

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: December 31, 2020

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 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 checked="" 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**
\$760,000	\$128,390	35%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$34,717	4.5%	33.3%

**This total budget is based on funds that are shown as “committed” on the TPF website.

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.):

- Good progress has been following the total lab shutdown that ending in mid-July. Progress has been made in the analytical modeling studies which will serve to develop the laboratory testing program. The modeling has resulting the design of flexural specimens in which pack-out distortion will be simulated on the cover plates. The girders will be fabricated from rolled shapes with distorted cover plates attached with common bolts.
- A method to introduce the distortions from pack-out has been effectively perfected using hydraulic jacks and wedges. This procedure has been further modified to introduce distortion in a cover plated beam (SEE ATTACHED PHOTOGRAPHS).
- A test is being conducted on a prototype flexural specimen (W24x68) in which a 3/8 thick cover plate has been installed. The test includes no distortion of the coverplate as well as various levels of distortion due to simulate pack out. The data are being used to further calibrated the FEA studies. Presently, excellent agreement between the laboratory measured data and the FEA results have been observed.

Anticipated work next quarter:

- Continue with the finite element studies and based on the results of the prototype test, develop the detailed experimental program;
- Obtain additional members with pack-out corrossions. **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.**
- Schedule the project kick-off meeting in the first quarter of 2021.

Significant Results:

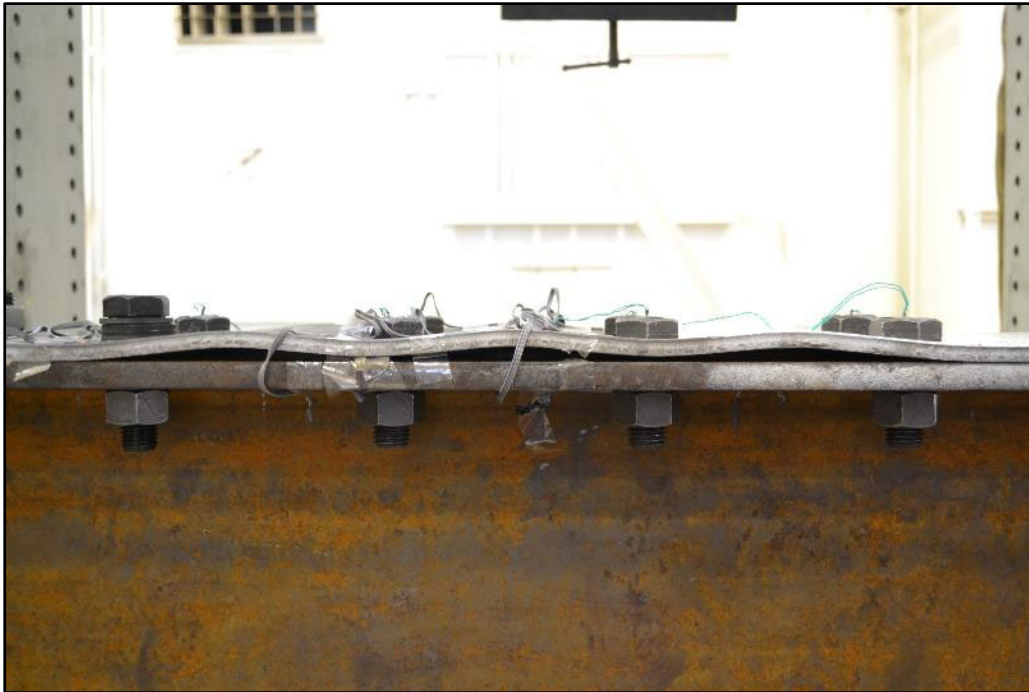
1. None to date

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).

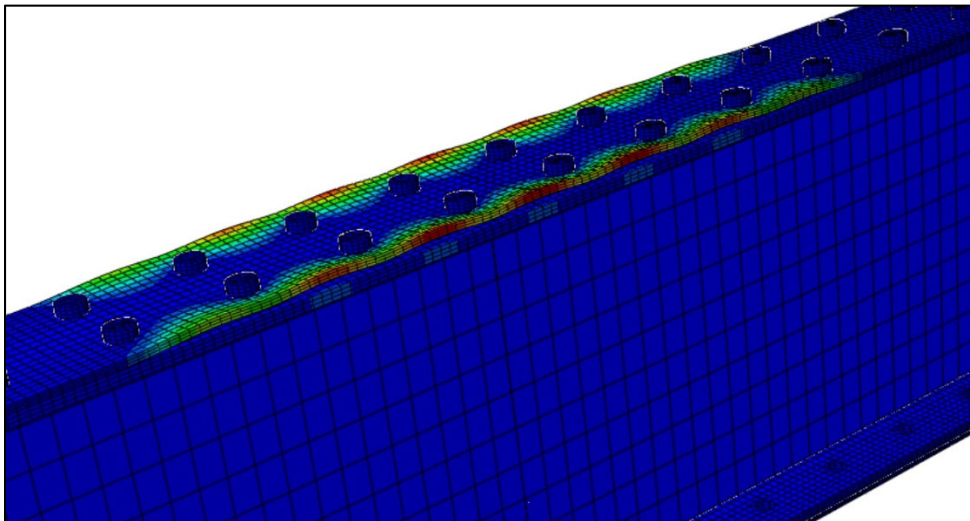
1. The COVID-19 restrictions resulted in Purdue University shutting down entirely in Mid-march 2020. All access to laboratory facilities were halted effectively bringing all research to a standstill. In mid-July 2020, the laboratory began to open back up for research. While progress has of course been significantly delayed, the Research Team is working as efficiently as possible to regain lost time.

Potential Implementation:

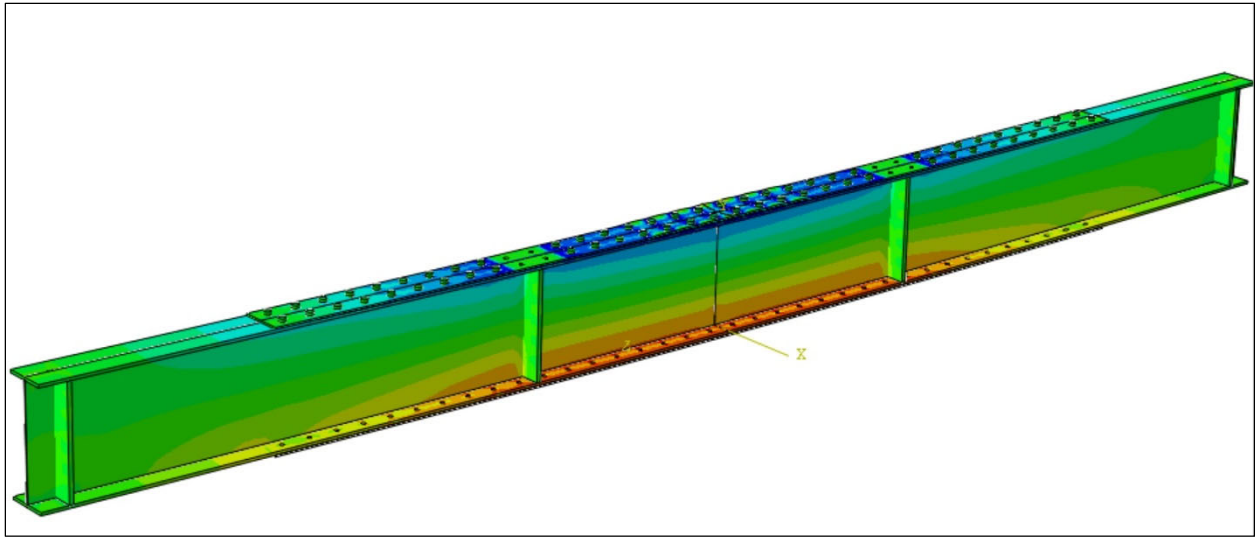
None to date



Photograph illustrating simulated pack-out in non-corroded cover plate



Global FEA showing stresses due to simulated pack-out without flexural stress



Global FEA model with stresses due to simulated pack-out and flexural stress