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TECHNOLOGY OF MANUFACTURE OF SOIL CEMENT BLOCKS

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Abstract. *Technological solutions for the production of soil-cement blocks are considered. It is proposed to make blocks from soil cement with the addition of fly ash in the amount of 5% of the cement content and loess loam. It is recommended to make blocks in such a way that the size of the finished block is the same as the size of the brick. A positive effect of the use of fly ash in the production of soil cement was determined.*

Soil cement has recently been widely used for individual construction. The strength and quality of the production of soil cement depends on the methods of preparation and laying of mixtures, control over the conditions of hardening of the blocks.

Currently, soil-cement floor slabs are used. In this case, products are formed from soil cement using a semi-dry method using clay or loam, binder, water and additives. The thickness of the soil-cement slabs was offered in the range of 50 - 80 mm. The application of such a solution is quite progressive and will allow to reduce the weight of the floor structure and get rid of the shielding effect [1].

Majevska I.V. offers production of ready-made blocks and slabs, unfired bricks. In order to increase the strength of the blocks, it is suggested to treat them with hot steam. The main advantage of soil-cement blocks is their low price. The main material (up to 70% of the composition) is the soil of the construction site. Therefore, soil cement is used to save resources.

However, there are disadvantages with a high cement content, soil cement can become brittle [2].

The purpose of the research is to develop a technology for the production of soil-cement blocks of sufficient strength by adding fly ash.

Many researchers have proven that the use of fly ash in the production of soil cement leads to an increase in strength characteristics. The optimal amount of ash in the soil-cement mixture is 5 to 12% of the weight of the added soil [3]. In this way, the waste of thermal power plants can be utilized and the strength of soil-cement blocks can be improved. Also, in order to save Portland cement, up to 20% fly ash was added to the mixtures. Ash is a mineral microaggregate that can help increase the plasticity of solutions.

The author suggests making blocks from soil cement using the following technology: the cement suspension should be prepared in the appropriate equipment (concrete mixers). Use Portland cement brand 400 in the amount of 20% of the soil

mass. To obtain a wet mixture, water should be added (water-cement ratio B:C – 1.0). Then you should add fly ash in the amount of 5% of the cement content to the mixture and mix. Then add soil (loam loam) with a moisture content of 12% - 14%. After preparing the appropriate mixture, blocks were formed. It is suggested that the size of the blocks be adopted as a uniform one similar to the size of the bricks.

Conclusions. The given method of making blocks from soil cement can be widely used in backyard construction in order to save resources. The advantages of the proposed technology are an increase in the strength of the blocks due to the addition of fly ash from the Mykolaiv Thermal Power Plant in the amount of 5% by weight of the weight of cement.

References:

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