

Ductility Reduction Factors for Displacement Spectra Corresponding to Soft Soil Zone of the Valley of Mexico

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Abstract : A simplified mathematical expression to estimate ductility reduction factors of the displacement spectra corresponding to the soft soil zone of Mexico City is proposed. The aim is to allow a better characterization of the displacement spectra and provide a simple expression to be used in displacement based design (DBD). Emphasis is on the Mexico City Building Code. The study is based on the analysis of single degree of freedom (SDOF) systems with elasto-plastic hysteretic behavior. Several seismic ground motions corresponding to subduction events with magnitudes equal to or greater than 6 and recorded in different stations of Mexico City are used. The proposed expression involves the ratio of elastic and inelastic pseudo-aceleration spectra, and depends on factors such the ductility demand and the vibration period of the structural system. The resulting ductility reduction factors obtained in this study are compared with others existing in the literature, and their advantages and disadvantages are discussed.

Keywords : displacement based design, displacements spectrum, ductility reduction factors, soft soil

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