VTRC File No: _____

Virginia Transportation Research Council
Contract/Grant Progress Report

Project No: TPF5 (045) **Starting Date: 3/1/2003** **Target Completion Date: 12/31/06**
Project Title: Development of Performance Guidelines for the Selection of Bituminous Hot-Poured Crack Sealants
Performing Agency: University of Illinois
Principal Investigator(s): Imad L. Al-Qadi
Date of This Report: 02/28/06 **Next Report Due Date: 5/31/06**

Project Description
The project will establish performance guidelines for the proper selection of hot-poured crack sealants. The guidelines will be in the spirit of the performance Grade (PG) system for bituminous binders with some modifications to the equipment, data analysis procedure, and testing methods.

Research Activities Pursued This Period:

- The research team has successfully modeled sealant material utilizing BBR sealant test results at wide range of low temperature. A constitutive relationship was developed that could be used to predict sealant performance.
- It is concluded that sealant behaves as a linear viscoelastic material at low temperature; hence, the stiffness and creep compliance equations developed during SHRP for binder are applicable for sealants.
- Further fine-tuning of the blister test is underway. A preliminary standard material was selected for use in the proposed blister test
- A three-dimensional finite element model for the blister test, using the developed Prony series constitutive model, was developed. Validation of the model with experimental measurements is to be started next quarter.

Problems Encountered:

- The DTT required further maintenance. The PC control computer was sent to the manufacture for repair
- Cannon BBR and DV-III RV viscometer devices were received and installation was completed in late February
- Temperature variation at different locations in the vacuum oven during aging exceeds +/- 1 C reported earlier from testing at CRC. The variation in temperature was measured as high as 30 C. A separate report was sent to sponsor on this issue with the suggested solution.

Activities Planned for Next Period:

- Finalize the aging procedure in light of the nonuniformity in temperature within the oven system
- Select seven sealants with wide rheological properties for testing in the new Canon BBR device.
- Investigate the repeatability for the BBR test using different testing devices, labs, and operators.
- Investigate the repeatability for the viscosity test using labs.
- Evaluate the fracture toughness test and the linearity response using the new DTT specimen geometry.
- Continue the work on verification and validation of the finite element blister model.
- Determine the repeatability of the semi-cylindrical adhesion fixture. If the test is repeatable, testing of sealant-aggregate combination will start.

Budget Status:

Current FY Project Budget: $291,434		Project Budget Lifetime: *820,000
Current FY Expenditures: $81,965	as of	Expenditures LTD: $464,265
Percent Expended this FY: 28.1%	(Date)	Percent Expended LTD: 56.7%

Timetable: Project is (check):

On Schedule	☒
Behind Schedule *	☐ (explain above)
Ahead of Schedule	☐

Preparer's Signature: _____ Date: _____