

## Assessment of Innovative Ground Modification Techniques Phase A



**Mitt Romney**  
*Governor*

**Kerry Healey**  
*Lieutenant Governor*

**John Cogliano**  
*Secretary*

**Luisa Paiewonsky**  
*Commissioner*

# Technical Report Document Page

1. Report No. SPRII.01.15A	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Assessment of Innovative Ground Modification Techniques Phase A		5. Report Date September 2004	
		6. Performing Organization Code	
7. Author(s) Dr. Heather J. Miller		8. Performing Organization Report No. UMTC-05-01	
9. Performing Organization Name and Address University of Massachusetts Dartmouth 285 Old Westport Road North Dartmouth, MA 02724-2300		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address Executive Office of Transportation Ten Park Plaza, Room 4150 Boston, MA 02116		13. Type of Report and Period Covered Final Report 09/27/01 to 09/30/04	
		14. Sponsoring Agency Code	
15. Supplementary Notes Prepared in cooperation with the Massachusetts Highway Department and the Federal Highway Administration.			
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 A, the subject of this report, a full-scale field study was conducted to compare the load-settlement behavior of two abutments placed on shallow foundations: one placed on granular soil reinforced with several layers of geogrid, and the other placed on unreinforced soil. On this project, it is likely that the contractor minimized the elastic settlement of the granular fill beneath the abutments as a result of the diligent construction procedures followed during placement and compaction of the granular fill. Because minimal settlements were observed, it was not possible to make definitive conclusions regarding the use of geogrid layers to limit settlements.</p>			
17. Key Word		18. Distribution Statement	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 69	22. Price