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Additional Deformation of Damped Layer Foundations of Buildings under the Influence of Dynamic (Seismic) Forces

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Abstract: This scientific article describes the results of the research work carried out to determine the reasons for the appearance of additional deformations (seismic prosadks) on moistened loam basess under the influence of dynamic (seismic) forces, the amount and their impact on buildings and structures. The article also provides an analysis of the results of the work of most specialist scientists on the study of additional deformations, i.e. seismic prosadks, that appear on lyosimal bases moistened by seismic forces at the time of an earthquake. At the same time, recommendations are also given to take into account the additional deformation that occurs under the influence of seismic forces in the design and construction of buildings and structures in earthquake districts in moistened sedimentary beds.

Keywords: dynamic and seismic forces, lessimistic precipitation, magnetization, seismic mists, deformations, seismic subsidence, static forces, physico-mechanical characteristics, density, fluidity, fluidity.

Introduction. In addition to all kinds of forces and influences that affect the basiss of buildings and structures in earthquake areas in static situations, seismic forces are also additionally affected.

Seismic forces can cause a decrease in the strength of the lyosmal bases of the structure, deform and, ultimately, damage, deterioration of the structure. Therefore, the study of the factors that contribute to the violation, decrease in strength, deformation and damage of the structure of ham lyosimal base soils under the influence of dynamic, seismic forces is important in guaranteeing the strength, priority, life expectancy and reliability of the structures being built in them.

The amount of seismic forces that affect the bases of the structures will be determined by the seismomicrorealization card compiled for this God, and it will be determined by the international seismic scale MSK-64 of 12 points, adopted in 1964 in some countries of Europe and Asia in the country. Based on this 12-point international seismic scale, our country is divided into small-small, microdistricts of 6.7.8.9 points. This seismomicroreanization card was created by summarizing the forces of earthquakes that have occurred in the same area for several centuries. When erecting and building structures, of course, the seismomicrorealization system card of the

same area is taken into account, and based on this, various additional measures are used in some seismofaol districts.

In seismic areas, James seismalar Turadigan Tumanlard, Ainix leskuvchan Lessimon Gruntlard, kuriadigan buildings and structures Seismic fortified, ustyvorligin, who provided the gift of Kunning Eng Quyin and a loving puzzle solver. From year to year, the growth of the population, that is, the rapid assimilation of land, as a result of the abundant, productive use of existing land as possible for various national agricultural purposes(especially in urban districts), increases the level of groundwater, which leads to a high level of hydration of soils that serve as the basis of buildings and structures. As a result of the high level of moisture content of loam soils, their various physical and mechanical properties are changing, and this affects their load-bearing capacity. Failure to take into account the change in the various properties of loam soils as a result of increased humidity in high seismic districts can have very bad consequences for buildings and structures built in these districts.

Lyossilon mountainjins are found on all continents of the planet, but are relatively widespread on the continents of Europe, Asia, North and South America. These mountainjins are especially common in Siberia, Mongolia, China and Central Asia. In the countries of Central Asia, including Uzbekistan, most buildings and structures are built on top of sedimentary lyosmic soils. Given the high level of moistening of the loam soils, which serve as the basis of these buildings and structures, for some reason (due to the rise of groundwater, violation of underground engineering communications, malfunction of the ground channel and ditches), the problem we are studying, that is, taking into account the change in its various properties with an increase in.

Additional deformations(seismoprosads), which are exposed to seismic(dynamic)forces on soils with very low viscosity, beyond consideration (sands of varying sizes)located in high seismic districts, have been studied for many years by scientists from foreign countries and our own, and this is not mistaken if we say that there is enough data in science today. But the additional deformations produced by seismic(dynamic)forces in moistened, precipitating lyose soils have not yet been fully studied [1-6].

Despite the fact that a huge number of scientists are engaged in determining the reasons for the appearance of additional deformations(seismic prosadks)that appear on calcareous floors moistened under the influence of seismic forces, the amount and their impact on buildings and structures, currently there is no clear and complete data on this area in science.

Seismic deformations caused by an earthquake on moistened loam soils are very complex processes that cannot be assessed through individual indicators. The occurrence of seismic deformation here is also influenced by internal factors: the composition of the grunt (mineralogical, granulometric, chemical), the condition of the soil (moisture, density), the nature of the soil (strength, sedimentation) and also external factors: strength, duration, character, external loads, etc. [7-11].

Analysis and results (Results and Discussion). Prof.A.A.According to the data of musaelyan (Tajikistan), additional deformations (seismic prosads) that appear on lyosimal bases at the time of an earthquake mainly occur as a result of a decrease in the strength characteristics of the soil under the influence of seismic forces.

Prof. N.I.According to Krieger (Russia), seismic prosadka would depend on the amount of seismic energy, the amplitude and frequency of seismic vibration, the appearance of a resonance state, the strength of the structural bond of the soil, etc.

A.S.Alyoshin, A.D.Kozhevnikova, I.G.Mindel, S.I.The research work of Lavrusevich (Russia, Tajikistan) and other specialists showed that as a result of increased moisture, the structural strength of the soil decreases, and this leads to additional deformation, compaction of lyose soils under the influence of dynamic and seismic forces.

In the 80s of the last century, a group of scientists from Uzbekistan (H.Z.Rasulov, S.Saifiddinov, Yu.N.Chastoedov et al.) created a method of forecasting, determining the amount of additional deformation (seismoprosadka) that occurs in loam soils moistened by seismic forces, depending on the changes in the physical and mechanical indicators of soils. It was created by scientists a methodology for laboratory detection of additional deformation(seismoprosadka), which occurs under the influence of seismic (dynamic) forces on moist, sedimentary loam soils, the main factors that contribute to an increase in the amount of seismoprosadka were identified. They found that in laboratory conditions, in a vibrating device(a vibrating table that gives dynamic forces close to the parameters of seismic forces), additional deformation(seismoprosadka), which occurs under the influence of dynamic (seismic) forces on moistened lyose soils, is 2-3 times more than in a prosadka, which is exposed to static forces. That is why these scientists recommended to take into account, in addition to prosadka, seismoprosadka, when calculating the strength, superiority of buildings and structures being erected on lyosmal soils in high seismic districts [12-15].

The research work of the scientists named above by the authors on the detection of seismic deformation, which occurs in moist, subsurface loam soils at the time of the earthquake, was continued in order to further expand and add additives. He focused on the fact that scientists create some of the causes of seismoprosadka, which appear on calcareous soils moistened under the influence of an earthquake, and a way to predict it. They did not focus on the fact that under the influence of seismic forces, moistened, weakly loosed soils can reduce all the parameters of their strength characteristics, as well as make them develop seismoprosadka and reduce the load-bearing capacity of loam bases, and methods of combating seismoprosadka.

The authors developed an improved formula for calculating the load-bearing capacity of buildings in earthquake zones taking into account seismic effects. This formula takes into account the decrease in the strength characteristics of moistened loam soils under the influence of seismic forces.

Recommendations have also been made by the authors on the compaction of the lye-like foundations of buildings in seismic areas and the improved vibrational method of depositional soils around the foundation [16-21].

But even so, all the reasons that cause additional deformation(seismoprosadka), which occurs in loam soils moistened under the influence of seismic (dynamic) forces, including the physical and mechanical properties of soils, parameters of external seismic (dynamic) forces, etc., have not been fully studied to date. In conclusion, it can be said that when building buildings and structures in high seismic districts on loamy, sedimentary soils, it is necessary to have clear and complete information about the seismoprosadka that occurs under the influence of seismic forces, and about the factors that affect the development of this process. From this conclusion, it can be seen that the change in the physical and mechanical properties of highly moistened loam soils when exposed to seismic forces, the determination of the causes that cause additional deformation(seismoprosadka)that occurs in them, as well as its exact amount, is one of the pressing issues of the present day.

Conclusions and recommendations. As a result of our research work on additional deformations (seismic prosads) that occur in loam soils moistened under the influence of seismic forces, we came to the conclusion as follows:

1. The laying of research work on the study of additional deformation of moistened lyossil soils under the influence of various factors, including seismic forces, has shown that there are still different, different opinions on this matter, which assumes a deeper study of the current problem.

2. Additional deformation of the lyosimal bases of buildings and structures occurs mainly as a result of the change in the strength characteristics of soils under the influence of various factors(dynamic and seismic forces, moisture, etc.).

3. Seismic microdistrict of the Belgilangan Carthage earthquake as scanty mud buildings and structures, and seismic imaging for a long time is guaranteed as the basis. To do this, it is necessary to take into account the features, characteristics, parameters (duration, frequency, amplitude) and soil conditions of earthquakes that have taken place in the same area for many years (changes in groundwater level, characteristics of the soil).

4. Under the influence of high-frequency dynamic and seismic forces, the structure of soils is rapidly disturbed and the degree of deformation is high. Therefore, high-frequency earthquakes (in terms of violation of dynamic stagnation) are considered very dangerous for the foundations of buildings and structures.

5. The strength and stagnation of buildings and structures in seismic areas, where weak, sedimentary loam soils are distributed, cannot always be achieved by calculating their floor in terms of the first marginal state, that is, the load-bearing capacity. To do this, it is necessary to take into account the change in the strength characteristics of the base soils under the influence of seismic forces, deformation.

6. The authors developed an improved formula for calculating the load-bearing capacity of buildings in earthquake zones taking into account seismic effects. This formula takes into account the decrease in the load-bearing capacity of buildings and structures as a result of changes in the strength characteristics of soils (under the influence of seismic forces and moisture) during an earthquake.

7. When designing buildings and structures in seismic districts, first of all, it is necessary to take into account the amount of additional deformation that can occur on the floors as a result of earthquakes(taking into account the duration of earthquakes, the strength of the impact and the change in the strength characteristics of the soils as a result). During an earthquake, a decrease in the strength characteristics of soils and The Associated additional deformation increases with an increase in the strength and duration of the impact of seismic vibrations.

8. It turns out that in earthquake districts, compaction of the lye-like foundations of buildings and the shed soils that are deposited around the foundation with the vibrational method has a good effect. In this case, dynamic forces affect the floor before the construction of the building, and therefore the deformation of soils under the influence of later seismic forces decreases, while seismic resistance increases. Therefore, in the vibrational method, the compaction of lyose soils is also important in terms of increasing the seismic strength of objects, with great effect.

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