Advance Researches in Civil Engineering
ISSN: 2645-7229, Vol.2, No.4, pages: 15-25

Code 729 the First Iranian Guideline for Strength-based Design of Non-Structural Masonry Walls: A Verification Report

Seyyed Amin Mousavi [1*]

[1*] *Ph.D., Behsazan Larzeh Davam Co., The Science and Technology Park of University of Tehran, Tehran, Iran (s.a.mousavi@ut.ac.ir)*

(Date of received: 12/08/2020, Date of accepted: 23/10/2020)

ABSTRACT

In 2017, the first Iranian guideline for strength-based seismic design of non-structural masonry walls, Code 729, published by The Plan and Budget Organization of Iran. Code 729 uses strength-based procedure and the yield-line theory to design unreinforced and reinforced non-structural masonry walls with or without openings. In this paper, first a brief overview of Code 729 is presented and then using a comprehensive experimental database of 72 full-scale masonry walls, accuracy of the code is demonstrated. It is seen that Code 729 can estimate out-of-plane capacity of different masonry walls with good accuracy. According to the results, average, median, and median plus one standard deviation of errors of the Code 729 in estimating out-of-plane capacity of masonry walls, respectively, are 20%, 18%, and 33.2% and with a probability of 85% the error would be less than 34%. Considering the complicated two-way orthotropic behaviour of non-structural masonry walls and their highly uncertain properties, such level of error is deemed to be acceptable for practical applications. In addition to experimental results, Finite Element simulations are also carried out in this study to shed more light on out-of-plane behaviour of walls with different opening details.

Keywords:

Nonstructural Elements, Nonstructural Masonry Wall, Out-of-plane Behavior.