

Implementation Report

GUIDELINES FOR CHEMICALLY STABILIZING PROBLEMATIC SOILS

https://www.mdt.mt.gov/research/projects/geotech/chemical_stablize.shtml

Introduction and Purpose

The Montana Department of Transportation (MDT) initiated the project, in 2017, to research and develop guidelines for chemical stabilization of problematic subgrade soils in the state of Montana. The research was conducted through the Sustainable and Resilient Geotechnical Engineering (SuRGE) lab at Boise State University (BSU). The goal of this project was to develop a comprehensive guideline for effectively evaluating the suitability and concentration of chemical additives. A survey of stabilization practices of State Departments of Transportation (DOTs) neighboring the State of Montana indicated the states surrounding Montana do not have much experience with chemical stabilization of subgrade soils. Thus, the stabilization guideline

developed through this study will not only help MDT but provide a reference to the nearby states as well.

This project focused on the laboratory protocols to establish the stabilization guidelines. The next logical step is to implement this in the field and develop field protocols to be used by MDT.

Implementation Recommendations

Two types of implementation studies could be taken up: 1) short-term improvements for constructability and 2) long-term improvements where the stabilization is used to strengthen the subgrade and becomes part of the pavement structure.

Recommendation: Use the stabilization design flowchart to establish required lime or cement content for

short-term and long-term strength improvements in the field.

For short-term improvements where the stabilization is used to strengthen soil for constructability, the implementation study can be conducted on any of the tested soils as all soils gained strengths higher than 50 psi at reasonable additive contents.

For long-term improvements where the stabilization is used to strengthen the subgrade and becomes part of the pavement structure, the implementation study should be conducted on the soils with low plasticity that performed well under durability studies.

MDT Response: MDT will utilize the information and procedures gained from this research project to

PROJECT NO: 9389-522

MORE INFO:

Principal Investigator

Bhaskar Chittoori

bhaskarchittoori@boisestate.edu

208.426.3794

MDT Technical Contact

Jeff Jackson

jejackson@mt.gov

406.444.9412

MDT Research Project Manager

Sue Sillick

ssillick@mt.gov

406.444.7693

help assess the feasibility of using chemical stabilization for problematic soils on our projects. This feasibility analysis will consist of using processes and procedures recommended in the research project, evaluating available MDT resources and project schedules, contractor availability, and economics which may include life cycle cost analyses as applicable for both short- and long-term conditions.



DISCLAIMER STATEMENT

To report implementation efforts, this document is disseminated by the Montana Department of Transportation (MDT). The State of Montana assumes no liability for the use or misuse of its contents. The State of Montana does not endorse products of manufacturers. This document does not constitute a standard, specification, policy or regulation.

ALTERNATIVE FORMAT STATEMENT

MDT attempts to provide accommodations for any known disability that may interfere with a person participating in any service, program, or activity of the Department. Alternative accessible formats of this information will be provided upon request. For further information, call (406) 444-7693, TTY (800) 335-7592, or Montana Relay at 711.

This document is published as an electronic document at no cost for printing and postage.