



RTI Semi-Annual Progress Report

Date of Report: March 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 99	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.	
Work Planned for next Reporting Period (Brief description of work planned.) Integrate the latest results from the NCHRP study into our analysis of fatigue performance.	
Task # 2	Task Name / Description Development of Test Plan
% Complete 99	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.) Mast arm and high mast specimens were donated by Pelco for the project. We were unable to obtain specimens from two other fabricators; they did not return any contacts we made. We have been discussing with the PD and the sponsoring states a plan of action. It appears that we will test some larger diameter high mast specimens similar to specimens that are being tested under a different program.	
Work Planned for next Reporting Period (Brief description of work planned.) Revise test plan if Pelco cannot donate the requested specimens.	
Task # 3	Task Name / Description Fatigue Testing
% Complete 97	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 repair of the mounting box for the high mast tests was completed. The testing of the Pelco specimens was also completed. We tested 8 mast arm and 4 high mast Pelco specimens.

Work Planned for next Reporting Period (Brief description of work planned.)
Finish the testing. The timing of the tests is dependent upon the time required to fabricate the specimens once a decision on the specimens to be tested is made by the PD and the sponsoring states.

Task # 4	Task Name / Description Analytical Studies
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% Complete 85	If task is complete, state when Technical Memorandum was submitted to RTI
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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 is almost complete. Approximately 50 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.)
Complete the remaining analysis and develop fatigue specifications based upon the hot spot stress which incorporate the effect of connection geometry upon fatigue performance.

Task # 5	Task Name / Description Summary of Results
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% Complete 0	If task is complete, state when Technical Memorandum was submitted to RTI
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Work Accomplished this Period Due at completion of project

Work Planned for next Reporting Period (Brief description of work planned.)
N/A

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

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

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