



Dipartimento di Strutture per l'Ingegneria e l'Architettura (DiSt)

Nell'ambito delle attività del Corso di Dottorato in
Ingegneria Strutturale Geotecnica e Rischio Sismico

25-26 marzo 2020, ore 10:00-14:00

27 marzo 2020, ore 10:00-18:00

Dr. Claudia Casapulla

(DiSt - Università degli Studi di Napoli Federico II)

terrà un Corso breve dal titolo

Non linear static and dynamic analysis of 3D rocking masonry structures using rigid macro-block modelling

In masonry buildings without a box-type behaviour, such as most existing masonry buildings in the historic city centres, local out-of-plane failures especially of peripheral walls can take place, even under low intensities of ground motion. It has been recognized, in particular, that the most recurrent failure modes caused by seismic forces acting orthogonally to the building walls involve simple and complex rocking of parts of masonry, e.g. overturning of masonry façades, with and without parts of sidewalls, and of masonry corners. These kinds of failure generally occur when a monolithic behaviour can be assured for walls so as they can be regarded as rigid blocks. The objective of the proposed short course is to analyse the out-of-plane seismic response of such rocking structures by means of two fundamental approaches in non-linear static and dynamic fields. The two modelling approaches are useful to define the onset and limit overturning conditions of any rigid block to a given earthquake and its seismic assessment. The non-linear static approach is based on the displacement-based assessment philosophy aimed at predicting the onset failure mechanism of the rocking rigid block and of the evolution of motion over time through incremental kinematic analysis. The stabilising role of friction between interlocked walls can be evaluated during the rocking motion and proper pushover curves can be constructed. The capacity in terms of both forces and displacements can then be compared with the seismic demand through the construction of Acceleration-Displacement Response Spectra (ADRS). According to the non-linear dynamic approach, which started with the pioneering Housner's work, the rocking motion occurs with dissipation of energy around a pivot point located at the two base corners of the block. Similarly to the non-linear static analysis, also the non-linear dynamic analysis can be performed for a masonry element in one-side motion both in free condition (e.g. neglecting intersection of walls) and in restrained configuration (e.g. with interlocked walls).

Via Claudio, 21 – edificio 6, aula Manfredi Romano (1° piano)

Tutti gli interessati sono invitati a partecipare

**Il Coordinatore del Dottorato
Prof. Ing. Iunio Iervolino**