



OREGON DEPARTMENT OF TRANSPORTATION

SPR Quarterly Progress Report
April 1, 2009 through June 30, 2009

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TO: Technical Advisory Committee Members:

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1. Project

Calibration of LRFD Resistance Factor for the Wave Equation Analysis Program
SPR # 683

2. Key Dates

Start Date for ODOT: July 2008
Completion Date for ODOT: September 2010

3. Principal Investigator

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4. Progress

Task 2-Progress continues- now an ongoing DOT monitoring effort.

- Clear that following the October 1 2007 deadline many states engaged in LRFD calibration. This requires Task 2 to be continuous as their research products continue to show in state DOT reports and other published papers.
- Recent secured published activity from FL,IL,WI,NC. The state of LA 'reluctant' to update PSU research group and resolve thier anomolies in PDLT2000 and offer new database which exist-this is to be further prsued as they have almost exclusively the clay group which is absent in PSU databases.
- From May 29th TAC, and Winter discussions with Jan and Bert, the Model Series 3 no longer has extensive CAPWAP provided input. Thus two Models in Seies 3 removed.

Task 3-Two Databases of the Three Required complete and 'locked down'

- Resolution of data base missing data continues. Anolomolies continue to show up-the new identified anomaly is he Davisson capacity between DFLTD and PDLT2000. Water table is most often lacking and critival for granular soils-this keeps these cases below Tier 2a. BOR has no clear definition but established in field by Pile Driving inspection contractor/Client acceptance.
- To adequately capture assumptions and additional data sources extenbsise use of note tabs in Excell used.
- Due to stringent data quality requirements only 1 pile from present set is in 'all clay' category. With ODOT practice needs in cohesive soils high increasing this number of case histories becomes a priority. Single biggest handicap is undrained shear strength related to SPT 'N' value.
- Output quality metrics established and 3 Output ranks defined and reported to TAC

Task 4-Complete

- Renewal secured from Pile Dynamics Inc. of the GRLWEAP version now in effect until December
- All 43 Tier 1 and 2a Case histoties have a completed for Model series 1at EOID and Model series 2 at BOR both with GRLWEAP defaults.
- Tentative staistical results presented to TAC in May meeting

Task 5 Ongoing-Final 3 Masters defined

- Source data now exists in 3 carefully structured Mastrs. These are: *PDLT2000 PSU Master* contained all supplied data from ODOT, *Tier 1 PSU Master* contains the Task 3

intital bearing graph exercise, and *The Full PSU Master* with ALL case histories including new identified cases.

- Considerable and extensive note tabs for all Masters.

Task 6 Begun

- Review of all the Task 4 preliminary studies to ensure in full compliance with TAC directions.

5. **Problems**

- Difficulty in matching to ODOT practice for BOR in clays (Model 3.2) as no drained clay residual friction angles are provided in any database, or available from ODOT. These are very unusual and expensive tests. Use of empirical relationships for friction angles to PI and other indirect relationships will be attempted, together with necessary Nordlund changes for prescribed DRIVEN use to allow GRLWEAP to receive the correct input in drained clays..
- Most DOT's appear very reluctant to undertake the data search to resolve anomalies and provide missing data from PDLT20000 and DFLTD case histories
- With 45 piles from PDLT2000, in superior input Tiers 1 and 2a, preliminary analysed (Task 4 preliminary) and 20 additional new piles the total of 65 is insufficient to statistically provide reliable resistance factors. A larger effort than was originally scopped must be made to obtain enough information to raise Tier 3 and Tier 4 piles up to Tier 1 or Tier 2a for satisfactory analysis.

6. **Work Planned for Next Quarter**

- Focus and resolution of anomalies and missing data from state DOT
- Continue to search technical literature for new case histories
- To bring the number of piles to input Tiers 1 and 2a to exceed 150 minimum
- Review internally all 63 Task 4 cases completed
- Begin Task 6

7. **Finances**
 SPR Project Summary

VENDOR	FY'09	FY'10	FY11	FY'12	TOTALS
ORIGINAL BUDGET	\$ -	\$ -			\$ -
REVISED BUDGET	\$ 98,241	\$ 141,759			\$ 240,000
EXPENDITURES - VENDOR	\$ 87,145	\$ -	\$ -	\$ -	\$ 87,145
BALANCE	\$ 11,096	\$ 141,759	\$ -	\$ -	\$ 152,855
ODOT	FY'09	FY'10	FY11	FY'12	TOTALS
ORIGINAL BUDGET	\$0	\$0	\$0		\$ -
REVISED BUDGET	\$9,471	\$5,000	\$1,500		\$ 15,971
EXPENDITURES - ODOT	\$ 9,471	\$ -	\$ -	\$ -	\$ 9,471
BALANCE	\$ -	\$ 5,000	\$ 1,500	\$ -	\$ 6,500
PROJECT	FY'09	FY'10	FY11	FY'12	TOTALS
ORIGINAL BUDGET	\$ -	\$ -	\$ -	\$ -	\$ -
REVISED BUDGET	\$ 107,712	\$ 146,759	\$ 1,500	\$ -	\$ 255,971
EXPENDITURES - PROJECT	\$ 96,616	\$ -	\$ -		\$ 96,616
BALANCE	\$ 11,096	\$ 146,759	\$ 1,500	\$ -	\$ 159,355