Quarterly Progress Report:
Project Number and Title: C7.2018: Alternative Cementitious Materials (ACMs) For Durable and Sustainable Transportation Infrastructures
Research Area: New Materials for Longevity and Constructability
PI: *Professor Eric N. Landis, Ph.D., University of Maine*
Postdoctoral Research Associate: *Hosain Haddad Kolour, Ph.D., PE, University of Maine*
Reporting Period: *Jan 2021 to Mar 2021*
Submission Date: *31 Mar 2021*

Overview: (Please answer each question individually)
Summary of activities during the reporting period:

- All done with carbonation tests and alkali activated slag (AAS) concrete tests. All compressive strength tests, shrinkage tests, bulk and surface resistivity tests are completed.
- Monthly Zoom Meeting with Maine DOT engineers
- Submitting an abstract to the 11th Advances in Cement-Based Materials Conference (Cements 2021). Title of presentation will be "Combined effects of slag and CO_2 curing on mechanical and transport properties of concrete"

During last three months, we completed all tests for concrete carbonation. Tests include compressive strength at different ages (3, 7, 28, and 56 days). Free shrinkage tests, bulk and surface resistivity tests. Three different curing procedures have been used for curing specimens. All tests have been completed for alkali activated slag (AAS) concretes as well. Also, we had a monthly Zoom meeting with Maine DOT engineers. Now, we are done with all tests and we are working on interpreting the results and writing the report.
Abstract of a presentation titled "Combined effects of slag and CO_2 curing on mechanical and transport properties of concrete" has been submitted to the 11th Advances in Cement-Based Materials Conference (Cements 2021).

Table 1: Task Progress

Task Number	Start Date	End Date	% Complete
Task 1: Selection of ACM with desired workability and strength	06/01/2019	12/31/2019	100%
Task 2: Shrinkage	01/01/2020	01/01/2021	100%
Task 3: Durability performance	10/01/2019	Continue	90%
Task 4: Life cycle analysis	10/01/2020	Continue	50%

Table 2: Budget Progress

Project Budget	Spend Amount	Spend Percentage to Date
$83,238 (from UTC)	Information is coming soon	

Describe any opportunities for training/professional development that have been provided…

One postdoctoral research associate is working in this project. It will be a great opportunity for him to learn about writing proposals, preparing reports, participating in meeting, attending conferences, and working with professionals in UTC, UMaine Advanced Structures and Composites Center, and MaineDOT.

Seven undergraduate students have been involved in this project. It will be a great experience for them to be familiar with ASTM tests and standards. They will learn how to conduct the experiments, how to follow the standards, and how to work in a team in a real project.

Participants and Collaborators:

Use the table below to list all individuals who have worked on the project.

Table 5: Active Principal Investigators, faculty, administrators, and Management Team Members			
Individual Name	**Email Address**	**Department**	**Role in Research**
Professor Eric N. Landis	*landis@maine.edu*	*Civil and Environmental Engineering*	*PI*
Dr. Hosain Haddad Kolour	*hosain.haddad@maine.edu*	*Civil and Environmental Engineering*	*Perform the experiments and analysis the results*

Use the table below to list all students who have participated in the project during the reporting. (This includes all paid, unpaid, intern, independent study, or any other student that participated in this project.)

Table 6: Student Participants during the reporting period				
Student Name	**Email Address**	**Class**	**Major**	**Role in research**
Parry Seddiqi		senior	Civil and Environmental Engineering	Help in performing the experiments
Kelsey Weir		sophomore	Civil and Environmental Engineering	Help in performing the experiments
Madison Ala		sophomore	Civil and Environmental Engineering	Help in performing the experiments
Nicholas Tiner		sophomore	Civil and Environmental Engineering	Help in performing the experiments
Alexander Baur		sophomore	Civil and Environmental Engineering	Help in performing the experiments
Tanner Laflamme		sophomore	Civil and Environmental Engineering	Help in performing the experiments
Emma White		sophomore	Civil and Environmental Engineering	Help in performing the experiments

Use the table below to list organizations have been involved as partners on this project and their contribution to the project.

Table 8: Research Project Collaborators during the reporting period						
Organization	**Location**	**Contribution to the Project**				
		Financial Support	**In-Kind Support**	**Facilities**	**Collaborative Research**	**Personnel Exchanges**
University of Maine	Maine	X	X	X		

Who is the Technical Champion for this project?
Name: *Michael.Redmond*
Title: Concrete *Quality Specialist at MaineDOT Bridge Program*
Organization: *MaineDOT*
Location (City & State): *Augusta, Maine*
Email Address: *Michael.Redmond@maine.gov*

Changes:
Professor Eric N. Landis is the new PI of this project since January 1st 2020. Both old PI (Dr. Warda Ashraf) and her graduate student (Mohammad Rakibul Islam Khan) moved to a different university.

Planned Activities:
Interpreting the results. Preparing and writing the report.