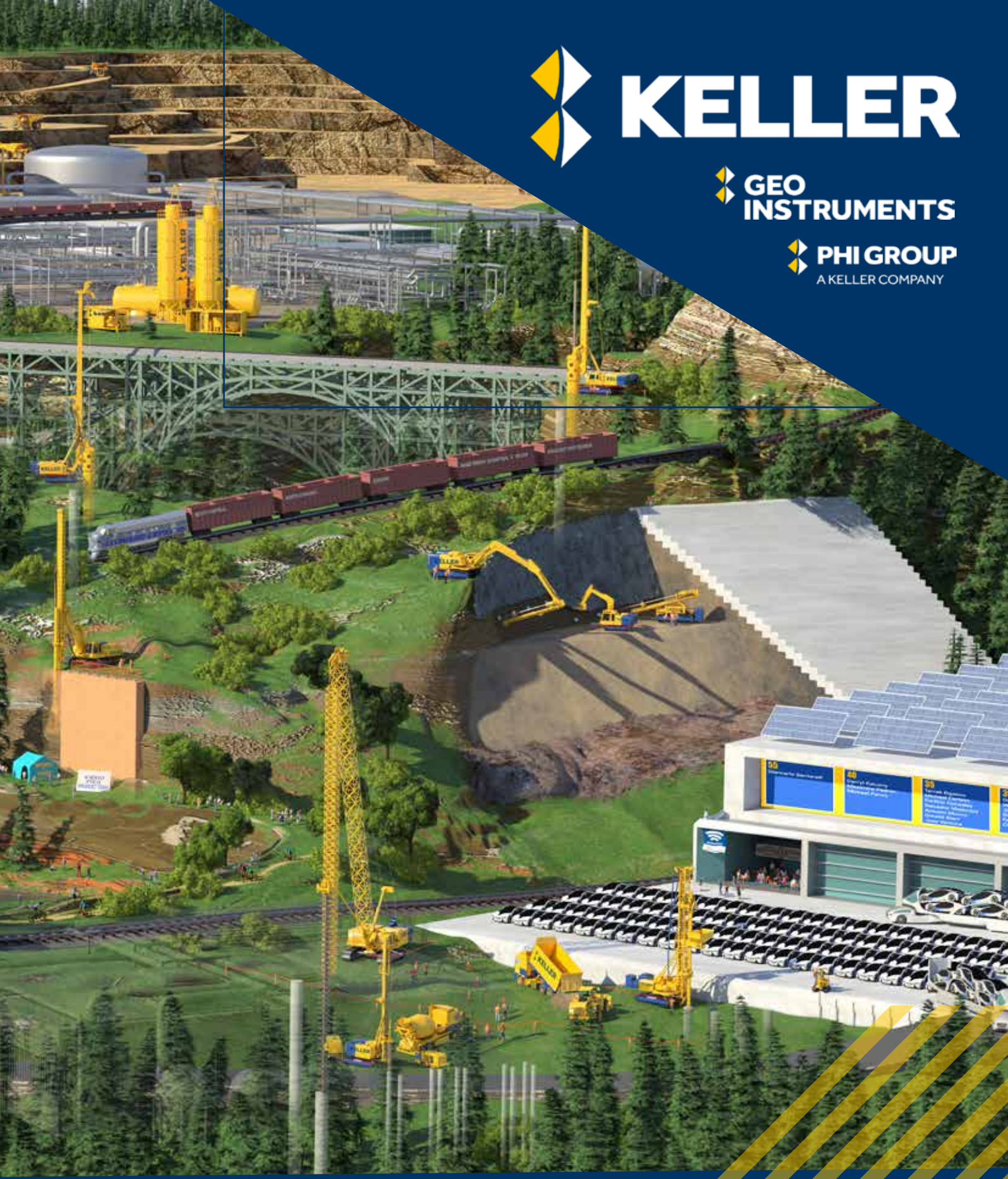


KELLER

GEO INSTRUMENTS

PHI GROUP
A KELLER COMPANY

Keller Capabilities

Offering the UK's widest range of geotechnical solutions

global strength and local focus

Every day, people around the world live, work and play on ground prepared by Keller.

We are the world's largest geotechnical solutions specialist. By connecting global resources and local knowledge, we can tackle the toughest engineering challenges.

Whatever geotechnical problem you are trying to solve, Keller UK has the people, expertise and experience to provide the answer.

Markets

Commercial

Keller UK provides geotechnical solutions for the commercial market sector for both existing and planned structures, including office buildings, hotels, distribution centres, retail, data centres, and other structures.

Industrial

Keller UK designs and constructs cost-effective build or design-build geotechnical solutions for the industrial and manufacturing sector.

Infrastructure

Keller UK is actively involved in efforts to upgrade infrastructure throughout the country. Whether it is transportation, railways, tunnels or utilities, we provide geotechnical solutions for each unique project.

Power

Keller UK has wide experience of providing the energy sector with cost-effective solutions to ground problems.

Institutional / public

Keller UK can provide solutions for the full range of institutional structures including government and military, education, healthcare, and sports and entertainment.

Residential

Keller UK has provided thousands of homeowners, developers and contractors with geotechnical solutions to both large and small residential projects.

Talk to our Business Development team about your project:

Mark Williams
07557 033271
mark.williams@keller.com

Derek Taylor
07769 654163
derek.taylor@keller.com

The expertise to get the job done

Piling

Piling is required whenever weak soils have little capacity to resist an existing load or a change in existing load. Piling involves the construction of structural elements to transfer loads down to stronger underlying soils or rock. Keller offers the following piling solutions:

- CFA piling
- Driven precast piling
- Rotary bored Piling
- Restricted access piles
- Driven steel piling

Piled walls

We use the latest technology, testing regimes and best practice protocols developed over many years to ensure the position, verticality and structural integrity of our piled walls. Keller offers the following piled wall solutions:

- Contiguous bored piled walls
- Secant bored walls
- King post retaining walls

Grouting

Keller leads the world in grouting technology – with systems for all applications from lifting structures to grouting dam curtains.

- Compaction grouting
- Permeation grouting
- Jet grouting (Soilcrete)
- Compensation grouting
- Rock/fissure grouting

Specialist piling

Keller has vast specialist piling experience in all ground conditions with the ability to design in-house based on subsurface conditions, structural requirements and environmental limitations. Keller offers the following solutions:

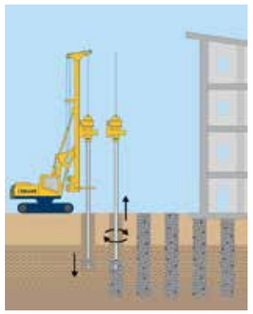
- Rail and highway piling
- Restricted access piling
- Minipiling
- Pali Radice
- Specialist Drilled Solutions

Ground improvement

With a pedigree of more than 75 years in the UK and specially manufactured equipment, Keller lead the way with these solutions:

- Vibro stone columns
- Vibro concrete columns
- Rigid inclusions
- Dynamic deep compaction
- Environmental stone columns
- Vibro compaction
- Mixed modulus columns CMM

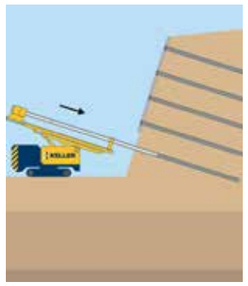
Soil mixing



Soil mixing is an advanced ground improvement technique requiring considerable expertise in planning, design and execution. The technique leads to significant improvement of the mechanical and physical properties of the in-situ soil. Keller offers the following solutions:

- Deep dry soil mixing
- Wet soil mixing

Stabilisation



Keller draws on its extensive experience to provide optimal stabilisation solutions for various projects. This includes the following techniques:

- Ground anchors
- Soil nailing
- SBMA

Groundwater control

Keller understands the challenges faced by asset owners and operators in managing groundwater safely and effectively. Keller delivers a comprehensive range of geotechnical solutions to support both new and existing assets, including:

- Diaphragm wall
- Slurry cut-off walls
- Ground freezing
- Permeable reactive barriers

Delivering the full package

Keller can support projects right from the start through to completion. Our in-house design and drawing teams work closely with clients to turn early ideas into clear, practical plans. We focus on getting things right early, so there are fewer issues later on. We also work to BIM Level 2 standards, which means everyone is working from the same, up-to-date information. This helps keep things organised, reduces mistakes and makes it easier for different teams to work together.

Contact us

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KELLER Solutions Matrix

APPLICATIONS \ TECHNIQUES	Injection grouting	Permeation grouting	Compaction grouting	Soilfrac / Compensation grouting	Jet grouting	Dry soil mixing	Dynamic compaction	Rigid inclusions	Vibro compaction	Vibro concrete columns	Vibro replacement	Wet soil mixing	Ground anchors	Soil nailing	Secant piles	Contiguous piles	King post walls	Continuous flight auger piles	Rotary bored piling	Driven precast piles	Minipiles / Pali Radice	Diaphragm / Slurry walls	Ground freezing
	GROUTING						GROUND IMPROVEMENT						EARTH RETENTION					STRUCTURAL SUPPORT				WATER CONTROL	
Tunnel portals	●				●							●	●	●	●	●							
Piling										●								●	●	●	●	●	
Earth retention		●			●							●	●	●	●	●	●					●	●
Environmental					●	●						●										●	●
Foundation upgrade / repair	●	●	●	●	●								●								●		
Groundwater control	●	●			●							●			●	●						●	●
Road and rail stabilisation	●		●			●						●		●					●				
Liquefaction mitigation		●	●		●	●	●		●		●	●									●		
Swallow hole remediation			●				●		●		●										●		
Slope stabilisation					●	●					●	●	●	●	●	●	●						
Ground improvement	●	●	●	●	●	●	●	●	●	●	●	●											
Tunnelling stabilisation	●	●	●	●	●	●						●											●
Underpinning		●			●									●	●	●	●				●		
Void filling	●		●																				

This chart represents techniques that could apply to the listed geotechnical challenges. The actual applicability of a particular technique will be dependent upon the soil character (soft, loose, stiff, dense, organic, collapsible etc) and its composition (clay, silt, sand, cobbles, boulders etc). Occasionally, multiple techniques used simultaneously could provide a more economical solution. Other considerations include accessibility, availability of materials, presence of utilities or other underground obstructions and many other internal and external influences. Consult with your local Keller representative to discuss specific site conditions and appropriate Keller geotechnical construction solutions.

For full details of each technique, visit www.keller.co.uk

KELLER

PHI GROUP
A KELLER COMPANY

Cost-effective and sustainable

Phi Group is the market leader in retaining structures and delivers a range of cost-effective, sustainable and buildable solutions.

We offer a full design and installation service, with the backing of our parent company Keller Limited.

Phi Group has experience throughout the construction industry and understands the unique challenges and requirements associated with each one.

Markets

Commercial

Phi Group provides retaining structures and slope stabilisation solutions for the commercial market including new retail, warehouse and distribution projects.

Industrial

Phi Group designs and constructs cost-effective retaining structures for the industrial and manufacturing sector. Whether cutting into site or raising levels to increase developable land, Phi Group has the answer.

Infrastructure

Phi Group is actively involved in efforts to upgrade infrastructure throughout the country. Whether it is transportation, railways, tunnels or utilities, we provide geotechnical solutions for each unique project.

Power

Phi Group is involved in efforts to provide the energy sector with the optimum retaining structures for each unique project.

Institutional / public

Phi Group can provide retaining structures and slope stabilisation solutions for a range of institutional developments such as schools, universities and hospitals.

Residential

Phi Group has provided retaining structures for many residential developments of all sizes.

Find out how we can help with your project. For more details, contact:

Rob Torrington
07753 573762
rob.torrington@phigroup.co.uk

Our techniques

Gravity retaining walls

These use the mass within the structure to resist the applied forces from the ground behind. Typically used in a cut situation, they are predominantly installed leaning back at an angle so are less imposing than a vertical structure. There are a wide range of gravity retaining wall solutions available, with cost, aesthetics and design life all a consideration.

- Permacrib timber crib
- Andacrib concrete crib
- Gabion baskets
- L-shaped concrete vertical walls
- Polycrib recycled plastic crib

Reinforced soil slopes

Reinforced soil slopes and structures are typically used where levels are being raised on site, and steep slopes or vertical structures are required, therefore increasing the amount of flat land available to develop. Material is compacted around layers of reinforcement to form a reinforced soil mass. The facing is then chosen based on slope angle, maintenance and aesthetic considerations.

- Textomur reinforced soil slopes
- 45 degree slope

Reinforced soil structures

Vertical reinforced soil structures use a variety of reinforcing elements such as geogrid, steel ladders or polymer and steel straps. A variety of facing elements are available with modular block and concrete panels being the most popular.

- Modular block reinforced soil structures
- Concrete panel vertical

Facing systems

Slopes or structures will often need to be faced with an aesthetically pleasing finish. Phi Group's range of facing solutions can be used to provide a finish to structures such as soil nailed slopes, buildings or sheet piled retaining walls. Vegetated slopes using our Soil panel system for soil nailed slopes, or gabion cladding to buildings are all widely used.

- Soil panel
- Gabion cladding

Bespoke solutions

Phi Group designs and installs more than 300 retaining walls every year in a challenging and demanding field of construction using our wide range of bespoke solutions. We are extremely proud of our track record, from a quality, service and health and safety perspective.

GEO INSTRUMENTS

Leading the way with reliable data

GEO-Instruments is one of the leading international providers of instrumentation and monitoring services.

We offer expert project support, accurate and repeatable data from a large array of professionally-installed instrumentation, and innovative, versatile visualisation software.

With more than 10 years of trusted industry experience in the UK, our clients value our reliability, flexibility and our ability to deliver each project on time and to the highest standard.

Markets

Rail monitoring

GEO-Instruments work extensively on all types of rail assets including Network Rail, TfL and Underground lines. Our rail monitoring and survey services are designed to meet the industry's specific requirements and standards.

Infrastructure monitoring

GEO-Instruments apply comprehensive expertise to deliver project-tailored monitoring schemes for all types of infrastructure. This includes surface assets such as roads, embankments and bridges as well as buried utilities.

Building monitoring

GEO-Instruments offer a wide range of manual and automated techniques for monitoring residential and commercial properties, historic buildings, and other sensitive structures for potential movement related to construction or demolition works.

Tunnelling

GEO-Instruments has extensive experience working on the UK's largest tunnelling projects. Our I&M solutions provide precise, high-frequency measurements, automated reporting, data alerts, and bespoke software features.

Find out how we can help with your project. For more details, contact:

Piotr Konieczny
07872 456295
piotr.konieczny@geo-instruments.co.uk

The services we offer

Rail monitoring

GEO-Instruments' comprehensive array of rail and track monitoring services includes condition surveys, track geometry and clearance surveys, automated deformation monitoring including automatic twist and cant calculations. Additional services are offered for railway tunnel applications such as 3D tunnel and convergence monitoring. Instrumentation options include: Manual Survey, Robotic Total Sta

Survey and manual monitoring

Manual surveys and Levelling are indispensable techniques for monitoring of 3D movement and settlement in construction environments. Valuable in a wide variety of applications, these trusted methods are ideal where highly accurate measurements are required at a lower frequency, or when site conditions prohibit automated monitoring. Instrumentation options include: Automated Total Station, Digital level, Survey prisms, Retro-reflective targets

Noise, vibration and air quality monitoring

GEO-Instruments provide the latest environmental monitoring instrumentation to measure of vibration, noise and dust concentration. Construction activities like excavation, demolition and piling are significant potential sources of these influences and it is increasingly important to monitor their effect on the site, structures, and neighbouring properties. Instrumentation options include: Dust Monitoring station, Vibration sensor, Sound level meter

Setting out and site engineering

GEO-Instruments' Site Engineering team have wide experience in providing precise and dependable setting out, rig alignment, as-built and borehole surveying services to clients throughout the UK. Engineers work closely with project teams to help realise designs accurately and efficiently. Instrumentation options include: Robotic Total Station, GNSS positioning tool, Gyroscopic borehole survey probe

Structural monitoring

GEO-Instruments can deploy a diverse range of automated systems to monitor structural movement using long lasting, battery powered sensors and reliable wireless communication. Depending on the project requirements, there are a large number of measurable factors including tilt, settlement/heave, displacement, strain and deflection. Instrumentation options include: Wireless Tiltmeters, Hydrostatic levelling cells, Strain gauge, GNSS meter, optical displacement sensor, Crack meters, Distributed Fibre Optic Sensing (DFOS)

Geotechnical monitoring

GEO-Instruments can deploy rugged, specialised in-ground instrumentation to measure changes in ground conditions and movement. Some examples of monitoring applications include ground settlement, soil pore pressure, excavation walls, landslips, embankments and ground stabilisation performance. Instrumentation options include: Manual and Automated Inclinometers, Load Cells, Piezometers, Extensometers, Settlement Plates

QuickView software

All of our solutions are supported by our specialist, in-house developed monitoring platform QuickView. The software is a comprehensive project data management solution designed for ease of use and rapid interpretation of complex monitoring data. It provides a vast range of features that enable project teams to process, manage, and visualise collected data so it becomes clear, meaningful, and easy to interpret. QuickView is built to provide a range of advantages to users, focusing on versatility, ease of use, scalability, customisation, reliability and security.

Contact us

For more details, contact the GEO-Instruments team:

0207 7092030 info@geo-instruments.co.uk

Or visit the GEO-Instruments website:

www.geo-instruments.co.uk

GEO INSTRUMENTS

global strength
and local focus

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