COWI IN THE UNITED KINGDOM

COWI

WE ARE COWI

Flint & Neill and Donaldson Associates have joined together to form COWI in the UK. By combining the talents and expertise of over 250 UK based staff, we are able to build on our 60 year legacy by continuing to provide unparalleled technical excellence and customer service for our clients. As part of our continuing growth strategy, we have rebranded as COWI, creating the opportunity to draw on the additional expertise of our parent company.

Flint & Neill was founded in 1958, providing innovative and advanced engineering solutions to a variety of bridge and long span structure projects and clients worldwide. After joining COWI in 2008, we continued to adapt to the evolving needs of our clients, whilst retaining our world-leading position as specialist civil and structural engineers. We have also demonstrated our commitment to maintaining a high visual appeal to all our structures, including award-winning highway and pedestrian bridges around the globe.

Donaldson Associates, established in 1987, grew to become a leading international tunnelling and ground engineering consultancy with offices in London, Glasgow, York, Derby, Uttoxeter and Hong Kong. Recognised as a centre of excellence in tunnelling, geotechnical and specialist civil engineering, the company joined COWI in 2014. We continue to work collaboratively with contractors and employers, bringing a focus on buildability and safety, to complex projects in a variety of sectors.

COWI is an independent multidisciplinary consultancy with more than 6,200 employees working across a broad range of engineering and development disciplines from 90 offices worldwide. Over the past 85 years, COWI has delivered over 85,000 projects in 124 countries within a variety of business sectors including: Bridge, Tunnel and Marine; Railways, Roads and Airports; Structures; Economics, Management and Planning; Water & Environment; Geographical Information and IT.

›BIM ›VALUE ENGINEERING ›HYDRAULIC MODELLING ›NAVIGATION SIMULATION ›MICROTUNNELLING
›SOIL STRUCTURE INTERACTION ›EARTHWORKS DESIGN ›AERODYNAMICS ›STAY CABLE VIBRATIONS
›SERVICE LIFE DESIGN ›NUMERICAL MODELLING ›3D FINITE ELEMENT MODELS ›SEISMIC ANALYSIS
›FATIGUE ASSESSMENTS ›UNDERTRACK CROSSINGS ›LIFE CYCLE COSTS ›SUSTAINABLE ENGINEERING
›TUNNEL REFURBISHMENT ›NON LINEAR TIME-HISTORY ANALYSIS ›STRUCTURAL ANALYSIS
›RISK MANAGEMENT ›STRUCTURAL DYNAMICS AND MONITORING ›DEHUMIDIFICATION SYSTEMS
›WAVE MODELLING ›SLOPE REMEDIATION ›RELIABILITY CENTERED MAINTENANCE ›FOUNDATION DESIGN
›HYDROGEOLOGY ›MOORING ANALYSIS ›CONSTRUCTION METHODS ›PROJECT MANAGEMENT
›MATERIAL TECHNOLOGY ›SHAFT DESIGN ›SUSTAINABLE URBAN DESIGN ›DIRECTIONAL DRILLING
›CATHODIC PROTECTION ›SPRAYED CONCRETE LINING ›SHIP IMPACT PROTECTION
›REHABILITATION ENGINEERING ›TUNNEL LINING DESIGN

OUR CAPABILITY

We are a leading civil, structural and geotechnical engineering consultancy, with extensive knowledge and experience in bridge, tunnel, marine and specialist infrastructure. Our passion and expertise enables us to deliver technically excellent, value engineered solutions.

By combining global experience with local knowledge, we deliver buildable projects, no matter how large or small, anywhere in the world, for contractors and clients.

We have rebranded as COWI and can create specialist, multidisciplinary teams with the right competencies and experience to suit the complexity of any project.

You will still work with the same UK teams and can expect the same high quality service. We combine specialist company approachability with big company capability.

You will still benefit from direct access to experienced senior staff for expert advice and project input. Steering the team from day one, they can challenge concepts and will bring industry leading expertise to every project.

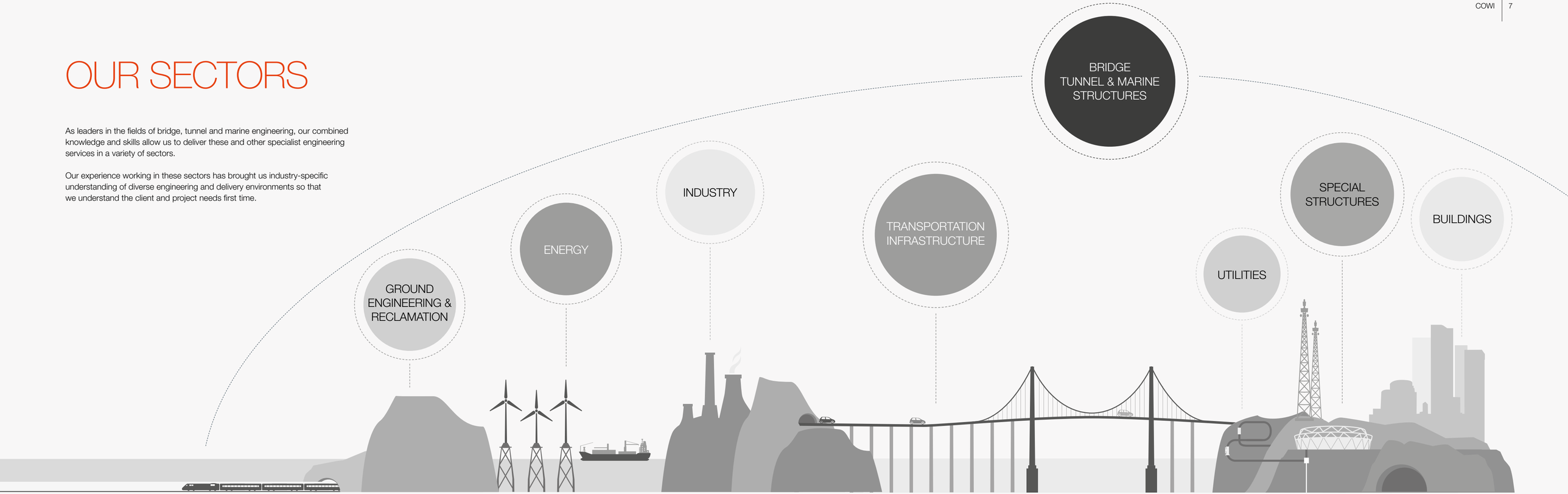
Our engineering culture is to design buildability in, and design risk out. We understand how important a varied workload is in developing our engineers, so our staff work on a mix of smaller, local assignments and larger, multidisciplinary projects.

Whether your project requires a single engineer or a multidisciplinary team, we will deliver what you need.

OUR SECTORS

As leaders in the fields of bridge, tunnel and marine engineering, our combined knowledge and skills allow us to deliver these and other specialist engineering services in a variety of sectors.

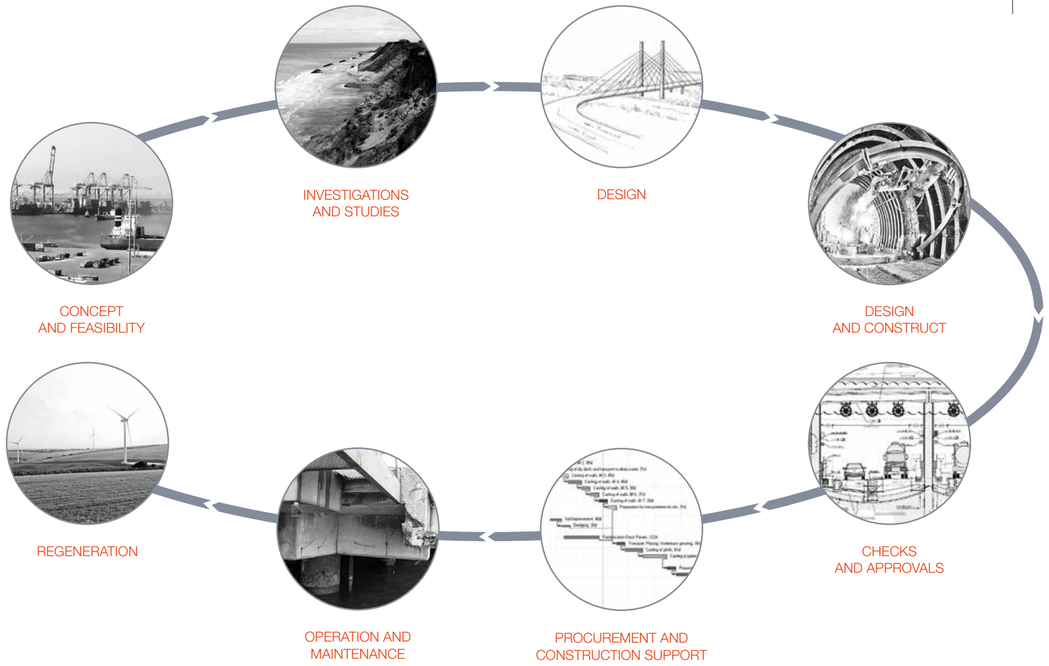
Our experience working in these sectors has brought us industry-specific understanding of diverse engineering and delivery environments so that we understand the client and project needs first time.



PROJECT STAGES

From planning and feasibility, through procurement and construction support, to final decommissioning, COWI offers seamlessly integrated services in all aspects of bridge, tunnel, marine and specialist engineering as well as other areas including roads and railways, environment, traffic planning and operation. We can deliver the entire project, or we can step in at any stage to provide your project with the extra expertise you need.

We have always been committed to solving problems through a sound understanding of engineering behaviours, never afraid to move outside the scope of codes and standards. This approach has enabled us to tackle complex problems, leading to our involvement in developing and drafting codes of practise for a variety of engineering applications.



BORDERS RAIL

SCOTLAND

The Borders Railway project involved the re-opening of approximately 50km of railway between Newcraighall to the south of Edinburgh and Tweedbank in the Scottish Borders along the route of the former Waverley Line (closed in 1969). COWI was appointed to prepare detailed design for the earthworks, remedial works to two existing tunnels and permanent maintenance access points.

The earthworks detailed design consisted of approximately 100km of railway earthworks; a combination of new earthworks (approximately 8km), along with reuse of pre-existing railway earthworks. The new earthworks consisted of a series of new cuttings through both soil and rock up to 14m in height, alongside a number of new embankment structures. At numerous locations along the previous railway corridor, the new alignment required the pre-existing earthworks to be modified and retention measures installed including gabions, soil nailing, sheet piles and bored piles. Remediation of existing defects was also required, including rock fill repairs and rock fall protection measures.

Following detailed design, COWI provided site support during the implementation of the works. Detailed design for the two tunnels involved masonry break-out and replacement with sprayed concrete, stitching of existing masonry, masonry repairs, grouting of voids behind the existing linings and lowering of the invert in one of the tunnels.

Access point design included pedestrian, vehicle and road-rail vehicle access points. This involved the design of a number of new sections of road including new junctions with existing local authority roads.

FACTS

Client:	Network Rail
Contractor:	BAM Nuttall

SERVICES

- Earthworks design
- Gabions, soil nails, sheet piles, bored piles
- Rock fall protection
- Re-use of existing earthworks
- Tunnel remediation
- Access track/junction design

MERSEY GATEWAY BRIDGE

UNITED KINGDOM

The Mersey Gateway Bridge will improve strategic transport links, maximise local development and reduce the environmental impact associated with increasing traffic volumes.

COWI is leading a four-way joint venture responsible for delivering the detailed design of the bridge and associated highway network, on behalf of Merseylink Civil Contractors. Working with URS / AECOM, Eptisa and Fhecor and Dissing + Weitling, the team has been assisting the Merseylink consortium that includes Samsung C&T Corporation, FCC Construccion S.A. and Kier Infrastructure and Overseas Limited since the start of the tender process in March 2012.

COWI is responsible for the tender and detailed design of a 1km long, six-lane, three tower cable-stayed bridge and approach viaducts. Featuring a large single cell post tensioned concrete box, the deck is supported from a single central plane of stays. In addition, the main bridge includes approximately 1km of approach viaducts to the north and south. Windshields are provided along the full length of the bridge deck on each side.

FACTS

Project period:	2012–present
Client:	Halton Borough Council

SERVICES

- Detailed design of the cable-stayed bridge and approach viaducts
- Foundation design
- Erection engineering
- Geometry control
- Construction supervision
- Site support

LONDON ARRAY OFFSHORE WIND FARM

UNITED KINGDOM

With 175 monopiles, designed to carry the Siemens 2.6MW turbines, the London Array offshore wind farm is the world's largest, with a peak rated power of 630 MW in 2013. Monopiles of 4.7m and 5.7m diameter have been installed at water depths up to 25m. With total length up to 85m, these foundations are amongst the largest ever built.

Its turbines are capable of generating enough energy to power nearly half a million UK homes and reduce harmful CO_2 emissions by over 900,000 tonnes a year.

A consortium of DONG, E.ON and Masdar commissioned Aarsleff | Bilfinger Berger Joint Venture (ABJV) as contractor to undertake fabrication and installation of the steel foundations. To carry out the detailed design of the monopiles, ABJV engaged COWI as lead in a joint venture with IMS Ingenieurgesellschaft mbH.

The project is one of the first offshore wind projects to use the conical grouted connection. Significant advances were introduced in the geotechnical methodology for calculations of soil-structure interaction.

FACTS

Project period:	2009–2013
Client:	Aarsleff | Bilfinger Berger Joint Venture

SERVICES

- Hydraulic load calculations
- Structural design
- Geotechnical design
- Driveability analyses
- Cathodic protection analysis and design
- Scour assessment
- Risk management

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GREENWICH REACH SWING BRIDGE

LONDON, UK

Located in the Thames Path, crossing the mouth of Deptford Creek in south east London, this award winning bridge delivers a vital link for local residents, removing the detour inland that involved using a busy highway crossing. With the bridge long planned as part of the Galliard Homes development at Greenwich Reach, COWI, as lead designer, was responsible for concept development and detailed design.

The scheme consists of a 44m span cable-stayed footbridge with a single mast and a central cable plane. A short 8m backspan contains a counterweight and provides an attachment point for pairs of backstay cables, which support the tip of the mast laterally and longitudinally. The structure is supported on a slewing ring bearing underneath the mast with electrical motors to drive the bridge clear of the navigation channel. This is supported on a piled foundation constructed adjacent to the existing river walls.

The steel structure was developed with structural efficiency in mind, but allowing for a clear architectural identity to be developed. Faceted planes create a relatively massive backspan before reducing to a delicate main span with a central spine box supporting diagonal struts to the edge of the deck. This plated concept is continued through the main mast, where two flat plates supported by diagonal stiffeners create an open Vierendeel type structure.

FACTS

Project period:	2013–2014
Client:	Galliard Homes Raymond Brown Construction Limited

SERVICES

- Concept development
- Detailed superstructure design
- Foundation design
- Construction supervision

M80 DBFO DETAILED DESIGN

SCOTLAND

The M80 DBFO project from Stepps to Haggs, north-east of Glasgow, included the construction of 8.5km of new offline dual two-lane carriageway with hard shoulders and 10km of online upgrades from A-road to motorway standards. The project included upgrading the A80/M73 junction as well as 60 new or existing highway structures.

Following support to the contractor at tender stage, COWI was appointed at detailed design stage as geotechnical designer for all offline works and for mining aspects of the whole project.

Our scope included ground condition assessment and foundation design for 11 structures, geotechnical design of cuttings (15m deep) and embankments (13m high), load transfer platforms for overbridge embankments and reinforced soils. As well as being principal checker of the 'online' geotechnical design works, we specified and supervised additional ground investigation works. Mining scope included assessment and remediation for the new motorway, including the design of catenary slabs in areas of potential instability.

The commission continued with site supervision of geotechnical construction works, with COWI providing designer's site representatives (DSRs) and office support.

FACTS

Client:	Transport Scotland
Contractor:	HMG

SERVICES

- Geotechnical lead for 8.5km of offline works
- Mining Remediation lead for the 18km project
- Design of rock slopes, reinforced soils, ground improvement
- Design of mine stabilisation works

AIN SUKHNA PRODUCT HUB

EGYPT

Arab Petroleum Pipeline Co. has established a fully equipped product hub at their Ain Sukhna complex on the Red Sea coast in Egypt. The hub includes both onshore and offshore facilities.

The onshore facility comprises 61 product storage tanks with a total capacity of 2,125 million m^3, and two 50km long unidirectional pipelines to the city of Suez. The diameter of the individual product storage tanks varies from 21m to 59m.

The offshore facility comprises a jetty and berths (500–160,000 DWT) including a topside pipeline and other auxiliaries. The hub includes an offshore single point mooring for very large crude carriers, connected via a sea pipeline. The offshore facility is intended to accommodate future expansions to handle up to 24 million tonnes per annum of various products.

The entire project development is planned to be completed in five main development phases with a specific phase for LPG tanks and berth.

FACTS

Project period:	2012–2013
Client:	Arab Petroleum Pipelines Co. (SUMED)

SERVICES

- Topographic survey at fuel tank site and land pipeline corridor
- Concept design of marine terminal, tank farm, single bay mooring and land pipeline
- Plant layout and 3D modelling
- Front end engineering design (FEED)
- Preparation of tender documents

PONT SCHUMAN

FRANCE

Pont Schuman features a unique pair of un-braced inclined arches that form a continuous smooth profile through both main spans passing beneath the deck at the centre pier.

In 2010, COWI won the design competition for a new 180m long highway bridge across the River Saône in Lyon. The design was developed with Explorations Architecture and Agibat Consulting Engineers who are responsible for the design of the piers and foundations.

The superstructure is a tied arch with a reinforced concrete deck and cantilevered pedestrian walkways. Each steel arch incorporates a unique twisted arch cross section which, at the springing points, is welded to the longitudinal girder.

Overall, the deck is up to 30m wide with the footways varying between 4-6m in width, with seating areas provided for pedestrians to enjoy views of the World Heritage site.

Geometrical constraints, which severely limited the available construction depth above the navigation channel, were a particular challenge for the design. The unique twisted configuration of the arch plates resulted in the warping of steel plates and required development of the design methodology from first principles. Construction began in 2012 and the bridge opened in November 2014.

FACTS

Project period:	2010–2014
Client:	City of Lyon

SERVICES

- Detailed design of superstructure
- Lead party in the design group
- Technical support
- Construction supervision

STEP T01

ABU DHABI

STEP, the $1.5bn Strategic Tunnel Enhancement Programme in Abu Dhabi, replaces some of the existing pumping stations in the city to decrease the pressure on the existing system.

COWI designed all 3 of the deep tunnel sewer packages T01, T02 and T03, linking Abu Dhabi island to the mainland. Totalling 42km in length, it is one of the longest gravity sewer tunnels in the world.

Package T01, designed in the UK, comprised 16km of large diameter sewer tunnel and 9 shafts. Samsung C&T Corporation was the contractor and built the tunnels using 3 TBMs.

COWI designed the tunnel and shaft linings, working as a specialist tunnelling consultant to the main consultant, Hyder Consulting Limited.

COWI's scope included the design of the TBM, tunnel linings for the 16km T01 scheme, the design of 9 deep diaphragm wall shafts to depths of 40m below ground level, and the design of 7 connection adits formed in sprayed concrete. The scope also included the design and supervision of the detailed ground investigation for the project.

FACTS

Client:	Hyder Consulting Middle East
Contractor:	Samsung C&T

SERVICES

- Design of 16km of 4m ID tunnel linings
- Design of diaphragm wall shafts to 40m depth
- Design of sprayed concrete connection adits

STOCKHOLM NORVIK CONTAINER AND RO-RO TERMINAL

SWEDEN

The Norvikudden project is a modern green-field port development of a 44 hectare site located about 65km south of Stockholm.

The fully developed port will comprise about 1.4km of quays accommodating four berths for container carriers with four to five ship-to-shore container cranes; and two berths with movable end ramps for ro-ro vessels.

The plant's water depth at the quays ranges from 10m to 16.5m and the port capacity will enable the annual handling of 300,000 TWU and 200,000 ro-ro vehicles.

COWI was selected as the contractor's consultant for the design of all quay structures, revetment, quay equipment, dredging work, scour protection, soil improvement, pavement works, drainage, utilities, mechanical and electrical works and access roads and bridges to the terminal.

FACTS

Project period:	2011–2012
Client:	NCC-Aarsleff Norvikudden Consortium

SERVICES

- Numerical modelling of waves, currents and water levels
- Programming of the geotechnical investigations
- Design basis for all marine works based on the functional requirements for the container terminal and ro-ro terminal
- Concept design of all marine works
- Estimation of main quantities

LONDON OLYMPIC STADIUM TRANSFORMATION

LONDON, UK

The construction contract for the legacy transformation of the Olympic Stadium was awarded to Balfour Beatty Construction Services in 2013. The transformation resulted in a multi-purpose venue with flexible retractable seating to allow it to host concerts, athletics and football matches without compromising the spectators' experience. As part of the transformation works, the original fabric membrane roof was dismantled and replaced with a new roof spanning almost three times as far, and covering an area twice as large as the original.

The new roof consists of a primary cable net structure supporting articulated steel trusses which create the upper roof profile. The new roof represents a substantial increase in loading, which required significant strengthening works to be carried out to the existing compression truss and V-columns which support it, in parallel with the dismantling and construction works. The gravity-stressed roof relies on the tension stiffness of the underlying cable-net for its stability resulting in a highly non-linear structure, which required a complex large displacement and fully staged analytical approach.

COWI was appointed by Balfour Beatty to provide comprehensive erection engineering services and ad-hoc advice during their tender, and later throughout the detailed design and construction. The project was carried out on a shortened and very tight programme and was re-opened in time for the Diamond League Athletics event in July 2015.

FACTS

Project period:	2013–2015
Client:	Balfour Beatty Construction Services

SERVICES

- Erection engineering
- Technical assistance during tender, detailed design and construction

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YANBU 2 POWER AND WATER PROJECT

SAUDI ARABIA

The power and water utility company, Marafiq, is developing a new 850MW (net to the grid) power and water plant for Yanbu 2 Industrial City to meet the increasing demand for power, process and potable water and seawater cooling.

The plant is located on the Red Sea coast of the Kingdom of Saudi Arabia, approximately 280km north of Jeddah.

Saudi Archirodon Ltd. was selected as contractor for the marine facilities, with COWI as consultant for the detailed design.

The marine facilities consist of a seawater intake facility and associated pumping station and a seawater outfall. Hydraulic modelling was used to develop near shore design conditions for marine structures (extreme waves, currents, water levels).

FACTS

Project period:	2011–2014
Client:	Saudi Archirodon Ltd.

SERVICES

- Seawater intake/outfall channel design
- Hydraulic and coastal engineering
- Design of dredging and reclamation
- Design of breakwaters and revetments
- Pumping station design
- Architectural and structural design of buildings
- Infrastructure design (roads and storm water drainage)

FEEDER 9: HUMBER CROSSING

UNITED KINGDOM

COWI was appointed as tunnelling consultant for a front end engineering design (FEED) study for National Grid's proposed Humber Estuary crossing. The 1050mm high pressure gas pipeline will cross the Humber between Paull and Goxhill above ground installations.

A 3.65m internal diameter tunnel driven approximately 4km from Goxhill to Paull was developed in the preferred solution. The FEED report assessed the geology of the crossing, described constraints on the tunnel alignment and gave reasons for route selection. It detailed the process of TMB and tunnel diameter selection as well as justification for tunnel drive direction.

COWI scoped the over land and water ground investigation and produced the tunnelling aspects of the Geotechnical Interpretative Report. COWI also produced the tunnel reference design, tunnel tender documentation and the Geotechnical Baseline Report. We worked closely with the pipeline designers, Capita, and with National Grid throughout the project.

FACTS
Owner: National Grid
Client: Capita

SERVICES
- Over land and over water site investigation
- Feasibility, Options and Cost studies
- Develop vertical and horizontal alignment
- Tunnelling methodology and risk advice and workshops

COMPIÈGNE BRIDGE, FRANCE

FACTS

- Year of completion: 2011
- Type: Urban arch bridge
- Length: 116m with spans of 72m and 44m
- Period of services: 2008–2011
- Client: Agglomération de la région de Compiègne

SCOPE

- Conceptual design
- Detailed design
- Fabrication review

BOSPHORUS BRIDGE, TURKEY

FACTS

- Year of completion: 1973
- Type: Suspension bridge
- Length: 1,560m
- Period of services: 2008–2011
- Client: KGM Istanbul

SCOPE

- Inspection
- Assessment
- Structural Health Monitoring
- Surveying
- Strengthening Concept Design

OSMAN GAZI (IZMIT BAY) BRIDGE, TURKEY

FACTS

- Year of completion: 2016
- Type: Suspension bridge
- Length: 2,682m with main span of 1,550m
- Period of services: 2010–2015
- Client: IHI Corporation

SCOPE

- Durability design
- Access design
- Inspection and maintenance manual
- Advanced structural health monitoring
- Main girder and cable dehumidification system

QUEEN ELIZABETH II CROSSING, UNITED KINGDOM

FACTS

- Year of completion: 1991
- Type: Cable-stayed bridge
- Length: 812m
- Period of services: 2010-ongoing
- Client: Connect Plus

SCOPE

- Survey
- Full bridge assessment including cable and tower vibrations
- Design of bespoke transverse bearings
- Design of temporary works overbridge system

HUMBER BRIDGE, UNITED KINGDOM

FACTS

- Year of completion: 1981
- Type: Suspension bridge
- Length: 1,410m main span
- Period of services: 2000-ongoing
- Client: Humber Bridge Board

SCOPE

- Inspections
- Fatigue assessment of deck
- Structural assessments
- Load monitoring
- Replacement of hangers and handstrands
- Resurfacing
- Supervision of works

CLIFTON SUSPENSION BRIDGE, UNITED KINGDOM

FACTS

- Year of completion: 1864
- Type: Suspension bridge (national heritage)
- Length: 214m main span
- Period of services: 2006-ongoing
- Client: Clifton Suspension Bridge Trust

SCOPE

- Emergency response to failure
- Investigation
- Structural assessment
- Replacement of hangers
- Resurfacing
- Strengthening
- Asset management

WEST GATE BRIDGE, AUSTRALIA

FACTS

- Year of completion: 1978
- Type: Cable-stayed bridge
- Length: 2,582m with 336m main span
- Period of services: 2008-2011
- Client: VicRoads

SCOPE

- Structural assessment
- Detailed design of strengthening works
- Inspections
- Derivation of loading
- Construction supervision

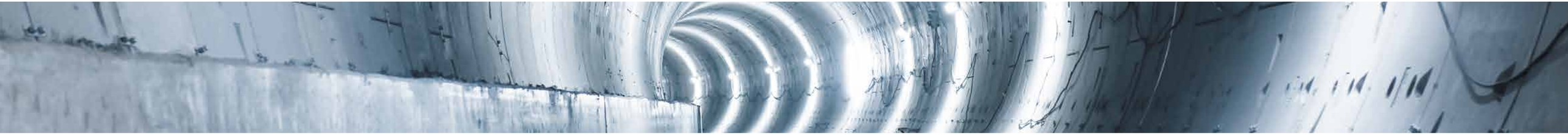
STONECUTTERS BRIDGE, HONG KONG

FACTS

- Year of completion: 2009
- Type: Cable-stayed bridge
- Length: 1,596m with 1018m span
- Period of services: 1999-2010
- Client: Highways Department, Hong Kong

SCOPE

- Design competition award winners
- Feasibility study of cable-stayed bridge
- Detailed design of main cable-stayed span and towers
- Global analysis



HOLME TUNNEL, UNITED KINGDOM

FACTS

- Year of completion: 2014
- Owner: Network Rail
- Client: AMCO
- Contractor: AMCO

SCOPE

- Ground and structure investigation and monitoring
- Factual /statistical analysis of the landslip
- Steel arch & sprayed concrete lining design
- Portal reconstruction design
- Temporary works designs
- Collaborative working

BRESSAY FIXED LINK, SCOTLAND

FACTS

- Year of completion: 2011
- Owner: Shetland Island Council
- Client: ZetTrans

SCOPE

- Options study in accordance with STAG (Scottish Transport appraisal guidance)
- Drill & blast highway tunnel
- Conceptual design including geometry and support
- Conceptual MEP design
- Whole life costing

CONTRACT 824, HONG KONG

FACTS

- Year of completion: 2016
- Owner: MTR Corporation
- Client: Kier-Kaden OSSA JV
- Contractor: Kier-Kaden OSSA JV

SCOPE

- 2.6km twin bore hard rock rail tunnels 7.8m span
- Rock mass and hydrogeology assessment
- Pre-grouting design
- Drill & blast assessment and design
- Rock support design including rock bolting and SFRC
- Large span crossover caverns 29m
- Construction stage site support

THAMES TIDEWAY TUNNEL, LONDON, UK

FACTS

- Year of completion: on-going
- Client: Thames Tideway
- Contractor: Ferrovial Agroman, Laing O'Rourke (FLO) Joint Venture

SCOPE

- Tender stage design
- 8m and 9m diameter shafts, 40m deep
- 10 connecting tunnels
- Sprayed concrete lining and segmental construction

BECKTON FINAL EFFLUENT, LONDON, UK

FACTS

- Year of completion: 2012
- Owner: Thames Water
- Client: Hyder Consulting
- Contractor: Tamesis

SCOPE

- Enabling works for Thames Tideway
- Geotechnical baseline report
- 755m total tunnel design & shaft design
- Settlement analysis
- Damage assessment of structures and utilities

WALBOTTLE CULVERT, UNITED KINGDOM

FACTS

- Year of completion: 2014
- Owner: Northumberland Estates
- Client: Northumberland Estates
- Contractor: AE Yates

SCOPE

- Emergency response and assessment
- Brick culvert collapse
- Sprayed concrete lining
- 2100 diameter pipejack
- 10m deep 12m diameter shaft design
- Slope stabilisation measures

NINE ELMS TUNNEL, LONDON, UK

FACTS

- Year of completion: ongoing
- Owner: UKPN
- Client: Joseph Gallagher Ltd
- Contractor: Joseph Gallagher Ltd

SCOPE

- Hybrid precast concrete/ SCL shaft lining
- Curved SCL launch chamber
- Complex connection using timber headings and RC to existing cable tunnel
- Assessment of 3rd party assets
- TBM bored segmental tunnel

LONDON CABLE TUNNELS, LONDON, UK

FACTS

- Year of completion: 2011
- Owner: National Grid
- Client: National Grid
- Contractor: Costain

SCOPE

- 40km of feasibility and options studies
- Route assessment and site finding
- 20km ground investigation
- Outside parties liaison
- Tunnel crossings, utility and asset assessment
- 20km reference design and tender documents

BLYTH DEMONSTRATOR, UNITED KINGDOM

FACTS

- Year of completion: 2017 expected
- Type: Offshore wind farm divided into 3 arrays
- Period of services: 2015-2017
- Client: BAM Infraconsult

SCOPE

- High level review of the gravity base foundation in three specific areas:
- Assumed geotechnical design parameters
- Preparation and performance of the gravel beds
- Finite element modelling undertaken by BAM in 2D and 3D Plaxis programs

LEICESTER SQUARE HOTEL, LONDON, UK

FACTS

- Year of completion: 2018 expected
- Type: 35m deep basement of new 10 storey hotel
- Period of services: 2016-2017
- Client: Edwardian Pastoria Hotels Ltd.

SCOPE

- Cat III design check of retaining wall and propping system
- Check of temporary steelwork support to retaining walls during excavation and bottom up construction of the basement
- Check of permanent floor slabs
- Numerical finite element analyses using Plaxis 2D and LUSAS

MONTGOMERY BRIDGE, LONDON, UK

FACTS

- Year of completion: 2018 expected
- Type: Bascule Bridge
- Period of services: 2016-2017
- Client: Canary Wharf Contractors

SCOPE

- Design of bascule bridge
- Design of marine deck structure
- Design of bored pile with permanent casing foundations
- Ship impact protection

ABERDEEN HARBOUR EXPANSION, SCOTLAND

FACTS

- Year of completion: 2019 expected
- Type: Harbour facility
- Period of services: 2015-2016
- Client: Aarsleff, Morrison, Van Oord JV

SCOPE

- Tender design of new harbour facility at Nigg Bay to complement the existing harbour facilities supporting AMV Consortium on:
- Design
- Permitting issues
- Interaction with the Aberdeen Harbour Board

NEW ORLEANS FLOOD PROTECTION BARRIER, USA

FACTS

- Year of completion: 2012
- Type: Storm surge barrier
- Period of services: 2008-2012
- Client: The US Army Corps of Engineers

SCOPE

- Numerical modelling
- Concept and detailed design of the main sector gate monolith, barrier pile floodwall, reinforced concrete by-pass barge gate, MRGO berm structure, GIWW approach walls, and scour protection.

AL RUWAIS PORT DEVELOPMENT, QATAR

FACTS

- Year of completion: 2016
- Type: Development of existing fishing port
- Period of services: 2010-2014
- Client: Public Works Authority (PWA) Ashghal

SCOPE

- Project management
- Redesign of marine works
- Quality assurance program
- As-built drawing review
- Record documentation
- Post contract quantity surveying
- Site supervision

PORT OF FREDERIKSHAVN, DENMARK

FACTS

- Year of completion: 2017
- Type: Expansion of existing port
- Period of services: 2012-2016
- Client: Frederikshavn Havn A/S

SCOPE

- Preparation of master plan
- Numerical modelling of waves, currents, sediment transport and wave agitation
- Geotechnical surveys
- Navigation surveys
- Concept design and budget for works
- Environmental impact assessment
- Detailed design and tender
- Site supervision

FORMOSA 1 OFFSHORE WIND FARM FOUNDATIONS, TAIWAN

FACTS

- Year of completion: 2018 expected
- Type: Monopile/Jacket foudations
- Total: 144 MW
- Water depth: 15-30m
- Period of services:
- Client: Formosa Wind Power Co.

SCOPE

- Front end engineering design and detailed design of foundations for eight positions
- Front end engineering design of the entire wind farm

BAHA'I TEMPLE, INDIA

FACTS

- Year of completion: 1986
- Type: Complex concrete shell structure
- Period of services: 1978-1982
- Client: National Spiritual Assembly of the Baha'i Faith in Delhi

SCOPE

- Structural design
- Early application of advanced desktop computers
- Finite element analysis
- Site supervision

MILLENNIUM DOME, LONDON, UK

FACTS

- Year of completion: 2000
- Type: Complex cable net system with PTFE glass fabric cladding
- Period of services: 1997-1998
- Client: New Millennum Experience Company

SCOPE

- Independent design check
- Analysis and assessment of the static and aerodynamic wind loading effects
- Assessment of the effects on Blackwall tunnel ventilation

NATIONAL THEATRE, LONDON, UK

FACTS

- Year of completion: 1976
- Type: Concrete structure housing three theatres with other facilities
- Period of services: 1969-1975, 1996 1999-2001, 2005-present
- Client: National Theatre

SCOPE

- Structural design
- Structural modification
- Design of strengthening
- Structural consultancy

HEATHROW TERMINAL 5, UNITED KINGDOM

FACTS

- Year of completion: 2008
- Type: Terminal buildings and Visual Control Tower
- Period of services: 2000-2006
- Client: Ove Arup & Partners British Airports Authority

SCOPE

- Detailed design check
- Review of design criteria
- Creation of new design methods for aspects not covered by Standards
- Complex wind loading and dynamic structural response analysis

LAMINGTON VIADUCT, SCOTLAND

FACTS

- Year of completion: 2016
- Owner: Network Rail
- Client: AMCO
- Contractor: AMCO

SCOPE

- Emergency call out bridge inspection
- Scour protection design for piers
- Pier strengthening jacket & new foundations
- Bridge deck condition assessment
- 8 week programme

KEADBY WINDFARM, UNITED KINGDOM

FACTS

- Year of completion: 2015
- Owner: SSE
- Client: Balfour Beatty Civil Engineering
- Contractor: Balfour Beatty Civil Engineering

SCOPE

- 20m span highway bridge at site entrance
- Foundation pile group design for 34 turbines
- Site track and hard standing design on soft ground with cost saving over ground improvement
- Sub-station bund and foundation design

SHELTON AND TELFORD RESILIENCE, UNITED KINGDOM

FACTS

- Year of completion: 2015
- Owner: Severn Trent Water
- Client: Amey
- Contractor: Amey

SCOPE

- Detailed design and ground investigation
- Civil, geotechnical and hydraulic design
- 8km potable water pipeline
- 6 pumping stations
- Major highway & river tunnelled crossings
- Co-location with Client and Contractor

ST GILES CIRCUS, LONDON, UK

FACTS

- Year of completion: 2011
- Client: Engenuiti
- Owner: Consolidated Developments

SCOPE

- 3 storey deep basement in close proximity to Crossrail running tunnel
- Approvals from London Underground and Crossrail
- Ground movement mitigation for construction
- Manage tight movement tolerance of new tunnel systems

ShenZhong link, China

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