Ground Response Analyses in Budapest Based on Site Investigations and Laboratory Measurements

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Abstract : Near-surface loose sediments and local ground conditions in general have a major influence on seismic response of structures. It is a difficult task to model ground behavior in seismic soil-structure-foundation interaction problems, fully account for them in seismic design of structures, or even properly consider them in seismic hazard assessment. In this study, we focused on applying seismic soil investigation methods, used for determining soil stiffness and damping properties, to response analysis used in seismic design. A site in Budapest, Hungary was investigated using Multichannel Analysis of Surface Waves, Seismic Cone Penetration Tests, Bender Elements, Resonant Column and Torsional Shear tests. Our aim was to compare the results of the different test methods and use the resulting soil properties for 1D ground response analysis. Often in practice, there are little-to no data available on dynamic soil properties and estimated parameters are used for design. Therefore, a comparison is made between results based on estimated parameters and those based on detailed investigations. Ground response results are also compared to Eurocode 8 design spectra.

Keywords : MASW, resonant column test, SCPT, site response analysis, torsional shear test

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