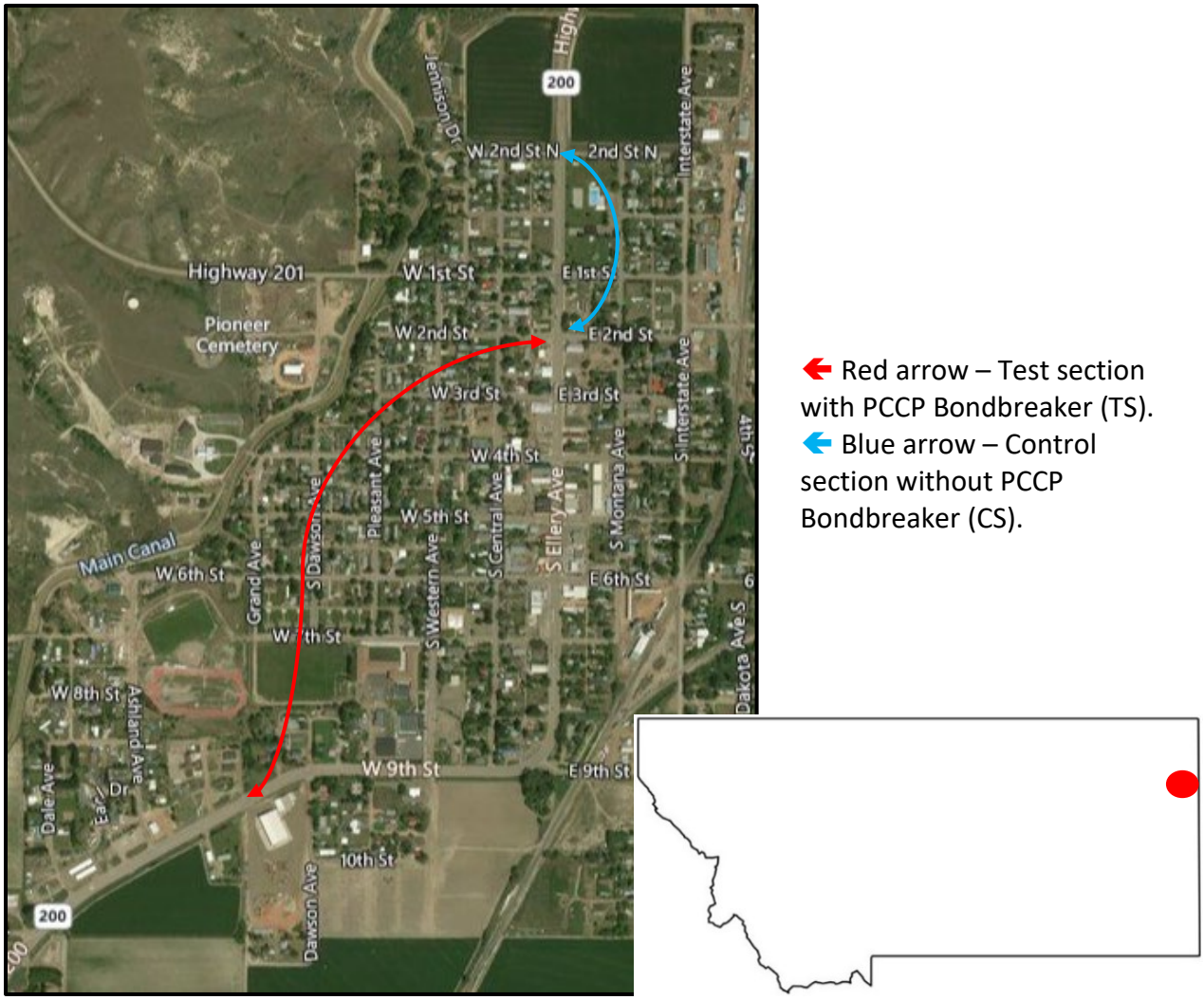
Experimental Feature Evaluation
December 2022

Experimental Feature:	PCCP Bondbreaker
Location:	Glendive District, Richland County, Fairview, MT Hwy 200, RP 62.1 – 63.9
MDT Project Name:	MT 200 – Fairview
MDT Project Number:	NHIP 20-2(32)62[8168]
Experimental Project Number:	MT-20-05
Principle Investigator:	Chad DeAustin, Experimental Project Manager (ExPM)
Construction Date:	Spring 2020
Date of Inspections:	May 2021, September 2022

Project Map



Red arrow – Test section with PCCP Bondbreaker (TS).
Blue arrow – Control section without PCCP Bondbreaker (CS).

Feature Description & Outline

SKAPS GT116 non-woven geotextiles, due to their effective thickness, are commonly selected for the intended purpose of separation between two layers, while its hydraulic properties help in adequate drainage function. The interlayer bond breaker fabrics are selected for numerous roadway rehabilitation projects due to potential in added structural capacity, durability, and low maintenance because of decreased deformations overtime.

For this feature, the PCCP Bondbreaker geotextile was added to potentially mitigate reflective cracking in the PCCP. From station 541+49.25 to 586+03.78 (2nd St), the geotextile will be placed over the aggregate base course which is the test section of this project. From station 586+03.78 (2nd St) to 11+15.00 (586+24.20=0+00.00, 2nd St N), there will be no bondbreaker geotextile and this will be considered the control section. The TS will be constructed on existing cement treated base after the plant mix is milled and the control section is receiving 1.5' of new crushed aggregate course prior to PCCP placement.

Evaluation Procedures & Schedule

The measure of effectiveness (MOE) prevalent with this project will focus on:

- Construction practices (constructability, construction time, cost effectiveness, etc.),
- Visual distresses in each of the sections of PCCP,
- Yearly IRI 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.

2020:	Installation/Construction Report
2021-2024:	Annual Inspections/Evaluation Reports
2025:	Final Evaluation/Final Report

A web page will be dedicated to display all reporting from the project.

URL: https://mdt.mt.gov/research/projects/pccp-bondbreaker.aspx

2022 Update

No issues or changes were noticed to the concrete surfacing during the site visit. Little surface wear is noticed even with high volumes of commercial vehicle traffic.

MT Hwy 200 and 2nd St N intersection, control section, view south.

MT Hwy 200 and 6th St intersection, test section, view south.

MT Hwy 200 and Western Ave intersection, test section, transverse view

South end of project, view north.

Construction Documentation – 2020

The construction began by milling the asphalt down to the cement treated base (CTB) of the roadway. CTB is a product that combines an aggregate blend with cement, that has been mixed with water. It is placed to create a surfacing layer that provides a solid structure for asphalt or Portland Cement Concrete Pavement (PCCP).

← The CTB is prepped and marked out for the SKAPS GT116 fabric. This CTB has several microcracks throughout the project.

← The SKAPS 116 nonwoven fabric was delivered on site in wrapped 300’ rolls. The cannisters next to the rolls are that of the adhesive that is used to attach the fabric to the CTB.

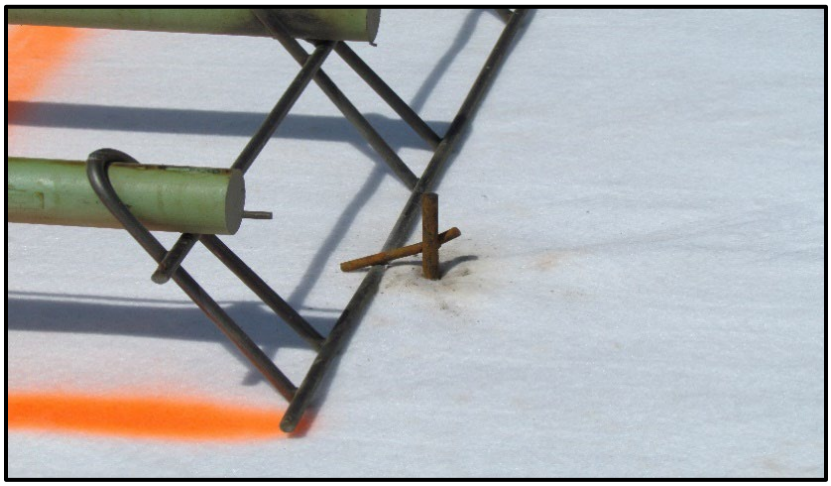
← The contractor then sprayed adhesive to hold the fabric in place. The contractor sprayed the 1 ft. wide strip in from the outside edge of the fabric on both sides of the fabric.

← The fabric placement over the CTB. The laborers worked on both sides to remove the wrinkles by brushing them out with brooms as the tractor pushed the fabric unrolling it over the CTB. This procedure later changed to the tractor pulling the fabric, referenced later.

← The contractor had issues with folds in the fabric when coming through curve sections. The contractor decided to fix folds that had a greater than 3 in. apex point. There were some small wrinkles that the vendor and contractor said is normal. The contractor cut down along the apex point of this fabric fold. This is the start of the fabric fold repair.

← The contractor cut along the median of the fold. They peeled back the flaps. They placed adhesive down to the CTB and placed the first flap down on the adhesive. Then adhesive is placed on top on the first flap and the second flap laid over. The contractor then smoothed out the second flap as it is laid over. The fix is complete when the glue is set.

← The contractor switched to use the tractor to pull the fabric, as opposed to tractor pushing the fabric forward. The change was made to improve the lay down of fabric as the equipment was not on it.



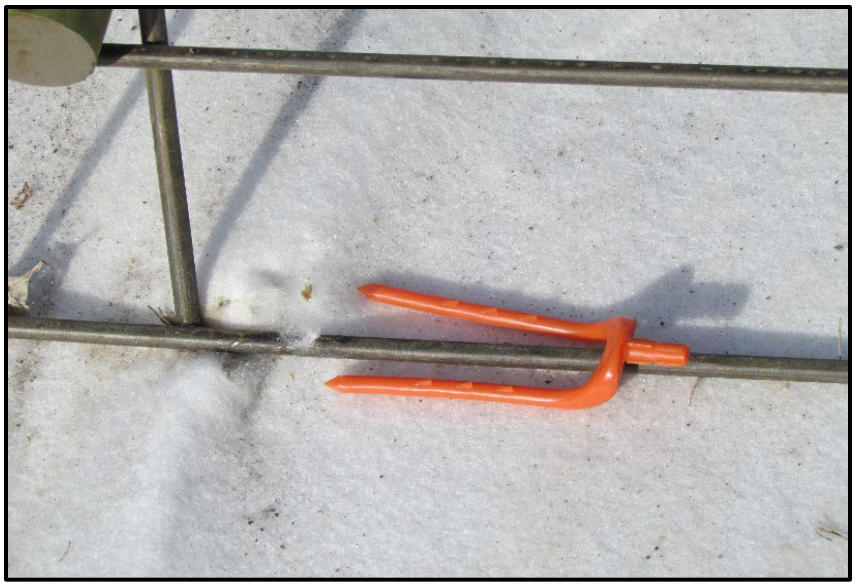
← The contractor initially anchored to the CTB. However, the contractor switched to use the anchoring system, made by Construction Materials, Inc., designed specifically for this fabric. The anchoring system anchors the baskets directly to the fabric rather than that of anchoring to the CTB.

↑ The contractor started with the pea stake attachment. They had to drill holes through fabric into the CTB. Then these stakes were driven in to anchor the ladders to the CTB.

🡸 The contractor moved to a plastic anchor system recommend by the onsite rep for the SKAPS GT116 product. The anchor is designed to be punched through the fabric rather than drilled in the CTB through the fabric.

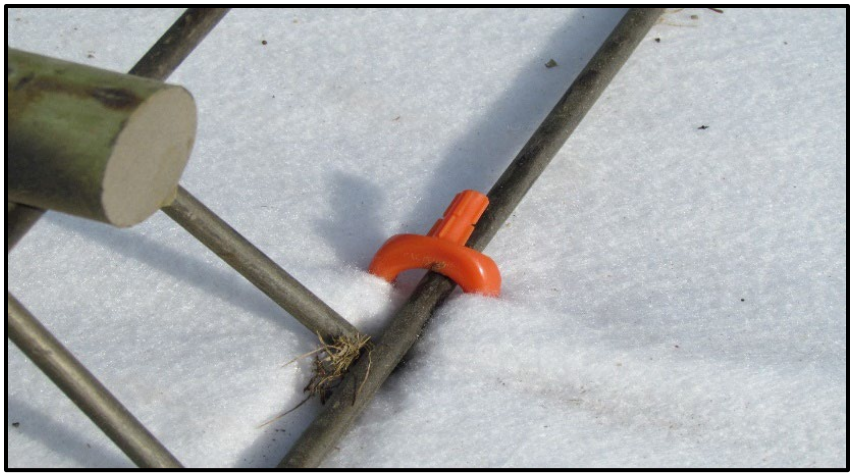
🡸 The tool attachment that the contractor built for their impact drill. This was measured to width of the Dowel Basket Fabric Anchors. The contractor felt this might be more efficient and less labor intensive than trying to drill through the CTB.

🡸 The drill the contractor used to punch the holes in the fabric for the dowel anchor installation. The use of this anchoring method significantly reduced labor versus the pea stake installation.



🡸 After the drill has punched holes in the fabric. The Dowel basket fabric anchor that the vendor recommended is ready to be inserted into the holes in the fabric.

🡸 The beginning process of insertion of the anchor into the fabric to secure the ladder to the fabric.



🡸 Completed dowel basket anchor installation.

🡸 Prepared SKAPS GT116 bondbreaker over CTB with a completed PCCP lane to the right. Also, example of dowl bar layout.

🡸 Completed PCCP lane with rebar inserted and prepared bondbreaker in the other lane.

🡸 GOMACO GP 2400 concrete paver for the median portion of operation.

⬅ PCCP placement in driving lane and bike lane.

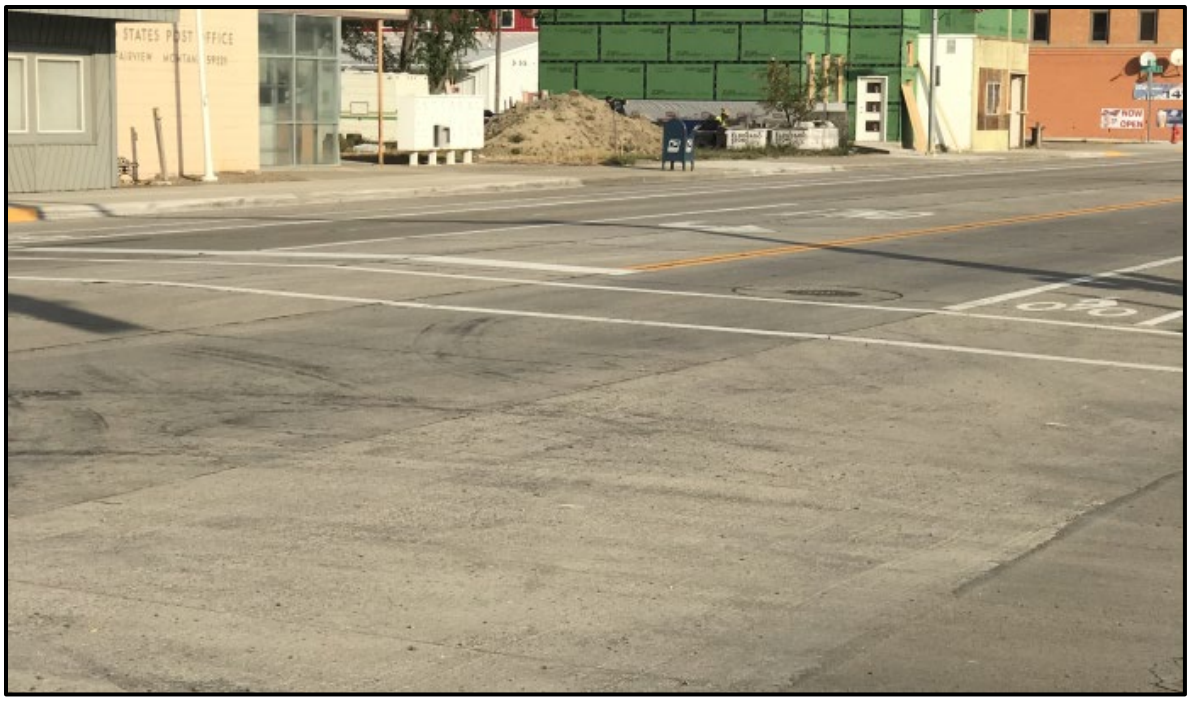
⬅ Finishing the PCCP using a vibratory roller. This tool helps with maintaining a proper grade and cuts down on some hand work.

⬅ PCCP section that is completed and curing compound placed.

🡸 WR Meadows 1600-White curing compound that was used. It is designed to help protect and aid in curing process.

🡸 Intersection of MT Hwy 200 and 4th St, view west. Test section.

🡸 Intersection of MT Hwy 200 and Pleasant Ave, view west. Test section.



⬆ Intersection of MT Hwy 200 and 6th St N, view west. Test Section.

⬆ Example of a crack that developed during curing process. Crack was sealed. No issues in compressive strength test results and no on-site material issues reported.

Preconstruction Documentation

↑ The existing condition of the road surface prior to construction. PCCP will replace the asphalt due to heavy rutting and shoving that has taken place with the existing asphalt pavement. The road is subjected to a high volume of loaded haul trucks.

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