

Scopus - Document details

Search Sources Alerts Lists Help Register Login

## Document details

Back to results | < Previous 3 of 60 Next >

View at Publisher | Export | Download | Add to List | More...

Computers and Structures  
Volume 174, 1 October 2016, Pages 133-138

### Stability of evolutionary brittle-tension 2D solids with heterogeneous resistance (Article)

Baratta, A., Corbi, I., Corbi, O.

Dept. Structural Engineering and Architecture, University of Naples Federico II, via Claudio 21, Napoli, Italy

Abstract

Modeling and analysis of masonry continuum through mechanical models that embed some low tensile skill of the masonry and account for its decay process during time is rarely treated in literature. More sophisticated models are to be considered able to produce results in major agreement with real data. The development of theoretical formulations aimed at a priori producing evaluations about the overall performance of these models have a central importance, since they allow to make reasoned computational choices about the mechanical models to be referred to for computations. In this paper one focuses on a special mechanical model for masonry bodies, which is referred to as Elastic Brittle tension (EB) model. Actually the EB model is evolutionary since the non-null tensile stress yield value is assumed to decay during time and converge towards the No-Tension behavior. This involves the need of investigating the relationships of the solution with other solutions related to more known mechanical models, which requires for the EB model the development of a proper theoretical formulation that is presented in the paper. One starts from the consideration that in this case, since the failure in tension is brittle, the theorems of Limit Analysis (LA) are not justified. Thereafter one sets up an approach to the problem aimed at investigating how far the collapse behavior of EB structures can be analyzed through the usual LA tools; some bounding thresholds for their ultimate load-carrying capacity with some original stability statements are then formalized. The proposed approach is here referred to masonry arches modeled under the EB hypothesis but it may be easily generalized to different structural typologies. © 2016 Civil-Comp Ltd and Elsevier Ltd

Author keywords  
Elastic-brittle behavior; Energy bounds; Masonry modeling; No-tension behavior; Structural mechanics; Theoretical formulation

Indexed keywords  
Engineering controlled terms: Computation theory; Load limits; Masonry materials; Yield stress  
Brittle behavior; Collapse behavior; Energy bounds; Model and analysis; Structural mechanics; Structural typologies; Theoretical formulation; Ultimate load-carrying capacity  
Engineering main heading: Stresses

ISSN: 00457049 CODEN: CMSTC Source Type: Journal Original language: English  
DOI: 10.1016/j.compstruc.2015.10.004 Document Type: Article  
Publisher: Elsevier Ltd

Cited by 0 documents

Inform me when this document is cited in Scopus:  
Set citation alert | Set citation feed

Related documents

Find more related documents in Scopus based on:  
Authors | Keywords

ScienceDirect Journals Books Register Sign in

Download PDF | Export | Search ScienceDirect | Advanced search

Article outline is loading...

Computers & Structures  
Volume 174, 1 October 2016, Pages 133-138  
CIVIL-COMP

### Stability of evolutionary brittle-tension 2D solids with heterogeneous resistance

Alessandro Baratta, Ileana Corbi, Ottavia Corbi

Show more

http://dx.doi.org/10.1016/j.compstruc.2015.10.004 Get rights and content

Highlights

- The problem of modeling and analysis of masonry continua is focused on.
- An original formulation is proposed accounting for a reduced tensile resistance.
- The evolutionary character in time of the material behavior is embedded.

Abstract

Modeling and analysis of masonry continuum through mechanical models that embed some low tensile skill of the masonry and account for its decay process during time is rarely treated in literature. More sophisticated models are to be considered able to produce results in major agreement with real data.

The development of theoretical formulations aimed at a priori producing evaluations about the overall performance of these models have a central importance, since they allow to make reasoned computational choices about the mechanical models to be referred to for computations.

In this paper one focuses on a special mechanical model for masonry bodies, which is referred to as Elastic Brittle tension (EB) model.

Actually the EB model is evolutionary since the non-null tensile stress yield value is assumed to decay during time and converge towards the No-Tension behavior.

This involves the need of investigating the relationships of the solution with other

Recommended articles  
Citing articles (0)  
Related book content