**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS REPORT**

**Lead Agency: Utah Department of Transportation**

**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.*

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| **Transportation Pooled Fund Program Project #**  **TPF-5(272)** | | **Transportation Pooled Fund Program - Report Period:**  **x Quarter 1 (January 1 – March 31, 2013)**  **\_** Quarter 2 (April 1 – June 30, 2013)  \_ Quarter 3 (July 1 – September 30, 2013)  \_ Quarter 4 (October 1 – December 31, 2013) | |
| **Project Title:**  Evaluation of Lateral Pile Resistance Near MSE Walls at a Dedicated Wall Site | | | |
| **Name of Project Manager(s):**  David Stevens | **Phone Number:**  801-589-8340 | | **E-Mail**  [davidstevens@utah.gov](mailto:davidstevens@utah.gov) |
| **Lead Agency Project ID:**  5H06803H, 42053, ePM PIN 11075  UDOT PIC No. UT11.404 | **Other Project ID (i.e., contract #):**  UDOT Contract No. Pending | | **Project Start Date:**  Contract in Preparation |
| **Original Project End Date:**  Contract in Preparation | **Current Project End Date:**  Contract in Preparation | | **Number of Extensions:** |

Project schedule status:

**X** On schedule \_ On revised schedule \_ Ahead of schedule \_ Behind schedule

Overall Project Statistics:

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| **Total Project Budget** | **Total Cost to Date for Project** | **Percentage of Work**  **Completed to Date** |
| $190,000.00 | $0 | 0 |

***Quarterly*** Project Statistics:

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| --- | --- | --- |
| **Total Project Expenses**  **and Percentage This Quarter** | **Total Amount of Funds**  **Expended This Quarter** | **Total Percentage of**  **Time Used to Date** |
| 0 | $0 | 0 |

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| **Project Description**:  Abutment piles are frequently surrounded by mechanically stabilized earth (MSE) walls rather than a soil slope. Piles near MSE walls must be designed for lateral loads from earthquakes and thermal expansion. Unfortunately, there are no design methods available to predict the reduction in pile resistance or the increase in force on the walls for these conditions. In addition, little guidance is available regarding the spacing behind the wall necessary to eliminate these effects. The data base of load tests is limited to three recent test series in Utah and one test series with block wall/geogrids in Kansas. Testing in the recent Utah study shows significant decrease in lateral resistance and increases in reinforcement force as piles are placed closer to the MSE wall. Placing piles further from the wall increases bridge cost. Additional field testing at a dedicated wall site with single and group piles is necessary to define performance.  Objectives for this study include:  1. Determine reduced lateral pile resistance vs. distance behind MSE wall for single and group piles from dedicated full-scale testing.  2. Determine the increase in wall force due to lateral load on the pile.  3. Develop design rules (p-multipliers, etc.) to account for reduced pile resistance.  4. Develop equations to predict increased force on MSE reinforcement due to lateral pile loading.  Tasks for this study include:  1. Construct dedicated MSE wall(s) away from the highway right-of-way, in coordination with contractors and suppliers.  2. Conduct lateral load tests on single piles and pile groups at dedicated MSE wall(s).  3. Perform parametric studies with a calibrated numerical model.  4. Develop design procedures to predict reduced pile resistance and increased wall pressures based on the results of the testing program and the parametric studies.  5. Submit a final report that documents the entire research effort.  6. Make presentations at AASHTO bridge engineers committee meetings to implement design methods into code.  Dr. Kyle Rollins of BYU is the Principal Investigator for this research project. Based on available funding and availability of contractors and suppliers, a target date of spring or summer 2013 has been set to start the wall construction. |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**  Dr. Rollins worked on a draft work plan for the project and continued to coordinate with contractors and suppliers for the test wall site and materials.  Dr. Rollins attended a follow-up meeting with the Association for Metallically Stabilized Earth to finalize plans for donations of wall panels and reinforcement materials. This meeting took place in Las Vegas in February and involved representatives from major suppliers nationwide. The Reinforced Earth Company (RECo) agreed to provide metallic strip reinforcements and wall panels for the load tests. SSL LLC also agreed to provide metallic grid (welded wire) reinforcements and wall panels for the load tests. This will allow both general reinforcement types to be tested. Atlas Steel agreed to provide 22 pipe piles and square piles for the testing program. Dr. Rollins also made a request to Skyline Steel and Spartan Steel to provide the H piles for the project. Deseret Foundations agreed to drive piles for mobilization cost only. These in-kind donations provide a major contribution to the project and allow the project to proceed within the budget constraints. |
| **Anticipated work next quarter**:  The technical advisory committee will be established with the study partners and will participate in reviewing the project work plan. The approved work plan will be utilized to establish a UDOT research contract with BYU. A kickoff tele-conference or web meeting will be held with the technical advisory committee. Coordination with contractors and suppliers will continue in preparation for wall construction. A target date of spring or summer 2013 has been set to start the wall construction. |

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| **Significant Results:**  Nothing to report at this stage |
| **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).** |

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| **Potential Implementation:** |