



Università degli Studi di Padova
Dipartimento di Ingegneria Civile, Edile e Ambientale
Scuola di Ingegneria



Seminari degli insegnamenti di

Problemi strutturali dei monumenti e dell'edilizia storica

Proff. Claudio Modena, Maria Rosa Valluzzi

Aseismic design of building structures - Costruzioni in zona sismica

Prof. Francesca da Porto

Aula Magna di Ingegneria

26 e 27 Maggio 2016

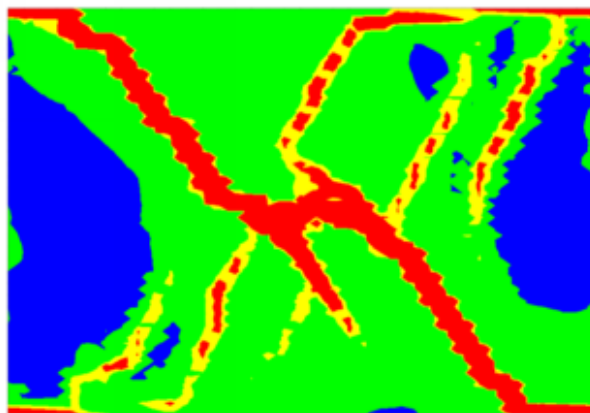
9.00 – 13.00

Jan G. Rots

Professor of Structural Mechanics

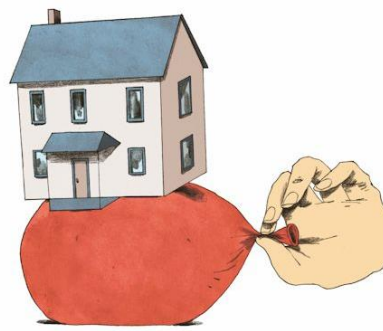
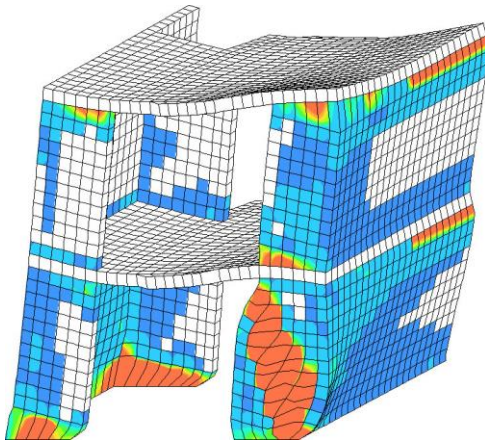
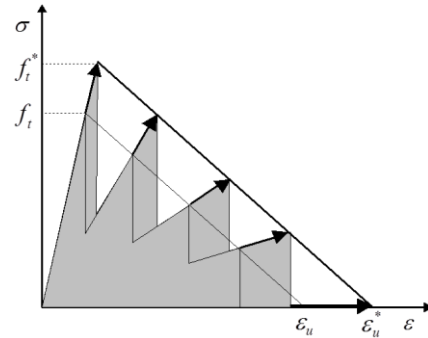
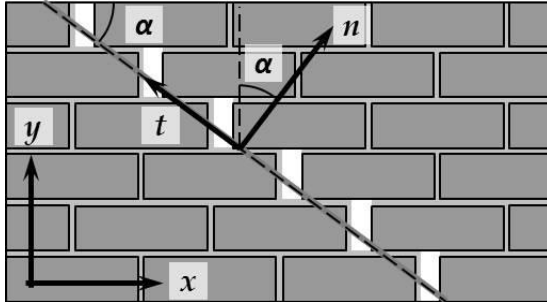
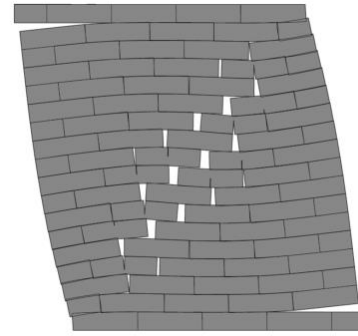
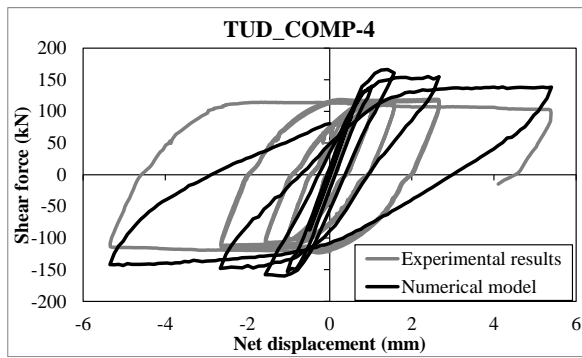
Faculty of Civil Engineering & Geosciences, TU Delft, The Netherlands

COMPUTATIONAL MODELLING AND LAB TESTING OF MASONRY WITH A VIEW TO GRONINGEN INDUCED SEISMICITY



Topics:

- Introduction to Groningen induced seismicity due to gas extraction
- Constitutive models for concrete and masonry: discrete cracking, crushing and friction, decomposed-strain based smeared cracking, total-strain based smeared cracking + crushing, plasticity based models, new total-strain based model for masonry including cyclic hysteresis
- Nonlinear finite element analysis: popular element types and incremental-iterative solution procedures
- Sequentially linear analysis: saw-tooth softening for stable post-peak analysis of quasi-brittle structures, including snap-backs and jumpy discontinuous behavior, event-by-event method, damage-driven
- Overview of multi-level experimental and computational masonry campaign for Groningen – materials, component and building level
- Research at materials level: masonry, parameters for FEM, correlations, distributions
- Research at component level: in-plane and out-of-plane behavior, tests and simulations with various softening models
- Research at building level: current possibilities and limitations of various models in quasi-static push-over and nonlinear time history analysis, validation against lab house test, attention to seismic cases and also examples for settlement damage



JAN ROTS

Jan Rots graduated from the faculty of Civil Engineering at Delft University of Technology. Subsequently, he continued his research into smeared cracking, discrete cracking and bond in concrete structures in a combined position at TNO Building and Construction Research and Delft University of Technology. He passed his Phd in 1988. Gradually, he shifted attention from concrete to masonry and glass and from laboratory scale to true building scale. He has contributed to the development, use and support of the DIANA finite element program. In the period 1994-1998 he chaired the TNO section of Computational Mechanics, the DIANA Foundation, STW/CUR-projects on brick/block masonry and underground structures. Since 1999, he is a full professor at TU Delft, first in the Faculty of Architecture and since 2006 in the Faculty of Civil Engineering and Geosciences, where he chairs the Department of Structural Engineering. His research interests include constitutive modelling, nonlinear and sequentially linear analysis for quasi-brittle structures and since recently modelling and testing of masonry for Groningen induced seismicity. Email: j.g.rots@tudelft.nl