
GeoEngineering
GEOTECHNICAL SURVEY COMPANY

ABOUT US

GeoEngineering Ltd carried out wide spectrum engineering-geology investigations for the constuction and projection of complex engineering facilities, industry objects and buildings. The Company was provided with the modern equipment manufactured by the leading companies of the world. Engineering geology surveys are carried out appplying the leading technology and progressive methods.

Our body consists of high qualified specialists with a great experience.

Our principle consists of individual approach each Client, high professional level for the carrying out of the surveys and guaranteed quality. GeoEngineering Ltd prefers criterions as responsibility, constructivity, justice value, efficiency in its activity. The Company operates on the basis of a license with a registration number FHN/40-00799 obtained from the Ministry of Emergency Situations of Azerbaijan Republic.

DRILLING

The drilling works are carried out in order to study the physico-mechanical characteristics of soils, which form the upper part of section, and assess the area's geological-engineering conditions.

During the drilling works the sampling preformed continuously and natural conditions of the retrieved soil samples maximally preserved. For onshore drilling works are used ST1023-N/PQ, URB-5AQ and URB-2A2 type drilling rigs. Offshore drilling also performed, by using Jack Up and drilling vessel.

CORING

Core sampling is done by double and triple
core barrels, shelby tube samplers and hollow stem auger as well. Using of 1st class core barrels will secure use of 85% non-cohesive soils and 95% cohesive soils.

DRILLING WORKS

CONE PENETRATION TEST

Cone penetration test allows to investigate phisycal and mechanical properties of core samples in in-situ condition. CPT performs the bellow indicated analyses.

Study of geological section and identification of engineering targets, outline of distribution of different soil types
Evalute resistivity at the low and pile and its leteral surface.
Acquired data are processed by "CPT task" software
As a result the following parameters are defined:

Cone resistance (qc)
Local friction (fs)
Pore pressure (u)
Relationship of lateral friction to cone resistance (Rf)

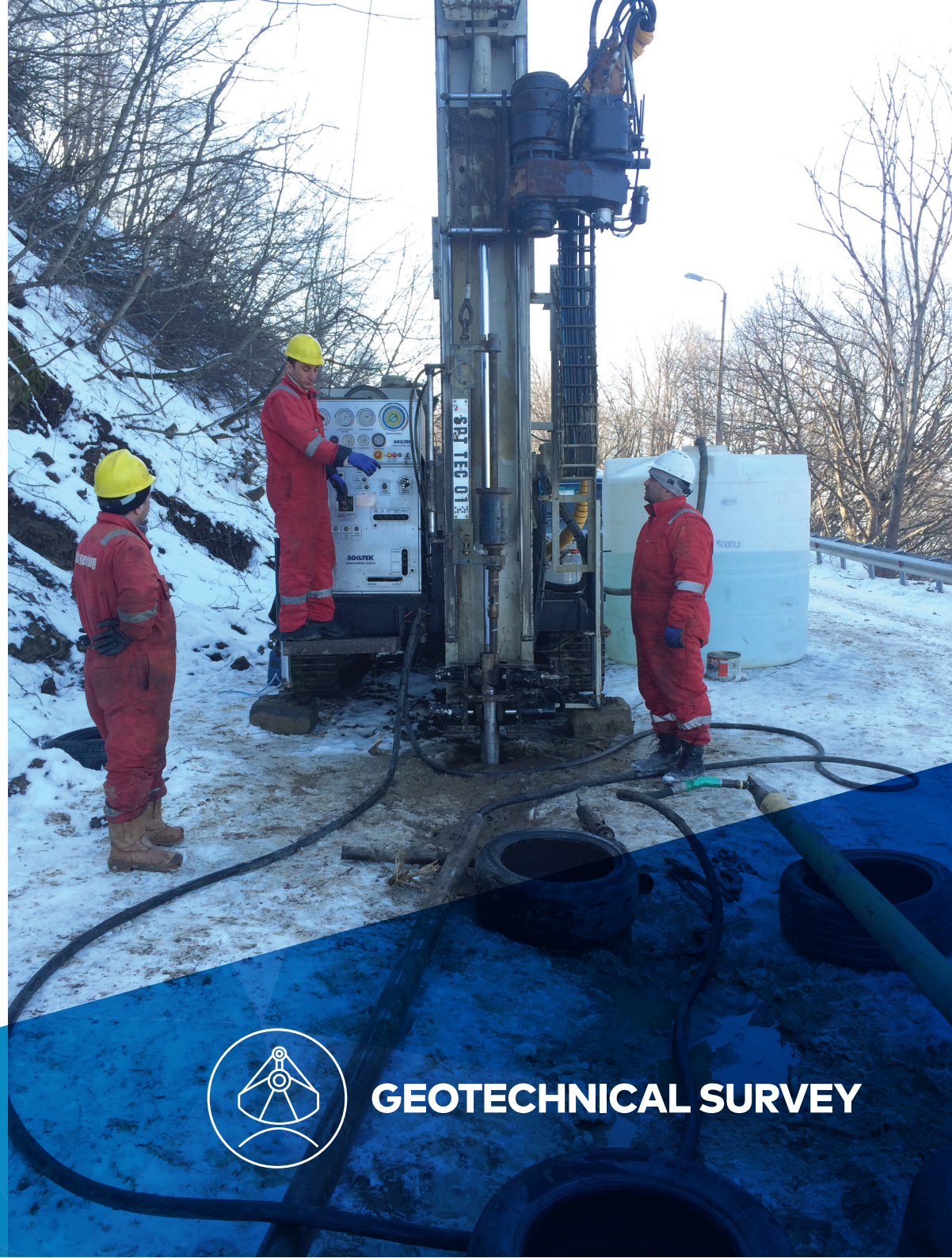
STANDARD PENETRATION TEST

Standard Penetration Test enables to study physical and mechanical properties of core in in-situ condition

The following equipment is used during the testing:

Automated hummer and steel bucket
Hook activated while hummer upward movement
Split barrel
Special steel rods
Technical parameters:

Weight of hummer - 63.5 kg
Dip angle of split barrel - 60°
Free falling height of hammer - 0.76 m
Length (split barrel) - 0.73 m



GEOTECHNICAL SURVEY

PRESSUREMETER TEST

The Menard-type pressuremeter test (PMT) consist of inserting a pressuremeter probe and then applying nitrogen gas to deform a flexible membrane. Deformation measurements are read by a control panel that measures and volume variations occuring as a result of soil deformation.

The test can be made on all types of soil and provides in-situ parameters for deformability and readings are made automatically by "Geospad" system.

VANE TEST EQUIPMENT

The vane shear test is an in-situ goetechnical testing methods used to estimate the undrained shear strength of fully saturated clays in wells. The test is relatively simole, quick, and provides a cost-effective way of estimating the soil shear strength; therefore, it is widely used in geotechnical investigations. Under special condition, the vane shear test can be also carried out in the laboratory on undisturbed soil specimens; however, the use of the vane shear test in in-situ testing is much more common.

PLATE LOAD TEST

The Static Plate Load Test is applied in eathworks and foundation engineering as well as road construction in order to determine load settlement lines and by this to evaluate the deformability and the load capacity of the soil.

DOWNHOLE TEST

The Downhole Test is a method which determines soil stiffness properties by analyzing direct compressional and shear waves along a borehole down to about 30 m.

The aim of the downhole testing is to derive elastic rock properties such as Poissons ratio or YOUNGs modulus. Shear waves have to be generated at surface. A shear wave source (sledge hammer hit sidewise) is used at surface and a coupled receiver system is moved in the borehole.Traveltimes of the seismic waves are analysed and seismic velocity is calculated. Shear wave velocity can be transformed to soil stiffness.

CROSSHOLE TEST

The seismic crosshole test provides dynamical soil parameters down to depths of 100 or 150 m based on the determination of wave velocities. Seismic waves are generated in a source borehole and recorded in a receiver borehole.

The focus of the crosshole test is on the determination of the shear wave velocity (s-wave velocity). Therefore a s-wave source has to be applied (e.g. a s-wave sparker or a borehole hammer). A borehole geophone is installed in the receiver hole and tightly coupled to the borehole walls by means of a pneumatic packer.A good coupling is needed since s-waves cannot be transmitted by the groundwater only.

Source and receiver are alwaysinstalled at same depths and moved parallel along the boreholesto achieve a velocity profile with depth. The usual vertical spacing between two measuring points is 1 to 2 m. The shear modulus (i.e. the dynamic stiffness) can be calculated if a value of the material density is assumed.

THE MULTICHANNEL ANALYSIS OF SURFACE WAVES

The Multichannel Analysis of Surface Waves (MASW) method is one of the seismic surveymethods evaluating the elastic condition (stiffness) of the ground for geotechnical engineering purposes.

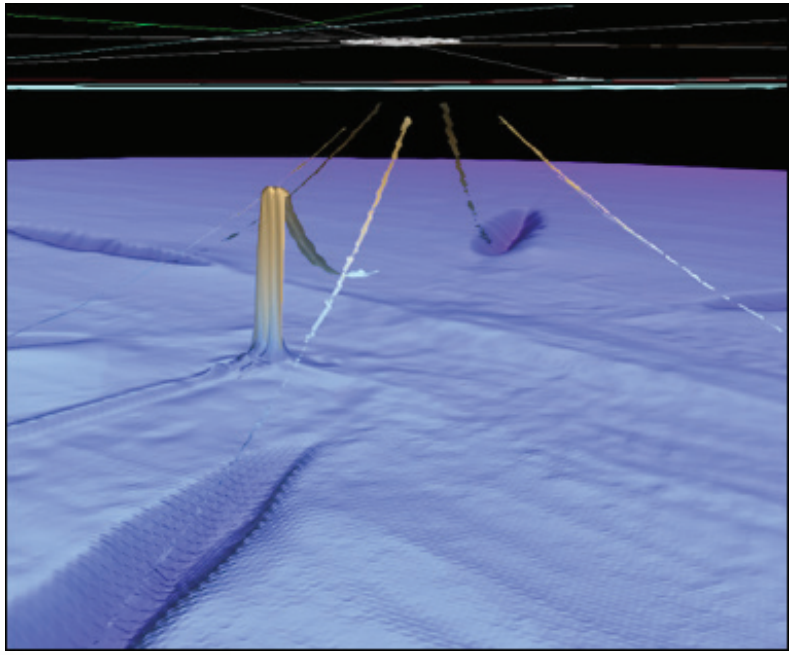
MASW first measures
seismic surface waves generated from various types of seismic sources—such as sledge hammer—analyzes the propagation velocities of those surface waves, and then finally deduces shear-wave velocity (Vs) variations below the surveyed area that is most responsible for the analyzed propagation velocity pattern of surface waves. Shear-wave velocity (Vs) is one of the elastic constants and closely related to Young's modulus.

BATHYMETRY & SONAR SURVEY

BATHYMETRY

The echo-sounding survey carried out in combination with the geophysical techniques by the dual-frequency echo-sounder manufactured by Odom hydrographic systems Inc, designed for measurements of depth from 1 to 200 m, with the ±0,01 m error.

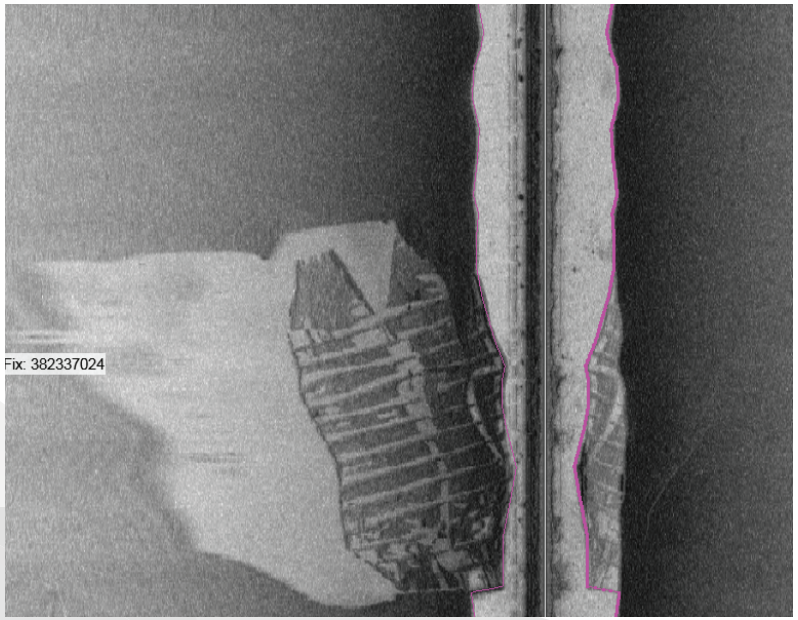
The depth are registered by the «HydroPro» navigational package with the 1sec. sampling interval with the automatic correction input for the vertical displacement and the sound velocity in the water.



SEABED SONAR SURVEY

Sonar survey carried out in order to identify on the seabed any items that might be hazardous.

For data processing apply "Sonar WizMap", "SonarWeb" and "SonarWiz" software packages.



STANDPIPE PIEZOMETER

Standpipe piezometers are used to monitor piezometric water levels. Typical applications include:

- Monitoring pore-water pressure to determine the stability of slopes, embankments, and landfill dikes.

- Monitoring the effectiveness of dewatering schemes.

- Monitoring seepage and ground water movements in embankments, landfill dikes, and dams.

Installation

After the borehole is drilled, the filter tip and riser pipe are assembled and installed downhole. Sand is tremied to the bottom of the borehole to form a sand intake zone around the filter tip. A bentonite seal is placed above the intake zone and the orehole is backfilled with a bentonite-cement grout.

The riser pipe is terminated above ground level and capped to prevent entry of rain water.

LABORATORY SURVEY

MECHANICAL PROPERTIES OF SOILS

- Free swell test (PNQ)
- Swell test (Oedometer)
- Measurement of collapse of soils (Oedometer)
- Consolidation test (Oedometer)
- Direct shear test
- Unconsolidated compaction test (UCT)
- Traxial tests:
- Unconsolidated Undrained Test (UU)
- Consolidated Undrained Test (CU)
- Consolidated Drained Test (CD)
- Compaction test (Proctor)
- California Bearing Ratio (CBR)
- Point load test (PLT)

PHYSICAL PROPERTIES OF SOILS

- Water content
- Bulk (mass) density
- Linear measurment method
- Immersion in water method
- Water displacement method
- Density of soils particle
- Pyknometer method
- Porosity
- Viods ratio
- Degree of saturation
- Aterberg limits (determination of the olastic liquid limits)
- Cone penetration method
- Determination of particle size distribution
- Hydrometer method
- Sieving method
- Carbonate content test
- Organic matter content test
- Loss on ignition (Muffle furnaces)

GEODETIC AND TOPOGRAPHIC SURVEY

PHYSICAL PROPERTIES OF SOILS

GPS RTK (Real Time Kinematics) and S6 tachymeter enable to fulfill the following tasks:

- Establishment of topographic base
- Topographic survey
- Flagging of facilities and linear objects
- In-situ testing

Topographic and geodetic works deploy GPS RTK in areas without any facilities or biuldings, while in areas of dense settlements the tachymeter is widely used. GPS measurments are managed by a single interface. Data are processed and interpreted by Survey controller and Geomatics OfficeTM software.

GeoEngineering

PROJECTS

Geological exploration works conducted according to work plan on research and monitoring of landslide in Flame Towers and surrounding areas in Bayil

Engineering - geological investigations carried out on the construction site of Gazakh cement plant

Geotechnical surveys on development plan for Baku Metropalitan

Geotechnical survey investigation Baku Shipyard
in garadagh district Baku, Azerbaijan

Geo-technical investigation performed at international sea port site

Provincial cites water supply and sewerage project in the Republic of Azerbaijan, Khizi district

Geological work carried out according to project for building water and sewage system in "Baku White City"

Engineering geology surveys performed at "Gandob-Samur concrete highway" site

Sumgait Fibro Cement Factory

- Of hydrogeology surveys performed on purpose of underground water monitoring in the area of Sadikhli village of Aghstafa district in 415 km area of btj pipeline.
- Geotechnical survey investigation “Garadagh landfill” and “Garadagh transfer station”.
- Geological work carried out according to project for construction of micro tunnels in Bilgah village for reconstruction of sewage system.
- Geotechnical survey investigation Baku resort of fire and water.

GeoEngineering

GEOTECHNICAL SURVEY COMPANY

+99412 434 74 68

www.geoeng.az