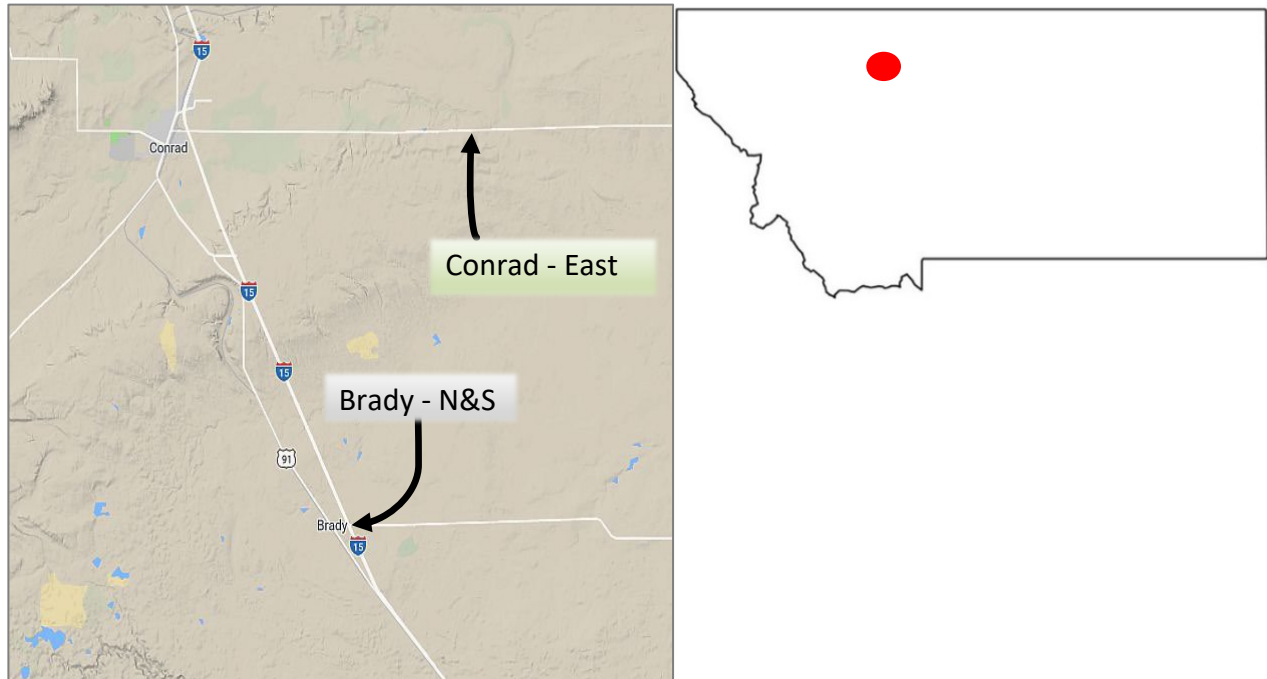


Experimental Feature Evaluation December 2022

Experimental Feature:	Crafco Mastic One Hot Applied Sealant
Location:	Great Falls District, Pondera County, MT 218, RP 8.9-18.8
MDT Project Name:	Conrad – East, Brady – North & South (ramps only)
MDT Project Number:	STPS 218-1(11)0[9401], IM 15-6(43)323[9391]
Experimental Project Number:	MT-20-04
Principle Investigator:	Chad DeAustin, Experimental Project Manager (ExPM)
Construction Date:	April 2020
Date of Inspections:	September 2021, June 2022

Project Map



Feature Description & Outline

This experimental feature involved placement of a hot-applied asphalt pavement repair/crack filling mastic material on large, deflected transverse cracks in two locations:

1. The Brady Interchange on-ramp, off-ramp, and crossroad; and
2. Between mileposts 8.9 and 18.8 on the Sollid Road, Secondary 218 in Pondera County.

The selected experimental feature is a product, Crafco Mastic One, which is designed for large cracks greater than 1"-1.5" and distressed surface areas too small for re-paving, but too large

for standard crack sealing. It is a hot-applied, pourable, self-adhesive ridged asphalt binder containing selected aggregate to ensure load bearing and skid resistant characteristics. It does not require compaction to achieve 100% density. Per the manufacturer's information, it is flexible and can withstand weather, traffic, and thermal movement. The manufacturer also states, it is waterproof, provides an air-tight seal, and it resists cracking, delamination, and spalling, with a reported service life greater than 10 years. In conjunction with the Mastic One application, smaller cracks less than 1.5" received a standard crack seal application.

The following is information on the differences between Mastic One use and that of conventional crack seal projects, per a representative from CrafcO. Mastic One is designed for repairing larger surface issues, with conventional crack sealing being used to fill smaller cracks. It is also recommended that for cracks deeper than 3 inches multiple lifts should be used. The Mastic One material bonds equally well to Portland Cement Concrete Pavement (PCCP). The following list provide examples of the types of repair work that can be done with this product are taken from the CrafcO instruction manual through their online site.

- Sealing and filling pavement cracks or joints over 1.5 in or wide
- Filling potholes
- Leveling depressed thermal cracks
- Sealing and repairing deteriorated longitudinal joints
- Skin patching
- Pretreatment of cracked areas prior to surface treatments
- Repairs prior to surface treatments
- Leveling manhole covers, bridge deck approaches, or other
- settlement at structures
- Capping settled utility cuts
- Filling spalls, pop outs, and corer breaks

Blending 25 percent aggregate by volume into the mastic being placed, can be used to fill cracks deeper than 4 inches. Minimum asphalt temperature to apply Mastic One is 40 degrees. It can be applied at lower temperatures if the surrounding mat is heated with a wand but the asphalt should not be overheated as it leads to oxidation and bonding issues with the Mastic One.

Evaluation Procedures & Schedule

The measures of effectiveness for this feature are:

- Construction practices (constructability, construction time, cost effectiveness, etc.),
- Durability and life cycle of Mastic One compared to traditional crack sealant.

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 dedicated [webpage](#) provides all reporting for the experimental feature.

2022 Inspection – June

There were some noticed changes of the Mastic One during the 2022 inspection. There were more areas of Mastic One bubbling were noticed than in 2021. There were also a few sections of Mastic One that lost significant chip adhesion, assumed to be caused by winter snowplow activity.



← RP 18.9, view west.



← RP 14, view of some Mastic One showing through the chip seal.



↑ Close up view of Mastic One. The mastic is bleeding through the chips, but the chips are holding for the majority of the mastic sections.



↑ Close up of some bubbling noticed near RP 14. There did not appear to be an increase in bubbling between 2021 and 2022 visits.



↑ There were a few areas of note where the chips stripped of the mastic. Assumed to be caused by winter maintenance activities. They will be closely monitored through the lifecycle of the project.

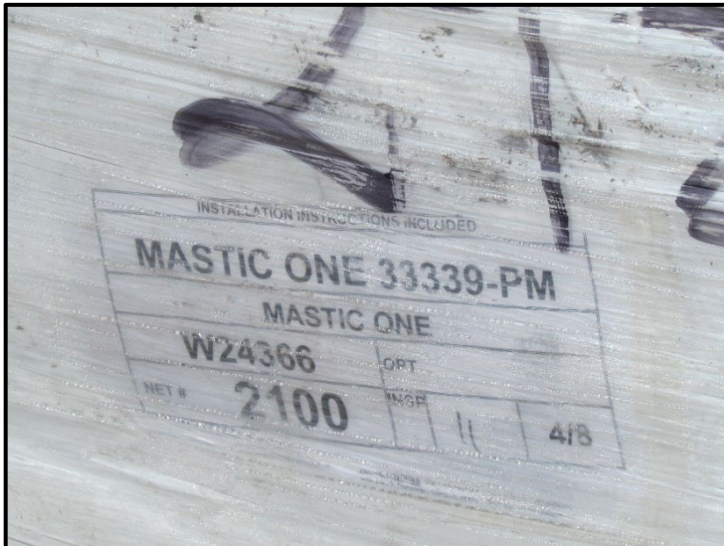


↑ View of some standard crack sealant that is bleeding through the chip seal. There did not appear to be much chip loss on these sections, only bleed through.

Construction – April 2020



← Shown walk behind Mastic One applicator. These are loaded from the Crafco Patcher 2 with the Mastic One material. These are used for longitudinal and horizontal cracks that are relatively straight.



← The Mastic One is prepacked in 30 lb. cardboard box or in a Plastic-melt package before delivered onsite. The contractor chose to use the plastic-melt packaging, which does not need to be opened and can be thrown into the Melter. The Mastic One material is a high-grade polymer modified asphalt that is combined with a washed mechanically engineered aggregate and is a two to three times higher grade modified polymer asphalt binder than that of other common surface treatments.



← The prepackaged Mastic One material is designed to be placed in the Melter truck, in preparation for heating and placement. This is an example of the Plexi-melt packaging. The material is not to be heated past 525 degrees Fahrenheit. Application temperatures should be between 375- 400 degrees.



← The Mastic One as delivered on site in wrapped sealed pallets.



← The contractor is placing the Mastic One with a drag box. The drag box is designed to keep the flowing material in the area that is designated for repair. These drag boxes can vary from 10" to 48" in width. A hot iron wand is used to smooth and level the material. The metal wand is meant to be kept hot to help blend the material while finishing the surface.



← The contractor applies the Mastic One to an angular crack. They are dragging the material across with the drop box. The contractor then used the hot iron wand to level this material to create a smoother ride. The application is the same for any kind of crack unless the depth is more than 2 ½".



← An example of a completed section about the 9-mile marker outside of Conrad going East on Sollid Road.



← A closeup view of a completed repair with Mastic One after it has cured. The curing process takes between 30-60 mins per inch depth of material. This shows how it bonds and blends with the surrounding surfacing.



← Shown is an example showing the difference between conventional crack sealing (bottom) versus that of a Mastic One repair.

Preconstruction – April 2020



↑ There are numerous transverse and longitudinal cracks throughout the length of this project.



↑ Not all the cracking extends across the width of road and not all cracks will require Mastic One.

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