Project Number: 0-6740

Project Title: Improvement of Construction Quality Control by Using Intelligent Compaction Technology for Base and Soil.

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Project Abstract

TxDOT current practice for field compaction quality control and acceptance for base and soil layers is to determine the compacted density and moisture content by nuclear density gauge (NDG). TxDOT has considered several stiffness-based devices to replace density measurement because stiffness parameters are more relevant to pavement design. Since both density and stiffness measurements are truly spot tests, they cannot represent the quality and uniformity of compaction in a continuous manner. Proof rolling is currently specified in TxDOT as a crude way of evaluating the uniformity of the compacted materials.

Intelligent compaction (IC) technique is a fast-developing technology for base and soil compaction quality control and acceptance. Proof rolling subgrade and base using the intelligent compaction rollers after completing compaction can effectively identify the weak spots and significantly improve the uniformity of the compacted layers. Even though TxDOT has participated in a FHWA-lead pooled fund study and funded several studies to implement the IC technology, there are still many obstacles and gaps that need to be explored and overcome in order to fully employ this technology in their day-to-day operations.

The primary objective of this project is to improve the process of accepting compacted materials to ensure quality, performance and durability using IC technology. We will develop innovative and practical test protocols and specifications to improve the general quality and acceptance of compaction for subgrade, embankment, and base construction with available IC rollers or instrumented rollers.