OREGON DEPARTMENT OF TRANSPORTATION

Research Section
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SPR Quarterly Progress Report
October 1, 2016 through December 31, 2016

Date January 17, 2017

TO: Technical Advisory Committee Members:

Kira Glover-Cutter, ODOT, *Chair*
Susan C. Ortiz, ODOT
Albert Nako, ODOT
Phil Wurst, ODOT
Tanarat Potisuk, ODOT
Tim Rogers, FHWA

1. Project

Title: Effects of High Strength Steel and Steel Casing on the Response of Drilled Shafts
SPR # 765

2. Project Investigator

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3. Project Coordinator

Name: Kira Glover-Cutter
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4. Key Dates

Project start date: February 5, 2014
Project completion date: June 30, 2018 (updated)

First Fiscal Year: 2014
Final Fiscal Year: 2018
May 11, 2016 Amendment WO end date June 2018 (17384; 14-07)
Projected Additional Amendment WO March 2017 to reflect new timeline and funding

5. Project Status

Task 1: Literature Review and Survey
Percent completed reported in last quarterly report: 85%
Percent completed after this quarter: 85%

Key Progress-To-Date
- Draft literature review is complete
- Literature review is being reviewed and revised
- Questionnaire / Survey drafted and released to DOTs
- Questionnaire results (24 of 50) analyzed and finalized.

Specific Progress This Quarter
- *None.*

Problems
- *None.*

Work Planned for Next Quarter
- Continue to finalize literature review as field work allows.

Task 2: Conduct Subsurface Investigation at OSU Geotechnical Field Test Site
Percent completed reported in last quarterly report: 95%
Percent completed after this quarter: 95%

Key Progress-To-Date
- One 141' seismic CPT pushed at the test site to help design reaction elements.
- Two 75' seismic CPTs pushed at the test site to help design reaction elements and interpret the axial loading tests.
- Four 40' seismic CPTs pushed just after the lateral loading tests to characterize the material in a temporally-appropriate context (our soils are moisture sensitive) for interpreting the axial and lateral loading tests and to try to detect changes in soil response after a significant loading event.
- Conducted some laboratory tests to classify the soil
- Constructed draft subsurface profile

Specific Progress This Quarter
- *None.*

Problems
- *None.*

Work Planned for Next Quarter
- Finalize subsurface information.

Task 3: Install and Test Instrumented Drilled Shafts
Percent completed reported in last quarterly report: 100%
Percent completed after this quarter: 100%

Key Progress-To-Date
- Test steel reinforcement cages have been delivered to test site (on February 20th).
- Instrumentation of cages complete.
- Four test shafts installed by Malcolm Drilling
- Quality control tests including Crosshole Sonic Logging (CSL) and Thermal Integrity Profilometer (TIP) tests were conducted.
- Installation of Reaction Anchors.
- Completion of all four axial loading tests.
- Completion of all four lateral loading tests.

Specific Progress This Quarter
- *None. This task is complete.*

Problems
- *None.*

Work Planned for Next Quarter
- *None. This task is completed.*

Task 4: Evaluate Axial and Lateral Load Transfer
Percent completed reported in last quarterly report: 25%
Percent completed after this quarter: 40%

Key Progress-To-Date
- All data has been reviewed for quality control and interpretation has been initiated.
- t-z curves have been developed for the uncased shafts
- q-z curves have been developed for the cased shafts
- Lateral deflection profiles developed for all shafts
- t-z curves have been developed for the uncased shafts
- q-z curves have been developed for the cased shafts
- Lateral deflection profiles developed for all shafts

Specific Progress This Quarter

- Evaluating various t-z curve and q-z curve design models
- Continued development of t-z curves for cased shafs
- Evaluating approaches for the development of p-y curves

Problems

- *None. Everything moving as planned.*

Work Planned for Next Quarter

- Continue to develop load transfer data: t-z curves for cased shafts, p-y curves for all shafts

Task 5: Develop Design Guidance and Document Findings in Final Report
Percent completed reported in last quarterly report: 0%
Percent completed after this quarter: 0%

Key Progress-To-Date

- *None.*

Specific Progress This Quarter

- *None.*

Problems

- *None.*

Work Planned for Next Quarter

- *None.*

6. <u>Project Coordinator's Comments</u> (Completed by ODOT)

Project progress is on track for completion by December 2017, well before the June 2018 WO Amendment #1 date. Additional funding and second amendment will be fully considered by March 2017. A TAC meeting to discuss expectations for Task 5 will be scheduled for late spring/early summer 2017.

7. <u>Finances</u> (Completed by ODOT)

SPR Project Summary

VENDOR	FY14	FY'15	FY'16	FY'17	FY'18	TOTALS
ORIGINAL BUDGET	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	$ -
WORK PLAN BUDGET	$ 111,182	$ 101,782	$ 79,598	$ 37,333	$ -	$ 329,895
REVISED BUDGET	**$ 10,770**	**$ 125,906**	**$ 113,000**	**$ 63,811**	**$ 16,408**	**$ 329,895**
EXPENDITURES - VENDOR	$ 10,770	$ 125,906	$ 117,051	$ 23,201	$ -	$ 276,928
BALANCE	**$ -**	$ -	$ (4,051)	$ 40,610	$ 16,408	$ 52,967
ODOT	FY14	FY'15	FY'16	FY'17	FY'18	TOTALS
ORIGINAL BUDGET	$57,500	$110,000	$110,000	$57,500	$0	$ 335,000
REVISED BUDGET	**$6,291**	**$5,715**	**$5,730**	**$5,000**	**$5,000**	**$27,736**
EXPENDITURES - ODOT	$ 6,291	$ 5,715	$ 5,345	$ 2,997	$ -	$ 20,348
BALANCE	**$ -**	$ -	$ 385	$ 2,003	$ 5,000	$ 7,388
PROJECT	FY14	FY'15	FY'16	FY'17	FY'18	TOTALS
ORIGINAL BUDGET	$ 57,500	$ 110,000	$ 110,000	$ 57,500	$ -	$ 335,000
REVISED BUDGET	**$ 17,061**	**$ 131,621**	**$ 118,730**	**$ 68,811**	**$ 21,408**	**$ 357,631**
EXPENDITURES - PROJECT	$ 17,061	$ 131,621	$ 122,396	$ 26,198	$ -	$ 297,276
BALANCE	**$ -**	$ -	$ (3,666)	$ 42,613	$ 21,408	$ 60,355