

A Case Study of Intelligent Compaction Used in Road Upgrades

Robert Leyland

Abstract

Compaction is one of the more important processes in roadway construction. It is needed to achieve high quality and uniformity of materials and ensure design performance. Current procedures using conventional compaction machines and limited Quality Control/Quality Assurance procedures may result in inadequate and/or non-uniform material densities, which can be one of the major factors that result in premature pavement failure. One of the most recent advances in related technology is that of intelligent compaction (IC) systems. As a whole such systems are said to provide numerous advantages including increased productivity, proactive compaction process adjustment, reduced spatial variations in compaction and greater data coverage compared to traditional testing methods. In a field study numerous different IC systems were used during construction of a number of experimental road sections in South Africa. These sections formed part of a road upgrade project typical of most road construction projects currently being performed in South Africa and the results obtained highlight the advantages and disadvantages of using the systems on such sites. Advantages included those commonly listed in IC literature whereas the disadvantages were related to the depth of measurement and manmade (brownfield) geological complexities. From this project potential advances in IC systems as well as additional uses of IC as a shallow subsurface characterization tool have been proposed.