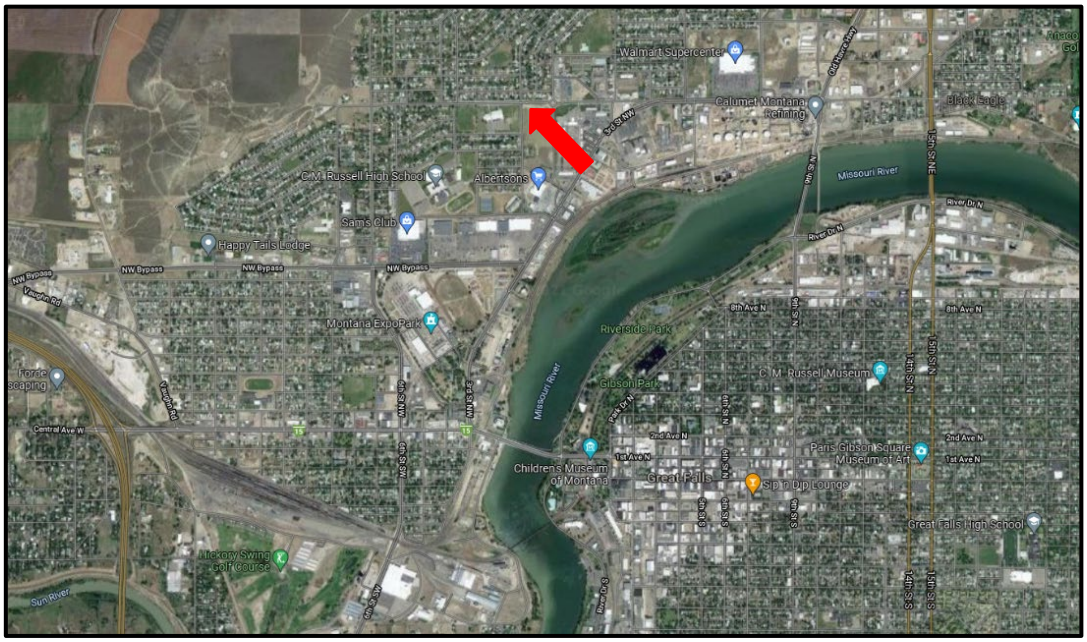
Experimental Feature Final Report
December 2022

Experimental Feature:	Tencate-MIRIFI MPV400 Polypropylene Nonwoven Geotextile
Location:	Great Falls District, Cascade County, City of Great Falls, U-5201 Smelter Ave. NW – 5th St NW to 1st St NW
MDT Project Name:	Smelter Ave – 1st to 5th St NW
MDT Project Number:	UPP 5201(24)
Experimental Project Number:	MT-17-03
Principle Investigator:	Chad DeAustin, Experimental Project Manager (ExPM)
Construction Date:	August 2017
Date of Inspections:	April 2018, April 2019, April 2020, September 2021, May 2022

Project Map



Feature Description & Outline

This is a pavement preservation project involving a cold mill, overlay, and added paving fabric. 2015 AADT is documented at 7,530 with a commercial number of 180. The contractor for this project was United Materials.

The contract called for installation of an approximate length of 0.4 miles of the designated paving fabric on prepared milled surface to potentially aid in extending the service life of the pavement. A portion of the project will be paved without fabric as a control. From station 100+45 to 106+00 there will be no paving fabric, this is considered the control section. Station 106+00 to 123+05 will be the test section using the paving fabric. According to the manufacturer's documentation, TenCate Mirafi® MPV400 nonwoven asphalt overlay fabric forms a membrane that minimizes surface water from penetrating pavement systems and provides a stress relief interlayer which inhibits the growth of reflective cracks. Produced from polypropylene staple fibers, TenCate Mirafi is heat-set to provide a waterproofing barrier.

Evaluation Procedures & Schedule

The measures of effectiveness prevalent with this feature are:

- Construction practices (constructability, construction time, cost effectiveness, etc.),
- Comparing plant mix condition of the test and control sections,
- Comparison of ride and rut data.

In accordance with MDT's Experimental Features Procedures, the Experimental Project Manager will monitor and report on performance for a minimum of five years annually. This includes delivery of a work plan, construction report, annual reports, and final project report.

2017:	Installation/Construction Report
2018-2021:	Annual Inspections/Evaluation Reports
2022:	Final Evaluation/Final Report

A dedicated webpage will display all reporting information for the experimental feature.

Conclusion

As seen in the data below, both the test and control data track similarly. There are no significant differences between the sets. Where there is a seen difference is in the transverse cracking. Prior to construction there were 87 visible cracks and in 2021 there were only 14 cracks. The geotextile fabric could be a contributing factor to the decrease in reflective cracking. To go along with that information, 8 of the 14 cracks were in the control section with no geotextile paving fabric. In conclusion for this evaluation, the Tencate-MIRIFI MPV400 Polypropylene Nonwoven Geotextile did not impact the ride or rut but might have reduced the reflective cracking.

Data

Ride is recorded in IRI, and rut is recorded in inches. 2019 data was not recorded, and the 2015 data was included for a preconstruction reference.

Test	EBDL Ride (IRI)	WBDL Ride (IRI)	EBDL Rut (“)	WBDL Rut (“)
2022	83	126	.12	No data
2021	88	124	.10	.07
2020	91	136	.11	.11
2018	86	121	.10	.10
2017	89	116	.09	.08
2015	262	221	.35	.21

Control	EBDL Ride (IRI)	WBDL Ride (IRI)	EBDL Rut (“)	WBDL Rut (“)
2022	80	130	.15	No data
2021	77	138	.15	.10
2020	80	162	.13	.08
2018	75	155	.11	.09
2017	77	117	.09	.12
2015	231	316	.49	.34

Preconstruction Documentation – March 2017

↑↓ Project section prior to milling phase; top picture is Smelter Ave & 1st NW, view west. Lower image Smelter Ave. & 5th St. NW, view east.

Construction Documentation – August 2017

← Mirafi MVP400 ready for application to the prepared road surface.

Each roll is 360’ (110m) in length and 12.5’ (3.8m) in width.

← The geotextile rolls are applied to the road surface using an applicator designed to fit on a front-loading tractor.

← As the tack coat is applied to the clean milled surface, the fabric is rolled out, properly tensioned, and prepared for the run.

The geotextile should be tight and without excess wrinkles and folds as it is placed.

🡸 As the first pass begins a pneumatic compactor 9-wheel roller follows close behind to insure good adhesion to the fabric, tack coat and underlying pavement.

🡸 The second pass of fabric being applied. Note the pneumatic roller insure a direct pass over the overlapping geotextile seam.

🡸 View of fabric placement at front end of geotextile train.

←↓ To ensure the geotextile remains in place during the paving phase, galvanized fasteners (perforate metal disks), tacked at longitudinal and transverse seams are to ensure that the geotextile does not shift or fold before or during asphalt cement (AC) placement.

← Longitudinal seams were overlapped on adjacent panels on average eight (8") inches.

Transverse panels seams averaged twenty-four (24") inches in overlap.

← Note that on the west end of the project (approximately 5th St. NW to 2nd St. NW), the condition of the milled pavement required a 1/2" leveling course of AC prior to the placement of the geotextile.

← The application of the geotextile is complete and now ready for paving.

A standard practice for this contractor is to broadcast a topical layer of milled AC aggregate to protect the fabric tearing or shearing from moving equipment during the paving process.

← Image of east end of project transition prior to paving.

← Representative image of completed paving pass, view west.

← Completed project, east end, view west.

← Completed project, west end, view east.

Site Inspections

Year 1 – April 2018

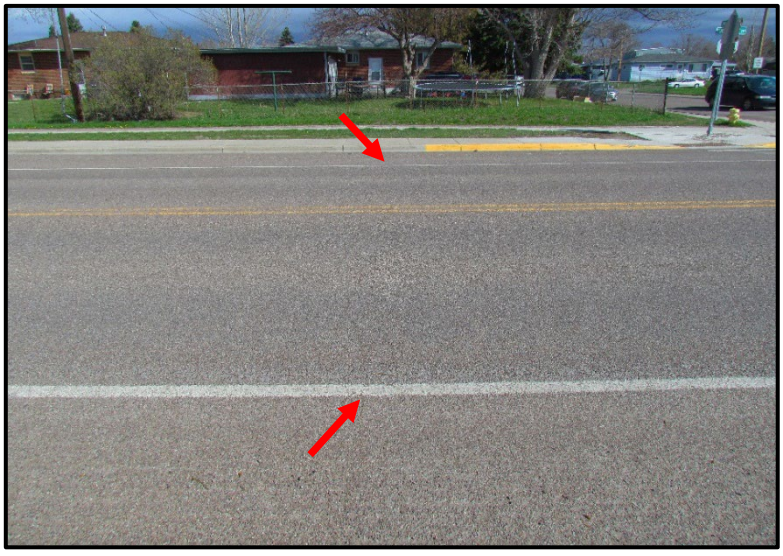
← East end of project; view west.

← West end of project; view east.

Year 2 – April 2019

🡐 East end of project; view west.

🡐 West end of project; view east.



🡐 Although difficult to see in this image; one low-severity longitudinal crack has appeared on the project near Riverview Blvd intersection (red arrows).

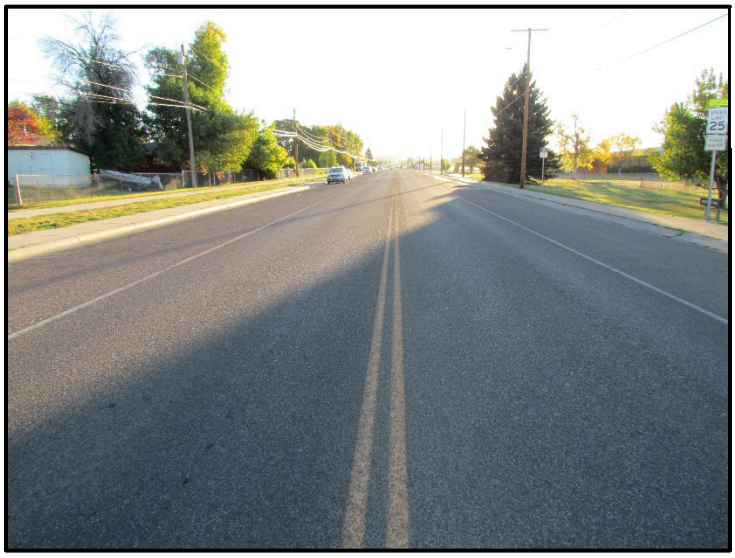
Year 3 – March 2020

🡸 East end of project; view west.

🡸 Example of pavement surface condition.

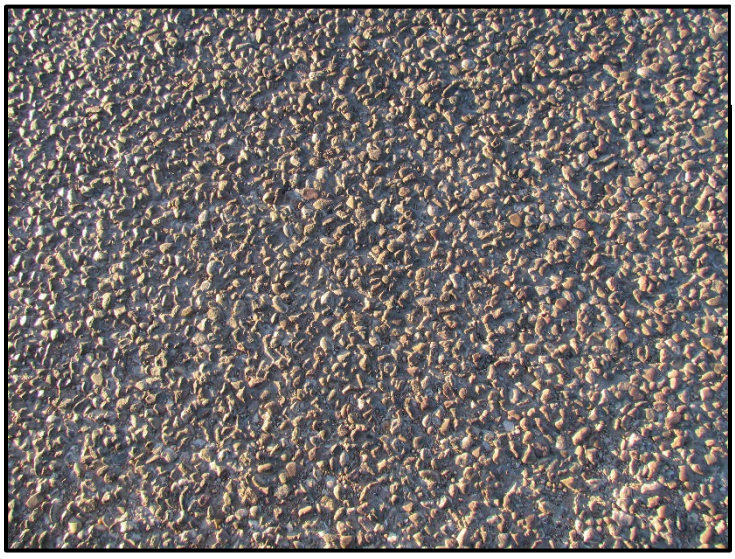
🡸 Transverse view of pavement.

Year 4 – September 2021



🡄 Image of Smelter Ave near intersection with Riverview Blvd view east.

🡄 Image of Smelter Ave near intersection with Riverview Blvd view west.



🡄 View of current surface of PMS with chip seal on the roadway.

⬇ Below are some images of the increased distress seen in 2021.






Year 5 – May 2022

1st Street NW, view west.

Riverview Boulevard, view east.

During the 2022 site visit, continued distress was noticed. There wasn't as significant of an increase as seen in 2021 and most of the distress is located from 1st Street NW to the front entrance sidewalk in front of Riverview Elementary, see below.

🡅 This distress was noticed near the Riverview Boulevard intersection and are being highlighted because of how the crack continues from the plant mix into the concrete, suggesting an issue in the base.

🡄 During the 2022 visit, Rocky Mountain Contractors was doing some utility work which provided the opportunity to see a cross section of the plant mix, notice the distinct layer of the paving fabric.

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