NEW ENGLAND TRANSPORTATION CONSORTIUM
QUARTERLY PROJECT PROGRESS REPORT

A. PROJECT NUMBER AND TITLE:
NETC 13-1: Development of High Early-Strength Concrete for Accelerated Bridge Construction Closure Pour Connections

B. PRINCIPAL INVESTIGATOR(s) & UNIVERSITY(s):
Sergio F. Breña (PI) – University of Massachusetts Amherst
Scott A. Civjan (Co-PI) – University of Massachusetts Amherst

C. WEB SITE ADDRESS (*If one exists***):**

D. START DATE (*Per NETC Agreement***): September 01, 2014**

E. END DATE (*Per NETC Agreement***): April 02, 2016; August 31, 2018 (amended)**

F. **ANTICIPATED COMPLETION DATE: August 31, 2018**
A request to extend the project (cost and time) was discussed with the Project Technical Advisory Committee as described in Section J. Their positive recommendation was sent to NETC for approval and the formal extension request process was initiated with NETC on June 2017. The amendment to the project contract was issued in early August 2017, and project activities restarted in September 2017.

A second request to have a no-cost extension to the project was submitted to NETC for approval on 22 January 2018 and was approved by the NETC AC and the TAC for the project on 28 February 2018. Project activities restarted after this date. A third no-cost extension has recently been granted to 31 August 2018.

G. PROJECT OBJECTIVES:
To develop and validate concrete mixtures capable of developing high early strength without detrimentally affecting their long-term durability. The mixtures are for use in projects using accelerated bridge construction methods.

H. REPORT PERIOD: July 1, 2018 – September 30, 2018

I. ACCOMPLISHMENTS THIS PERIOD:

Task 1*: Literature Search*
- Task Complete.

Task 3*: Develop Mix Design*
- Task Complete

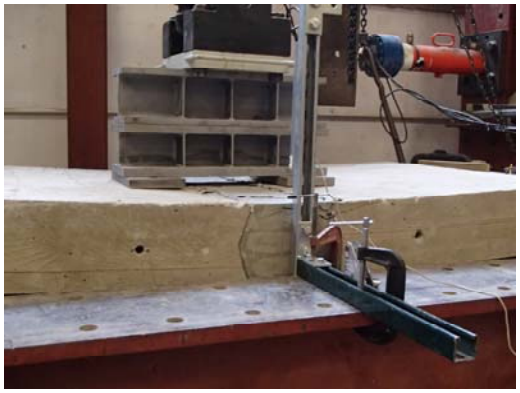
Task 4*: Test Mixture*
- Task complete

Panel specimens were tested during this reporting period after the closure pour was cast in the laboratory. The mix used for the first panel closure pour was also used to fabricate two prisms that will be cycled in the freeze-thaw chamber owned by MassDOT in October 2018. Additional prisms were cast using the same mix as used for the closure pour but in a separate batch to demonstrate consistency of the mix between batches. Pictures of the panels during are after testing are presented below. Pictures of the prisms that were cast for freeze-thaw cycling are also presented.

(a) Panels positioned to cast closure pour

(b) Closure pour casting

(c) Panel testing setup



(d) Panel during test

(e) Closure pour concrete cylinder tests

(f) Prisms for freeze-thaw cycling

J. PROBLEMS ENCOUNTERED (If any):

The research team reinitiated project activities at the end of February 2018 after approval of the no-cost extension to 31 May 2018. Another no-cost extension was awarded during this reporting period to complete the project on 31 August 2018.

The end date of the project has been reached but the team is still receiving comments on the draft project report that was sent in mid-August 2018. The freeze-thaw prisms will be transported to the MassDOT testing facilty for cycling in early October 2018. The results of this testing will be sent to NETC as an addendum to the project report after they are received by the research team.

K. TECHNOLOGY TRANSFER ACTIVITIES:

The research team participated in the VTrans Symposium that took place on September 12, 2018. For this symposium a poster and fact sheet were prepared in coordination with NETC.

L. STATUS BY TASK:

Task 1*: Literature Search – 100% complete*
Task 2*: Develop Mixture Design Specification – 100% complete*
Task 3*: Develop Mix Design –Trial batches –100% complete*
Task 4*: Test Mixture –Laboratory specimens have been fabricated and test rig for panel tests is ready to conduct the tests. The closure pour for the specimens was cast at the end of the reporting period. Freeze-thaw specimens will be fabricated at the same time as closure pours for panel tests -- 100%*

Draft Project Report *– The draft project report was prepared and sent to the NETC Coordinator for review by the Advisory Panel of the project. It is under review at the time of writing of this quarterly report. These comments will be considered for incorporation into the final project report when the review period closes as determined by the NETC Coordinator.*

M. PERCENT COMPLETION OF TOTAL PROJECT: 99%

N. ACTIVITIES PLANNED FOR NEXT QUARTER:

- The freeze-thaw prisms will be brought to the MassDOT laboratory for freeze-thaw cycling in early October. Although the project end date has been officially reached, the research team will transport the prisms to the testing laboratory for assistance with freeze-thaw testing.

O. FINANCIAL STATUS:

As of: September 30, 2018
Total Project Budget: $ 174,923; $191,710 (Amended)
Total Expenditures: $ 189,411