GEOTECHNICAL MEASUREMENTS

SPOTLIGHT
GEOPHYSICAL SERVICES

Geophysical measurements are used to obtain in-situ values of geotechnical and engineering parameters such as seismic velocity, elastic parameters, and electrical resistivity. These measurements are important factors in the appropriate design of foundations, electrical grounding systems, and seismic control measures. For example, seismic shear-wave measurements (Vs30) are used to obtain the site class defined by the National Earthquake Hazards Reduction Program. The in-situ geophysical measurements are often a more realistic approach to obtaining these values compared with disturbed laboratory samples. Examples of geophysical measurements for geotechnical applications include:

- SASW to non-invasively obtain measurements of seismic shear-wave velocity to depths of 100 feet or more. SASW is a seismic method that uses the dispersive characteristics of surface waves to obtain shear wave velocity soundings. 1D models are used to develop the thickness-weighted Vs30 measurements and seismic site classification.

- MASW to non-invasively obtain measurements of seismic shear-wave velocity to depths of 100 feet or more. MASW is similar to SASW, however, multiple receivers are used to increase the signal-to-noise ratio and aid in the analysis. Multiple 1D models along a survey line can be combined into a 2D cross-section of shear-wave velocity.

- Cross-hole and Down-hole Seismic to provide in-situ measurements of seismic P-wave and S-wave velocities to calculate elastic parameters. Cross-hole methods use sources and receivers in boreholes (typically separated by 15 feet) to measure the velocity between the boreholes. Down-hole methods utilize a surface source and down-hole receiver in a single borehole. Both methods are outlined in ASTM guidelines.

- Resistivity Soundings to assess subsurface electrical resistivity for grounding and cathodic protection systems.

For more information, contact Spotlight Geophysical Services at info@spotlightgeo.com on the web at www.spotlightgeo.com