

## **INTRODUCTION**

Effective quality control procedures are an essential part of ground improvement projects. Quality control can involve monitoring construction procedures (method specifications) or post-construction verification of results (end-result specifications). The choice between method specifications and end-result specifications is an important consideration for design, and depends on the type of ground improvement, the time required to acquire and analyze data, the cost of the quality control procedures, and the degree of assurance they provide that the desired ground improvement has been achieved.

Webster's Dictionary defines quality control as the "system for ensuring quality of an output involving inspection, analysis, and action to make required changes." In current geotechnical practice, these activities have been separated into two categories: quality control and quality assurance. As described by Hayward Baker Inc. (1998) in Table 1, quality control involves field and laboratory tests, and aspects of quality and inspection that are field identification of deficiencies. Quality assurance is defined as the review, analysis, and reporting of quality control data to ensure conformance with the project intent and design.

This report summarizes common quality control methods for ground improvement. In situ verification tests and method specifications are often employed due to the potential for real-time quality control. Common in situ tests are discussed, highlighting their use for verifying quality control, and their advantages, limitations, costs, and the time required for obtaining data and identifying non-conformance. References documenting the use of each in situ test for quality control of various ground improvement techniques are included. The advantage of using a test section in order to develop method specifications, and refine construction procedures, is addressed. Common quality control methods for various ground improvement techniques are discussed, highlighting method specifications, end-result specifications, and time considerations.