

SEISMIC PERFORMANCE ASSESSMENT OF MULTISTORY BUILDINGS WITH NON-STRUCTURAL HOLLOW CLAY TILE INFILLS

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ABSTRACT

In recent years, walls made by Hollow Clay Tiles (HCT), have been used as a common partitions in Iran and other countries. These partitions are generally thought as non-structural elements and hence not considered in analysis and design of buildings; this is due to the lack of information about the seismic performance of partitions. In this study, based on experimental tests, a new analytical backbone curves are proposed to simulate the performance of HCT partitions. Partitions considered in this study have two types of overlays (plaster + browning plaster and cement), R.C. frames are in 3 and 6 stories and OpenSees software is used for non-linear modelling.

The effect of presence of this type of partitions in seismic performance of R.C. frames is investigated by modal and nonlinear push-over analysis. It has been observed that the presence of the wall makes a significant reduction in fundamental period of frames while the changes in mode shapes are not considerable. On the other hand, the deformation capacity of the frames decreases.

INTRODUCTION

Nowadays the use of Hollow Clay Tile (HCT) partition in buildings is a common practice; but, these partitions are generally thought non-structural and hence not considered in the analysis and design of buildings. The background of neglecting infill walls in the analysis process is partly the result of incomplete knowledge on behaviour of such partitions, particularly those made by HCT. In recent years, some experimental and analytical researches have been conducted on seismic response of HCT infills and the lack of information in this field is dissipated. Seismic performance of three HCT walls with different overlays was investigated in a series of experimental tests by Khanmohammadi et al. (2011). Overlays used in this study (Khanmohammadi et al. 2011) are plaster + browning plaster, cement and tile + grout and seismic responses are reported. In current research an analytical investigation is performed and analytical backbone