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METRO

August 17, 2006
In reply to: N/A

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Response Required: Yes
Due Date: August 31, 2006

Mark Evans, Vice President
Siemens Transportation Systems, Inc.
7464 French Rd.
Sacramento, CA 95828

Subject: Stray Current Mitigation Efforts, Costs and Responsibilities

Contract: CT0000065, Vehicles & Systems Components

Dear Mr. Evans,

Over the last several weeks many meetings, conversations and conference calls have taken place regarding the low track-to-earth resistance issues along METRO's Red Line. This letter will formalize the critical items and outline our expectations and our mutual responsibilities regarding this matter.

We will address six primary areas:

- METRO incurred costs;
- Bathtub membrane drainage;
- Earthbox drainage drawing responsibilities;
- Latent defects;
- Switch point box insulated bolts; and
- Pierce/Gray bathtub testing.

**METRO Incurred Costs**

It is METRO's intent to back-charge Siemens for all repairs, testing, management, and other costs incurred during the stray current investigation.

Siemens has investigated and corrected signal and negative return cable connections to the rails, started investigating bridge expansion joints, and completed the investigation and upgrade of the earthbox at the northern-most bathtub at Pierce.

During the Siemens investigation, METRO has incurred costs directly related to the stray current investigation. Costs incurred from May 2005 through June 2006 are detailed below. We anticipate incurring additional costs related to stray current testing. As these additional costs are incurred you will be notified.

| | |
|---|---|
| Bridge Anchors | $243,852.00 |
| V&A Consulting | $199,738.88 |
| PCS | $ 38,434.52 |
| Corrpro | $ 14,866.72 |
| California Institute of Electronics and Materials Science | $ 480.00 |
| Blake Consulting | $ 34,560.00 |
| METRO Consultant Management (STV Team) | $312,531.17 |
| METRO Staff Support | $ 72,935.90 |
| TOTAL | $917,399.19 |

**Bathtub Membrane Drainage**

During the recent Pierce earthbox investigation and modification efforts, Siemens proposed the need to not only drain water from the earthbox but from above and beneath the bathtub membrane. Siemens believed, according to our discussions, that the membrane is not properly functioning as a barrier to stray current and that water beneath the membrane is providing a path for current to leave the bathtubs. An earthbox drainage design was submitted via SMG-1304, revision 4, that included means to drain the membrane, and this configuration was installed at the northern most Pierce bathtub.

However, after the Pierce installation, it now appears that Siemens has reconsidered the need to drain below and above the membrane. We drew this conclusion only when we received Siemens's revised earthbox drainage design package (the configuration to be installed at Wheeler), which was submitted to METRO on July 27, 2006 (via Bill Moorhead). As no explanation or formal report accompanied the drawings, METRO requests an explanation as to why the membrane drainage design was abolished, and a confirmation that Siemens now no longer believes that water above or below the membrane is relevant to the low track-to-earth resistances of the bathtubs.

METRO agreed to pay up to $5,000 towards the Pierce drainage installation at our meeting of June 23, 2006. For the remaining 19 drainage installations, ongoing

discussions between Siemens's on-site project manager and METRO's Sr. Director of Construction identified Siemens's cost to be $8,000 per location. This equates to a total not-to-exceed $157,000 for all 20 drainage locations.

Also, METRO must be formally notified before changes are made and other directions taken by Siemens in its attempts at resolving the issues. We are prepared to conduct late-notice meetings or discussions in the interest of time, provided written notification (via e-mail is acceptable) by Siemens is made.

**Earthbox Drainage Drawing Responsibilities**

During the development of the earthbox drainage design, a series of separate drawing packages have evolved. As has been discussed, it is necessary to properly track, define and seal all drawings relative to these efforts. A brief listing of the known design packages and the party responsible for creating proper CAD versions of each drawing and having each stamped and sealed by a Texas Professional Engineer is as follows:

- Pierce Earthbox Drainage Design – Siemens (SMG-1304 documents)
- Pierce Earthbox Permanent Pump and Power Design – METRO
- Pierce Earthbox Sump Area Cover Plate Design and Analysis - Siemens
- Wheeler Earthbox Drainage Design – METRO
- Power Switch Locations – Junction Box Relocation – Siemens

To ensure proper tracking of submittals and revisions, and efficient transmittal of comments and issues relative to these important drawing packages, all must be submitted via formal, contractual SMG letters as appropriate.

METRO hereby requests that Siemens formally submit the final sealed CAD drawings as indicated above for formal review as soon as possible.

**Latent Defects**

As provided in the Contact, latent defects are to be rectified by Siemens. As has been previously discussed, during the recent bathtub threshold investigation at the northern most bathtub at Pierce, it was discovered that each of the six thresholds excavated were not installed properly and are contributing to low track-to-earth resistance. Based on these excavations and inspections, METRO deems all bathtub thresholds to be a latent defect and hereby reminds Siemens that all thresholds of each bathtub of the Red Line must be excavated, reworked and properly installed. We look forward to working with you to organize this effort and make the appropriate corrections.

**Switch Point Box Insulated Bolts**

During the recent earthbox upgrade at the northern most bathtub at Pierce, it was documented that only one side (the signal rail side) of the switch point box insulated bolts were installed per the drawings submitted by Siemens via SMTW-0079 (dated March 13, 2002). These drawings show that both switch point sides are to use large insulated bolts. METRO considers the lack of insulating bolts a latent defect and requires that Siemens remove the non-insulated bolts and properly install new bolts with insulation as specified in Siemens's submittal SMTW-0079.

**Pierce/Gray Bathtub Testing**

Although it appears that Siemens has abolished their original stray current mitigation plan to drain below and above the bathtub membrane in lieu of injecting foam grout around the earthbox and at other locations within the bathtub, METRO believes that performing final track-to-earth resistance tests at the four bathtubs at Pierce/Gray is necessary. These tests, along with the previous, will document what improvement, if any, the foam grout injections, earthbox excavation, membrane drainage and upgrade has had on the Pierce/Gray locations. These tests will be scheduled as soon as Siemens completes the foam injection processes, but not until at least three consecutive days of dry weather have passed to ensure appropriate results.

We look forward to discussing the above items at your earliest convenience, and await receipt of the noted completed and sealed drawing packages for our review and files.

Sincerely,

John von Briesen
Senior Director, Planning, Engineering and Construction
METRO Solutions

JVB\MAT\cd

cc: Scott Grogan, Ruth Schrupp, Tony Venturato, Mike Tagaras, Mark Golucki, Jim Cody, Allen Smith