Problems and Application of the Seismic Refraction Method in Civil Engineering Projects in Malaysia

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In recent years, the seismic refraction method has been graining popularity as an effective tool in civil engineering site investigation. This paper discusses some of the practical problems encountered in the application of the shallow seismic refraction techniques in Malaysia.

Apparently, as the depth of investigation becomes shallower, the limits of the practical capabilities of the method are approached because the differences between the theoretical assumptions and the actual conditions become more pronounce. Experience from shallow seismic work shows that the ground terrain, weathering pattern, soil conditions and other local irregularities have profound effects on the seismic results obtained. Results improved considerably when local ground conditions and terrain are taken into consideration in the planning of the layout of the geophone spreads and shot points.

Constraints by rugged and hilly terrain, thick low velocity layer and thick vegetation limit the practical capabilities and applications of the seismic refraction techniques in Malaysia. In sub-surface investigation for engineering earthworks, quarrying and foundation purposes, the seismic refraction method has proven to be more 'reliable', economical and less time consuming than large-scale conventional drilling method of investigation. Nevertheless, due to the inherent ambiguities in the seismic interpretation, it is advisable to include limited drilling programme in the seismic survey for correlation purposes.

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