



SPR Quarterly Progress Report

Date: October 29, 2007

TO: Technical Advisory Committee Members:
Jon Mullarky, FHWA
Tim Rogers, FHWA
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FROM: Steve Soltesz, Research Coordinator (ph: (503) 986-2851)

1. Project

Abrasion-Resistant Concrete Mix Designs for Bridge Decks Phase 1
SPR 622

2. Key Dates

Start Date for ODOT: October 2004
Completion Date for ODOT: December 2009

3. Principal Investigators

Todd Scholz
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4. Progress

- Additional work was done to establish the lab space in Graf Hall. This was necessary due to having to vacate Apperson Hall so that it could be renovated (see Problems).
- A meeting with Knife River personnel was held on July 3, 2007 at the Harrisburg Plant to discuss obtaining materials to be used in the concrete mixtures, concrete mix designs, and Knife River involvement.

- Coarse and fine aggregates were obtained from Knife River from the Corvallis Plant. In total, approximately 12.5 tons of aggregates were obtained. These included coarse and fine aggregates for normal weight concrete mixtures produced out of the Corvallis plant (for the control mixture) as well as coarse and fine aggregates from separate stockpiles for producing high performance concrete mixtures out of the Harrisburg Plant (for the experimental mixtures). These were transferred to the OSU laboratories and characterized for unit weight, specific gravity, absorption, and gradation.
- The half-time summer hire graduate student completed a draft of the literature review. This student developed two documents: one for high performance concrete, and one for high durability concrete.
- A new graduate student was hired in September to conduct the research work. She conducted sieve analyses on the aggregates (which were not completed to the PI's satisfaction over the summer) and developed an initial mix design for one of the high performance mixtures containing slag and silica fume. She initiated work on determining the admixture content for entrained air for the control mix. She also combined the two literature review documents developed by the summer hire graduate student into one document.
- A framework for mix designs and the experiment design was developed.
- Mix designs for the control mix were completed.
- The curing tanks were established with heaters and circulators.

5. **Problems**

- Progress on the project has been delayed due to having to accommodate construction work carried out over the summer in Graf Hall. This work stemmed from having to vacate Apperson Hall and relocate the labs in Graf Hall. The construction work was carried out in the area where the work was planned for this project.
- OSU has not yet received the abrasion tester or the sonometer. Both of these pieces of equipment will be used to assess the performance of the experimental mixtures relative to that of the control mixture.

6. **Work Planned for Next Quarter**

- Set up the abrasion tester and sonometer.
- Fabricate molds for the abrasion tester, chloride ion penetration test, and freeze-thaw apparatus.
- Design and fabricate the test apparatus for chloride penetration testing.
- Set up the freeze-thaw environmental chamber and fabricate conditioning jigs for the specimens.
- Hold a TAC meeting and finalize the experiment design.
- Mix and cast the control mixture specimens. Perform essential tests on the freshly mixed concrete for these mixtures (e.g., air content, unit weight, slump, etc.).

- Conduct performance tests (e.g., compressive strength) on the control mixture as required by the experiment design.

7. **Finances**

VENDOR	FY'04	FY05	FY06	FY07	FY08	FY'09	FY'10	TOTALS
ORIGINAL BUDGET	\$ 14,000	\$ 164,000	\$ 25,000	\$ 25,000	\$ 12,000	\$ -	\$ -	\$ 240,000
REVISED BUDGET	\$ -	\$ 21,810	\$ 33,019	\$ 312	\$ 70,601	\$ 99,087	\$ -	\$ 224,829
EXPENDITURES - VENDOR	\$ -	\$ 21,810	\$ 33,019	\$ 312	\$ -			\$ 55,141
BALANCE	\$ -	\$ -	\$ -	\$ -	\$ 70,601	\$ 99,087	\$ -	\$ 169,688

ODOT	FY'04	FY05	FY06	FY07	FY08	FY'09	FY'10	TOTALS
ORIGINAL BUDGET	\$ 1,626	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ -	\$ -	\$ 21,626
REVISED BUDGET	\$ -	\$ 5,747	\$ 9,795	\$ 7,107	\$ 4,000	\$ 4,000	\$ 2,000	\$ 32,649
EXPENDITURES - ODOT	\$ -	\$ 5,747	\$ 9,795	\$ 7,107	\$ -	\$ -		\$ 22,649
BALANCE	\$ -	\$ -	\$ -	\$ -	\$ 4,000	\$ 4,000		\$ 8,000

PROJECT	FY'04	FY05	FY06	FY07	FY08	FY'09	FY'10	TOTALS
ORIGINAL BUDGET	\$ 15,626	\$ 169,000	\$ 30,000	\$ 30,000	\$ 17,000	\$ -	\$ -	\$ 261,626
REVISED BUDGET	\$ -	\$ 27,557	\$ 42,814	\$ 7,419	\$ 74,601	\$ 103,087	\$ 2,000	\$ 257,478
EXPENDITURES - PROJECT	\$ -	\$ 27,557	\$ 42,814	\$ 7,419	\$ -	\$ -	\$ -	\$ 77,790
BALANCE	\$ -	\$ -	\$ -	\$ -	\$ 74,601	\$ 103,087	\$ 2,000	\$ 179,688