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(211)	√Quarter 1 (January 1 – March 31) 2013 ☐Quarter 2 (April 1 – June 30) 2013 ☐Quarter 3 (July 1 – September 30) 2013 ☐Quarter 4 (October 1 – December 31) 2013

Project Title: *Bridge Pier Scour Research*		
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**

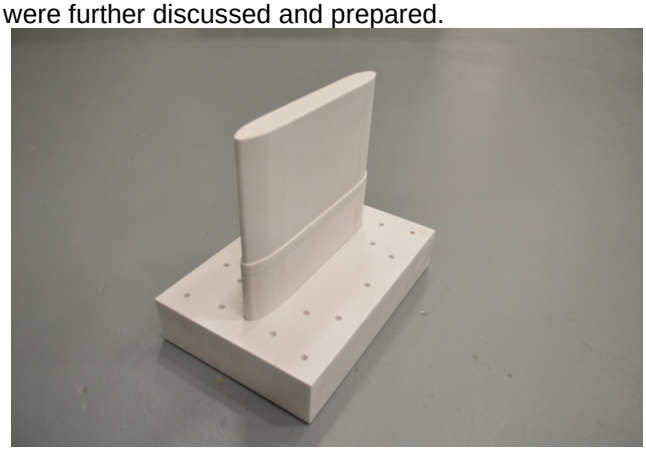
Project Description:
The present evaluation shows that, while the individual scour influences of the many bridge waterway variables are now well understood for simple or standard pier designs, and that recently developed scour estimation methods attempt to encompass these influences, there are several sources of substantial complexity that complicate the development of reliable comprehensive design relationship for estimating scour depth at piers:

- Complexity of flow field
- The fundamental problem of simultaneously scaling three scales (flow depth, bed material size and, structure size)
- Variations in channel boundary materials
- Differences in pier structure
- The complicating interaction of pier scour and other boundary erosion processes , such as accumulation of woody debris, ice bridge over-topping, abutment proximity, channel morphology, bedforms
- The large number of parameters involved

The TFHRC Hydraulics Laboratory will collaborate on this proposed research and will provide Lab capabilities and technical assistance.

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

- The fabrication of the pier model for the physical experiment was carried out. There were four potential methods in producing parts of the model: (1) In-house machining (TFHRC), (2) In-lab machining/assembly, (3) In-lab 3D printing, and (4) Prototyping service provider. Capability and precisions of each method were identified and jobs carried out simultaneously. The model design and fabrication were targeted at providing accurate geometry, adequate stability, and proper access to measurement of scour in the close vicinity of piles.
- CFD modeling approach were further discussed and prepared.



Part of the scale model showing the pier stem and retrofitted pile cap

Anticipated work next quarter:

- Detailing of pier model (drilling and finishing).
- Preparing the testing flume for the scour tests.

Significant Results:

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:

None from this period.