

State of Wisconsin/Department of Transportation
RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: March 31, 2007

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| Program: SPR-0010(36) FFY99 | | Part: II Research and Development | |
| Project Title: Comparison of Three Different Methods Determining Pile Bearing Capacities | | Project ID: WisDOT 0092-07-04 | |
| Administrative Contact: Nikki Hatch | | Sponsor: Wisconsin Department of Transportation | |
| WisDOT Technical Contact: Mr. Robert Arndorfer and Mr. Jeffrey Horsfall | | Approved Starting Date: Oct. 1, 2006 | |
| Approved by COR/Steering Committee: | | Original End Date: April 1, 2008 | |
| Project Investigator (agency & contact): James H Long/ Univ. of Illinois UW Sub-award: 296H984 | | Current End Date: (extension requested) | |
| | | Number of Extensions: 0 | |

Percent Complete: 16 percent

Request a No Cost Time Extension (Please Select One): YES NO

Reason for No Cost Time Extension:

The original start date for the project was scheduled to be Oct. 1, 2006, however, the final fully executed agreement was received by me on January 3, 2007 and a notice to proceed was received on January 4, 2007. I am therefore requesting a no-cost extension of 3 months. Accordingly, this project should reach completion on June 30, 2008. A revised Gantt chart is attached.

Project Description:

This project will quantify the ability of the three methods (EN, Gates, and PDA) for predicting pile capacity in a way that allows Wisconsin DOT to assess when or if it is appropriate to use each of the methods and to confidently estimate the reliability/safety and economy associated with each method.

The steps necessary to achieve the overall objectives stated above are listed below:

- to review the current use and state of practice for using the three methods
- to collect load test information, statewide and nationwide, that will allow the calculation of EN, Gates, and dynamic pile test and/or static load test results
- to quantify the agreement between EN, Gates, dynamic pile tests and/or static load test results
- to compare the predictions made with EN, Gates, and dynamic pile tests
- to quantify the accuracy of each of the methods and identify their limitations
- to assess the cost-effectiveness for each of the methods

Particular emphasis will be directed toward investigating the FHWA-modified Gates method since WisDOT is considering its use. In addition, an alternative modified Gates formula will be developed as part of this study to assess if better accuracy can be achieved using a minor modification to the Gates equation.

Progress This Quarter:

The Principal Investigator met with the technical review panel on January 16 to review the scope of work. Since that time, we have collected and reviewed more references and are currently in the process of writing a summary of the literature (Task 1a, 1b, 1c). I will present the summary to the technical review panel with an interim report at our next meeting in Madison on April 27, 2007. We should have Task 1 complete by the first week in April.
Task 2a - We have been looking at 3 collections of data so far. One database by Fragaszy, one by Olson and Flaate/ and one by Allen. We just recently acquired the Allen database and are investigating its contents. We are using the data collections to compare the EN formula and the FHWA Gates formula for these datasets. We will continue these efforts and expand to other datasets we currently have. Task 2c - We have also received a project file from Wisc. DOT on the results of a test pile that includes driven data and estimates made with a PDA. These results are being cataloged and are currently under review (Task 2c).

Work Next Quarter:

The next quarter will continue with and concentrate on Task 2 efforts. There are three significant sub-tasks to the data collection efforts: Task 2a will collect, interpret, and enter data from the Marquette Interchanges (MI), Task 2b will collect, interpret, and enter data from six past projects of the Wisconsin DOT, and Task 3 will use data from load tests the PI has collected over the last 20 years. Descriptions of the common efforts for each subtask are given below.

Circumstances Affecting Progress/Budget:

There have been no circumstances affecting the current progress or budget.

Gantt Chart:

An updated Gantt chart is given on the next page.

WORK-TIME SCHEDULE

| Task | Description | Month | | | | | | | | | | | | | | | | | |
|------|--|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| | | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1a | Collect Publ. | xx | xx | xx | | | | | | | | | | | | | | | |
| 1b | Review Publ. | | xx | xx | | | | | | | | | | | | | | | |
| 1c | Interim Rpt. | | | xx | | | | | | | | | | | | | | | |
| 2a | Collect PI's Pile Data | xx | xx | xx | xx | xx | | | | | | | | | | | | | |
| 2b | WDOT MI* Data | | xx | xx | xx | xx | xx | xx | xx | xx | xx | xx | xx | xx | | | | | |
| 2c | WDOT misc | xx | xx | xx | xx | xx | | | | | | | | | | | | | |
| 2d | Catalogue Data | | | | | | xx | | | | | xx | | | | | | | |
| 3a | Quantify Methods with Static Load Tests | | | | | | | xx | xx | xx | xx | | | | | | | | |
| 3b | Quantify Methods with Dynamic Load Tests | | | | | | | | | xx | xx | xx | | | | | | | |
| 3c | Dev. Improved Gates | | | | | | | | | | | xx | xx | | | | | | |
| 3d | Identify Limitations of Gates | | | | | | | | | | | | xx | xx | | | | | |
| 3e | Identify Cost Savings | | | | | | | | | | | | | xx | xx | | | | |
| 3f | Prepare and Submit Report | | | | | | | | | | | | | | xx | xx | | | |
| 3g | Review, re-edit, and Issue Final Report | | | | | | | | | | | | | | | | xx | xx | xx |
| | Meetings | *M | | | *M | | | | | | | *M | | | | | *M | | |