

Montana Department of Transportation
Research Programs-Experimental Projects
May 2020

CRS-2P AND CHFRS-2P EMULSION COMPARISON ON CHIP SEAL

Location: Sanders County/Missoula District – HWY 200 (P-6/C000006): RP 99-116 (Approx.)

Project Name: Dixon – West/Dixon – Ravalli

Project Number: STPP 6-1(155)99/STPP 6-1(153)109

Experimental Project No. MT-19-02

Type of Project: Chip Seal (CS) Performance Comparison

Principal Investigator: Craig Abernathy: Experimental Project Manager (ExPM)

Technical Contact: Jim Davies, P.E. Materials Bureau Chief

Date of Construction: July 2019

Date of Inspection: April 2020

Description

The project was nominated to evaluate two types of asphalt emulsion chip seals (CS) placed adjacently to compare efficacy in chip retention and overall CS performance without an added fog seal.

The roadway selected is a river valley route with an average elevation of 2600 ft. .Average annual daily traffic (AADT), for all vehicles is approximately 1677.

Experimental Design

The Project is located on Primary Highway 200 (P-6) in Sanders County.

The **Dixon-West** portion of the project is from reference point (RF) 98.7 to 108.5; and will use the Cationic Rapid-Set High-Viscosity Polymer Modified (**CRS-2P**) emulsion.

The **Dixon-Ravalli** portion is from RF 108.5 to 116.1 (approximate); and will use the Cationic High Float Rapid-Set High-Viscosity Polymer Modified (**CHFRS-2P**) emulsion

Both project sections used type 1 Chips.

See page 17 for an overview of the project layout.

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.

Research documented the installation phase for best practice and any construction concerns germane to the performance of the project test sections. Semi-annual inspections will report on seal integrity and any other measurable outcomes.

The information presented in this report represent the general condition of the chip seal treatments. Any visual distress or anomalous conditions seen during inspections will be demarcated and reported.

-Construction Documentation: Will include information specific to the installation events of the seal and cover sections.

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

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).

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:

https://www.mdt.mt.gov/research/projects/chip_seal_emulsion.shtml

2019: Installation/Construction Report

2020-2023: Semi-Annual Inspections/ Annual Evaluation Reports

2024: Final Evaluation/Final Report

Project Information to Date:

No construction issues were reported during placement of the CRS-2P and CHFRS-2P chip seal sections in July.

An informal drive-through inspection took place in late November 2019; A formal inspection took place in April 2020. No distress to report. Visually both sections exhibit good chip adhesion/retention.

The following images are representations of the general placement activities of both project sections.

July 2019



← CRS-2P application pass.



← Self-propelled chip spreader in action.



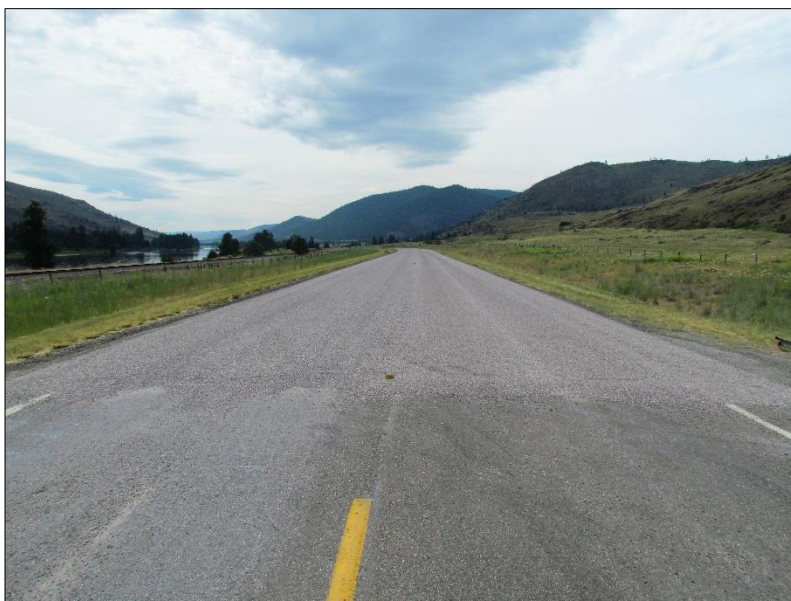
← Two nine-wheel pneumatic rollers were used to set the chips.



← Several aggregates sweepers were used on the projects.



← Completed chip seal – Dixon/Ravalli CHFRS-2P near reference post 113 (view east).



← Completed chip seal – west end of Dixon-West CRS-2P near reference post 99 (view east).



↑ Close-up of **CRS-2P** chip seal after sweeping.

↓ Close-up of **CHFRS-2P** chip seal after sweeping.





↑ Example of how sections are marked in the field.

April 2020-CRS-2P



↑ Section **CRS-2P**: Approximate project length RP 98.7-108.5; Project start at west end on Primary HWY 200; view east.



← ↓ Approximate RP 99; several images of chip seal surface at varying distance to show texture.





↑ Section **CRS-2P**: Approximate RP 103; view east: Areas denoted by the red arrows point to where (at least visually) the seal and cover has lost adhesion to previous crack sealing.



← ↓ Approximate RP 103; several images of chip seal surface at varying distance to show texture.





↑ **CRS-2P:** End of project, Township of Dixon; view west.

April 2020-CHFRS-2P



↑ Section **CHFRS-2P**: Approximate project length RP 108.5-116.6; project start at west end on Primary HWY 200 within the township of Dixon; view east.

Note: Project delineation is marked at the Selow Creek Rd.



← ↓ Approximate RP 109; several images of chip seal surface at varying distance to show texture.





↑ Section **CHFRS-2P**: Approximate RP 112; view east.



← ↓ Approximate RP 112; several images of chip seal surface at varying distance to show texture.

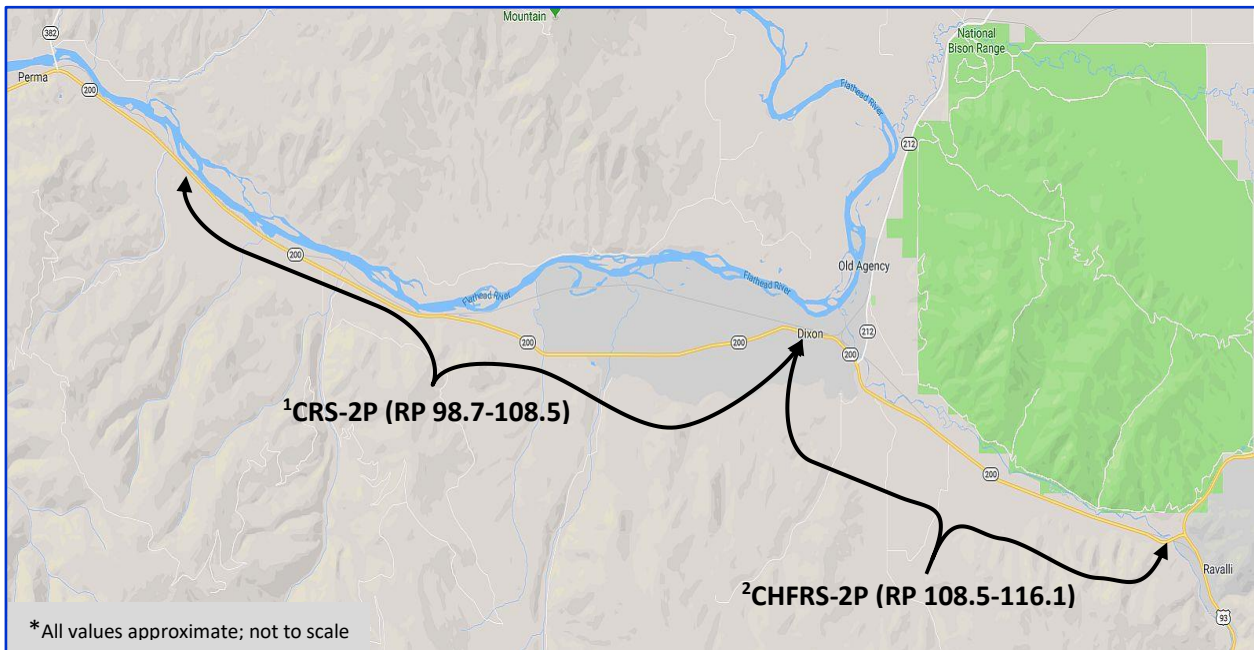




↑ **CHFRS-2P:** End of project, junction of P-200 & NHS/NI-93, ; view west.

Project Layout

***Dixon-West/Dixon-Ravalli HWY 200 (P-6/C000006): Missoula District**



¹Dixon-West: Cationic Rapid-Set High-Viscosity Polymer Modified (CRS-2P)

²Dixon-Ravalli: Cationic High-Float Rapid-Set High-Viscosity Polymer Modified (CHFRS-2P)

- Type 1 Chips
- 2018 ADDT 1677

Disclaimer

The use of a product and/or procedure in the course of an in-service evaluation does not constitute an endorsement by the Department nor does it imply a commitment to purchase, recommend, or specify the product in the future.

Data resulting from an evaluation of a submitted product or procedure is public information and will not be considered privileged. The MDT may, at its discretion, release all information developed during and after the experimental project assessment.