

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 # TPF-5(211)	Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31) 2014 <input type="checkbox"/> Quarter 2 (April 1 – June 30) 2014 <input checked="" type="checkbox"/> Quarter 3 (July 1 – September 30) 2014 <input type="checkbox"/> Quarter 4 (October 1 – December 31) 2014	
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.):

- Experimental pier scour was measured at several stages before equilibrium scour occurs. The bathymetry from these stages was incorporated in the computational modeling.
- Erosion power at different scour depth is studied in detail to help in the formulation of erosion power.

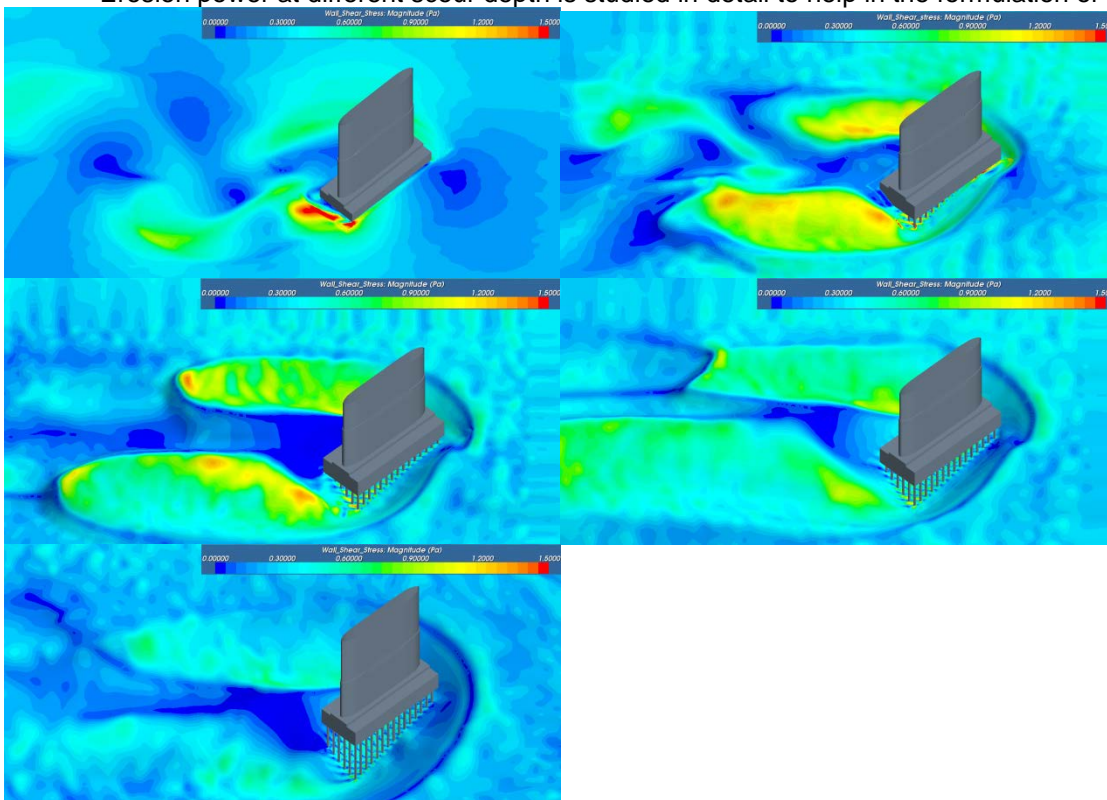


Figure 1 Bed stress at 0%, 25%, 50%, 75%, and 100% of equilibrium scour

- Using the experimental result and data from other sources, preliminary erosion power formulation was attempted. This will be used in the advanced scour evaluation to produce more accurate and economical bridge foundation design.

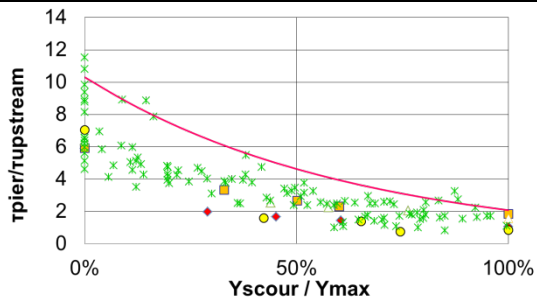


Figure 2 Decay of erosion power with increasing scour depth

Anticipated work next quarter:

- Search for more experimental data.
- Variation of erosion power decay function with respect to type of foundation element, shape of foundation, and size of foundation..

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.