Title:	Exploring Feasibility of Using Rapid Setting Cements as a Cost-Effective Solution for Structural Applications in Texas
The Problem:	Construction and replacement of bridge structures and decks results in costly road closures. Using rapid setting cements, such as calcium sulfoaluminate (CSA) cement or calcium aluminate cement (CAC), can dramatically reduce the time needed for construction. These cements are sometimes used as repair materials, but are not commonly used for structural concrete or bridge decks. CSA, CAC, and other rapid-setting cements cost more than Portland cement, and the long-term performance in structural concrete and the long-term durability is not well understood, particularly in reinforced concrete. Implementation of these materials comes with the benefit of rapid construction, but the risk of higher cost and uncertain performance under some conditions. Research is needed into the property development and performance of these materials in structural concrete before the benefits of rapid construction can be realized.
Technical Objectives:	The researchers shall address the following: 1. Evaluate the typical range of fresh and hardened properties of concrete containing rapid-setting cements that are relevant for the design of structural concrete; e.g., modulus, shrinkage, strength gain, setting time, permeability/resistivity. 2. Evaluate the extent to which the initial cost of the materials can be offset by savings due to rapid construction. 3. Evaluate material properties of the rapid-setting cement concrete that can influence durability of the concrete; e.g., susceptibility to carbonation and corrosion potential. The expectation of this project is that the end product will obtain a TRL level 5.
Desired 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. 4. Research report documenting the findings of the research, including a material specification for quality monitoring program for rapid setting cements, a perspective specification for the use of rapid setting concrete, and a performance-based specification for making durable rapid setting concrete. 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.