



RTI Semi-Annual Progress Report

Date of Report: September 1, 2009 **Project Number:** 9-1526 **RMC:** 5

Period Covered: September 1 – February 28/29 March 1 – August 31

Project Title: Investigation of the Fatigue Life of Steel Base Plate to Pole Connections for Traffic Structures

Research Supervisor (name & agency): Karl Frank/CTR

- 1. Progress to Date, by Task** (Provide the following information for each task in the current Work Plan. List **all tasks**, even if no work was done during this reporting period. If a task was not active during this period, state “none” under Work Accomplished. Copy the following table as needed to cover all tasks.)

Task # 1	Task Name / Description Literature Review
% Complete 100	If task is complete, state when Technical Memorandum was submitted to RTI
Work Accomplished this Period (Brief description of work done and any major problems encountered.) The search through the literature continues. We have collected all available test data in the literature and continue to share data with the NCHRP study at Lehigh. We have recently received the latest European thinking on the calculation and application of hot spot stress to fatigue life estimation. We are evaluating these IIW procedures in our analytical study. We finished our exchanged data with the Lehigh NCHRP project.	
Work Planned for next Reporting Period (Brief description of work planned.)	
Task # 2	Task Name / Description Development of Test Plan
% Complete 100	If task is complete, state when Technical Memorandum was submitted to RTI
Work Accomplished this Period (Brief description of work done and any major problems encountered.) Larger diameters, 33 inch, specimens with the standard Texas butt weld connection were tested. The specimens were supplied by Valmont Industries. The selection of the specimen was based upon recommendation of the project director. The specimens came in with small weld toe cracks which produced a reduction in fatigue life. These specimens have been incorporated into an IAC project investigating cracking during galvanizing.	
Work Planned for next Reporting Period (Brief description of work planned.)	
Task # 3	Task Name / Description Fatigue Testing
% Complete 100	If task is complete, state when Technical Memorandum was submitted to RTI

Work Accomplished this Period (Brief description of work done and any major problems encountered.) The fatigue tests of the large diameter high mast lighting specimens was completed.	
Work Planned for next Reporting Period (Brief description of work planned.)	
Task # 4	Task Name / Description Analytical Studies
% Complete 100	If task is complete, state when Technical Memorandum was submitted to RTI
Work Accomplished this Period (Brief description of work done and any major problems encountered.) The analysis phase examining the influence of the geometric variables upon the hot spot stress was completed. Approximately 60 different geometries of high mast and mast arm connection have been analyzed. The influence of weld detail, base plate thickness, base plate geometry, and bolt layout as well as mast diameter upon the hot spot stress as the critical locations have been studied.	
Work Planned for next Reporting Period (Brief description of work planned.)	
Task # 5	Task Name / Description Summary of Results
% Complete 35	If task is complete, state when Technical Memorandum was submitted to RTI
Work Accomplished this Period In preparation for the project meeting held August 6, the data was synthesized and design recommendations were developed. The test results and design recommendations were presented to the sponsors and their input noted.	
Work Planned for next Reporting Period (Brief description of work planned.) The final report will be finished.	

2. Progress to Date, by Deliverable (Provide the following information for each deliverable on the current Deliverables Table.)

Deliverable #	Deliverable Description	Progress to Date &/or Date Submitted to RTI
R1	Final report with fatigue design guide and a list of recommended changes to the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals for submission to AASHTO T-12 Committee.	The analysis of the test results has begun and the final design recommendations await the results of the tests and analytical studies. Expected delivery date is 10/31/09.
PSR	Summary of work performed, findings, and conclusions	Expected completion is 10/31/09.

3. Equipment Purchases (Provide the following information for all equipment purchased to date on this project. Equipment is defined as items with a unit cost of \$5,000 or more, or components of a system costing \$5,000 or more. For each item over \$5,000, attach evidence that the equipment was added to the university inventory system and a digital photograph of the item.)

Description of Equipment	Date Purchased	Task and / or Deliverable Directly Related to Equipment Purchase
None		

4. Meetings / Conferences (List any project meetings or conferences that were conducted during this reporting period and / or are planned for the next reporting period.)

Date & Time	Location	Purpose of Meeting / Conference
August 6-All Day	Ferguson Structural Engineering Laboratory	Project Meeting with Sponsoring States- Test results summarized and design recommendations presented.

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