

Assessment of Innovative Ground Modification Techniques Phase B



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16. Abstract <p>As our society continues to expand, land that is suitable for construction in its natural state becomes increasingly scarce, and we are forced to place many of our projects on sites that would have formerly been considered "unsuitable." Highway structures located on soils with poor support conditions are often placed on deep foundations to transfer the loads to more competent bearing materials. Recently, however, advances in ground modification techniques have produced alternatives which, in many cases, are much more cost-effective. Reinforcement of foundation soils with geosynthetics and in situ densification of unsuitable soils represent two innovative approaches for cost-effective ground modification. Phase A of this research contract dealt with the former technology. Phase B involved research related to an in situ densification project.</p> <p>Under Phase B, the subject of this report, an extensive in situ testing program was conducted to evaluate deep dynamic compaction (DDC) on a granular fill placed in a fairly loose state under water between two rows of steel sheet piling. The in situ tests included cone penetration testing (CPT), seismic cone penetration testing (SCPT), standard penetration testing (SPT), drive cone penetration testing (DCPT), dilatometer testing (DMT), and testing with a specially designed instrumented dilatometer (IDMT) constructed at the University of New Hampshire. The results of the Phase B study showed that the CPT, DMT and IDMT were particularly useful tools for providing stratigraphic profiles as well as QA/QC data for in situ densification projects. In addition to evaluating the sufficiency of compaction, the test results were used to validate design assumptions and to develop correlations between several factors that influence the magnitude of soil improvement resulting from dynamic compaction.</p>			
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