

Innovative Stormwater Control Measure Products Evaluation

Research Brief



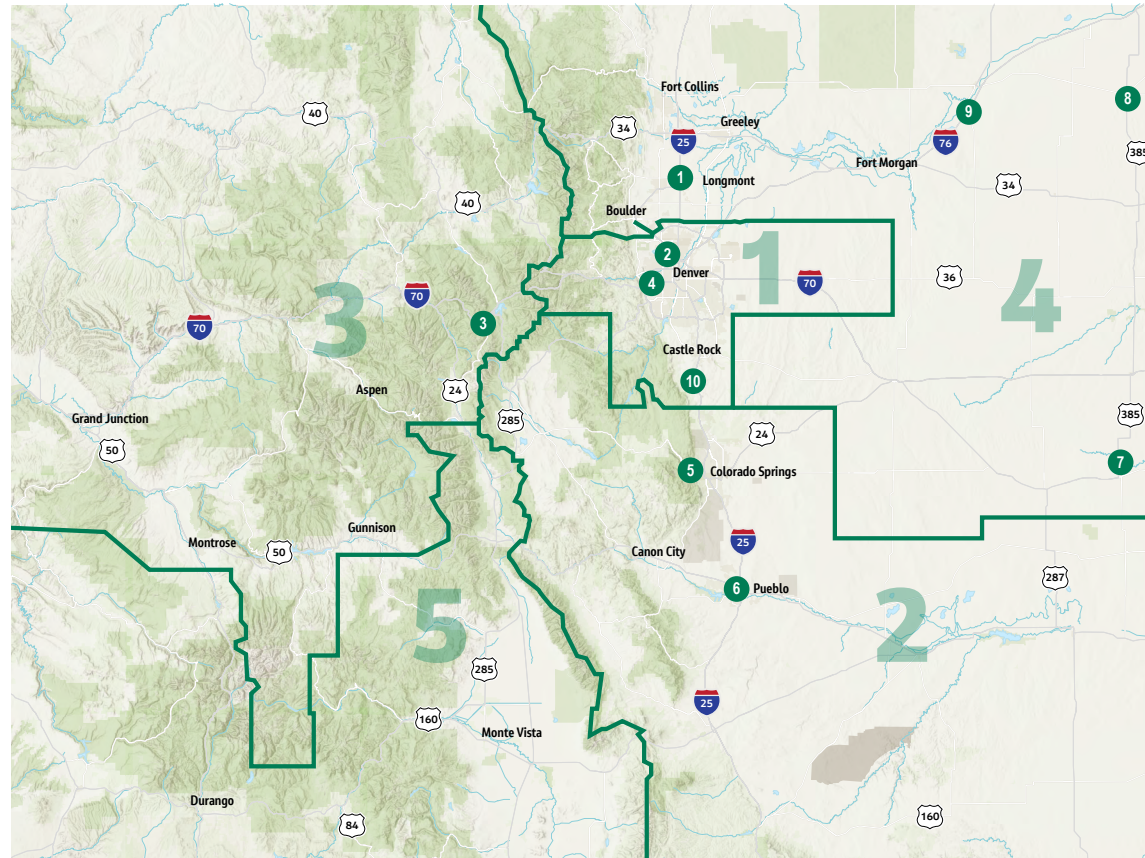
Project Timeline



* = Meetings with CDOT's statewide water quality staff

Potential Benefits Analyzed

- Reduce Cost and/or Time
- Improve Effectiveness
- Longer Service Life
- Greener Products



Study Timeline September 2020 - June 2023	CDOT Project Manager Greg Fischer greg.fischer@state.co.us 720-253-2936	Project Consultants Jacobs Pinyon Environmental	Investigator Kiersten Hines, PE Jacobs kiersten.hines@jacobs.com
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[Link to Complete Report](#)

- SH 66 at CR 7 Intersection Improvements (21657)**
Siltworm
- I-70 Bridges Over Ward Road (24473)**
SiltSaver 2 Stage Silt Fence | Edge EarthGuard
- I-70 Eastbound Auxillary Lane - Frisco to Silverthorne (22381)**
Siltworm
- I-70 Over 32nd Avenue Bridge Replacement (23673)**
BioD-SiltTrap | Edge EarthGuard | Gator Guard Extreme Wattle | Rubberosion Sedi-Mat
- US 24, I-25, and SH 16 Bridge Repairs (23537)**
Rubberosion Sedi-Mat
- 100 W. 23rd Street Demolition Project (23535)**
Gator Guard Extreme Wattle
- US 385 Resurfacing North of Cheyenne Wells (23513)**
Siltworm | Edge EarthGuard
- US 385 Holyoke North Rehabilitation/Resurfacing (20867)**
SiltSaver 2 Stage Silt Fence
- I-76 Roadway Improvements East of Sterling (23468)**
Paper Mulch | Filtrexx Siltsoxx
- I-25 South Gap Project: Monument to Castle Rock (22589)**
Flexamat | Muscle Wall | SiltSaver 2 Stage/ Combo Silt Fence

Introduction

In support of its mission to provide the best multi-modal transportation system for Colorado that most effectively and safely moves people, goods, and information, CDOT continuously evaluates innovative construction stormwater control measure products for suitability for CDOT projects. Ever-evolving products and newer technology may offer CDOT cost savings, flexibility, or other project efficiency benefits. Remaining accountable to Colorado taxpayers and the traveling public, CDOT diligently evaluates innovative products through its standardized, defensible, and transparent process, developed in this study, before adopting them into standard specifications.

Methodology and Action Taken:

Twenty-eight innovative products were considered for potential suitability for use on CDOT projects, using a scoring matrix of environmental, ecological, and safety criteria, functional longevity, green benefits, innovativeness, experience/case studies, local representation, fit within an existing approved product list (APL) category/subcategory, and fit within CDOT specifications.

Following screening, fourteen products were selected for complete project delivery evaluation. Specifications, plans, detail drawings, and Stormwater Management Plan guidance were developed for each of the products. During the study period, ten products were installed during the construction phase, on seven CDOT projects, in four of CDOT's five regions. In each instance, inspectors gathered data on the deployed product's installation, maintenance, and performance over time through site observations and interviews.

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Muscle Wall



Paper Mulch

Legend

- Recommending Adoption into CDOT Standards
- Not Recommended for Use on CDOT Projects
- Recommending Ongoing Investigation for Use on CDOT Projects



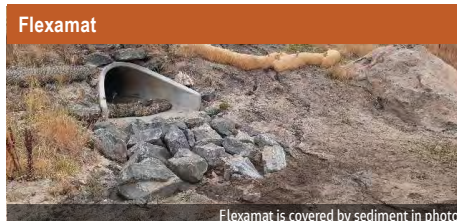
Rubberosion Sedi Mat



Silt Saver 2 Stage/ Combo Silt Fence



BioD SiltTrap



Flexamat

Flexamat is covered by sediment in photo



Siltworm



Filtrex Siltsoxx (Biodegradable)



Gator Guard Extreme Wattle

Lessons Learned

Incorporating innovative products into CDOT projects for research proved challenging.

- Evaluating the suitability of mulching products implemented as part of interim and final stabilization requires: 1) Proposing incorporation of those products early in a project's design, and 2) Observing the implemented product's performance later in the project's construction. The span of time from the initial project design stages to the end of construction may exceed the research study's timeline, limiting the potential for mulching product data collection.
- Assessing permanent control measures such as [InstaTurf](#) and [Flexamat](#) requires identifying, in the planning phases, CDOT projects requiring these types of permanent control measures.
- For future rounds of innovative control measure products research, CDOT may consider nominating project designers or product 'champions' who can identify and act on opportunities to implement innovative products earlier in the design stages of CDOT projects. Resources to identify projects would include the 10-Year Strategic Project Pipeline Plan and data searching in PMWeb.

Conclusions

Through this study, CDOT has developed a defensible, cost effective, standardized procedure for the evaluation of new and innovative stormwater control measure products for suitability for use on CDOT projects. Based on the suitability screening matrix, the screened products' trial installations on projects, and evaluation of detailed data collected, the following initial round of products are recommended for adoption into CDOT standard specifications, because they performed equal to or better than existing approved products, for similar cost and/or with similar or better ease of installation:

[Muscle Wall](#), [Paper Mulch](#), [Rubberosion Sedi-Mat](#), [SiltSaver 2 Stage/ Combo Silt Fence](#)

Due to observations during the trial installations such as increased cost, increased installation efforts, product durability and functionality, it is currently not recommended for CDOT projects to use the product [Filtrex Siltsoxx](#) with biodegradable casing nor the [BioD-SiltTrap](#).

Certain product evaluations were ongoing or not yet conclusive based on the limited data available at the end of the study period. The following products currently have inconclusive evaluations:

- [Flexamat](#)
- [Gator Guard Extreme Wattle](#)
- [Siltworm](#)
- [Edge EarthGuard](#)
- [Seed Aid Aero](#)
- [InstaTurf](#)
- [Silt Saver Standard Silt Fence](#)

Continuation

Because CDOT desires to continue to access the potential benefits of the newer innovative construction stormwater control measure products and technology coming available over time, it is recommended to continue this research through an ongoing study or program, following the standardized, defensible, and transparent process developed in this 2020-2023 study. It is recommended that CDOT implement a continual research process at each phase of projects: design, construction, and maintenance. The process including product research, product selection, product comparison, field evaluation, and monitoring and recommendations can be implemented within a program for consistent research and recommendations.

