A large, abstract, circular pattern in shades of red and orange, resembling a stylized sunburst or a complex geometric design, serving as a background for the text.

Instrumentation for
geotechnical, civil & structural monitoring



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About us

Established in 1992, Geosense Ltd is one of Europe's leading manufacturers and suppliers of instruments to the geotechnical, civil engineering, mining and environmental industries.

Geosense products are used globally and have been supplied to major projects in more than 75 countries and in 2022 the company received the UK's prestigious Queen's Award for Enterprise for International trade.

Geosense specialises in the manufacture of vibrating wire and MEMS sensors, which are used to produce a wide range of instruments. In addition we manufacture automated data acquisition systems to complement our sensors, including wireless systems.



“

Geosense provides an efficient, personal service, with in-depth technical assistance

Paul Thurlow, VP Western Region,
Geo-Instruments, USA



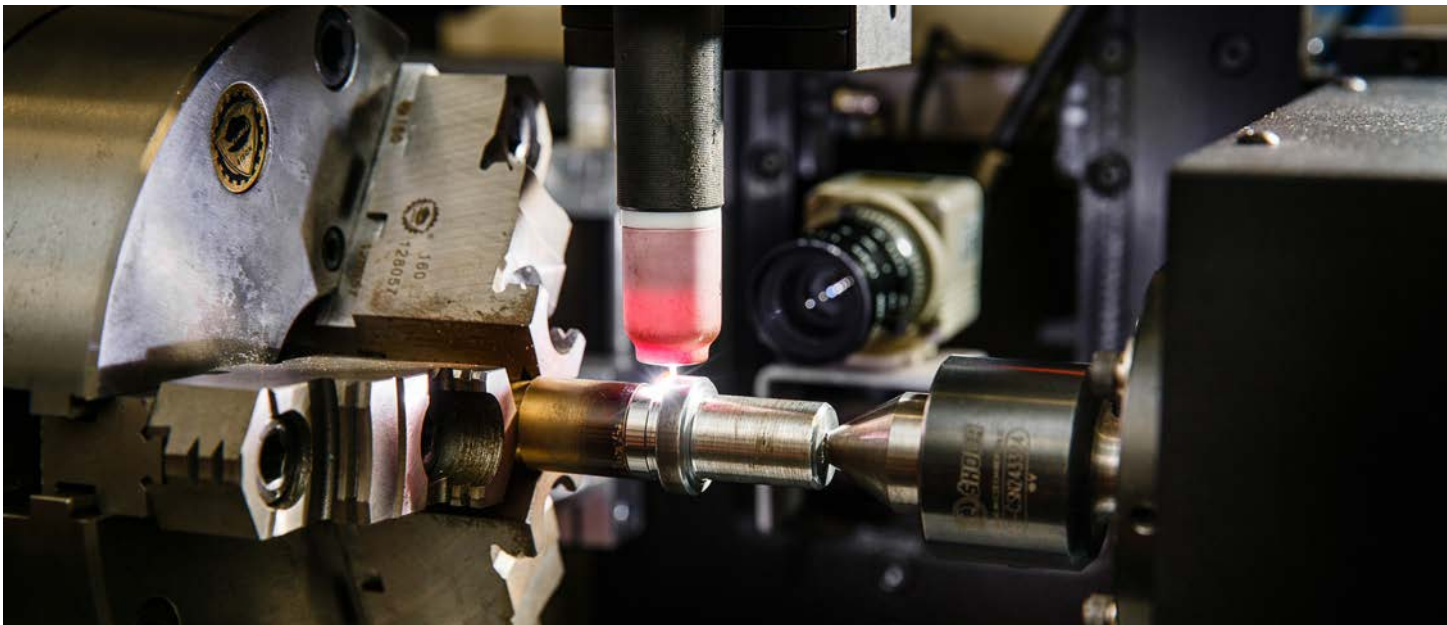
Manufacturing



We offer the highest quality instrumentation and provide the necessary technical support and field-proven engineering experience. All components are manufactured using CAD-CAM and CNC techniques and rigorous inspection under the ISO 9001 quality management system ensures products are of the highest quality.



With a comprehensive in-house design and manufacturing capability Geosense can provide products not only to tight deadlines but also to suit custom-engineered solutions for specific project requirements. The company's purpose-built manufacturing facility houses a range of specialist process equipment for machining, heat treatment, micro tig welding, swaging, load and pressure testing, PCB manufacture and electrical and mechanical assembly.



Engineering Excellence for site-specific solutions

Geosense is committed to developing new products to meet our customers' needs. Our engineers are always working on the development and continual improvement of products and are on hand to help and advise our customers.

Our engineering design team has years of experience working with clients to create purpose-designed or specially-adapted products to meet specific project requirements. No two installations are the same and with our team of trained, qualified and experienced machinists and assemblers, we are able to provide custom-engineered solutions to solve site specific problems.

Quality

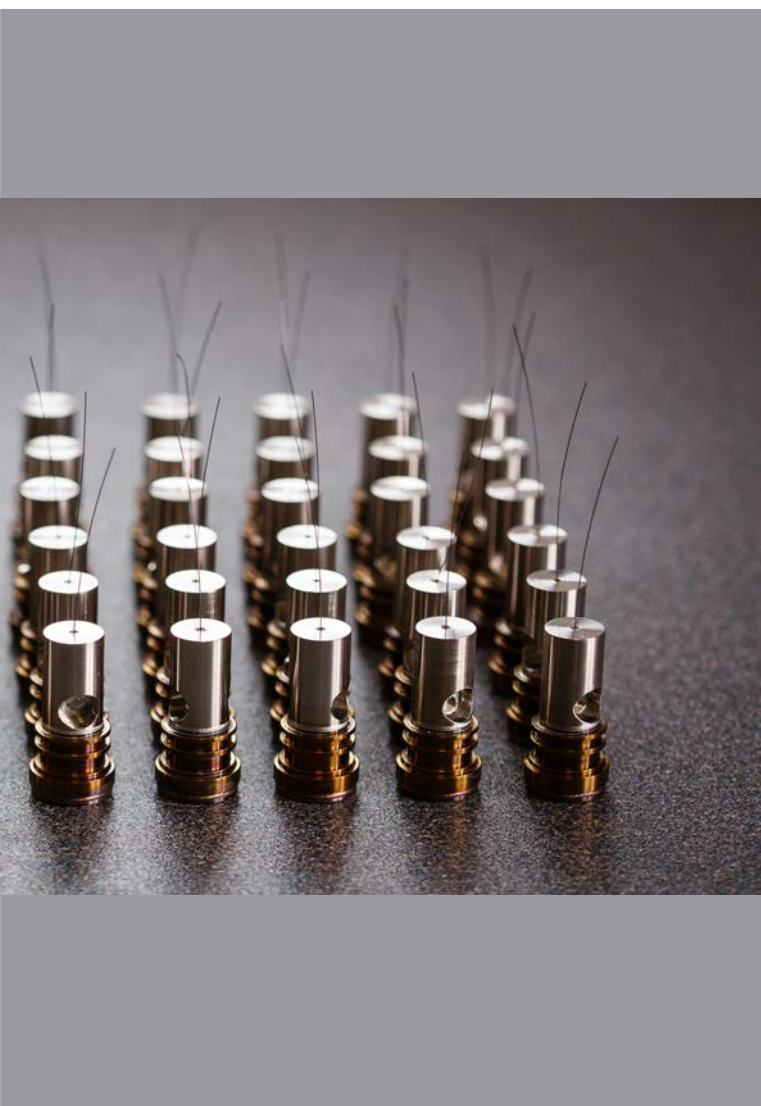
Our instrumentation embodies the highest standards of engineering, the latest technology and an accredited quality control system to achieve maximum reliability and long-term performance.

ISO 9001

Geosense is committed to quality in management responsibility, design control, inspection and testing, delivery, internal quality audit procedures, training and servicing. With ISO 9001:2015 certification, Geosense guarantees to customers that a quality management system is in place and strictly followed.

We're confident in the performance of everything we make which is why all our products come with an industry-leading two-year warranty as standard.





“ The quality of their fabrication is unsurpassed in the market, particularly their equipment which easily achieves its specifications, leaving no doubt for our end users on the precision and accuracy of their monitoring.

William Ward , PCTE, Australia

Compliance

All geosense products conform to internationally recognised directives.

UK
CA

FC

CE

Industry Engagement

Training with the Geosense Academy



The Geosense Academy has been set up to provide Education, Training & Workshops for Geotechnical & Structural Instrumentation.

The training covers Instrumentation theory & particularly the use of the full range of Geosense products plus troubleshooting.

Sessions take place at Geosense UK headquarters and can also be purpose-designed to suit individual client training requirements at their premises.



Technical support

Our technical team are on hand to ensure the correct selection of instrumentation and to provide post-sales support.

We are happy to provide on-site technical support both during and post installation ensuring our customers to install their instruments.



“It was an efficient way of enhancing the technical knowledge of our teams, enhancing their ability to react efficiently to issues on site and provide a more effective service for our clients,”

Alex Bond, Operations Manager at Socotec Monitoring

Memberships

Geosense attends numerous international industry events and technical conferences and is a corporate member of several trade bodies.



Technologies

Geotechnical Instrumentation requires a wide range of sensor and data acquisition technologies together with full connectivity to ensure all instruments on projects from simple to complex can be easily integrated and the data collected either manually or automatically.



Vibrating wire



Analogue



Digital MEMS



LoRa wireless



Data acquisition



Connectivity

Measurements

Our instruments provide a measured value for the following measurands associated with most Geotechnical applications for the Built Environment or natural Geohazards. The signal output from an instrument can be converted into Engineering units using calibration factors created during manufacture.



Pressure



Displacement



Tilt



Load



Strain



Settlement



Convergence



Temperature

Sectors

Whilst the use of Geotechnical Instrumentation can be used within many different applications, they are often divided into the various sectors below.



Infrastructure

Monitoring of roads, railways and pipelines which include embankments, cuttings and tunnels.



Dams

Safety monitoring and design verification during construction and long term performance of all types of dams.



Mines

Ensure safety, control operations, verify design, measure natural events, ensure compliance, control and reduce costs.



Deep Foundations

Metro station boxes, high rise building foundations, underground car parks, sewer shafts require deep excavations.



Ground Investigation

Typical monitoring requirements are stability of natural slopes and the position of the ground water and its fluctuation limits.



Asset Monitoring

Monitoring the effects of construction immediately below or adjacent to existing structures and utilities.



Tunnels & Metros

Instrumentation can be implemented in three stages; pre, during and post construction.



Geohazards

Landslides, slope movement or rock falls are the main causes of damage along linear infrastructures.

Product range

Quality manufactured in the UK

Standard products are designed and built to a specification to suit most Geotechnical Instrumentation applications.

To meet the requirements of projects where the standard design is not suitable, we can offer Be-spoke solutions to tailor our products to meet the specific project requirements.



Inclinometers

Used for monitoring lateral movements and deformations in soil, rock and retaining structures.

- Portable version for manual survey.
- Metric & Imperial versions.
- User friendly app with Android Smart Device.
- Vertical & horizontal In-Place version for safety critical monitoring.
- Proven MEMS technology



Tilt Sensors

Used to detect and monitor differential movement and rotation in structures.

- Available as Tilt Meters & Tilt Beams.
- Submersible options available.
- Point & profile tilt monitoring.
- Proven MEMS & electrolytic technology.



Piezometers

For the measurement of pore water pressure & water levels.

- Standard, low pressure & heavy duty.
- Drive-in option.
- High temperature & saltwater resistant.
- Thermistor included as standard.
- Vibrating wire and Strain Gauge technology



Extensometers

Used to measure and locate settlement, heave, displacement and deformation in soil and rock.

- Multi-point Borehole Rod Extensometers (MPBX).
- Magnetic extensometers (GXM) for manual monitoring.
- In-Place Extensometers (IPX) for automatic monitoring.
- Soil Extensometers (GEO-XS).
- Proven vibrating wire and MEMS technology.



Joint & Crack Meters

For measuring displacement of adjacent surfaces.

- Uses displacement gauges.
- 1, 2, 3D versions available
- Manual & automatic monitoring.
- Joint meters for mass concrete strain.
- Vibrating wire & linear potentiometer technology



Product range



Settlement Monitors

Used to monitor settlement or heave in soils and other structures such as embankments, earth and rockfill dams.

- Liquid settlement system for automatic monitoring.
- Rod settlement system for manual monitoring.
- In-Place Extensometer (IPX) for automatic settlement profile.
- Hydrostatic profiler for a settlement profile.
- Vibrating wire & MEMS proven technology



Load Cells

For measuring loads in rock bolts, strand anchors and struts.

- Centre hole for use with anchors & bolts.
- Solid load cells for pile testing & strut monitoring.
- Tunnel lining monitoring.
- Manual or automatic reading
- Vibrating wire, strain gauge and hydraulic technology.



Pressure Cells

For measuring total stresses in soils and concrete.

- Total Earth Pressure and NATM Cells.
- Push-in options.
- Embankment dam monitoring.
- Tunnel lining monitoring.
- Vibrating wire and Strain Gauge technology.



Strain Gauges

For measuring strain in a wide range of applications.

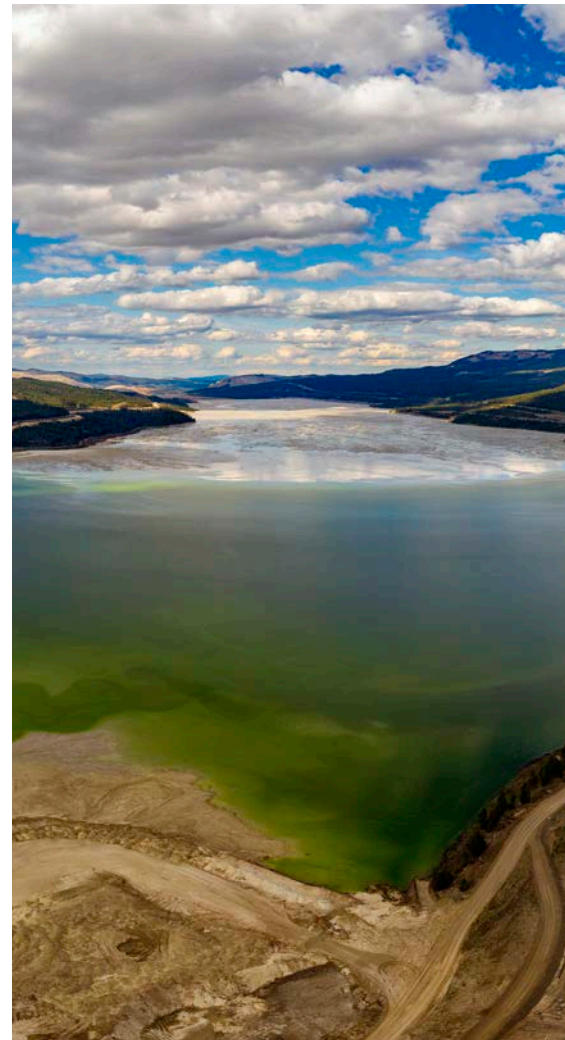
- Embedment within concrete.
- Surface mountable.
- Pile testing.
- Strut monitoring.
- Vibrating wire technology.



Readouts

Used to read & download data from instruments.

- Vibrating wire inputs.
- Analogue inputs.
- Digital inputs.
- Bluetooth connection.
- Data storage.



Product range



Data Loggers

For automatic data acquisition.

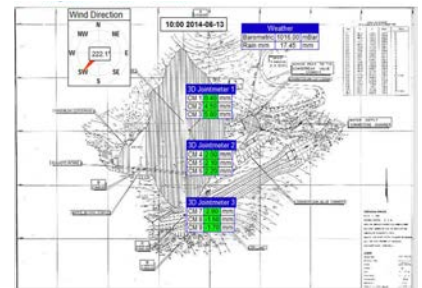
- Built around CR series modules.
- VW stand-alone battery powered.
- Single and multi-channel inputs.
- Mains with battery back up.
- Rugged Peli Case option.



Wireless

Cable free solutions.

- Long range LoRa Sub-GHz.
- Star configuration
- Mesh Network topology. 2.4GHz
- VW, analogue and digital nodes.
- Tilt and Laser Nodes.



Software

Data visualisation.

- Proprietary software solutions.
- Near real time data.
- Map, profile and graph formats.
- Web based or on-premise.
- Inclinator data.



Temperature

For measuring temperature in concrete, soil and rock.

- Vibrating wire & NTC technology.
- Resistance Temperature Detector (RTD) Pt100.
- Single and Multi-point option.
- Geothermal and ground temperature monitoring.
- Mass concrete monitoring.



Cables & Accessories

Direct connection to sensors.

- Direct burial, vented, high strain relief cables.
- Heavy duty and high elongation.
- Braided and EMC compliant.
- Surge Protection Devices.
- Junction and terminal switch boxes.



International Experience

Geosense has extensive experience in more than 75 countries and operates through carefully selected partners who are supported by our international Technical Support Team.

With more than 25 years' experience of shipping products overseas, our Logistics Department can organise deliveries to anywhere in the world and deal with the necessary paperwork to ensure there are no hold-ups in transit.

Our capability for International Trade has been recognised in 2022 with Geosense receiving The Queen's Awards for Enterprise for International Trade.

The award entry process is rigorous and detailed, requiring a high level of financial information as well as a compelling narrative of business achievements. It is described as the most prestigious business award in the world





UK Geosense Headquarters

USA North America Office

40+ International Partners & Distributors network

50,000+ VW piezometers sold worldwide

1.3 million Metres of cable sold

150,000 Metres of casing

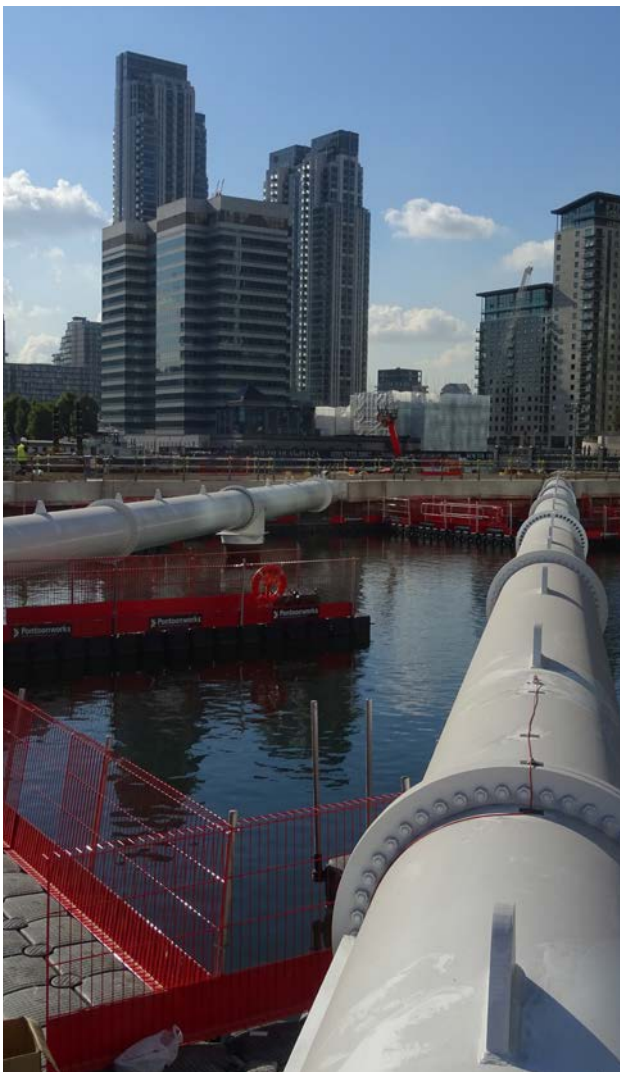
700 km of metro track monitored

160 International wireless projects

100+ Products in the Geosense range

Projects

Geosense products are used globally and have been supplied to projects in more than 75 countries. Projects range from complex large metro schemes, deep open cast mines, hydro-power and irrigation dams to ground investigation projects.



MAKING A DIFFERENCE

The part played by Geosense instruments in major projects globally

- Chosen by engineers in the biggest metro projects
- Infrastructure to keep the world's cities moving
- Ensuring safety for international pipelines
- Time critical track monitoring systems
- Structural safety sensors in major city projects
- From super sewers to huge infrastructure schemes
- Worldwide experience in major dam projects
- Specialist sensors for open cast mining
- From the ground up, trusted by leading engineers
- Monitoring the depths in foundations & piling
- Specialist instruments for water-side developments



01

INFRASTRUCTURE

SPOTLIGHT

6th Street Viaduct, Los Angeles, USA

Special clamps were designed to attach the strain gauges to the 2.75 inch diameter hanger cables. Off-site calibration tests were performed to characterise the response of the strain gauges to the tensioning of the cables.

Due to the large number of sensors (408) and cable lengths (29,120 ft), Geosense worked closely with the installer. Sensors were packaged and labelled for each span and each VWS-2100 strain gauge was fitted with an individual cable length and uniquely marked. This ensured maximum efficiency for the installation process and eliminated any confusion over sensor location.

The actual load transfers were done early in the morning when the temperature of all elements was in equilibrium.

Projects

HS2, London, UK

West Gate Crossing, Melbourne, Australia

Lower Thames Crossing, London, UK

Mersey Gateway Project, Liverpool, UK

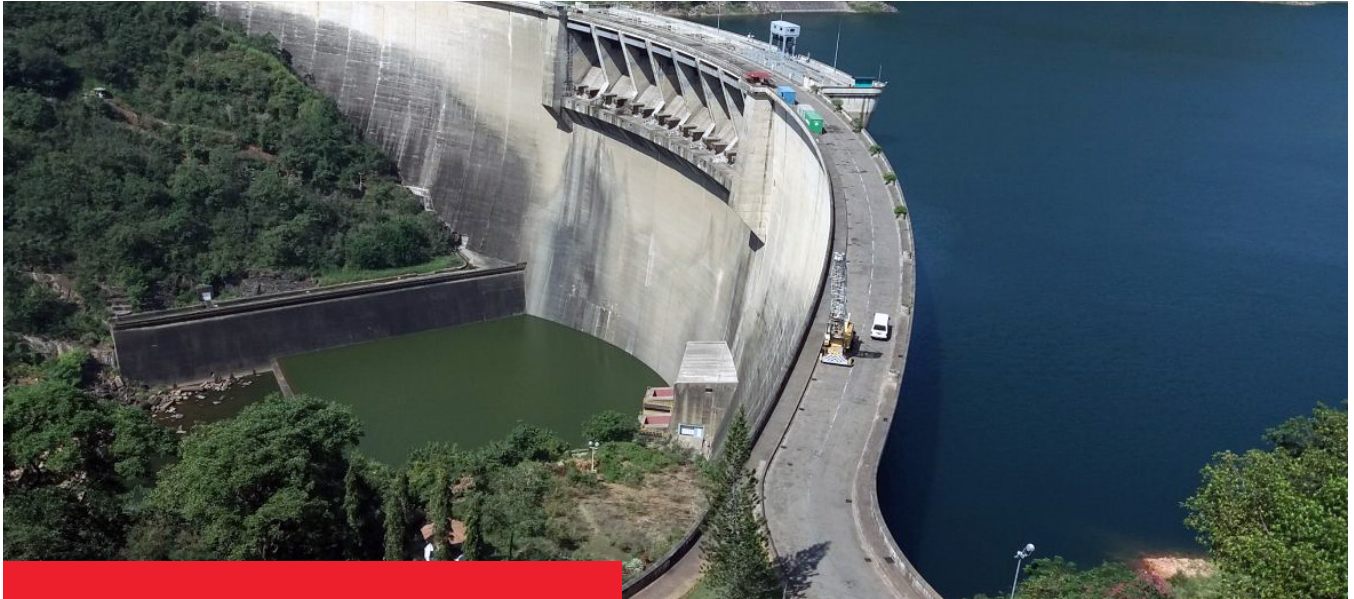
Venjar, Eidsvoll, Akershus Rail Track, Norway

Madrid High Speed Railway, Spain

Hillerød Rail Track, Copenhagen, Denmark

Slovak Gas Pipeline, Slovakia





Projects

Baish Dam, Kingdom of Saudi Arabia

Tishreen Dam, Syria

Ziezoun Dam, Syria

Chemususu Dam, Kenya

Kashimbila Dam, Nigeria

Didachara Dam, Georgia

Dogancay Dam, Turkey

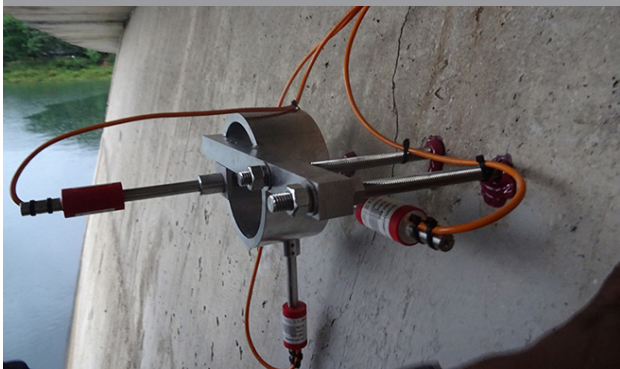
02

DAMS

SPOTLIGHT

Victoria Dam, Sri Lanka

As part of on-going monitoring, two 3D vibrating wire crack meters were installed on the upstream and downstream faces near the crest of the dam. The vibrating wire displacement sensors were cabled back to a data logger located within the central control room.





03

MINES

SPOTLIGHT

Manjung Iron Ore Handling Plant, Malaysia

The onshore stockyard consists of five bays approximately 800m long by 40m wide with iron ore stockpile material up to 19m high. The underlying soils are silty clays and completely decomposed granites containing sand layers. The objective of the instrumentation is to measure:

- Soil settlement at the stockyard area (underneath iron ore stockpile)
- Soil movement at the edge of each stockyard
- Lateral movement of the berms
- Pore pressure during the loading of iron ore

Projects

Boulby Mine Shaft Re-lining, UK

Vale Teluk Rubiah, Malaysia

Krumovgrad Gold Mine, Bulgaria

Tara Zinc Mine, Ireland





Projects

Royal Albert Hall, London, UK

Whitechapel Station, London, UK

Museum of Human Evolution, Spain

Liverpool Street Station, London

Doha New Airport Station, Qatar

Canary Wharf Station Crossrail, UK

04

DEEP FOUNDATIONS

SPOTLIGHT

One Nine Elms, London, UK

One Nine Elms landmark towers will be the tallest residential towers in Europe. Soaring over 50 storeys, One Nine Elms will offer luxurious private apartments alongside a world-class five-star hotel.

The monitoring system featured a mix of instruments, including vibrating wire piezometers to monitor pore water pressure, in-place inclinometers installed in the diaphragm walls (D-walls) to monitor displacement of the walls during basement excavation works.

Adjacent buildings were also monitored using digital BUS MEMS tilt meters as part of an Asset Protection design scheme during the large amount of deep excavations within the area.





05

GROUND INVESTIGATION

SPOTLIGHT

Lower Thames Crossing, London, UK

The 14.5-mile route of the planned Lower Thames Crossing is one of the UK government's top 40 infrastructure projects in its National Infrastructure Plan. It includes dual tunnel bores accommodating three-lane carriageways for 2.6 miles below the river. With each bore measuring 16.4 meters in diameter, it will be the third widest bored tunnel in the world and the largest in Britain.

As one of the largest Ground Investigations in the UK 400 boreholes were drilled along the 23.3km route, both north and south of the Thames as well as under the River Thames itself.

A significant number of instruments were installed including QJ inclinometer casing and VWP-3000 vibrating wire piezometers with data acquisition using Linx data loggers.

Projects

East West Rail Project, UK

Vejle Hospital, Denmark

The Sigma Plan, Belgium

Barton-on-Sea Cliffs, UK

Cottingham Bridge, UK





Projects

Battersea Power Station, UK

Bishopsgate Tower, UK

Teatro Colon, Colombia

Shell Centre, UK

Guy's Hospital, UK

06

Asset Monitoring

SPOTLIGHT

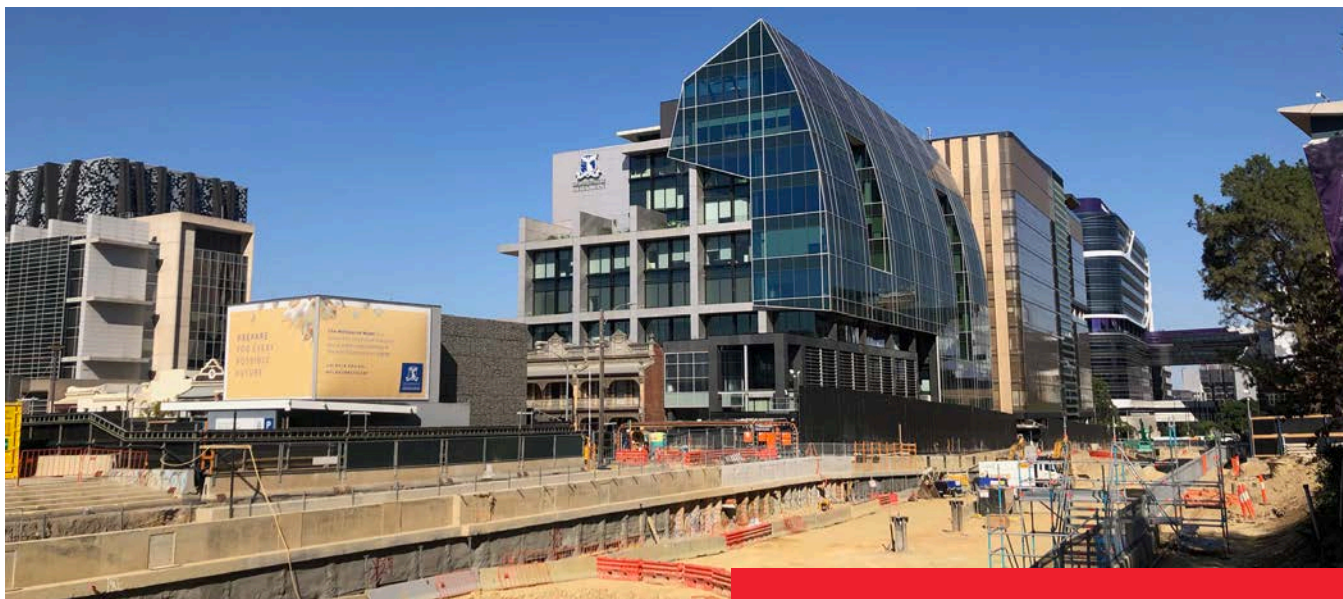
Gediminas Castle Hill, Lithuania

Following signs of movement on the steep slopes surrounding the iconic Gediminas Castle, monitoring began to establish the extent and rate of movement which endangered buildings at the foot of the slopes and the castle walls.

In all, 23 Wi-SOS tilt meters were installed, connected to the Wi-SOS 480 Gateway and a series of load cells to measure loads on ground anchors that were installed to prevent further movement.

In addition 50 prisms were installed and four GeoMax Total Stations as part of the overall monitoring scheme.





07

Tunnels & Metros

SPOTLIGHT

Melbourne Metro, Australia

The Melbourne Metro Tunnel Project was built through the CBD and dense urban areas, requiring a complex, robust and reliable instrumentation and monitoring system.

A wide range of instruments were installed including in-place inclinometers, VW strain gauges, VW piezometers and VW multi-point borehole rod extensometers to monitor the deep excavations for the five stations and the twin nine-kilometre running tunnels.

Projects

Thames Tideway, London, UK

Jakarta Metro, Indonesia

Kuala Lumpur MRT, Malaysia

Crossrail, London, UK

Tel-Aviv Metro Red Line, Israel

Bucharest Metro, Romania

Doha Metro, Qatar

City Rail Link, Auckland, New Zealand





Projects

Eden Brows Landslip, UK

Severn Valley Landslip, Ironbridge, UK

08

Geohazards

SPOTLIGHT

CRIP, Sri Lanka

Five strategic landslides had been identified as posing a significant risk to local inhabitants and/or main public highways.

Monitoring of ground movements, groundwater levels and pore water pressures was necessary long-term to establish any impending instability.

All instruments are individually equipped with radio-enabled CR Series data loggers and each site has a GSM connected Radio Gateway to provide remote data gathering and processing.





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