

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: September 30, 2013

Lead Agency (FHWA or State DOT): Indiana 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.

Transportation Pooled Fund Program Project # <i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i> <u>TPF 5-253</u>		Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input checked="" type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
Project Title: Evaluation of Member Level Redundancy in Built-up Steel Members			
Name of Project Manager(s): Tommy E. Nantung		Phone Number: (765) 463-1521 ext. 248	E-Mail tnantung@indot.in.gov
Lead Agency Project ID:		Other Project ID (i.e., contract #):	Project Start Date: 9/1/2011
Original Project End Date: 8/31/2014		Current Project End Date: 8/31/2014	Number of Extensions: None

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
\$600,000	\$225,000	40%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$87,746	14.6%	66%

Project description:

The objective of this research project is to quantify the redundancy possessed by built-up members. For example, a riveted built-up member will not typically “fail” if one of the components fractures. However, there is very little experimental data which is available to quantify the remaining fatigue life or strength of a member in which one of the components has failed. Furthermore, if built-up members are located in bridges classified as fracture critical, when significant member redundancy can be shown the bridge may not need to be classified as FC. However, doing so would release these members from the more rigorous arms-length inspection currently required. As a result, should a component fail, it may go undetected for an extended interval. Thus, a portion of the project is devoted to setting rational inspection intervals for these members. Lastly, the advantages of using built-up members fabricated with HPS components fastened using HS bolts in new construction will also be explored.

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

- Received repaired actuator.
- Assembled second test setup - actuators mounted, and calibrated (see Figure 1).
- Received first set of bolted built-up specimens – (2) 46” girders, and (2) 36” girders (see Figure 2).
- Material tests completed for specimen component material (flange angles, and cover plates).
- Completed fatigue testing of the following specimens: 23-1, 23-2, 46-1, 46-2. (see Figure 3)
- Initiated fatigue testing of specimen 23-3.
- Ordered and received additional flange angle and cover plate material for 46” specimen (will reuse welded top flange and web from specimen 46-1).
- Assembled specimen 46-3 using new cover plate and flange angle in conjunction with welded top flange and web from specimen 46-1.
- Prepared for interim progress meeting in October
- Continued work on FE analysis. FE Models using built-up riveted plates have been created and are being compared with experimental data.

Anticipated work next quarter:

- Continue reviewing relevant literature.
- Hold interim progress meeting at end of October 2013.
- Finalize testing matrix with input of sponsor representatives.
- Material testing on recently received flange angle and cover plate material.
- Receive additional flange angle and cover plate material for next specimens.
- Begin testing regimen for members with two cover plates.
- Instrumentation of specimens.
- Place orders for remaining built-up specimens.
- Continue FE analysis.

Significant results:

During the past quarter, the major steps forward included:

1. Second setup is complete and functional
2. Four specimens have been tested completely.
3. FE analysis was continued.

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).

Potential Implementation:

None at this time. Too early in the research.

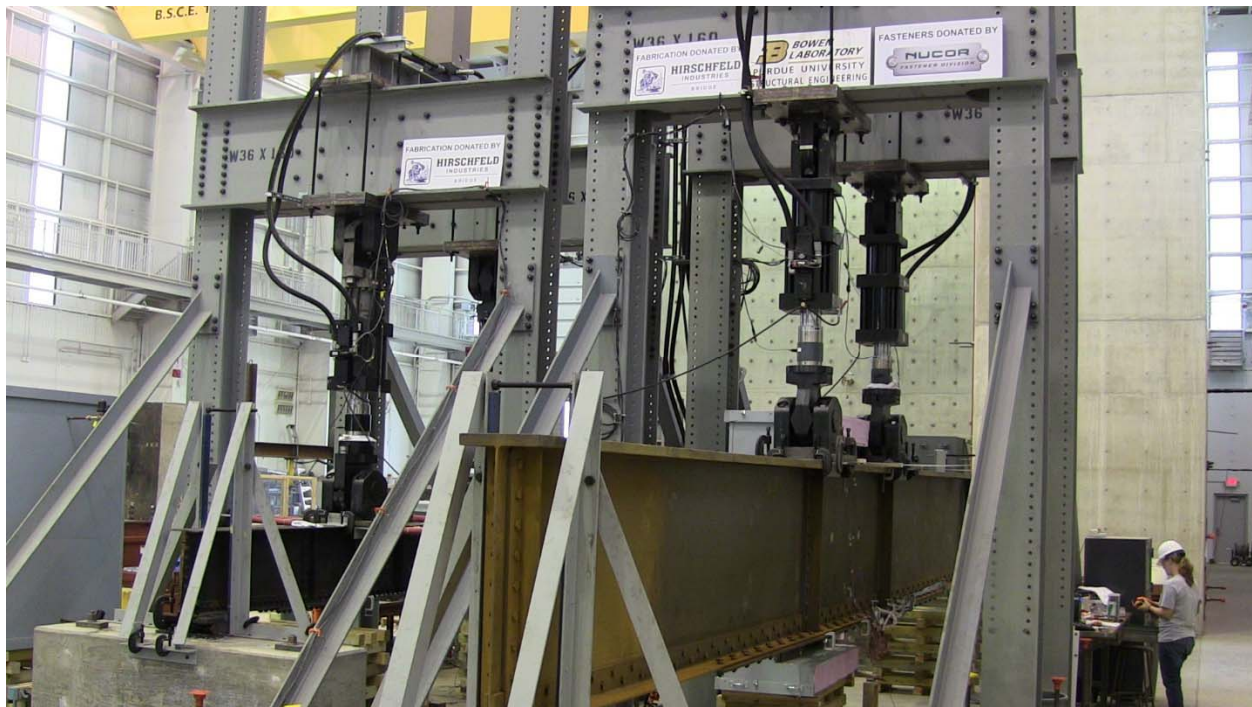


Figure 1: East setup w/ Specimen 23-3, West setup w/ Specimen 46-1

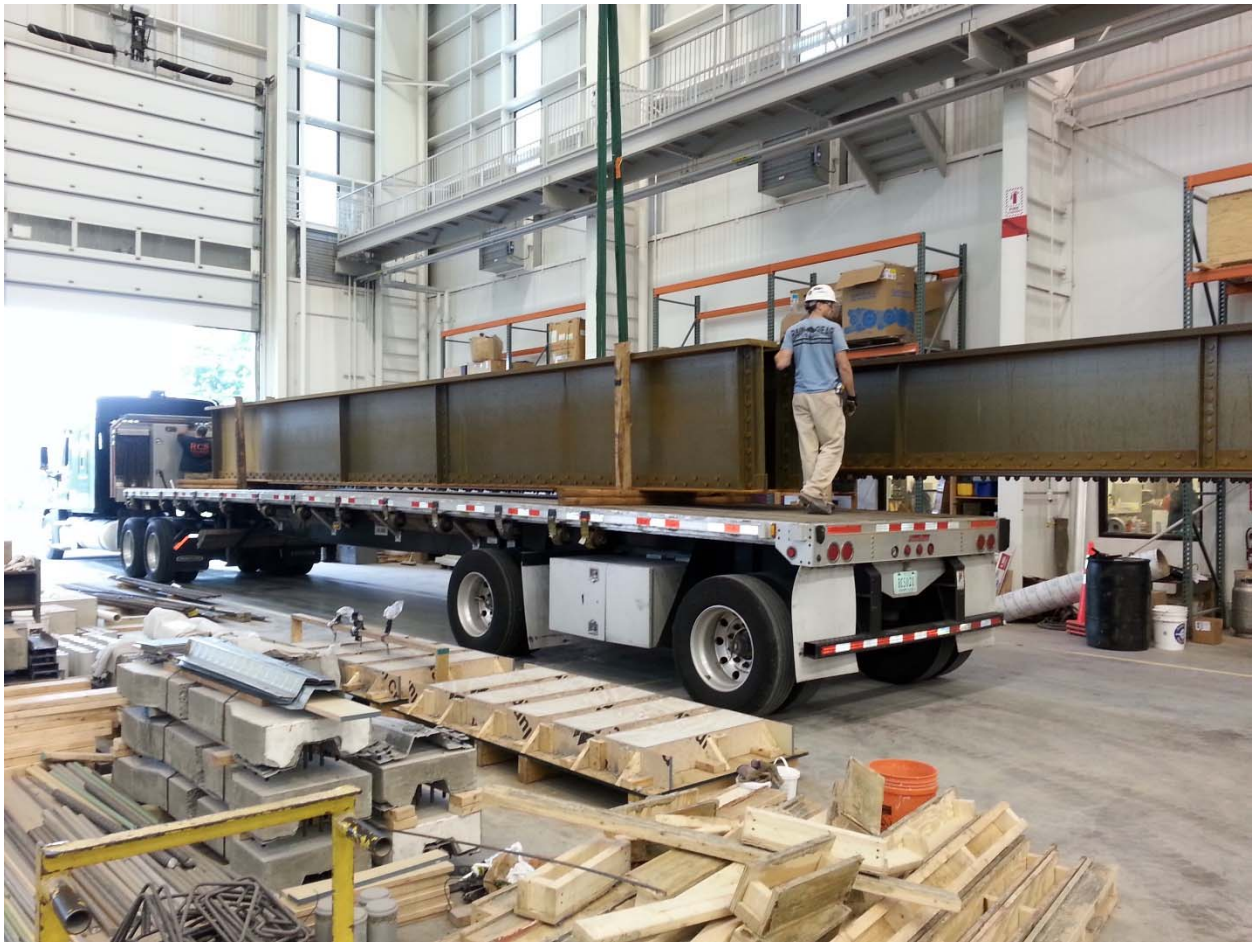


Figure 2: Arrival of Built-up Specimens

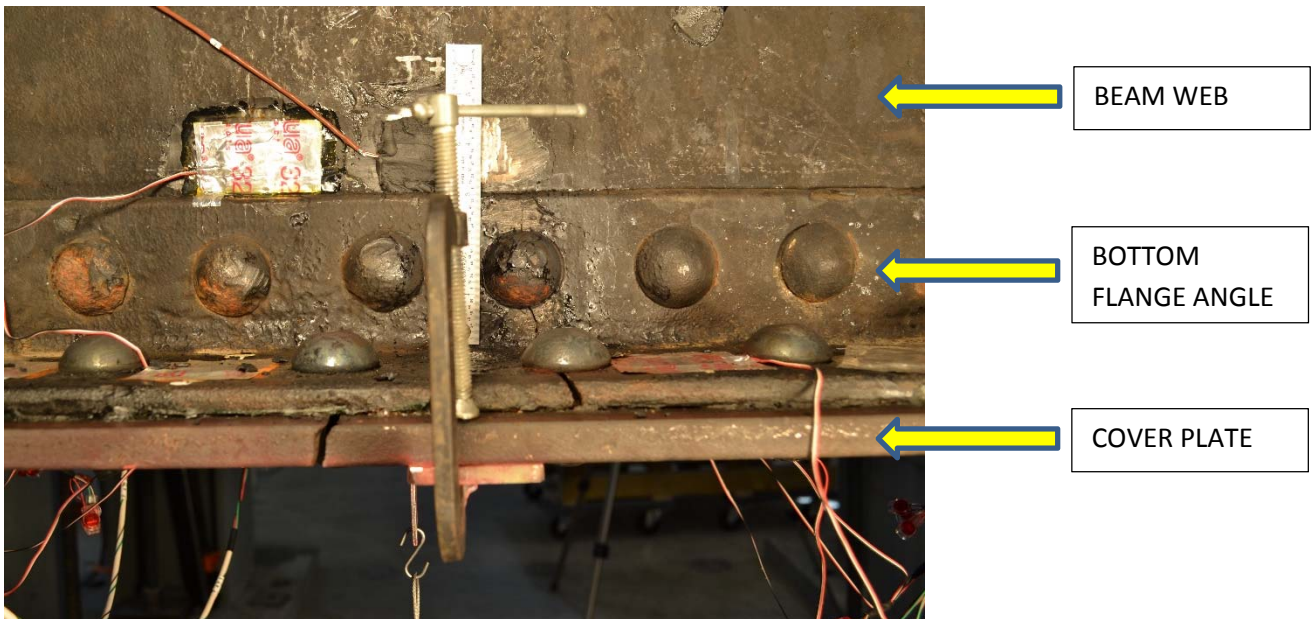


Figure 3: Specimen 23-2 after 'failure'