

**TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT**

Date: March 31, 2022

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 5-436</u>		Transportation Pooled Fund Program - Report Period: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
Project Title: Development of Criteria to Assess the Effects of Pack-out Corrosion 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: 9/1/2019
Original Project End Date: 8/31/2022		Current Project End Date: 8/31/2022	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**
\$560,000	\$270,794	58%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$51,129	901%	63.9%

**This total budget is based on funds that are shown as “committed” on the TPF website. However, it has been reduced at this time (4/22) since all commitments have not been realized to date.

Project Description:

This study proposes to:

- 1) To develop AASHTO ready specifications for the evaluation of the effects of pack-out corrosion in built-up steel tension, compression, and flexural members.
- 2) Provide guidance on the need for repairs and corrosion rates that can be expected in various environments in order to assist owners in programming when repairs may need to be made.
- 3) Identify the most effective methods of repairs and provide suggesting verbiage that could be used when preparing special provisions for repairs.
- 4) Develop several case-study examples, including calculations that will be used for training users on the methodologies to be developed. It is anticipated that the research team will host a number of webinars or on-site training sessions to ensure technology transfer and implementation.

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

- The tests on small portions of members with real pack out corrosion is completed and data are being reviewed and used to calibrated FEA simulations. These specimens were subjected to compression loading to evaluate the effect of section loss and distortion on local buckling. These data will be used along with the data from the compression flange girder tests to begin to develop strategies to evaluate the effects of pack-out on the capacity of compression members.
- The large-scale fatigue specimens have been fabricated and shipped to the lab. Testing will begin in early April 2022. A photograph of a typical specimen is shown in figure 1.
- Continued calibrating FEA models based on the experimental data. 3D mapping of the distortion from pack-out and section loss is being incorporated into the girder FEA models to identified regions of amplified local stresses.

Anticipated work next quarter:

- Continue with the finite element studies and based on the results of the prototype test, develop the detailed experimental program for compression flanges;
- Continue analytical and experimental studies on tension flanges with pack-out corrosion.
- Begin fatigue testing of girder specimens with real pack-out corrosion.
- Obtain additional members with pack-out corrosions. **If a state has such members available or coming out of service in the near future, the RT requests that they contact Robert Connor to discuss the potential for obtaining the members for the research.**

Significant Results:

1. None to date

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 to date

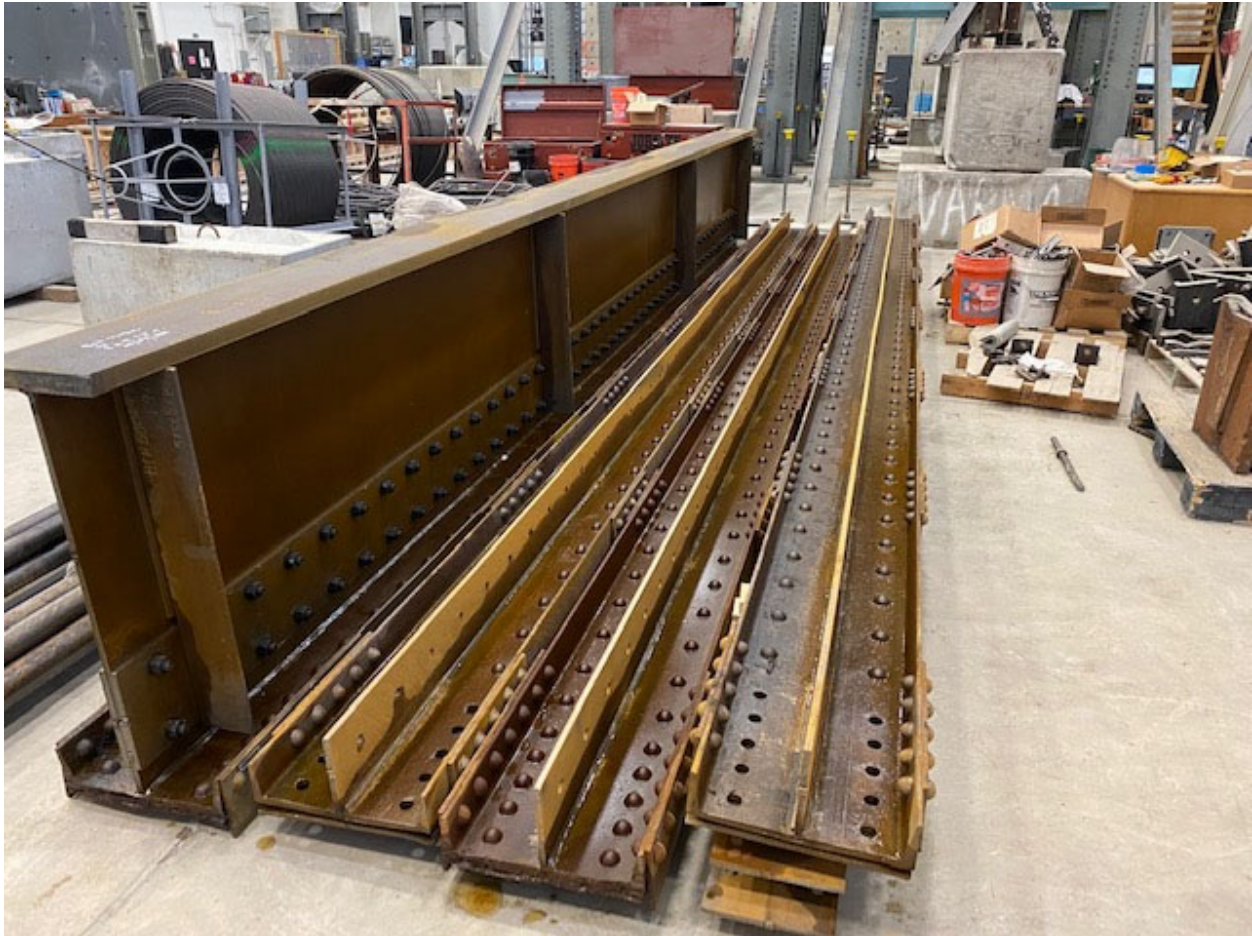


Figure 1 – Left specimen is completed girder with lower flange that contains pack-out corrosion. The three specimens to the right are remaining lower flanges to be tested. Though not shown, an additional web and top flange was fabricated so that two tests can run simultaneously.