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CONSTRUCTION OF GROUNDS AND FOUNDATIONS ON BULK SOIL

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Abstract
This article describes the characteristics of cast-in-place soils, their storage time and variation depending on the conditions of origin, the organization of ground and foundation construction, the work done to strengthen the foundation soil or build pile foundations.

Keywords: Bulk soil, types, properties, physical, chemical and biological processes, foundation, soil, soil compaction, compaction technology, vibratory compaction, batch and cast piles.

Introduction

Due to the ongoing reforms in our country, great changes are taking place in the construction industry. At the same time, the number of construction sites is growing day by day and has not decreased. With this in mind, work is underway to study and implement new technologies and materials in the construction industry. One of the most pressing issues is the production of structures with the addition of building materials made from local raw materials, without compromising their strength, durability, durability and fire resistance.

In accordance with the Decree No. PF-5963 of March 13, 2020 "On additional measures to deepen reforms in the construction sector of the Republic of Uzbekistan", the task was given to adapt and implement in construction projects developed on the basis of foreign regulations. Therefore, in the field of construction, in order to adapt multi-storey buildings and projects based on foreign standards to our conditions, it is necessary to think of ways to prepare the structures of buildings and structures using new technologies. Therefore, in order to improve the foundation in the poured soils, it is necessary to add additives to it and study the issues of saving cement material .The main task is to use local materials.

Bulk soils (original soils with disturbed natural structure, mineral wastes of industrial production, solid household wastes), although characterized by a certain depth, are widespread in all regions of the country. Their emergence and accumulation depends on the activities of construction, mining and agricultural operations, ore beneficiation, smelting of steel and cast iron, burning of solid fuels and smoke removal, production of building materials, mining. During the construction process, prefabricated soils are leveled before construction or rehabilitation of underground structures (automobile and railway dumps, plots, earthworks, etc.), construction of artificial foundations (sand, gravel, clinker, subsoil) and drainage. formed in the reburial of trenches of various buildings and structures.

Construction problems in cast soils and their properties.

Construction on such soils is the most important, complex and problem-solving foundation construction. The urgency of these problems is determined by the fact that:

- The prevalence of loose soils, as a rule, in industrially developed areas, in old cities, in the areas of reconstruction of existing enterprises;
- when it is necessary to dispose of various industrial wastes;
- Sometimes due to long-lasting, unacceptable deformations in the structure of structures;
- Increased consumption, labor intensity and cost of materials for the construction of soils and foundations in areas with loose soils.

The peculiarity of bulk soils is that their composition is not as homogeneous as possible, uneven compressibility, compaction due to its own weight, vibration during operation of industrial and urban transport equipment, changes in hydrogeological conditions and decomposition of organic additives. Significant and multi-variable layer thickness, varying from zero to 20-30 m, makes it difficult to silt and pour through the foundation in a variety of ways. Occasionally, large voids and solid material compounds are found in loose soils, and it is not always possible to break up these voids and eliminate uneven subsidence of future foundations when they are compacted. When digging piles or digging wells for cast piles, it is very difficult to break down such hard material compounds that are common in cast soils, especially reinforced concrete fragments, metal, stone structures, insoluble stones in slag, piles, and so on.

In the design and construction, additional subsidence frictional forces resulting from compression of the casting and subsoil and sometimes up to 0.5-1 m, as well as additional loading frictional forces resulting from self-compaction of piled foundations and earth-filled walls due to their own weight and other influences are taken into account. need to get.

Problems of construction on cast soils and, although much earlier (the first temples and cathedrals built on the hills dates back to the X1-X11 centuries), although since 1972 there have been various levels of councils on this issue (scientific and technical seminar on methods of testing artificial soils for construction) , Kiev, 1976; International Conference on the Use of Industrial Waste in Civil Construction, Paris, 1978; Special Branch of the X International Congress on Soil Mechanics and Foundation Construction, Stockholm, 1981) Many questions remain unresolved.

The formation of properties of cast soils occurs in the process of their formation, depending on the method of accumulation and their presence, under the influence of dynamic and other compaction factors, changes in hydrogeological conditions, decomposition of organic additives in chemical, biological and other processes. The properties of cast soils are significantly determined by their composition, wear of the cast, the degree of compaction and other factors. Loose clay loam soils with low humidity can be very sedimentary when moistened, and densities - foamy. In bulk soils, which are composed of various types of industrial wastes, such as slag and slag, especially when mixed with a mixture of various alkalis and acids, foaming can also occur. Over time, the properties of cast soils change, on the one hand, due to self-compaction and the formation of new content under the influence of various factors, resulting in improved density, strength and deformation characteristics, on the other hand, due to the decomposition of organic matter in the main composition. decrease occurs. In many cases, these self-consolidation and decay processes occur simultaneously.

The development of more proven and well-established methods for the further development of construction methods in bulk soils is of great importance. From the specific gravity of the cast soils, the dynamic effects of technological equipment, urban and industrial transport, changes in hydrogeological conditions, etc. a quantitative assessment of the degree of self-condensation under the influence should be included. It is necessary to check the additional load-bearing frictional forces in the deepened parts of the piles and foundations, which are compacted by the specific gravity of the cast soils, as well as the dynamic and other effects mentioned above. The problem of whether the structure of a substance can be preserved (predominant) or decomposed under the influence of physical, chemical, biological processes in loose soils has not yet been studied.

Sedimentation Measures in Bulk Soils

Ensuring the durability, priority and normal use of buildings and structures to be restored on loose soils is achieved by:

- When using loose soils as soil, pre-compaction to reduce the compaction and leveling of all or part of the layer, as well as the application of complex design measures, taking into account the possibility of uneven deformation of soils in soils;
- Reinforcement of cast-in-place soils with piles and and other deep foundations that fully or partially intersect with soils with sufficient load-bearing capacity and low compaction, which allow permissible subsidence for buildings and structures.

Each of the above methods requires further improvement, taking into account the existing experience of construction and the prospects for their development.

Densification of bulk soils at great depths (more than 2-3 m) is carried out by compaction of foundations with heavy screeds, construction of soil piles, water vibration compaction at depth and compaction of hard soil (rock) materials. In order to increase the efficiency of surface compaction, it is necessary to use high-weight compactors with a diameter of 150-250 kN and a diameter of 3-4.5 m when compacting to a depth of 6-10 m. Quarries and mounts should be equipped with steel ropes, crane-excavators with a carrying capacity of not less than 500-600 kN to work with the specified hoists. Alternatively, a significant increase in the depth of compaction is achieved by mixing the surface silt compaction by blasting it at depth (the lower layer soils are compacted by blasting at a depth of 3-6 m, and the upper layers are compacted by heavy slags).

Aqueous vibratory compaction at depth is carried out using depth vibrators and is effective only when free water flows well in loose sandy soils.

Densification of cast soils between hard (rocky) materials is developed by three technologies: surface compaction; deepening compaction with ground piles; compaction by inserting between the trenches. In the first case, a layer of stone material with a thickness of 2-5 m is poured on the surface of any cast soil and compacted into a hollow soil with a diameter of 1.5-3 m by inserting it between the sides and dipping it down.

In the technology of compaction between solid soils, deep compaction with soil piles is often called reinforcement of loose soils with vertical elements with high strength. This method differs from deep compaction in that no local soil is usually used to fill the wells, a stronger

material (shlakabeton, loose concrete, sheben, etc.) is used, and the distance between the wells is significantly larger and is usually 5-8 times their diameter. accepted.

The difference between the technology of penetration of solid ground materials on the technology of trench trenching and the previous technology is mainly in the applied techniques and the depth of compaction is significantly less, usually does not exceed 5-8 m.

Pile foundations in cast soils

Crossing of cast soils is carried out with various constructions of cast-in-place and cast-in-place piles, the most effective and promising of which are: cast-in-place piles, piles with expanded bottom, solid material immersed to the bottom of the well, compacted underground cast-in-place piles.

It is expedient to use piles in cast soils, as their compaction creates additional compaction in the cast soils, which in many cases excludes the formation of additional loads from the loading friction forces. In this case, the installation of piles should be carried out without leader wells, if necessary, reducing the distance between the piles to 2-2.5 diameter.

Bulk piles with compacted soil piles are made in wells drilled with impact shells, resulting in the formation of sloping soil zones around the wells. In order to form the barrier zone, the boundary of the pile area and the compaction of the soils around its perimeter are carried out according to the technology of deep plowing of the soil piles. When it is more necessary to use cast piles in compacted soils, it is expedient in the areas of solid piles where the soils under the foundations of the floor and technological equipment are compacted at the same time.

Conclusion

In conclusion, the construction of loose soils is becoming more and more popular today. it is necessary to take into account the possibility of disintegration, the nature of the building and structures planned for construction. It is also advisable to use foundations or pile foundations with shallow depth of laying with pre-compaction of soils, depending on the nature of the soils, when laying foundations on loose soil

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