Special Brochure Special Brochure Special Brochure

Geotechnical Engineering

Ground Improvement

Tunnelling

October 2013

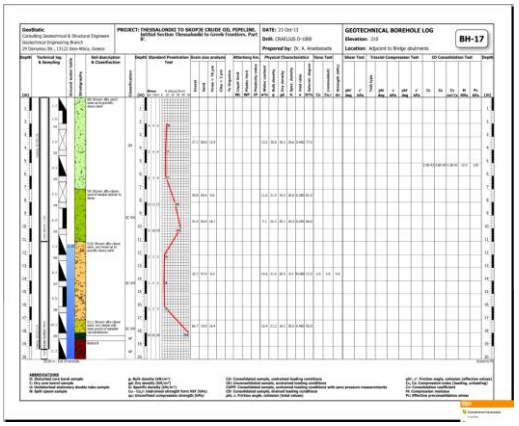
A General Introduction to Geotechnical Works

GeoStatic maintains a strong service base and expertise in our original core business and specialty of geotechnical engineering. Through the initial Geotechnical Site Investigation and Characterization and the focused integration of geotechnical and structural engineering expertise, **GeoStatic** routinely addresses a variety of complex ground-related conditions.

We provide engineering analyses and design services for foundations, tunnels, dams, slope stabilizations, ground improvements, earth anchored retaining structures, buried utilities, marine facilities, highways, railroads, site development and temporary underground structures. From site selection through construction, **GeoStatic** provides each client with site-specific solutions for their below ground construction.

Our engineers are experienced in a wide range of geotechnical engineering applications, including:

- Geotechnical Site Investigation and Characterization
- Subsurface Exploration Programs
- Footing and Mat Foundations
- Piles and Caisson Foundations
- Tunnels
- Drilled Shafts
- Retaining Walls
- Deep Anchored Piled Retaining Walls & Structures
- Braced Excavations
- Soil and Rock Slope Stability
- Earth and Rock Fill Embankments
- Groundwater Control
- Preloading and Surcharging
- Deep Soil Densification
- Ground Improvement
- Pavement Design
- Seismic Design
- Geotechnical Instrumentation



Head of Geo Department
GeoStatic

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Civil & Geolog, Geotechnical Engineer,
B.Eng, Dipl. Geol., M.Sc.(Eng), Ph.D., Post-Doc. UK

GeoStatic's design approach is focused on reducing foundation and earthwork construction costs while providing our clients with a technically sound project. This often involves evaluating the costs and benefits of ground improvement alternatives to traditional structural solutions (i.e., deep foundations and structural slabs).

The construction oversight and management we provide our clients is as important as the up front work, and is a key element in keeping a project on track. **GeoStatic's** field engineers combine technical expertise, quality control and project understanding to confirm that the job gets done. We work as our clients' eyes and ears on the site, monitoring construction for conformance with project specifications and providing immediate engineering input when design or field conditions change. Our goal is to address on-site issues before they turn into problems.

Geostatic's main concept of work is to consider the interaction between ground and structure.

Having the capacity to provide an integrated process of work, it is easy to implement a holistic view in any kind of project. Thus, the basic differences in approach between structural and geotechnical engineering concept which very often leads to project time delays, increasing of predetermined budget or unreasonable claims, are easily resolved.

Also in the case when the **GeoStatic** it is not possible to be engaged for the whole project, due to the project delivery method, the structural branch assists providing the proper link in order to achieve the most efficient solution.

Design and Consulting Availability

- Fully operational in Greek, English and Romanian.
- Fully conversant with European, American, British and Romanian Codes.
- Fully operational via IT and web networking technologies.

Ground Improvement Services

There are various treatment techniques that are available to improve the condition of poor or unstable ground by altering the nature of the soil insitu. For example, where loose sands or man- made fill are encountered, deep densification methods can be used to increase the density of the material to a degree that allows for construction of shallow foundations or, in the case of loose sands, mitigates potential for liquefaction during a seismic event. Otherwise, costly over-excavation of the unsuitable material or deep foundations may be required.

GeoStatic engineers have extensive experience with the design and construction of several types of ground improvement techniques, and are aware of their appropriate applications and limitations.

GeoStatic looks at each project and each site independently and regularly develops economical alternatives to conventional foundation systems. Ground improvement is a method which has been successfully implemented by **GeoStatic** on several projects, often times as value engineering alternates, thus saving the Contractor time and money.

Examples of applications include dynamic compaction of loose silty sands to improve stability and mitigate liquification, chemical or cement grouting for groundwater control during soft ground tunneling, soil mixing to increase wall stability for future dredging operations, and jet grouting to facilitate jacking of an historic structure or church that settled. The various techniques that may be employed include:

- Geotechnical Site Investigation and Characterization
- Cantilevered Reinforced Concrete Piled Retaining Walls
- Jet Grouting Piles
- Chemical and Permeation Grouting
- Cement Grouting
- Compaction Grouting
- Soil Mixing
- Deep Densification (vibro compaction, deep dynamic compaction)
- Vibro Stone Columns
- Blast-induced Compactions
- Preloading/Surcharging
- Wick drains
- Geosynthetics and Soil Reinforcement
- Cement/Lime Stabilization

GeoStatic's application include:
Infrastructure projects: Embankments for highways and rail, brides, tunnels, underpinning of structures
Building projects: Residential, Industrial, other building types, underpinning of deep excavations
Energy projects: Dams & Waterfront systems, Photovoltaic systems.
Environmental projects: Site development, Site improvement.

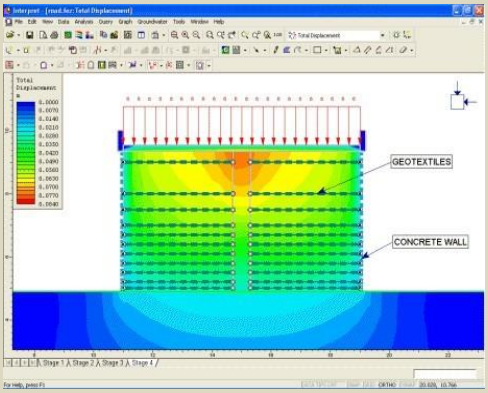
Placement of the steel reinforcement cage. The spacing of the boreholes ranged between 1.25 and 1.55 m.

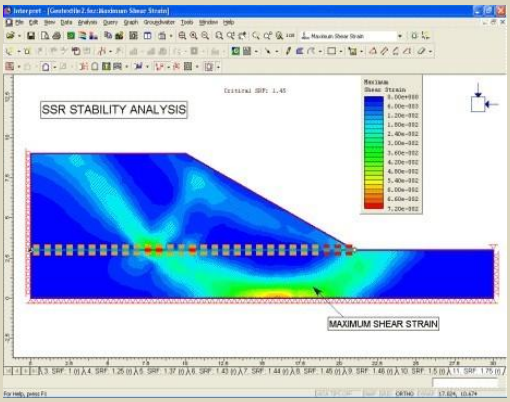
Ground Improvement Design Tools

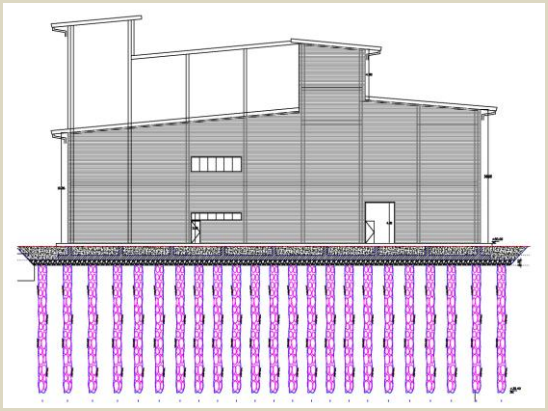
In **GeoStatic**, we have extensive experience in Modelling, Analysis, Design and Detailing of Foundation Ground Improvement by using the following specialised state of the art engineering software and programme suites.

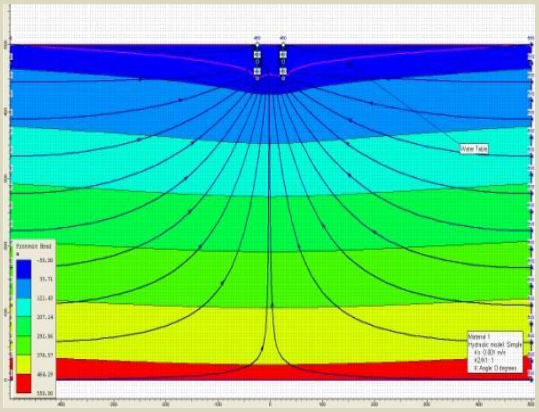
Indicative list of **Foundation Ground Improvement Engineering software and programme suites**:

- **GEOLOGISMIKI - Geotechnical Engineering Software Suite:**
  - ✓ **StoneC: is a software that performs design calculations of vibro replacement.**
  - ✓ **SPTCorr: is a simple software for estimating various soil properties.**
  - ✓ **LiqIT: is a software for the assesment of soil liquefaction.**
  - ✓ **SteinN Pro: Parametric analysis of settlements of a single footing**
  - ✓ **SteinP 3DT: Elastic settlements of footings in plane view**
  - ✓ **BLogPro: Geotechnical borehole creation software (more)**
  - ✓ **CPeT-IT: is a CPTU data presentation and interpretation software.**
  - ✓ **CLiq: is a software for the assessment of soil liquefaction.**
  - ✓ **SPAS 2007: is a seismic piezocone and downhole test analysis software.**
- **AuGeo is software to calculate piled embankments based on the BS8006.**
- **VDRAIN is software to calculate settlement and consolidation where Mebradrain vertical wick drains are used.**
- **VDRAIN is software to calculate settlement and consolidation where Mebradrain vertical wick drains are used.**
- **OILSTAB is a draft soil stabilisation knowledge base.**
- **PVDrain is a computer program for the design of vertical wick drain installations.**
- **Injectsoft is a module of GEO-LOG 2. It carries out presentation and analysis of grouting data recorded by LIM instruments (Injectlim 2P, Injectlim 4P, Compactlim).**
- **Geospec 2 deals exclusively with the Specification of Prefabricated Vertical Drains. It provides a design utility which will automatically calculate spacing requirements for Wick Drain Installation based on simple input.**
- **FEQDrain is a Finite Element Computer Program for the Analysis of the Earthquake Generation and Dissipation of Pore Water Pressure in Layered Sand with Vertical Drains.**
- **EXPVD collates and analyses the data from grouting operations including pressure and flow, to produce a graphical account of the grouting and an interpretation of the ground conditions.**





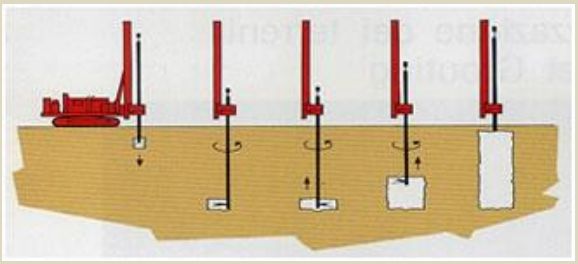




Ground Improvement Featured Projects

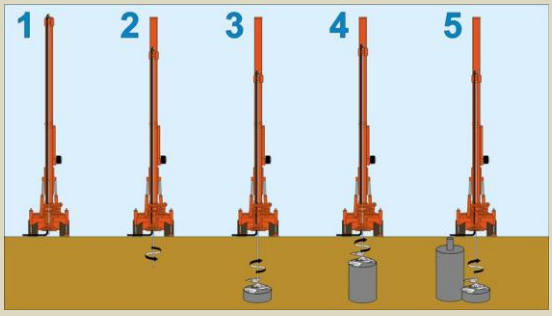
We have been involved in the following Major Ground Improvement Projects for a number of Public and Private Sector Authorities and Organisations:

Geotechnical site investigation & characterisation at the access road layout of the Monastery of Saint Patapios in Loutraki City, and Soil Mechanics Study in order to stabilise the creeping, settlements and landslides phenomena of road foundation ground, and proposals on how to remedy the existing failures. (Geotechnical Site Investigation and Characterization / Chemical and Permeation Grouting & Jet Grouting Piles).

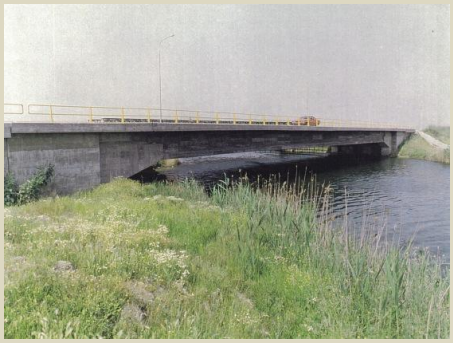


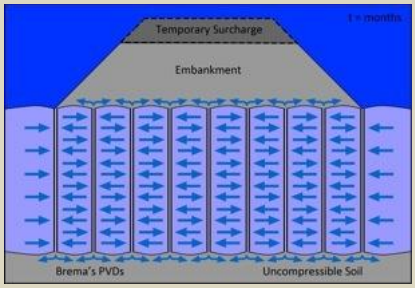
Geotechnical site investigation & characterisation at the foundation area of the 6th Primary School of Megara City - Prefecture of Attica, in order to stabilise the differential settlements of the foundation ground, and proposals on appropriate remedial measures, interventions and techniques to be used for the improvement, strengthening and stabilisation of the existing failures.

(Geotechnical Site Investigation and Characterization / Jet Grouting Piles).

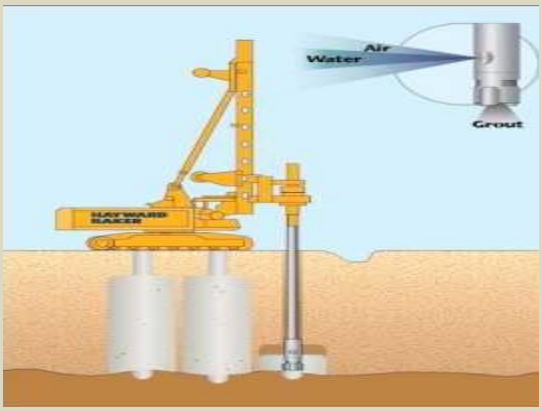


Soil Mechanics report on the Bearing Capacity calculation of the foundation ground due to embankments surcharge and the additional loading of the river Loudias Bridge, North Macedonia, as well as calculation of total and differential settlements and time-dependent rate of consolidation settlement (Relationships between average degree of consolidation and time). Proposals for appropriate ground improvement techniques.
(Preloading/Surcharging & Wick drains).





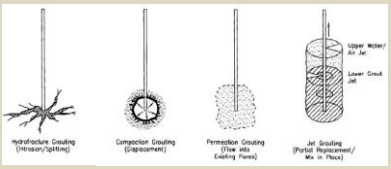
Geotechnical & Geophysical site investigation & characterisation and Soil Mechanics Study at the foundation area of a buildings on the 5 K. Palama & R. Golfi road in Psihiko City - Prefecture of Attica, in order to stabilise the differential settlements of the foundation ground, and proposals on appropriate remedial measures, interventions and techniques to be used for the improvement, strengthening and stabilisation of the existing failures.
(Geotechnical Site Investigation and Characterization / Jet Grouting Piles & Cement/Lime Stabilization).

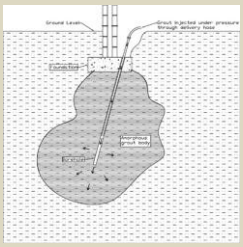


Geotechnical site investigation & characterisation and Soil Mechanics Study at the foundation area of a 5-storey buildings on the 54 Filotheis road in Neo Iraklio City - Prefecture of Attica, in order to stabilise the differential settlements of the foundation ground, and proposals on appropriate remedial measures, interventions and techniques to be used for the improvement, strengthening and stabilisation of the existing failures.

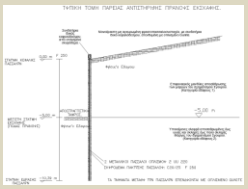
(Geotechnical Site Investigation and Characterization / Jet Grouting Piles & Cement/Lime Stabilization).

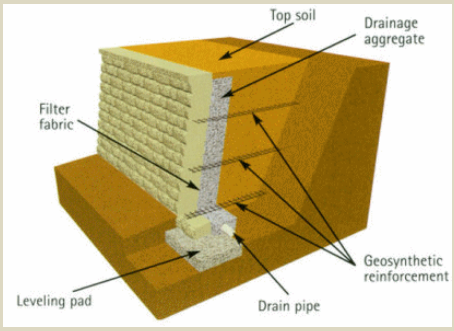
Geotechnical engineering inspection at the foundation area of the building K.ER.EF.Y.T. of Athens Water Supply and Sewerage Company (EYDAP SA) at Metaforfosi Municipality - Attica Prefecture, and Soil Mechanics report for the best appropriate interventions and measures for strengthening and stabilising the differential settlements of the raft foundation ground, and proposals on appropriate remedial measures, interventions and techniques to be used for the restoration of the existing failures. **(Geotechnical Site Investigation and Characterization / Compaction Grouting & Chemical and Permeation Grouting).**



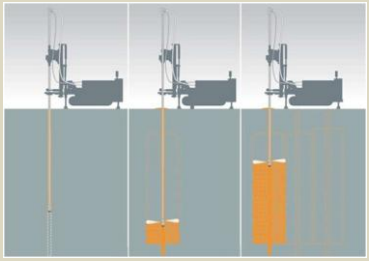


Geotechnical site investigation & characterisation, Soil Mechanics Study and Hydrogeological investigation in the foundation area of the hotel complex "RODIAN BEACH RESORT HOTEL" at Ixia - Rhodes Island, in order to performe the best geotechnical and economic intervention measures for the arrangement, stabilisation, reinforcement, shoring, retaining and securing of the precarious and locally failed slope faces due to creeping and landsliding of the foundation ground at the rear part of the hotel complex, as well as groundwater aquifers drainage Study for addressing the moisture problems in buildings. Compilation of proposals for stabilisation, bracing and repairing of the damages. **(Geotechnical Site Investigation and Characterization / Cantilevered Reinforced Concrete Piled Retaining Walls & Geosynthetics and Soil Reinforcement).**





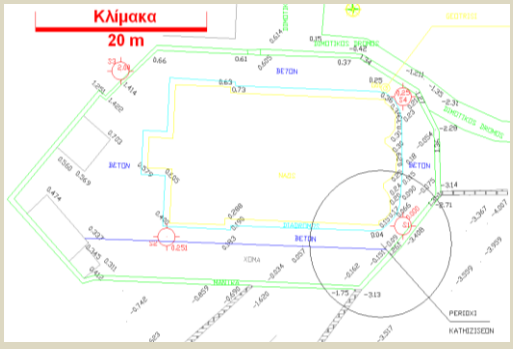
Geotechnical engineering and Soil Mechanics Study for the design of Cement injection - Jet Grouting Piles, in order to seal, stabilise, underpin and enhance the bearing capacity of the foundation ground of a low elevation dam and retaining wall, in the area of the water intake of the small Hydroelectric Plant "Kastaniotiko" in Thessaly County - Greece. (Geotechnical Site Investigation and Characterization / Cement Grouting &Jet Grouting Piles).



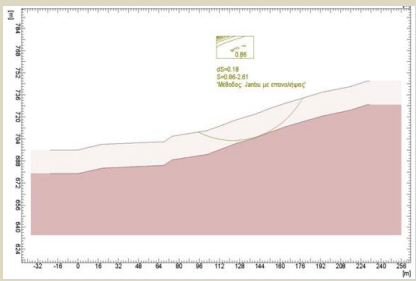
Compilation of Take off Sheets and Budgeting Worksheets for the construction of two vertical Cantilevered (non-anchored) reinforced concrete Piled Retaining Walls, covered with shotcrete (Gunite) coating, for the arrangement, stabilisation, reinforcement, shoring, retaining and securing of the precarious and locally failed slope faces due to creeping and landsliding of the foundation ground at the rear part of the hotel complex "RODIAN BEACH RESORT HOTEL" at Ixia - Rhodes Island, Greece.

(Geotechnical Site Investigation and Characterization / Cantilevered Reinforced Concrete Piled Retaining Walls & Geosynthetics and Soil Reinforcement).

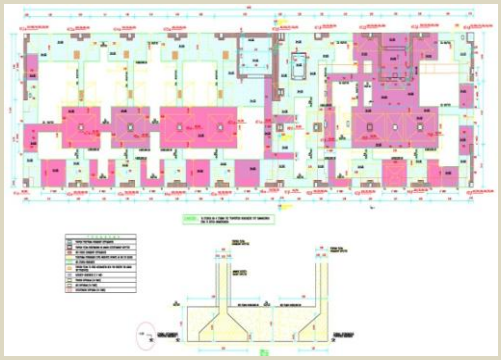
Geotechnical site investigation & characterisation and Soil Mechanics Study for improvement, strengthening and stabilisation of the foundation ground due to subsidence and differential settlements of the Church of St. Nicholas in the Community of Koumaiika - Samos Island Prefecture. Proposals for the best geotechnical and economic interventions & measures for strengthening, stabilising, restoring and securing the Holy Temple, by using Cement injection - Jet Grouting Piles technique. **(Geotechnical Site Investigation and Characterization / Jet Grouting Piles & Cement/Lime Stabilization).**



Geotechnical site investigation & characterisation and Soil / Rock Mechanics Slope Stability Analysis Study in the area of the existing failures of slopes north of the Sub-Station (S/S) building / facilities and the Transformer / Inverter building of the "Prophet Elias" Wind Farm, situated in Achladokampos Community - Argolida Prefecture. Proposals for the best geotechnical and economic intervention remedial measures and techniques to be used for the strengthening, stabilisation, shoring, retaining, restoration, rehabilitation and securing of the slope failures. **(Geotechnical Site Investigation and Characterization / Cement Grouting & Jet Grouting Piles).**

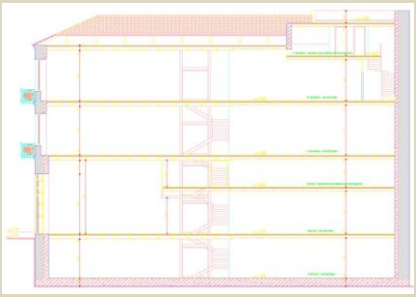


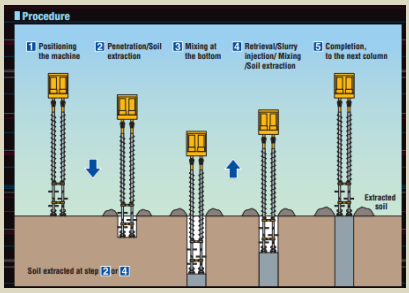
Geotechnical site investigation & characterisation and Soil Mechanics Study for strengthening the foundation of the existing building situated on Ephesus, Karakoulouxi and Grevena Steets (Block O.T. 53) in Nikaia Municipality - Attica Prefecture, and proposals for the best geotechnical and economic interventions & measures for strengthening, stabilising and securing the foundation of the existing building, by using Cement injection - Jet Grouting Piles technique. **(Geotechnical Site Investigation and Characterization / Cement Grouting & Jet Grouting Piles).**



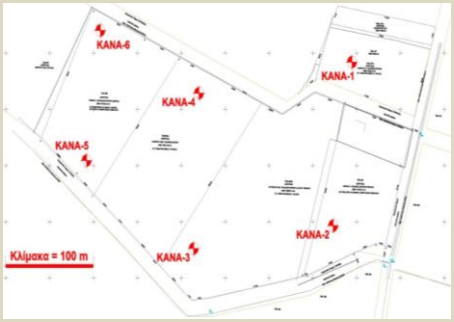
Geotechnical site investigation & characterisation and Soil Mechanics Study for improvement, strengthening and stabilisation of the existing failures due to landslides, subsidences and settlements of the National Road of Samos Island at the position "Leka". Proposals for the best geotechnical and economic interventions & measures of the Road Deck against further failures by using bored cast in place piles and jet grouting piles. **(Geotechnical Site Investigation and Characterization / Bored Cast in Place Reinforced Concrete Piled & Jet Grouting Piles).**

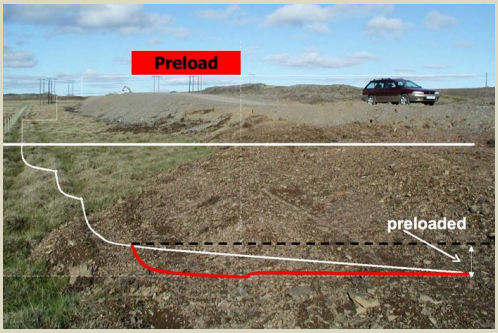
Geotechnical site investigation & characterisation and Soil Mechanics Study at the foundation area of a 7-storey preserved building with one-underground basement floor, located on 70 Ermou Street (Block O.T. 66654) in the cetre of Athens - Prefecture of Attica, in order to improve the foundation ground. Proposals on appropriate safe & economic measures, interventions and techniques to be used for the improvement, strengthening and stabilisation of the foundation ground. **(Geotechnical Site Investigation and Characterization / Jet Grouting Piles & Cement/Lime Stabilization).**





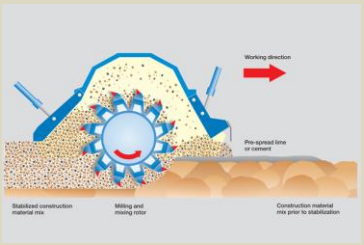
Geophysical survey and Geotechnical / Soil Mechanics / Hydrogeological Study at the foundation area of the panels of the photovoltaic units of the planned 3,15 MW Photovoltaic Park located in "Kanata" position, of Thestieon Municipality, Prefecture of Aetoloacarnania, for either the design of the drainage system of the groundwater aquifers from the immediate vicinity of the foundation area of the panels of the photovoltaic units in order to address the flooding problem during winter time, or the geotechnical ground improvement of the very soft and saturated silty clayey foundation soil.
(Geotechnical Site Investigation and Characterization / Wick drains & Preloading/Surcharging & Vibro Stone-Gravel Columns).



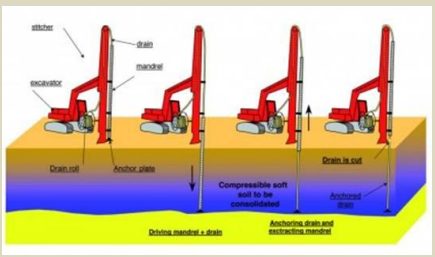


Geotechnical engineering and Soil Mechanics Study for the alternative methods / solutions in order to improve the foundation soil characteristics and properties (Ground Improvement) of the parallel Aircraft Axle Corridor (Runway 10-28) of the Thessaloniki Airport "Macedonia", using Gravel Piles, Geosynthetic Drains, Preloading, Lightweight Materials and Hydrated Lime at various parts og the Airport. (Soil Mechanics Calculations - Compilation of the Interpretative / Implementation Report).

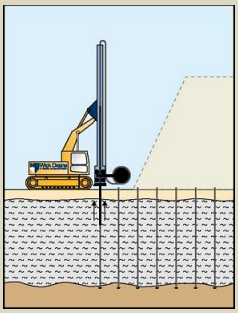
(Geotechnical Site Investigation and Characterization / Vibro Stone-Gravel Columns & Wick drains & Preloading/Surcharging & Cement/Lime Stabilization).

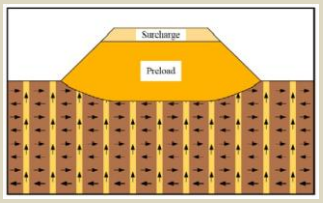


Geotechnical site investigation & characterisation, Soil Mechanics Study and Ground Improvement Design of the Railway Station at New Peramos city, within the framework of the project: "Study and planning of N.Peramos - Megara - Rodopolis Railway Stations (Architectural, Structural and Electromechanical Design)". **(Geotechnical Site Investigation and Characterization / Wick drains & Preloading/Surcharging & Vibro Stone-Gravel Columns).**

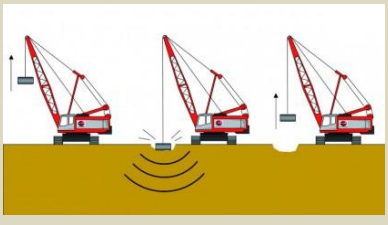


Supplementary Geotechnical Engineering Study for acceleration of high expected consolidation settlements at the soft clayey foundation ground of the Megara Railway Station occupants building by employing additional preloading methods within the framework of the project: Study of Railway Stations N.Peramos - Megara - Rodopolis (Architectural, Structural, Geotechnical and Installations). **(Additional Wick drains & Preloading Design in the R.Station wider zone).**

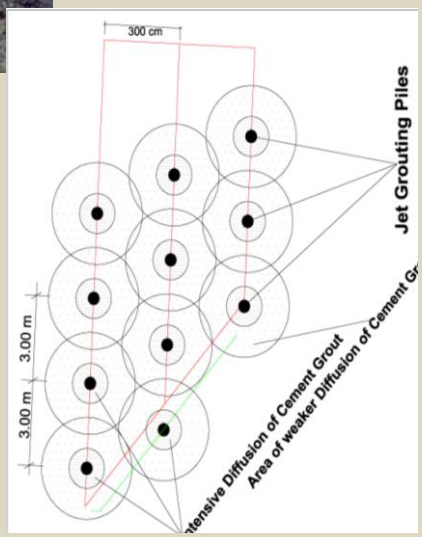


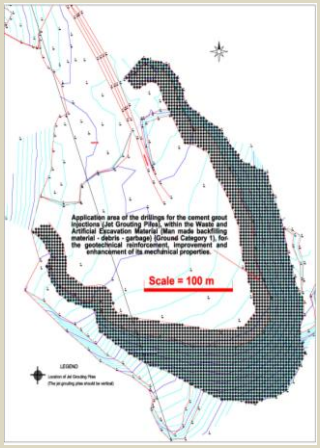


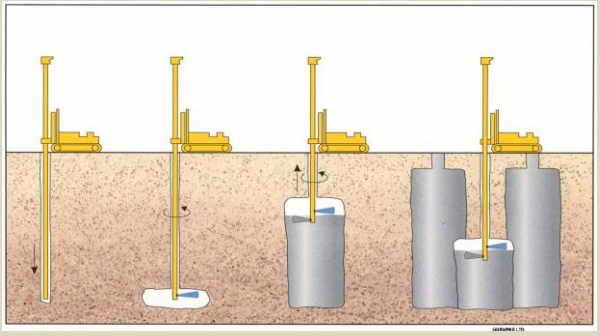
Expertise Report for improving the foundation ground conditions of the Photovoltaic Farm in the Second Eastern External Mine Waste Tailings "Choremis" of Megalopolis Lignite Center. **(Deep Densification-vibro compaction, deep dynamic compaction & Geosynthetics and Soil Reinforcement).**



Stability investigation programme and technologies for stabilisation of slopes and body of the "Peania" unstable Uncontrolled Waste Disposal Site (UWDS) in Athens – Greece. **(Geotechnical Site Investigation and Characterization / Jet Grouting Piles & Chemical and Permeation Grouting & Soil Mixing).**







Tunnelling Services

With more than 15 years of tunneling experience, **GeoStatic** provides engineering for design and construction of shafts, tunnels, and underground chambers in soil and rock. Tunnel construction involves many risks related to soil, rock and groundwater conditions. Through evaluation of ground conditions and a thorough knowledge of construction methods, **GeoStatic** helps clients manage these risks. The firm's experience includes sewer, water, highway, rapid transit, power tunnels and caverns.

Tunnel engineering services include:

- Geotechnical Site Investigation and Characterization
- Alignment Selection
- Geotechnical Data and Interpretive Reports
- Geotechnical Baseline Reports
- Tunneling Machine Performance Studies
- Drill-and-blast Evaluation
- Ground Support Design
- Groundwater Control System Design
- Subsidence Control
- Raise-bore Evaluations
- Tunnel Muck Management
- Subsurface Explorations
- Geotechnical Instrumentation

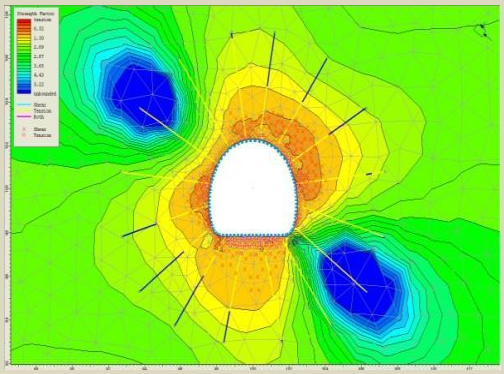
Tunnelling Design Tools

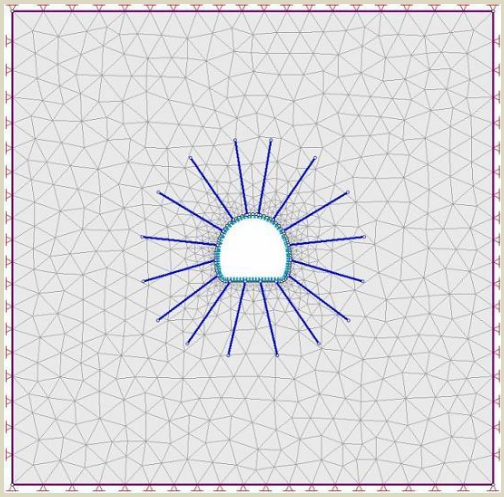
In **GeoStatic**, we have extensive experience in Modelling, Analysis, Design and Detailing of Tunnels & Underground works by using the following specialised state of the art engineering software and programme suites.

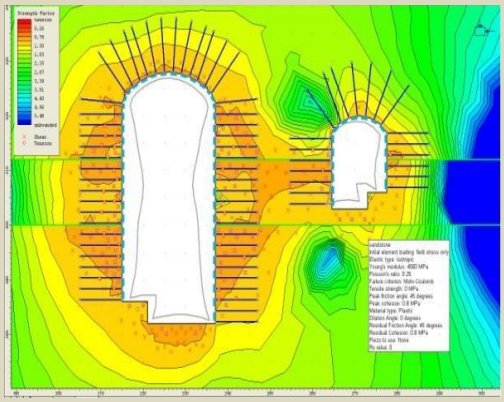
Indicative list of **Soil & Rock Mechanics/Tunnelling Engineering software and programme suites**:

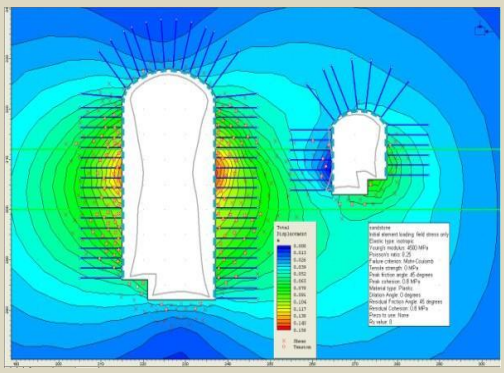
- **Cubus Larix-5S/5G/5M**
- **Cubus Tunnel-H**
- **Rocscience software Suite 2013 (Phase2 8.0, Examine2D 8.0, RocData 4.0, RocPlane 2.0, Rocsupport 3.0, RocTopple 1.0, Swedge 5.0, Unwedge 3.0, Settle3D 2.0, Slide 6.0, RocFall 4.0, Dips 5.1).**
- **3D Tunnel FEM**
- **GEMSoft**
- **Tunnel analysis programs, by the NATM New Austrian Tunneling Method**
- **Talren-4**
- **Plaxis**
- **GeoStudio 2013 Universal Suite (SLOPE/W, SEEP/W, SIGMA/W, QUAKE/W, TEMP/W, CTRAN/W, AIR/W, VADOSE/W)**
- **Lusas 14.1**
- **Geosolve Slope**
- **Geo 5**
- **Tunnel Assistant**
- **BLOCK**
- **Slope Stability Analysis Software (STABL)**
- **TAGAsoft**
- **GOC Rocsience**
- **Mitre Software Corporation**
- **Wedge Failure Analysis**
- **WEDGE**
- **Swedge**
- **SLOPEPACK**
- **ROTOMAP**
- **RocPlane**
- **ROCKPF**
- **ROCKPACK III**
- **ROCK3D**
- **RocFall**
- **Plane Failure Analysis**
- **Kbslope**
- **Geoslide/Proslide**
- **GeoRock (GeoStru)**
- **EzSlide**
- **CLU_STAR**
- **ACCECALC**
- **Slope stability and inclinometer software**

A complete list with capabilities of each software program should be provided upon request









Tunnelling Featured Projects

We have been involved in the following Major Tunnel Projects:

- Attico Metro S.A. (Athens metro underground network, http://www.attikometro.gr/)
- Egnatia Odos SA (670 Km motorway, http://www.egnatia.eu/page/)
- Ergoose SA (a subsdiary of Hellenic Railway Organization executing related projects http://www.ergose.gr/)

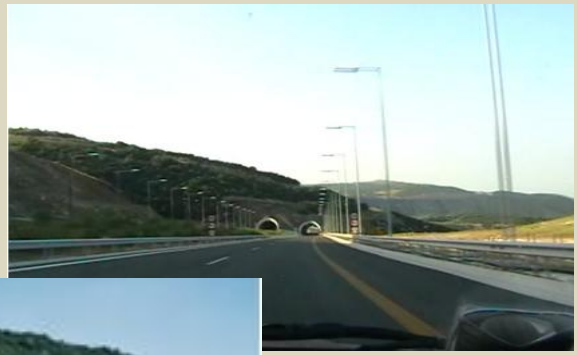
Egnatia Odos is the Greek part of the European route E90. It is a motorway in Greece that extends from the western port of Igoumenitsa to the eastern Greek–Turkish border at Kipoi. It runs a total of 670 km (420 mi). The project began in the 1990s and was completed in 2009. We have participated as a geotechnical engineering consultant in a number of projects like the ones which are indicatively presented below:

Geotechnical site investigation, characterisation & Design in Section: 1 - 1.1.3 to 1.1.8. Neochori - Grika (Paramithia) Tunnels within the framework of the project: Consulting services for implementation of Geotechnical site investigation works in various positions along the Egnatia Odos Motorway (Geotechnical Site Investigation call ups).

Geotechnical site investigation, characterisation & Design in Section: 14.1.1 - New Karvali - Chrisoupolis junction and Tunnels within the framework of the project: Consulting services for implementation of Geotechnical site investigation works in various positions along the Egnatia Odos Motorway (Geotechnical Site Investigation call ups).

Geotechnical site investigation, characterisation & Design in Sections: 4.1.5 / 6 - Panagia-Grevena Tunnels and junction Grevena. 4.2.4 - Grevena - Kozani (Industrial Area Kozani). 5.2. - Veria (Asomaton Detour). Work Order Numbers: 27a , 27b and 27c respectively, within the framework of the project: Consulting services for implementation of Geotechnical site investigation works in various positions along the Egnatia Odos Motorway (Geotechnical Site Investigation call ups).

Geotechnical site investigation, characterisation & Design in Section: 4.1.2s - Panagia – Grevena Tunnels. Work Order Number: 27a.a, within the framework of the project: Consulting services for implementation of Geotechnical site investigation works in various positions along the Egnatia Odos Motorway (Geotechnical Site Investigation call ups).



Geotechnical site investigation, characterisation & Design in Section: 2.4 - Arachthos River – Peristeri Twin Tunnels. Work Order Number: 30.a, within the framework of the project: Consulting services for implementation of Geotechnical site investigation works in various positions along the Egnatia Odos Motorway and its vertical axis (Geotechnical Site Investigation call ups).

Geotechnical site investigation, characterisation & Design in Sections: 4.1.3s - Panagia - Grevena, Bridge C2. Work Order Number: 30.b, within the framework of the project: Consulting services for implementation of Geotechnical site investigation works in various positions along the Egnatia Odos Motorway and its perpendicular axes (Geotechnical Investigation call ups).

Geotechnical site investigation, characterisation & Design in Sections: 4.1.2s - Panagia - Grevena, Bridge C3. Work Order Number: 30.c, within the framework of the project: Consulting services for implementation of Geotechnical site investigation works in various positions along the Egnatia Odos Motorway and its perpendicular axes (Geotechnical Investigation call ups).

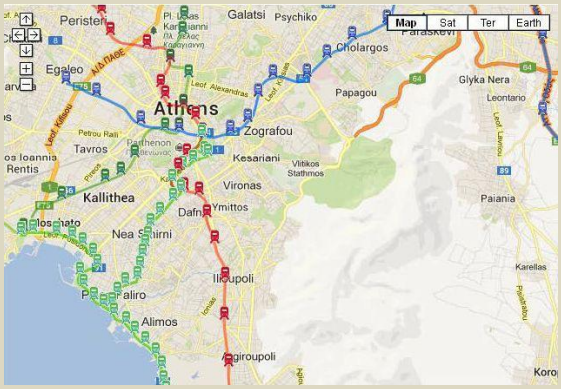
The Athens Metro

The Athens Metro is a rapid transit system in Greece, serving the Athens conurbation and parts of East Attica. It incorporates the former Athens-Piraeus Electric Railways (ISAP S.A.), which opened in 1869 and is now part of Line 1. Beginning in 1991, Attiko Metro S.A. constructed and extended Lines 2 and 3 and the Attiko Metro Operations Company (AMEL S.A.) operated these lines from 2000 until 2011. The metro network formally merged in 2011 when the Greek government created the Urban Rail Transport Company (STASY S.A.), a subsidiary of the Athens Urban Transport Organization (OASA S.A.). **GeoStatic** has participated as a geotechnical engineering consultant in a number of projects like the ones which are indicatively presented below:

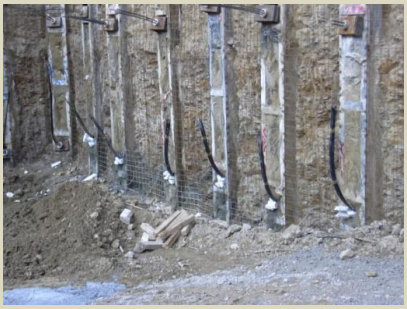
Geotechnical engineering and Soil Mechanics Study for the Analysis, Design and stability Calculations of Anchored piled Retaining Walls, 19,45 m deep, for the fourty (40) excavation faces of Agios Antonios Metro Station at Peristeri City – Attica - Greece, in the framework of the project: "CON 00/001 - Extension of Line 2 Sepolia - Peristeri towards Peristeri - Agios Antonios Metro Station".

The Athens Railways Transporting Organization

Evaluation of existing Geotechnical site investigation & characterisation Factual Reports and compilation of Soil Mechanics Study for the safe & economic design of the foundation of temporary columns with micropiles required in the underground openings and retaining walls for the renovation of the existing Athens Railways Transport Organisation (ISAP) station in the Municipality of Neo Heraklion - Attica Prefecture / Greece.



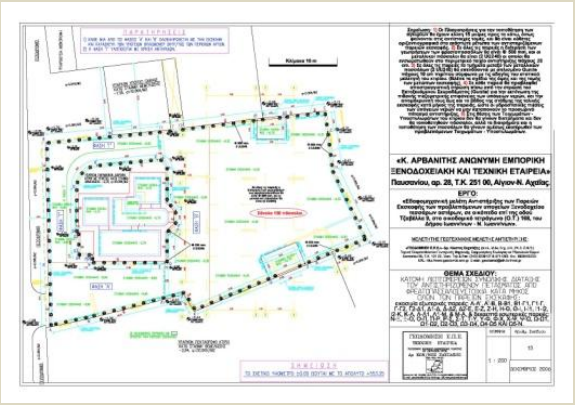
Evaluation of existing Geotechnical site investigation & characterisation Factual Reports and compilation of Soil Mechanics Study for the safe & economic design of the foundation of temporary columns with micropiles required in the underground openings and retaining walls for the renovation of the existing Athens Railways Transport Organisation (ISAP) station in the Municipality of Neo Heraklion - Attica Prefecture / Greece.



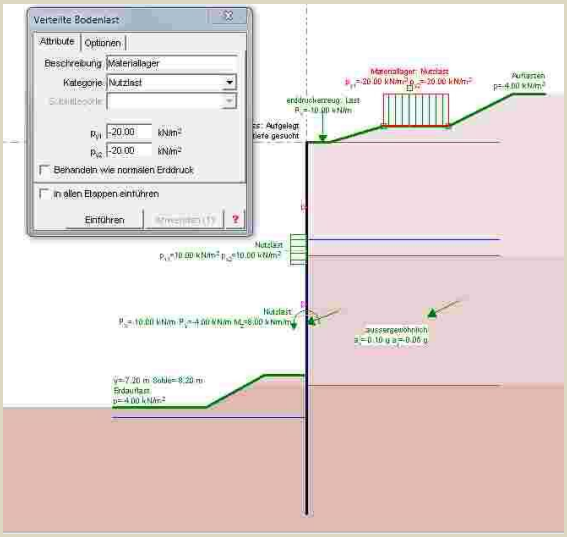
For all the aforementioned projects a more detailed presentation could be made upon request

Other Various Projects

Evaluation of existing Geotechnical site investigation & characterisation Factual Report and compilation of Soil Mechanics Study for the safe & economic design of Anchored Piled Retaining Walls for Shoring, Retaining and Securing of the Excavation slope faces of a six-basements underground car park garage building, located on a plot on 115 Kolokotronis road (Block O.T. 19), in Piraeus Municipality - Attica Prefecture.



Geotechnical site investigation & characterisation and Soil Mechanics Study as well as Analysis, Design and stability Calculations of Anchored piled Retaining Walls of the Sewage Pumping Stations and Treatment Plants, within the framework of the project: "Topographic, Environmental, Hydraulic, Geotechnical and Structural Study for the Drainage and Sewerage Master Plan of the Municipality of Ampelakion, Salamis Island - Greece".

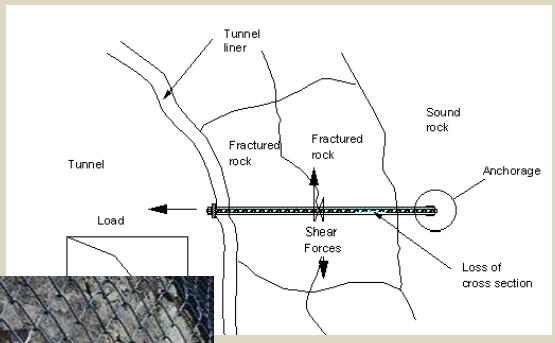


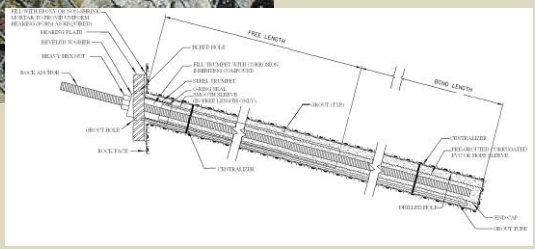
Soil Mechanics Study for the safe & economic design of Anchored Piled Retaining Walls for Shoring, Retaining and Securing of the Excavation slope faces of the planned new five-storey hotel building with two-underground basement floors, on a plot of 1,095.71 m2 located on 9 Tzavellas road (Block O.T. 168), in Ioannina Municipality - Ioannina Prefecture.

Rock Mechanics - Geotechnical Engineering and Hydrogeological Study of the “Alistratis” Cave entrance Tunnel in Serres Prefecture, Greece.

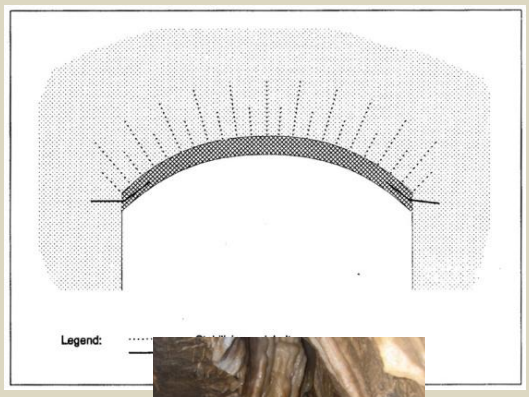
Rock Mechanics and Geotechnical Engineering Study of “Limnes” Cave entrance Tunnel, in Kastrion Community, Achaia Prefecture, Greece, for the project: "Extension - Modernization of Limnes Tunnel / Cave".

Geotechnical Engineering and Rock Mechanics slope stability analysis Study of the open pit excavation and estimation of the rock bolt / nailing / anchorage parameters of the precarious side wall near the point S2 and of the boulders on the floor of the Sykia Tunnel / Cave, in Community of Olympon, Chios Isle, Greece.





Geotechnical engineering and Rock Mechanics Study for the estimation of the nailing parameters for the stabilisation of the unstable part (Rock Wedges and Blocks) between points S.8 and S.10 on the roof of the Tunnel / Cave "Sykia", located in the Community of Olympon - Chios Island, Greece.



Credentials

Prof. Dr. Constantine Sachpazis, is Director and Head of the Geotechnical Department, is also Associate Professor of the Department of GEOtechnology and ENVironmental Engineering (GEOENV), part of the School of Technological Applications based in Kozani, Greece (http://geope.teikoz.gr/GEOPE_EN/index.htm)

Costas teaching the following courses:

- Soil Mechanics I (Theory, Exercises and Laboratory)
- Geotechnical Engineering for Tunnels and Dams (Theory, Exercises and Laboratory)
- Soil Mechanics II and Rock Mechanics (Theory, Exercises and Laboratory) with Computer Aided Geotechnical Engineering Design & Analysis.

http://geope.teikoz.gr/GEOPE_EN/ep/ep_sahpazis.htm

Committed

To

Excellence

GeoStatic

A Company for Civil Engineering Works

Related equipment for geotechnical studies

Related equipment for geotechnical studies:

The **GeoStatic** geotechnical engineering department is comprised not only of the experts the project needs, but the equipment needed to get the project carried our correctly. Our staff combines decades of technical knowledge with a deep understanding of regional field conditions, and our array of testing equipment is the most extensive in our region.

For Subsurface Exploration our geotechnical fleet is ready to service any project, anywhere in our region. We operate a fleet of three drill rigs and one all-terrain vehicle, allowing for access to any site regardless of site conditions. Specialized field equipment includes pressure meters, inclinometer instrumentation, standard penetration test equipment, dynamic cone penetrometers, geophysical equipment for electrical resistivity measurement, ground penetrating radar, shear strength pocket penetrometers, traditional continuous sampling capability and coring, etc.

The drill rigs of our company are:

- Drill rig for sampling, type GREALIUS ATLAS-COPCO D-750, on the sled, with chassis number: 114, motor PERCINS 35 HP, and engine number : 1520, which is in excellent condition and ready at all times for operation,
- Drill rig for sampling, type GREALIUS ATLAS-COPCO XC 90, on the sled, with chassis number: 702, motor PERCINS 35 HP, and engine number: 5/152, which is also in excellent condition and ready at all times for operation, and
- Drill rig for sampling, type GREALIUS ATLAS-COPCO XC 90, on the sled, with chassis number: 224, motor PERCINS 35 HP, and engine number: 4700, which is also in excellent condition and ready at any time for operation.

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