ISSN NO: 2771-8840
Date of Publication: 06-05-2023

Design of Foundations in Extremely Solid Soils.

Makhsimov Qosimkhon Ibayevich
E-mail: mahsimovkosimhon@gmail.com
Ferghana Polytechnic Institute
DSc, prof. of the department of "English Linguistics", NUUz

Annotation: this article provides information on the design of foundations in highly sedimentable soils, the characteristics of extreme subsidence of soils, and the problems of determining the condition of soils in terms of subsidence.

Keywords: soils, foundations, loess, loamy soils, ground, sedimentary, construction, layer, strength.

Introduction.

Designing structures on subsiding soils and ensuring their durability is considered one of the most complex problems in modern construction, as construction work on subsiding soils is increasing year by year. [1,2]

A significant part of the inhabited districts of our republic consists of loess and loamy soils, alluvial soils. [3,4] The depth of the sinking ground layer is 25-30 m. reaching up to causes the deformation process to continue complicatedly and is characterized by having a high index of compressibility.

Due to the complexity of the problem of construction on sinking loess soils, the problems of laying foundations on such soils began to be solved at the end of the 20s. [5,6,7]

Simultaneously with theoretical researches, experimental work and tests were widely used to solve the problems of construction on subsiding soils.

Additional settlement due to its specific weight or external forces acting through the foundation and increased moisture is the main characteristic of subsiding soils.

Sedimentary soils include loess, loamy supes, loamy and silty soils. [8,9]

Lesser soils, the main representative of sedimentary soils, occupy a large area of our country, in particular, the Central Fergana districts, the western regions of our country. [1,11,12]

In its natural state, the sedimentary loess soil is in an uncompacted state, and it maintains this state until it is affected by an external force or until its specific gravity increases due to moisture.

Insufficient compaction of soils is caused by their relatively low density: bulk density 1.2-1.5 t/m3, porosity 0.6-0.45; porosity coefficient 0.65-1.2. density increases with increasing depth.

In addition to the non-compaction index, sedimentary soils are distinguished by their natural low moisture content, clay content and high strength structure. In our dry-hot climatic nature, humidity is 0.04-0.12 percent, and humidity level is 0.1-0.3.

Sedimentation of soils is a complex physico-chemical process. As a result of this process, soil particles change from one state to another, and as a result of densification, porosity decreases and strength increases [13,14,15].

The continuation of deformation in sedimentary soils over time depends on its moisture status. Deformation lasts for a long time in soil saturated with water.

Result And Discussion.

Super-sedimentation properties of soils.

One of the most important problems is to take into account the laws and features of subsidence deformation in the design and surveying of bases and foundations in subsiding soils. Therefore, when determining the physico-mechanical properties of soils, it is necessary to check them in their natural moisture and water-saturated condition. [16,17,18]

In addition to the engineering-geological research conducted for ordinary soils at the construction site, the following should be determined: [19]

- Size of sedimentary layer;

ISSN NO: 2771-8840
Date of Publication: 06-05-2023

- the sedimentation property of soils in the researched area and the value of sedimentation due to the effect of specific gravity;

- Relative Swelling under normal pressure;

- to determine the value of the initial subsidence pressure at 1=2 m intervals and to determine the initial subsidence pressure of each lithological layer;

- Determination of initial deposition moisture for each lithological layer;

- Deformation modulus of soils Yeye - for natural moisture condition and Yev - for water-saturated conditions;

- The degree of change in soil compaction;

- Indicators of strength of sinking soils (relative grip strength and angle of internal friction) [20,21,22].

When conducting engineering-geological research, it is necessary to install wells and wells on the construction site itself, and take soil samples from places with maximum and minimum sedimentation properties.

To ensure that Relative Slump and Initial Slump Pressure can be found with high accuracy by testing on compression tools.

One of the most important issues of engineering-geological research in the areas where sedimentary soils are located is to determine the condition of soils in terms of sedimentation, and the following problems are solved: [23]

a) engineer-geological analysis of the site and local construction experience;

b) Sedimentation of soils based on laboratory experiments;

c) flooding of experimental trenches.

The following are analyzed at the same time during the initial point check: [24,25]

- geographical location and climatic conditions of the researched area;

- Examination of the structure of the earth, the possibility of formation of suffocates;

- lithological structure and genesis of the studied layer;

- soil composition, density level, humidity and the amount of quickly soluble salts along the depth;

- Information on operation, deformations in existing buildings, soil subsidence due to specific gravity, causes of dampness, etc.

On the basis of the above-mentioned information, the necessary characteristics of soils - subsidence from specific gravity, categories of soil subsidence, the volume of laboratory experiments are determined.

One of the most important ways to determine the condition of sinking soils is the method of flooding experimental trenches. [26,27,28]

1. For the design of floors and foundations, the physical and mechanical properties of the soil are determined for its natural and wet conditions. Soil specific gravity (ɤ), density (q), moisture (w), porosity (P), porosity coefficient (ε), internal angular resistance (φ), specific viscosity (s), shrinkage modulus (Indicators such as E) are among them.

2. In addition, indicators specific to the settling soil, i.e. the initial settlement pressure of the soil (Rse), initial settlement moisture (Wse), relative settlement coefficient (Ese) and the coefficient of variation of soil compaction (a) is determined.

3. It can be divided into 2 types according to the determined parameters of the soil.

Type 1. The value of the additional subsidence when the soil is moistened due to the external force and specific gravity does not exceed 5 cm.

Type II. The value of the additional subsidence when the soil is moistened due to the external force and specific gravity is more than 5 cm.

Floors and foundations can be calculated according to I and II - limit states. The calculation of the II limit state of the soil can be used mainly in seismic regions [29,30].

The calculation of soil II - limit state in all conditions is as follows:

1. Based on initial data (ground properties, building project), the type of building foundation and its main dimensions are determined in a simple manner.

2. The total value of foundation settlement (S) is determined and the corresponding condition S < [S]rux is checked [31].

Total foundation settlement:

ISSN NO: 2771-8840
Date of Publication: 06-05-2023

$$S = \bar{S} + Ssi$$

here:

$\bar{S}$- foundation subsidence resulting from soil compaction.

Conclusion.

In short, the measurement of the experimental trenches should be at least 15 m, or should not be less than the thickness of the sedimentary layer. The depth should be up to 0.4-1 m after the soil surface is cleared of vegetation. It is advisable to mark trenches in non-building areas. It is recommended to lay sand or gravel in a thickness of 6-10 cm in order to prevent siltation of the bottom of the trench.

To determine the amount of subsidence in the trench, depth measuring beacons are installed at the bottom of the trench and outside the trench up to a distance of (1.5 - 2) m. Surface beacons are installed at intervals of 2-4 m, depth beacons at intervals of 2-3 m. In addition, support signs are installed every 1-2 m.

When pouring water into the trench, it is necessary to burn water taking into account the fact that the sedimentary layer is completely saturated with water. Determination of the amount of water absorption during wetting and leveling of surface lighthouses is carried out in 5-7 days.

References

1. Ibayevich M. K. В ГОРИЗОНТАЛЬНО ЗАГРУЖЕНЫЕ СВАИ В ЗАСОЛЕННЫХ ГРУНТАХ //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1085-1092.
2. Ibayevich M. K., Qizi E. M. A. Preparation of Maps for Tourist and Recreational Purposes Based on GIS Technologies //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 10. – С. 296-302.
3. Ibayevich M. Q. Свайные Фундаменты Сельскохозяйственных Зданий На Засоленных Грунтах //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 10. – С. 290-295.
4. Arabboyevna A. M. et al. CREATION OF A SATELLITE GEODESIC BASE ON THE TERRITORY OF THE REPUBLIC OF UZBEKISTAN //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1033-1039.
5. Kamariddinovich O. R. et al. IMPROVING METHODS FOR MAPPING IRRIGATION NETWORKS USING GIS TECHNOLOGIES //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 4. – С. 691-699.
6. Musimovich S. M. et al. THEORETICAL AND PRACTICAL ISSUES IN CREATING POPULATION EMPLOYMENT MAPS USING GIS SOFTWARE //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1060-1068.
7. Abdurakhmanov A. A., Mirzaakhmedov S. S. H. DEVELOPMENT OF MECHANISM FOR CARTOGRAPHIC SUPPORT OF REGIONAL DEVELOPMENT //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1110-1118.
8. Abduvakhabovich A. A., Shavkat o‘g‘li S. Y. IMPROVING THE METHOD OF MAPPING AGRICULTURE USING REMOTE SENSING DATA //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1093-1100.
9. Abboskhonovich M. A. et al. PROCESSES OF INTRODUCING THE DIGITAL ECONOMY ON IRRIGATED LAND //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1126-1131.
10. Valievich M. X., Bakhodirjon o’g’li M. B. LARGE-SCALE ENGINEERING AND TOPOGRAPHIC PLANS //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1119-1125.
11. Yusufovich G. Y., Shavkat o‘g‘li S. Y. CARTOGRAPHIC RESOURCES USED IN THE CREATION OF ELECTRONIC AGRICULTURAL MAPS OF FERGANA REGION //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1001-1009.

ISSN NO: 2771-8840
Date of Publication: 06-05-2023

12. Abduvakhabovich A. A., Shavkat o‘g‘li S. Y. IMPROVING THE METHOD OF MAPPING AGRICULTURE USING REMOTE SENSING DATA //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1093-1100.
13. Ganiyev Y. Y., Qosimov L. M., Murodilov K. T. CREATING AGRICULTURAL MAPS USING GEO-INFORMATION SYSTEMS AS AN EXAMPLE OF BANDIKHAN DISTRICT //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1132-1140.
14. Akhmedov B. M. GEODETIC SURVEY NETWORKS (CREATING LEVEL-HEIGHT GEODETIC SURVEY NETWORKS IN ENGINEERING-GEODETIC RESEARCH FOR CONSTRUCTION) //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1040-1052.
15. Турдикулов Х. Х. РАСЧЕТ НАПРЯЖЕННОГО СОСТОЯНИЯ ГРУНТОВЫХ ГИДРОТЕХНИЧЕСКИХ СООРУЖЕНИЙ ПРИ ОСОБЫХ НАГРУЗКАХ С УЧЁТОМ ДАННЫХ НАТУРНЫХ НАБЛЮДЕНИЙ //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – Т. 11. – №. 3. – С. 1069-1078.
16. Kasimov L. M., Ganiev Y. The Essence of Using Electronic Tachometers and GPS (Global Navigation System) in Monitoring Areas //Eurasian Research Bulletin. – 2022. – Т. 15. – С. 48-51.
17. Khakimova K., Yokubov S. CREATION OF AGRICULTURAL ELECTRONIC MAPS USING GEOINNOVATION METHODS AND TECHNOLOGIES //Science and innovation. – 2023. – Т. 2. – №. D1. – С. 64-71.
18. Mamatqulov O., Qobilov S., Yokubov S. CULTIVATION OF MEDICINAL SAFFRON PLANT IN THE SOIL COVER OF FERGANA REGION //Science and Innovation. – 2022. – Т. 1. – №. 7. – С. 240-244.
19. Abdukadirova M. A., Mirzakarimova G. M. The importance of installation of base gps stations in permanent activity in Fergana region //Asian Journal of Multidimensional Research. – 2021. – Т. 10. – №. 9. – С. 483-488.
20. Arabboyevna A. M. Biological Activity of Typical Irrigated Gray Soils //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 285-289.
21. Axmedov B. M. et al. Knauf Insulation is Effective Isolation //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 298-302.
22. Marupov A. A., Ahmedov B. M. General Characteristics of Zones with Special Conditions of use of the Territory //Middle European Scientific Bulletin. – 2021. – Т. 18. – С. 446-451.
23. Khakimova K. R., Holmatova D. B., Abdusalomov A. A. Basics of atlas mapping optimization in the ferghana region //ACADEMICIA: An International Multidisciplinary Research Journal. – 2020. – Т. 10. – №. 5. – С. 613-617.
24. Abduvaxobovich A. A. Methods of Improving Physical and Mechanical Properties of Light Concrete on the Basis of Chemical Additives //Texas Journal of Multidisciplinary Studies. – 2022. – Т. 8. – С. 165-167.
25. Abbosxonovich M. A., Abduvaxobovich A. A. Measures for the Protection of the Historical and Cultural Heritage of Fergana and the Mode of Monitoring of Cultures with the Help of Geoinformation Systems //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 342-348.
26. Yusufovich G. Y. et al. Formation of a Personal Database of Data in the Creation of Soil Science Cards in GIS Programs //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 303-311.
27. Valievich M. H. Measurement Of Sediments Of Industrial And Civil Buildings And Structures By High-Precision And Accurate Levelling Of Short Rays //The American Journal of Engineering and Technology. – 2021. – Т. 3. – №. 05. – С. 65-71.
28. Мадумаров Б. Б., Манопов Х. В. НАЧАЛО РАБОТЫ С ARCGIS. ARCMAP //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 325-333.

ISSN NO: 2771-8840
Date of Publication: 06-05-2023

29. Khakimova K. R. et al. THEORETICAL AND METHODOLOGICAL QUESTIONS OF MAPPING THE ENVIRONMENTAL ATLAS //Galaxy International Interdisciplinary Research Journal. – 2022. – Т. 10. – №. 4. – С. 240-245.
30. ABBOSXONOVICH M. A. MONITORING OF SOILS OF LINEAR PROTECTED ZONES, THEIR ASSESSMENT AND EFFECTIVE USE //Global Book Publishing Services. – 2022. – С. 01-145.
31. Abbosxonovich M. A. et al. Designing and Drawing up Employment Maps the Example of the City of Kokand //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 11. – С. 79-83.