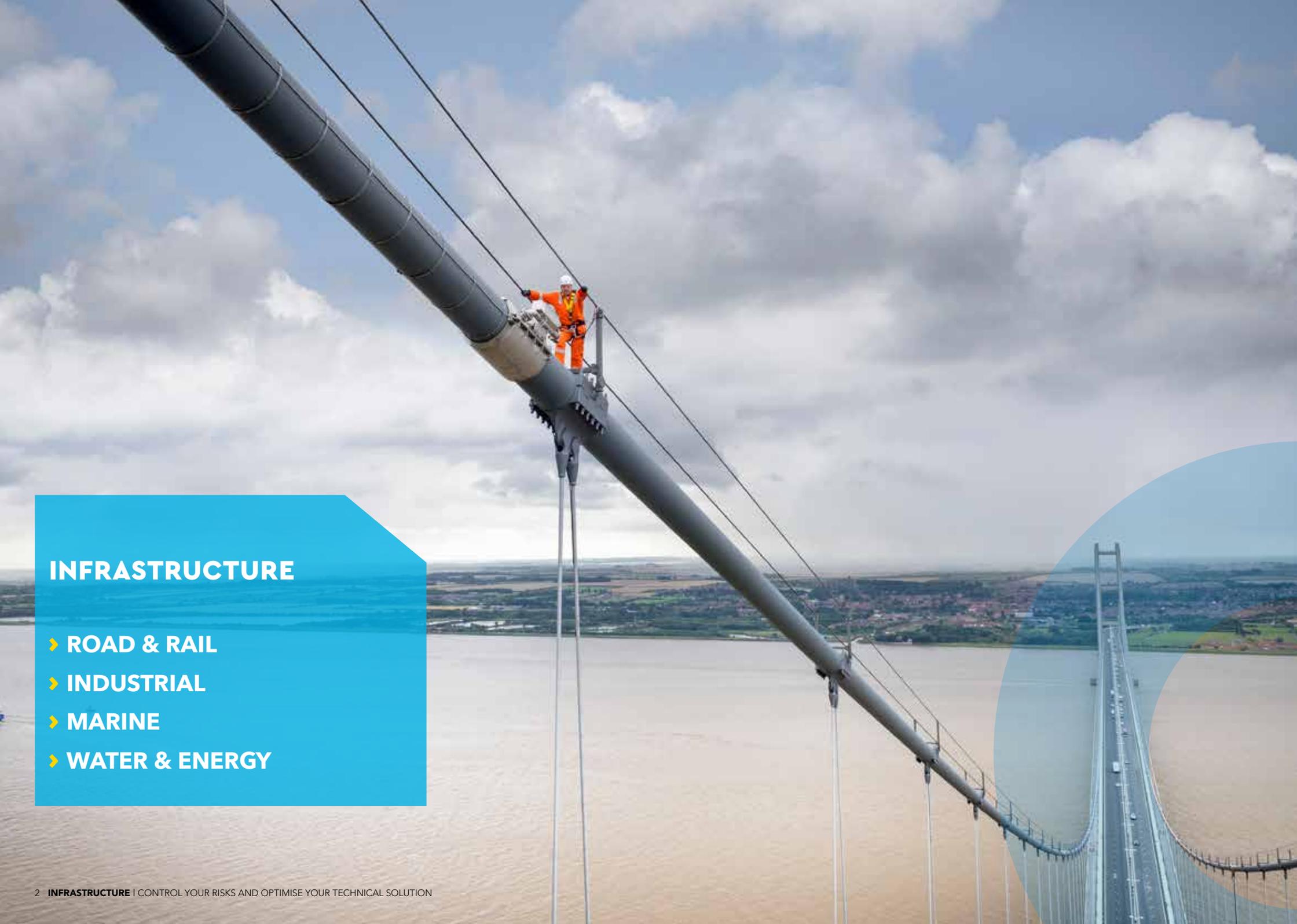


SOCOTEC

INFRASTRUCTURE

**CONTROL YOUR RISKS AND OPTIMISE
YOUR TECHNICAL SOLUTION**



INFRASTRUCTURE

- › ROAD & RAIL
- › INDUSTRIAL
- › MARINE
- › WATER & ENERGY

EUROPEAN INFRASTRUCTURE



Arnaud de PRACOMTAL
Director
BU Middle-East, Africa &
Infrastructure



Philip BALL
Group Technical Director
UK



Ingo SPOHR
Managing Director
Germany



Massimo DE IASI
Managing Director
Italy



Jean-Marie STEINER
Managing Director
France

AMBITION

“ Become a European leader in the analysis, inspection, verification of infrastructure, whether existing or future, to control the technical and financial interests of our customers. ”

MISSION

“ Europe-wide first choice provider of services assuring the quality and performance of assets throughout their entire life cycle as well as the safety of people, through a comprehensive range of testing, inspection and verification. ”

OUR EUROPEAN PROJECTS

Thanks to our **4** centres of expertise based in:

- › FRANCE
- › UNITED KINGDOM
- › GERMANY
- › ITALY

With its European-wide network of experts at your service, SOCOTEC enables its clients to take advantage of a local presence to deliver combinations of testing, design reviews and risk management.

EXAMPLES OF EUROPEAN PROJECTS

1. FRANCE - Paris - Grand Paris Express

Building risk assessment, monitoring, design review and diagnosis

2. DENMARK - Copenhagen - Metro extension

Independent (external) verification of highly complex and innovative elements

3. MONACO Offshore: Urban Extension Project

Design review, risk management, geotechnical expertise, project monitoring

4. FRANCE - RTE off-shore wind farm

Preparation of tender documentation and supervision of site operations (landfall)

5. UK - London - HS2: High Speed 2 railway

Ground investigation, monitoring, surveying, materials testing

6. UK - LTC: Lower Thames Crossing

Ground investigation, ground water pumping, geotechnical monitoring

7. UK - London - Euston Station

Drilling and sampling in metro, asbestos, metallurgy studies and metal sampling

8. ITALY - Genoa - Construction of the Genova-San Giorgio viaduct

Geotechnical investigations, geophysical surveys, construction control, monitoring

9. ITALY - Brennero tunnel construction

Geotechnical investigations, geophysical surveys, construction control

10. ITALY - Tunnels assessments - ASPI

Georadar investigations services aimed at characterising the geometric and structural elements of tunnels coverings of the highway network

11. GERMANY - Extension of motorway A7 Hamburg

Ordnance detection

12. GERMANY - Stuttgart 21

Client support and design review

13. NETHERLANDS - Power Plant Eemshaven

Structural verification of entire plant

14. DENMARK - Vordingborg - New Storstrøm bridge

Multibeam, UXO Survey

15. FRANCE - ITALY - TELT - Lyon-Turin railway line

Project management assistance - Health and safety coordination - Environmental coordination - Technical inspection - Numerous interventions to check equipment and installations



FOCUS ON OUR PROJECTS



FOCUS ON OUR PROJECTS

HS2: HIGH SPEED 2 RAILWAY: LONDON TO BIRMINGHAM

This new high speed railway will run from Euston Station in London 130 km north west to Birmingham and beyond. The current Phase 1 started in 2016 with ground investigation and in March 2020 main contractors started the design and build stages.

The route passes through dense urban areas in north west London before entering the less populated countryside where, after crossing a 1.5 km long viaduct it enters an 18 km tunnel through the chalk Chiltern Hills. From there it runs at ground level towards Birmingham. There will be a new international exchange near the Airport and one branch leading to a new station at Curzon Street.

SOCOTEC SERVICES PROVIDED BY OUR UK & GERMANY TEAMS

SOCOTEC has been involved since the beginning with completion of nine ground investigation contracts directly for HS2 Limited. Since then, working with many contractors, we have completed £30 million of field and laboratory work. SOCOTEC has been also involved for design verification for TBMs in Germany.

Currently we are continuing with more:

- › Ground investigations
 - › Material testing of concrete and aggregates in the laboratory and in situ
 - › Monitoring of a highway (M25) crossing plus the portals for the tunnel
 - › Asbestos and demolition control
 - › Surveying and utility mapping
- These are expected to continue for four more years.



Client: High Speed 2 Limited (a UK Government department) - Period: 2015 - 2023

METRO EXTENSION IN COPENHAGEN

The new extension will link Copenhagen's southern harbour district with its new urban development areas to the rest of Copenhagen, Denmark.

The works consists of the creation of a 4.5 km bored double track, serving 5 deep and semi-shallow stations, with 2 crossover shafts.

During the construction phase, the shaft construction of the H. C. Ørstedsværket cross-over structure shall act as launching shaft for the mechanised tunnelling.

The TBMs will be assembled and launched from here, first in the direction of Havneholmen shaft and later - after recovery and return shipment of the TBMs - towards Ny Ellebjerg station.

SOCOTEC SERVICES PROVIDED JOINTLY BY OUR GERMAN AND FRENCH TEAMS

- › Enhanced control of VC3* type performance documents that apply to highly complex or innovative elements.
- › The Verification Category 3 mission is implemented using an independent analysis with counter-calculations.

Verification scope included:

- › Stations (structure): Enghave Brygge Station, Havneholmen Station, Ny Ellebjerg Station, Sluseholmen station, Mozarts Plads station
- › Tunnel section (structure): from Ørstedsværket to Fisketorvet
- › Art work for underground stations
- › Cut & cover structures
- › M&E System
- › Architectural works

*VC3: independent verification (Category 3)



Client: TUNN3L JV (Vinci / Hochtief) - Period: 2018 - 2024 (estimated)

FOCUS ON OUR PROJECTS

OFFSHORE URBAN EXTENSION PROJECT IN MONACO

SOCOTEC performed the technical inspection of the complex construction of a platform built on the seabed in Monaco. This project, currently under construction, is part of the Principality's coastline expansion.

This platform has been built in the middle of two natural areas requiring the preservation of maritime fauna and flora. This infrastructure will become home to the future l'Anse du Portier district, which will be delivered in 2025.

The district of l'Anse du Portier is helping to redevelop Monaco's maritime façade. Covering 6 hectares, this extension into the sea includes luxurious accommodation, a public park, shops, an extension of the Grimaldi Forum, a port and public facilities including a car park, a coastal promenade and shady walking areas.

To build this infrastructure, an area of coastline is being reclaimed which will eventually be enclosed by a belt of trapezoidal boxes fitted with damping chambers. Numerous technical challenges linked to the location of the project, the innovative construction methods, the 50-metre depth and its location between two nature reserves have to be overcome.

SOCOTEC engineers are working in several capacities: overall technical control, the control of studies in the design and construction phase and the monitoring of construction work through regular onsite and offsite audits (quarry, load boxes, etc.).

SOCOTEC SERVICES PROVIDED BY OUR FRENCH AND MONEGASQUE TEAMS

- › **Civil Engineering**
- › **Maritime structures**
- › **Land structures interactions**
- › **Superstructures**
- › **Hydraulic**
- › **Geotechnical & deep foundations**
- › **Project risk management**
- › **Environment**
- › **Fire risk**



Client: SAM l'Anse du Portier CC - Period: 2013 - 2025 - Size: 6 hectares district size

CONSTRUCTION OF THE GENOVA-SAN GIORGIO VIADUCT IN GENOA

SOCOTEC is proud to be part of the construction of the new bridge of Genoa, made of a continuous 1067m steel deck, with 19 spans and supported by 18 reinforced concrete elliptical piers.

SOCOTEC supports the PERGENOVA consortium in the construction of the new bridge.

Our experts provided laboratory testing to control the quality of construction materials and supplies and monitored the construction.

The urgent re-construction work was performed 24 hours a day, 7 days per week. SOCOTEC matched the client's very demanding programme with sufficient resources to maintain the control on schedule.

SOCOTEC was key in the success of this great work, as it provided crucial services.

SOCOTEC SERVICES PROVIDED BY OUR ITALIAN TEAM

- › **Diagnostic/geotechnical investigations and corresponding monitoring for the initial planning of the new bridge**
- › **Geophysical surveys with cutting-edge georadar technology**
- › **Tests of the foundation piles and dynamic monitoring of the concrete piles**
- › **Supply and installation of sensors**



Client: PERGENOVA S.C.p.A. (Fincantieri Infrastruttura e Salini Impregilo) - Period: 2019 - 2020

FOCUS ON OUR PROJECTS

POWER PLANT EEMSHAVEN

RWE's new hard coal power plant Eemshaven is located in the Dutch province Groningen on the western shore of the mouth of the Ems, across from the German city of Emden.

The location Eemshaven has numerous advantages and good logistic conditions. The power plant can be supplied with its main fuel, hard coal, via the seaport. Other materials such as limestone powder for the exhaust gas desulphurisation or the power plant ash can be transported on the river Ems, minimising environmental impact. Cooling with sea water allows for a very high degree of effectiveness.

The double block unit with an overall performance of 1,600 MW will be conventionally consisting of a pulverised fuel boiler, DENOX, electric filter exhaust gas desulphurisation system, steam turbine, sea water cooling and secondary structures.

SOCOTEC SERVICES PROVIDED BY OUR GERMAN TEAM

- › **Structural verification of entire plant**
- › **The verification was done on the basis of German standards and rules (according to SV-VO: German expert regulation) and taking into account specific Dutch standards.**

VERIFICATION SCOPE INCLUDED

- › **All buildings of the entire complex including the boiler house framework**
- › **Ducts, absorbers, silo containers, large tanks**
- › **All components made from concrete and steel**
- › **Documentation of the verification including all related documents with INTERPROJECT, an in-house project management tool.**



Client: RWE Technology GmbH - Period: 2008 - 2017

NEW STORSTRØM BRIDGE (VODINGBORG AREA)

The new Storstrøm Bridge has a total length of 6.5 km including a deck of about 3.8 km, with a tower of 100 m. The deck will be 24 m wide, two road lanes, double rail track for the high-speed, plus pedestrian and cycle paths. The Storstrøm Bridge has a great regional importance and is also an important part of the railway corridor between Copenhagen and Hamburg.

The bathymetric survey of 18 km² was targeted to locate UXO (ordnance) in Orehoved area and new bridge footprint area.

Scope of work was a bathymetric survey in support of detailed design of the Storstrøm bridge.

Project prior to the commencement of construction activities.

SOCOTEC SERVICES PROVIDED BY OUR ITALIAN TEAM

- › **Bathymetric plans of project area**
- › **The final bathymetric layout was composed of the following surveys carried out in three phases:**
 - **First phase: multi beam echo sounder survey of sailing navigation area**
 - **Second phase: single beam echo sounder survey of shallow waters**
 - **Third phase: Real-Time Kinematic Survey of coastal shore line project area**



Client: SBJV Storstrøm Bridge Joint Venture - Period: 2018

FOCUS ON **OUR PROJECTS**

LYON-TURIN RAILWAY LINE - TELT

Begun in 2014, the railway line project linking Lyon to Turin covers a 65 km route, and includes numerous structures: an international station, tunnels and bridges. 2020 will mark the beginning of one of the most complex stages of the project: the Montcenis base tunnel construction.

The tunnel will consist of two 57 km long excavations in rock from Saint-Jean de Maurienne, France to Suze, Italy.

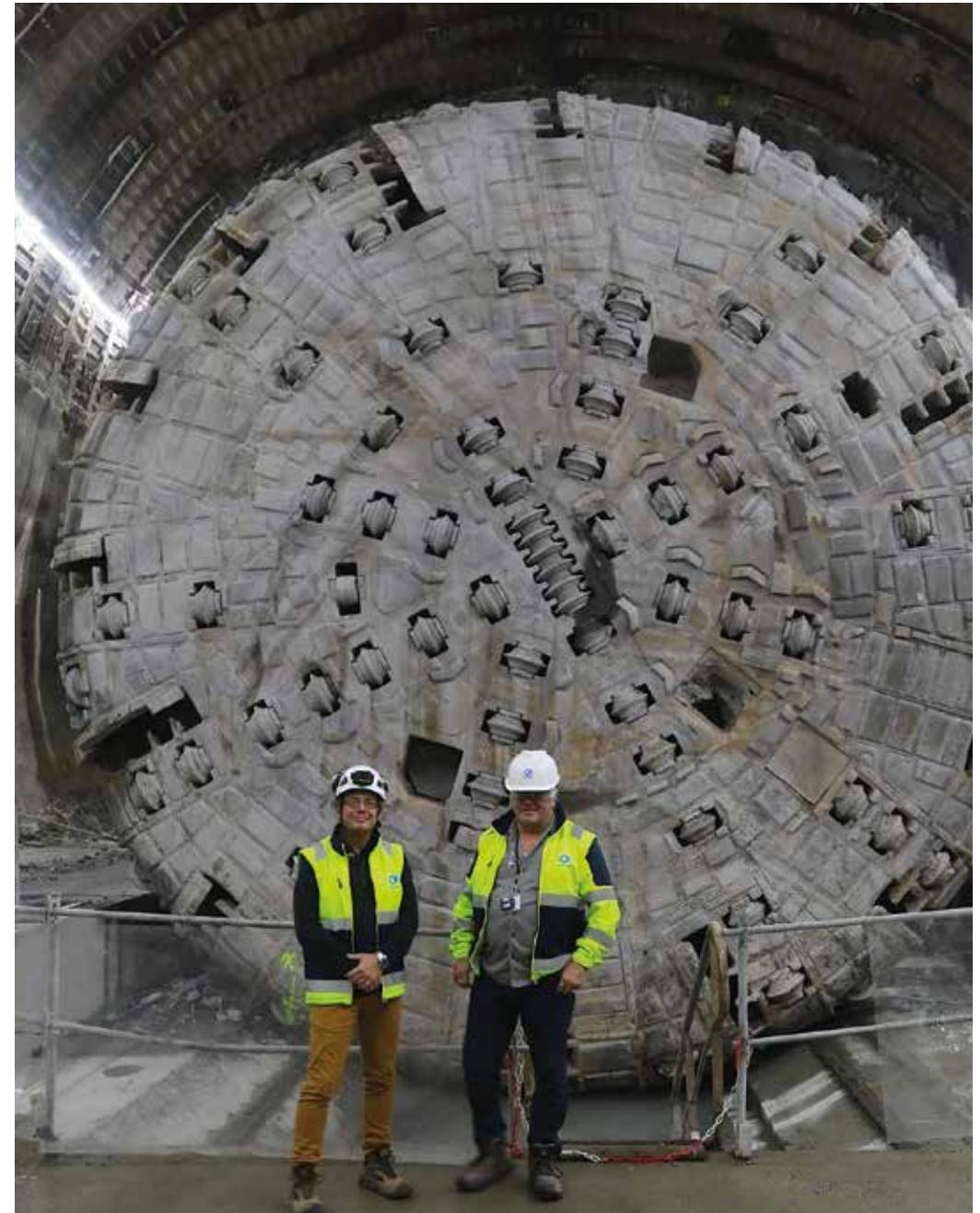
The development of this colossal infrastructure project involves many participants including the Alps Environmental & Safety agency.

SOCOTEC SERVICES PROVIDED BY OUR FRENCH TEAM

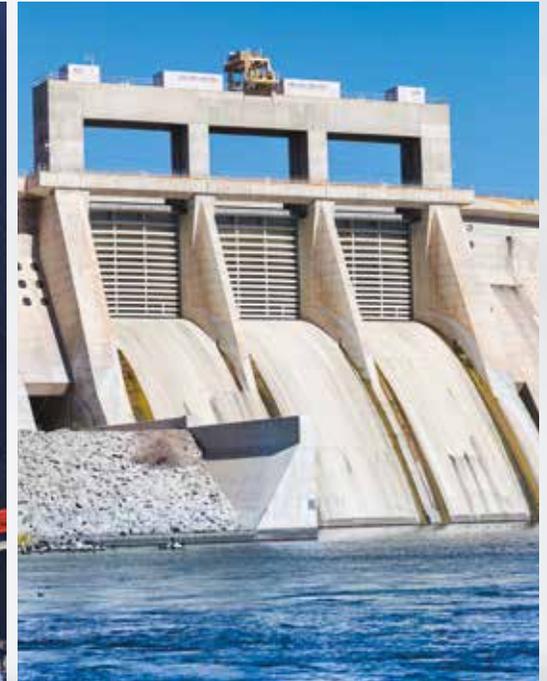
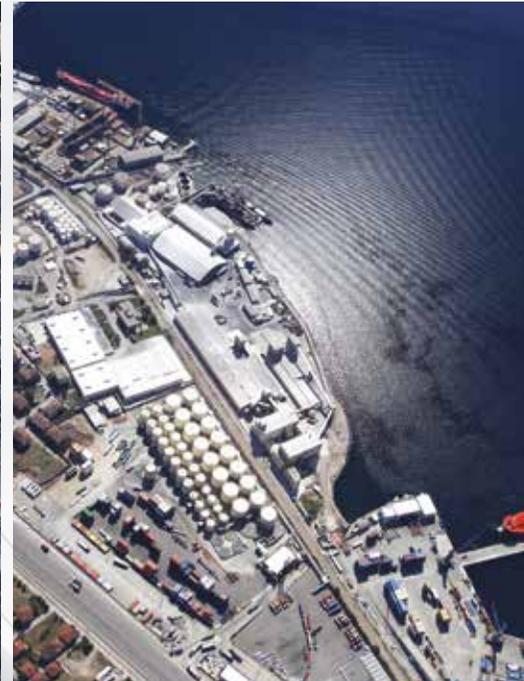
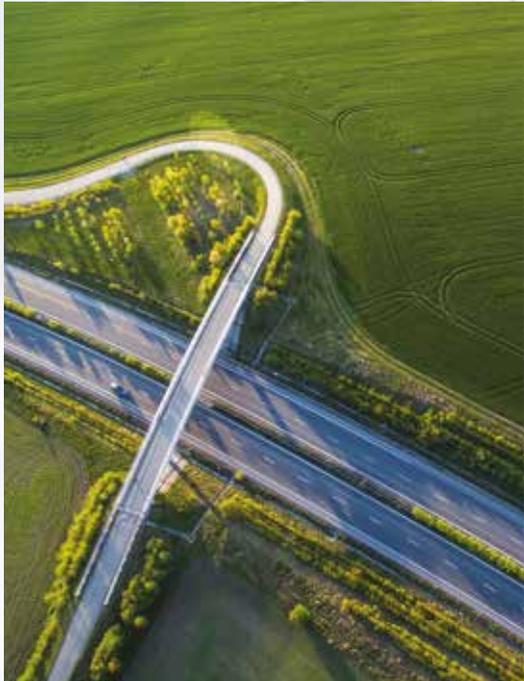
- ▶ **Project management assistance task known as "environmental coordination" for the work, logistics and rubble dumping sites affected by the works on the French part of the new Lyon- Turin rail link.**
- ▶ **Health and safety coordination**
- ▶ **Technical inspection from 2004 to 2006 (checking compliance of the functional and technical studies of the preliminary project: Operation and Maintenance, Safety, Civil Engineering, Non-Railway Equipment, Geology and Environment)**
- ▶ **Numerous commissions to check equipment and installations via the project managers and their subcontractors and as well as technical assistance**



Client: TELT: Tunnel Euralpin Lyon Turin - Period: 2018 - 2024



OUR SECTORS



ROAD & RAIL

- › Underground structures
- › Platforms & tracks
- › Underground stations
- › Tunnels
- › Bridges
- › Earthworks, embankments

INDUSTRIAL

- › Industrial buildings
- › Temporary structures
- › Refineries

MARINE

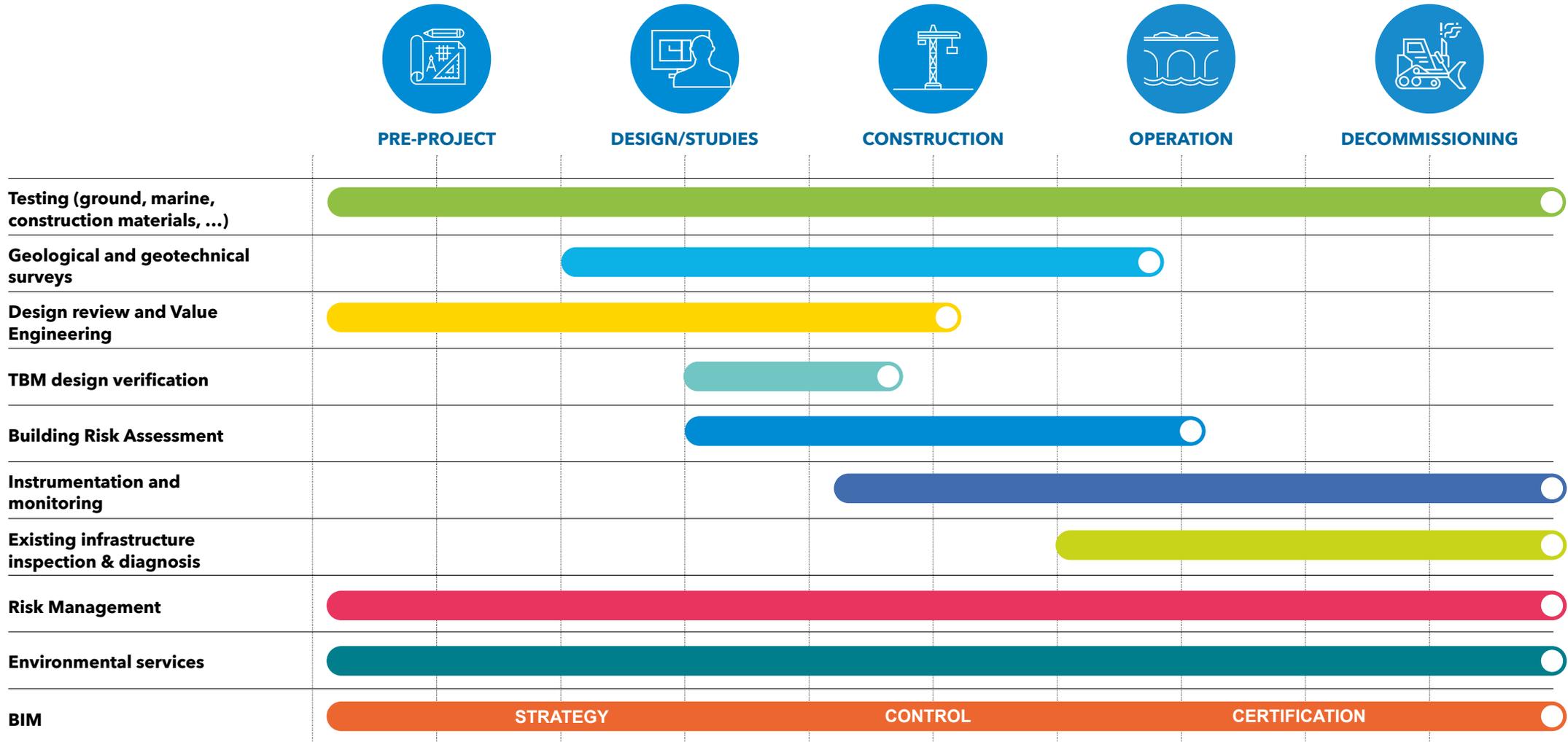
- › Maritime works
- › Ports & harbours
- › Barrages
- › Offshore windfarm

WATER & ENERGY

- › Sanitation
- › Potable water
- › Dams & dykes
- › Drainage
- › Power plants
- › Energy transport (transmission systems)

OUR SERVICES & SOLUTIONS

SOCOTEC offers a diverse range of specialisms to support the full lifecycle of an asset, from the design and pre-construction phases, through decommissioning, **with significant expertise** in structural and ground surveys, monitoring and data management, design review and value engineering and risk management.



< **HELPING TO CONTROL CLIENT RISKS AND OPTIMISE PERFORMANCE** >



TESTING

Deploying proven systems and accredited processes, SOCOTEC provides assurance that the construction activities are demonstrated to comply with specifications and codes. SOCOTEC holds many accreditations for all its services including: UKAS, MMO, ISO 9001, 18001 and 14001, UNI CEI EN ISO/ IEC 17025, Safety management system UNI EN ISO 45001, SOA certification Category OS20-B Classification IV and OS20-A Classification I.

Also, laboratories authorised by the Italian Ministry of Infrastructures for tests on Soil and Rocks (Circ. 7618 STC), for Concrete and Steel (Circ. 7617 STC), plus a qualified laboratory for the sampling and analysis of airborne asbestos fibres by the Italian Ministry of Health.

OUR SERVICES

- › Geotechnical sampling, in situ testing, ground water testing, water sampling
- › Laboratory testing of soils, rocks and ground water
- › Identification and remediation of contamination
- › Utility mapping and ground penetrating radar for hazard identification
- › Asbestos contamination and removal control
- › Quality testing of steel, wet and cured concrete
- › In situ testing embankments and soil structures

High quality testing of soil and construction materials is essential at every stage of a project: feasibility, design and construction. Essential for the compliance and reputation of developers and clients SOCOTEC provides control and reassurance for every stage of a project and while in service.



- › Comprehensive range
- › Accredited services
- › Digital delivery



GEOLOGICAL & GEOTECHNICAL SURVEYS

SOCOTEC's range of geotechnical services are commonly used in conjunction to support client's project-wide requirements. The SOCOTEC Group has a footprint for services which when combined are unparalleled. Effective and efficient investigations require experience and expert knowledge to design them. A thorough understanding of the project is necessary to design a robust and flexible scheme that will include: desk study, flexible techniques, phased stages and a comprehensive laboratory testing programme. Equally supervision during the work, with modifications as required, support a superior solution.

OUR SERVICES

- › Desk studies of historic information
- › Thousands of records and reports on file
- › Ground investigation drilling and sampling
- › Laboratory testing
- › Factual and interpretative reporting
- › In situ testing of soil parameters
- › Unexploded ordnance search and removal
- › Contamination identification and management
- › Geophysical investigation and delineation
- › Seismic risk evaluation
- › Interferometry surveys
- › Data management and BIM coordination

Optimise the information for design and minimise risks with comprehensive high quality geotechnical investigations and reporting.



- › Accredited ground investigation field work
- › High quality soil, rock and water testing
- › Digital records from end-to-end



DESIGN REVIEW & VALUE ENGINEERING

Identifying as soon as possible the major risks of your project is crucial for the success of your operation and to ensure deadlines and costs of your project. SOCOTEC is a partner capable of getting right to the point and is able to determinate the key elements to be checked. We know how to integrate effectively into decision-making process with multiple stakeholders.

OUR SERVICES

- › Check in the pre-project study phase: structural design of the elements, resilience, safety, durability and adaptation to the site and climate
- › Review during the execution study phase: design assumptions; dimensioning and justification calculations of the structures; constructive provisions indicated on the plans
- › Review during the construction phase: structures resistance and deformation; design assumptions for the temporary structures; construction work programmes and specifications
- › Work control: conflict resolution and contradictory hold points, testing assistance, compliance and quality reporting

SOCOTEC helps you to reduce your risks: cost and schedule of your project remain under control.

Using proven processes and procedures, SOCOTEC can help to identify critical design and execution stage risks and thereby protect the owner's success and costs.



- › Reliability of studies at design and planning
- › Technical expertise
- › Advice, pre-construction and on site



RISK MANAGEMENT

You wish to identify, analyse, quantify and control the technical and organisational risks inherent in your infrastructures and equipment.

You need to draw up a global strategy for optimising costs and deadlines. You are looking for an effective decision-making tool to assist you in your choices of design, maintenance or project set-up.

We facilitate the risk analysis process and risk mitigation process for large construction projects

OUR SERVICES

- › Risk analysis and mitigation
- › Cost, schedule and productivity monitoring and analysis
- › Assistance for the implementation of the ISO 31000 (Risk Management) approach
- › Creation and participation in meetings to monitor the project risk management plan or risk review
- › Assistance in the decision making process for maintenance choices (integrated maintenance / subcontracted maintenance)
- › Follow-up of subcontractors in charge of carrying out operational safety studies: guarantee of the technical quality of the service provided, assistance in specific regulatory frameworks
- › Identification of the contractual obligations of the parties in order to avoid the risk of variation requests and claims
- › Assistance in the analysis of companies' claims files

Making informed decisions, taking into account the entire life cycle of your project, enables you to control and manage your project risks, while avoiding project cost overruns.

The assurance that SOCOTEC can provide about the risk management can support the acceptance of complex projects. We help our clients prevent disputes and construction claims.

Project developers and insurers will rely on such assurances.



BUILDING RISK ASSESSMENT

Clients developing significant underground infrastructure projects need to assess and control the risks and issues related to the vulnerability of existing buildings during its implementation.

It is essential to have detailed knowledge of the buildings and structures that may be impacted by underground works, to control the risks to the surrounding area and to have all the information you need to make your decisions.

OUR SERVICES

- › Sensitivity: map processing and visualisation, onsite surveys, determination of sensitivity, hazard identification, provision of a register of residual uncertainties (risk register)
- › Vulnerability (control of frame damage): evaluation of ground movements and vibration intensities, definition of thresholds, vulnerability for all the built assets in the area on the basis of the theoretical ground movements provided during the design and execution phases, identification of particularly vulnerable parts of the buildings and determination of the critical parameters, expertise in redefining thresholds
- › Advice on operational visits & technical expertise
- › In situ monitoring of the buildings during the construction and post-construction phases

SOCOTEC allows project owners to avoid damage to buildings and services.

The assurance that SOCOTEC can provide about the security and control of buildings and assets owned by others can support the acceptance of complex projects. Project developers and insurers will rely on such assurances.



- › Reliability of studies: movement, damage assessment
- › Technical expertise including special temporary mitigation works
- › Advice throughout



INSTRUMENTATION & MONITORING

Providing a comprehensive, robust and effective monitoring system is an essential part of many complex projects. Essential for the approval, risk management and control of construction works, SOCOTEC's well established processes and expertise support many of the biggest projects.

Designing and optimising the client's requirement are a crucial step requiring experience and access to modern technologies. Being able to deploy our in-house operation monitoring system is a differentiator which facilitates the management of data, visualisation of results and reporting. Long-term monitoring using durable systems can be used to support the extension of the serviceable life of assets. Typically low-energy sensors and fibre optics are deployed and read remotely.

OUR SERVICES

- › Design and optimisation of monitoring schemes
- › Monitoring design planning
- › In-house development of equipment and solutions
- › Data monitoring, reporting and alarm systems
- › As-built records and archiving
- › Structural solutions
- › Soil-structure interactions
- › Noise, dust & vibration monitoring

Risks associated with major construction projects are wide ranging. They can include construction tolerance and damage limitation.

For a developer it is essential that movement or construction consequences are within permissible limits - and can be shown to be so - and that no detrimental consequences occur for their project or third parties.



- › Robust and resilient solutions
- › Clear data delivery
- › Responsive to changes



EXISTING INFRASTRUCTURE INSPECTION & DIAGNOSIS

Collecting data on your infrastructure assets is a key. You must preserve them by carrying out the analyses and diagnostics necessary to take decisions that may affect them in the long term.

SOCOTEC is a partner able to provide an exhaustive and reliable knowledge of your assets, having both control over the collection and analysis of data and their security over time.

It also helps clients to extend the service life of infrastructure and to better manage investment and maintenance costs.

Our ability to mobilise the necessary expertise and technologies is recognised by our customers. This allows us to master the different technologies and types of infrastructure work.

OUR SERVICES

- ▶ Periodic inspection of structures
- ▶ Detailed inspection and diagnosis
- ▶ Residual capacity determination
- ▶ Technical assistance for the change of use of an existing asset
- ▶ Technical expertise in the event of a disaster
- ▶ Hazard studies and in-depth technical visits
- ▶ Maintenance and repair advice
- ▶ Asset management consulting (risk management)
- ▶ Asset management with LISA: Lifelong Infrastructure Software & Analytics
- ▶ Predictive maintenance consulting

With SOCOTEC you are able to better control your assets' changes throughout their life cycle.

Our services allow you to secure the sustainability of your structures' data, define the relevant milestones and alert thresholds and improve your ability to make optimised maintenance and upgrade decisions.



- ▶ Secure project data
- ▶ Reliability of technical choices during the life cycle
- ▶ Ensure the sustainability of assets



PAVING THE WAY FOR CITIES OF THE FUTURE AND SUSTAINABLE INDUSTRIES



ENVIRONMENTAL SERVICES

Management of environmental risks and compliance with environmental regulations during infrastructure projects is an essential requirement. SOCOTEC is able to provide environmental services for the whole project including design input, site characterisation and data collection, construction phase environmental testing and advice and ongoing operational monitoring.

We have extensive experience in providing this to major infrastructure projects allowing on-time and cost effective environmental management and compliance.

OUR SERVICES

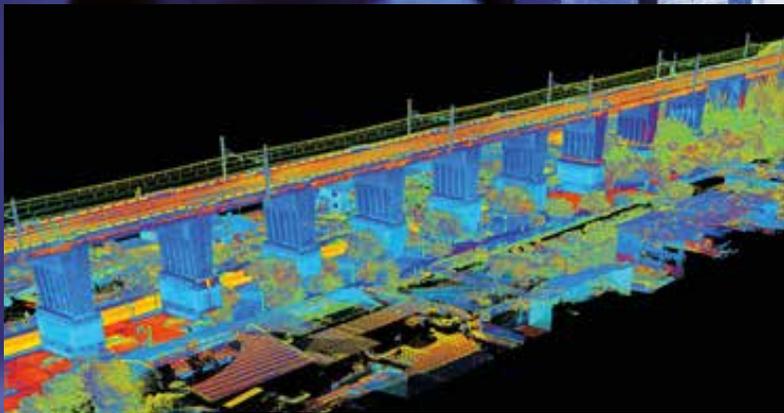
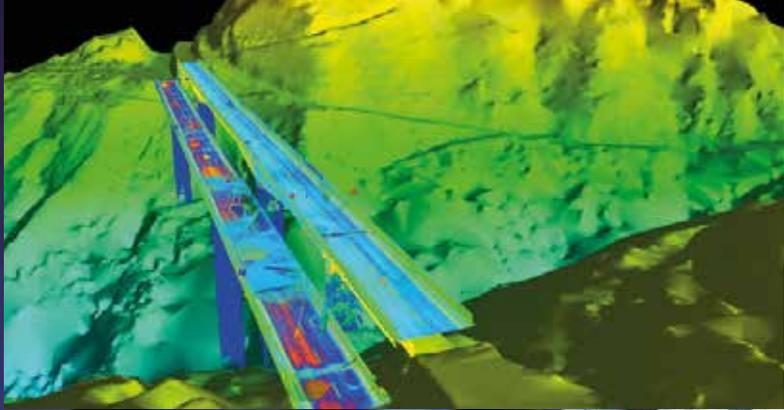
- ▶ Detailed site characterisation
- ▶ Environmental risk assessments and definition of environmental thresholds
- ▶ Polluted soil remediation design and implementation
- ▶ Regulator negotiation and completion of planning and permitting requirements
- ▶ Construction phase support with legal and cost effective waste management
- ▶ Environmental monitoring of soil, air, water, noise and vibration
- ▶ Environmental laboratory analysis including mobile site laboratory analysis
- ▶ Occupational Hygiene Consultancy and Exposure Monitoring
- ▶ Management of asbestos in buildings and in the soil

SOCOTEC works with contractors and clients to ensure robust environmental design and appropriate data to manage and monitor environmental performance. Our broad ranging services allow us to maintain a project's environmental performance from the initial site identification stage, through site construction and operation and ultimately during decommissioning and redevelopment.



- ▶ Accredited and certified services
- ▶ Reliability of studies
- ▶ Technical expertise

INNOVATION KEY PLAYER



DIGITAL INNOVATION

MONITORING SYSTEM

SOCOTEC Monitoring's proprietary data visualisation software is used to process and visualise data for all of our remote monitoring systems. Using this online data visualisation platform, the type of data recorded and the way it is delivered is highly flexible.

Supporting vital decision making, instant and reliable access to data improves the overall effectiveness of any construction or asset monitoring project, and our tool is designed to provide just that.

Designed to offer a user-friendly graphical interface, it allows quick and easy interpretation of large amounts of validated instrumentation data from multiple sources, regardless of project scale.

SOCOTEC provides data visualisation services from thousands of remote sensors on major projects. Not only can this web-based platform be relied upon to provide a clear view of the data collected via desktop, smartphone or tablet devices, but also, by setting up sitespecific thresholds, SMS and email action alerts can be issued to those who need them to maintain the integrity and safety of the site.

Data is also available for use with other applications, such as asset management platforms.

Importantly, with SOCOTEC, you own your raw data to store and use as you wish.



LISA: SMART INFRASTRUCTURE ASSETS MANAGEMENT

Lifelong Infrastructure Software & Analytics

You need to preserve your assets?

You want to access the necessary analyses and diagnostics to make the right long term decisions?

You are confronted with the difficulty?

SOCOTEC is the right partner to provide you with the critical success factors:

- ▶ Exhaustive and reliable knowledge of your assets
- ▶ State of the art technical expertise
- ▶ Data collection and long term back up
- ▶ Expert decision maker's analysis

LISA makes your infrastructure asset portfolio management more reliable with state of the art expertise and technologies:

- ▶ Exhaustive works inventory
- ▶ Instant recording, analysis and backup of all field inspection visits outputs
- ▶ Assistance in decision-making (technical and budgetary programming of investment)
- ▶ Homogeneous and secure backup of all assets life cycle information

With our bespoke services proposal you will:

- ▶ Be able to carry out inspections and diagnostics
- ▶ Have access to a unique work management expert software
- ▶ Enhance your capacity to assess large maintenance strategies
- ▶ Enhance your decision making process



BIM: STRATEGY TO CERTIFICATION

In addition to the many challenges developers and owners have, there is a new demand: to deploy and manage a BIM strategy. Driven by many national governments, this is a crucial step to realising efficiencies in construction and not least, traceable and managed handover to operators of buildings and structures.

Utilising the range of support developed by SOCOTEC's group of specialists, clients can plan, develop and realise effective BIM solutions that save time and money. Those benefits are passed on to facility managers and maintenance engineers.

Strategy: Client support for strategy and detailed planning on how to establish an appropriate and effective BIM approach; either for internal use or to meet a client's demands. Service includes establishing data exchange protocols, hosting and maintenance of a model while in use. Models can be created for a client and handed over with "certificates of conformity".

Assurance: How does anyone know a BIM Model is appropriate, correct and can be relied upon? To deliver assurance SOCOTEC's Certification business has uniquely developed audit and certification solutions for users, the model and even companies:

- ▶ User training and certification (novice to expert training for current or potential users)
- ▶ BIM Model As Built certification (verification that a model is an accurate reflection of the finished product on site plus complies with the Codes)
- ▶ BIM Model In Use (assurance that a model is being used and maintained by all operators)
- ▶ BIM Company (that an organisation's BIM strategy and application complies with Codes and best practice).



Building Control and re-engineering can be done with augmented reality, precision and visualisation using the BIM Model alone. This has revolutionised the checking of BIM models.

INNOVATION IN THE FIELD

SOCOTEC allows its clients to benefit from the latest innovations in services and technologies such as:



FOUNDATIONS

SOCOTEC is integral to the ongoing global research into the design of foundations for the world's monopile wind farms installed by the wind Energy Providers.

SOCOTEC's foundation testing division has adapted its vast technical knowledge, data capture capability and hydraulic system design to provide solutions that enable the wind energy researchers to develop new foundation design codes and parameters for the installation of offshore monopile wind farms.

Most recently SOCOTEC has deployed a bidirectional load test solution providing compact high-load axial strain in a number of large pile types. This solution uses technology unique to SOCOTEC across Europe.

This solution uses technology unique to SOCOTEC across Europe.

STREAM D*

Radar system for real-time investigation

DETAIL - Stream D* provides very high resolution and is also characterised by an excellent penetration capacity.

PRECISION - the result is an effective, precise and easily usable 3D map.

PRODUCTIVITY - The Type V antennas allow GPR to work at a distance from the structure, assisted by sensors that constantly monitor the positioning.

VISUALISATION - Supported by software that delivers usable high quality data and profiling images.

**Patented by SOCOTEC*

PRIME

PRIME (Proactive Infrastructure Monitoring and Evaluation) is an innovative monitoring system designed to deliver non-intrusive imaging of geotechnical assets and provide valuable insight into sub-surface processes for improved asset management and risk mitigation.

Developed by the British Geological Survey (BGS), PRIME combines geophysical ground imaging technology, remote data acquisition and web-based data visualisation with intelligent monitoring, to develop the basis of a new generation of 'smart' earthworks technology, capable of imaging the internal physical condition of infrastructure earthworks, whilst simultaneously monitoring ground movements.

SOCOTEC has exclusive use of PRIME throughout Europe.

INTERFEROMETRY

Terrestrial Interferometry exploits the same principles as satellites. However, it uses very practical portable equipment that can be easily transported where necessary, maintaining safety even in dangerous scenarios, as it allows operations from long distances remote from the structure.

It is ideal for monitoring movement of quarries, landslides and large civil structures such as bridges.

Monitoring can be continuous to detect slow movements as in the case of landslides or dynamic with a very high measurement frequency to detect the main vibration frequencies of the structures.

Precise monitoring at a safe distance.

WISE BACK GIM

When access is demanding or hazardous and precise inspections are required WISE BACK GIM offers a unique solution. Real time inspection and recording with live communication back to the control centre ensures effective and efficient reporting.

- ▶ Inspections performed quickly, accurately and consistently
- ▶ Menu driven procedural checklists and orientation forms
- ▶ Suite of standard inspections forms
- ▶ Capture and embed photographs and videos
- ▶ Speech-to-text features for comments, defect/deficiency descriptions photograph/video captions
- ▶ Complete reporting solution in the field

Unique to SOCOTEC.

WHO WE ARE



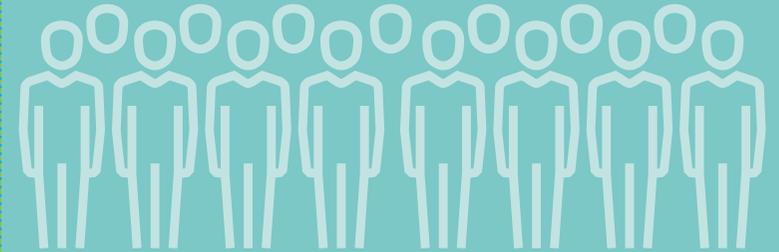
900 M€

TURNOVER IN 2019



OPERATES IN

23 countries



9000

PEOPLE



WORKING ON THE **10**
EUROPEAN LARGEST
INFRASTRUCTURE
PROJECTS



200 000

CLIENTS AROUND THE WORLD

AECOM AEROPORT TOULOUSE BLAGNAC AEROPORTI DI ROMA AIRBUS AKTII ALLIANZ ALSTOM TRANSPORT AMEY ANAS ANDRA ARIANE GROUP ARNHOLDT ARUP ATKINS AUTOROUTES DU SUD DE LA FRANCE AUTOSTRAD E MERIDIONALI AUTOSTRAD E PER L'ITALIA BAE SYSTEMS BALFOUR BEATTY BESIX BLACKSTONE BLB NRW BORDEAUX METROPOLE BOTTE FOUNDATIONS BOUYGUES BP CEGELEC CELINE CFAO CNES CNR COFELY COFIROUTE COLAS CONSERVATOIRE DU LITTORAL CROSSRAIL DEGES DEMATHIEU & BARD DEUTSCHE BAHN DREAL BRETAGNE E.ON EAU DE PARIS EDF EGIS EIFFAGE ENEL GREEN POWER ENGIE AXIMA ENI ENVIRONMENT AGENCY ESID BREST ESID LYON EUROVIA FAIR FAYAT FRAPORT FREYSSINET GHELLA GOLDER ASSOCIATES GRAND ANGOULEME GRAND PORT MARITIME LE HAVRE GRAND PORT MARITIME DUNKERQUE PICCINI GROUP SPA GRUPPO GAVIO HAMBURGER HOCHBAHN HIGHWAYS ENGLAND HORIZON HS2 LIMITED IMERYS INFRASTRUTTURE VENETE INGEO INGEROP ITALFERR KELTBRAY GROUP KIER LAING O'ROURKE LEON GROSSE LES SABLES D'OLONNE LOUIS VUITTON MAIRIE DE PARIS METROPOLE AIX MARSEILLE PROVENCE MILANO SERRAVALLE-MILANO TANGENZIALI MINISTRY OF DEFENSE (UK & FR) MULTIPLEX MONTPELLIER MEDITERRANEE NEXITY NGE GENIE CIVIL NETWORK RAIL NICE CÔTE D'AZUR PAVIMENTAL PIZZAROTTI PONTICELLI PRINCIPAUTE DE MONACO RATP RAZEL REGION BRETAGNE REGION PACA RFF RFI RTE RTM RWE SALINI-IMPREGILO SAM L'ANSE DU PORTIER SANEF SANOFI SAPN SEMTCAR SEVERN TRENT SETEC SKANSKA SNCF SOCIÉTÉ DU GRAND PARIS SOGIN SOLETANCHE BACHY SONATRACH SPEA ENGINEERING SPIE BATIGNOLLES STRABAG STRASSEN.NRW SUEZ SWISS RE SWM SYSTRA SYTRAL TANGENZIALE DI NAPOLI TELEKOM TELT TENNET TERNA THALES TRANSPORT FOR LONDON TOTAL TRANSDEV TUNN3L JV UNIBAIL RODAMCO WESTFIELD UNITED UTILITIES VEOLIA VINCI VNF WEBUILD ZAYO EUROPE



**BUILDING TRUST
FOR A SAFER AND SUSTAINABLE WORLD**

CONTACT

SOCOTEC INFRASTRUCTURE
5 place des Frères Montgolfier
Guyancourt - CS 20732
78182 Saint-Quentin-en-Yvelines Cedex
France

infrastructure@socotec.com

