RTI
Semi-Annual Progress Report

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(GSD-EPC)

Fiscal Year 2007

Date of This Report: March 1, 2007 **Project Number:** 9-1526 / TPF-5(116) **RMC:** 5

Period Covered by This Report: September 1, 2006 – February 28, 2007

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

	Name	Agency	Phone No.	FAX	E-mail
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1. Requested Changes for Possible Project Modification

Project Personnel: No changes

Work Plan: The project work plan remains intact.

Deliverables Table: No changes

Project Termination: The project termination date may need to be extended due to delays beyond the control of the researchers. The project schedule has slipped because the project meeting to decide the next test specimens was not held until late February. We had hoped to have ordered the next test specimens by January of this year. We have lost almost 3 months of time. This will delay the start of testing. We assume the budget is sufficient to cover the cost of the specimens that were selected by the sponsoring states for tests. If the funding is not available this year, the progress of the research will be severely slowed.

Project Budget: We are unsure of the funding for this year. We are currently funded for $100,003. This is not sufficient to cover the cost of specimens. This topic was raised in our SAR last year. We were told that there is now sufficient funding for the increase of $43,333 that we requested last year. We need to have this money in hand, in our account, before we can initiate the purchase of the specimens.

2. Equipment

We purchased a pneumatic wrench to tighten the mounting bolts for the specimens. The total was more than $5,000. Approximately half of the cost will be shared with the Laboratory.

Item: Pneumatic torque wrench
Amount: $2800
Date Purchased: 2/23/07
Inventory# 793787
Serial# 732842
Location: Ferguson Lab

3. Progress to Date, by Task

1) **Literature Review-** The literature review is up-to-date. We will continue to search for new research results as they become available. We recently received the work done by Ocel at the University of Minnesota and some of the work done at the University of Wyoming.

2) **Development of Test Plan-** The test plan for the first phase was developed in the first project meeting. The test plan for the second set of specimens was developed at the February 20, 2007 meeting of the sponsors. We will be developing specimen drawings and then obtaining prices in the next two months.

3) **Fatigue Testing-** The fatigue tests of the first set of specimens has been completed. The mast arm specimens revealed both the external collar and the Wyoming weld detail could produce fatigue lives comparable to Category C. This is a tremendous improvement over the standard socketed connection. The 24-inch high mast specimens gave very poor fatigue performance. Only the stool detail made it to Category E. The socketed details produced very poor fatigue performance. Two updates on the test results were sent out to the sponsors to apprise them of the results.

4) **Analytical Studies-**The analytical studies have begun and will continue for the remainder of this year. A study of the relationship between connection stiffness and fatigue performance has been developed. In addition, the relationship between tip deflection and connection fatigue stress range has been studied for signal mast arms.

5) **Summary of Results-** A short summary of the first set of specimens was sent out to the sponsors.

4. Progress on Development of "Product" Deliverables

No products required for this project.

5. Meetings/Conferences

We had a meeting with the sponsoring states on February 20, 2007. This was an all-day meeting where the fatigue test results were presented and a decision on the future test specimens was reached.

6. Possible Candidates for Formal Presentations at the Upcoming RMC Meeting

We have developed sufficient data that a presentation at an RMC meeting might be warranted.

7. Miscellaneous

None