Statement No. 08

Arkansas State Highway and Transportation Department
Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 08/27/2010 **PROJECT AREA:** Construction

TITLE: Static Load Testing Program for Calibration of PDA "Measured" Capacity and Simple QA Device

PROBLEM STATEMENT:

The FHWA now requires all new bridge designs to be completed using LRFD design methods. A current research project has established a first step in allowing the AHTD to use somewhat higher resistance factors in its designs. However, these factors are well lower than what they could be if the AHTD currently has no in-state static load tests to verify the accuracy of the Pile Driving Analyzer (PDA) which is currently used as a predictor of pile capacity. As a result of not having a calibration between true measured static capacity and the PDA predicted capacity, a significantly lower resistance factor must be taken for useful pile capacity when the PDA is used. A series of 10 full scale load tests, conducted during construction, would serve to provide a basis for removing bias from the PDA prediction which might allow the use of higher resistance factors in design. In addition, a new laser based QA/QC tool has recently been developed which can allow a 100% check on the capacity of all piles driven on a job for a cost of about $5-$10 per pile. Unfortunately, this device has not be calibrated for pile driving conditions in Arkansas and there is little to no data in the literature to support a calibration of the device. However, if it could be calibrated and used on each job the highest possible resistance factors could be used in design, allowing significant cost savings in the construction of bridge foundations.

OBJECTIVES:

Improve the data base of pile load tests that was created in TRC-0904 by conducting 10 full scale static load tests.

Validate the effectiveness of the PDA as a predictor of "measured" pile capacity.

Evaluate a potential 100% quality control device.

Form of Research Implementation:

Improved resistance factors for driven piles.

Protocol for an economical 100% QC device to predict "measured" capacity of all driven piles.

Note: Project cost includes procurement of QC device but not the cost of load testing.

Total Estimated Cost and Project Duration: **$** 160,000 **and** 24 **months.**

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ADVISORY COUNCIL RANKING	TRC RANKING	Statement Combined with Statement Number(s)
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