

Preliminary response spectra for seismic microzones in Quito

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The city of Quito, located in a basin limited by active faults, is exposed to high seismic hazard, and the effects of an earthquake might be amplified by basin effects, which motivated studies of seismic response and seismic microzoning since the 90s (e.g. EPN et al., 1995; ERN et al., 2012). These studies generated detailed knowledge of geological zones, for which resulting response spectra at surface have been defined. Nevertheless, this technical information had not been implemented for use in building design, which motivated the conformation of an interdisciplinary group to analyze the existing studies (Schmitz et al., 2017). It turned out that the seismic hazard, dominated by local blind faults, had to be adjusted to the values of the national building code (MIDUVI, 2015). 10 Microzones of similar seismic behavior, including expansion areas in the Interandean Depression, were defined and adjusted to the geology, together with an analysis of near surface soil quality (Vs30) based on limited geophysical and geotechnical data and analysis of the topography. Response spectra were calculated using a linear equivalent approach for a limited number of soil profiles (29) considering a depth to bedrock of up to 700 m for the deepest part of the basin. The spectra were calibrated with recent records, and adjusted to the factors defined in the building code; these indicative results might be used as base for a preliminary ordinance. For the detailed exploration of the basin with geophysical and geotechnical methods, funds have been addressed by the local government.

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