

Numerical Modelling of Dry Stone Masonry Structures Based on Finite-Discrete Element Method

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Abstract : This paper presents numerical model based on finite-discrete element method for analysis of the structural response of dry stone masonry structures under static and dynamic loads. More precisely, each discrete stone block is discretized by finite elements. Material non-linearity including fracture and fragmentation of discrete elements as well as cyclic behavior during dynamic load are considered through contact elements which are implemented within a finite element mesh. The application of the model was conducted on several examples of these structures. The performed analysis shows high accuracy of the numerical results in comparison with the experimental ones and demonstrates the potential of the finite-discrete element method for modelling of the response of dry stone masonry structures.

Keywords : dry stone masonry structures, dynamic load, finite-discrete element method, static load

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