CONTRIBUTION TO DEFINITION OF SEISMIC REHABILITATION NATIONAL RECOMMENDATIONS FOR BUILDINGS

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ABSTRACT

The present paper systematizes and organizes a summary of a survey carried out on the technical documentation available at international level in countries with moderate to high seismic hazard and that, taking into account the Portuguese reality, may contribute to the elaboration of standards and provisions applicable to Portugal in the seismic rehabilitation interventions of existing buildings. The most relevant concepts, criteria and provisions of the documentation studied at European and North American level are summarized and analyzed and a preliminary assessment is made

Keywords: seismic rehabilitation, seismic reinforcement, standards, tech. recommendations.

INTRODUCTION

Recent earthquakes such as those of Amatrice (2016), Lorca (2011) and L'Aquila (2009) have shown that a large number of European cities, located in regions of high population density, may eminently suffer significant economic and human losses, considering the vulnerability of the building park. Most of the buildings built until the end of the first half of the 20th century of moderate to high seismic hazard zones, due to the lack of regulations for seismic design and the aging of these buildings, have insufficient seismic capacity. In the case of more recently designed structures, recent events have shown behavior deficiencies, sometimes associated with the absence of maintenance or non-compliance with current regulations (Falcão Silva and Coelho, 2014).

A significant part of the technical and scientific literature dedicated to the subject of seismic rehabilitation is oriented towards ancient constructions of specific importance. Regarding the evaluation and seismic rehabilitation of current buildings, there are, in the most affected countries by the seismic threat, regulations, norms or recommendations whose application makes possible seismic rehabilitation. This type of documentation does not exist yet in Portugal, constituting the study and analysis of the recommendations existing in other countries with analogous situations and constructions, presented in the this paper, basic information that could contribute to the definition of guidelines to be implemented in a seismic rehabilitation strategy of buildings at national level (Falcão Silva and Baião, 2016).

RESULTS AND CONCLUSIONS

The paper includes a survey of the internationally available technical documentation for seismic rehabilitation of buildings, with a brief comparison between the contents of the
documentation referred (Falcão Silva; Baião; 2016), making a specific comparison of the approaches at European level, according with Eurocode 8 (CEN, 2004) (CEN, 2005) and the Italian standard (OPCM, 2003) (OPCM, 2005), and the approaches proposed at north American level (USA) (ASCE: s / d).

The results of this analysis allow obtaining some comments on the similarities and differences between the concepts and methodologies present in each of the analyzed documents. The analysis carried out may constitute an important and relevant contribution to the future development of support documentation for rehabilitation and structural reinforcement interventions in Portuguese existing buildings.

Actually there is no complete legal framework for the current practice of rehabilitation and seismic reinforcement in Portugal. The Portuguese experience is expressed in some guidelines and recommendations that derive from national practice, combined with previous theoretical knowledge, as well as other theoretical and practical sources collected throughout the world.

Following the economic and social environment that the country has been experiencing in recent years, it seems that the market for the rehabilitation of Portuguese built assets may increase significantly in the coming years. In the view of the foregoing, the development of technical recommendations or national standards to support interventions for rehabilitation and structural and seismic enhancement of existing buildings appears to be an urgent need.

REFERENCES


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