ESTRATTE

Gruppo A

1. tecniche e strumenti per la misura delle deformazioni nelle strutture oggetto di prova di carico

2. conversione analogico digitale all'interno di sistema di acquisizione di un laboratorio prove materiali e strutture

3. macchine di prova materiali a compressione e trazione. tipi e caratteristiche principali. taratura. classe di precisione.

Gruppo B

Composizione e funzioni del Consiglio di Dipartimento.

Informatica

Con Excel tracciare il grafico della funzione y = sen x per x tra -pi e pi e si importi il grafico come figura in Word

Inglese

Vedi testi allegati

Latest findings on the behaviour factor q for the seismic design of URM buildings

Morandi, P., Butenweg, C., Breis, K., Beyer, K., Magenes, G.

Bulletin of Earthquake Engineering, 2022

Hide abstract

Recent earthquakes as the 2012 Emilia earthquake sequence showed that recently built unreinforced masonry (URM) buildings behaved much better than expected and sustained, despite the maximum PGA values ranged between 0.20–0.30 g, either minor damage or structural damage that is deemed repairable. Especially low-rise residential and commercial masonry buildings with a code-conforming seismic design and detailing behaved in general very well without substantial damages. The low damage grades of modern masonry buildings that was observed during this earthquake series highlighted again that codified design procedures based on linear analysis can be rather conservative. Although advances in simulation tools make nonlinear calculation methods more readily accessible to designers, linear analyses will still be the standard design method for years to come. The present paper aims to improve the linear seismic design method by providing a proper definition of the q-factor of URM buildings. These q-factors are derived for low-rise URM buildings with rigid diaphragms which represent recent construction practise in low to moderate seismic areas of Italy and Germany. The behaviour factor components for deformation and energy dissipation capacity and for overstrength due to the redistribution of forces are derived by means of pushover analyses. Furthermore, considerations on the behaviour factor component due to other sources of overstrength in masonry buildings are presented. As a result of the investigations, rationally based values of the behaviour factor q to be used in linear analyses in the range of 2.0–3.0 are proposed.

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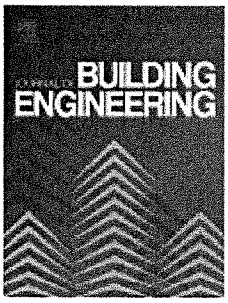

Linear and non-linear FEM analyses to assess a shear flat-jack test for masonries

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Highlights

Numerical study of in-situ performed shear Flat Jack tests on existing masonry.

Linear analyses of FE micro-models for studying measured shear moduli.

Non-linear analyses of FE macro-models for studying measured shear strengths.

Abstract

The shear properties are key characteristics for evaluating masonry elements under in-plane horizontal actions. Historical structures may need the evaluation of these properties in order to perform safety evaluations, diagnoses, retrofitting, etc. These properties are often difficult to estimate and may be measured using Destructive Testing (*DT*) methods, which are not always compatible with the structure under test, either because of the cultural value, the high cost or the excessive damage introduced. Therefore, this paper addresses a Minor Destructive Testing (*MDT*) technique with the purpose of measuring masonry shear properties. This represents a first contribution to a universally adopted and accepted *MDT* technique, which is not currently available. The present paper aims to study in detail the experimental results of four shear Flat Jack (*FJ*) tests from literature, by means of linear and non-linear analyses performed using micro and macro Finite Element models. These analyses are meant to study the ability of the shear *FJ* test for evaluating the shear modulus and the diagonal tensile strength of unreinforced brick masonry. The numerical results highlight the potential for the shear *FJ* test to become a suitable *MDT* method for evaluating the shear modulus and strength of brick masonry and evidence some aspects where further investigation is advisable.