

consequences of their consumption and transformation, the protection of the world around us – only this will help us survive, find ways to correct mistakes made in economic and in any other human activity, will save planet Earth for our future generations.

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## PILE IMMERSION METHOD AND BEARING CAPACITY

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**Abstract.** This article discusses the problem of building foundations in cramped urban conditions, and also describes the results of laboratory tests in a tray of pile models loaded by driving and indenting.

**Relevance.** Bearing capacity of pile foundations is influenced by many factors. Such factors include: design and geometric parameters of piles; distance between piles; the location of piles in the bush; way to dive piles.

As you know, recently, more and more often there is a need to build residential and civil buildings adjacent to existing buildings and structures. With such construction, the use of piles immersed by driving or vibration dipping is dangerous, since dynamic effects arise from which damage to the structures of existing buildings occurs. In the late 70s and early 80s in the city of St. Petersburg, Moscow, Kiev, etc., thanks to the joint work of scientists and builders, a number of technologies and mechanisms have

been developed that allow you to immerse prismatic piles by indentation. This issue was addressed by such scientists as: Abelev M.Yu. [1], Dalmatov B.I. [2], Gdalin S.V. [3], Simagin V.G. [4], Sotnikov S.N. [5], Shvets V.B. [6], Ginzburg L.K., Koval V.E., Feklin V.I. and etc.

**Materials and methods.** The problem of construction in cramped urban conditions is becoming more and more acute in Odessa. Therefore, the urgent issue is the influence of the method of piling in specific geological conditions of the southern region. This article discusses the study of the processes occurring at the base of the pile during its immersion. These processes have been studied before, but mainly on penetrometers. Many scientists (Kerizel, Lerminje, Cheng and others) believe that penetrometers are small-diameter piles, so the questions studied on them can be transferred with some accuracy to natural-sized piles. If we agree with this and compare the bearing capacity of the base, determined using a static penetrometer (S) with the bearing capacity of the base, determined using a dynamic penetrometer (D), then with respect to these two values (S / D) we obtain a coefficient. This coefficient, by definition of various scientists, varies in large aisles (S / D) = 0.5-1.5. This fact confirms the lack of knowledge of this issue.

Before conducting field studies of piles [7], tests of their models in laboratory conditions were performed. The tests were carried out in order to study the joint work of piles with the base during immersion by indentation and driving. The tests were carried out in a tray. The tray in the plan has dimensions 5x20cm, its height is 20cm. The front wall of the tray is made of glass for the possibility of observing layer-by-layer movement of soil during the immersion of pile models. The test procedure is as follows. The tray was filled with soil. A load was placed on the lower suspension, which was transmitted through the beam to the ground, thus creating household pressure corresponding to the pressure in natural conditions. A beam of the upper suspension was installed on the immersed pile. The load necessary for immersion of the pile by pressing was placed on the upper suspension. Pile immersion by driving was carried out using a device attached to the beam of the device. The device is a guide rod with a moving load. To determine the movement of soil, deformation clamps were placed in the tray, which were stacked in horizontal tracks with a vertical interval of 1 cm. Piles were immersed in various soils (sand, sandy loam, loam) of disturbed structure. The study of the operation of pile models immersed in various ways was carried out in soils of the same density and humidity.

**Conclusions.** Comparing the test results, it can be seen that the compaction zone of the near-pile space of the piles immersed by indentation and immersed by driving are different. The compaction zone of piles

immersed by driving is larger than the compaction zone of piles immersed by indentation, moreover, this pattern is better seen in soils with higher humidity, and in those experiments where cohesive soils served as the basis.

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### **STABILITY OF PROTECTIVE WALLS**

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**Abstract:** The article discusses the design options for retaining walls that are used to strengthen the soil mass.

**Relevance.** In the process of their activity, builders often encounter a situation when the soil mass cannot be kept in equilibrium by itself. At this point, there is a need to create soil reinforcements.

This problem arises during construction in areas with a natural or artificial slope, with a complex and diverse relief, if necessary, the construction of buildings and structures towering above the terrain, as well