

INFLUENCE OF ELASTIC PROPERTIES OF BACKFILL ON THE STRESS FIELD FORMATION IN MULTIMODAL MASSIF

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Purpose. Investigation into the influence of the elastic properties of a backfill massif on the stress state formation by performing computer modelling using the finite element method.

Methodology. The task of studying the stress state of the backfill massif surrounding the second-order chamber was solved by the finite element method using the SolidWorks software package by constructing and investigating a geomechanical model of a multimodal massif. Variables in the model were the depth of extraction chamber and the elastic modulus of the backfill massif. Sixteen computational experiments were performed.

Findings. Regularities of change of maximum destructive stresses in zones of decreased stability of the backfill massif depending on its elastic properties and depth of development are revealed. It is established that with increasing the depth of development, despite the increase of the elastic modulus of the backfill massif, the magnitudes of the stresses arising in its increase in polynomial dependence. It is recommended that the depth of the mining operations should not increase the elastic properties of the backfill massif because it will cause brittle destruction. It is necessary to form in backfill viscoplastic properties.

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Key words: stress state, backfill massif, elastic properties, computer modelling, tensile stresses.

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