



MODERN ASPECTS OF ECONOMIC AND SOCIAL SUSTAINABLE DEVELOPMENT

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VIBRATION DRILLING IS BASED ON VIBRATION POWER

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Annotation: The article describes drilling operations and necessary techniques for earthworks in complex mountainous areas.

Key words: Drilling, drilling, rock, railway, well, spur.



Drilling is the process of creating a cylindrical excavation in the form of a well or a spur when breaking the rock. Excavation works include engineering geological and hydrological research, soil research, construction of foundations for bridge supports and supports in frozen and rocky soils, development of soil masses by blasting methods, crushing of hard rocks and frozen soils, artificial strengthening of soils, groundwater is carried out during the construction of supply wells. Formation of pits for sources of underground water and water subsidence, foundations of communication networks, communication lines, etc. Drilling the most common holes and wells during excavation using blasting. Technical guidelines for the design and manufacture of drilling and blasting during subgrade construction are recommended for drilling blast holes:

The cone method is used in weak (groups V and VI), medium (groups VII and VIII) and strong (groups IX) low abrasive rocks, as well as in rocks with non-rock layers and hard inclusions. on rock-free frozen and moraine soils;

Percussive roller cone (with an underwater drummer and cone tip), pneumatic percussion (with an underwater drummer) and rotary percussion (with an external striker) methods - in medium-hard, strong and very strong rocks (groups VIII - X);

Rotation method - on frozen and semi-solid soils of groups IV and V.

Drilling machines are distinguished by their purpose, device, and drilling characteristics. BTS-150 drilling machine is used to drill holes with a diameter of up to 150 mm in rock formations of groups V - IX. The method of borehole charges is used in the construction of tunnels and in the processing of rock carvings. Wells are drilled vertically, horizontally or obliquely, depending on the conditions of work. Vertical wells are drilled when the excavation depth is 3-25 m and the slope is greater than 70-75', and inclined wells are drilled when the slope is 60-75'. Fossil up to m. A well is an excavation with a depth of more than 5 m, a diameter of 75-300 mm and more.

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- In the impact method, the rock is destroyed as a result of dynamic compressive stress.
- In the rotational method, the rock is broken due to shearing force.
- Vibration drilling is based on vibration power.

Drilling is divided into mechanical and non-mechanical methods depending on the damage of rocks.

By mechanical method, the drilling equipment has a direct impact on the rock and destroys it. Mechanical drilling is divided into the following types according to the movement of the working body: impact, rotary, rotary-impact, vibration.

At the shock or at the angle of the shock, the rock is destroyed due to the dynamic stress, which is compressed perpendicular to the plane of the layer. Typically, wedge-shaped drilling tools are driven into the rock under the influence of a shock directed along the hole or axis. Before each lift for the next shot, the motor cuts the entire face area and rotates to a certain angle. In the reciprocating mode, the rocks are destroyed by cutting force and splitting, directed at a sharp angle to the face. The drilling rig is rigidly attached to the end of the rotating bar. The main types of rotary drilling are screw, core and rotary.

When drilling a well, a tool that works in the form of a line or knife cutter is cut during the rotation of the rod, which is raised to the surface underground with the help of a burger. Column drilling makes it possible to open the middle column of the rock, not through the entire surface of the rock, but only along the perimeter ring - in a form that does not produce geological analysis. In rotary drilling, the drilling tools destroy the rock along the entire face, and it is removed from the well when the mud is washed with lime or water. Non-mechanical methods include thermal, hydraulic and electrohydraulic methods. Thermal method destroys the rock based on high temperature. Hydraulic shock energy is used in electrohydraulic method based on water blank washing. The success of drilling depends to a large extent on the presence of hardness, cracking, rock flooding. As a result of severe fracture of the rock, it is easier to destroy, but sometimes there are difficulties in starting to drill wells and holes, and there is a risk of jamming the drilling tool in the cracks.

For each drilling type and drilling tool, rock drilling is determined under production conditions. The classification of the stone is based on the developing difficulty. Soilless subsoils can be easily obtained by drilling. A spur is an excavation with a diameter of up to 75 mm and a depth of up to 5 m. A well is an excavation with a depth of more than 5 m, a diameter of 75-300 mm and more. Drilling is divided into mechanical and non-mechanical methods depending on the damage of rocks. The mechanical drilling equipment has a direct impact on the rock and destroys it. There are the following types of milling machines:

q BTS-150 brand drilling machine;

q BTS-75 brand drilling machine;

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q BTS-60 brand drilling machine:

q BS-1m impact-blade drilling machine.

Application of drilling operations in railway construction. Excavation of spurs and wells is common in railway construction. The BTS-150 drilling machine is used for drilling 5-9 groups of rocks with a diameter of up to 150 mm. Vertical and inclined spurs and wells with a diameter of 60-112 mm are drilled using BTS-75, BTS-60 drilling machines. Wells with a diameter of 0.5-1 m are drilled using a BS-1m hammer drill. It is common to dig spurs and wells for the purpose of soil softening and blasting during earthworks in railway construction. The BTS-150 drilling machine is used for drilling 5-9 groups of rocks with a diameter of up to 150 mm. Vertical and inclined spurs and wells with a diameter of 60-112 mm are drilled using BTS-75, BTS-60 drilling machines. Wells with a diameter of 0.5-1 m are drilled using a BS-1m hammer drill.

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