Reviewed research article

Shear wave velocity in surface sediments

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Abstract — *Surface sediments of different nature are common in Iceland. Natural soil sites and man-made fillings commonly serve as foundations for different types of structures. In Civil engineering work it is fundamental to know the geotechnical properties of these materials in the upper 20–30 m. A seismic method called Spectral Analysis of Surface Waves (SASW) has been used in recent decades in Iceland to measure and evaluate shear wave velocity at different natural sites as well as in man-made fillings. The method is fast and involves low cost equipment. It gives reliable results down to 20 m depth by using sledge as a seismic source and copes with both soft and stiff soil sites. Furthermore, the technique can be applied at coarse grained gravelly sites where it can be difficult to use borehole and penetration methods. We describe the methodology used in these projects and review all SASW measurements carried out in Iceland. The soil strata at all test sites are classified based on sieve analysis when possible. Natural sites and man-made fillings are kept separated. A database and an open web site are introduced where all the SASW results can be viewed and shear wave profiles for different soil types and unlike sites can be compared. The main aim with the database and the webpage is to give scientists and engineers access to this data and enable them to compare stiffness at different sites.*