TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): __FHWA____

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.

Transportation Pooled Fund Program Project #	**Transportation Pooled Fund Program - Report Period:**
TPF-5(210)	☐Quarter 1 (January 1 – March 31) 2012 ☐Quarter 2 (April 1 – June 30) 2012 ☐Quarter 3 (July 1 – September 30) 2012 √Quarter 4 (October 1 – December 31) 2012

Project Title: *In-situ Scour Testing Device*		
Name of Project Manager(s): *Kornel Kerenyi*	**Phone Number:** *(202) 493-3142*	**E-Mail** *kornel.kerenyi@fhwa.dot.gov*
Lead Agency Project ID:	**Other Project ID (i.e., contract #):**	**Project Start Date:**
Original Project End Date:	**Current Project End Date:**	**Number of Extensions:**

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**	**Percentage of Work Completed to Date**

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	**Total Amount of Funds Expended This Quarter**	**Total Percentage of Time Used to Date**

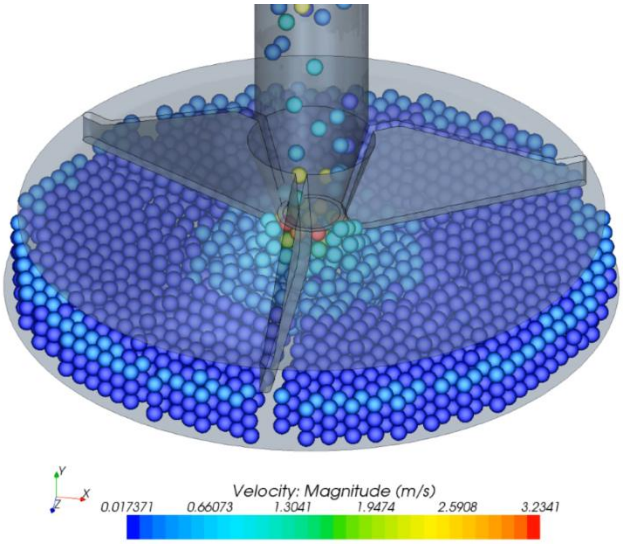
Project Description:
The contractor shall work with federal personnel from the Hazard Mitigation team at the Turner-Fairbank Highway Research Center (TFHRC) to demonstrate the feasibility of using an in-situ scour testing device to for use as a foundation design aid by the highway and bridge engineering community. The research will be based on a combination of data obtained from the historical scour research literature, laboratory experiments, and data collection.
The work includes:

- Fabricate Laboratory Device. Identify a practical combination of prototype device components (size of confining column, piping, etc.) and variable speed pumps (or throttles) that can be appropriately scaled down for laboratory testing. Acquire and/or manufacture the scaled-down device for laboratory use. Consider using CFD modeling to supplement developing the laboratory device.
- Calibrate and Test Laboratory Device. Correlate the discharge rate through the device with the viscous shear that is generated at the head of the device. Create a laboratory setting that will accommodate the sediment and flowing water necessary to conduct the tests both in the dry and submerged by varying depths of water.
- Run Experiments with the Laboratory Device. Identify the critical shear of the easily erodible, fine sand to be used in the tests and the appropriate shear decay function needed to define the reduction in flow rate with scour depth. Run a series of tests using the device in the easily erodible sand with initial shear stresses at the head of the device being multiples of the critical shear. Measure the resultant equilibrium scour depth. Run tests with successively higher initial shear stresses until an equilibrium scour depth on the order of 60-100 ft is attained for the prototype scale. The resulting data point pairs will define the relationship between initial shear and resulting scour depth for a given shear decay function.
- Run Experiments with the Laboratory Device for Different Sand Sizes. Repeat the test using a different sand size to determine the potential impact of gradation.
- Final Report. A detailed final report shall be submitted documenting all laboratory and field for the use of recycled concrete for smart armoring countermeasure.

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

- The C-ISTD was further improved, tested, and simulated. More robust erosion head design was explored to provide a larger range of applicability and more reliable results.


- CFD simulations are conducted on all potential configurations of the device to identify the benefit and potential adverse effects.



- The propeller-based ISTD was assembled and verified.

Anticipated work next quarter:

- U-ISTD, C-ISTD, and P-ISTD (propeller-based) will be calibrated by using high-precision shear sensor and by com the results to ESTD.

Significant Results:

The devices are being tested and optimized. More results will be given in the final report.

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, along with recommended solutions to those problems).

None to report.

Potential Implementation: