

**NEW ENGLAND TRANSPORTATION CONSORTIUM
QUARTERLY PROJECT PROGRESS REPORT**

A. PROJECT NUMBER AND TITLE: NETC 15-3

B. PRINCIPAL INVESTIGATOR(s) & UNIVERSITY(s): Eshan V. Dave, University of New Hampshire

C. WEB SITE ADDRESS (If one exists):

D. START DATE (Per NETC Agreement): 8/1/2016

E. END DATE (Per NETC Agreement): 7/31/2018

F. ANTICIPATED COMPLETION DATE: 7/31/2018

G. PROJECT OBJECTIVES:

1. Evaluate good and poor performing asphalt mixtures in New England and determine mechanisms responsible for poor performing mixtures
2. Determine impacts of remedial measures (anti-stripping additives and hydrated lime) in reducing moisture susceptibility of poor performing mixtures
3. Assess impacts of moisture induced-damage on pavement performance and service life
4. Recommend an evaluation framework consisting of appropriate test procedure(s), specification, analysis procedure verified with field performance data that is reliable and suitable for moisture susceptibility testing of asphalt mixtures used in New England

H. REPORT PERIOD: 4/1/2017 – 6/30/2017

I. ACCOMPLISHMENTS THIS PERIOD:

The main focus of work in this quarter was on collecting and analyzing the responses to the survey distributed to the six state agencies, preparing a laboratory testing plan on the basis of the survey responses, and sampling materials suggested by the agencies. All the results from the agency survey were collected, tabulated, and prepared in two forms. The first is a detailed report showing all the received responses to the various questions, and the second is a summarized version of the key points among the responses.

Based on the survey responses, the laboratory testing plan was developed with an emphasis on three conditioning methods (modified Lottman, MIST, multi-cycle freeze-thaw) and four laboratory tests (indirect tensile strength, dynamic modulus, Hamburg wheel tracker, and fracture tests). It was also decided that some mixes will be subject to more conditioning and test method combinations than other mixes so that the total amount of testing can be decreased while data for all possible combinations is obtained on select mixes. For example, only limited number of mixes will be conditioned using the modified Lottman procedure (4 out of 10) due to previous New England DOTs experience that this method does not discern good and poor performing mixtures. The testing plan has been compiled and summarized into a spreadsheet.

The researchers contacted staff from ConnDOT, MaineDOT and VTrans to discuss mixture sampling. Multiple candidate mixes were received, and six of these mixes (three from Vermont and three from Maine) were sampled by the research team. Two more mixtures will be sampled from Maine in the coming weeks, and two mixes are planning to be sampled from Connecticut. Once all of these mixes are sampled, the ten mix target set at the beginning of the project will be reached. The laboratory evaluation of these mixes has begun. For all sampled mixtures, compaction characteristics have been established to prepare laboratory test

specimens. Researchers at UNH have started to conduct indirect tensile strength tests on unconditioned specimens as well as to compact Hamburg wheel tracking test specimens.

J. PROBLEMS ENCOUNTERED (If any):

No significant problems encountered.

K. TECHNOLOGY TRANSFER ACTIVITIES:

No activity to report.

L. STATUS BY TASK:

Task 1: State of the Practice and Literature Review: Minimal work was conducted on Task 1 activities during the past quarter. The literature review was completed and compiled into a report. The final report is being formatted and edited for submittal. It is expected to be delivered during the first month of upcoming quarter.

Task 2: Identify and Inspect Moisture Susceptible Mixes and Develop Testing Plan: A laboratory testing plan was developed and finalized, this plan was presented to the project technical committee in the past quarter and feedback was incorporated into the final testing plan. A material sampling plan was also developed, and has been acted upon over the last month of the past quarter. So far, six mixes have been sampled, with four more mixes anticipated over the next few weeks.

Task 3: Laboratory Testing: As soon as first mix was sampled, laboratory testing ensued. Laboratory compaction characteristics were determined for fabrication of test specimens. Production of laboratory specimens is underway at both UNH and WPI. UNH researchers have started indirect tensile strength testing and Hamburg specimen preparation. WPI researchers have started to finalize MiST conditioning parameters.

Task 4: Final Report and Recommendations: This quarterly report serves as the deliverable for the reported calendar quarter. No other activity is reported.

M. PERCENT COMPLETION OF TOTAL PROJECT: 25 %

N. ACTIVITIES PLANNED FOR NEXT QUARTER:

- Sample remaining four mixtures from Maine and Connecticut
- Continue the laboratory testing:
 - o Conditioning: Modified Lottman, MiST and Multi-cycle Freeze-Thaw; Mechanical Characterization: Indirect tensile strength, complex modulus and fracture parameters from semi-circular bend (SCB) test
- Begin conducting data analysis on laboratory results to assess changes in mechanical characteristics of mixtures due to laboratory moisture conditioning.

O. FINANCIAL STATUS:

As of: 7/1/2017

Total Project Budget: \$ 150,000

Total Expenditures: \$ 38,430

Note: This report should not require more than 2-3 pages & should be e-mailed to the NETC Coordinator so as to arrive no later than three (3) working days after the end of each calendar quarter.