

Title:	Determine Impact of Field Sands on Workability and Engineering Properties of Superpave Mixtures in Texas
The Problem:	The use of field sand in the asphalt industry is a common practice to minimize the use of asphalt binder. Current TxDOT specification limits field sand to no more than 15 percent of the total aggregate or other uncrushed fine aggregate as described in TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, Item 344, "Superpave Mixtures." Traditionally the content of field sand in mixtures can be up to 10 percent. It is surmised that the compactability of mixtures is not affected by the inclusion of field sands. Similarly, as a practice, it is envisioned that the inclusion of field sand seems to improve the rutting resistance of asphalt concrete (AC) mixtures; however, there is a lack of technical information regarding the effect of the clay component in field sand and its impact on the compactability and engineering properties of AC mixtures.
Technical Objectives:	This research shall provide TxDOT with a testing protocol and corresponding specifications to determine the optimum field sand content to design Superpave mixtures without compromising the quality and performance of the HMA mixture. To achieve this objective, the work to be performed shall include: 1. Conduct an experiment to look at calcium carbonate versus bentonite clay using Methylene Blue, Linear Shrinkage, and Sand Equivalent tests or other appropriate test methods. 2. Characterize the minus 200 material from the field sand sources by using Methylene Blue, Linear Shrinkage, and Sand Equivalent tests or other appropriate test methods. 3. Utilize 100 percent calcium carbonate to develop the standard mix design, then substitute the minus 200 from the different field sand sources, bentonite clay, and calcium carbonate/clay blends. 4. Carry out HMA performance tests to evaluate how the mineral filler composition and properties affect the engineering performance of the mix. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.
Anticipated Deliverables:	1. Technical memorandum for each task completed. 2. Monthly progress reports. 3. Value of Research (VoR) that includes both qualitative and economic benefits, to be included in the final research report; <u>not a stand-alone deliverable</u>. 4. Research report documenting the findings of the research, including recommended guidelines in frameworks for each type of viable additive, and proposed revisions to TxDOT specifications and/or mix design procedures to implement recommended guidelines. 5. Project Summary Report
Proposal Requirements:	1. Utilize the "Proj/Agre" and "PA_Form" templates located at the TxDOT RTI website. 2. Proposals will be considered non-responsive and will not be accepted for technical evaluation if they are not received by the deadline or do not meet the requirements stated in RTI's University Handbook, which is also located at the RTI website. 3. Proposals should be submitted in PDF format, 1 PDF file per proposal. File name should include project name and university abbreviation. 4. This project will be tracked during the life of the project using a Technology Readiness Level (TRL) scale. For more information about the use of a TRL, click.