

Geophysics and Geology

Using Geophysics

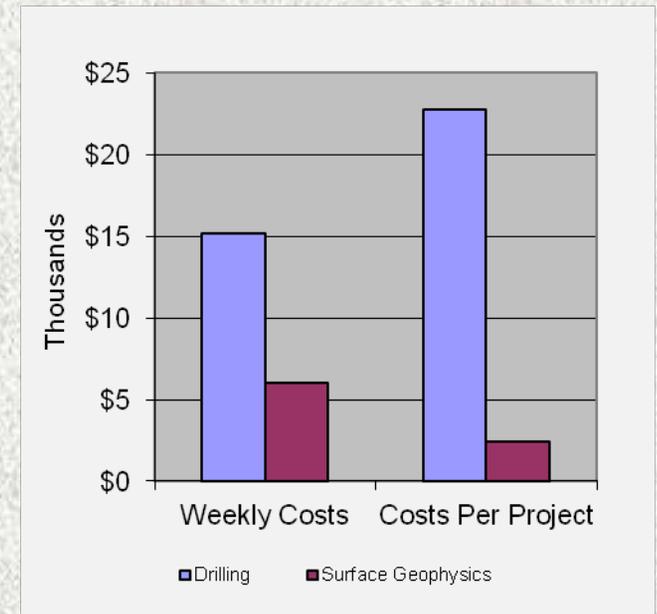
Selection of geophysical methods for geotechnical assessment is dependent on the targets of interest, external sources of interference (noise) and cost-effectiveness. Different geophysical methods are sensitive to different physical properties. Site-specific evaluation is needed to determine which technique (or techniques) best meets the needs of the investigation.

Evaluation includes assessing target composition and depth of burial, physical site constraints on equipment layout, the influence of site conditions on method performance, required data resolution, cost and safety.

There are instances where the use of geophysics would not be feasible or cost-effective. Discussion of project specifics with the Geophysics and Geology Branch can assist in making that determination.

External noise influences selection and use of geophysical techniques, especially for surface methods, which are more prone to noise effects. Survey designs must account for increased noise from urban environments. Highway structures and associated traffic present potential noise sources that may interfere with geophysical measurements. These noise sources must be carefully considered when planning geophysical surveys.

Cost effectiveness must also be assessed prior to using geophysics. Surface methods for reconnaissance can assist in planning borehole locations and provide cost savings by focusing drilling efforts on anomalous areas, reducing the required investigation time. Additional savings (and project safety) can be realized by using geophysics for clearing underground utilities prior to drilling.



Geophysical methods are significantly less expensive than drilling. Geophysics will never replace drilling entirely: drilling provides “ground truth” verification of all geophysical interpretations. However, judicious use of geophysics reduces the number of boreholes needed to a reasonable minimum, providing significant cost savings for field investigations.

More information on geophysical applications is available from the Federal Highway Administration at the following link:

<http://www.cflhd.gov/resources/agm/engApplications/index.cfm>