

The main objective of the development of mining operations using open-pit methods is to expand the scope of utilization of natural and technogenic georesources.

Mining enterprises are the primary source of environmental pollution: during production, large volumes of overburden classified as hazardous are removed, and solid waste is generated.

The creation of external dumps will enable the comprehensive storage of rocks, forming cavities within them for the placement of hazardous industrial waste. The use of container technology will allow for the creation of high dumps and the separate storage of rocks. All of this will reduce energy costs for dump construction and increase operational safety.

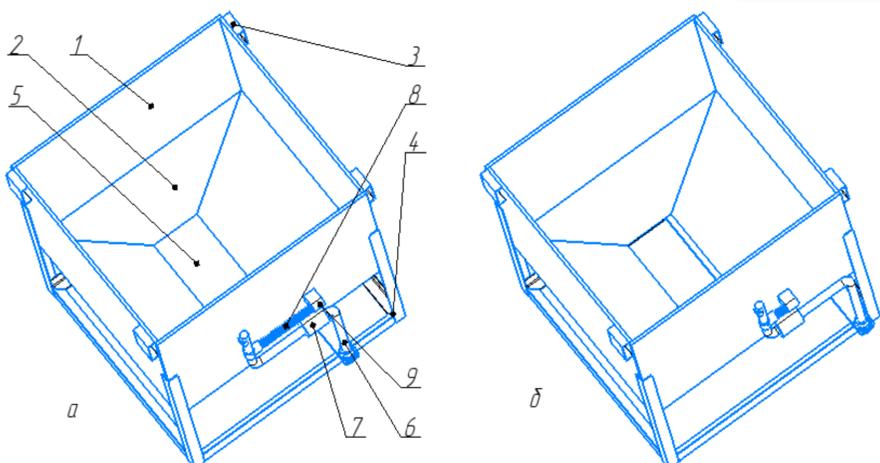
Introduction



More than 375 million tons of iron ore waste are concentrated in the rock dumps of the Sokolovsko-Sarbayevskoye Mining and Processing Enterprise Joint Stock Company. Valuable components of technogenic deposits – chalk, limestone, sand, loam, certain types of hard rock overburden, and Chegan clays – can be used for the production of building materials, chemical fertilizers, fluxes, and more.

New container design

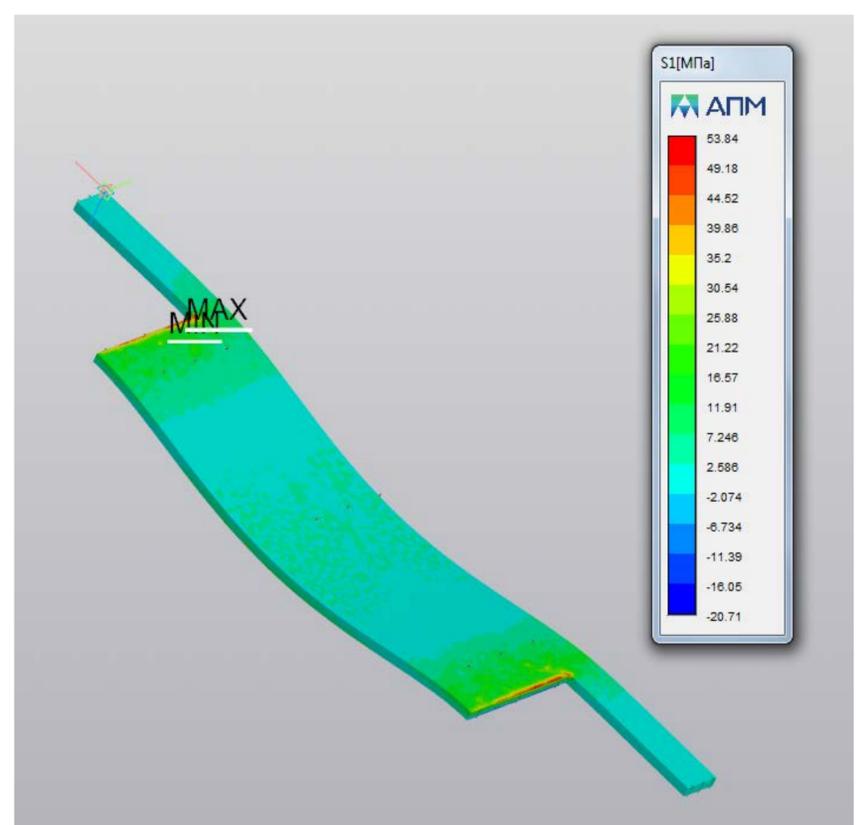
It allows for a significant increase in the height of the dump tier and the width of the approach while reducing its area.



Results

The implementation of container technology in dumps will allow the distribution of different rock types across the dump area, ensuring their comprehensive future use. A new equipment complex based on container technology and a walking excavator has been developed for rock placement.

A grab for container transportation has also been developed, with its design protected by a utility model patent (Patent №10364 for utility model).



The computer modeling method made it possible to test the strength of the container's components.