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Development and Validation of a MassHighway Geotechnical Engineering In Situ Testing Vehicle

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16. Abstract

This technology transfer and implementation project developed a state-of-the-art in situ testing vehicle for the Massachusetts Highway Department (MassHighway) that can be used to perform detailed geotechnical engineering in situ testing at project sites throughout the Commonwealth of Massachusetts in a wide variety of geologic materials. An existing MassHighway truck mounted drill rig manufactured by Mobile Drilling Co., Inc., was retrofitted with the necessary tooling to conduct the in situ tests. The project developed the equipment for conducting standard penetration (with an automatic hammer), drive cone, cone penetration, seismic piezocone, plate load and pressuremeter tests. Interpretation of data from such testing provides information on basic soil characteristics and key design parameters such as in situ stress state, stiffness, flow and shear strength properties. Training of MassHighway personnel on use of the equipment was conducted at five research test sites that consisted of a variety of soil conditions ranging from fine to coarse-grained soils. The efficiency and potential of the in situ tests developed for MassHighway in this project was demonstrated through the field work and subsequent presentation of measured and interpreted data. Details on how to conduct the in situ tests, data processing, data presentation and data interpretation are presented in a user manual entitled "Development and Validation of a MassHighway Geotechnical Engineering In Situ Testing Vehicle: User Manual" that accompanies this report.

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