

IMPLICATIONS OF SITE SPECIFIC RESPONSE ANALYSIS

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ABSTRACT

Definition of design earthquake characteristics, more specifically uniform hazard acceleration response spectrum, on the ground surface is the primary component for performance based design of structures and assessment of seismic vulnerabilities in urban environments. The adopted approach for this purpose requires a probabilistic local seismic hazard assessment, definition of representative site profiles down to the engineering bedrock, and 1D or 2D equivalent or nonlinear, total or effective stress site response analyses depending on the complexity and importance of the structures to be built. Thus, a site-specific response analysis starts with the probabilistic estimation of regional seismicity and earthquake source characteristics, soil stratification, engineering properties of encountered soil layers in the soil profile. The local seismic hazard analysis would yield probabilistic uniform hazard acceleration response spectrum on the bedrock outcrop. Thus, site specific response analyses also need to produce a probabilistic uniform hazard acceleration response spectrum on the ground surface. A general review will be presented based on the previous studies conducted by the author and his co-workers in comparison to major observations and methodologies to demonstrate the implications of site-specific response analysis.