

EXPERIMENTAL PROJECTS CONSTRUCTION REPORT
CENTERLINE RUMBLE STRIP (CLRS) EVALUATION

Location: Missoula District/Lincoln County: US 2; RP 0.0-13.75

Project Name: 508 E/W

Project Number: N/A

Experimental Project: MT-17-04

Type of Project: Centerline Rumble Strip (CLRS)

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

Technical Contact: Justun Juelfs: Kalispell Maintenance Chief

Description

This project is a centerline rumble strip (CLRS) longitudinal joint performance evaluation located in Lincoln County on US Highway 2 (C000001/N1); Missoula District. Reference point (RF) 0.0 to 13.75. 2016 average annual daily traffic (AADT) through this corridor is 1539.

Experimental Design

A center line rumble strip is a longitudinal safety feature installed at or near the center line of a paved roadway. On this project the strip is a series of rectangular milled indents intended to alert distracted drivers (through vibration and sound) that their vehicles have left the travel lane.

Asphalt Pavements are typically constructed with a longitudinal joint (or meet line) along the center of the road. Degradation over time may allow the entry of water, leading to early pavement deterioration. Rumble strips provide another potential reservoir to hold water and could accelerate this joint deterioration. Traffic and environmental characteristics may also affect joint performance.

This project will have a test section of CLRS (TS1) adjacent to a control section on non-CLRS (CS2) to compare performance. TS1 begins at reference Point (RF) 0.0 on the Idaho/Montana border and runs east to the section transition CS2 at RF 8.2 which continues

to RP 13.75 just east on the entrance to the township of Troy (see page 13 for project map locations). TS1 pavement treatment was a mill and fill with CS2 a standard overlay.

Evaluation Procedures

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

Post Documentation: Research staff will conduct full site inspections semi-annually (late fall/early spring to compare performance with the CLRS and non-CLRS sections; in addition to include any maintenance or other Department inspection information associated with this project.

Evaluation Schedule

Research will monitor and report on performance for a minimum period of five years annually, with every year up to *ten years (informally). This is in accordance with the Department's "Experimental Project Procedures". 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 will be dedicated to display all reporting from the project.

2017: Installation/Construction Report

2018-2021: Semi-Annual Inspections/ Annual Evaluation Reports

2022: Final Evaluation/Final Report

*If considered the extra data collection and analysis will add value to the overall results of the project.

Inspection Dates: Construction summer of 2017; semi-annual inspections April/September 2018, and May 2019. Evaluation consists of 100% review of both project sections.

Process

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 as an in-service evaluation. This report also establishes a baseline for defining performance for any given feature under actual service conditions to determine its relative merits.

The following information is representative of the installation of the CLRS and subsequent site inspections. Both sections TS1 & CS2 longitudinal paving joints are inspected in their entirety and if any joint stress is visible it will be added to this report.

Since installation in early spring of **2017**; no visible distress to date is apparent at the longitudinal meet lines on either section as documented in May **2019**. Next project inspection is scheduled for spring of **2020**.

Project Pre-Documentation March 2017



← New (2/10") overlay completed.

Project CLRS (TS1) begin point at Idaho/Montana border on US 2 (N-1/C000001).

The section of CLRS begins at reference point 0.0. View east.



← Approximate reference point 8.2.

Transition end of CLRS section (TS1) to non-CLRS (CS2) section (view east).



← End of CS2 section near Troy city limit.

Approximate reference point 13.75 (view east).

Compaction for the longitudinal joint (meet line) is specified for 91%; the average compaction for the project was reported at 93%.

CLRS Construction: August 2017



← ↓ Representative images of the rumble strip milling equipment in operation.

Average depth of grind was 1/2"-5/8", with a standard eight (8") inch rumble width.





◀ View of completed pass of CLRS grind application.



◀ Cleaning consisted of using a fixed-blade and connected sweep broom to remove millings off the road.



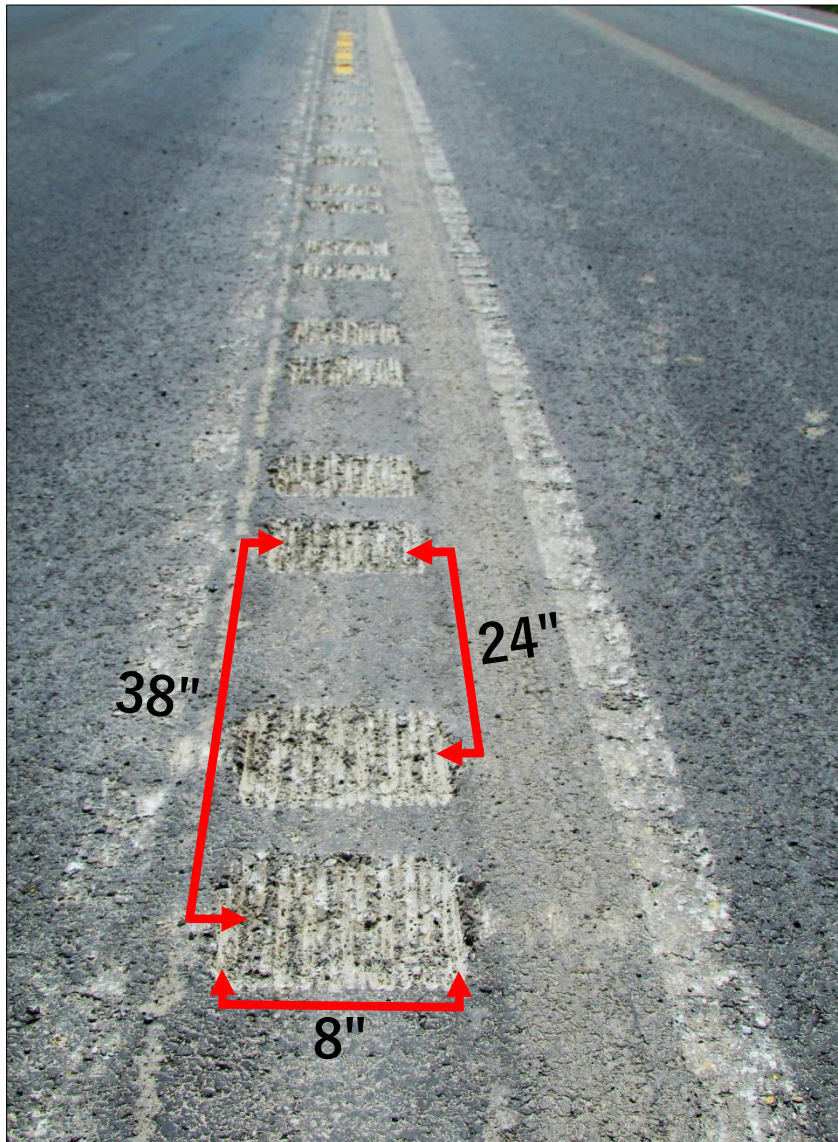
← The MDT Inspector continuously monitored strip compliance during the project.



← Representative image of swept rumble strip.



← Close-up of rectangular style rumble strip prior to seal and cover.



← Image of cleaned rumble strip section and added dimensions.



← Additional close-up of milled rumble strip in no-passing zone.



← Completed project.

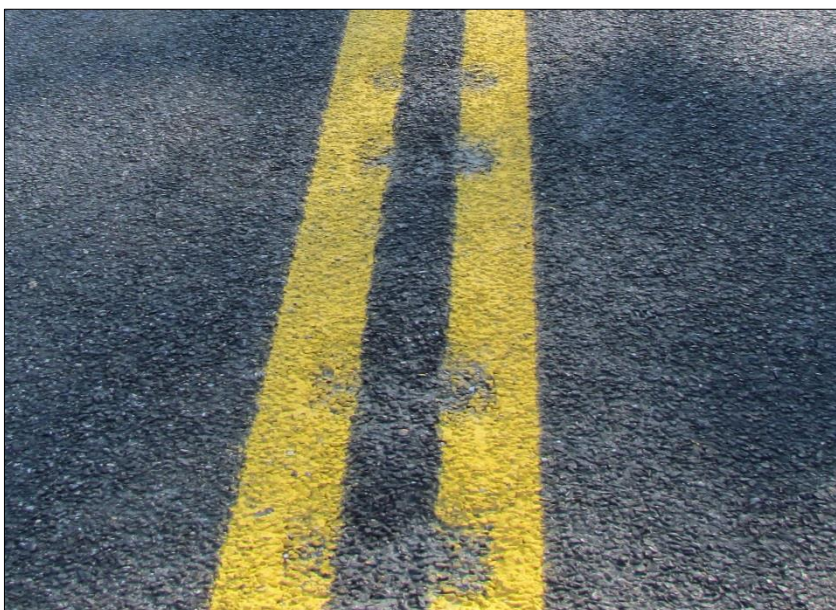
Road bed has received seal and cover (chip seal) with added fog seal.

Beginning of CLRS section at approximate reference point 0.0. View east.



← CLRS to non-CLRS transition point approximate reference point 8.2 (view east).

Although not in this image the section break is delineated by orange paint on the road surface.



← Close-up of CLRS after seal and cover with added fog seal.

Spring 2018 inspection: April



← Section TS1 at the Idaho/Montana border.

The section of CLRS begins at reference point 0.0. View east.



← Close-up section of CLRS.

No visual distress of the TS1 paving joint was observed.



← Transition of sections TS1 & CS2 (reference point 8.2); view east.



← Representative view of CS1, non-CLRS; reference point 12 (view east).

No visual distress of the CS2 paving joint was observed.

Fall 2018 Site Inspection: September



← Section TS1 at the Idaho/Montana border.

The section of CLRS begins at reference point 0.0. View east.



← Additional image of CLRS (reference point 4) view east.

No visual distress of the TS1 paving joint was observed.



← Example of chip loss and striping damage assumed from snow plow activity.



← Transition of sections TS1 & CS2 (reference point 8.2); view east.



← Representative view of CS1, non-CLRS; reference point 12.5 (view east).

No visual distress of the CS2 paving joint was observed.

Spring 2019 inspection: May



← Section TS1 at the Idaho/Montana border (view east).

The section of CLRS begins at reference point 0.0. View east.



← Representative close-up of TS1 at approximate RF 0.5.

No visual distress of the TS1 longitudinal joint was observed.



← Section TS1 at reference point 5 (view east).



← Representative close-up of TS1 longitudinal joint at approximate RF 5.



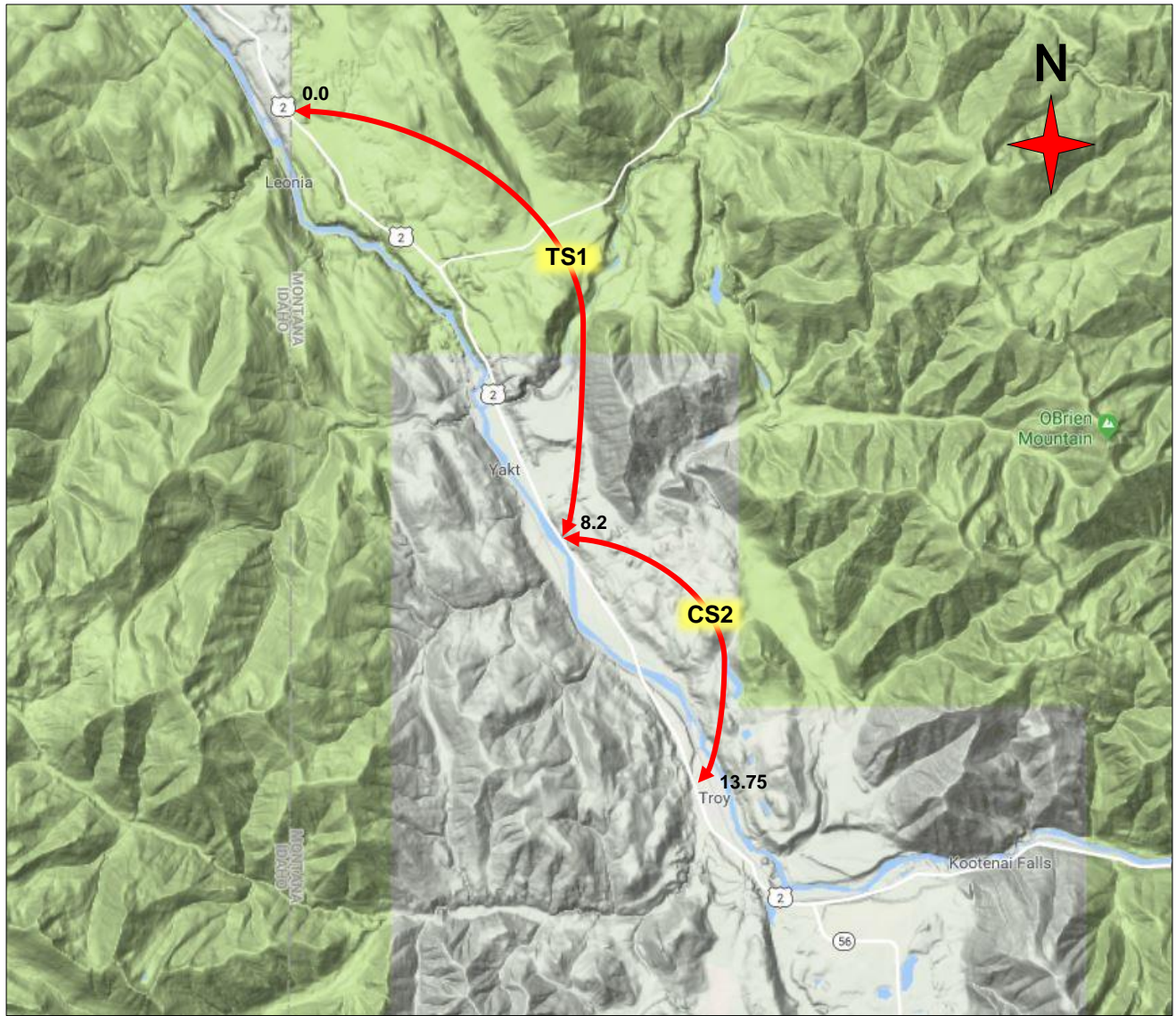
← Transition of Section TS1 and Control Section 2 (CS2) at approximate RF 8.2 (view east).

No visual distress of the CS longitudinal joint was observed.



← Representative close-up of CS2 longitudinal joint at approximate RF 9.

***Project Location**



Missoula District/Lincoln County-Montana: US 2 (N1); RP 0.0-13.75

- Centerline rumble strip (CLRS) - Test Section 1 (TS1): RF 0.0 (Idaho/Montana Border) – 8.2
- Non-centerline rumble strip - Control Section 2 (CS2): RF 8.2-13.75 (West edge Troy Township)

***Note:** All values are approximate; not to scale

Disclaimer

The use of a product and/or procedure during 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 process is public information and will not be considered privileged. The MDT may, at its discretion, release all information developed during and after the evaluation.