Montana Department of Transportation
Research Programs
March 2015

# EXPERIMENTAL PROJECT

# EVALUATION OF A CONVENTIONAL CHIP SEAL UNDER AN OVERLAY TO MITIGATE REFLECTIVE CRACKING (INFORMAL)

## Annual Report

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| **Location:** | Big Horn County, Secondary 313; C000313 – MP Reference approximately 27: Billings District |
| **Project name:** | St. Xavier N & S |
| **Project Number:** | SFCS 313-1(18)22 |
| **Type of Project:** | Experimental trial using a conventional chip seal under an overlay (76mm-0.25') to mitigate reflective cracking |
| **Principal Investigator:** | Craig Abernathy<br>Experimental Program Manager |
| **Date Constructed:** | June 2008 |
| **Evaluation Date:** | March 2015 |

## Objective

The Billings District initiated an experimental project in placing a conventional chip seal (as an interlayer) on an existing pavement prior to an overlay (composed of a 0.25' PMS thickness). The intent of the chip seal (CS) was to seal existing cracks and test the potential in retarding reflective cracking.

## Experimental Design

The project is located on Secondary 313, at the mile reference 27 (just south of St. Xavier). Two 305 meter (1000') sections encompass the experimental design. Section 1 is the control site with no chip seal as interlayer. Section 2 is the test site which incorporates the CS interlayer. Jon Watson and Dan Hill of the Pavement Analysis Section along with Research staff visited the project to

delineate the sections prior to construction to insure uniformity of surface distress (spacing, frequency, and severity of transverse cracking) on both sites 1 & 2 for consistency with the ongoing analysis. See attached layout on page 13.

## Analysis

The main objective of the research is to monitor the effectiveness of the chip seal interlayer by comparing it to the control section. As visible distress begins to appear on the pavement, Research will document the sites with visual representation and crack mapping. Normally the construction activities of the placement of the chips seal and overlay are documented. Research was unable to document those activities.

Since construction in 2008, the site visits conducted in 2009-2014 to date has displayed no distress data to report.

During the March 2015 inspection it was found the control section 1 had formed two (2) transverse cracks rated as moderate severity (>1/2" - <3/4"). No cracks were visible on test section 2.

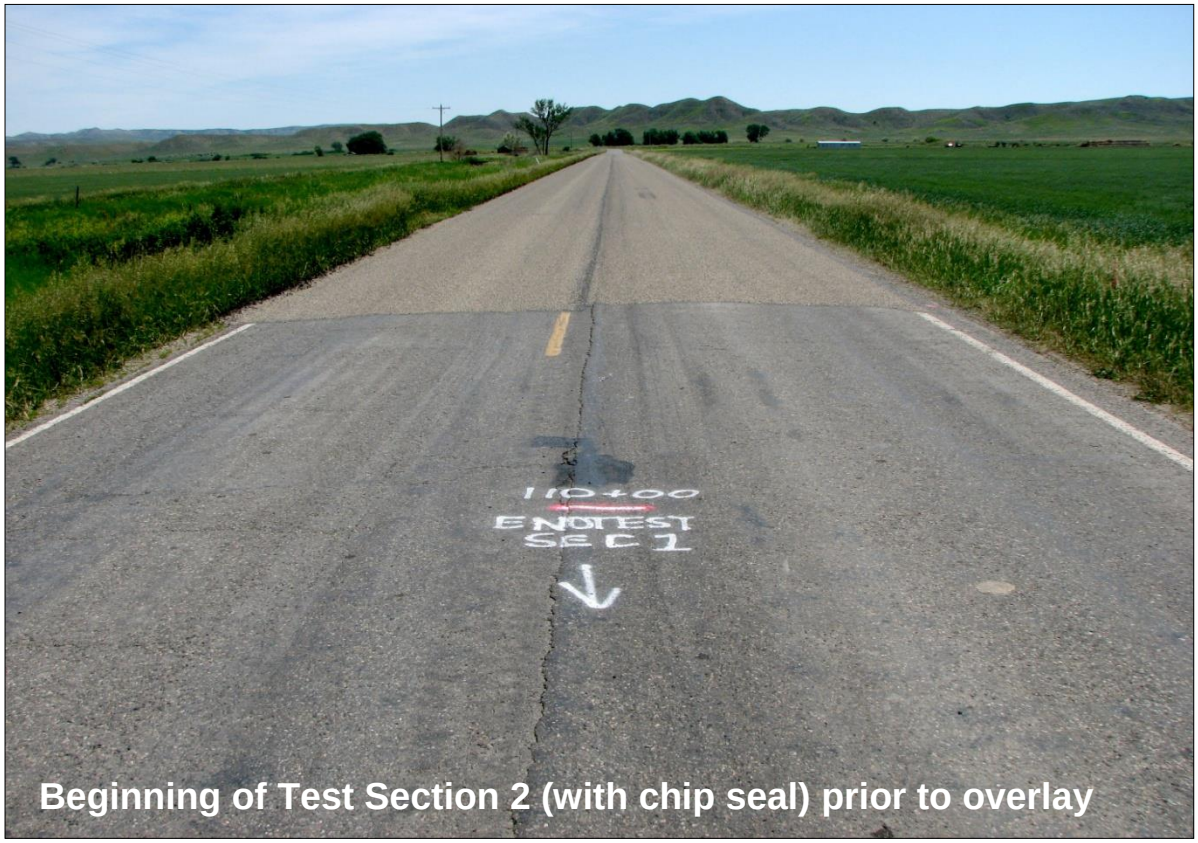
See crack map on page 14.

Surface distress regarding bleeding and/or raveling is at a minimum on both sections.

The following images are examples of the general condition the pavement sections 1 & 2 from 2008 to 2015.

**June 2008**

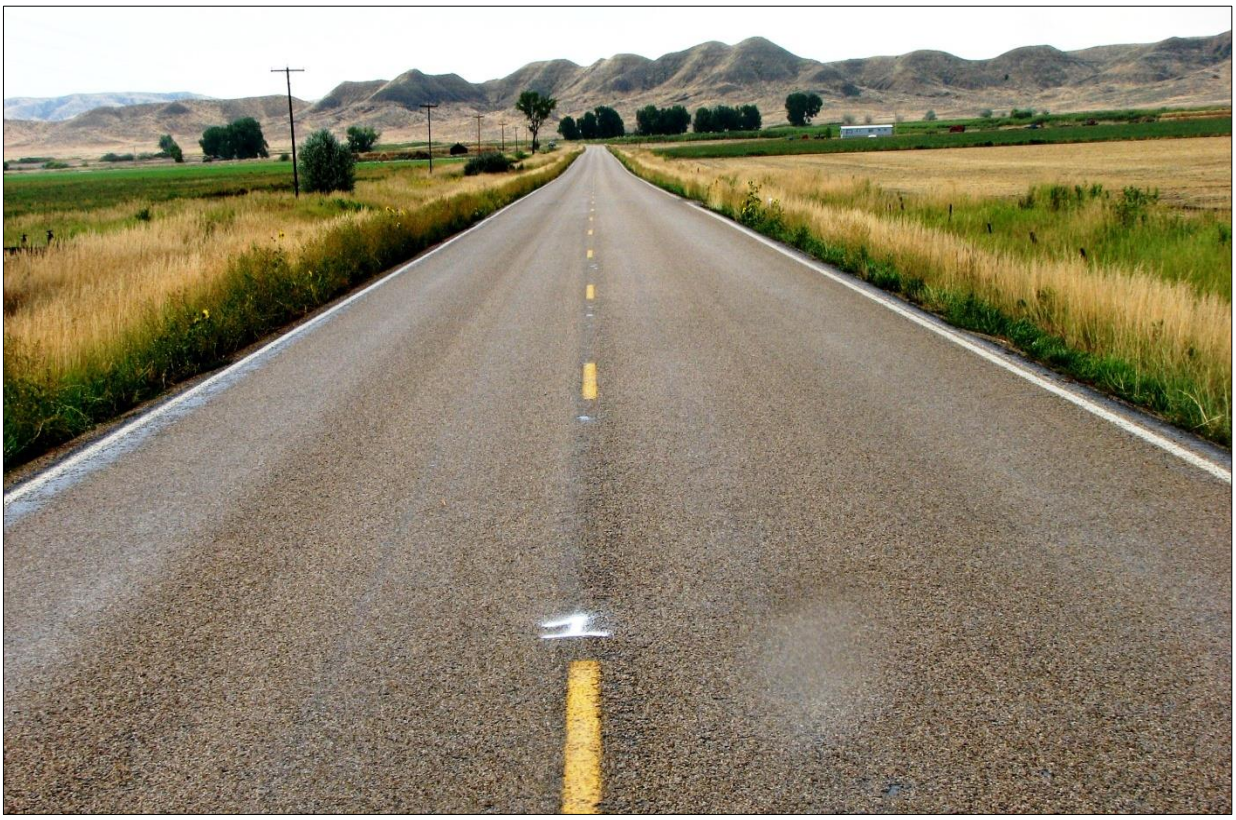
Beginning of Control Section 1 prior to overlay




Beginning of Test Section 2 (with chip seal) prior to overlay

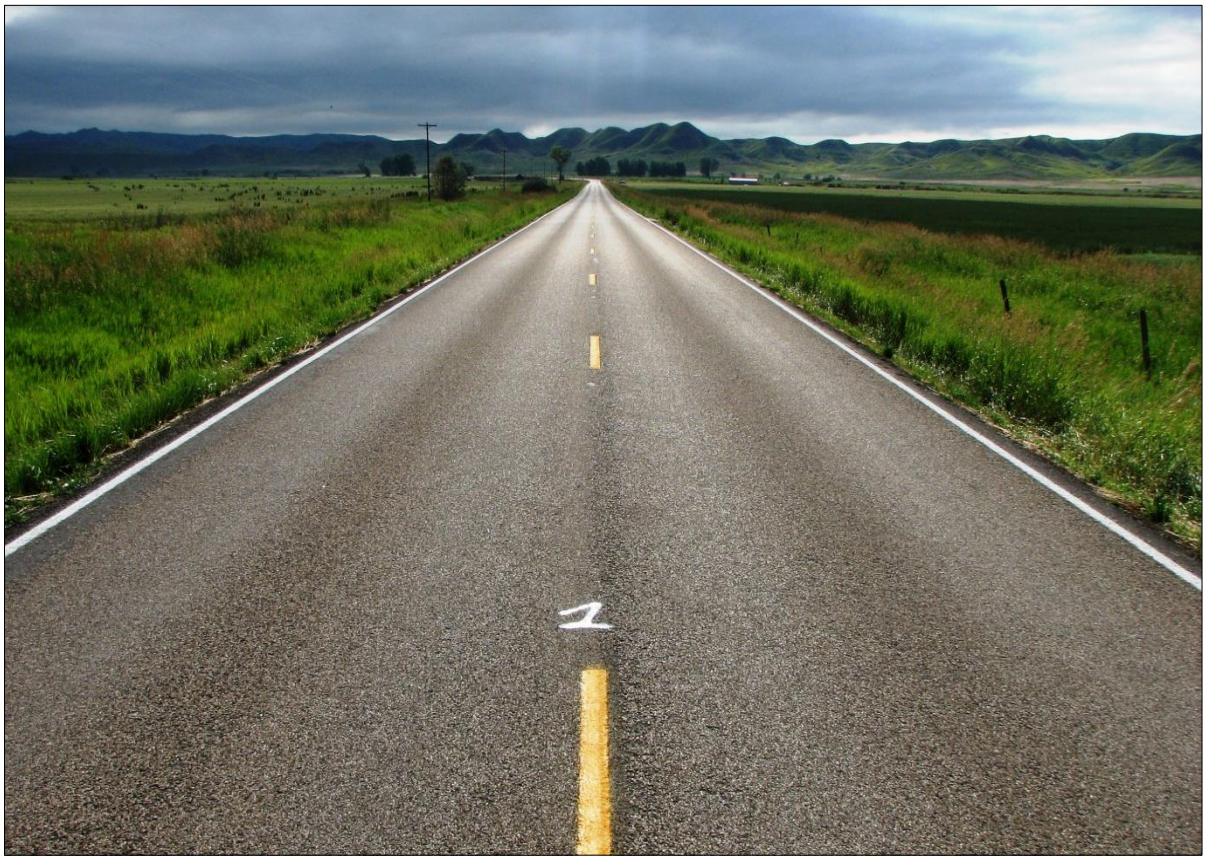
**<u>October 2008:</u> Completed sections 1 & 2 (views east)**

**<u>July 2009</u> Sections 1 & 2 (views east)**



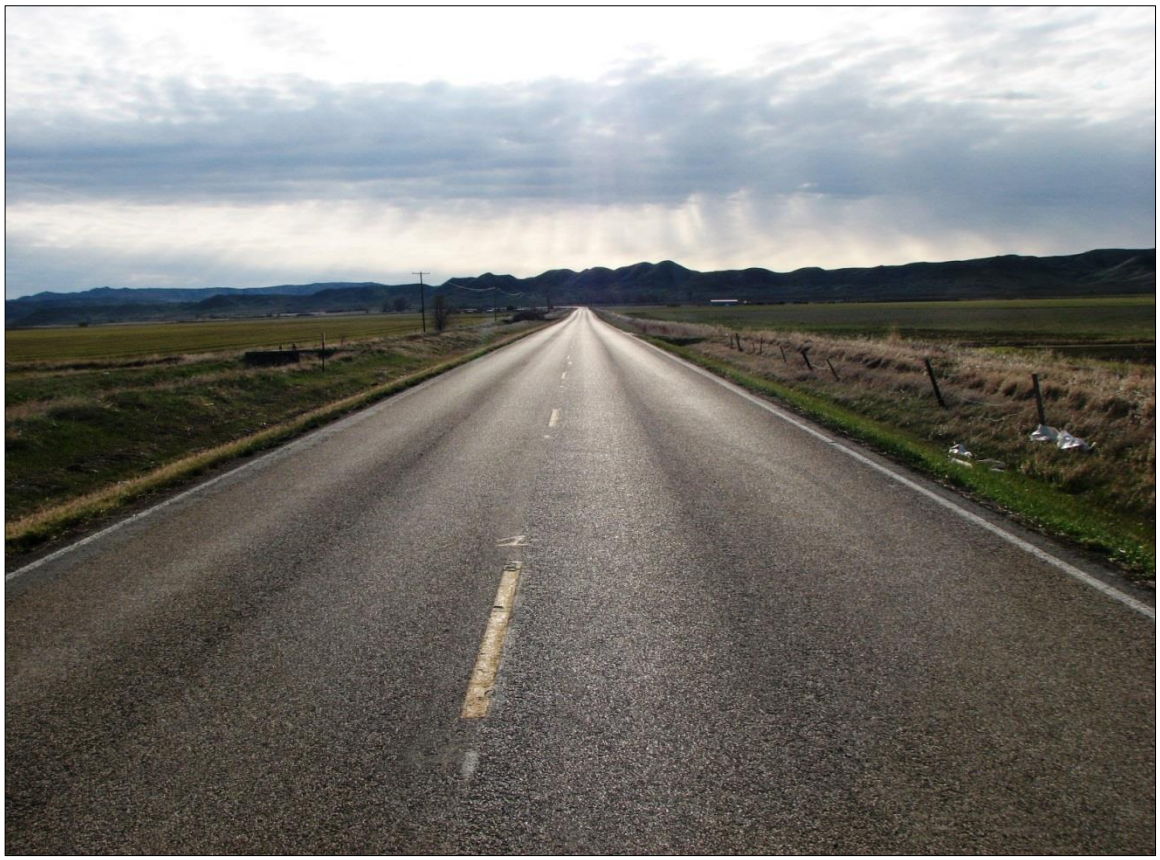
**<u>August 2010</u> Sections 1 & 2 (views east)**

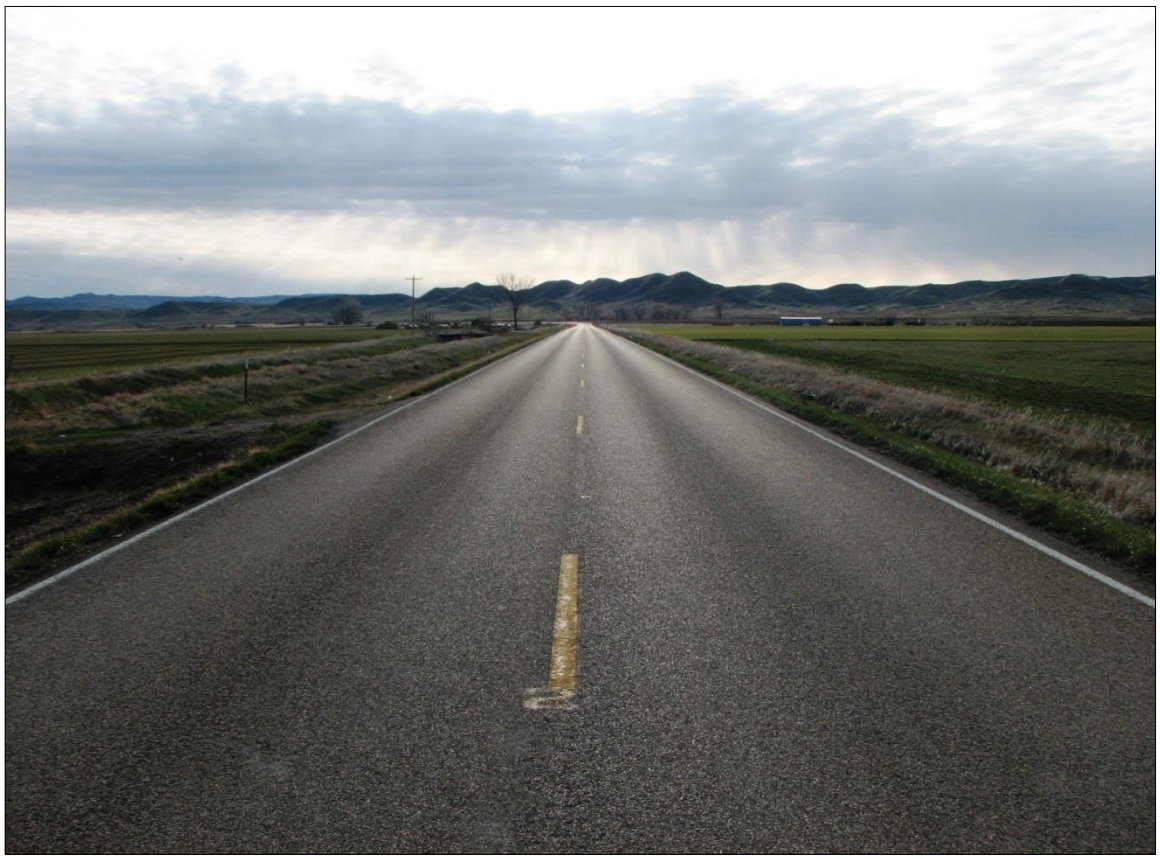
**<u>July 2011</u> Sections 1 & 2 (views east)**



**<u>April 2012</u> Sections 1 & 2 (views east)**

**<u>April 2013:</u> Sections 1 & 2 (views east)**





**<u>April 2014:</u> Sections 1 & 2 (views east)**

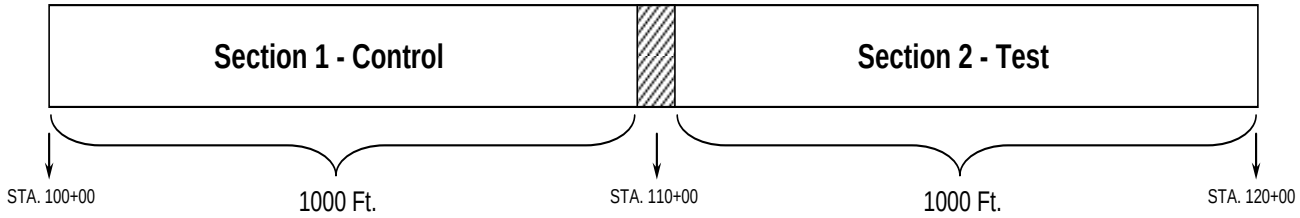
**<u>March 2015:</u> Sections 1 & 2 (views east)**

**<u>March 2015:</u> Control Section 1 – Example of Moderate Severity Cracking**

C000313 - Secondary 313

**St. Xavier: Chip Seal with Overlay to Retard Reflective Cracking**

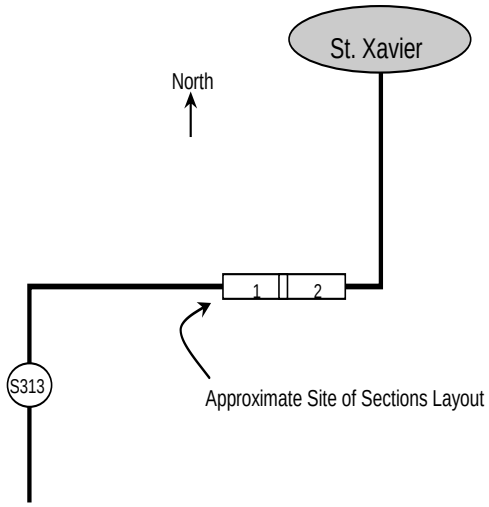
Experimental Layout - located approximately within mile point reference 27




Section 1 - Control: No chip seal

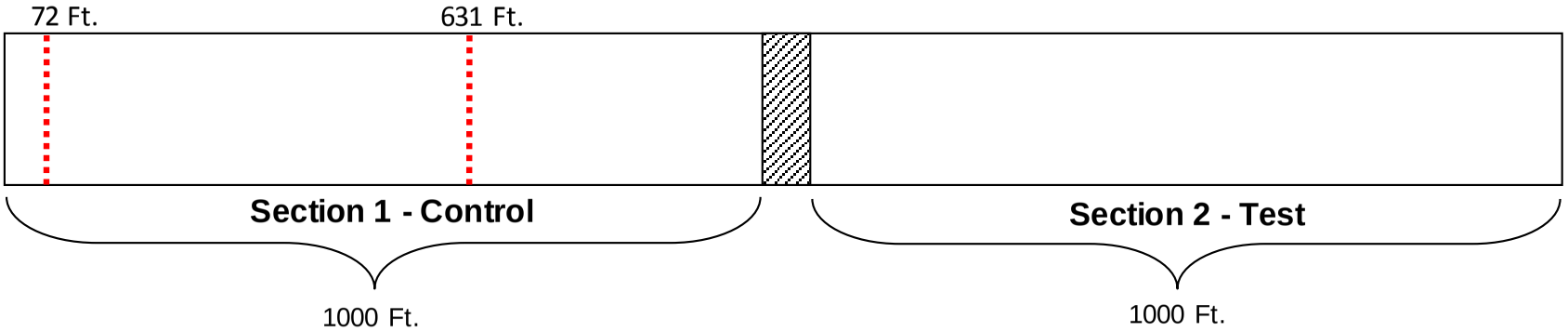
Section 2 - Test: Chip seal with overlay

- 25' Transition zone




Note: All values are approximate

**Section Crack Map**




Section 1 - Control: No Chip Seal
Section 2 - Test: Chip Interlayer
- 25' Transition zone

Note: Not to scale - all values are approximate