

Quarterly Progress Report:

Project Number and Title: 3.13: Investigating the Effectiveness of Enzymatic Stabilizers for Reclaimed Stabilized Base Projects

Research Area: Thrust # 3, New systems for longevity and constructability

PI: Ehsan Ghazanfari, The University of Vermont

Co-PI(s): Mandar Dewoolkar, The University of Vermont

Reporting Period: 1/1/2021 to 3/31/2021

Submission Date: 3/30/2021

Overview:

During the past quarter, we started the literature review on using enzymatic stabilizers (e.g. lingsulphonate, terrazyme, bio-grouting) in reclaimed stabilized base (RSB) projects to improve stabilization outcome. The overarching goal of this project is to evaluate the effectiveness of enzymatic stabilizers in RSB projects in Vermont and the NE region. In addition to the performing literature review, we started to prepare, cure and test sub-base soil specimens stabilized with lingsulphonate and terrazyme in the laboratory. The performed work in previous months helps us move closer toward the next steps of the project in evaluating the effectiveness of the enzymatic stabilizers in RSB projects and determining the appropriate enzymatic agent for the type of base/subbase material encountered in different RSB projects.

Table 1: Task Progress

Task Number	Start Date	End Date	% Complete
Task 1: Prepare specimens with enzymatic stabilizing agents	1/1/2021	11/1/2021	5%
Task 2: Evaluate the strength and stiffness improvement and hydraulic response of prepared specimens	1/1/2021	3/31/2022	0%
Task 3: Investigate the mechanism of strength improvement and develop design parameters	2/1/2022	8/31/2022	0%
Task 4: Perform relatively large-scale laboratory tests and/or field tests to evaluate the performance of enzymatic stabilizers	9/1/2022	8/1/2023	0%
Task 5: Provide a set of recommendations and develop guidelines for implementation	1/1/2023	8/31/2023	0%
Overall Project:	1/1/2021	8/31/2023	5%

Table 2: Budget Progress

Project Budget	Spend – Project to Date	% Project to Date*
\$538,278	\$20,101	3.73%

Table 3: Presentations at Conferences, Workshops, Seminars, and Other Events

Title	Event	Type	Location	Date(s)
Presentation title	Name of event (i.e. TIDC 1 st Annual Conference)	i.e. Conference, Symposium, Seminar,		
None				

Table 4: Publications and Submitted Papers and Reports

Type	Title	Citation	Date	Status
None				

Participants and Collaborators:

Table 5: Active Principal Investigators, faculty, administrators, and Management Team Members			
Individual Name	Email Address	Department	Role in Research
Ehsan Ghazanfari	Ehsan.ghazanfari@uvm.edu	Civil & Environmental Engineering	Principal Investigator
Mandar Dewoolkar	Mandar.Dewoolkar@uvm.edu	Electrical and Biomedical Engineering	Co-Principal Investigator

Table 6: Student Participants during the reporting period				
Student Name	Email Address	Class	Major	Role in research
Bijay K-C		Ph.D.	Civil & Environmental Engineering	Graduate Research Assistant

Table 7: Student Graduates			
Student Name	Role in Research	Degree	Graduation Date
None			

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
None						

Table 9: Other Collaborators			
Collaborator Name and Title	Contact Information	Organization and Department	Contribution to Research

Name: Callie Ewald

Title: Geotechnical Engineering Manager

Organization: Vermont Agency of Transportation

Location (City & State): Berlin, Vermont

Email Address: callie.ewald@vermont.gov

Changes:

None.

Planned Activities:

continue preparing, curing, and testing sub-base soil specimens stabilized with enzymatic stabilizing agents