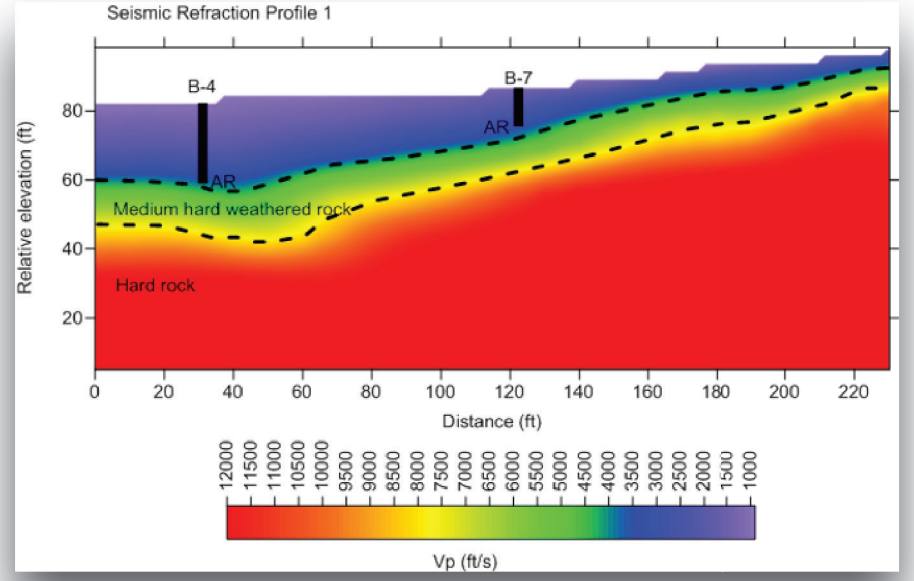
Seismic

Seismic methods include seismic Refraction, Reflection and Multi-Channel Analysis of Surface Waves (MASW). The refraction method is one of the most commonly employed methods for near surface subsurface investigations. All methods utilize a seismic source such as a hammer or explosive charge to generate seismic energy which is recorded from a series of geophones along a line or traverse over the area of interest. Variations in soil and bedrock density directly control the velocity of the seismic wave and therefore the overall layering or composition of the subsurface is modeled. The refraction method is highly efficient and effective for determination of depth to bedrock greatly reducing the need for geotechnical borings and/or guiding the boring program.



The MASW seismic method measures shear wave velocity variations in the subsurface as the wave energy disperses. Vertical geophones are used to measure the shear wave arrivals that vary with frequency and their corresponding depth. The measured shear wave velocity is directly related to the density and shear strength of the material. The measurements are excellent indicators of the "stiffness" or moduli of various layers in the subsurface. As with the other seismic methods inversion software is used to model the wave properties into a geologic interpretation. The method is very effective at identifying voids, mapping geologic layers, depth to bedrock, and moduli of those respective layers.

APPLICATIONS

- Depth to bedrock profiling
- Rock quality rippability
- Rock and soil moduli evaluation
- Karst and void detection
- Groundwater exploration
- Mapping of aggregates/materials such as sand, clay, and gravel