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OREGON DEPARTMENT OF TRANSPORTATION

SPR Quarterly Progress Report

October 1, 2016 through December 31, 2016

Date December 21, 2016

TO: Technical Advisory Committee Members:
Larry Ilg, ODOT
Cole Mullis, ODOT
Justin Moderie, ODOT
Anthony Boesen, FHWA

1. Project

Title: Binder-Grade Bumping and High Binder Content to Improve Performance of RAP-RAS Mixtures
SPR # 797

2. Project Investigator

Name: Erdem Coleri, PhD
Title: Assistant Professor, School of Civil and Construction Engineering
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3. Project Coordinator

Name: Norris Shippen, Research Coordinator
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4. Key Dates

Project start date: 11/16/2015
Project completion date: 6/30/2017

First Fiscal Year: [year]
Final Fiscal Year: [year]
[List revised completion dates and corresponding amendment numbers]

5. Project Status (Completed by project investigator)

Task 1: TAC Meeting
Percent completed reported in last quarterly report: 100%

Task 2: Draft Literature Review and Draft Methodology
Deliverable: Draft Literature Review Document
Deliverable Due 12/30/2015

Percent completed reported in last quarterly report: 99%
Percent completed after this quarter: 99%

Key Progress-To-Date
- Draft literature review was completed.
- Interim report for the literature review was sent to the TAC.

Specific Progress This Quarter
- Recent studies on RAP/RAS were investigated.

Problems
- None

Work Planned for Next Quarter
- Literature review document will be updated and improved.

Task 3: TAC Meeting
Percent completed reported in last quarterly report: 100%

Task 4: Data Collection and Analysis
Deliverable: Progress Report
Deliverable Due: 12/30/2016
Percent completed reported in last quarterly report: 40%
Percent completed after this quarter: 60%

Key Progress-To-Date
- Test equipment at OSU were calibrated and sample preparation and test procedures were reviewed to get ready for sample preparation and testing.
- 35 barrels of aggregate, 10 barrels of RAP, 12 buckets of RAS were collected from Riverbend to be used for specimen preparation.
- Most of the aggregates and RAP materials were wet and dry sieved at OSU asphalt materials lab to get ready for mixing.
- 50 buckets of asphalt binder with PG58-34, PG64-22, and PG76-22 were collected from McCall oil. OSU started to divide those buckets into small containers to use for mix preparation.
- Asphalt mixes were started to be prepared by using Superpave gyratory and roller compactors. Compacted samples were started to be cut and prepared for testing.

- 90% of samples for experimental plan #1 are prepared. Almost all experiments of experimental plan #1 tests are completed (about 55% of all testing in the project).
- A MATLAB code is developed to process semi-circular bend test results to extract cracking parameters.
- Maximum specific gravity for experimental plan#2 samples are currently being measured while the experiments for experimental plan #1 are conducted simultaneously.
- Aggregates for the entire project are sieved and ready for batching and sample preparation.

Specific Progress This Quarter

- 90% of samples for experimental plan #1 are prepared. Almost all experiments of experimental plan #1 tests are completed (about 55% of all testing in the project).
- A MATLAB code is developed to process semi-circular bend test results to extract cracking parameters.
- Maximum specific gravity for experimental plan#2 samples are currently being measured to get ready for sample preparation (batching is currently being done) while the experiments for experimental plan #1 are conducted simultaneously.
- Aggregates for the entire project are sieved and ready for batching and sample preparation.

Problems

- None

Work Planned for Next Quarter

- Results for experimental plan #1 will be send to TAC for review towards the end of March.
- Test sample preparation for the entire project will be completed.
- 75% of testing for the project is planned to be completed.

Task 5: MEPDG Simulations
Deliverable: Interim Report with results from Tasks 4 and 5
Deliverable Due: 1/31/2017
Percent completed reported in last quarterly report: 20%
Percent completed after this quarter: 30%

Key Progress-To-Date
- MEPDG software is purchased and OSU started to work on the models to decide the type of analysis that will be conducted for RAP/RAS field performance simulation.
- MEPDG model coefficients for the conducted tests were started to be calculated.

Specific Progress This Quarter
- MEPDG model coefficients for the conducted tests were started to be calculated.

Problems
- None

Work Planned for Next Quarter
- Continue MEPDG simulations for the completed experiments.

Task 6: Draft Final Report
Deliverable: Draft Final Report
Deliverable Due: 3/31/2017
Percent completed reported in last quarterly report: -
Percent completed after this quarter: -

Key Progress-To-Date
- -

Specific Progress This Quarter
- -

Problems
- -

Work Planned for Next Quarter
- OSU will start calculating the parameters, preparing the plots, and results summary for the report.

Task 7: Draft ODOT Research Note
Deliverable: Draft Research Note
Deliverable Due: 3/31/2017
Percent completed reported in last quarterly report: -
Percent completed after this quarter:

Key Progress-To-Date

- -

Specific Progress This Quarter

- -

Problems

- -

Work Planned for Next Quarter

- -

Task 8: TAC Meeting
Date: 3/2017
Percent completed reported in last quarterly report: -
Percent completed after this quarter:

Key Progress-To-Date

- -

Specific Progress This Quarter

- -

Problems

- -

Work Planned for Next Quarter

- -

Task 9: Final Report
Deliverable: Final Report
Deliverable Due: 5/30/2017
Percent completed reported in last quarterly report: -
Percent completed after this quarter:

Key Progress-To-Date

- -

Specific Progress This Quarter

- -

Problems

- -

Work Planned for Next Quarter

- -

Task 10: Final ODOT Research Note
Deliverable: Final Research Note
Deliverable Due: 5/30/2017
Percent completed reported in last quarterly report: -
Percent completed after this quarter:

Key Progress-To-Date
- -

Specific Progress This Quarter
- -

Problems
- -

Work Planned for Next Quarter
- -

6. **Project Coordinator's Comments** (Completed by ODOT)

7. **Finances** (Completed by ODOT)

SPR Project Summary

VENDOR	FY'16	FY'17	FY'18	FY'19	TOTALS
ORIGINAL BUDGET					$ -
WORK PLAN BUDGET	$ 71,626	$ 98,374	$ -	$ -	$ 170,000
REVISED BUDGET	**$ 18,000**	**$ 122,000**	**$ 30,000**	**$ -**	**$ 170,000**
EXPENDITURES - VENDOR	$ 34,286	$ -	$ -	$ -	$ 34,286
BALANCE	$ (16,286)	$ 122,000	$ 30,000	$ -	$ 135,714
ODOT	FY'16	FY'17	FY'18	FY'19	TOTALS
ORIGINAL BUDGET	$ 6,000	$ 10,000	$ -	$ -	$ 16,000
REVISED BUDGET	**$ 4,000**	**$ 6,000**	**$ 6,000**	**$ -**	**$ 16,000**
EXPENDITURES - ODOT	$ 5,731	$ 2,914	$ -	$ -	$ 8,645
BALANCE	$ (1,731)	$ 3,086	$ 6,000	$ -	$ 7,355
PROJECT	FY'16	FY'17	FY'18	FY'19	TOTALS
ORIGINAL BUDGET	$ 77,626	$ 108,374	$ -	$ -	$ 186,000
REVISED BUDGET	**$ 22,000**	**$ 128,000**	**$ 36,000**	**$ -**	**$ 186,000**
EXPENDITURES - PROJECT	$ 40,017	$ 2,914	$ -	$ -	$ 42,931
BALANCE	$ (18,017)	$ 125,086	$ 36,000	$ -	$ 143,069

Tested SCB samples for experimental plan#1

(a)

(b)

(a) Maximum specific gravity samples for phase#2 (b) Sieving completed for the entire project.