

EXPERIMENTAL PROJECTS CONSTRUCTION REPORT AND ANNUAL EVALUATION

FOG SEAL OVER CHIP SEAL FOR ADDED RETENTION OF TYPE III CHIPS

Location:	Interstate Highway 90 (C-000090) – Reference Point 5.7-23.3: Missoula District/Mineral County
Project Name:	Exit 5 – East – CN 8954000
Project Number:	IM 90-1(220)6
Experimental Project No.	MT-18-02
Type of Project:	Fog Seal on Chip Seal (FSCS)
Principal Investigator:	Craig Abernathy: Experimental Project Manager (ExPM)
Site Inspections:	Construction 07/2017: Site Inspections 10/2017, 04/2018, 10/2018, 05/2019 & 04/2020

Description

This project was implemented to determine the performance of an applied fog seal to chip seal (FSCS) will extend the service life of the pavement treatment (chip retention) compared to the conventional practice of a chip seal (seal and cover).

The area selected is a high mountain (average project elevation of 6800 ft.) section of Interstate highway with extreme weather conditions which maximize maintenance activities, and which has severely limited the effectiveness of past pavement preservation treatments.

Average annual daily traffic (AADT), for all vehicles is approximately 7431.

Experimental Design

The Project is located on Interstate Highway 90 (I-90) from approximate reference point 5.7 to 23.3 in Mineral County.

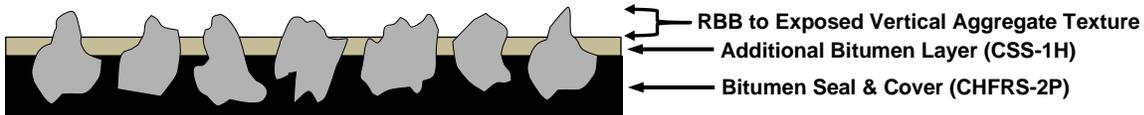
The FSCS section encompasses both the westbound and eastbound lanes of the project length. See page 9 for an overview of the project location.

Evaluation Procedures

The purpose of an experimental features report is to document the phases and events

of any given project to gain the reader an understanding of the general activities required to install or incorporate the research element into an active construction or maintenance project. This report also establishes a baseline for defining performance for any given feature under actual service conditions to determine its relative merits.

The objective of the project is to determine the selected emulsion (CSS-1H) will add additional reinforcement of the embedded type III chip (within the conventional seal using CHFRS-2P) to enhance the residual bitumen binder (RBB) on the FSCS section. The level of objective relief (the visual appearance of the ratio of binder to the exposed vertical area of the aggregate (as seen in diagram below) may offer a tighter bond with the RBB (the level of texture is not an indicator of friction coefficient).



Research will document the installation phases for best practice and any construction concerns germane to the performance of the project test and control sections. Semi-annual site visits will encompass complete inspection of the entire project and report on seal integrity and any other measurable outcomes.

Additional site inspections may supplement the semi-annual visits based on need. Research will monitor and report on long-term performance.

Construction Documentation: Will include information specific to the installation events of the FSCS section.

Post Documentation: Will entail semi-annual inspections (late fall/early spring) of the seals durability based on visual distress.

Evaluation Schedule

Research will monitor performance for a minimum period of five years annually, with every year up to ten years (informally if project requires additional quantitative data). This is in accordance with the Department's Experimental Project Procedures. Delivery of a construction/installation report, interim, annual or semi-annual reports is required as well as a final project report (responsibility of Research). A web page with all project information is located at: http://www.mdt.mt.gov/research/projects/seal_coat.shtml

2017: Installation/Construction Report

2018-2021: Semi-Annual Inspections/ Annual Evaluation Reports

2022: Final Evaluation/Final Report

The following is a general representation of the CS/FSCS application documented during construction in July and site inspections in October of 2017; April of 2018 & October of 2018, May 2019, and April 2020. The final inspection will take place in spring of 2021. To date the FSCS project is performing well.

July 2017



← Representative image of FSCS application in progress.



← Close up of type III chip seal with CHFRS-2P emulsion.



← Close-up of completed FSCS application with CSS-1H emulsion.



↑ Both lanes with completed FSCS application. Travel lane has active traffic while passing lane is allowed to complete cure.

October 2017



↑ ← FSCS as documented during site visit in October 2017 (view west).

Fog seal layer shows slight topical wearing on exposed aggregate.

Chip retention is tight with no visible distress to date.

April 2018



↑ ← FSCS as documented during site visit in April 2018 near RP 14.

Emulsion has typically flaked off the surface aggregate but visually chips are viable within the emulsion matrix.

October 2018



← FSCS as documented during site visit in October 2018 near RP 15 (view east).

Visually the FSCS application shows good pavement texture and solid chip embedment.



← ↓ Several close-ups of the FSCS representative of the current condition of the pavement surface during this inspection.

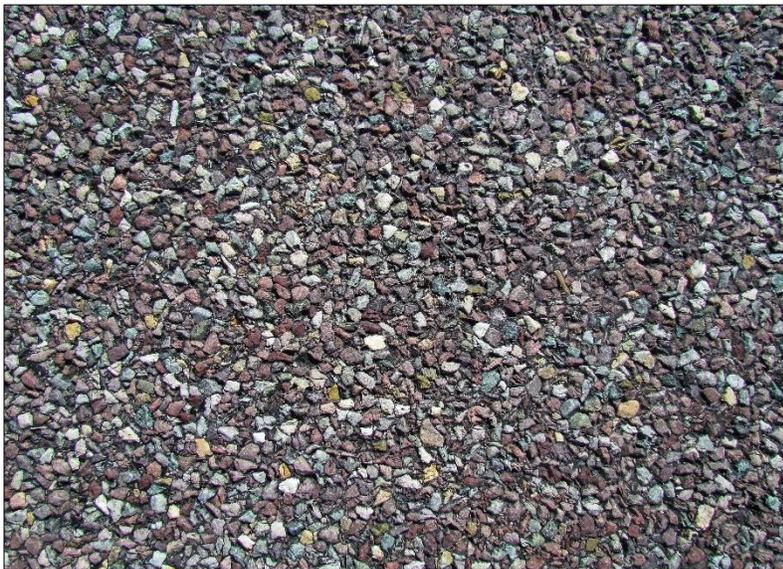


May 2019



← FSCS as documented during site visit in May 2019 near RP 8 (view east).

Visually the FSCS application continues to show good pavement texture and solid chip embedment.



← ↓ Several close-ups of the FSCS representative of the current condition of the pavement surface during this inspection.



April 2020



← FSCS as documented during site visit in April 2020 near RP 20 (view east).

Visually the FSCS application continues to show good pavement texture and solid chip embedment.



← ↓ Several close-ups of the FSCS representative of the current condition of the pavement surface during this inspection.

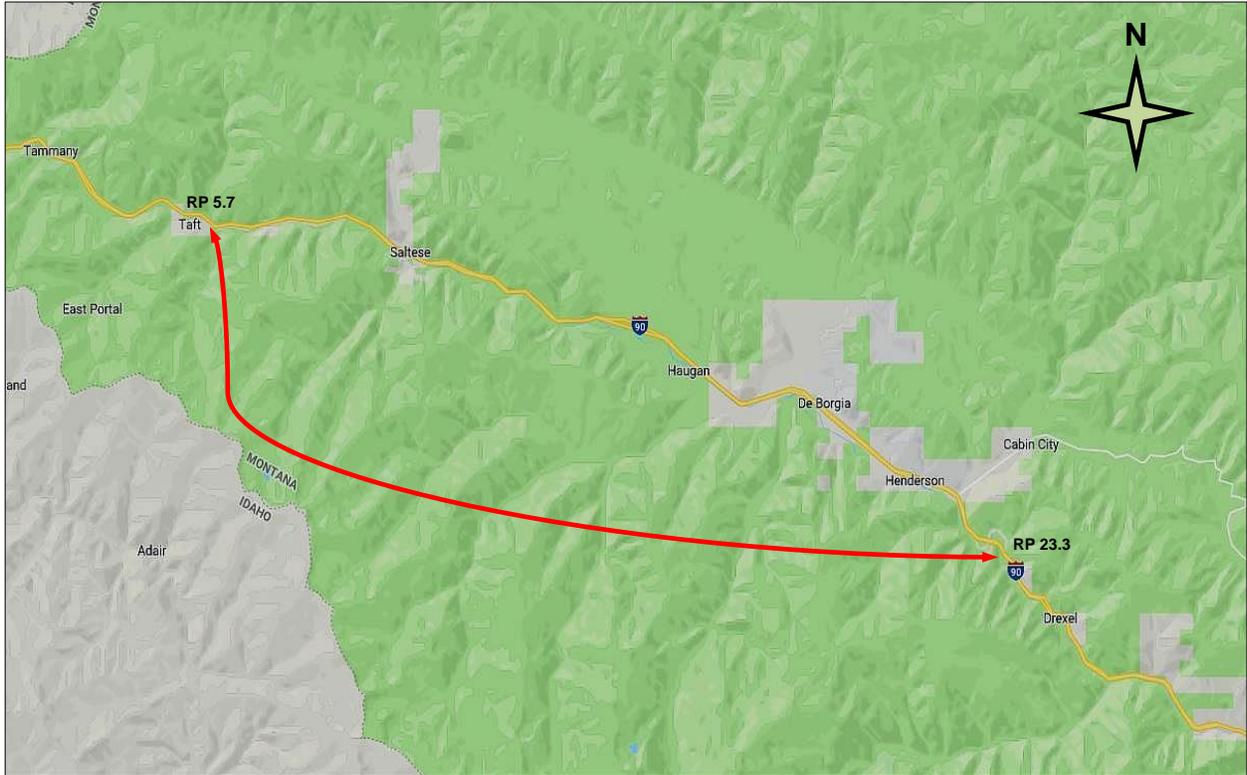


Supplemental



- ↑ There are areas of the project which have exhibited chip loss mainly at the centerline (or crown) as seen here at RF 20 most likely attributable to plow activities; and at areas of deck approaches, but this is minor and not indicative of performance to date.

***Project Location**



Interstate 90: Mineral County-Montana/Missoula District; Approximate Reference Point 5.7-23.3

*All values approximate; not to scale

Disclaimer

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