

# FE Analysis of Complex Discontinuous and Jointed Structural Systems (Part 1: Presentation of the Method - A State-of-the-Art Review)

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## **ABSTRACT**

*This study presents an efficient finite element analysis technique which shows great versatility in analysing complex discontinuous systems subjected to static, dynamic, or seismic loadings. The method incorporates discontinuities in the analysis of discontinuous structures by the use of interface elements designed to simulate the actual behaviour at the interfaces between contacting materials. Several case-problem studies that exhibit discontinuous behaviour have been performed in order to demonstrate the potential and applicability of the proposed method of analysis. One of these studies is reported in Part 2 of this paper, where a non-linear model for the analysis of unreinforced masonry walls is presented. Response results obtained, demonstrate that the overall response of a discontinuous system to external loading is significantly affected by behaviour at the interfaces between contacting materials. Through the inclusion of discontinuities with particular measurable properties, the proposed method of analysis conforms better to actual conditions than do other methods where a continuum is assumed.*

## **KEYWORDS**

*Discontinuous structures, Seismic analysis, Joints, Interface element, Non-linear behaviour.*

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