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### An unbridged push-over approach: Beyond POR analyses for three-dimensional masonry buildings (Conference Paper)

Corbi, O.

Department of Structural Engineering, University of Naples Federico II, Italy

#### Abstract

In the paper the problem of static analysis of three-dimensional masonry buildings is approached, based on the no tension (Nt) assumption of its wall elements. The novelty of the method mainly consists of performing a full holonomic plastic analysis of the structure, which is decomposed in its structural elements, starting from the treatment of the single masonry panel using the NT theory. The proposed approach allows a more exhaustive representation of its behaviour with respect to the classical POR approach, as well as the inclusion of architraves and tendons in the walls. © Civil-Comp Press, 2012.

#### Author keywords

Holonomic-plastic behaviour; No tension model; Push-over; Three-dimensional masonry structures

#### Indexed keywords

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**Paper 122**

**An Unbridged Push-Over Approach: Beyond POR Analyses for Three-Dimensional Masonry Buildings**

O. Corbi  
Department of Structural Engineering, University of Naples "Federico II", Italy  
doi:10.4203/ccp.99.122  
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**Keywords:** static analysis, push-over, three-dimensional structures, masonry, holonomic-plastic behaviour, no tension model.

**Summary**

For masonry structures, the proneness to degradation or collapse is much more dependent on the activation of cracking mechanisms than on the probability of masonry crushing. Thus masonry material models should include fracture as an intrinsic feature for the stress-strain relationships which in turn pushes researchers to develop structural mechanics for no-tension (NT) materials.

The formulation of analysis tools for NT bodies stands on the possibility of performing some extension of the plastic theory to masonry gravity structures such as arches and panels, provided certain assumptions are made. The underlying premise is that masonry structures can conceptually be considered as possessing an overall 'ductile' capacity; this viewpoint is largely supported by the experimental evidence. Some clear advantages can be immediately observed, such as an example, that