

KANSAS DOT RESEARCH PROJECTS QUARTERLY PROGRESS REPORT

Lead Agency (University or Contractor): Kansas DOT

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

KDOT Project Number RE-0738-01	Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31, 2019) <input type="checkbox"/> Quarter 2 (April 1- June 30,2019) <input checked="" type="checkbox"/> Quarter 3 (July 1 – Sept 30, 2019) <input type="checkbox"/> Quarter 4 (October – December 31, 2019)	
Project Title: Utilization of Laser Induced Breakdown Spectroscopy for Real-Time Quality Control Monitoring and Characterization of Aggregate Materials Used in Highway Construction using		
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Project Investigator: Warren Chesner Phone: 516-431-4031 E-mail: wchesner@chesnerengineering.com		
Lead Agency Project ID: RE-0738-01	Other Project ID (i.e., contract)	Project Start Date: July 1, 2017
Original Project End Date: June 30, 2020	Current Project End Date: June 30, 2020	Number of Extensions: 0

Project schedule status:

- On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Total Percentage of Work Completed
\$870,000.	\$600000.00	69.0 %

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Complete This Quarter
\$870,000.	\$40000.00	4.6%

Project Description:

The primary objectives of this research effort is to develop a near-real-time laser-scanning system to rapidly classify aggregates used in highway construction. The intent is to employ this classification process to

- Quantify specific engineering properties (e.g., acid insoluble residue, soundness, LA Loss, etc.)
- Assess whether an aggregate will pass or fail a defined engineering property test
- Identify and/or quantify the presence of deleterious materials (e.g., ASR, chert, shale, reactive aggregate)
- Determine the composition of blends in stockpiled aggregate
- Determine the source of an unknown aggregate

Six states are part of this TPF program. They include: KS, MD, OK, OH, NY and NM.

Each State is supplying aggregates that will be tested and evaluated to determine the efficacy of the technology

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

During this period, modeling studies continued with a focus on MD samples to identify the quarry source of unknown samples. MD has provide 42 different source materials. This means that the laser will be tested to determine whether the system can be modeled to identify which of the 42 sources the unknowns came from. OH counting models are being developed for shale and chert counting. Software bugs and spectrometer hardware issues resulted in analytical and scanning schedule delays.

Anticipated work next quarter:

New modeling normalization techniques (mean centering and scaling) and wavelength reduction techniques will be employed to attempt to improve MD and OH counting models. New KS samples will be received for D cracking evaluation.

Significant Results:

Modeling of New York and Maryland friction properties were successful using carbonate samples. Kansas D cracking Models were developed for samples of a given formation. Chert counting models for Ohio were not initially Effective; but additional work is ongoing.

There is a lack of adequate sample volume from Oklahoma and New Mexico to pursue modeling activities at this time

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, with recommended solutions to those problems).

Sample collection has lagged and equipment and software issues have results in additional delays The program is Scheduled for completion in ~6 months-time. We are tracking budget and schedule closely at this time to determine the extent of these delays and their budgetary and scheduling impacts, which will hopefully be more clear by the end of next quarter .