W. Allen Marr

Uses of Automated Geotechnical Instrumentation Systems


ABSTRACT: Developments occurring in electronics and instrumentation promise to lower the cost and improve the reliability of electronic systems to monitor geotechnical instrumentation. The miniaturization of electronics, reduction of power consumption, reduced component cost, and improved component reliability all help to make new instruments possible and geotechnical instrumentation more cost effective.

This paper describes the application of some of these developments to three problems and summarizes the potential benefits to the engineer from their use. The increased capabilities of instrumentation and data acquisition equipment combined with their improved reliability and lower cost will make future applications of geotechnical instrumentation more cost effective.

KEYWORDS: field instrumentation, tilt meters, piezometers, automated data acquisition

Introduction

The geotechnical practitioner faces many unknowns in design. In many cases, the effort required to remove these unknowns during design is too costly. Construction must proceed anyway. As a result, geotechnical engineers rely on field instrumentation to monitor the constructed facility and forewarn them of adverse performance resulting from these unknowns. Where required, the design or construction method is adjusted to avoid unacceptable performance. On most major geotechnical projects, field instrumentation constitutes an important element of the engineer’s overall design. The results from field instrumentation programs have contributed in a major way to many of the advances in our profession.