TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Date: _March 31, 2023_

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.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* ***TPF 5-436***	**Transportation Pooled Fund Program - Report Period:** X Quarter 1 (January 1 – March 31) ☐ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ 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:** **8/31/2024**	**Number of Extensions:** None

Project schedule status:

X 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**
$680,000	**$442,720**	**65%**

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date*
$25,524	**3.8%**	**72%**

*Based on revised project end date of 8/2024.

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.):

- Fatigue testing of the four girder specimens is completed. Some specimens were run for over 20 million cycles with no evidence of significant cracking observed. The data confirm there is no effect of pack-out corrosion on the fatigue resistance of these members. It is anticipated these results will translate into very useful recommendations for owners who have members with even severe pack-out corrosion.
- FEA parametric studies were initiated on flexural members with pack-out corrosion subjected to tension to evaluate the limits of using the fatigue test data in terms of applications to other members with distortion damage.
- Work on parametric studies focused on compression members was intimated for a range of flexural members. Conclusions and AASHTO-ready evaluation procedures should be forthcoming in the 3rd quarter of 2023.
- The strength testing of the flexural members with pack-out corrosion on tension flanges was completed. There was no significant impact on the strength of the girders. These tests utilized the girders that had also been fatigue tested. The cover plate was severed to evaluate the effects on strength and more specifically, internal redundancy. There did not appear to be any significant effect on the strength of the girder even with a cover plate fully cut. This suggests the existing work on internal redundancy is applicable to members with severe pack-out corrosion.

Anticipated work next quarter:

- Continue with the finite element parametric 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.
- Continue evaluating the strength and fatigue data.
- Begin to craft AASHTO-ready code and commentary for evaluation of members with pack-out corrosion for consideration by AASHTO COBS, T-18 and T-14.
- 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

Potential Implementation:
None to date