Montana Department of Transportation
Research Programs
April 2020

EXPERIMENTAL CONSTRUCTION REPORT

Jointbond Asphalt Cement (AC) Joint Stabilizer

Location:	Gallatin County/Butte District-Bridger Canyon Rd.-P-86; Reference Point 11-12.8
Project Name:	Bridger Canyon-UPN 8112000
Project Number:	STPP 86-1-55-10
Experimental Project:	MT-19-5
Project Type:	AC Joint Stabilizer Evaluation
Principal Investigator:	Craig Abernathy; Experimental Project Manager (ExPM)
Technical Contact:	Paul Cogley; MDT Bozeman Construction
Date Constructed:	June 2019
Inspection Dates:	August 2019, March 2020

Description

Concern has been expressed that the Department's expanding practice of installing centerline rumble strips on many of the State's two-lane roads has exacerbated joint weakening by exposing more of the longitudinal internal joint to the intrusion of moisture and other environmental factors.

Based on this concern, the MDT Butte District has elected to test a joint stabilizer in an effort to mitigate meet-line deterioration. The chosen product is the Jointbond (JB) longitudinal joint stabilizer. This was installed in Gallatin County on Bridger Canyon Road (P-86), approximate reference point 11-12.8, in **June of 2019**. Average Daily Annual Traffic for this section of highway is 940. The contractor was Pavement Technology Inc. directed by Mr. John Schlegel.

Experimental Design

Per the manufacturer's information, Jointbond was developed to inhibit the premature deterioration of construction joints by penetrating the asphalt pavement and combining with the existing asphalt binder. As a polymerized maltene-based emulsion, this stabilizer may extend the service life of longitudinal joints and adjacent areas in two ways:

- Improving the chemistry of the in-place asphalt binder
- Adding a physical in-depth seal to the construction joint, thereby sealing the joint and surrounding area against intrusion by air, water and deicers, and detrimental effects of freeze-thaw.

Once topically sprayed, the stabilizer migrates 1-2" into the asphalt joint and surrounding mat (applied one and one-half foot on either side of the joint) and may take several hours to fully cure based on ambient air temperature. It is typically used on pavements less than two years old.

Note:
This project has one added element. JB has only been applied on unsealed pavements; because of time constraints, the application of JB was delayed a season. The pavement received a seal & cover (chip seal) prior to the JB installation. This will be the first trial in the country using this stabilizer on a chip-sealed asphalt pavement.

Also, there was a concern that after application of the JB, areas of the chip seal that had been scraped smooth by plowing (exposing the emulsion seal) might present a safety hazard since the stabilizer created a slippery surface during the curing phase. After about 90 minutes it was tacky enough not to be considered detrimental to the travelling public (refer to page 8).

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.

Construction Documentation: The Research Section will document the construction methods and equipment, material placement, weather, and specification conformance etc.,

Post Documentation: Will entail semi-annual site visits/inspections of the Jointbond section, for visual documentation representing of the current condition of the chip seal surface; in addition to include any maintenance or other Department inspection information associated with the JB and seal and cover treatment.

The following documentation represents the general activities of the Jointbond placement. Average temperature was 67°F (19°C), average humidity at 22%.

Jointbond Application June 2019

⬆ Representative image of project centerline prior to striping.

⬇ Recently striped roadway placed approximately one week prior to JB application.

← Jointbond application starting at reference point 11, view north.

JB was applied using a computerized distributor truck specifically designed for this type of product deployment.

The centerline was mechanically swept prior to JB placement

← Close-up of JB showing a uniform distribution along the longitudinal construction joint and an area from 1 to 1.5 feet on both sides of the joint.

Application rate was set at .03 gallons per square yard (GSY).

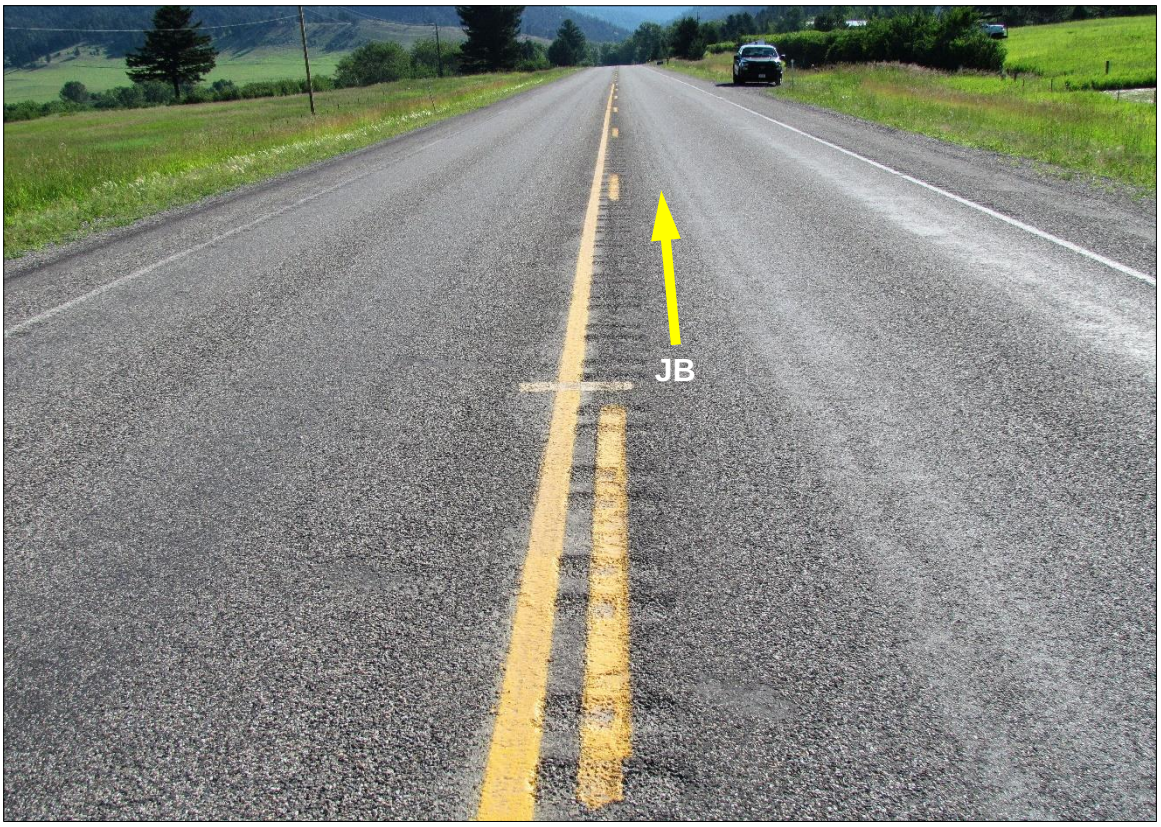
← Closer view of JB application directly after placement.

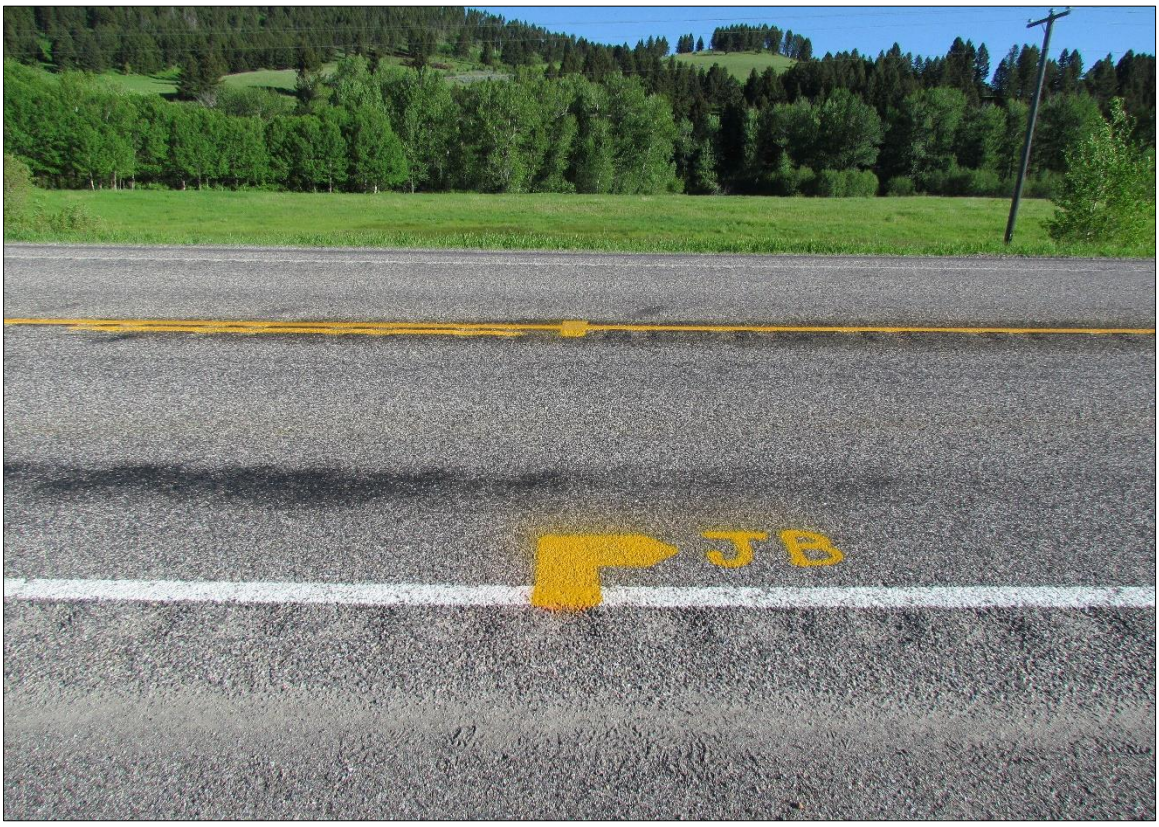
⬆ Appearance of JB approximately 30 minutes after application.

⬇ Appearance of JB approximately 90 minutes after application.

⬆ Appearance of JB approximately 2 weeks after application.

⬇ Appearance of JB approximately 6 weeks after application.





⬆ Reference point 11; showing how start of project is delineated in the field.

⬇ Reference point 12-8; end of project field delineation.

March 2020 Site Inspection

⬅ Reference point 11 at start of project; view north.

⬅ Representative image of Jointbond application on project.

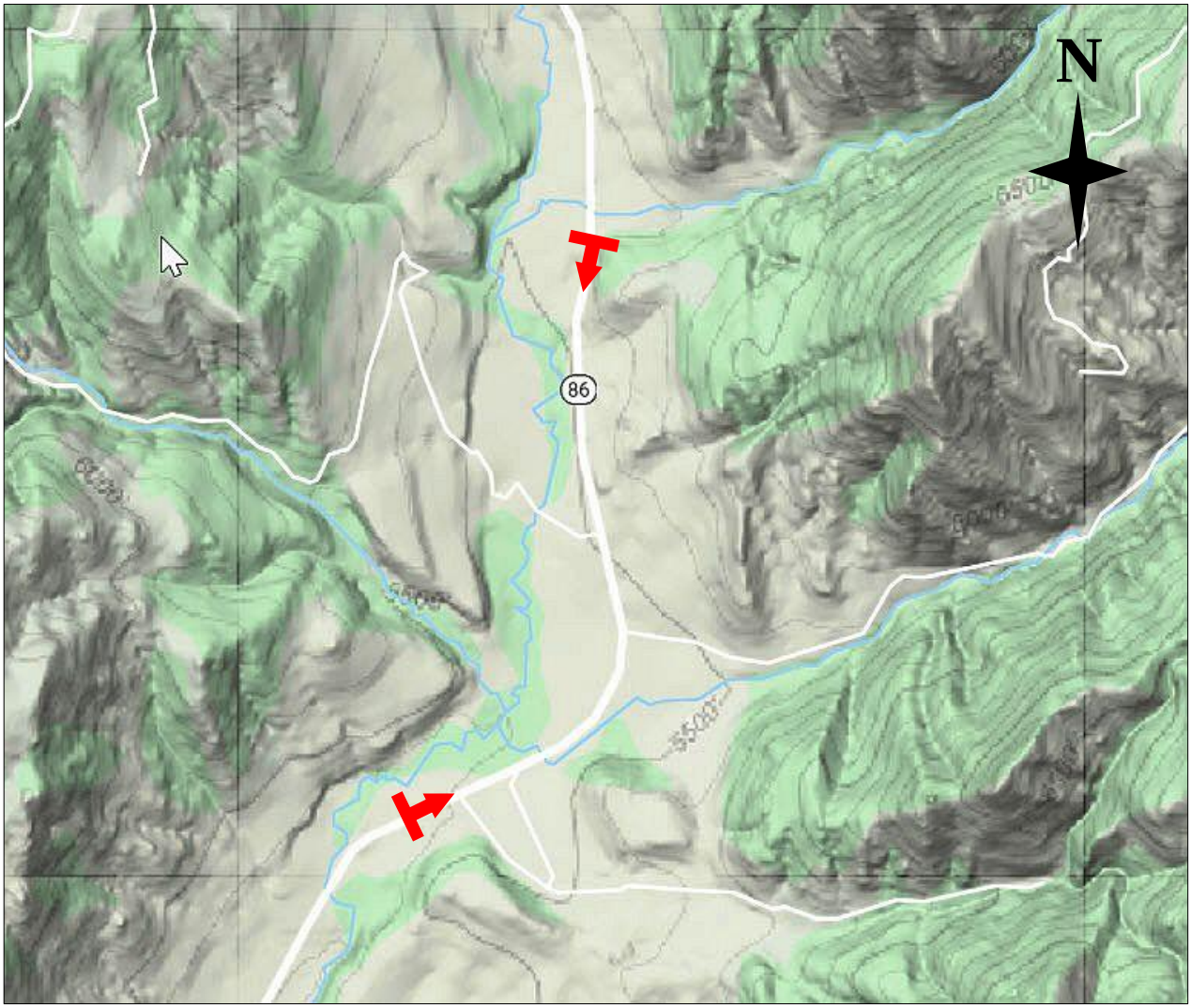
⬅ Demarcation of Jointbond (JB) application (yellow arrow); at this point in the project timeline the JB is not visibly detectable on the surface.

Any documentable distress may not be apparent for several seasons.

Supplemental: Slick Surface Issue

- During application, there was a concern that the JB produced a very slick surface on the exposed seal emulsion after application which may impart a safety issue especially for motorcycles. Within 60 minutes the surface became tacky and after about 90 minutes the product firmed to a point it was no longer considered a problem.

***Project Location: Jointbond Application**



Bridger Canyon Rd/Gallatin County: P-86; approximate reference point 11-12.8.

*All values approximate, not to scale.