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TECHNOLOGY OF PREPARATION, TRANSFER AND PLACEMENT OF FILLING MIXTURES

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ABSTRACT

Multicomponent systems based on composite binders were used in the preparation of filling mixtures. according to its composition, filling mixtures belong to the type of liquid mixtures, which made it possible to transfer them to the excavated rock cavities, under the influence of gravitational forces, through pipelines at a certain angle.

KEYWORDS: Portland cement, copper, industry, rock, superplasticizers, rock, rocks, filler, composite,

LITERATURE REVIEW

World scientists have conducted many studies on these scientific works: Gaziev U.A. Vasilkov Yu.V. Rizaev K.A. Aldambergenov U.A., Osipova G.A., Sherbakova. gaziev U.A., Orudjev U.S. and others are conducting scientific and practical work and developing innovative technologies.

RESEARCH METHOD

Portland cement, copper smelting industry rock, fly ash and superplasticizers were stored in closed warehouses, bunkers or silos, in reserve for 7-10 days to the backfilling plant. marble processing waste was stored in covered warehouses with a moisture content of not more than 5-7%. Sand based on loose rock GOST 8735-88. "Sand for construction work. It was produced in accordance with the requirements of "testing methods".

Quantification of the components of the filler mixture was carried out in weight feeders. At the same time, volume quantification was also performed for the sand and marble processing waste based on loose rock, in order to control the geometric capacity of the loader bucket.

The filling mixture in the mine was prepared according to the following two schemes: the consumable components were measured separately using the tape feeder of the mixing mixer, then transferred to the consumption hopper, the components were mixed in the mixing mixer and sent through pipelines; of the filling mixtureconsumable components were stored in the form of a heap with a volume of 40 m3 (volumetric method), mixed until a homogeneous mass was obtained, transferred to a cooler and mixed with the required amount of water.

During the mixing of the components of the filling mixture, importance was attached to the sequence of their transfer to the mixer. To obtain a quality filler mixture, the components were mixed in the following sequence:

- cement-ash or cement-copper smelting stone composite binder is thoroughly mixed;
- sand and marble processing waste based on loose rock was added to the binding mixture in calculated quantities;

- "FREM S-3" additive was dissolved in water until it reached a concentration of 30-35% and transferred to the freezer through chemical additives or from a water tank through a measuring device;
- a calculated amount of water was added to the mixture and mixed continuously until the mobility was 11-12 cm or more. This mobility made it possible to transfer the mixture through pipelines to the mountain cavities where the ore was mined;
- the components of the filling mixture were transported on belt conveyors and mixed in two-roll mixers. The total mixing time of the mixture was 2-3 minutes;
- the ready-made filling mixture was transferred from the mixer to the place of laying through the receiving equipment.

In hot climates, when the ambient temperature is 30 0C and above, an additional 10% of water is added to the calculated amount of water for each composition.

Due to the variety of technical conditions of ore mining, several methods of building artificial massifs have been developed. M.N. Tsygalov [1] developed and proposed construction methods of artificial mountain massifs.

Several authors (2, 3) based on the analysis of research work and the conditions of extraction of minerals in the ore deposits belonging to the Almalyk mining and metallurgical combine, presented to us two schemes for the construction of artificial massifs using the filling mixture in the mountain cavities where the ore was minedmade it possible to develop and test in industrial conditions.

The technology of filling the ore-mined mountain voids with a backfilling mixture is directly related to the construction scheme of artificial massifs. in the technology of placing mixtures according to the first scheme, artificial mountain massifs were built on the basis of filling mixtures of different strength (two and more layers). The essence of building artificial mountain massifs on the basis of filling mixtures of different strength consists in layer-by-layer filling of mountain cavities with the help of filling mixtures obtained according to different consumption of binders.

According to the technology of filling the mountain cavities, the filling of the cleared chambers was carried out on the basis of three stages. in the first stage, a lower layer was laid, with a height of not less than 1 meter and a cement consumption of 140-160 kilograms per 1 m3 of mixture, the average strength of this layer was 4.2-6.8 MPa. then the middle layer was laid, the consumption of cement for 1 m3 of the mixture was 70-80 kilograms, the average strength of this layer was 2.0 MPa and less. then an upper layer with a height of 0.5-1.0 meters and a cement consumption of 110-120 kilograms per 1 m3 of mixture was laid, the average strength of this layer was 2.4-3.8 MPa.

The bottom layer, where the most binder is consumed, acts as the main load bearer and load distributor among the layers. the upper layer, which consumes relatively little binder, acts as a bed to prevent loss of ore in backfill operations, and to ensure the normal operation of the machines and equipment working to extract ore from the upper layer. made it possible to apply two- or three-layer filling works based on filler mixtures of different strengths, reduce cement consumption and reduce the cost of 1 m3 of hardened filler.

In the technology of placing mixtures according to the second scheme, artificial mountain massifs were built on the basis of combined (rock + filler mixture) filling.

According to the second scheme, the technology of placing mixtures was carried out as follows: first, a lower layer with a height of 1.5-3.0 meters was laid in the mountain cavities where the ore was mined, the average strength of this layer was 3.4-6.0 MPa; then came out of the mountain hollows or specialpoured rocks were placed in the pits; then filled with filler mixture of required consistency. .in this case, the distance between the rock pile and the chamber walls was 0.8-1.0 meters, and the height of the piles was 1.0-1.5 meters [4, 5].

Transfer of filling mixtures to ore-mined mountain cavities was carried out in the mode of its own movement (under the influence of gravity), under static pressure of inclined or vertically installed pipes designed for transfer of the mixture. in the complex schemes of pipeline routes, the mixtures were transferred in their movement-pneumatic mode. Figure 3.3 shows the technological scheme of the preparation of filler mixtures in industrial conditions.

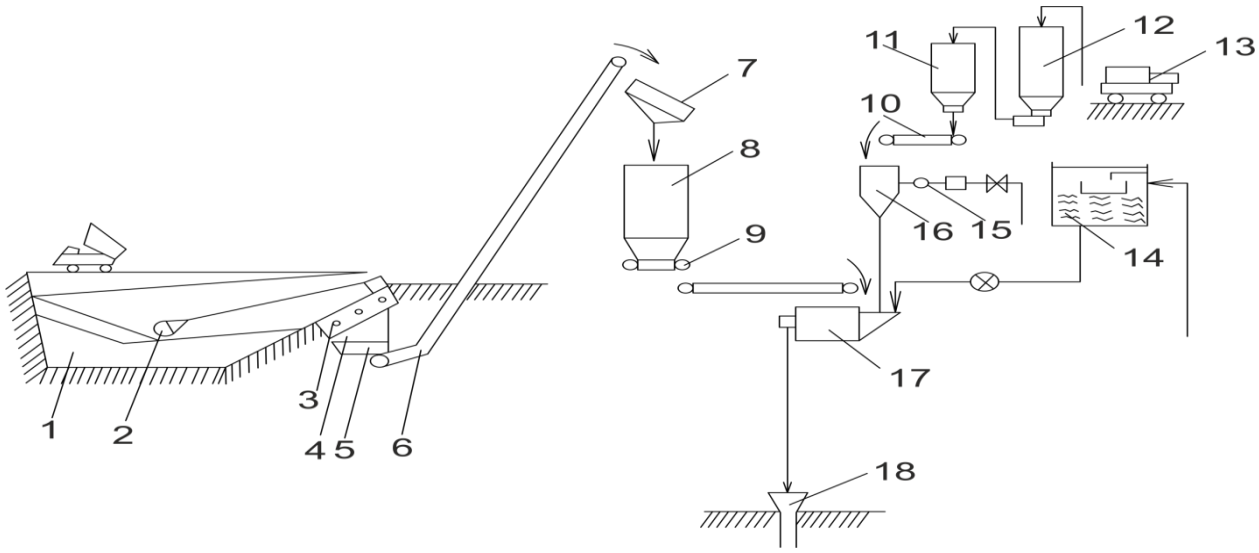

Figure 3.3.scheme of preparation of filler mixture: 1-filler warehouse; 2nd scripter; 3-colossal sieve; 4th bunker; 5th supplier; 6-belt conveyor; 7th vibrating sieve; 8-filling waste hopper; 9th supplier; 10-supplier for cement and ash (copper smelting rock); 11- for ash (copper smelting rock)spent silage can; 12 spent silage can for cement; 13. special car carrying cement; 14. additional tank for water and superplasticizer; 15-water and additional consumption measuring device; 16-cement and ash (copper smelting stone) mixing device; 17-mixed fuse; 18-pipe conductor.

Backfilling was delivered through main and site pipelines. Main pipes were laid in the mine body, wells and important mountain cavities. and the pipelines related to the site were laid in the main or additional mountain cavities at the border of the block or stratum where the excavation works are being carried out.

In carrying out research work on an industrial scale, by obtaining the main required results and controlling the components of the filling mixture, the optimal composition, preparation technology, modes of transfer and placement in the mountain cavities, and the quality of the artificial arrays based on the filling mixturemade it possible to determine the strength properties and structure and ensure its stability.

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