International Geotechnical Contractors

Keller Grundbau is a member of the London based Keller Group plc. We provide customised solutions for a variety of geotechnical and ground water problems. From our head office in Offenbach (Germany) and more than 30 branches worldwide Keller offers its services to various parts of the construction industry. Keller is capable of solving many different geotechnical problems using our own technology and know-how. Our main focus is soil improvement methods and grouting techniques.

As a leading contractor with roots dating back to 1860 Keller is committed to two fundamental principles – the highest possible standard of execution and the continued advancement of its technologies. We can turn complex soil and groundwater problems into solutions. From its operational bases in Europe, North America, Australia and Singapore Keller companies have proven their skills in almost every country in the world.

Keller serves the whole construction industry in industrial and residential projects, in refurbishment and structural repair as well as in maintenance and environmental protection.

From Soil Investigation to environmental protection our products and technologies cover 8 different market segments. Their individual use and possible combinations are able to solve a variety of geotechnical problems.
Soil Investigation
Our strength lies in carrying out large soil investigation programs for infrastructure projects, industrial plants, dams and landfill sites.

Boreholes
— Rotary drilling
— Percussion drilling
— Wire line drilling
— Drilling with grabs
— Augering
— Reverse circulation drilling
… also from pontoons or jack-up barges

Sampling
— Disturbed sampling
— Undisturbed sampling
— Water sampling
— Core-sampling with and without PVC liners
— Rock core drilling
— Gas sampling, environmental sampling

Soundings
— Dynamic penetrometer testing
— Standard penetration testing
— Cone penetration testing
— Soil index testing
— Lateral pressure gauges

Borehole Instrumentation
— Ground water level gauges
— Ground water level recorders
— Water volume meters
— Settlement gauges
— Micrometers
— Verticality measuring
— Borehole alignment survey
— Extensometers

Borehole Tests
— SPTs
— Dilatometer testing
— Flow direction testing
— Inclinometers
— Permeability testing
— Slug-bail tests
— Video camera investigation
— Injection well testing

1 Undisturbed sample from a container terminal construction site
2 Rammed core samples in PVC casing for the investigation of and underpass beneath a river
3 CPT’s for a planned harbour extension using our all-terrain CPT-truck
4 Soil investigation for a wind farm in the North Sea
5 Core-sampling for a new container quay
Typical layout of a Soilcrete® sealing slab consisting of intersecting columns. Precise survey systems ensure effective sealing.
Ground Water Sealing
As lowering the ground water level with deep wells is subjected to more and more restrictions, Keller is able to offer its sealing wall and slab technologies as alternatives. Whether it’s an excavation or an embankment, Keller provides environmentally friendly solutions to any problem.

Sealing Walls
— Grout walls
— Bored pile walls
— Soilcrete® sealing walls
— Soilcrete® lamella walls
— Vibro diaphragm walls
— Diaphragm walls
… With embedded sealing elements

Sealing Slabs
— Cement grout slabs
— Chemical grout slabs
— Layered slabs
— Soilcrete® slabs
— Compaction slabs using depth vibrators

Joint Seals
— Soilcrete® joint sealing
— Cement grout sealing

Uplift
— Grouted Anchors
— Tension piles
— MESI tension piles

Dam Sealing
Keller counts itself among the main partners for all geotechnical works relating to dams, sea walls and the like. Our main focus lies on sealing techniques to prevent seepages below and around such structures. Repair works on existing dams are also becoming more and more frequent with ageing structures.

Dams
— Grout curtains
— Cavity grouting
— Drains
— Joint sealing
— Contact grouting
— Refurbishment grouting
— Rockbolts
— Uplift anchors
— Grouted anchors
— Piezometers
— Water level gauges
— Ground and structural investigation

Dykes
— Vibro diaphragm walls
— Slurry walls
— Soilcrete® walls
— Soilcrete® lamella walls
— Grouted walls
— Diaphragm walls using top vibrator

Installation of a Soilcrete® bottom seal (principle).
Improving the soil underneath single foundations is one of the common applications for deep vibro techniques. The compaction points are arranged in a pattern to cover the foundations and the bulb of pressure.
Foundations
Soil improvement using depth vibrators was first developed by Keller. Several different types of vibrators for cohesive and non-cohesive soils are available. Soils have been compacted up to a depth of 50 m below ground level.

Compaction Techniques
- Vibro compaction
- Vibro replacement
  - with bottom feed vibrator
  - with jets of compressed air
  - with high pressure water jets
  - with top feed method
  - with pull down force using reaction of the vibrocat
  - with continuous power consumption record
  - with geotextile sleeve
  - suitable for stabilising soil to mitigate earthquake risk
- Compaction grouting
- Dynamic compaction
- Vertical drains
- Cavity grouting

Piled Foundations
- Cast in situ bored piles
  - with enlarged base
  - with grouted base
  - with Soilcrete® base
- Cast in situ driven piles
- Continuous flight auger piles
- Grouted piles
- Mesi piles
- Vibro piles
- Grouted stone columns
  - with enlarged gravel base
- Vibro concrete columns
- Soilcrete® columns
- Grouting

Excavation Support
Keller can construct complete excavation support packages. We can underpin, strut, protect neighboring structures and seal against ground water ingress.

Shoring
- Soldier pile wall
  - with timber shoring
  - with Soilcrete® shoring
  - with shotcrete shoring
- Bored pile walls
  - secant or contiguous
  - non-contiguous with shoring
  - with Soilcrete® joint sealing
- Tubular Piles
- Grouted walls
- Diaphragm walls
- Soilcrete walls
- Facing piles
- Temporary anchors
- Permanent anchors
- Ground water windows within shoring

Underpinning Excavation Supports
- Cement grouting
- Soilcrete® walls

Slope Protection
- Shotcrete
- Anchoring
- Soil nailing
- Drains

The application of depth vibrators with and without feeding additional aggregates is a versatile method offering economical soil improvement solutions for a wide range of soils.
With the Soilfrac® delicate tunnel sections may be constructed safely. For example, where tunnels pass at a close distance underneath existing foundations the installation of a pipe umbrella can compensate for settlements. Real time monitoring (e.g. with liquid levels) accompanies the execution and delivers a seamless documentation of all works.
Preservation
Keller has refurbished the foundations of over 1,000 old churches, historical buildings, town halls, residential buildings, industrial and infrastructure complexes.

Underground Structures
Keller has been active for many years in the field of pipe jacking and tunneling. With our innovative ideas and individual solutions Keller is a strong partner if you have difficult tunneling challenges such as tunneling beneath existing structures.

Building Protection
— Against expected settlements
  ... Soilcrete® foundations
  ... Soilcrete® arching support
  ... Soilfrac® stabilization
  ... Soilfrac® lifting
  ... Compaction grouting
  ... Cavity grouting
— Against erosion
  ... Soilcrete® stabilization
  ... Grouting
— Against ground failure
  ... Transfer loads to deeper stratum
  ... Anchoring
  ... Slope nailing
  ... Slope anchoring

Tunnelling
— Shafts
  ... Soilcrete® shafts
  ... Sealing grouts
  ... Starter blocks for tunnels
  ... Sealing slabs
  ... Ground freezing
— Tunnel driving
  ... Pipe umbrella roofs
  ... Soilcrete® arch blankets
  ... Injection of the roof
  ... Settlement protection for structures
  ... Ground water handling
— Pipe umbrella roofs
  ... with driven steel pipes
  ... with horizontal Soilcrete® elements

Restoration and Refurbishment
— Transfer loads to deeper stratum
  ... by grouting
  ... by Soilcrete® elements
  ... by Soilfrac® stabilization
  ... by grouted piles
  ... by bored piles
— Lifting structures
  ... With the Soilfrac® technique
— Restoration of masonry
  ... Silica gel grouting
  ... Cement grouting
  ... Joint grouting

Sewer Construction
— Starter and recovery shaft
— Ground water control

Structural Modifications
— Foundation extension (width and depth)
  ... by Soilcrete® technique
  ... by grouting
— Underpinning / Load transfer
  ... Auxiliary structures
  ... Soilcrete® foundations
  ... Pipe umbrella roofs

1 Soilcrete® underpinning of a former monastery barn from the middle ages
2 Bottom seal for a deep excavation for the extension of a hospital
3 Soilcrete® supporting vault for a tunnel built in a gravelly slope
4 Soilfrac® rig set up and working to protect surface structures during tunnel construction
5 Liquid levels are used to monitor deformations of structures
6 see item no 4
The combination of geotechnical structural elements and geothermal probes can be observed in a growing number of state of the art and ecologically designed projects. Geothermal loops can be installed into the foundation of new buildings as well as into the underpinning of existing structures. Vibro concrete columns or Soilcrete® underpinning is suitable for this. Depending on the type of foundation various optimised solutions can be offered. The use of foundation elements for geothermal applications can give considerable savings during construction and over a project’s lifetime.
Environmental Techniques
In addition to the normal soil treatment techniques available to the specialist geotechnical contractor, Keller concentrates its efforts on innovative in situ soil washing technique under existing structures.

Investigation
— Boreholes
— Soundings
— Water level gauges

Isolating
— Soilcrete® sealing walls
— Soilcrete® lamella walls
— Soilcrete® sealing slabs
— Soilcrete® joint seals
— Grouting
— Deep soil mixing
— Removal
— Vibro diaphragm walls
— Diaphragm walls
  … with embedded sealing elements

Rehabilitation
— In-situ soil decontamination underneath existing structures
— Ground water decontamination
— Stabilisation using binders
— Compaction with depth vibrators
— Vacuum pumping
— Soil washing

Land Fill Compaction
— with depth vibrators
— with dynamic compaction

Geothermal applications
— Soilcrete® column
  … with built-in geothermal probes
— Vibro concrete columns
  … with built-in geothermal probes
— Micropiles
  … with built-in geothermal probes
— can be combined with anchors

Equipment
Keller’s present day equipment factory started as a blacksmiths shop in 1860. New developments for geotechnical engineering techniques are carried out here. Our advanced equipment is derived from our research and development and continues to ensure our technical excellence.

Support Units
— Vibrocats
  … with pull down force using reaction of the vibrocat
  … with guide for the vibrator
  … with generators

Depth Vibrators
— A-vibrator
— L-vibrator
— M-vibrator
— S-vibrator
— T-vibrator
— Accessories

Drilling Rigs
— Modified vibrocats equipped for drilling
— Drilling rigs
— Mini drilling rigs

Mixers and Agitators
— Universal mixers
— Sludge pumps
— Agitators
— Container mixing units

Grouting Rigs
— Grouting container
— Soilcrete® units

Quality Control Devices
— Measuring equipment

Tools

Information Material
Our soil improvement and ground water handling techniques are described in a variety of
— Brochures,
— Site Reports,
— Technical Papers.

A collection of all Keller publications in different languages can be found on our Keller DVD which is available for the public. Ask for it.

Building on our strength

1 Soilcrete® cut off wall to encapsulate contaminants left over from a former industrial facility and to protect the groundwater around a city park.

2 Installation of geothermal probes into an underpinning body under an old building as part of the excavation pit for a new office building.

3 Installation of geothermal probes into a micropile (MESI geothermal probe).

4 Equipment for Soilcrete® works: AKM-mixer, KB-0 drill rig and und high pressure pump; mixer and drill rig are manufactured in-house.