

Public Abstract

Matt Hollrah

MS

Civil and Environmental Engineering

Development and Implementation of an Underwater System for Interface Wave Measurements

Advisor: Dr. Brent Rosenblad

Graduation Term Fall 2005

Measurement of shear wave velocity profiles has become an important component of geotechnical site investigation both on land and offshore. Obtaining accurate near surface profiles in soft marine sediments can be expensive and time consuming using conventional intrusive methods. This work includes the development and field testing of an underwater source and receiver array capable of generating surface wave energy for the determination of shear wave velocity profiles to depths of approximately 15 to 20 feet with resolution in the top 1 to 2 feet.

A portable and remotely fired underwater impact source was developed. Dispersion curves generated using conventional surface wave methods and instrumentation for shallow testing on land were compared to those obtained using the source. The source was also used to conduct underwater measurements using both contacting and non-contacting receivers. Measurements conducted with the source and contacting instrumentation showed that Scholte waves were generated in the underwater environment over the wavelength range of interest. Non-contacting interface wave measurements were compared to the contacting measurements and show promising results with a need for further investigation.