

## Innovative solutions for pile foundation construction

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*One of the effective foundation mechanisms is the use of pile foundations. At the same time, a significant increase in the level of complex mechanization of technological processes of pile foundation engineering requires new, advanced technologies for the construction of pile foundations.*

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To date, in pile foundation construction, two functionally progressive directions have been clearly identified, which include increasing labor productivity and reducing energy consumption when building pile foundations [1, 2]:

- the first - in a continuous mode with high labor productivity to receive a finished reinforced stuffed pile of the required standard size of high quality in class II soils;

- the second - shockless and noiseless, with a tendency to gradually increase effort and continuously monitor the bearing capacity of crushing reinforced concrete piles of all sizes of industrial production [3, 4], as well as sheet piles, pipes, pile piles and other (including non-standard) pile elements in all bearing soils.

In these areas, one of the innovative is equipment for the installation of piles, which provides full-scale technical equipment of these latest technologies of pile foundation construction.

The complex includes a set of a model range of injection devices that are shocklessly immersed for the manufacture of reinforced concrete piles of all sizes without excavation, as well as a set of a model range of universal pressing devices for shock-free and silent immersion of piles (all sizes).

The latest high-amplitude devices that immerse piles equipped with rotary driving mechanisms protected from external influences from the soil compaction side compares favorably with existing devices in that they are able to produce foundation wells in a

wide range of diameters and depths, as well as in bearing soils of the above class (without excavation of the soil itself) with significantly greater productivity and lower energy costs.

The absence of fluctuations in the forming body when it is pressed into the soil eliminates the compaction of the soil, sharply reduces the frontal resistance of the soil and virtually eliminates the transfer of dynamic loads to nearby structures.

The use of high-performance machines and low energy consumption opens up new opportunities for the manufacture of high-quality reinforced concrete piles in soils of various conditions. Such piles suit with increased bearing capacity and with a significant reduction in energy for immersion, reducing material costs, namely:

- to replace such methods of construction of foundation wells as drilling, immersion with cams or vibrators of inventory casing pipes closed from below;

- create a unified range of high-performance injection piles, immersed by indentation with vibration, for the manufacture of foundation wells (without excavation) and reinforced concrete piles in the full range of sizes.

Output:

The intensification of construction production can be achieved only if modern high-performance means of complex mechanization are used. In this case, it is necessary to use resource-saving technologies that provide energy, material and technical and labor resources.

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