

**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: April 1, 2018 – June 30, 2018

I. ACCOMPLISHMENTS THIS PERIOD:

Task 1: Literature Search

- Task Complete.

Task 3: Develop Mix Design

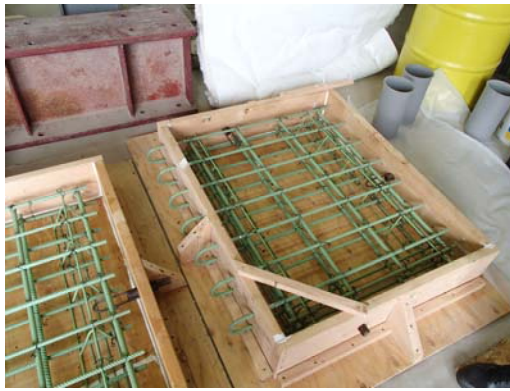
- Task Complete

Task 4: Test Mixture

Most activities for this task have been completed. Freeze-thaw testing and panel tests are the only two activities missing that will be conducted during the extension granted for the project.

The geometry and preliminary design of the specimens for panel testing were sent to the Project Technical Advisory Committee for review and comments. To avoid further delays, the project team is proceeding using the dimensions proposed on a communication dated 27 September 2017.

The panel specimens were fabricated for testing after assembling formwork and tying the reinforcing cage (see pictures below). The closure pour for the first slab specimen was cast near the end of the reporting period and the slab was tested. The closure pour of the second specimen will be cast and the slab will be tested at the beginning of the next reporting period. Freeze-thaw specimens will also be fabricated then to ship to a MassDOT freeze-thaw testing facility.



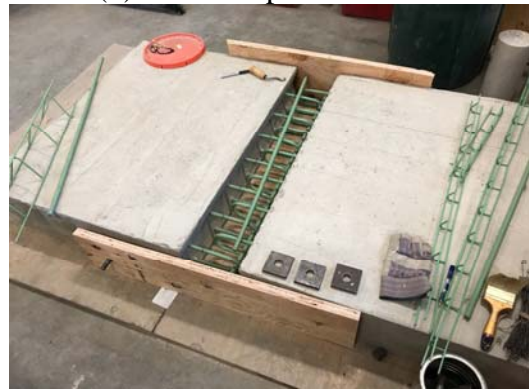
(a) Formwork and cage assembly



(b) Concrete placement



(c) Panels after casting



(d) Panel positioning for closure pour



(e) Closure pour after casting



(f) Panel positioned for testing

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

K. TECHNOLOGY TRANSFER ACTIVITIES:

No technology transfer activities were performed.

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 (95%)

M. PERCENT COMPLETION OF TOTAL PROJECT: 96%

N. ACTIVITIES PLANNED FOR NEXT QUARTER:

- Fabricate freeze-thaw specimens using concrete from trial batches to be sent to DOT lab to be tested (ASTM C666)
- Closure pour casting and laboratory test of second panel

O. FINANCIAL STATUS:

As of: June 30, 2018

Total Project Budget: \$ 174,923; \$191,710 (Amended)

Total Expenditures: \$ 188,770