

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: Sept. 30, 2021

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.*

|   |  |  |   |
|---|--|--|---|
| <b>Transportation Pooled Fund Program Project #</b><br><i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i><br><br><u><b>TPF 5-436</b></u> |  | <b>Transportation Pooled Fund Program - Report Period:</b><br><input type="checkbox"/> Quarter 1 (January 1 – March 31)<br><input type="checkbox"/> Quarter 2 (April 1 – June 30)<br><input checked="" type="checkbox"/> Quarter 3 (July 1 – September 30)<br><input type="checkbox"/> Quarter 4 (October 1 – December 31) |   |
| <b>Project Title:</b><br><b>Development of Criteria to Assess the Effects of Pack-out Corrosion in Built-up Steel Members</b>             |  |  |   |
| <b>Name of Project Manager(s):</b><br>Tommy E. Nantung  |  | <b>Phone Number:</b><br>(765) 463-1521 ext. 248  | <b>E-Mail</b><br><a href="mailto:tnantung@indot.in.gov">tnantung@indot.in.gov</a> |
| <b>Lead Agency Project ID:</b>  |  | <b>Other Project ID (i.e., contract #):</b>  | <b>Project Start Date:</b><br>9/1/2019  |
| <b>Original Project End Date:</b><br>8/31/2022  |  | <b>Current Project End Date:</b><br>8/31/2022  | <b>Number of Extensions:</b><br>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** |
|------------------------|--------------------------------|--|
| <b>\$760,000</b>       | <b>\$237,236</b>               | <b>45%</b>                             |

Quarterly Project Statistics:

| Total Project Expenses and Percentage This Quarter | Total Amount of Funds Expended This Quarter | Total Percentage of Time Used to Date |
|--|---|---------------------------------------|
| <b>\$36,867</b>                                    | <b>4.8%</b>                                 | <b>52.8%</b>                          |

\*\*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.):**

- Testing of the three prototype specimens is complete. Data are being evaluated and compared to the results from the FEA studies to further calibrate the analytical models.
- The specimen that includes both simulated distortion and section loss is currently being subjected to fatigue loading. While the specimen does not include corrosion damage, but it will provide some useful data on the effect of geometric changes on the local fatigue performance. At present, the girder has exceeded the mean life for Category D, which is promising.
- Small portions of members with real pack out corrosion are being testing in a universal testing machine. Specifically, members are being subjected to compression loading to evaluate the effect of section loss and distortion on local buckling.
- Quotes are being obtained from steel fabricators for the fabrication of members that will incorporated components from the Winona truss that contain real pack out. Only one quote has been obtained to date and unfortunately it is a bit high due to the increases in steel prices. The RT awaits the other two quotes and will keep the project sponsors appraised of the results. Figure 1 illustrates the basic concept of the specimen.

**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.
- If all goes well, 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:**

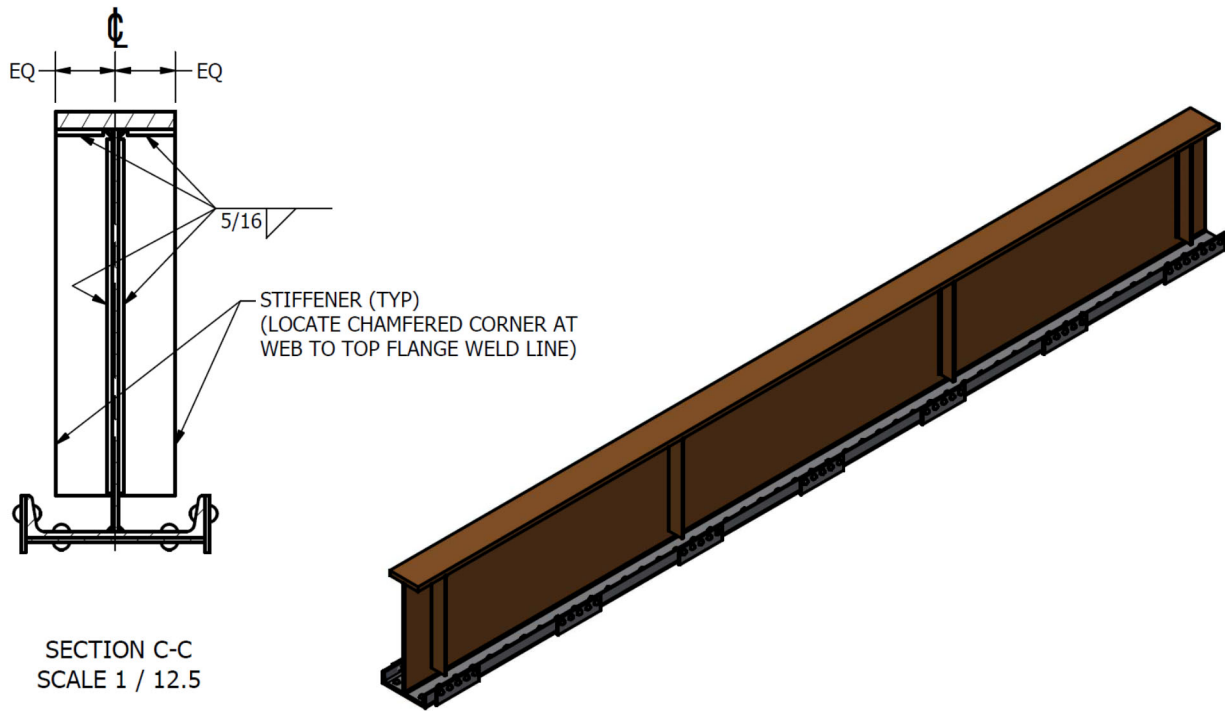
1. None to date

**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).**

**THE INCREASES IN STEEL PRICES MAY AFFECT THE OVERALL PROJECT SCOPE. STEEL PRICES HAVE RISEN DRAMATICALLY AND THIS WILL AFFECT FABRICATION OF SPECIMENS. THE RT WILL WORK WITH FABRICATORS AND CONTACT PLATE SUPPLIERS TO EXPLORE THE POSSIBILITY OF IN-KIND SUPPORT FOR THE PROJECT.**

**Potential Implementation:**

None to date



**Figure 1 – Illustration of girder specimen for fatigue testing with bottom flange utilizing half section truss chord from the Winona bridge that contains real pack-out corrosion.**

**The web and top flange are new and added on to convert the specimen into a girder to facility fatigue testing**