

OHIO DEPARTMENT OF TRANSPORTATION
QUARTERLY RESEARCH REPORT

For Quarter Ending: December 31, 2002

Regional Pooled Fund Study

Project Title: "Environmental Durability Evaluation of Externally Bond Composites

Research Agency: The University of Cincinnati

Principal Investigator(s): Drs. Bahram M. Shahrooz, Michael Baseheart

PFS No.: SPR-3(093)

State Job No.: 14755(0)

Contract No.: 9895

Start Date: June 19, 2000

Contract Funds Approved: \$ 173,190

Completion Date: February 19, 2003

Spent To Date: \$162,678

% Funds Expended 94

% Work Done 95

% Time Expired 93

SUMMARY OF PROGRESS FOR QUARTER:

1. Tested all the conditioned and unconditioned, retrofitted beams.
2. Worked on the draft of the final report, and finalized 90% of the report.

PROPOSED WORK FOR NEW QUARTER:

1. Finalize and submit draft of the final report to ODOT.
2. Request a no-cost extension to allow ODOT review our report, and to print the approved final report.

IMPLEMENTATION (if any): NONE

PROBLEMS (if any): See the 3-31-2002 quarterly report.

EQUIPMENT PURCHASED (if any): NONE

Table 1. Test Matrix for Material Tests Per System

Test Type	No. of Specimens	Type of Exposure	Exposure Conditions/Temperature	Exposure	Total No. of Specimens	Current Status - % Complete	
				Duration/Stress Levels		Conditioning	Testing
Tensile (Longitudinal)	4	Baseline	Room Temperature	1	4	N/A	100%
	4	Water	100% Humidity @ 100°F	1000, 3000, 10000 hours	12	100%	100%
	4	Salt Water	Immersion @ 72°F	1000, 3000, 10000 hours	12	100%	100%
	4	Concrete Alkalinity	Immersion in pH 9.5 CaCO ₃ @ 72°F	1000, 3000, 10000 hours	12	100%	100%
	4	Dry Heat	Furnace @ 140°F	1000, 3000 hours	8	100%	100%
	4	Vehicle Fuel	Immersion in Diesel Fuel @ 72°F	4 hours	4	100%	100%
	4	Weathering	Alternating UV @ 145°F for 102 min. & UV @ 145°F with Water Spray for 18 min.	2000 hours	4	100%	100%
	4	Freeze/Thaw	Cycle Between 100% humidity @ 100°F & Freezer @ 0°F	24 hours per cycle, 20 cycles	4	100%	100%
CTE	4	Baseline	-20°F to 150°F	N/A	4	N/A	100%
T _{eg}	2	Baseline	Room Temperature	1	2	N/A	100%
	1	Water	100% Humidity @ 100°F	1000, 3000, 10000 hours	3	100%	100%
	1	Salt Water	Immersion @ 72°F	1000, 3000, 10000 hours	3	100%	100%
	1	Concrete Alkalinity	Immersion in pH 9.5 CaCO ₃ @ 72°F	1000, 3000, 10000 hours	3	100%	100%
	2	Dry Heat	Furnace @ 140°F	1000, 3000 hours	2	100%	100%
	1	Vehicle Fuel	Immersion in Diesel Fuel @ 72°F	4 hours	1	100%	100%
	1	Weathering	Alternating UV @ 145°F for 102 min. & UV @ 145°F with Water Spray for 18 min.	2000 hours	1	100%	100%
	1	Freeze/Thaw	Cycle Between 100% humidity @ 100°F & Freezer @ 0°F	24 hours per cycle, 20 cycles	1	100%	100%
ILSS	4	Baseline	Room Temperature	1	4	N/A	100%
	4	Water	100% Humidity @ 100°F	1000, 3000, 10000 hours	12	100%	100%
	4	Salt Water	Immersion @ 72°F	1000, 3000, 10000 hours	12	100%	100%
	4	Concrete Alkalinity	Immersion in pH 9.5 CaCO ₃ @ 72°F	1000, 3000, 10000 hours	12	100%	100%
	4	Dry Heat	Furnace @ 140°F	1000, 3000 hours	8	100%	100%
	4	Vehicle Fuel	Immersion in Diesel Fuel @ 72°F	4 hours	4	100%	100%
	4	Weathering	Alternating UV @ 145°F for 102 min. & UV @ 145°F with Water Spray for 18 min.	2000 hours	4	100%	100%
	4	Freeze/Thaw	Cycle Between 100% humidity @ 100°F & Freezer @ 0°F	24 hours per cycle, 20 cycles	4	100%	100%
Creep	4	Baseline	72°F and 120°F	75% Ultimate Strength (3000 hours)	24	N/A	In Progress
Impact	4	Baseline	Room Temperature	1	4	N/A	In Progress
Fiber Content/ Void Ratio	1	Baseline	Room Temperature	1	1	N/A	100%

Table 2. Test Matrix for Bond Tests Per System (Lap Shear Strength Tests)

No. of Specimens	Type of Exposure	Exposure Conditions/Temperature	Exposure	Total No. of Specimens	Current Status - % Complete	
			Duration/Stress Levels		Conditioning	Testing
4	Baseline	Room Temperature	1	4	N/A	100%
4	Water	100% Humidity @ 100°F	1000, 3000, 10000 hours	12	100%	100%
4	Salt Water	Immersion @ 72°F	1000, 3000, 10000 hours	12	100%	100%
4	Concrete Alkalinity	Immersion in pH 9.5 CaCO ₃ @ 72°F	1000, 3000, 10000 hours	12	100%	100%
4	Dry Heat	Furnace @ 140°F	1000, 3000 hours	8	100%	100%
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