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PRESSING PRIVATE ARTIFICIAL SOILS FORM ITS WEIGHT BY ITSELF

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Annotation: This paper describes the properties of cast soils, the amount of subsidence, self-compaction, the fact that the density of dry soil for lower depths is higher than in the experiment, the self-compaction feature of re-poured clayey soils.

Keywords: Specific gravity, bulk soil, self-compaction, Sediment volume, soil, soil density, soil compaction, compaction technology, vibratory compaction, subsidence graph, initial moisture.

Over the past period, the organization of a single geological service for the implementation of state policy in the field of integrated geological study of subsoil, ensuring the effective implementation of long-term programs for the development and replenishment of mineral resources, rational use of mineral resources and further increase their investment attractiveness. a number of complex measures have been taken.

Bulk soils (natural soils with disturbed natural structure, mineral wastes of industrial production, solid household wastes), although characterized by 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, cast-in-place soils are leveled before construction or rehabilitation of underground structures (road and railway dumps, plots, earthworks, etc.), construction of artificial foundations (sand, gravel, clinker, ground cover) and drainage. formed in the re-burial of trenches of various buildings and structures.

One of the main features of cast soils is their specific gravity subsidence. Sedimentation of cast soils occurs due to the compaction of the materials that make it up, mainly due to its specific gravity, external load on them, as well as dynamic load, changes in humidity at the base, the location of groundwater.

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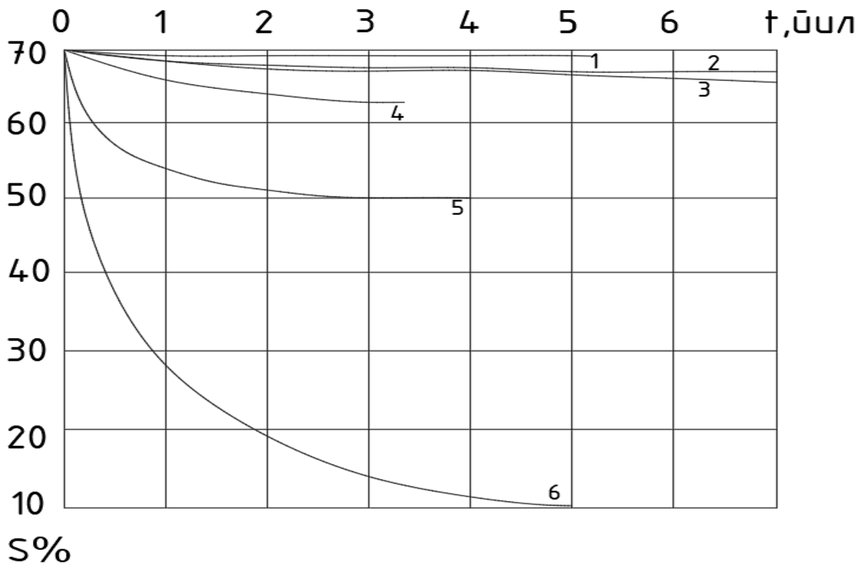

Figure 1.2. Sedimentation of cast soils by specific gravity.1 - well-compacted coarse sand; 2 - uncompressed rock; 3 - concentrated gill; 4 - uncompressed sand; 5 - uncompressed gill; 6 - household waste

The amount of subsidence, the duration of the process of self-compaction of bulk soils, depends mainly on the materials that make it up: the minimum time of self-compaction - in bulk soils with loose material; maximum - in high-viscosity casting soils (gill soils, flotation process technologies of some concentrators) and cast soils with organic additives, etc..

Available data from observations of subsidence of bulk soils by specific gravity allow us to estimate the amount of subsidence.

The subsidence graph (Figure 1.2) is based on observations of subsidence observations of different types of cast soils, control marks (marks) mounted on them at the base and surface [1]. Sedimentation in well-compacted loose soils consisting of coarse-grained sands and gravels is 1% relative to the initial height (1 curve), less compacted soils of the same soils are up to 1.5% (2 curves), and a compacted sand (4 curves) is 2.5%. … .. up to 3%, moderately compacted clayey soils (3 curves) around 2… 2.5%, non-compacted (5 curves) up to 10… 12%. The largest sediments of specific gravity were observed in municipal and industrial wastes containing large amounts of compact organic additives such as paper, sawdust, sawdust, sawdust. The 6-curve (see Figure 1.2) corresponds to a New York City landfill in the form of 40… 60% paper and food waste. Sedimentation of bulk soils by specific gravity in this case reached 28… ..30% of the initial height, typically due to compaction of organic materials.

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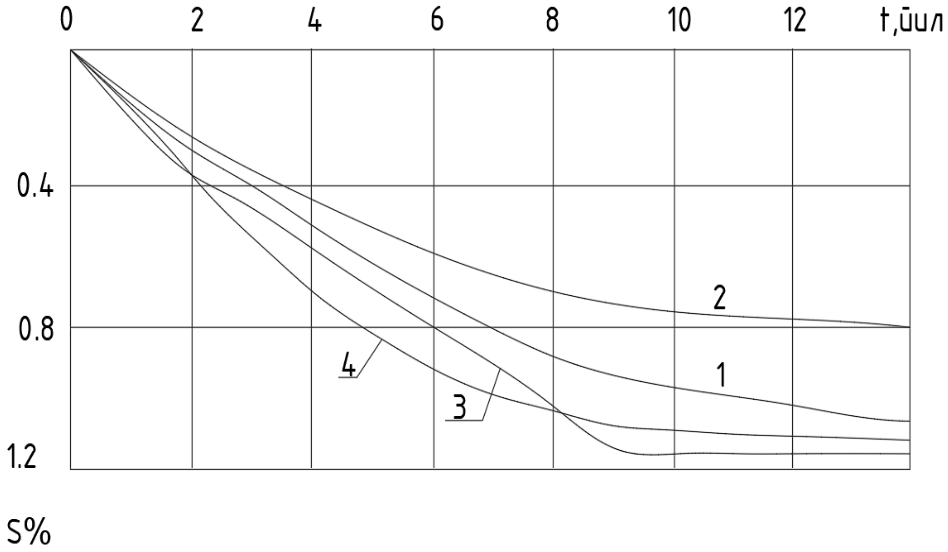

Figure 1.3. Sedimentation of deep-seated marks on the dam built by Zemlasos over time; 1-10 m; 2-12 m; 3-14 m; 4-24 m.

The subsidence from the specific gravity of the road pouring soils, which were 0.2-0.5 m thick, paved with layered supes and suglinoks, and then compacted by blasting or impact slabs, was 1% relative to the initial height.

The results of monitoring the subsidence of the restored dam using Zemlasos are shown in Figure 1.3. The height of the underwater part of the dam is 15 m, and the surface part of the dam is 18 m. The dam is washed of homogeneous fine sand. After washing, the dry density of the sand in the dam was 1.48… 1.75 t / m3 and the corresponding porosity coefficient was 0.79… 0.514.

To observe the sinking of the dam from its specific gravity during the washing process, deepened marks were installed at depths h = 10, 12, 14, 15 and 24 m. The subsidence of dam dam soils lasted for 10 years and was 0.8.1.2% relative to the height of the dam, i.e. close to the subsidence of reclaimed cast soils by layering and compaction.

Special studies were conducted on the construction of a single-storey shop on the self-compaction of cast soils, filling gaps with a length of not less than 10 m, an average width of not less than 6 m and a depth of 8..8.5 m. The cavities were filled without compaction with lyossimon suglinoks with moisture content of 0.08 to 0.3. Once the gaps were completely filled, they were leveled with a light bulldozer. The density and moisture of the soil were determined by radioactive method. The first density and moisture determination cycle was carried out after the completion of soil filling, the next 1, 2,3 months and then every 6..8 months.

The results of the self-compaction studies showed that the low humidity (0.08; 0.13; 0.18) of the spilled soils under closed indoor conditions (Figure 1.4.) Did not change in practice for a long time (up to 3 years). When lyosimon suglinoks with higher moisture content (W = 0.24 and W = 0.3) were spilled, their moisture content decreased to 0.21… 0.22, i.e., a consolidation process took place with the outflow of excess water.

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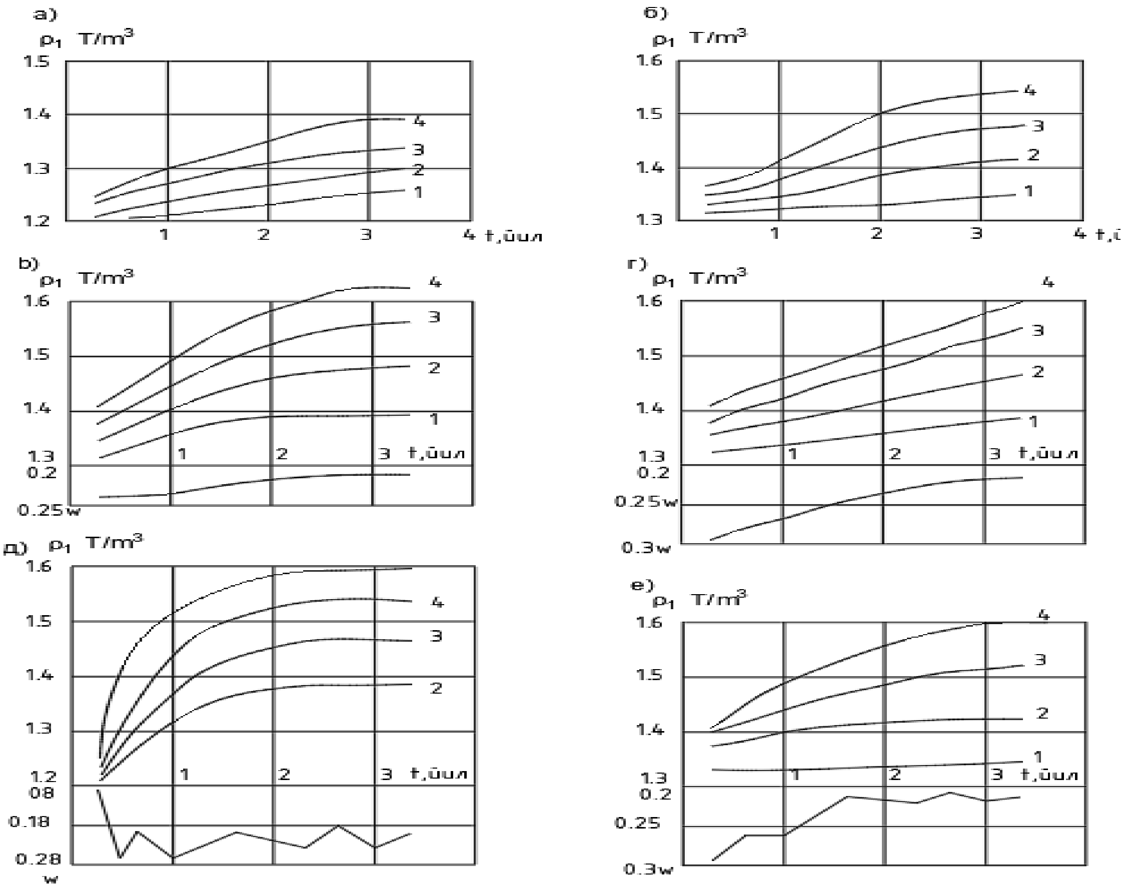

1.4. figure. Moisture change of cast soils over time, humidity:a - W = 0.08; b- W = 0.08; v - W = 0.24; g - W = 0.3; d - W = 0.08; e - W = 0.3;1, 2, 3, 4 - at a depth of 1, 3, 5 and 8 m, respectively.

The intensity of self-compaction of soils (Fig. 1.4. A, b, c, g) depends significantly on the load and moisture resulting from the weight of the topsoil. There is practically no self-compaction in the upper layers to a depth of 1 m, while at a depth of 8 m in the lower layers, the density of dry soil increases by 10… 15%.

The most intensive case of self-compaction occurs at high soil moisture, in this case 0.30. If the initial soil moisture was 0.08, the dry soil density at a depth of 8 m increased by 1.39 t / m3, while at W = 0.30 it increased to 1.62 t / m3.

For lyossimon suglinoks with an initial moisture content of 0.08… 0.24, the most intensive self-condensation occurs in 2.5..3 years of observations based on time, and apparently full compaction occurs in 4...5 years. In lyossimon suglinoks with an initial moisture content of 0.3, no decrease in compaction intensity was observed for a period of 3.5 years, indicating that the consolidation of such soils is a long-term process.

According to the results of the experiments (Figure 1.5), a graph of self-compaction of dry loam soils with a depth of 8 m for three years was drawn up. The graph shows that most of the self-compaction is achieved at high humidity, when the moisture content is 1.15–1.2 times greater than the humidity at the rounding limit (low humidity). In the experiments, a moisture content of 0.21–0.22 was found to be a critical humidity; moisture above this amount did not lead to an increase in self-condensation. On the other hand, an increase in moisture above the critical amount slows down the self-condensation process [1-39].

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In parallel with the study of the properties of self-compaction of soils in closed rooms, he also conducted experiments to study the effect of changes in the moisture content of subsurface soils on the properties of self-compaction. According to engineering and geological surveys, the experiments were carried out at construction sites with a groundwater level at a depth of 8-10 m. In addition, an edge prolet area protected from atmospheric precipitation but exposed to aeration and temperature was selected. Filling was performed with lyossimon suglinok with a moisture content of 0.08, 0.18 and 0.3.

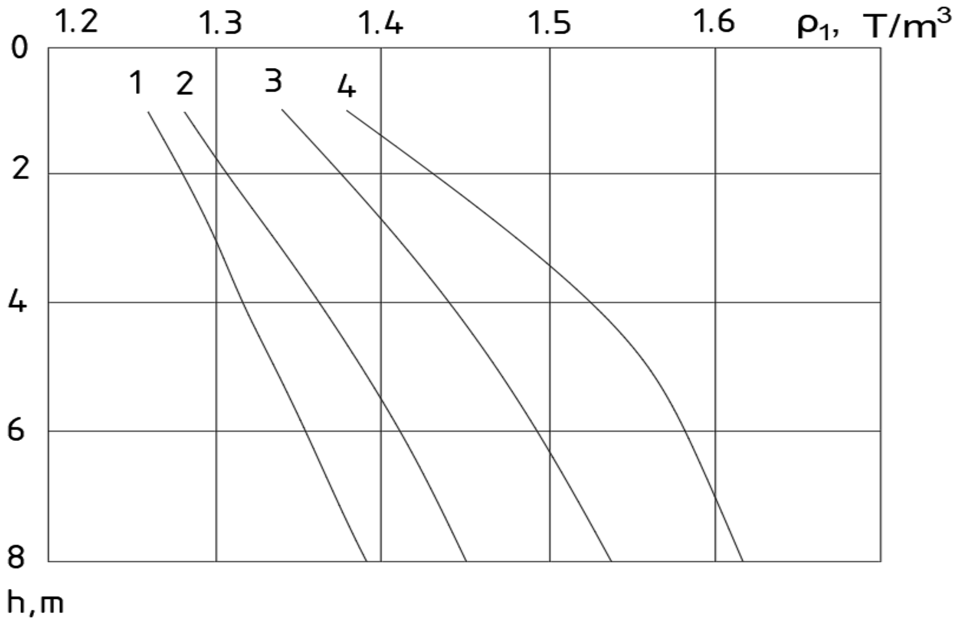

Figure 1.5. Depth change of density of cast soils, humidity:1 - W = 0.08; 2 - W = 0.13; 3 - W = 0.18; 4 - W = 0.24 - 0.3;

According to these experiments, the proximity of groundwater to the surface led to a constant increase in the moisture content of the poured soil from 0.08 to 0.28, its cyclical variation from 0.18 to 0.28-0.24 (Figure 1.4, d). In this case, the self-compaction process was practically completed in 1.8 years.

A similar self-compaction condition was observed in suglinok cast soils with a moisture content of 1.8. In lyossimon suglinoks (Fig. 1.4, e) with a moisture content of 0.3 at the same time, it occurred in practice almost as in closed rooms (Fig. 1.4, v, g). In this case, the characteristic is that in a small cyclical change, the process of moisture reduction slows down and the process of self-compaction of the soil slows down.

It has been found from these few experiments that the self-compaction intensity of cast clayey soils, whose moisture content is equal to or lower than the moisture content at the rounding limit, is significantly higher than the self-compacting intensity of overgrown or water-saturated clayey soils. This phenomenon can be explained by the effect of capillary forces on the self-condensation process. The formation and migration of the capillary horizon occurs at the same time as the compaction of the soil when the moisture content of the cast soils is low, as evidenced by the effect of cyclical changes in humidity on the intensity of self-compaction. The process of self-compaction occurs when the soil moisture is high, only associated with a decrease in moisture, before the period of formation of the capillary horizon [19-59].

To evaluate the reliability of the results, samples of soil self-compaction, re-spilled dry soil density in the building under construction were analyzed and collected many times by sampling and

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paraffinization only by radioisotope method, and again directly by cutting shear (9 sites). 240 detections were analyzed).

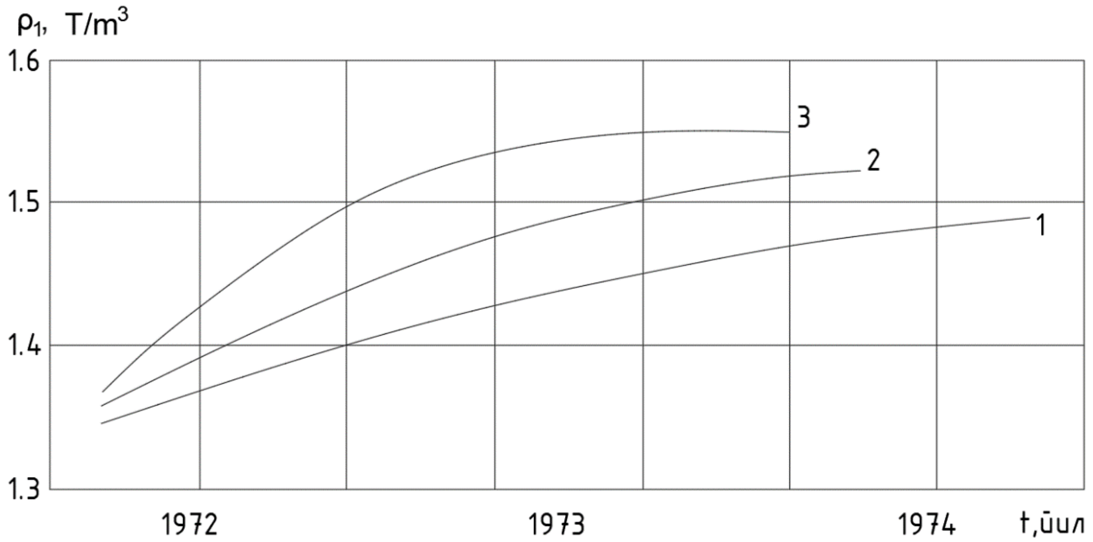

Figure 1.6. Change in the density of re-poured soils in the trenches, depths 1 - 1 m; 2 - 3 m; 3 - 4 m.

Based on the data obtained, a graph of the time change of the re-poured soil in the dry state is given (Figure 1.6). The graph shows that the process of self-compaction of the poured soils due to their specific gravity, as well as the impact of the operating crane, excavator, truck was quite intensive. Density of soil in the dry state, t / m3, increased from 1.34 to 1.49 in two years at a depth of 1 m of the upper layer, from 1.35 to 1.52 at a depth of 2-3 m, 1.36 at a depth of 3-4 m from 1.55, i.e., 10–12%, with the self-compaction of the cast soils in the lower layers occurring in one year in practice.

Comparing the graphs (Figure 1.6) with the graphs obtained by self-compaction experiments shows that they are well suited under conditions of variable soil moisture at depths greater than z m, i.e.

For shallower depths (Figures 1 and 2, 1.6), the density of the dry soil was found to be higher than in the experiment. This is understood to mean that inside the building under construction, construction machinery, vehicles move and lead to a slight increase in soil density in the upper zone.

Studies on the self-compaction properties of reclaimed clayey soils have shown that, in exceptional cases, when there is sufficient time reserve, self-compaction can be used effectively enough to achieve a given density of soils when the depth of reclaimed soil exceeds 3-5 m; it should be borne in mind that cyclic changes in humidity allow to increase the intensity of self-compaction, which reduces the duration of self-compaction in two to three cycles of moisture change by 1.5 - 2 years.

When using the self-compacting effect for re-casting, it is not possible to use over-moistened primers, as in this case the self-compacting process will take a long time[17-45].

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