

BAU screw piles installation rules

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1. Main types of BAU screw piles:

- Bladed screw pile (BSP) is a product consisting of a steel helical blade (or several blades) and a tubular steel shaft with a cross-sectional area being significantly smaller compared to the blade; the blades are located at the bottom or along the shaft length.
- Cone-spiral screw pile (CSSP) is a product consisting of a round steel pipe with a cone compressed in a rotary forging machine and forged in a press with a sharp end, with a thin multi-turn helix welded on the conical and straight parts of the pipe body



2. Tools used

The following tools and devices are recommended for use to drive BAU BSP and CSSP screw piles into the soil:

- hand tool (gate (lever) or hand lever wrench);
- compact portable hydraulic and electric screwing devices;
- mounted hydraulic equipment mounted on the excavator or loader crane boom.



3. Installation rules

When installing BAU screw piles, the requirements of labor protection, fire safety and environmental protection rules shall be followed.

1. General rules

To drive a pile into the soil one should do the following:

1. Mark the pile field, check the dimensions and diagonals.
2. Arrange the pile exactly on the mark of the marked pile field. Corner piles shall be installed first.
3. Ensuring and monitoring the vertical position and diagonals, put the pile to the design level by rotating it.



When driving a BAU screw pile into the ground, the pile shall not:

- scroll and slip, i.e., when a torque (force) is applied, rotate around its axis without progressive driving into the soil;
- dive into the soil without rotation and force (under its own weight);
- be mechanically rammed into the soil without rotation;
- be screwed out immediately after screwing it into an erroneous level or re-screwed into the same spot without layer-by-layer backfilling with plugging of the pilot hole formed after the first erroneous screwing.

3.2 Result

The following are the results of the BAU BSP and CSSP screw piles diving into the soil:

- the pile is driven to the design mark at the level of the upper cut of the pile shaft;
- the pile failed when being driven in (it stopped or rotates around its axis at the maximum tool or device pressure without progressive driving into the soil at a level of no more than 0.5-1 m above the design mark of the upper cut of the pile shaft)

3.3 Use restrictions

BAU screw piles shall not be used and operated under the following conditions:

- with the cone end or blade supporting on peat, soil, bulk (without layer-by-layer filling with plugging), collapsible and unstable soils, as well as on anthropogenic soils;
- in the areas of underground utilities location, without the written permission of the operating Organizations, while the responsibility shall be borne by the Customer and the Contractor;
- without preliminary engineering calculation and selection of standard sizes, amount and anti-corrosion coating of piles, depending on the design of the structure, the applied loads and the soil basement;
- with deviations from the design depths of laying, horizontal and vertical levels, as well as marked laying out axes at the construction site, exceeding the standard and design values specified in the engineering calculation and selection or pile foundation project;
- when embedding a support blade of screw bladed piles less than 300 mm below the line of the calculated seasonal freezing of soils to exclude deformations caused by a frost heaving (swelling) of wet and water-saturated soils;
- when embedding the ends of screw piles at less than 500 mm into the root bearing soil layer, located under soils prohibited from supporting the ends of screw piles.

3.4 Cases of pilot drilling

Preliminary drilling of pilot holes, or soil loosening without forced excavation, is applied in the following cases:

- in winter to go through a frozen soil;
- in dense, very coarse soils or rocks.

The pilot hole, depending on the structure design, applied loads and soil basement, shall meet the following regulatory requirements:

- depth max. 50-70% of the length of the screw pile being screwed or;
- diameter equal to or less than 0.1d (d) of the diameter of the screw pile being screwed in;

- when screwing in a bladed pile with a pilot hole diameter more than the diameter of the shaft, it is necessary to backfill the cavity between the pile and the hole wall with non-frost heaving and non-collapsible soil (sand, screening dust) with uniform compaction (plugging) of the layers.

4. Transportation and storage of products and materials

- piles handling operations shall be performed in ways that exclude damage to the structure and the protective anti-corrosion coating of products;
- handling operations with more than 1 package at a time is prohibited;
- it is allowed to transport structures by any type of transport provided that they are protected against pollution and mechanical damage.
- the structures shall be stored in specially equipped warehouses sorted by types, sizes, brands and shall be protected against contamination, or stored outdoors at the construction site in case construction and installation work is performed immediately after delivery of products to the site. Warehousing of structures shall ensure the safety of work and life.