

INFLUENCE OF THE SHEAR–BENDING INTERACTION ON THE GLOBAL CAPACITY OF REINFORCED CONCRETE FRAMES

A brief overview of the new perspectives

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ABSTRACT

In many seismic countries in the World (e.g. Europe, Northern USA, Japan, Turkey, etc.), the assessment of existing structures is a priority, since the majority of the building heritage was designed according to out-of-date or even non-seismic codes. The uncertainties about the nonlinear behaviour of the structures are, therefore, important and the nonlinear response should be treated directly, with a correspondingly strong increase in complexity of the assessment procedure. The assessment of regular reinforced concrete frame buildings has been performed, according to the Italian Seismic Code, Eurocode 8 and the CNR DT-212 guideline. A lumped plasticity model has been used with the aim of quantifying the differences between a fixed and a continuously updated shear span and between the use of inelastic springs located at the member ends or continuously along the beam elements, and with the purpose of considering the influence of axial-bending-shear interaction on the global capacity of the buildings.

Keywords: Nonlinear Seismic Response; RC Frame Building, Shear Strength, Shear Interaction, Shear Span, Nonlinear Static Analysis, Lumped Plasticity Model.

INTRODUCTION

The recent seismic events and the importance of seismic prevention, increasingly growing in the last few years, have highlighted the necessity of assessing the capability of the existing building heritage to sustain earthquakes, in order to improve the average safety level of the population. The adequate modelling of