BEFORE STARTING THE STUDY IMPORTANCE OF GEOTECHNICAL ENGINEERING

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Abstract

Geotechnical study is very important from a very simple reason. If all other elements of a building (walls, columns, roof beams) can occur relatively easily, the foundation is extremely difficult and costly to intervene after it was built. Moreover, the study is attached to the book Geotechnical Engineering and Construction is one of the important legal documents when the property is provided or resold.
Geotechnical study is a documentation technique that analyzes the stratification of land, the groundwater depth, optimum depth of the building foundation, bearing capacity of soil, providing the structural engineer designing the resistance necessary information to properly size the building foundation.
In Romania is not yet given due importance to this study, Western Europe and the USA, insurance is extremely expensive în the absence of the geotechnical study and other documents of Construction Paper.

Key words: stabilizing a landslide, lands susceptible to wetting, geotechnical studies, soil bearing capacity

Geotechnical study is a documentation technique that analyzes land stratification, depth of groundwater level, optimum depth of the building foundation, bearing capacity of soil, providing the resistance structure design engineer the information needed to properly size the building foundation (Răileanu, P., Boţi, N., Stanciu, A., 1986).

It is not just about building new construction, but also the modernization, expansion, rehabilitation or expansion of an old.

All geotechnical study offers solutions for other works with it to stabilize a landslide threatening a goal (eg a house, a road) or offer technologies to improve land foundation.

MATERIAL AND METHOD

Geotechnical study is a comprehensive analysis of land and its capacity to support a building safely. In this study there are conclusions, recommendations and possible solutions to land planning.

Geotechnical study shows that soil is stratification, which is the maximum supported weight and pressure field, at what level is the ground water at the recommended drilling depth is so. These data are subsequently used to design the house foundation. Based on this analysis, structural design engineers made the right sized project, construction of one or more levels.

For this analysis, are extracted from soil samples analyzed, which are then taken to specialized laboratories and subjected to various tests (for compaction, compression, etc.).

The results of these tests are written in a file. Geotechnical study itself is represented by the file of results, with conclusions and recommendations of specialists who called.

RESULTS AND DISCUSSIONS

Geotechnical study is attached to the Book of Construction Engineering and is given great importance to whether or trading property. If Romania still close my eyes if this study is lacking in the U.S. and Western Europe is much more expensive insurance without geotechnical study.

What can happen without a geotechnical study?

If other elements of the house (roof, walls, columns) can occur easily if the situation requires, the foundation is not only difficult but also very expensive to intervene after construction was finished. For this reason it is recommended that a geotechnical study appropriate to the actual data of the land in question.

There were instances where land owners to expedite the project, provided data from neighbor obtained from archival data.

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Such cases, and lack of proper analysis can lead to effects that involve substantial additional costs:

• Each type of land supports some external pressure. This is determined based on the geotechnical study. Without these, can lead to breaks in the land structure and hence effects on the integrity of the building;

• To ensure the quality of construction, in the absence of adequate information, oversize designer can design the structure. In this case, even if initially exempt some money then it spends more to acquire iron, concrete and labor;

• There is land or lands susceptible to wetting clay that can act on building foundations and construction may affect the appearance, finish and integrity;

• In areas of meadow, under the layer of sand or gravel, there may be highly compressible layers malo;

• Analysis of these data is more important to land in areas with seismic activity.

Execution of drilling is done to:

• Establishing of stratification land (nature, sequence and thickness of layers);

• Establish groundwater level and its variation during the execution of drilling;

• Sampling of ground (undisturbed and disturbed) for physical-mechanical geotechnical laboratory (*fig. 1*);

• Sampling of water to determine the chemical composition

• field research aspect penetration dynamics of SPT.

Figure 1 **Soil samples**

Drilling is performed manually or mechanically operated machinery. After execution, drilling stopper with local soil, well compacted.

Undisturbed samples are collected throughout the drilling depth at intervals of 2 m 2 m for a uniform stratifications and every layer change and the changing nature or physical state of the earth (moisture, texture). Crop undisturbed samples are thin-walled metal tubes (nozzles).

After harvesting, the layers must paraffin ends with two successive layers of 5 mm minimum to preserve the natural moisture until its dissolution in the laboratory.

Disturbed samples are extracted from the drilling device at each change of coat and at least 2 m 2 m, interspersed between undisturbed samples. When you can not extract undisturbed samples, collect samples troubled meter meter.

From drilling performed and water samples are collected for identification of its aggression on the foundation.

Geotechnical study is a comprehensive analysis performed by ground conditions and its ability to safely support a goal. the same study are calculations of the weight that supports land and land presents its solutions both on target as the location and neighborhood (Florea Mircea, 1983).

Consider a number of factors in various fields of geology and geophysics (geological engineering, geology historical stratigraphy, seismic electrometry etc.), mathematics and statistics, geography.

In the production and construction of any necessary geotechnical study objective to prevent any degradation in time of construction but also to protect nearby buildings.

Making geotechnical study is required by law, this being the normative regulating NP 074/2007 on geotechnical construction documentation.

Beyond the potential risk of failure involved the study and implications of failure to comply with the law, ignoring the achievement of a geotechnical study, the achievement of incomplete data or obtain it only from archival materials or documentation in the proximity can lead to several effects involving costs considerable additional namely:

- Each type of land can support a certain external pressure which is determined based on information from the study and some cases determine whether the study. Can lead to breaks in the structure of land and hence to large deformation effects on the integrity of the building;

- The designer can make sizing project structure, in which case the costs of acquiring iron, concrete and put into operation to achieve the structure can increase costs by 50%;

- The clay land in the area of influence of objective foundation, there may be contract or clay soils susceptible to wetting that can act on building foundations, sometimes creating considerable differential settlements that may affect both the appearance of the building, finishes (gypsum boards are very sensitive type From this point of view) and the integrity of the building itself

(especially for building high differential settlements with small area of the foundation);

- Similar negative effects can occur in areas of meadow under layers of sand or gravel that can hide superficial layers investigated malo very compressible;

- Although not across the country is affected by intense seismic, equally important in analyzing data should be given throughout the country. Do not forget that in addition there are two areas Vrancea epicenter in northern Banat and Bulgaria, which made their presence felt in the last two decades. The problems caused by earthquake liquefaction remember sands of zone of influence of the foundation soil and landslides that may be caused in those moments.

Geotechnical Investigation of a site can be done in stages, achieving first a feasibility study (SF), preliminary geotechnical study and then study for the project geotechnical proper Technical (PT) and finally a study for details of execution (DE). If you want can be a geotechnical study, single phase project.

Stages of a geotechnical study are:

- Viewing the site, and eventually plans to obtain a design theme, destination, types and sizes foundations, the pressure transmitted to the ground.

- Based on historical data, geological maps, the size and degree of importance of the construction works is established program and choose appropriate tools of investigation, and drafted the technical-economic offer;

- Execution phase of field work will include investigating proper by mapping the area, drilling, boring penetration, trenches, seismic investigation, surveying measurements, pumping wells, and other in situ tests, etc.;

- Samples will be transported and specialized geotechnical laboratory testing and certification MLPTL;

- Interpretation of field data, laboratory findings and developing the geotechnical study;

- Analysis of documents in the company by the entire team of engineers, geologists;

- Checking and approving the requirement A.f. by a licensed supervisor;

- Teaching the beneficiary documentation.

CONCLUSIONS

Geotechnical study is very important from a very simple reason. If all other elements of a building (walls, columns, roof beams) can occur relatively easily, the foundation is extremely difficult and expensive to intervene after it was built.

Moreover, the study is attached to the book geotechnical engineering construction and is one of the important legal papers when property is provided or resold.

The purchase of land also must take into account an analysis of land for geological prevent possible trouble.

By this I mean buying a piece of land that an owner wants to build a building, so it is advisable to request a study to determine the geotechnical characteristics of the land.

If the soil structure is not appropriate, it is likely that after buying the land owner have to spend the foundation surprise more than the structure.

In Romania still does not give due weight to this study, Western Europe and the USA, insurance is extremely expensive in the absence of the geotechnical study and other documents in the book building.

Building a house is an investment for many of us the life we are forced to borrow even bank on us for decades. And how land is an important part of the investment should give it due attention.

We must not allow ourselves drawn to a very good price to buy, it is important that the land we want to build is one of quality. ***A geotechnical study can tell us this.***

Therefore, to ensure that the land on which we intend to build is exactly what we need, it's good to have a geotechnical study prior to a purchase.

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