QUARTERLY PROGRESS REPORT

October, 1 2011 to December, 31 2011

In this reporting period the Support Services contractor for the FHWA Hydraulics Laboratory selected two sub contractors for the tasks of literature search, field test, QA/QC, and report production. The determination of scopes of subcontracts was purported for attaining necessary expertise for each task and maintaining objective oversight from independent party.

Research Objectives

The contractor works with federal personnel from the Hazard Mitigation team at the Turner Fairbank Highway Research Center (TFHRC) to research the application of acoustic imaging technology to satisfy the inspection requirements of Federal Highway Administration (FHWA) 23CFR650 and the Bridge Inspection Reference Manual (BIRM) for Level I Underwater Inspections. This project has the potential to improve methods to assess the underwater condition of existing transportation structures and increase the safety of the nation's bridges. In addition, the proposed technology has the potential to reduce exposure of staff to hazards encountered while performing underwater inspections.

The following underwater applications are recognized to have significant potential benefits to the current practice in bridge inspection of underwater components:

- Rapid condition assessment (i.e. post seismic events and boat impacts)
- Active and passive scour evaluation
- Construction inspection
- Security threat assessment
- Enhancing diver safety and efficiency
- Visual representation of the entire underwater structure

This research project will evaluate the feasibility of using underwater acoustic imaging technology to produce underwater inspection results that are equal or better than current practice for Level I underwater inspection requirements. The project will conduct an objective comparative evaluation of the inspection quality, cost, time and employee safety aspects of conducting the underwater inspection using in water divers versus acoustic imaging technology.

Subcontract 1

Task 1: Literature Review. Conduct a literature search of all types of sonar-imaging. The operating limits, strengths, and weaknesses of each type shall be discussed. Past data on testing and implementation of various types of acoustic imaging technology may be included to supplement field tests in Task 4. The literature search will be summarized in a written report.

Task 2: Develop Detailed Work Plan. Develop a detailed work plan for the achievement of the intended project objectives, including a detailed description of the proposed evaluation method, major project milestones, a Gantt chart detailing the schedule and delivery of each milestone including quarterly reports, meetings with project team.

Task 3: Develop an Objective Test Plan for Phase I. Work with the project team and Technical Advisory Committee (TAC) to develop an objective test plan for the comparisons between actual diver inspections

that satisfy the FHWA requirements and the sonar technologies being considered. In particular, two commonly used technologies will be employed.

Task 4: Field Testing – Phase I. The Dive Team will conduct a Phase I test program based on the Field Diving Inspection Work Plan designed and approved in Task 3. Scheduling of Field Tests shall be submitted and approved at the beginning of this task. Request for changes in scheduling, scope, and budget shall be submitted for approval in writing ahead of time and include all associated modifications to the test plan from that point on.

Task 5: Report and Documentation. Quarterly reports will be submitted at the end of each quarter. An Interim Field Testing Report shall be submitted upon completion of Task 4 to present field results to the TAC, after reviewed and revised within the work group. The report will include test results from each dive site, technique(s) used, photos, videos, drawings, resource needs for each site and imaging technology, as well as expenditures at each time point.

Supply Manpower and Materials. The subcontractor is responsible for supplying the manpower, purchasing or leasing all equipment, technology, materials, hardware, supplies, systems, computers, required imaging software, any required tooling or special fittings, and vehicles necessary for the testing of underwater imaging technology and diver inspections.

Test Site Access. The subcontractor will arrange for access to the test site for the four TAC members during testing operations when scheduled by the TAC. However, it is anticipated that no special arrangements will be required to accommodate TAC members on site. Likewise, TAC members will be responsible for their own safety on site. The subcontractor will only be responsible for the safety of its own employees.

Special Conditions. It is not anticipated at this time that the waterways will be contaminated and additional funding would be anticipated for any selected contaminated water sites.

Dive Team Leader and Diving Personnel Requirements. The person responsible for leading all field diving operations will be a qualified NBIS Team Leader. The Team Leader shall be present on site for all of the underwater inspections. The divers will be qualified underwater inspectors satisfying FHWA 23CFR650 inspector requirements.

Deliverables for Phase I:

Coordination with the TAC

Summary of Literature Survey

Draft and final work plan

Draft and final test plan for the first phase

Field diving inspection

Quarterly progress reports

Interim Field Testing Report including recommendations on final test plan for comprehensive test

Subcontract 2

Task 1: Develop Detailed Work Plan. Provide technical advice on the development of a detailed work plan for the achievement of the intended project objectives, including a detailed description of the proposed evaluation method, major project milestones, a Gantt chart detailing the schedule and delivery of each milestone including quarterly reports, meetings with project team.

Task 2: Quality Assurance/Quality Control. Monitor the work progress and review the test plan/test report to ensure quality and objectiveness of field work. The subcontractor will also provide oversight and advice on the personnel qualification and procedural adequacy. All reports will be reviewed and, if necessary, revised to ensure quality and adherence to policies and practices.

Task 3: Report and Documentation. Assist the project team in finalizing the Interim Field Test Report for the Phase I Field Test. The Phase I Field Test is not a full-blow testing program. The result will be used in future studies, which is not in the scope of this agreement.

Deliverables

Advice on work plan, selection of technology, and practical aspect

Quality Control/Quality Assurance summary

Interim Field Testing Report

Final test plan for comprehensive test