The plant is capable of processing 250,000 tonnes of waste wood per annum, including contaminated wood with no pre-treatment.
- Waste wood (wood chip) will be delivered via HGV to a fuel reception and storage building. The building will store, organise and feed from the storage areas; it will have a total capacity of 5 days storage.
- A key success factor in the delivery of the project is the design of the MEP services directly into a centrally held 3D model.



TRACK RECORD - INFRASTRUCTURE



QUEENSFERRY CROSSING

Client: Forth Crossing Bridge Constructors Consortium

(HOCHTIEF Solutions AG, American Bridge International, Dragados S.A. and Morrison Construction)

M&E Value: £23.9m

The Queensferry Crossing - the longest three-tower, cable-stayed bridge in the world forms the centrepiece of the Scottish Government's unprecedented £1.35bn upgrade to the cross-Forth transport corridor in the east of Scotland. During this two year project, SES' role was to deliver Mechanical, Electrical and Plumbing (MEP) services to the new replacement road bridge's North and South approach viaducts, the cable-stayed bridge itself, its three towers and abutment buildings.

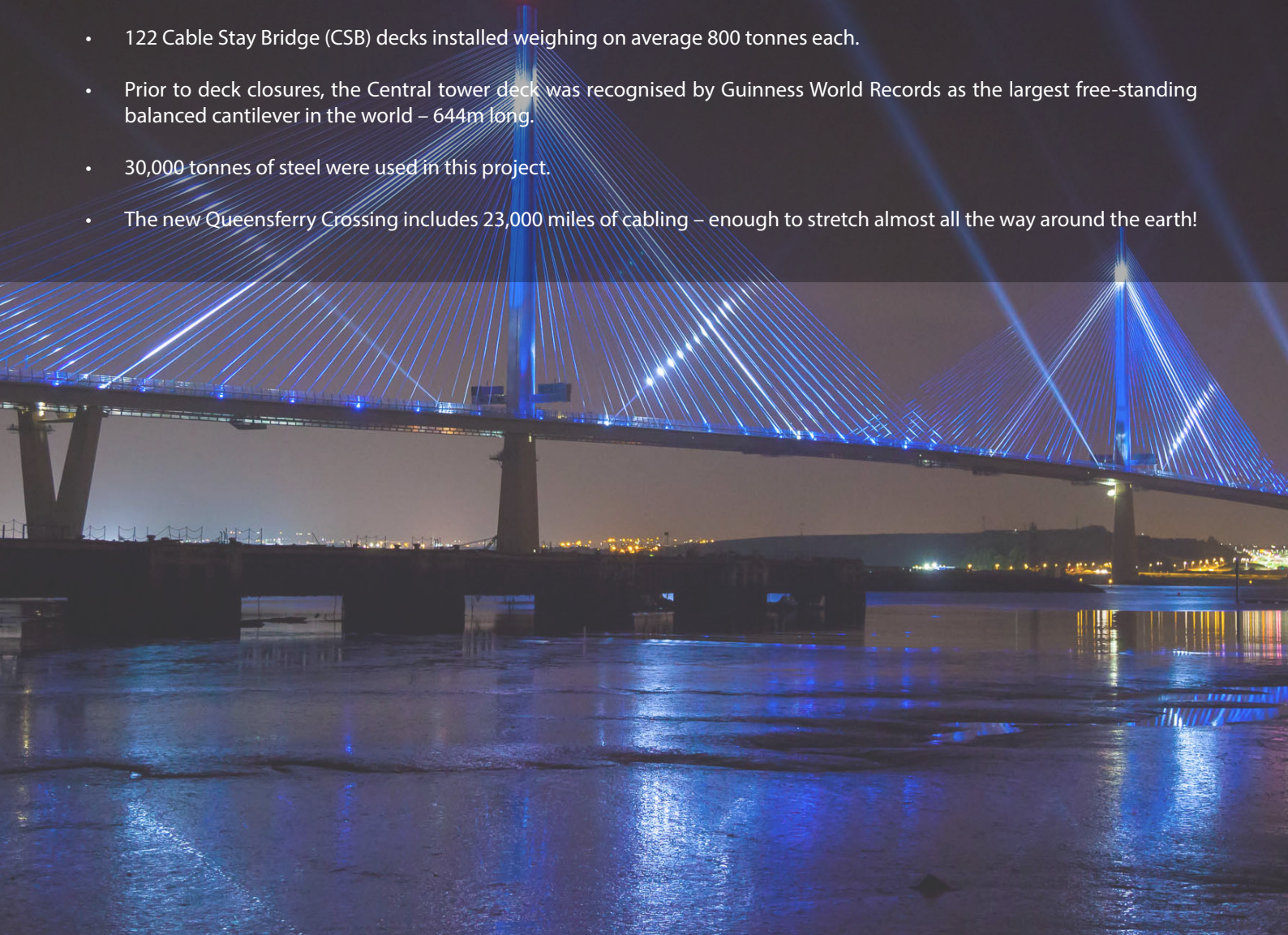
Jason Knights, SES' Managing Director said: "For a company's first bridge services project, the biggest infrastructure project in Scottish history isn't a bad place to start.

"The Queensferry Crossing represents leading-edge, 21st Century civil engineering. It's a rare opportunity to be involved in building a major new infrastructure project of international significance.

"We knew this was the perfect opportunity for us to showcase the true capabilities of our offsite technologies. Offsite working on this project was not just a consideration, it was a necessity."

KEY FACTS:

- SES was awarded with Project of the Year (subcontract over £6m) for the Queensferry Crossing at the Construction News Specialist Awards 2018.
- The hours taken offsite on this project are substantial standing at a total of over 32,500.
- 122 Cable Stay Bridge (CSB) decks installed weighing on average 800 tonnes each.
- Prior to deck closures, the Central tower deck was recognised by Guinness World Records as the largest free-standing balanced cantilever in the world – 644m long.
- 30,000 tonnes of steel were used in this project.
- The new Queensferry Crossing includes 23,000 miles of cabling – enough to stretch almost all the way around the earth!





GATWICK AIRPORT PIER 5
 Client: Gatwick Airport Ltd
 M&E Value: £7.5m

Gatwick Airport is the UK's second largest airport. It serves more than 228 destinations in 74 countries for 46m passengers a year on short and long-haul point-to-point services. It is also a major economic driver and generates around 85,000 jobs nationally, with 24,000 of these located on the airport. Working in this live operational airport environment, SES made extensive use of its industry-leading prefabrication factory, Prism. They delivered a series of innovative offsite solutions including 78 modularised chilled beams with support frame cable containment, ladder, pipework isolation and control valves all pre-installed at Prism.

KEY FACTS:

- Some 800 hours of onsite labour were saved from airside operations which ensured a much safer working environment and by utilising offsite manufacturing we were able to significantly reduce our carbon footprint.
- 6,000 hours labour saved from airside operations.
- 4,800m of pipes fixed offsite and insulated.
- 400m corridor chilled beams between the gate-rooms.



EDINBURGH GATEWAY

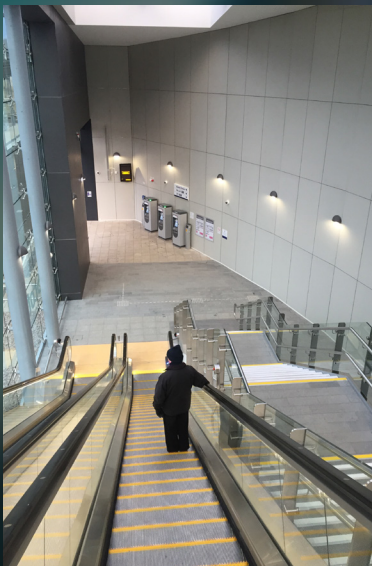
Client: Balfour Beatty

M&E Value: £2.3m

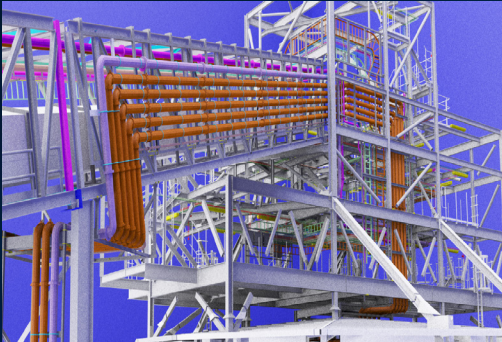
Edinburgh Gateway is part of the Edinburgh to Glasgow Improvement Programme (EGIP), a major Scottish transport project involving infrastructure improvements and the electrification of most railway lines between Glasgow and Edinburgh. SES provided full M&E services including lighting, heating, ventilation and the Station Information and Surveillance System (SISS) along with a fully lit pedestrian underpass tunnel between the station and the nearby Gyle shopping centre, SES also provided electrical services for a new tram stop for Edinburgh Trams.

KEY FACTS:

- The first Scottish Railway station to have all SISS equipment individually IP addressed for better quality CCTV images and equipment reaction times.
- EMC compliant due to difference between Network Rail AC electrical supply and Edinburgh Trams DC electrical supply.
- Platform modular trunking saved circa 500 hours working near live track.



BIM



PHOTO



BIM TO REAL LIFE



ENGINEERING EXCELLENCE

SES has been an early adopter of BIM, using 3D modelling on projects for over 15 years and embedding data into models since 2010. SES was the first mechanical, electrical and plumbing contractor (MEP) to achieve BRE BIM Level 2 business certification. This accreditation enables us to lead our peers into the critical industry changes and develop the industries skilled workforce to learn, understand and adopt these new developments as the industry grows.

BIM is intrinsically important to the successful delivery of any project within the energy and infrastructure sectors, whether it is for our in-house Prism module solutions used on projects such as Drax and The Queensferry Crossing or for co-ordination/clash detection with the architecture, structures and more importantly the process installation on energy from waste projects.

We have a dedicated team of BIM specialists working with design teams to develop building design in accordance with Level 2 BIM where appropriate. Our in-house BIM department will take the lead in developing the centrally held BIM model and designing directly into it. SES strives to share knowledge and experience in BIM with our customers ensuring that there is a one team ethos through pre-construction to post completion.

The services we offer cover the complete built environment lifecycle and are encapsulated within a BIM framework from engineering services, prefabrication, installation and commissioning, bringing value to our business and clients in a number of sectors.



Back in 2016, SES was delighted to become the first MEP contractor to have achieved Level 2 certification and is proud to have achieved reaccreditation in May 2018.

Our accreditation supports the SES brand, our strategy and our reputation for technical authority. BIM is a major strand of our strategic differentiation and is key in our approach to bringing innovation and intelligence to all our proposals.



PRISM

Prism is a leader in the industry, utilising and realising the benefits of offsite construction of engineering services and integrated build solutions across a wide range of industry sectors. Offering clients a modern, collaborative, innovative and forward-thinking solution that presents an accurate and affordable option to labour intensive, time consuming on site production and assembly.

Prism improves safety, reduces risk, contributes to environmental management and improves quality to our building solutions, providing bespoke solutions which can be adapted to include various combinations of mechanical, electrical and build functionality which are designed to fit to individual buildings.

Bespoke solutions have been designed and installed including:

- MEP multi-serviced low or high level gantries
- Curved modular solutions for more challenging architectural buildings
- Prefabricated risers
- Prefabricated horizontal and vertical modules
- Packaged plantroom solutions
- Plant skids





WINNER

BEST USE OF
MEP PREFABRICATION



WINNER

BEST USE OF
MEP PREFABRICATION

OFFSITE
AWARDS 2018

WINNER

BEST USE OF MEP & POD
TECHNOLOGY

OFFSITE
AWARDS 2019

WINNER

BEST USE OF MEP &
POD TECHNOLOGY



HEALTH & SAFETY

We are consistent in our positive and proactive approach to safety, health and environmental issues with highly skilled and well trained teams located across the country. Our world-class record is testament to our investment in behavioural safety – SES has an outstanding health and safety reputation, which is enviable in the construction industry.

Working in various sectors and high risk environments we ensure that all our workforce are well trained and well equipped to carry out their daily tasks in a safe and responsible manner. We have a highly skilled team of people working across the nation ensuring our business complies and maintains safety procedures.

Our Zero Harm campaign is more than a set of measurable outcomes; it is an uncompromising characteristic in the way we mitigate risk, adopting the right behaviours and creating the right environments to plan our projects to deliver Zero Harm for our clients.

In February 2019, SES was awarded the British Safety Council International Safety Award, for the 23rd consecutive year achieving a merit. And in 2017 SES also won the Best Health & Safety Initiative Award at the ECA Annual Awards.







SUSTAINABILITY

We will continue to develop our awareness in sustainability and the impact we have on the environment contributing to the sustainability standards of the built environment.

As part of our continuing strategy to maintain industry standards in sustainability SES has established membership with the 'UK Infrastructure Supply Chain Sustainability School' where we will work with the School and its partners to help reshape the construction industry going forward.

Our Prism solutions are a major factor in our contribution to sustainability where there are many areas in which we improve our own carbon footprint along with that of our clients and the industry.

Our offsite solutions contribute by:

- Reducing accident frequencies
- Providing sophisticated and advanced waste management
- Providing accurate material take-off and procurement
- Providing environmental and energy management
- Providing carbon and cost reduction

Sustainability progress:

- On average over 130,000 man hours are removed from site on an annual basis
- On average at least 4,500 waste materials are recycled per annum
- 98% of office waste is recycled and not sent to landfill
- Reduction in site hire costs amounting to £71,000 per year
- 80% less waste per annum



Kevin Neave

Energy & Infrastructure Sector Leader

T: 07801 214054

E: kneave@ses-ltd.co.uk



NATIONAL COVERAGE

REGIONAL DELIVERY

We operate in seven regional offices in three operating areas, giving us the capability to deliver for our customers on a national and regional basis.

- North and Scotland
- London and South East
- Midlands and South West



Yorkshire
Moorside
Monks Cross Drive
York
YO32 9GZ

T: 01904 437340

North East
Centre For Adv.Industry
Coble Dene, Royal Quays
North Shields
NE29 6DE

T: 0191 258 6627

North West
The Royals
353 Altrincham Rd
Sharston
Manchester
M22 4BJ

T: 0161 945 5589

London & South East
184 - 192 Drummond Street
London
NW1 3HP

T: 0207 380 1800





Scotland
Cadell House
27 Waterloo Street
Glasgow
G2 6BZ

T: 0141 221 8800

Midlands
The Podium
Bank House
Cherry Street
Birmingham
B2 5AL

T: 0121 616 4350

South West
190 Aztec West
Park Avenue
Bristol
BS32 4TP

T: 01454 627150

Prism
Unit 2
New Lane
Huntington
York
YO32 9PT

T: 01904 673272



