Translation from Romanian

Name and surname of the certified verifier:
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Dr. Eng. CHIRILA P. DANIELA ELENA
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Phone: 0720 043 322

No. 1059/23.10.2024
According to the records register

REPORT

Regarding the quality check of the **Af** requirement of the geotechnical study:

SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, NOW UNIVERSITY HOUSE (HISTORICAL MONUMENT CODE LMI B-II-M-A-19107 CODE)

Phase: **Geotechnical study**

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1. ***IDENTIFICATION DATA:***

- General designer: S.C. GEOSTRUCT S.R.L.
- Specialist designer: S.C. INFRATECH CONSTRUCT S.R.L.
- Beneficiary: BUCHAREST UNIVERSITY
- Location: BUCHAREST MUNICIPALLITY, DISTRICT 2, LUPU DIONISIE, NO. 46, CADASTRAL NUMBER 214529
- Date of submission of the document for verification: 22.10.2024

2. ***DOCUMENTATION TO BE PRESENTED DURING VERIFICATION:***

Geotechnical study no. 1534 / 10.2024

Written documents: General data, Site land data, Presentation of geotechnical information regarding the foundation land, Evaluation of geotechnical information, Conclusions and recommendations. Technical reference regulations.

Drawn documents: Geotechnical drilling sheet, Geotechnical drilling location plan.

3. ***MAIN CHARACTERISTICS OF THE PROJECT AND CONSTRUCTION:***

The beneficiary wishes to prepare a technical expertise of the annexes and the greenhouse located in the courtyard of the Librecht-Filipescu House in Bucharest.

The geotechnical category of the site is "1".

Prospections were carried out through two geotechnical drillings with disturbed and undisturbed samples taken at a depth of 7.00 m, marked F01 and F02, and three geotechnical surveys marked S01 - S03. The land stratification identified in the drillings is as follows (F01):

- (0.00 - 1.00) m: Fillers from construction waste and topsoil;
- (1.00 - 3.70) m: Brownish sandy silty clay with medium plasticity, soft to hard plastic, with medium compressibility;
- (3.70 - 7.00) m: Medium gravel with dense coarse sand.

Groundwater was not intercepted in the geotechnical drilling.

The foundation soil consists of:

• Brownish sandy loam with medium plasticity, soft to hard plasticity, with medium compressibility is a good soil; it falls into the category of fine soils with IP>20%: sandy loams, silty loams and clays, having e<l. 1 and IC>0.75, under conditions of a practically uniform and horizontal stratification;

• Medium gravel with dense coarse sand is a good soil; it falls into the category of Blocks, boulders and gravel, containing less than 40% sand and less than 30% clay, under conditions of practically uniform and horizontal stratification (having a slope of less than 10%). The following conclusions are highlighted following the S01 survey conducted:

• The external foundations of the investigated construction are made of concrete and are arranged at a

depth of 0.70ni compared to the elevation of the developed land; they do not exceed the frost depth according to STAS 6054-77;

- The hydrostatic level was not intercepted;
- The type of existing foundation does not comply with the minimum requirements set out in the current SR EN 1997-1:2004 standards, therefore work is required to increase the foundation depth to a depth of 1.10m in the layer of brown sandy silty clay with medium plasticity, soft to hard plasticity, with medium compressibility.

When carrying out the consolidation of existing foundations, the following recommendations will be taken into account:

- The minimum foundation depth will be 1.10m from the level of the developed land;
- When carrying out foundation rehabilitation works, increased attention will be paid to supporting the earth banks according to NP 120-2014 Normative requirements for the design, execution and monitoring of deep excavations in urban areas.
- An increase in the foundation depth will be carried out by means of sub-constructions. The substructure will be carried out starting with the even-numbered sections, having a maximum length of 1.10m, followed by the odd-numbered sections. Due to the risk of water infiltration, all infrastructure works will be adequately waterproofed.
- Increasing the bearing capacity of the foundations by increasing their contact surface with the foundation ground, so that through the rehabilitation of the construction the bearing capacity of the ground beneath the existing foundations can be ensured;

The final solutions regarding the choice of foundation system will be adopted by the specialized designer.
Following the S02 survey conducted, the following conclusions are highlighted:

- The exterior foundations of the investigated construction are made of concrete and are arranged at a depth of 1.20m from the elevation of the developed land; they thus exceed the frost depth according to STAS 6054-77;
- The hydrostatic level was not intercepted;
- The building's foundation does not have a waterproofing system;
- The type of existing foundation complies with the minimum requirements set out in the current SR EN 1997-1:2004 standards, therefore no work is required to increase the foundation depth.

Following the S03 survey conducted, the following conclusions are highlighted:

- The exterior foundations of the investigated construction are made of concrete and are arranged at a depth of 1.10m from the elevation of the developed land; they thus exceed the frost depth according to STAS 6054-77;
- The hydrostatic level was not intercepted;
- The building's foundation does not have a waterproofing system;
- The type of existing foundation complies with the minimum requirements set out in the current SR EN 1997-1:2004 standards, therefore no work is required to increase the foundation depth.

The bearing capacity of the foundation soil at a depth of 1.1 m in the layer of brown sandy silty clay with medium plasticity, plastic to hard, with medium compressibility:

- SLEN (SLD) - fundamental grouping: ppl = 178 kPa;
- SLU (SLCP-resistance) - special group: per = 254 kPa.

Ground acceleration according to P100-2013 ag = 0.30 g, Tc= 1.60 sec.
Solutions were recommended for systematizing the land adjacent to the construction and collecting rainwater.

4. ***CONCLUSIONS ON THE VERIFICATION:***

Following verification, the project is considered appropriate, and is signed and stamped according to the supervisor.

23.10.2024

I have received 3 copies.
Investor/Designer

I have handed over 3 copies.
MDRAP certified technical verifier, Af requirement:
Dr. Eng. CHIRILA P. DANIELA ELENA
Official stamp Illegible signature

Registered office: Iasi municipality, Calea CHISINAULUI, Nr. 29, cadastral number: 3861/208/4-C1, et. 1, Iasi municipality,
Sole Registration Number: RO39194450, J22/937/2018, Phone: 0730495980,
Email: infratech.construct@gmail.com

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GEOTECHNICAL STUDY
FOR THE PURPOSE:

SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, NOW UNIVERSITY HOUSE (HISTORICAL MONUMENT LMI B-II-M-A-19107 CODE)

Beneficiary: BUCHAREST UNIVERSITY
General designer: S.C. GEOSTRUCT S.R.L.
Developer: S.C. INFRATECH CONSTRUCT S.R.L.
No. 1534/10.2024

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FILE INDEX

A. WRITTEN DOCUMENTS:

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B. DRAWN DOCUMENTS:

1. Geotechnical drilling sheets
2. Geotechnical investigation site plan
3. Geotechnical survey details

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1. General data

1.1 Brief for the development of the geotechnical study

The brief of the geotechnical study imposed the depth of prospecting, the method of sampling and the specific conditions of identification, transport and storage according to the regulations in force.

The position of the investigation points was established in agreement with the Beneficiary and corresponds to the location of future constructions. The executor of this Geotechnical Study has mastered the brief imposed by the Beneficiary as well as its instructions formulated during the works.

1.2 Objective name

SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, TODAY, UNIVERSITY HOUSE (HISTORICAL MONUMENT LMI B-II-M-A-19107 CODE)

1.3 Location of the objective

BUCHAREST MUNICIPALITY, DISTRICT 2, LUPU DIONISIE, STREET, NO. 46, CADASTRAL NUMBER 214529

1.4 Investor/Beneficiary

BUCHAREST UNIVERSITY

1.5 General designer

S.C. GEOSTRUCT S.R.L.

1.6 Specialized designer for the geotechnical study

S.C. INFRATECH CONSTRUCT S.R.L.

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1.7 Units that participated in the land investigation

INFRATECH DRILL S.R.L. - for visual investigation, execution of geotechnical drilling/surveying and development of technical documentation.

Laboratory for analysis and testing in construction activity, owned by INFRATECH CONSTRUCT S.R.L. with authorization no. 3805 dated 03.03.2022, with registered office in Iasi county, Iasi municipality, Calea Chisinaului no. 29 - for performing physical-mechanical laboratory analyses.

INFRATECH CONSTRUCT S.R.L. has a quality management system certified by the CERTIND body according to the **ISO 9001:2015 standard (certificate no. 43958-40-C).**

1.8 Documentation development team

eng. Voicu Eduard
eng. Sofron Stefan-Dan
eng. Sumanu Marian-Alexandru
eng. Vouciuc Constantin
eng. Covasneanu Andrei
eng. Belei Emanuel Mircea

1.9 Data regarding the expected construction system

According to the design theme received from the beneficiary, a technical expertise of the annexes and the greenhouse located in the courtyard of the Librecht-Filipescu House in Bucharest is planned to be prepared on site.

2. SITE LAND DATA

2.1 General geological data and topography

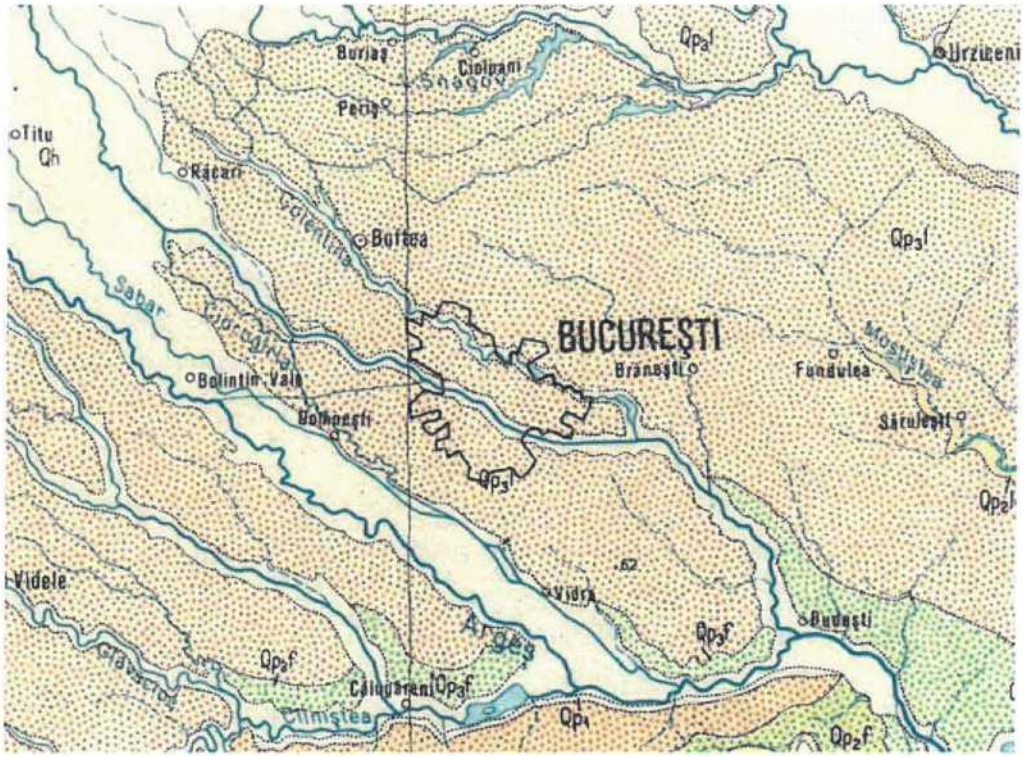


Figure 1. Geological map of Romania

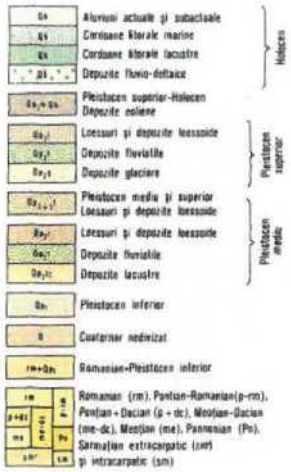


Figure 2. Geological layers legend

From a geological point of view, the studied site is part of the Wallachian Platform, it is a northern sector of a larger unit called the Moesian Platform and represents the platform unit comprised between the Carpathian Orogen, the North Dobrogean Orogen, the Central Dobrogea Massif, the South Dobrogea Platform and the Danube.

This structural unit is delimited from other structural units generally by tectonic accidents (faults), which also constitute the limits of the unit:

- N and NW: where the Wallachian Platform comes into contact with the molasse area of the Southern Carpathians, it is constituted by the Pericarpathian fault (Bibesti-Tinosu fault).
- N-E: The Wallachian Platform comes into contact with the buried North Dobrogean Orogen through the Peceneaga-Camena fault.
- E: The Wallachian Platform comes into contact with the Central Dobrogea Massif and the South Dobrogea Platform along a line approximately parallel to the Danube Valley, which is a tectonic accident generally called the Danube Fault.
- S: the state border on the Danube Valley.

Stratigraphy

The Wallachian Platform is a typical platform clearly presenting the 2 structural floors - base and cover. The general characteristic for the superficial area of the platform is the presence of Quaternary deposits, the exception being the area of the confluence of the Jiu with the Danube where formations older than the Quaternary are also removed by erosion, namely Romanian, Dacian and Pontic deposits. The other formations older than the Quaternary were studied through deep drilling carried out for geological prospecting for oil. The total stratigraphic thickness of the cover exceeds 23 km.

The platform base was intercepted through drilling in 2 higher areas: in the NW and NE part. Between the two elevated areas on the Wallachian Platform, a major fault called the Calarasi-Fierbinti Fault was highlighted. In the NW part, the foundation of the Wallachian Platform was intercepted between the Leu-Balsi-Octasi localities. In this area, the basement is made up of crystalline schists (amphibolites with epidote, chlorite schists, chlorite quartzite schists, magmatites, granitites, granodiorites and gabbros). The depth at which the basement was encountered is between 2000-3700 m. In the NE part of the Wallachian Platform, the basement was intercepted at depths similar to those in the NW and is represented by green schists. The area is known as the Bordei-Verde sector.

The formations that make up the cover of the Wallachian Platform are arranged over the consolidated, peneplained basement (part of the Karelian orogeny, part of the Baikalian orogeny). In the subsequent evolution of consolidation, the Wallachian shelf was subjected to tilting movements that determined transgressions and regressions that are reflected in the existence of several sedimentation cycles.

As in the other platform units, the accumulation of sediments was not continuous, but due to geodynamic oscillations, 4 megacycles of sedimentation were separated:

- Paleozoic Cycle (Cambrian and Carboniferous);
- Permian-Triassic Cycle;
- Liassic-Eocene Cycle;
- Badenian-Quaternary Cycle.

The evolution of the geosynclinal stage of the Wallachian domain can be reconstructed based on observation starting with the Upper Proterozoic. During this time, the region of the current Wallachian Platform was part of a much larger geosynclinal area, including a good part of Dobrogea and part of the Carpathian domain.

The beginning of the geosynclinal evolution in the Upper Proterozoic was marked by a basic magmatism that replaced the material from whose metamorphism the amphibolites identified in the Bals — Slatina area resulted. The deposits accumulated in the geosyncline were affected by regional metamorphism during the Baikal orogeny.

Subsequent to the paroxysmal phase, late-stage plutonic magmatism occurred when the granitoid body known in the Bals — Optasi — Slatina region was emplaced. The last phases of the Baikal orogeny led to the consolidation of the entire Wallachian domain, including the northeastern part formed by greenschists.

Starting from the Paleozoic, the Wallachian domain behaved as an unstable platform sensitive to the orogenic movements that manifested themselves in the neighboring geosynclinal areas and which resulted in the formation of regional-scale fractures in the consolidated domain.

Due to the special interest in hydrocarbons, the Wallachian Platform was investigated through numerous prospecting and exploitation drillings. Geophysical investigations allowed the deciphering of the structural arrangement of the Wallachian Platform, thus at the platform level, 5 higher sectors were highlighted alternating with 4 deeper sectors. This mosaic of blocks is of particular importance in the emergence of hydrocarbon traps.

2.2 General geomorphological, hydrographic, hydrogeological framework and climatological data

From a geomorphological point of view, the Wallachian Platform presents a plain relief mostly overlapping with what geographers call the Romanian Plain. This was formed over geological time by the silting and elevation of foreland basins, the last basin having a fluvial-lacustrine character during the Quaternary. It is the last phase of evolution of the Dacian basin.

The NW part of the Wallachian Platform presents a series of more pronounced heights known as the Getic Plateau. As for the hydrographic network, it is made up of a series of rivers that originate from the Southern Carpathians. There are, however, a few rivers that have their sources within the Wallachian Platform, such as the Calmatui river, Mostistea, Teleorman. In the NE part of the platform, a phenomenon of neotectonic origin can be noted within the hydrographic network, which consists in the orientation of the hydrographic network towards the E and even towards the NE = divergence - consequence of the sinking process of the confluence region of the Buzau river with the Siret river.

From a hydrological and hydrogeological point of view, groundwater is represented by descending aquifers accumulated in the Sarmatian and Quaternary deposits, which are naturally drained by their sectioning by river valleys and emerge as springs. Aquifers are deep (captive) and free. The most important free waters are the groundwater, located at the top of plateaus and interfluves (at depths of 10 - 30 m) or at the base of terraces and plains along the main valleys.

Bucharest is located on the banks of the Dambovita River, which flows into the Arges, a tributary of the Danube. Several lakes - the most important of which are Herastrau, Floreasca, Tei and Colentina - stretch in the northern parts of the city, along the Colentina, a tributary of the Dambovita. In addition, in the center of the capital there is a small artificial lake - Cismigiu Lake - surrounded by the homonymous park. This park has a rich history, once frequented by poets and writers. Opened in 1847 according to the plans of the German architect Carl F. W. Meyer, [37] the park is the main recreational area in the city center.

The climate of the city area is temperate-continental, pontic type, with manifestations of excesses, that is, dry and with strong temperature contrasts between winter and summer. The annual average of the isotherms is +10 °C and -11 °C, the coldest month of the year being January (average temperature -3 °C), and the warmest July (average temperature +32.6 °C). The result is an average temperature amplitude of 25.6 °C, which is one of the highest in the country.

In terms of precipitation, the area is arid. The driest month is February (19.0 mm), the wettest is June (70.2 mm), the annual average of precipitation being 456 mm. The maximum amount of precipitation in Slobozia in 24 hours was 69.8 mm and was recorded on August 20, 1949.

From a technical point of view, the climatic zoning of the national territory, places the studied site in the following areas:

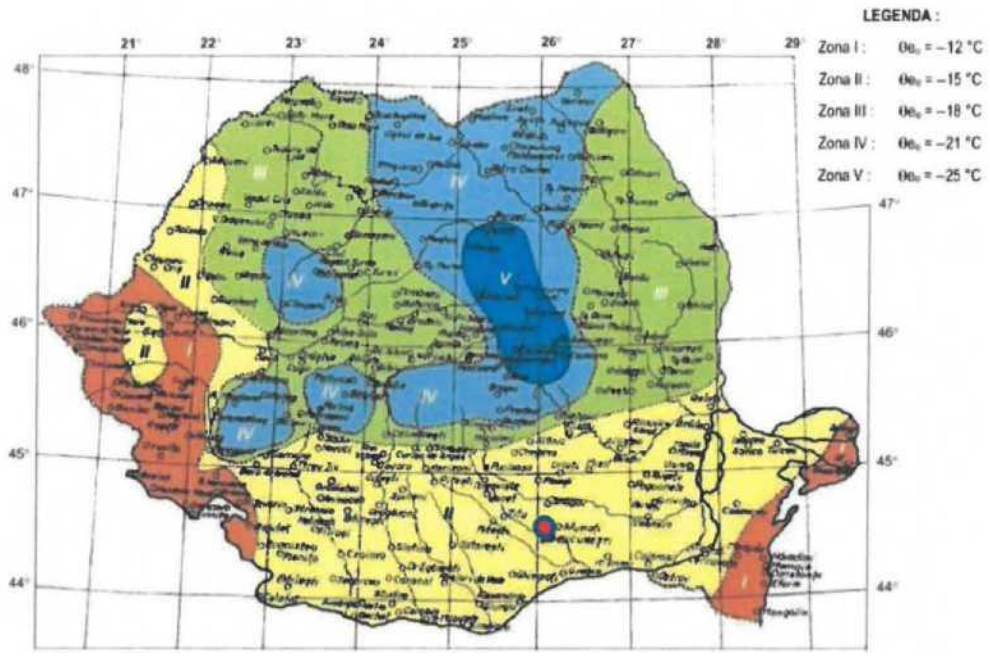


Figure 3. Climate map of Romania

- dynamic reference wind pressure, averaged over 10 minutes ***qb= 0.5 kPa****, according to* ***CR 1- 1-2012 "Design code. Evaluation of wind action on constructions"****;*

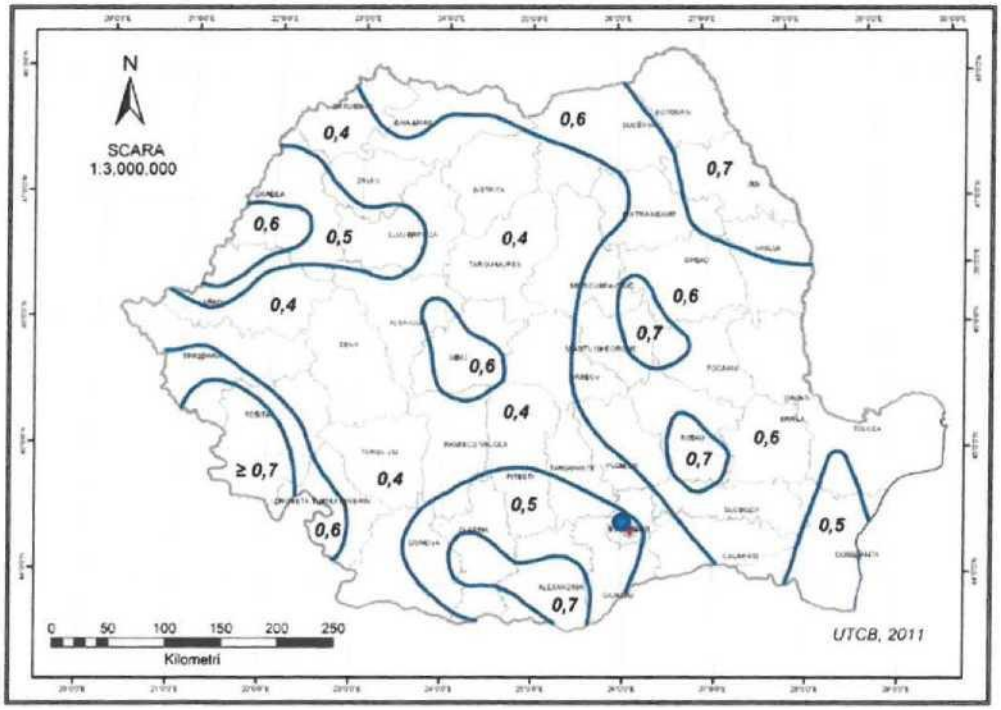


Figure 4. Characteristic values of dynamic reference wind pressure, qb having 50 years mean recurrence interval

- characteristic value of the snow load on the ground $s_{0,k}$ = **2.0 kN/m²**. according to **CR 1-1-3/2012 "Design code. Evaluation of snow action on constructions."**

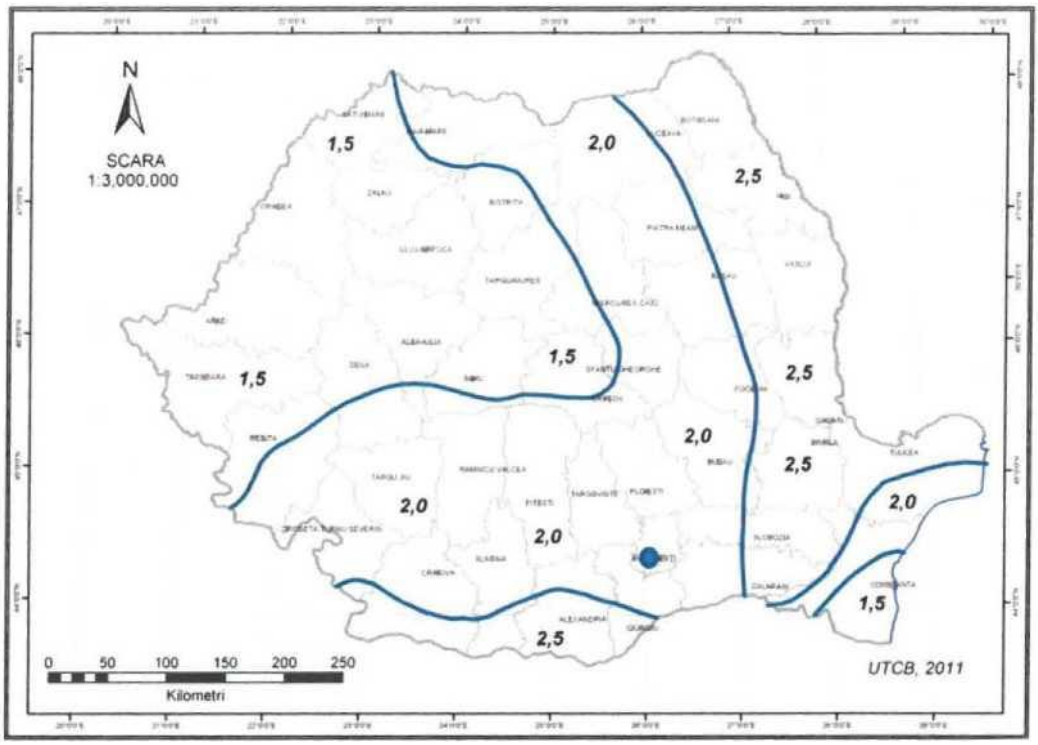


Figure 5. Zoning of the characteristic value of the snow load on the ground

The maximum freezing depth is considered to **be 0.80 ÷ 0.90 m** from the elevation of the natural or developed terrain, according to **STAS 6054-77.**

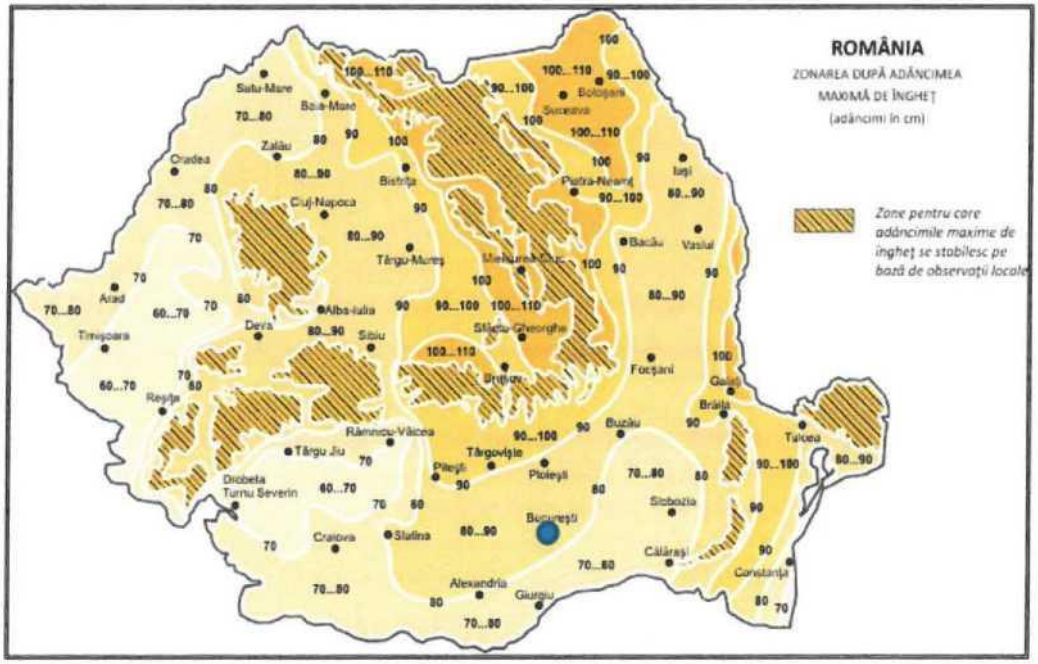


Figure 6 Map of freezing depths

2.3 General geotechnical data

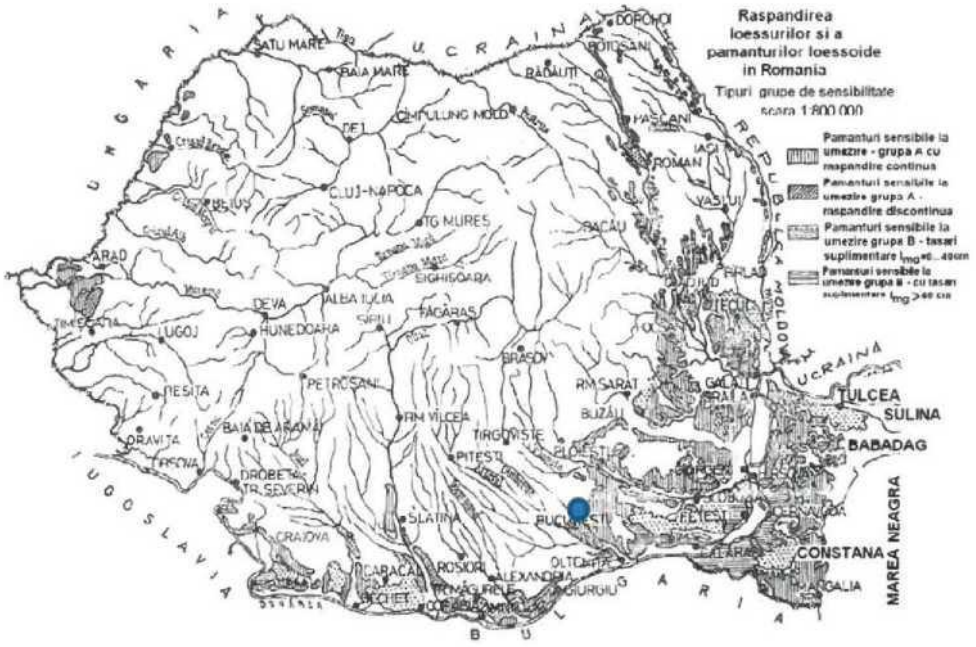


Figure 7 The spread of loess and loessoid soils in Romania

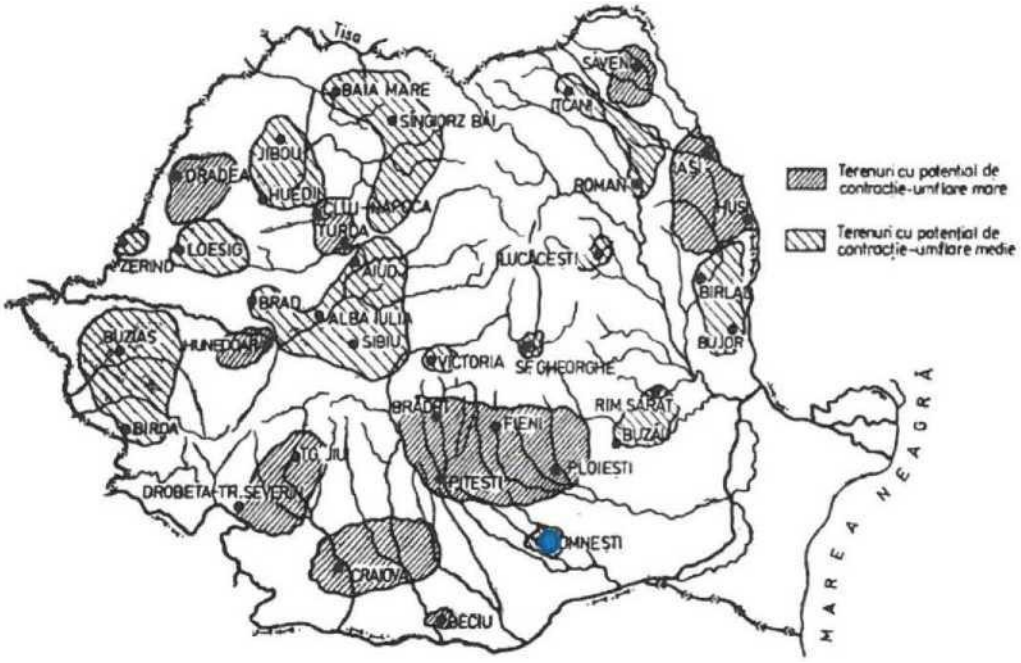


Figure 8. The spread of lands with large swellings and contractions across Romania

From the geotechnical studies carried out for existing constructions in the vicinity, from the geotechnical zoning maps of the site or in the vicinity, from the existing archives, it appears that the investigated site falls within the areas of distribution of soils with large swellings and contractions.

Soils with large swellings and contractions, briefly called PUCM in the following, can also be found in the specialized literature under the names of contractile soils or expansive soils.

These are clay soils that are active in relation to water, which have the property of significantly modifying their volume as a result of humidity variations.

The production of significant variations in land volume is conditioned by:

• the presence in the surface area of active clays, susceptible to large swellings and contractions;
• the occurrence of significant humidity variations as a result of climatic conditions or other causes (strong sources of humidification or drying, evapo-transpiration of vegetation, etc.).

2.4 Seismological data

According to the technical regulation "**Seismic Design Code - Part 1 - Design Provisions for Buildings**" **indicative P 100-1/2013**, the zoning of the peak value of the ground acceleration for design, in the municipality of Bucharest, for seismic events with the average recurrence interval IMR = 225 years, has the following values:

Design ground acceleration: $\mathbf{a_g = 0.30g}$;

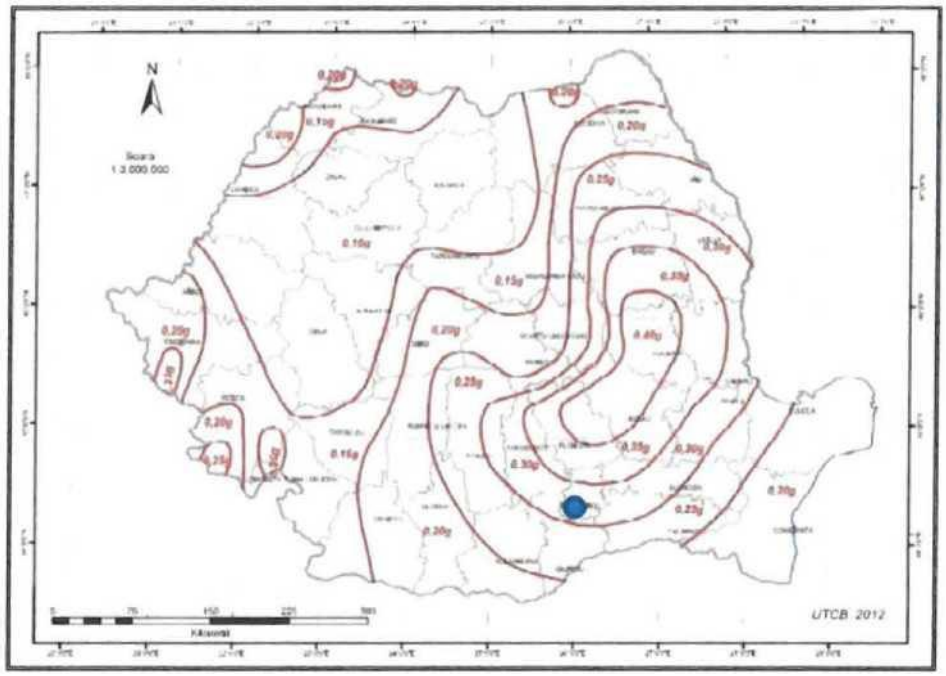


Figure 9. Zoning of the peak ground acceleration value for earthquake design with an IMR of 225 years and a probability of exceedance of 20% in 50 years

The control period (corner) Tc of the response spectrum represents the boundary between the area of maximum values in the absolute acceleration spectrum and the area of maximum values in the relative velocity spectrum. For the studied area, the corner period has the value **Tc = 1.6 sec.**

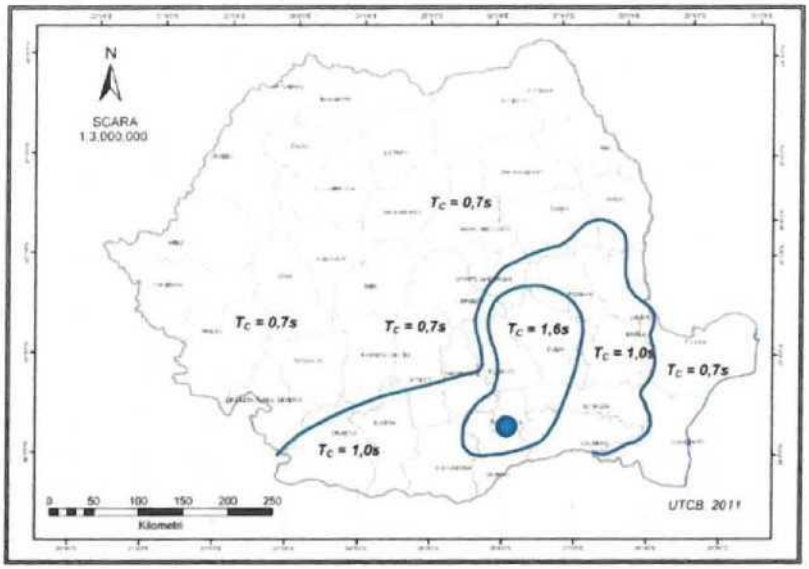


Figure 10. Zoning of the Romanian territory in terms of control period (corner). Tc of the response spectrum

2.5 History of the site and current situation

The investigated location is located in the municipality of Bucharest.

Figure 11. Investigated location

2.6 Conditions relating to the vicinity of the work

The neighborhoods within the studied site are represented by access roads, collective housing constructions, etc.

2.7 Classification of the objective in "Natural risk areas" that form the "National Land Use Plan - Section V - Natural risk areas"

The area of the Bucharest municipality, in terms of landslide risk, falls into the **low-risk area**, with practically zero probability of **primary** landslides occurring.

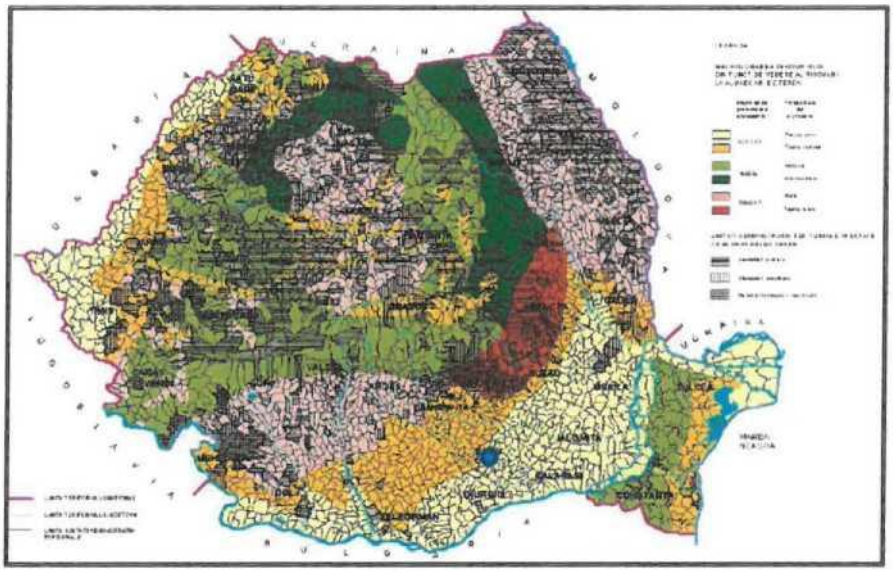


Figure 12. National Spatial Development Plan Section V Natural risk areas: Landslides

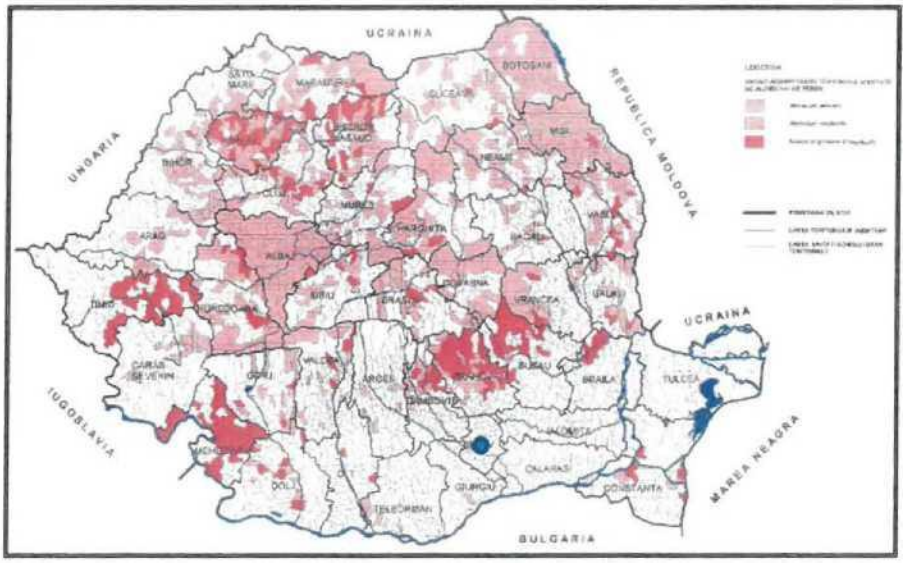


Figure 13. National Spatial Development Plan Section V Natural risk areas: Type of landslides

From the point of view of flood risk, the municipality of Bucharest belongs to the area with a maximum amount of precipitation falling in 24 hours, estimated to be between **100-150mm** with the possibility of flooding as a result of the **overflow of a watercourse.**

The hydrological and geomorphological elements identified on the site do not describe, for the investigated land area, a risk of flooding of the area as a result of the overflow of a watercourse.

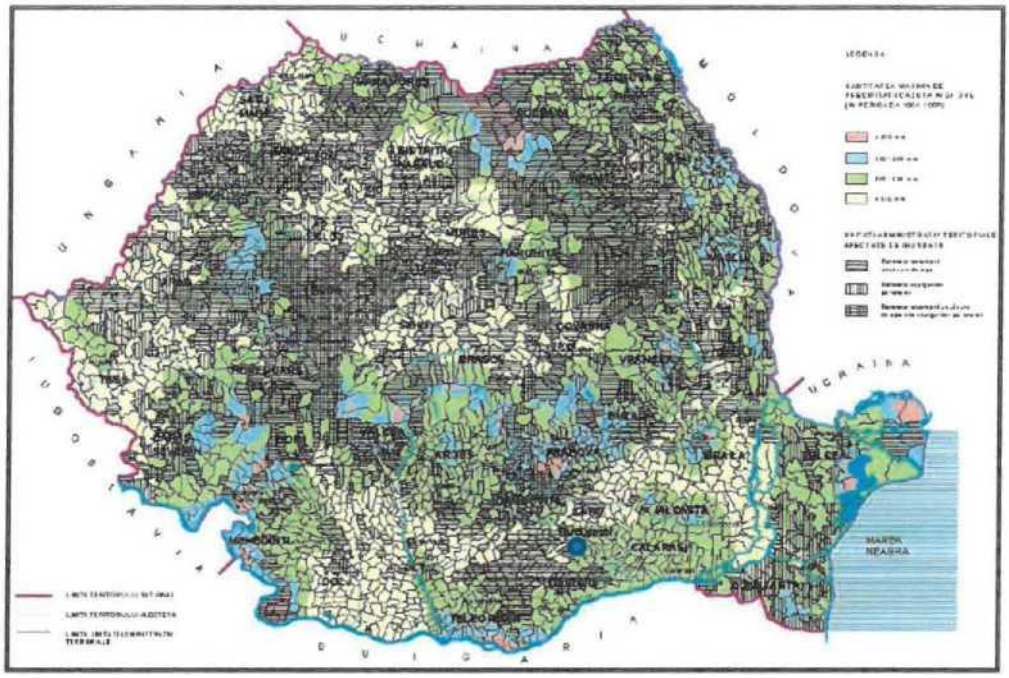


Figure 14. National Territorial Development Plan - Section V - Natural risk areas: The maximum amount of precipitation that fell in 24 hours.

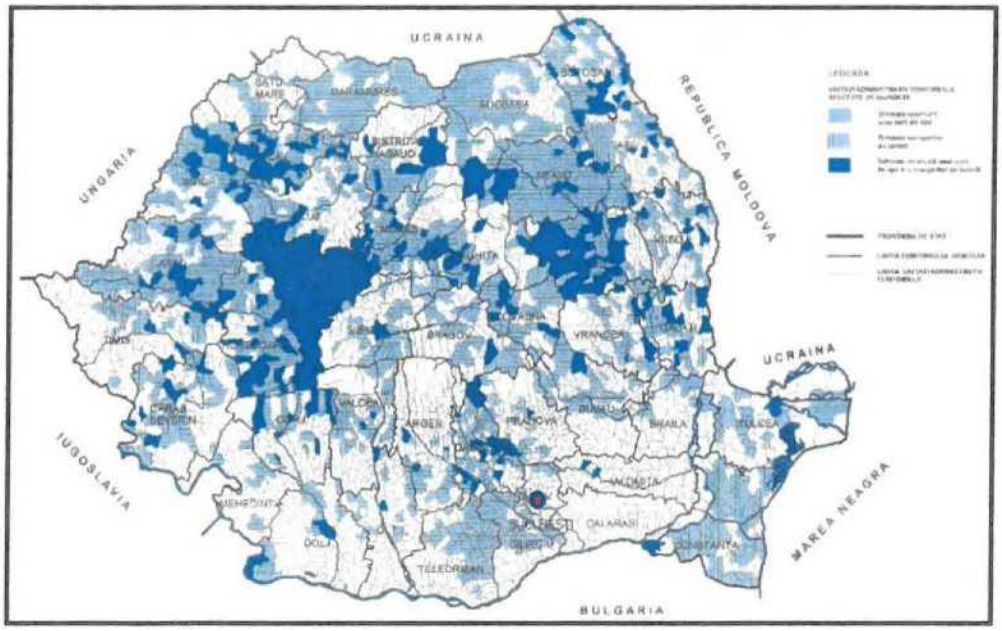


Figure 15. National Spatial Development Plan - Section V - Natural risk areas: Types of floods

The seismic intensity of the site area, equivalent to the calculation parameters regarding the seismic zoning of the Romanian territory, is the **VIII** for the studied area, expressed in MSK degrees.

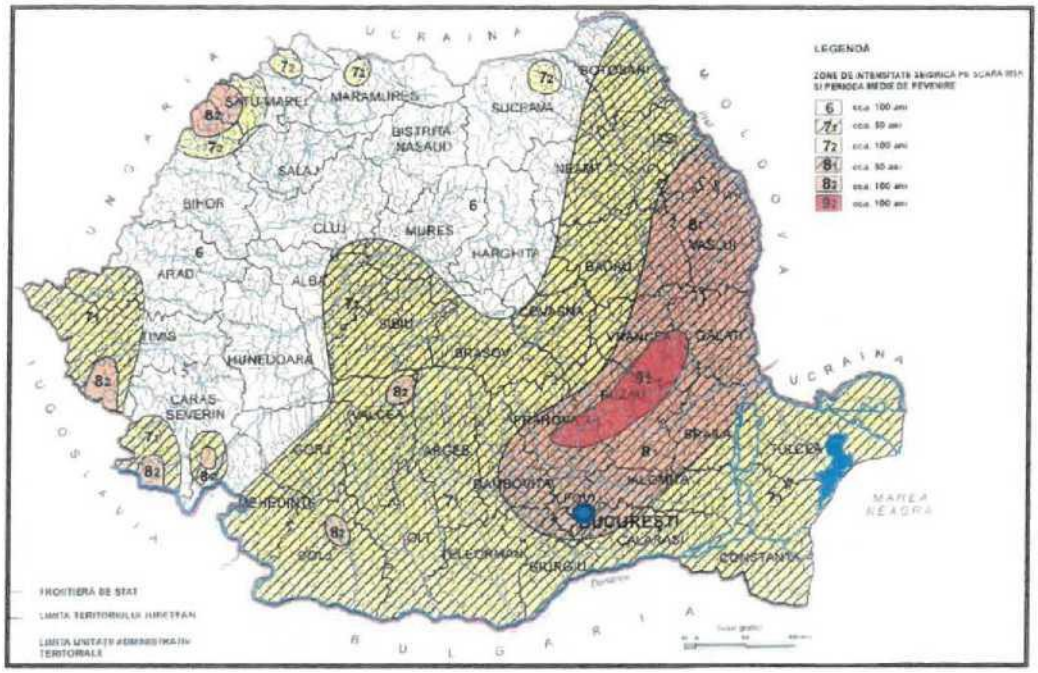


Figure 16. National Territorial Development Plan - Section V - Natural risk areas: Earthquakes

3. PRESENTATION OF THE INVESTIGATIONS AND GEOTECHNICAL AND HYDROGEOLOGICAL INFORMATION CARRIED OUT

3.1 Scheduled field tests, in accordance with the requirements of the brief

On the site, two geotechnical drillings will be carried out with disturbed and undisturbed samples taken at a depth of 7.00 m, marked with F01 and F02, and three geotechnical surveys marked with S01 - S03. In order to determine the mechanical parameters of the soil and to verify the intercepted stratification, samples will be taken for the purpose of laboratory analysis.

3.2 Calendar dates between which the field work was carried out

Field work was carried out between 14.10.2024 and 14.10.2024.

3.3 Field observations

The targeted location has a low slope and is considered approximately flat, with general and local stability assured. The area of interest is not subject to water surges or flooding, and the buildings in the area do not have degradation caused by the behavior of the foundation soil.

3.4 Volume of geotechnical and hydrogeological works, methods and standards on which they are based, equipment and devices used

Geotechnical drilling was carried out with semi-mechanized drilling, with disturbed and undisturbed samples taken. The diameter of the drilling is = 100.0/nm. The geotechnical drilling was carried out in accordance with SR EN ISO 22475-1:2008.

The drilling was carried out in accordance with the theme for the development of the geotechnical study imposed by the Beneficiary.

Figure 17. Equipment used to carry out the geotechnical study

3.5 Methods used for collecting, transporting and storing samples and classification of the samples category

The samples were collected manually, in plastic bags to preserve humidity. The samples must contain all the mineral constituents of the layers from which they were collected. They must not be contaminated with any material from other layers or additives used during the sampling process.

Three categories of sampling methods (SR EN ISO 22475-1) will be considered, depending on the desired quality of the samples: sampling methods category A, B or C.

The samples were stored in the laboratory in a desiccator to preserve the initial conditions at the site. The collection, transport and storage were carried out in accordance with SR EN 180 22475-1:2008.

Sampling category according to SR EN ISO 22475-1	**A, B**

3.6 Field position of the investigations carried out

Survey code	**Depth [m]**	**Location area**	**X (N)**	**Y (E)**	**Z (Elevation)**
F01	7.00 m	BUCHAREST MUNICIPALITY, DISTRICT 2, LUPU DIONISIE, NO. 46, CADASTRAL NO. 214529	44^{0}26'32.78"N	26° 6'14.42"E	78.51 m
F02	7.00 m		44°26'33.58"N	26° 6'11.40"E	78.80 m
S01	0.70 m		44°26'32.20"N	26° 6'14.05"E	78.77 m
S02	1.20 m		44°26'33.41"N	26° 6'14.33"E	78.71 m
S03	1.10 m		44°26'33.49"N	26° 6'9.56"E	78.96 m

Table l. Geotechnical survey centralizer

3.7 Primary stratification highlighted

Disturbed and undisturbed samples were taken from the geotechnical drillings, which were analyzed in the laboratory, highlighting the following stratification:

Geotechnical investigations	Layer	Layer depth	Layer thickness	Lithological description
Drilling F01	1	-1.00 m	1.00 m	Fillers from construction waste and topsoil
	2	-3.70 m	2.70 m	Brownish sandy silty clay with medium plasticity, soft to hard plastic, with medium compressibility
	3	-7.00 m	3.30 m	Medium gravel with dense coarse sand
Drilling F02	1	-1.10 m	1.10 m	Fillers from construction waste and topsoil
	2	-7.00 m	5.90 m	Brownish sandy silty clay with medium plasticity, soft to hard plastic, with medium compressibility

Table 2. Geotechnical survey centralizer

<u>FORAJUL F01-F02</u> (Nivelul de referinţă a cotelor si adâncimea forajului s-a raportat la C.T.N. la gura forajului - considerat a fi cota 0.00)

Figure 18. Geotechnical drilling

Figure 19. Sampling

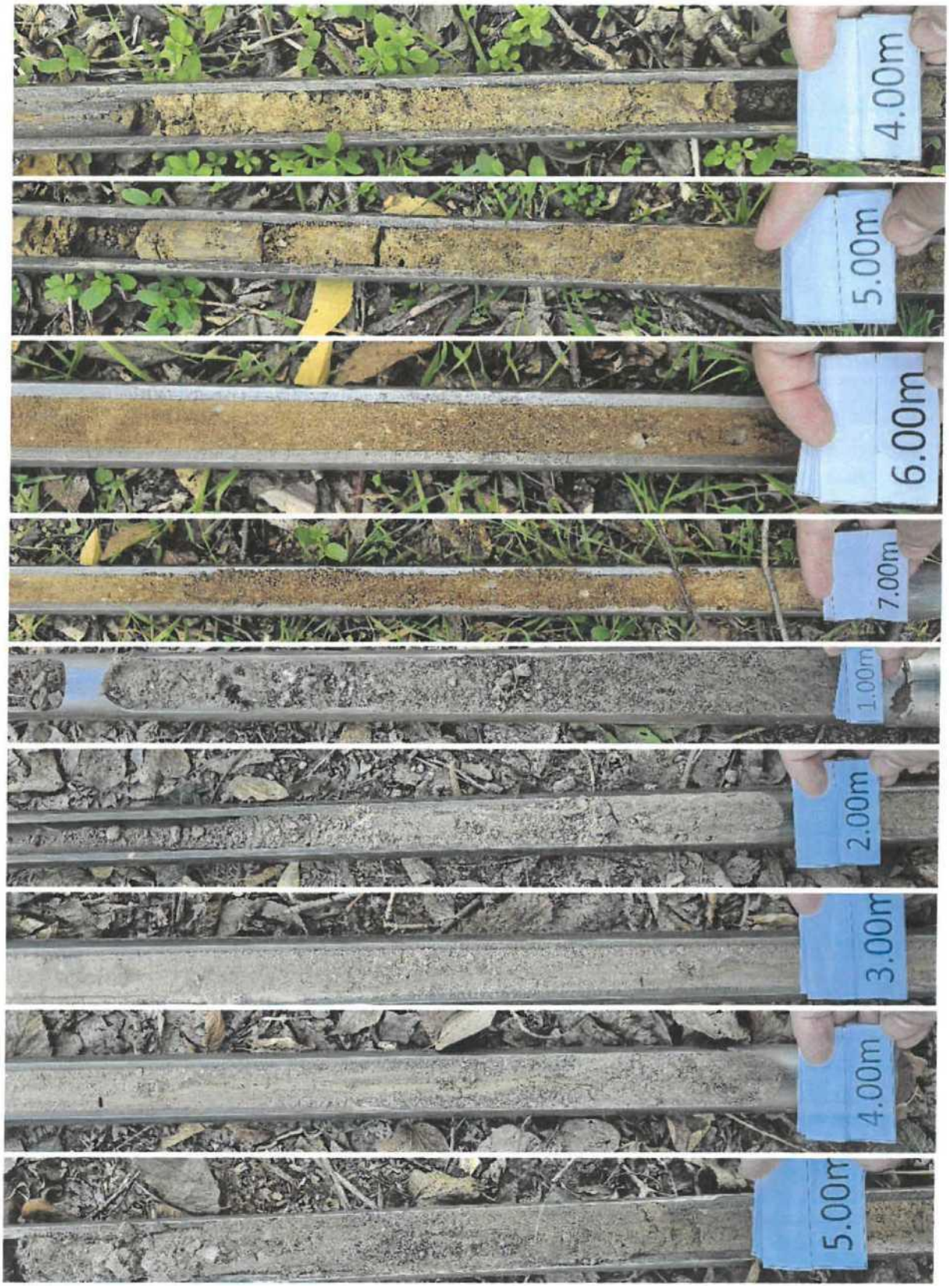


Figure 20 Sampling

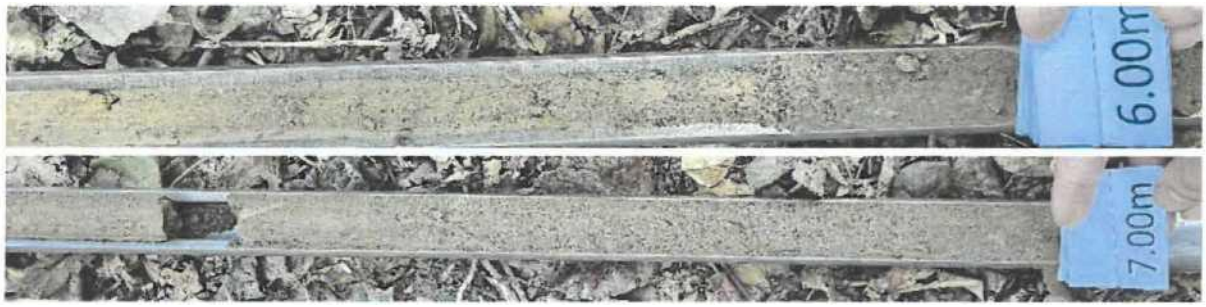


Figure 21. Sampling

3.8 Sheets of various measurements and in situ tests

Not applicable.

3.9 Measured data regarding the groundwater level and the character of the aquifer

Groundwater was not intercepted in the geotechnical drilling.

3.10 Aggressiveness characteristics of groundwater and, possibly, of some soil layers

Not applicable. According to the topic of the geotechnical study, the beneficiary did not request these types of tests.

3.11 Calendar dates between which the laboratory work was carried out

Laboratory work was carried out between 14.10.2024 - 18.10.2024.

3.12 Name of the authorized/accredited laboratory that carried out the soil and water tests/analyses

Laboratory for analysis and testing in construction activity, owned by S.C. INFRATECH CONSTRUCT S.R.L. with authorization no. 3805 dated 03.03.2022, with registered office in Iasi county, Iasi municipality, Calea Chisinaului, no. 29 - for performing physical-mechanical laboratory analyses.


INSPECTORATUL DE STAT ÎN CONSTRUCȚII

AUTORIZAȚIE

Figure 22. Authorization of the construction analysis and testing laboratory

4. EVALUATION OF GEOTECHNICAL INFORMATION

4.1 Presentation of open field survey results

SURVEY S01 ***(The reference level of the elevations and the depth of the survey were reported to the C.T.A. - considered to be depth 0.00)***

Figure 23 Carrying out geotechnical survey S01

Figure 24. Geotechnical survey S01

SURVEY S02 ***(The reference level of the elevations and the depth of the survey were reported to the C.T.A. - considered to be depth 0.00)***

Figure 25 Carrying out geotechnical survey S02

Figure 26 Carrying out geotechnical survey S02

<u>SURVEY S03</u> (The reference level of the elevations and the depth of the survey were reported to the C.T.A. - considered to be depth 0.00)

Figure 27. Geotechnical survey S03

Figure 28. Geotechnical survey S03

4.2 Analysis and interpretation of field and laboratory work data

In order to specify the **stratification of the land and determine the physical and mechanical parameters**, two geotechnical drillings were carried out on the site with disturbed and undisturbed samples taken at a depth of 7.00 m, marked F01 and F02, and three geotechnical surveys marked S01-S03. The laboratory tests used to determine the geotechnical parameters are:

- Determination of granulosity:
  - granulometric analysis by sieving method;
  - granulometric analysis by sedimentation method.
- Humidity determination:
  - successive weighing method.
- Determination of plasticity limits:
  - cup method;
  - earth cylinder method.
- Determining the compressibility of soils through compression-settlement testing;
- Determination of the shear strength of soils by direct shear.

Based on the experimental results presented in the test reports, it was found that the soils fit into the lithological column observed during drilling.

According to the Indicator of Estimate Norms for Earthworks TS/1-93, according to the cohesive characteristics and digging behavior, the land falls into the hard category for manual digging, respectively class I in the case of mechanized excavation.

4.3 Preparation of geological, lithological, geotechnical sections/profiles

Not applicable.

4.4 Tabular and graphical presentation of geotechnical parameters

Following the analysis of the nature of the samples taken and the primary drilling logs drawn up during the geotechnical prospecting drilling, a heterogeneous Myology was identified for the analyzed site, consisting of the following soil layers:

Drilling F01-F02

Under the layer of fills made of construction material debris and topsoil with a thickness varying between 1.00 m-1.30 m, the following stratification was intercepted:

Layer 1: Brownish sandy silty clay with medium plasticity, soft to hard plastic, medium compressibility with intercalations of organic matter with a thickness varying between 2.70m-5.70m;

Item no.	Name	Symbol	MU	Values	
				x_k^{inf}	x_k^{sup}
1	Clay particle size fraction	Cl	%	26.21	28.01
2	Dust particle size fraction	Si	%	50.37	51.60
3	Sand particle size fraction	Sa	%	21.55	22.45
4	Natural moisture	w	%	17.79	21.81
5	Upper plasticity limit	W_L	%	39.64	42.53
6	Lower plasticity limit	W_p	%	18.14	18.93
7	Plasticity index	I_p	%	21.50	23.69
8	Consistency index	I_c	-	0.87	1.02
9	Density	ρ	g/cm^3	1.84	1.88
10	Dry density	ρ_d	g/cm^3	1.51	1.55
11	Porosity	n	%	44.58	46.11
12	Porosity indices	e	-	0.80	0.86
13	Moisture content	S_r	-	0.70	0.71
14	Oedometric modulus	M_{2-3}	kPa	10399	10417
15	Flooded modulus	M_{2-3}	kPa	-	-
16	Specific settlement at 200 kPa	ƐP2	%	3.8	3.8
17	Additional settlement	im_{300}	%	-	-
18	Inflation pressure	p_u	kPa	-	-
19	Internal friction angle	ϕ	o	15.6	15.9
20	Cohesion	C	kPa	29.7	30.4

Layer 2: Medium gravel with coarse sand packed with a thickness of 3.30m;

Item no.	Name	Symbol	MU	Values	
				x_k^{inf}	x_k^{sup}
1	Dust particle size fraction	Si	%	5.63	7.56
2	Sand particle size fraction	Sa	%	22.67	32.36
3	Gravel particle size fraction	Gr	%	62.01	69.77
4	Natural moisture	w	%	4.23	4.94

In the content of the geotechnical project, depending on the designed geotechnical structure and the analyzed limit states, the appropriate characteristic and calculation values of the geotechnical parameters will be determined and used, in accordance with the NP 122:2010 standard, based on the results presented previously.

As a rule, the characteristic values of geotechnical parameters are established for a geological element called a layer, made up of soil belonging to the same geomorphological formation and the same class (according to SR EN 14688-2:2005, SR EN ISO I4688-2:2005/C91:2007), which presents a limited variability of the values of these parameters.

4.5 General and local stability of the ground on site

Field observations show that the site does not present destructive physical-geological phenomena that would endanger its stability. Local stability is ensured, with no active, reactive or stabilized landslides identified. Also, no areas with the potential for morpho-dynamic phenomena have been identified.

4.6 Classification of geotechnical layers

Following the analysis of the land on the site, it can be concluded that the foundation soil consists of:

- **Brownish sandy silty clay with medium plasticity, soft to hard plastic, with medium compressibility** is a good land; it falls into the category of fine soils with IP>20%: sandy clays, silty clays and clays, having e<1.1 and IC>0.75, under conditions of a practically uniform and horizontal stratification;
- **Medium gravel with dense coarse sand** is a good land; it falls into the category of Blocks, boulders and gravel, containing less than 40% sand and less than 30% clay, under conditions of a practically uniform and horizontal stratification (having a slope of less than 10%).

4.7 Indicative recommendations regarding the existing foundation system

According to the design theme received from the beneficiary, a technical expertise of the annexes and the greenhouse located in the courtyard of the Librecht-Filipescu House in Bucharest is planned to be prepared on site.

Following the **S01 survey** conducted, the following conclusions are highlighted:

- The external foundations of the investigated construction are made of concrete and are arranged at a depth of 0.70m from the elevation of the developed land; **they do not exceed the frost depth** according to STAS 6054-77;
- The hydrostatic level was not intercepted;
- The type of existing foundation does not comply with the minimum requirements set out in the current SR EN 1997-1:2004 standards, therefore work is required to increase the foundation depth to a depth of 1.10m in the layer of brown sandy silty clay with medium plasticity, soft to hard plasticity, with medium compressibility**.**

When carrying out the consolidation of existing foundations, the following recommendations will be taken into account:

- The minimum foundation depth will be 1.10m from the level of the developed land;
- When carrying out foundation rehabilitation works, increased attention will be paid to supporting the earth banks according to NP 120-2014 Normative requirements for the design, execution and monitoring of deep excavations in urban areas.
- An increase in the foundation depth will be carried out by means of sub-constructions. The substructure will be carried out starting with the even-numbered sections, having a maximum length of 1.10m, followed by the odd-numbered sections. Due to the risk of water infiltration, all infrastructure works will be adequately waterproofed.
- Increasing the bearing capacity of the foundations by increasing their contact surface with the foundation ground, so that through the rehabilitation of the construction the bearing capacity of the ground beneath the existing foundations can be ensured;

The final solutions regarding the choice of foundation system will be adopted by the specialized designer.

Following the **S02 survey** conducted, the following conclusions are highlighted:

- The exterior foundations of the investigated construction are made of concrete and are arranged at a depth of 1.20m from the elevation of the developed land; they thus exceed the frost depth according to STAS 6054-77;
- The hydrostatic level was not intercepted;
- The building's foundation does not have a waterproofing system;
- The type of existing foundation **complies with the minimum requirements** set out in the current SR EN 1997-1:2004 standards, therefore no work is required to increase the foundation depth.

The final solutions regarding the choice of foundation system will be adopted by the specialized designer.

Following the **S03 survey** conducted, the following conclusions are highlighted:

- The exterior foundations of the investigated construction are made of concrete and are arranged at a depth of **1.10 m** from the elevation of the developed land; they thus exceed the frost depth according to STAS 6054-77;
- The hydrostatic level was not intercepted;
- The building's foundation does not have a waterproofing system;
- The type of existing foundation **complies with the minimum requirements** set out in the current SR EN 1997-1:2004 standards, therefore no work is required to increase the foundation depth.

The final solutions regarding the choice of foundation system will be adopted by the specialized designer.

In the event of changes in the loads at the foundation level, calculations will be made to ensure the bearing capacity of the ground beneath the foundations (GEO condition) and to ensure the resistance of the existing foundations (STR condition). During the building appraisal stage, the information from this study will be taken into account and it will be determined whether intervention at the infrastructure level is required.

4.8 Indicative indication on the need to improve/consolidate the ground

Not applicable.

4.9 Indicative indication on the need to provide complementary, temporary or definitive works regarding groundwater

Not applicable.

4.10 Classification of the work in a specific geotechnical category or of parts of the work in different geotechnical categories

Land classification	Good land	2
Groundwater	No depletion	1
Importance category	Low	2
Neighborhoods	Without risks	1
Design Ground Acceleration a(g)		3
TOTAL		**9**
Geotechnical category		**1**

Geotechnical category 1 includes only small and relatively simple works for which it is possible to assume that the fundamental requirements will be met using comparable experience gained and qualitative geotechnical investigations and for which the risks to property and persons are negligible.

Geotechnical Category 1 methods are sufficient only in field conditions which, based on comparable experience, are recognised as being sufficiently favourable so that usual methods can be used in the design and execution of the works.

5. DEVELOPMENT OF THE LAND MODEL, CONCLUSIONS AND RECOMMENDATIONS

The level of detail of the terrain model depends on the geotechnical category, as follows:

Geotechnical category 1	General structure/stratification of the site terrain, including derived or measured values of geotechnical parameters for each component unit, general hydrogeological conditions
Geotechnical category 2	Detailed structure/stratification of the site, highlighting any local conditions, including derived and measured values of geotechnical parameters processed to establish defining values for the nature and condition of each unit/horizon/layer, general or detailed hydrogeological conditions (depending on the requirements of the investigation topic)
Geotechnical category 3	General and detailed structure/stratification of the site, highlighting any local conditions and variability of the terrain at the site, including derived and measured values of geotechnical parameters processed to establish defining values for the nature and condition of each units/horizon/layer, general or detailed hydrogeological conditions (depending on the requirements of the investigation topic).

5.1 Characteristic parameters of the foundation ground

By correlating the results of in situ and laboratory determinations, the characteristic values (according to SR EN 1997-1:2004 and NP 122-2010) indicated in Table 3 resulted.

<u>Layer 1</u>: Brownish sandy silty clay with medium plasticity, soft to hard plastic, with medium compressibility

Item no.	Name	Symbol	MU	Values	
				x_k^{inf}	x_k^{sup}
1	Plasticity index	I_p	%	21.50	23.69
2	Consistency index	I_c	-	0.87	1.02
3	Density	ρ	g/cm^3	1.84	1.88
4	Dry density	ρ_d	g/cm^3	1.51	1.55
5	Oedometric modulus	M_{2-3}	kPa	10399	10417
6	Specific settlement at 200 kPa	ЄP2	%	3.8	3.8
7	Internal friction angle	ϕ	o	15.6	15.9
8	Cohesion	c	kPa	29.7	30.4

Table 3. Characteristic values of the main geotechnical parameters for a synthetic calculation stratification

5.2 Construction and systematization recommendations for the ground

Construction elements located below the level of the developed land will be waterproofed in accordance with the requirements imposed on spaces located below this level, in compliance with the NP 040/2002 regulation - Regulation on the design, execution and operation of building waterproofing.

Excavations with a height of H < 3.00m will be carried out according to Normative C169/88. Excavation with slope walls can be carried out in any type of terrain, subject to the following:

- the excavation should not remain open for a long time;
- the tangent of the angle of inclination to the horizontal formed between the height and width of the excavation should not exceed the following values:
    - o fillers - tg β = h/b = 1/1.25
    - o clayey sand - tg β = h/b = 1/0.67
    - o sandy clay - tg β = h/b = 1/0,67
    - o clay - tg β = h/b = 1/0.50
    - o loess - tg β = h/b = 1/0.50

Excavations with a height of H> 3.00m will be carried out in compliance with the provisions of the NP 120-2014 Normative on the requirements for the design, execution and monitoring of deep excavations in urban areas.

In the case of land sensitive to water action, the foundation excavation will stop at a level higher than the elevation provided for in the project, as follows:

- for fine sands 0.20...0.30 m;
- for clay soils 0.15...0.25 m;
- for soils sensitive to moisture 0.40...0.50 m.

The fillings will be made with sorted, certified soil, preferably clay-clay dust (local material) arranged in elementary layers of 20 cm, which will be mechanically compacted with slight slopes towards the outside of the construction. Before putting the soil used for fillings into use, its optimal compaction humidity will be determined according to STAS 1913/13-83. Compaction will be considered completed upon reaching an average compaction degree of 92% according to Normative C 56/02.

During the execution period and during the exploitation of the constructions, specific measures will be adopted to **protect the land against wetting**, thus:

- **Vertical and plan systematization** of the site to ensure the rapid collection and evacuation of rainwater to an outlet, by providing slopes of at least 2%; the systematization necessary for the execution works will be carried out initially, with the other systematization works to be completed once the facility is put into operation; in the case of construction platforms on land with slopes greater than 1:5, protection measures will be provided against water flowing from the slopes, through guard ditches whose section will ensure the maximum flow of rainwater; construction platforms located on slopes will be leveled into terraces with slopes of maximum 1:1, which will be protected by various technological solutions (furrows, grassing, coverings made of local materials, geosynthetics, etc.);
- **Rapid collection and evacuation of precipitation water** throughout the duration of the excavation through appropriate arrangements (slopes, wells, pumping installations, etc.); if a layer of soil affected by precipitation is found at the foundation level, it will be removed immediately before pouring the concrete;
- **Avoiding water stagnation around the constructions,** both during the execution period and throughout the exploitation period, by arranging appropriate works (appropriate slopes, gutters). Special attention will be paid to the joint between the sidewalk and the building, which will be sealed with bituminous mastic and efforts will be made to maintain this tightness throughout the entire operational life of the construction.

5.3 Assessment of bearing capacity

To establish the admissible values of structural deformations and foundation displacements, the provisions of NP 112/2014 and those of Annex H of SREN 1997-1:2004 and, where applicable, the associated national annexes will be taken into account.

The calculation at the serviceability limit state is performed, as appropriate, for the actions or combinations of actions in the characteristic, quasi-permanent and frequent groups, defined according to SR EN 1997:2004 (partial resistance coefficients for geotechnical parameters have the unitary value ($\gamma M=1.0$).

The serviceability limit state check must aim to meet two conditions:

- the calculated possible displacements or deformations must be lower than the permissible limit values of foundation displacements and structural deformations established by the design;
- verification of the criterion regarding the limitation of loads transmitted to the ground, $p_{ef,\max} \le p_{pl}$ - for centrically loaded foundations, and for eccentrically loaded foundations $p_{ef,\max} \le p_{pl}, p_{ef,\max} \le 1.2 p_{pl}, p_{ef,\max} \le 1.4 p_{pl}$.

pef, max - is the average effective pressure at the base of the foundation, calculated for the groups of actions (effects of actions) defined according to CR 0, as appropriate (characteristic, frequent, quasi-permanent);

ppl - is the plastic pressure, which represents the limit calculation value of the pressure for which plastic zones of limited extension appear in the soil.

In correlation with the provisions contained in NP 112/2014 and SR EN 1997-1:2004, values of the bearing capacities of the foundation soil (plastic and critical pressures) were estimated at different depths, considering a foundation footing width B=1.00 m.

Foundation depth relative to C.T.N.	**Ppl**	**Per**	**Land stratification**
[m]	[kPa]	[kPa]	
-1.10	178	254	Brownish sandy silty clay with medium plasticity, soft to hard plastic, with medium compressibility
-1.20	196	288	

Table 4. Estimating the bearing capacity of the ground

6. TECHNICAL REFERENCE REGULATIONS

The following standards and regulations in force were the basis for the investigations carried out in the field and in the laboratory and the interpretation of the data obtained with their help:

1. The foundation soil investigation was carried out in accordance with the requirements of the following standards:

Geotechnical research through drilling in the ground	STAS 1242/4-85
Foundation land. Open-ended survey research	STAS 1242/3-88
Eurocode 7: Geotechnical design Part 1: General rules	SR EN 1997-1:2004
Eurocode 7: Geotechnical design. Part 1: General rules.	SR EN 1997-I:2004/NB:2016
National annex	
Eurocode 7: Geotechnical design Part 1: General rules	SR EN 1997-1:2004/AC:2009
Eurocode 7: Geotechnical design. Part 2: Investigation and land testing. National annex	SR EN 1997-2:2007/NB:2009
Eurocode 7: Geotechnical design. Part 2: Investigation and land testing.	SREN 1997-2:2007
Eurocode 7: Geotechnical design. Part 2: Investigation and land testing.	SR EN 1997-2/AC:20l0
Geotechnical investigations and tests. Groundwater sampling and measurement methods. Part I: Technical principles for execution	SR EN ISO 22475-1:2021
Geotechnical investigations and tests. Groundwater sampling and measurement methods. Part 2: Qualification criteria for companies and personnel	SR CBN ISO/TS 22475-2:2009

Geotechnical investigations and tests. Groundwater sampling and measurement methods. Part 3: Third-party assessment of compliance of companies and personnel	SR CEN ISO/TS 22475-3:2009
Geotechnical research and testing. Field testing. Part 2: dynamic penetration test	SR EN ISO 22476-2/2006/AI:2012
Geotechnical research and testing. Field testing. Part 2: standard penetration test	SR EN ISO 22476-3/2006/A1:2012
Geotechnical investigation and testing. Field testing. Part 12: Static cone penetration mechanical test (CPTM)	SR EN ISO 22476-12/2009
Geotechnical research and testing. Identification and classification of lands. Part 1: Identification and description	SREN ISO 14688-1:2018
Geotechnical research and testing. Identification and classification of lands. Part 2: Principles for a classification	SR EN ISO 14688-2:2018
Geotechnical research and testing. Identification and classification of lands. Part 2: Principles for a classification	SREN ISO 14688-2:2005/C91:2007

2. Laboratory determinations were performed according to the following standards:

Granulometric composition	SR EN ISO 17892-4:2017
Plasticity limits	SR EN ISO 17892-12:2018
Determining soil density	SR EN ISO 17892-5:2017
Humidity determination	SR EN ISO 17892-1:2015
step load test in oedometer	SR EN ISO 17892-5:2017
Determination of the physical and mechanical characteristics of soils with large swelling and shrinkage.	STAS 1913/12-88
direct shear tests	SR EN ISO 17892-10:2019
Eurocode 7 - Geotechnical design — Part 2 Design assisted by laboratory testing	DDENV 1997-2:2000

3. The analysis, processing and interpretation of the results was carried out in accordance with the following standards and regulations:

Normative on the design of direct foundation structures	NP 112-2014
Regulations regarding the foundation of buildings on soils sensitive to moisture	NP 125-2010
Regulations regarding the foundation of buildings on soils with high swelling and shrinkage	NP 126-2010
Seismic design code - Part I - Design provisions for buildings	P100-1/2013 (amended and supplemented by order 2956/2019)
Maximum freezing depths. Zoning of the territory of Romania	STAS 6054-77
Design and execution code for buildings founded on soils with high swelling and shrinkage (PUCM)	NE 0001-96
Seismic zoning. Macrozonation of the territory of Romania	SR 11100/1-2006
Execution of special geotechnical works. Drilled piles	SR EN 1536-2015
Norm regarding geotechnical documentation for constructions	NP 074 - 2022
Engineering geology-vol. I	Ion Bancila et. al., Technical Publishing House, 1980
Foundation	Anghel Stanciu, Technical Publishing House, 2006
Eurocode 7 - Part 1: Geotechnical design - General rules	DDENV 1997-1:1995

Cone Penetration Testing in Geotechnical Practice	T. Lunne, P.K.Robertson and J.J.M.Powell, Taylor & Francis, 1997
Geology of Romania	Mutihac, V., Ionesi, L., Technical Publishing House., Bucharest, 1974
Geological map 1:200 000	IGR

During the execution of the works, it is necessary to carry out, based on a technical assistance contract, geotechnical monitoring of the execution, through which, if necessary, the execution details can be adapted depending on the geotechnical conditions encountered and the behavior of the works during the construction phase.

The provisions of the labor protection norms in force will also be respected, especially those of the "Regulation on labor protection and hygiene in construction" approved by the MLPAT with order 9/N/15 March 1993.

The presence of the geotechnical designer will be requested in the following cases:

- if unforeseen situations arise in this study;
- after the execution of excavations for the various types of works in order to certify the quality of the foundation layer.

Elaborated,
eng. Voicu Eduard-Gabriel
S.C. INFRATECH CONSTRUCT S.R.L. IASI
Official stamp
Illegible signature

Technical verifier, Af requirement:
Official stamp
Illegible signature

Geotechnical study: "SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, NOW UNIVERSITY HOUSE (HISTORICAL MONUMENT LMI B-II-M-A-19107 CODE)"

Drilling sheet F01

Sediu Social: Municipiul Iași, Calea CHIȘINĂULUI, Nr. 29, nr. cadastral 3861/208/4-C1, et.1, Județ Iași CUI RO39194450 J22/937/2018 Tel: 0730495980 Email: infratech.construct@gmail.com

Studiu geotehnic: „SERVICII DE ÎNTOCMIRE EXPERTIZĂ TEHNICĂ A ANEXELOR ȘI A SEREI AMPLASATE ÎN CURTEA CASEI LIBRECHT - FILIPESCU, AZI CASA UNIVERSITARILOR (MONUMENT ISTORIC COD LMI B-II-M-A-19107)"
Fișa Forajului F01

Beneficiar: UNIVERSITATEA BUCUREȘTI

COTA ABSOLUTA / RELATIVA	ADÂNCIMEA	GROSIMEA	COLOANĂ LITOLOGIC	N.H. - Apa subterană	DESCRIEREA STRATULUI	PROBA □ Tulburate ■ Stut ■ Monolit: NUMĂR PROBĂ (TULBURATĂ / NETULBURATĂ)	CLASA PROBEI	ADÂNCIME	GRANULOZITATE: DISTRIBUȚIE PROCENTUALĂ: Argilă	Praf	Nisip	Pietriș	Bolovăniș	$C_u = d_{60} / d_{10}$	W	W_L	W_P	I_P	I_C	ρ	ρ_d	n	e	S_r	U_L	COMPRESIBILITATE: E_{oed} 200-300 natural	E_{oed} 200-300 inundat	ε_{200}	I_{m300}	P_s	REZISTENȚĂ LA FORFECARE: Tip încercare	Φ'	c'	Φ_{CU}	C_{CU}	Φ_{UU}	C_{UU}	SPT: N	OBSERVAȚII
m	m	m	-	m		-	-	m	Argilă	Praf	Nisip	Pietriș	Bolovăniș	-	%	%	%	%	-	g/cm³	g/cm³	%	-	-	%	kPa	kPa	%	%	kPa		°	kPa				lov.	
	-1.00	1.00			Umpluturi din resturi de materiale de construcții și sol vegetal																																			
	-3.70	2.70			Argilă prăfoasă nisipoasă maronie cu plasticitate medie, plastic vârtoasă spre tare, cu compresibilitate medie	1	1	2.00	26.70	50.85	22.45				20.89	41.35	18.89	22.46	0.91	1.88	1.55	44.58	0.80	0.71		10399.0		3.8			CU	15.6	30.4						
	-7.00	3.30			Pietriș mediu cu nisip mare îndesat	2	3	5.00		7.56	22.67	69.77			4.94																									
						3	3	7.00		5.63	32.36	62.01			4.23																								
					Oprit foraj																																		

Sondor șef: ing. Sofron Ștefan-Dan
Data începerii sondajului: 14.10.2024
Data terminării sondajului: 14.10.2024

Întocmit, ing. Vouciac Constantin

F01

Geotechnical study: "SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, NOW UNIVERSITY HOUSE (HISTORICAL MONUMENT LMI B-II-M-A-19107 CODE)"

Drilling sheet F02

Sediu Social: Municipiul Iași, Calea CHIȘINĂULUI, Nr. 29, nr. cadastral 3861/208/4-C1, et.1, Județ Iași CUI RO39194450 J22/937/2018 Tel: 0730495980 Email: infratech.construct@gmail.com

Studiu geotehnic: „SERVICII DE ÎNTOCMIRE EXPERTIZĂ TEHNICĂ A ANEXELOR ȘI A SEREI AMPLASATE ÎN CURTEA CASEI LIBRECHT - FILIPESCU, AZI CASA UNIVERSITARILOR (MONUMENT ISTORIC COD LMI B-II-M-A-19107)"
Fișa Forajului F02

Beneficiar: UNIVERSITATEA BUCUREȘTI

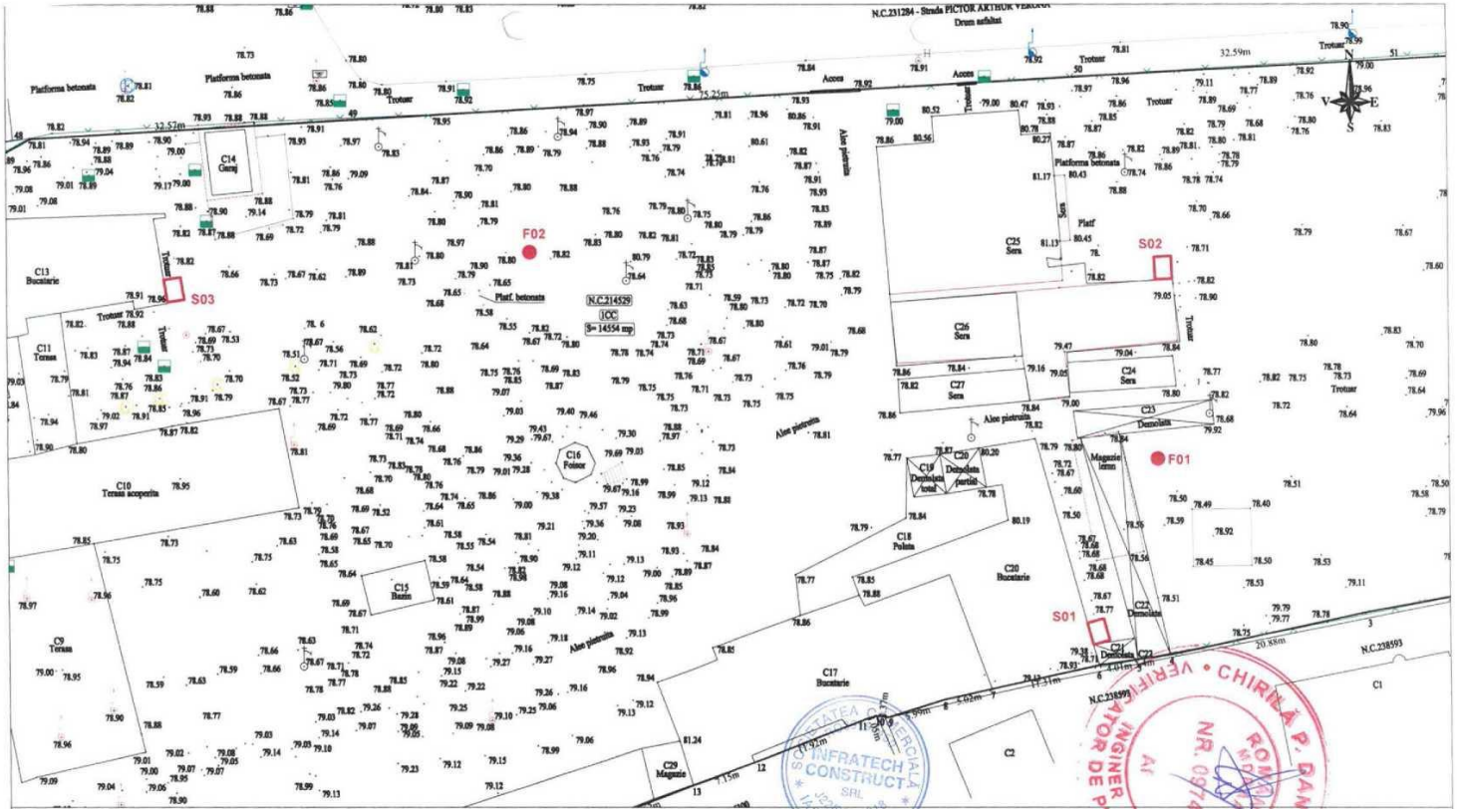
COTA ABSOLUTĂ / RELATIVĂ	ADÂNCIMEA	GROSIMEA	COLOANĂ LITOLOGIC	N.H. - Apa subterană	DESCRIEREA STRATULUI	PROBA (□Tulburate ▣Stut ▣Monolit)			GRANULOZITATE						W	W_L	W_P	I_P	I_C	ρ	ρ_d	n	e	S_r	U_L	COMPRESIBILITATE					REZISTENȚĂ LA FORFECARE			SPT	OBSERVAȚII
						NUMĂR PROBĂ (TULBURATĂ / NETULBURATĂ)	CLASA PROBEI	ADÂNCIME	DISTRIBUȚIE PROCENTUALĂ					$C_u = d_{60}/d_{10}$												$E_{ed\ 200-300}$ natural	$E_{ed\ 200-300}$ inundat	ε_{200}	I_{m300}	p_s	Tip încercare	Φ'	c'	N	
									Argilă	Praf	Nisip	Pietriș	Bolovăniș																		Φ_{CU}	C_{CU}		
																															Φ_{UU}	C_{UU}		
m	m	m	-	m		-	-	m						-	%	%	%	%	-	g/cm³	g/cm³	%	-	-	%	kPa	kPa	%	%	kPa		°	kPa	lov.	
	-1.10	1.10			Umpluturi din resturi de materiale de construcții și sol vegetal																														
						1 ☒	1	2.00	27.51	50.94	21.55				21.81	42.53	18.84	23.69	0.87	1.84	1.51	46.11	0.86	0.70		10417.0		3.8			CU	15.9	29.7		
					Argilă prăfoasă nisipoasă maronie cu plasticitate medie, plastic vârtoasă spre tare, cu compresibilitate medie cu intercalații de materie organică	2 □	3	5.00	26.21	51.60	22.19				21.08	41.83	18.93	22.90	0.91																	
		5.90																																	
	-7.00					3 □	3	7.00	28.01	50.37	21.62				17.79	39.64	18.14	21.50	1.02																
					Oprit foraj																														

LABORATOR DE ANALIZE ȘI ÎNCERCĂRI IN ACTIVITATEA DE CONSTRUCȚII S.C. INFRATECH CONSTRUCT S.R.L. RO39194450 AUTORIZAȚIE nr. 3815 din 07.03.2023

Sondor șef: ing. Sofron Ștefan-Dan
Data începerii sondajului: 14.10.2024
Data terminării sondajului: 14.10.2024

Întocmit, ing. Vovinic Constantin

F02



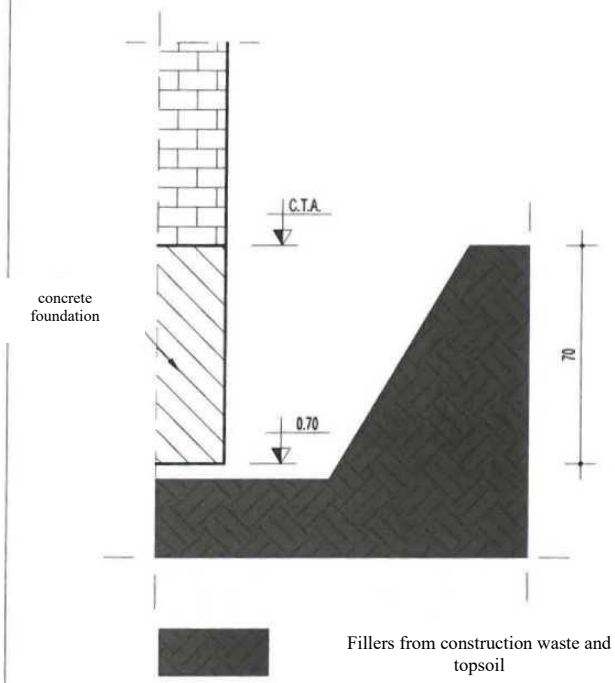
GENERAL DESIGNER: S.C. GEOSTRUCT' S.R.L.

Official stamp
Illegible signature

	S.C. INFRATECH CONSTRUCT s.r.l Registered office: Iasi municipality, Calea Chisinauului, No. 29 CUI (Sole Registration Number): RO39194450 J22/937/2018, Phone: 0730495980 Email: infratech.construct@gmail.com		VERIFIER	NAME	SIGNATURE	REQUEST	Af
			VERIFICATION REPORT / TECHNICAL EXPERTISE REPORT, (title, number, date)				
			Beneficiary: BUCHAREST UNIVERSITY				PROJECT 1534/2024

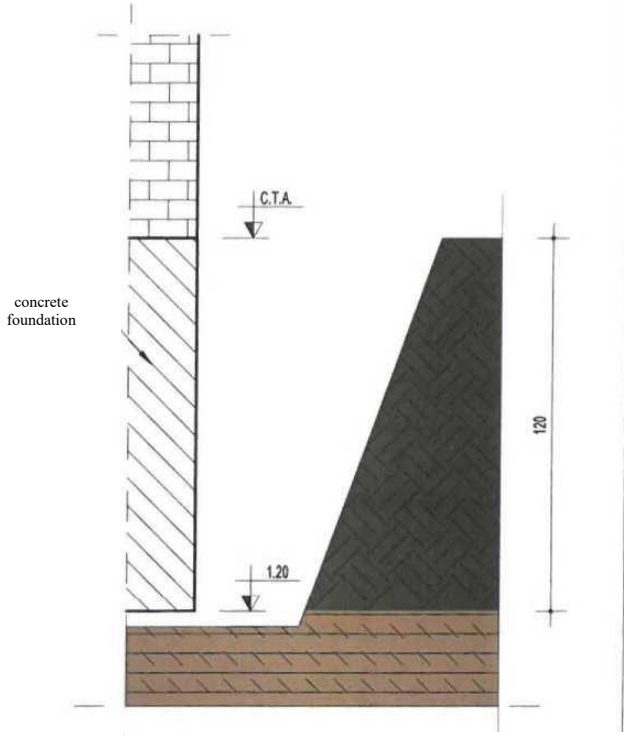
SPECIFICATION	NAME	SIGNATURE	SCALE 1:500	project name: SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, NOW UNIVERSITY HOUSE (HISTORICAL MONUMENT LMI B-II-M-A-19107 CODE) address: BUCHAREST MUNICIPALLITY, DISTRICT 2, DIONISIE LUPU STREET, NO. 46, CADASTRAL NUMBER 214529	PHASE SG
PROJECT MANAGER	eng. Sofron Stefan	*Illegible signature*			
DESIGNED	eng. Eduard Voicu	*Illegible signature*	DATE 2024	drawing name: GEOTECHNICAL INVESTIGATION LOCATION PLAN	DRAWING P1
DRAWN	eng. Eduard Voicu	*Illegible signature*			

GEOTECHNICAL SURVEY S01
Scale 1:20



Fillers from construction waste and topsoil

GEOTECHNICAL SURVEY S02
Scale 1:20



Fillers from construction waste and topsoil

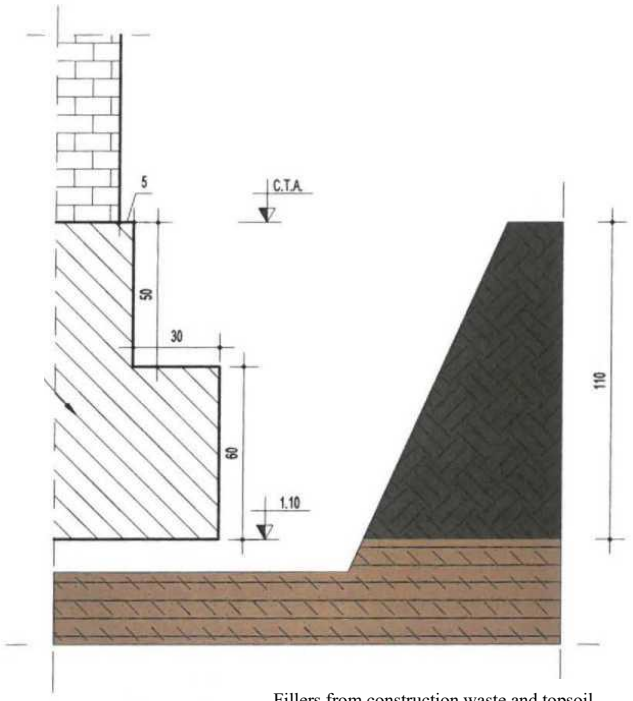
Dusty, sandy, brownish clay, with medium plasticity, soft to hard plastic, with medium compressibility with intercalations of organic matter

GENERAL DESIGNER: S.C. GEOSTRUCT' S.R.L.

Official stamp
Illegible signature

	S.C. INFRATECH CONSTRUCT s.r.l Registered office: Iasi municipality, Calea Chisinaului, No. 29 CUI (Sole Registration Number): RO39194450 J22/937/2018, Phone: 0730495980 Email: infratech.construct@gmail.com			VERIFIER | NAME | SIGNATURE | REQUEST | Af VERIFICATION REPORT / TECHNICAL EXPERTISE REPORT, (title, number, date)	
				Beneficiary: BUCHAREST UNIVERSITY	PROJECT 1534/2024
SPECIFICATION	NAME	SIGNATURE	SCALE 1:20	project name: SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, NOW UNIVERSITY HOUSE (HISTORICAL MONUMENT LMI B-II-M-A-19107 CODE) address: BUCHAREST MUNICIPALLITY, DISTRICT 2, DIONISIE LUPU STREET, NO. 46, CADASTRAL NUMBER 214529	PHASE SG
PROJECT MANAGER	eng. Sofron Stefan	*Illegible signature*			
DESIGNED	eng. Eduard Voicu	*Illegible signature*	DATE 2024	drawing name: S01 AND S02 GEOTECHNICAL SURVEYS DETAIL	DRAWING P2
DRAWN	eng. Eduard Voicu	*Illegible signature*			

GEOTECHNICAL SURVEY S03
Scale 1:20



concrete foundation

Fillers from construction waste and topsoil

Dusty, sandy, brownish clay, with medium plasticity, soft to hard plastic, with medium compressibility with intercalations of organic matter

GENERAL DESIGNER: S.C. GEOSTRUCT' S.R.L.

Official stamp
Illegible signature

<table>
<tr><td colspan="2"></td><td colspan="2">S.C. INFRATECH CONSTRUCT s.r.l
Registered office: Iasi municipality, Calea Chisinaului, No. 29
CUI (Sole Registration Number): RO39194450
J22/937/2018,
Phone: 0730495980 Email: infratech.construct@gmail.com</td><td></td><td colspan="3">VERIFIER | NAME | SIGNATURE | REQUEST | Af
VERIFICATION REPORT / TECHNICAL EXPERTISE REPORT, (title, number, date)
Beneficiary:
BUCHAREST UNIVERSITY</td><td>PROJECT
1534/2024</td></tr>
<tr><td>SPECIFICATION</td><td colspan="2">NAME</td><td>SIGNATURE</td><td rowspan="2">SCALE
1:20</td><td colspan="2" rowspan="2">project name: SERVICES FOR PREPARING A TECHNICAL EXPERTISE OF THE ANNEXES AND THE GREENHOUSE LOCATED IN THE COURTYARD OF THE LIBRECHT - FILIPESCU HOUSE, NOW UNIVERSITY HOUSE (HISTORICAL MONUMENT LMI B-II-M-A-19107 CODE)
address: BUCHAREST MUNICIPALLITY, DISTRICT 2, DIONISIE LUPU STREET, NO. 46, CADASTRAL NUMBER 214529</td><td rowspan="2">PHASE
SG</td></tr>
<tr><td>PROJECT MANAGER</td><td colspan="2">eng. Sofron Stefan</td><td>Illegible signature</td></tr>
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2024</td><td colspan="2" rowspan="2">drawing name:
S03 GEOTECHNICAL SURVEY DETAIL</td><td rowspan="2">DRAWING
P3</td></tr>
<tr><td>DRAWN</td><td colspan="2">eng. Eduard Voicu</td><td>Illegible signature</td></tr>
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