Determination of the Optimum Size of Building Stone Blocks: Case Study of Delichai Travertine Mine

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Abstract : Determination of the optimum block size with high profitability is one of the significant parameters in designation of the building stone mines. The aim of this study was to determine the optimum dimensions of building stone blocks in Delichai travertine mine of Damavand in Tehran province through combining the effective parameters proven in determination of the optimum dimensions in building stones such as the spacing of joints and gaps, extraction tools constraints with the help of modeling by Gemcom software. To this end, following simulation of the topography of the mine, the block model was prepared and then in order to use spacing joints and discontinuities as a limiting factor, the existing joints set was added to the model. Since only one almost horizontal joint set with a slope of 5 degrees was available, this factor was effective only in determining the optimum height of the block, and thus to determine the longitudinal and transverse optimum dimensions of the extracted block, the power of available loader in the mine was considered as the secondary limiting factor. According to the aforementioned factors, the optimal block size in this mine was measured as 3.4×4×7 meter.

Keywords : building stone, optimum block size, Delichay travertine mine, loader power
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