

Montana Department of Transportation
Research Programs
November 2018

EXPERIMENTAL PROJECT

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

Final Report

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
Experimental Program Manager

Date Constructed: June 2008

Evaluation Date: July 2018

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 14.

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 15.

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

The **May 2016** and **July 2017** site inspection revealed no additional information to date than was reported in 2015. No visual documentation was taken.

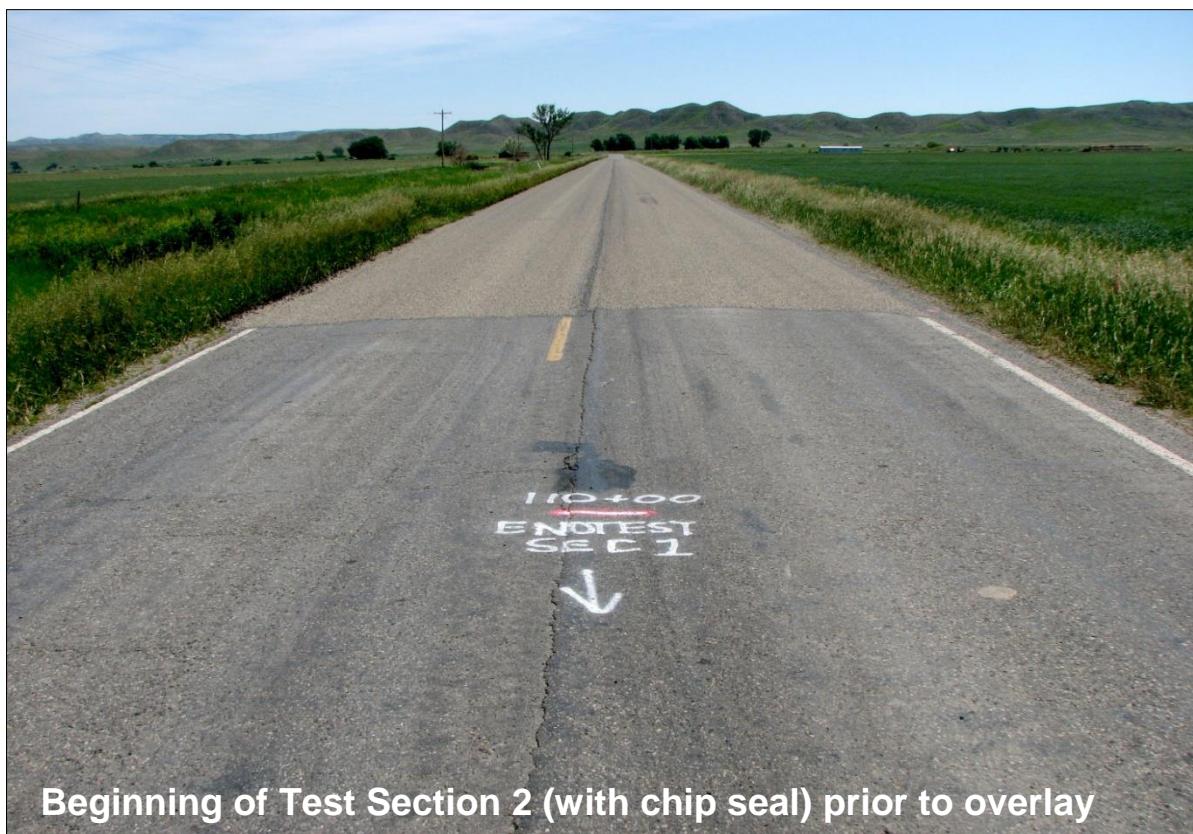
The following images are examples of the general condition the pavement sections 1 & 2 from 2008 to 2015.

July 2018 – Final Inspection: No additional visual distress (transverse crack) has occurred since 2015. Since installation in 2008; only two low-severity cracks were documented (2015) located in section 1 (control).

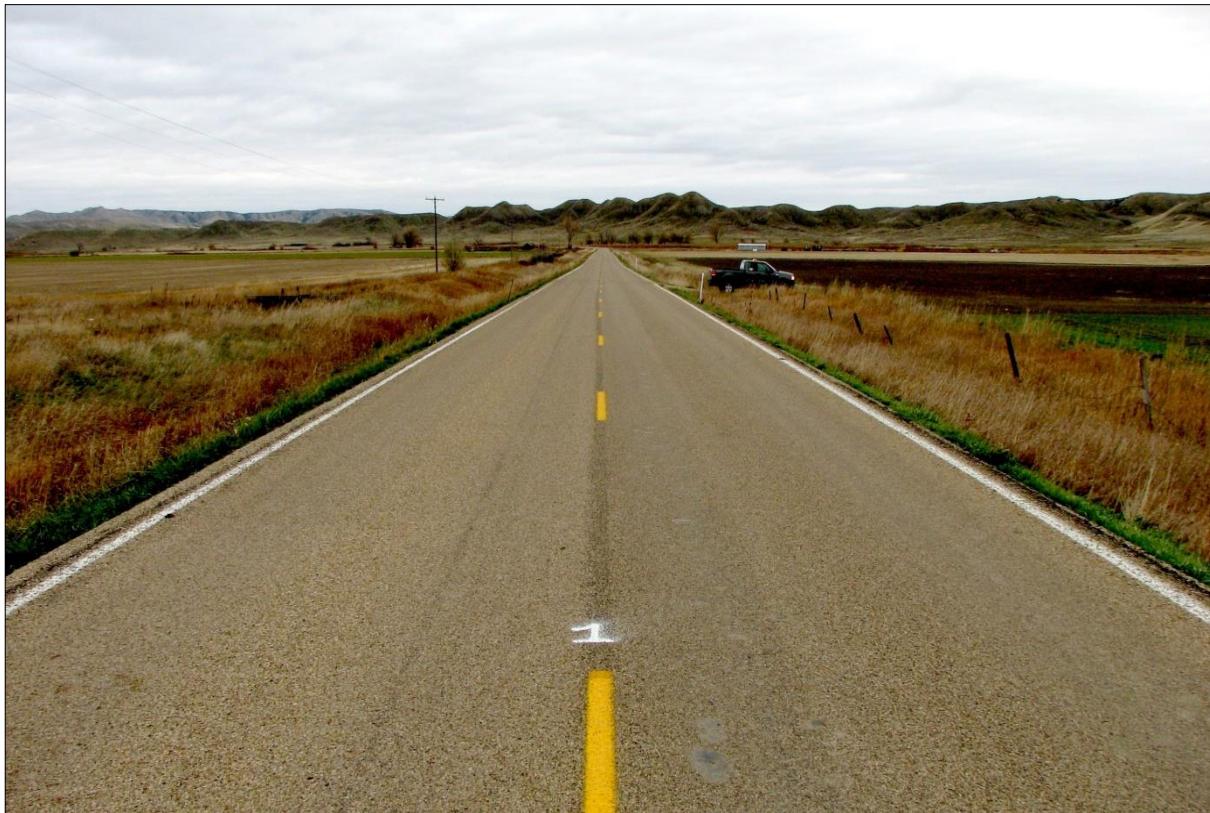
Although no cracking has yet to be identified in section 2 (test); with only two data points detected in section 1, any conclusion of the efficacy of the CS interlayer would be difficult to quantify.

Average AADT for the project timeline was estimated at 700.

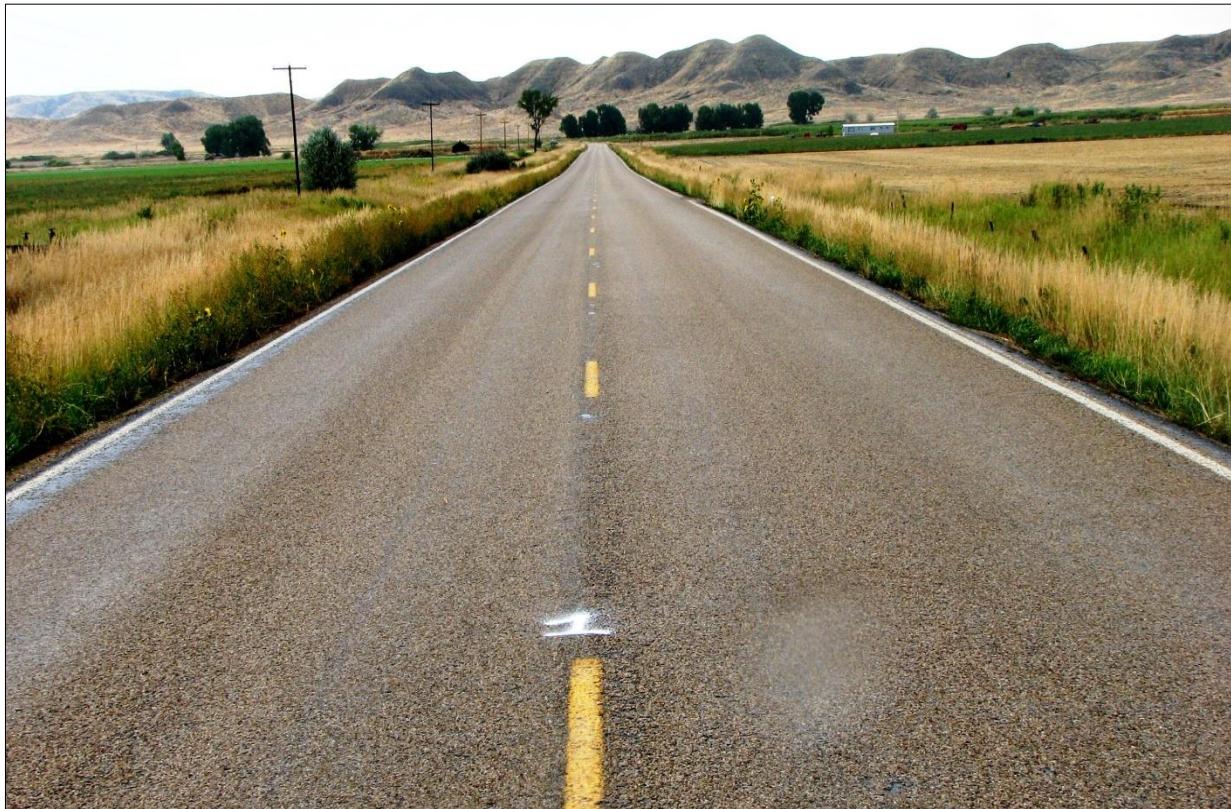
June 2008



October 2008: Completed sections 1 & 2 (views east)



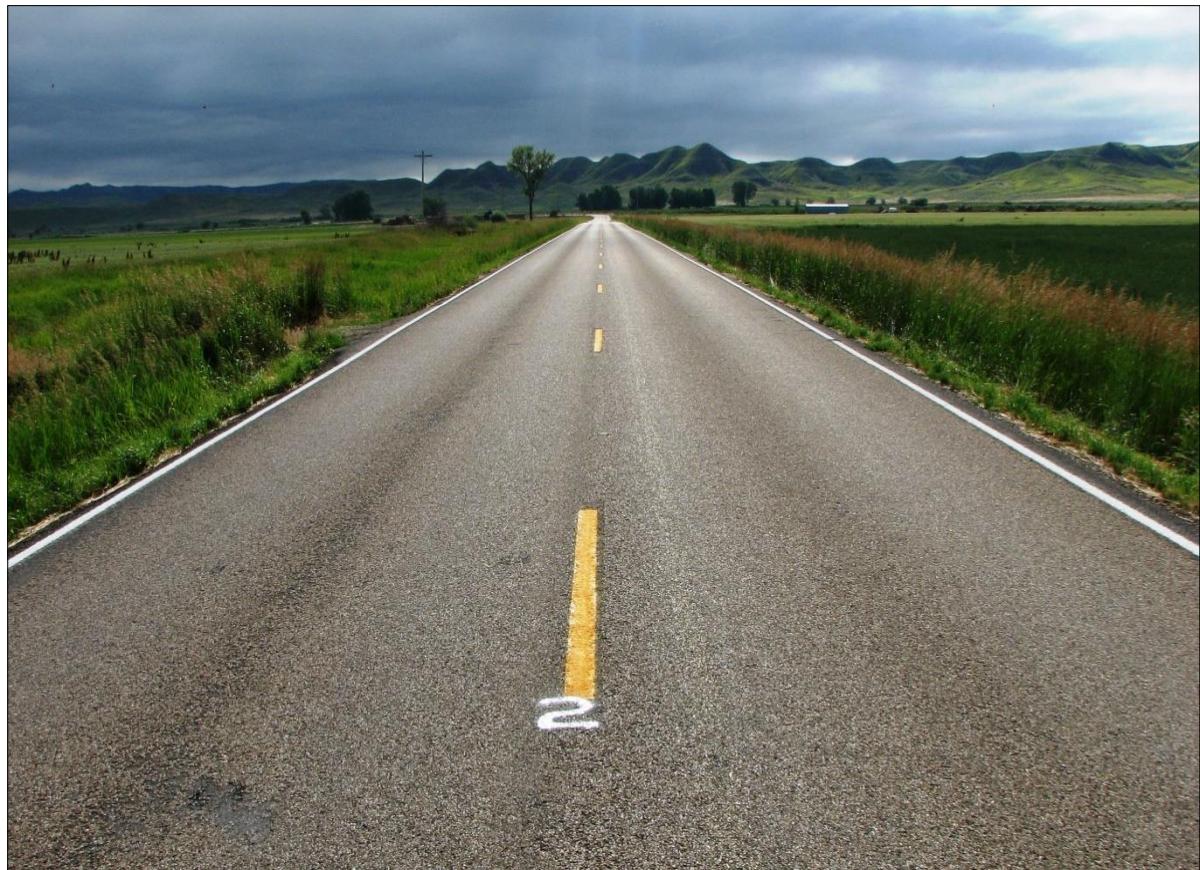
July 2009 Sections 1 & 2 (views east)



August 2010 Sections 1 & 2 (views east)



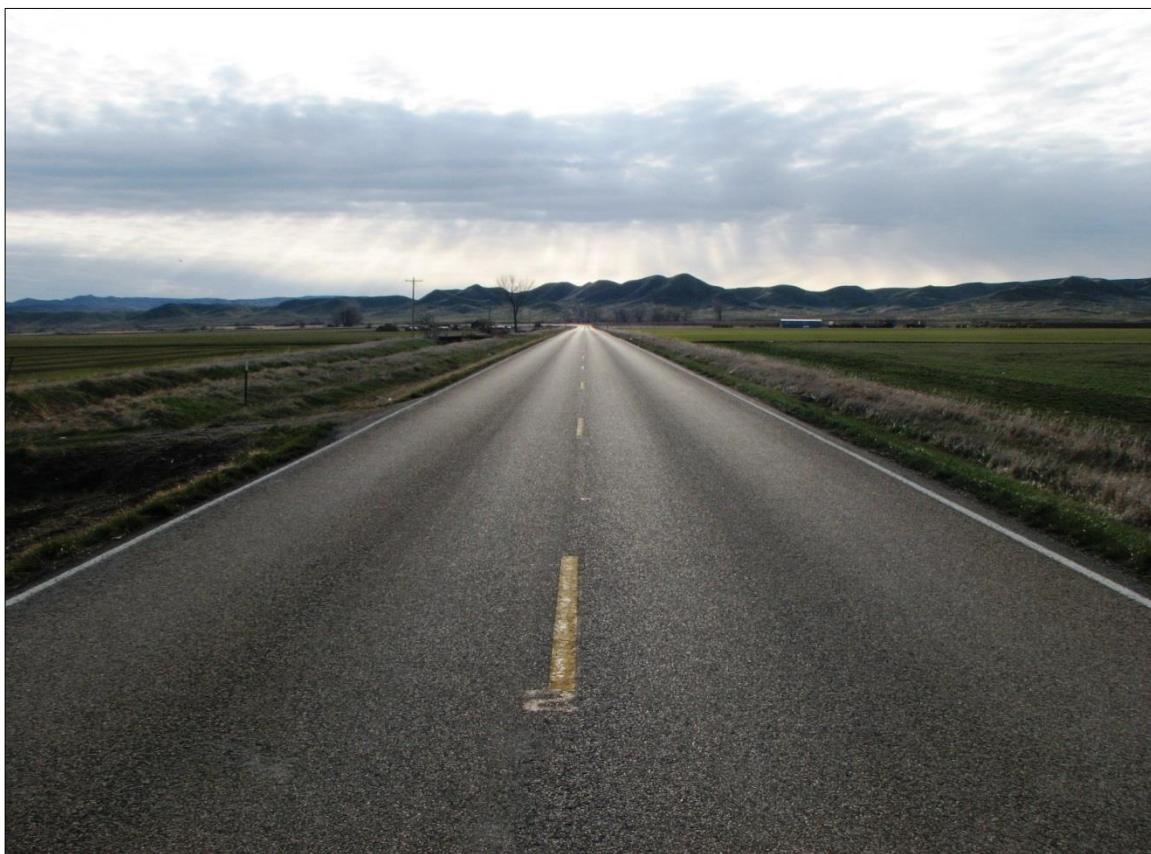
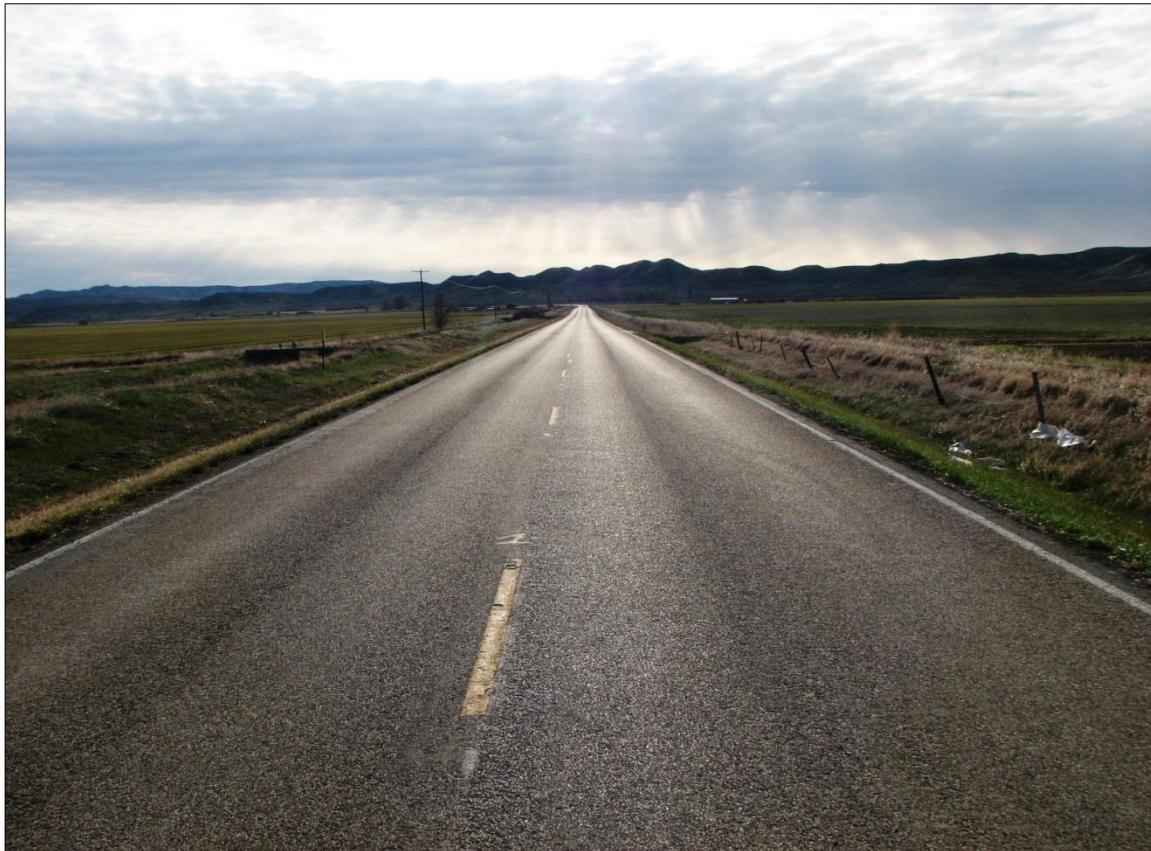
July 2011 Sections 1 & 2 (views east)



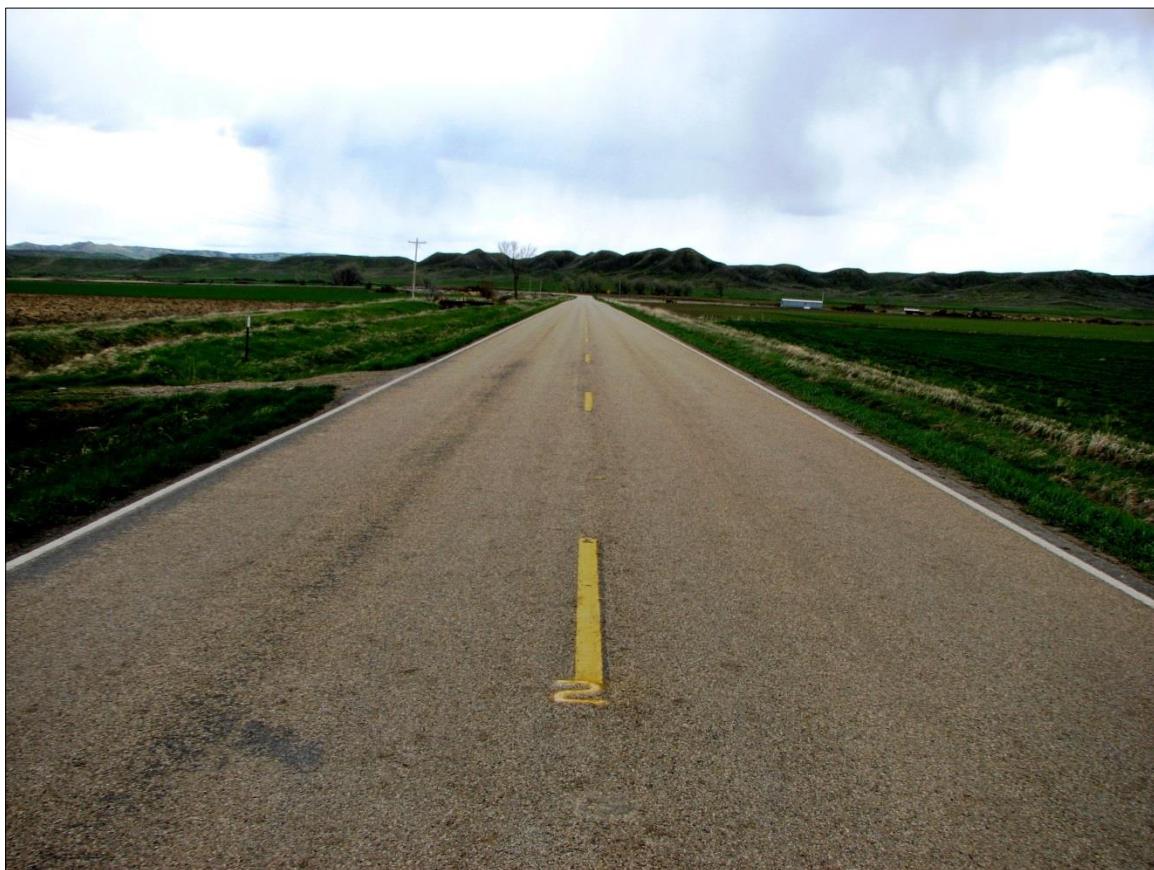
April 2012 Sections 1 & 2 (views east)



April 2013: Sections 1 & 2 (views east)



April 2014: Sections 1 & 2 (views east)



March 2015: Sections 1 & 2 (views east)



March 2015: Control Section 1 – Example of Moderate Severity Cracking



July 2018: Site Inspection

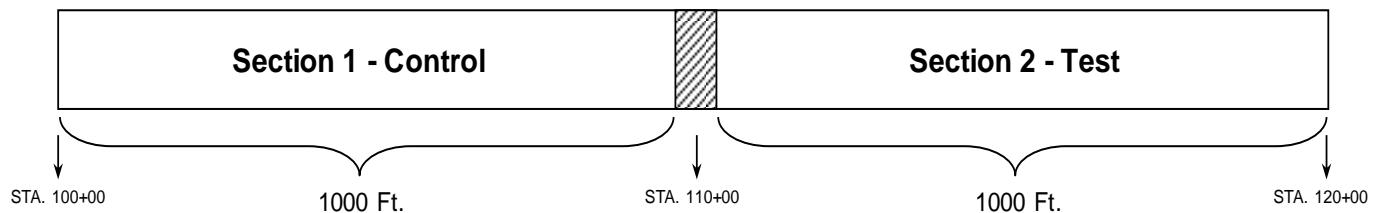


↑ Overview of project near section 2 (view east).

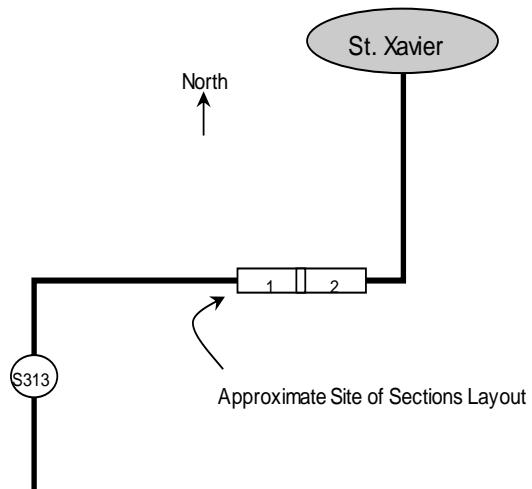
SFCS 313-1(18)22 St Xavier – N & S
CN 5894000 Work Type - 180
Big Horn County
C000313 - Secondary 313

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

Experimental Layout - located approximately within mile point reference 27

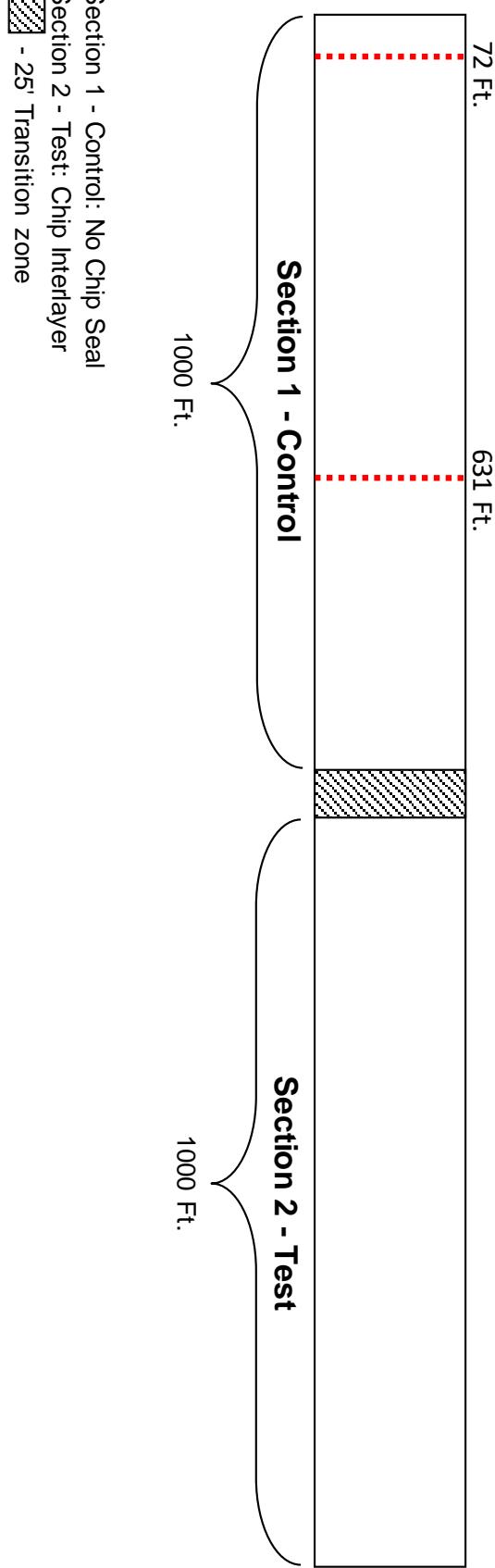


Section 1 - Control: No chip seal
Section 2 - Test: Chip seal with overlay
- 25' Transition zone



Note: All values are approximate

Section Crack Map



Note: Not to scale - all values are approximate