Montana Department of Transportation
Research Programs
2013

Experimental Project Final Report

EVALUATION OF VARIOUS PAVEMENT FABRIC AND MAT APPLICATIONS TO RETARD REFLECTIVE CRACKING

Project Name:	Flesher Pass - East
Project Number:	STPS 279-1(15)22: Control No. 6234000
FHWA Project Number:	MT 00-18
Project Location:	Secondary 279, C000279; RP 22.2-30.5, Lewis & Clark County: Experimental site locations at RP 24
Average ADT:	560 (2009)
Description:	Pavement reinforcement to mitigate reflective cracking on hot mix asphalt (HMA) pavement
Date of Installation:	September 2008
Date of Evaluation:	April 2013
Principal Investigator:	Craig Abernathy Experimental Program Manager

Objective

Experimental assessment of various pavement reinforcement systems (PVS) in effort to determine effectiveness of these treatments for potential use in future road construction projects for the reduction of reflective cracking.

Experimental Design

The paving mats selected for trial as follows:

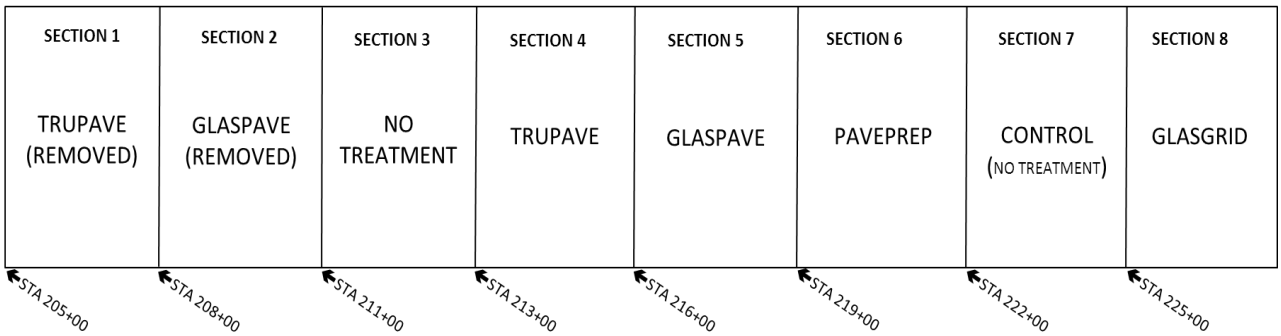
-TruPave Engineered Paving Mat – Full Lane Application

-PavePrep Geo-Composite Membrane – Spot Treatment of Transverse Cracks

-GlasPave 25 Waterproofing Paving Mat - Full Lane Application

-GlasGrid 8512 Pavement Reinforcement System - Spot Treatment of Transverse Cracks

The following diagram depicts the experimental sections as initially designed. Each section is approximately 300 ft. (91m) in length. Section 3 (no treatment) is 200 ft. Note that sections 1 & 2 were removed from the experimental plan prior to construction. These sections were initially designated to have the PVS as a topical treatment to the overlay prior to seal and cover (aka chip seal). Upon consultation with the manufacturers regarding this application, in which they stated that this procedure was not the intended use of the product and failure will most likely occur, it was determined not to construct these features. Section 7 is the formal control for the project. A tack coat was applied to the milled pavement prior to application of the test sections. An approximate crack map of the test and control sections was documented prior to construction to compare past and future pavement distress.



The following images represent the sites as of May 2009 through to July 2012. No cracking to document was present in 2009. The formal 2010 site inspection did not take place due to an early winter; however a cursory visit in the fall noted cracking beginning to appear at the shoulders. There was indication of suspected frost heave random throughout the sections. That has been documented in this report. The 2008-2012 accumulated crack maps begin on page 11.

Analysis

All active project sections (4-8) were mapped for transverse cracking prior to construction. Site visits to document new cracking occurred during 2009 and 2012. The maps show that cracking is occurring approximately at the same areas as prior to construction and progressively consistent in all sections. Section 3 has no cracking to date and will not be included in the 2012 evaluation or beyond. As stated previously, cracking was beginning to appear near the shoulders in the fall of 2010 (undocumented) in all sections. As represented in the crack maps we can assume the majority of the cracking appeared between the fall of 2010 and summer of 2012. Overall transverse cracking was rated as

low-severity (≤6 mm/.25"). During the 2012 site visit it was found that all cracks had been sealed. As reported in the 2008 construction report; in addition to the transverse cracking, there was longitudinal cracking, block and alligator cracking indicative of issues below the pavement (or loss of support). Also this project was placed in a severe environment; excessive freeze thaw cycles, temperature extremes, etc., which may have prematurely accelerated the cracking to date.

April 2013 – Final Inspection

No additional cracking was noticed on the control and test sections during the 2013 site visit. All sections (control and tests) appeared to progressively transverse crack since the 2008 installation; leading to a conclusion that none of the PVS treatments delayed cracking as compared to the control section. Refer to the crack-mapping diagrams on pages 14-18.

Project reports are available at: http://www.mdt.mt.gov/research/projects/flesher.shtml.

🡻 August 2008 - Representative image of general condition of road bed prior to construction.

MAY 2009

Section 3: No Treatment

Section 4: TruPave – Full Lane Application

🡅 Section 5: GlasPave 25 – Full Lane Application

🡅 Section 6: PavePrep – Spot Treatment of Transverse Cracks

Section 7: Control – No Treatment

Section 8: GlasGrid 8512 - Spot Treatment of Transverse Cracks

As stated earlier in this report. There are areas of noticeable heaving in the pavement surface indicative of characteristic frost heave as shown in these two images documented in 2009. You can see the effect that snow plowing caused at the pavement surface. At the time of the site visit this appeared randomly throughout the project and not (at this time) specific to any one treatment. It will be watched closely in future evaluations.

July 2011

Section 3: No Treatment

Section 4: TruPave – Full Lane Application

Section 5: GlasPave 25 – Full Lane Application

Section 6: PavePrep - Spot Treatment of Transverse Cracks

Section 7: Control – No Treatment

Section 8: GlasGrid 8512 - Spot Treatment of Transverse Cracks

May 2012

🡅 Section 4: TruPave – Full Lane Application

🡅 Section 5: GlasPave 25 – Full Lane Application

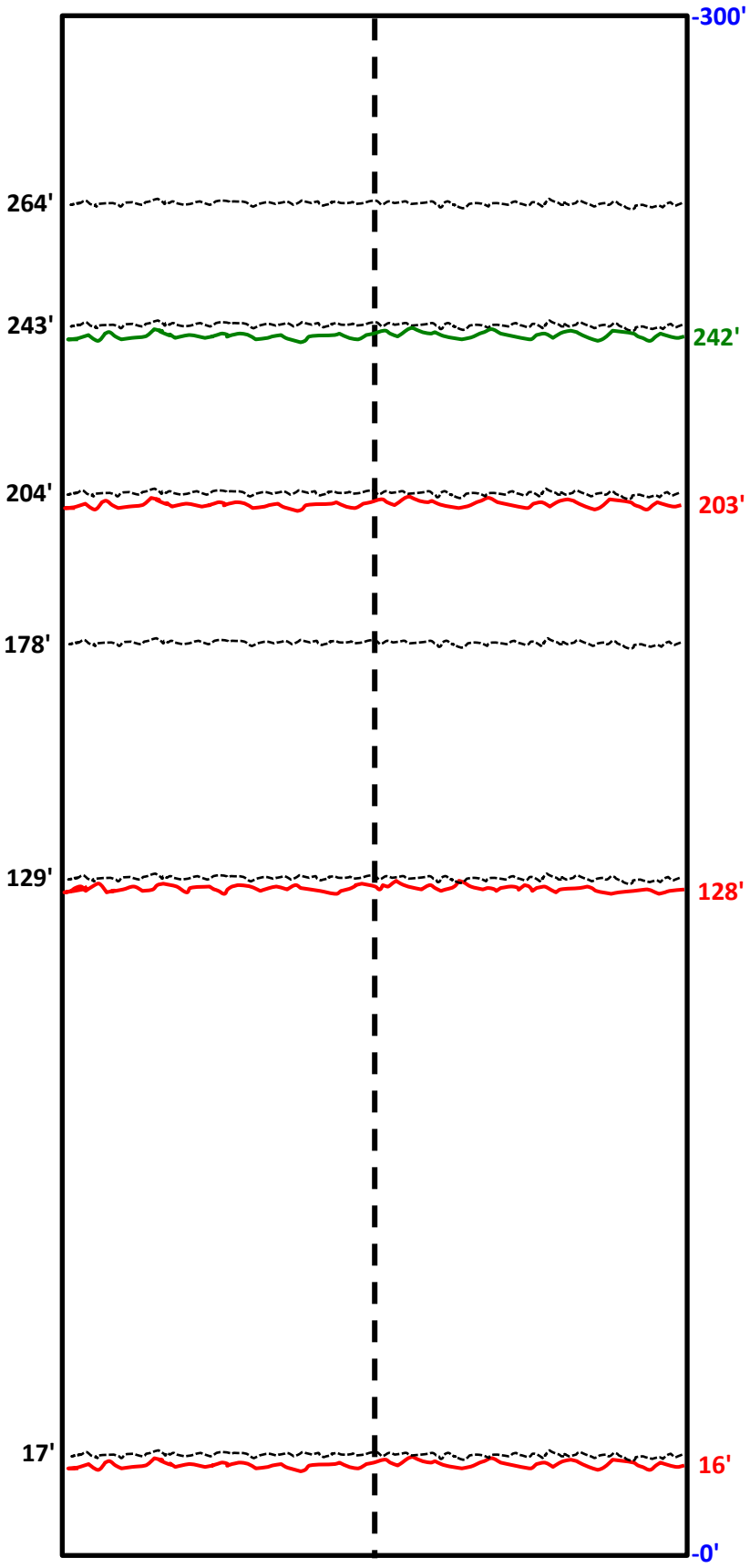
🡅 Section 6: PavePrep - Spot Treatment of Transverse Cracks

🡅 Section 7: Control – No Treatment

Section 8: GlasGrid 8512 - Spot Treatment of Transverse Cracks

Representative Image of Sealed Transverse Crack

2008-2012 Transverse Crack Maps



LEGEND

2008 (Pre-construction)

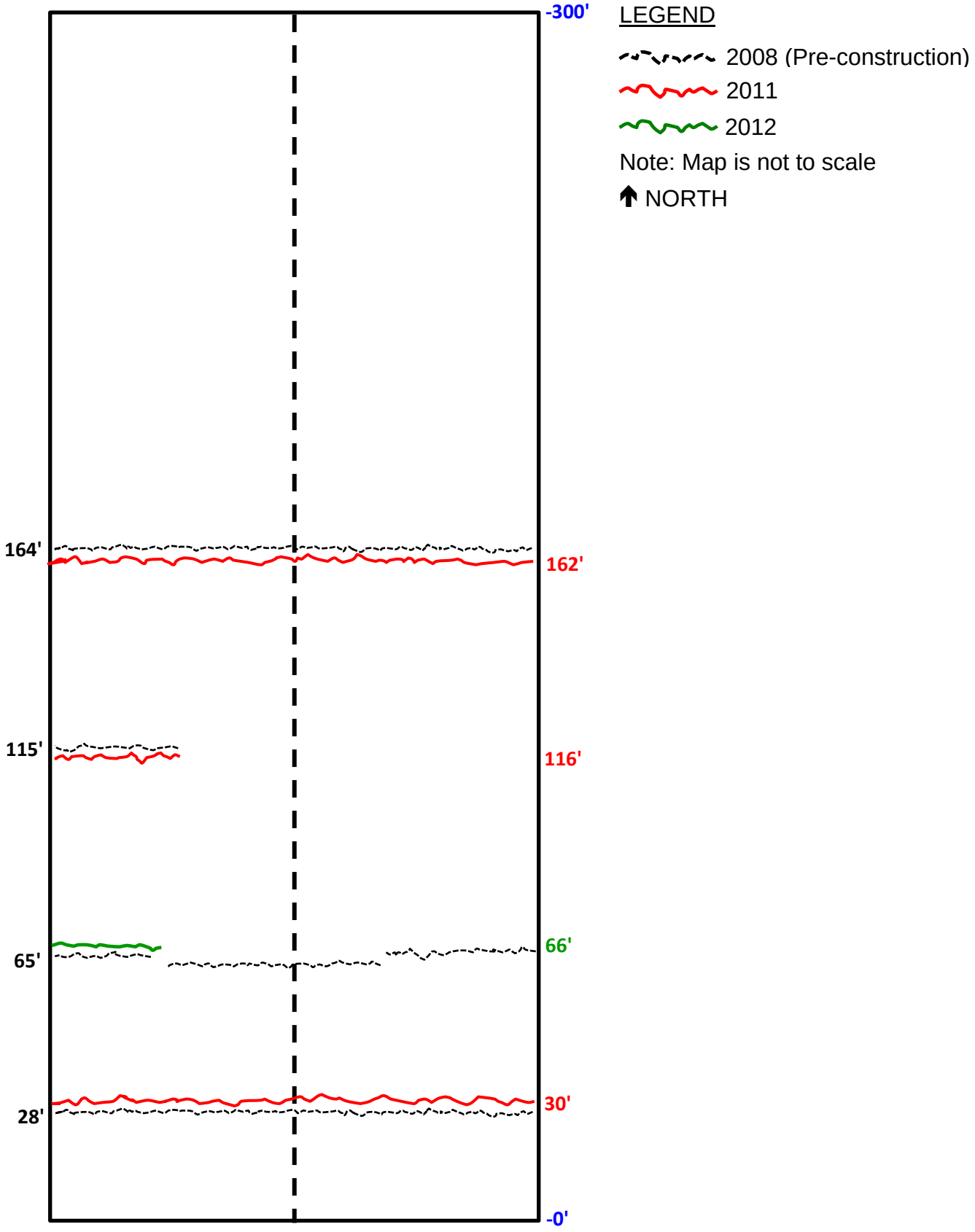
2011

2012

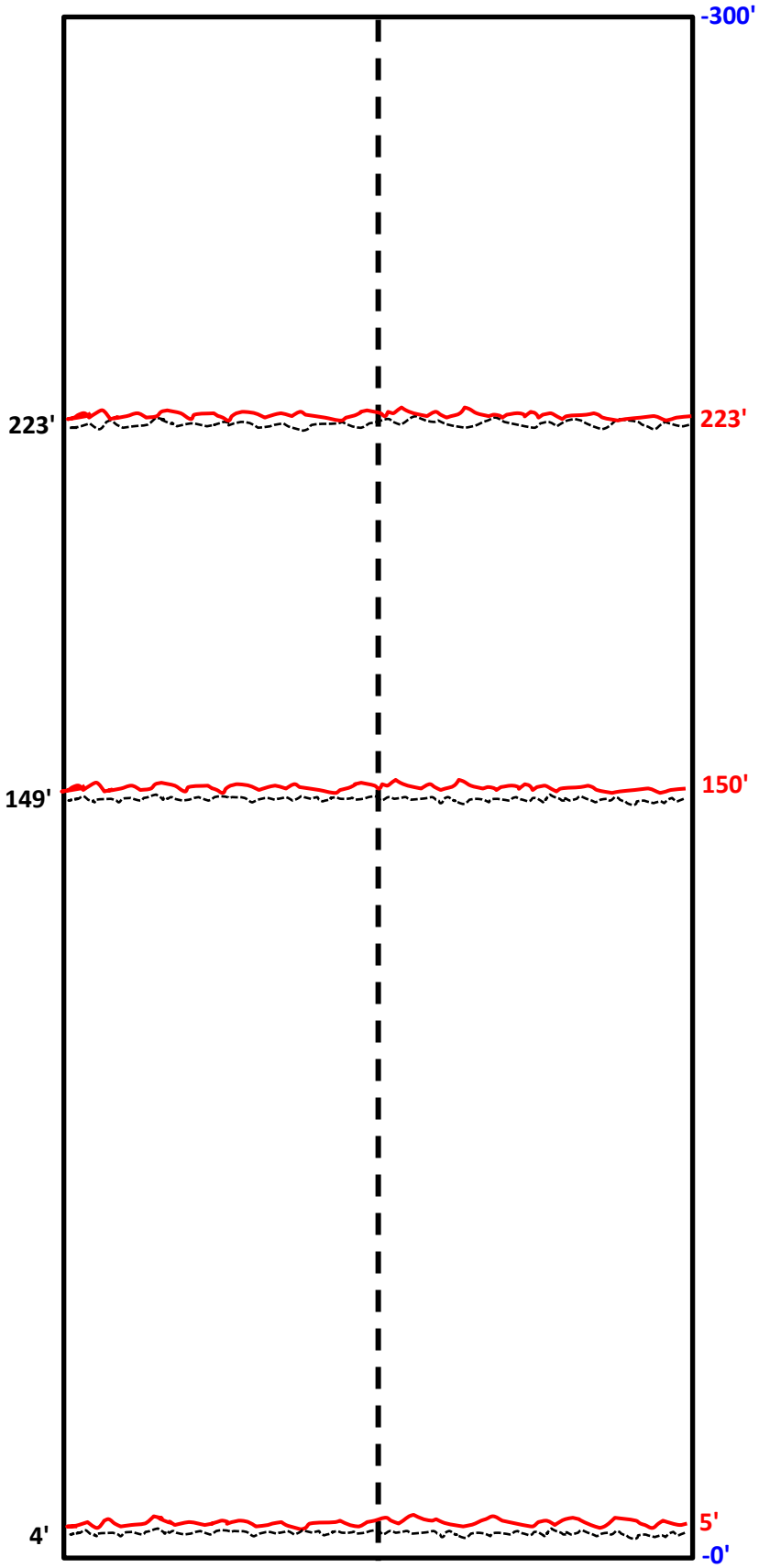
Note: Map is not to scale

NORTH

Section 4: TruPave



Section 5: GlasPave



LEGEND

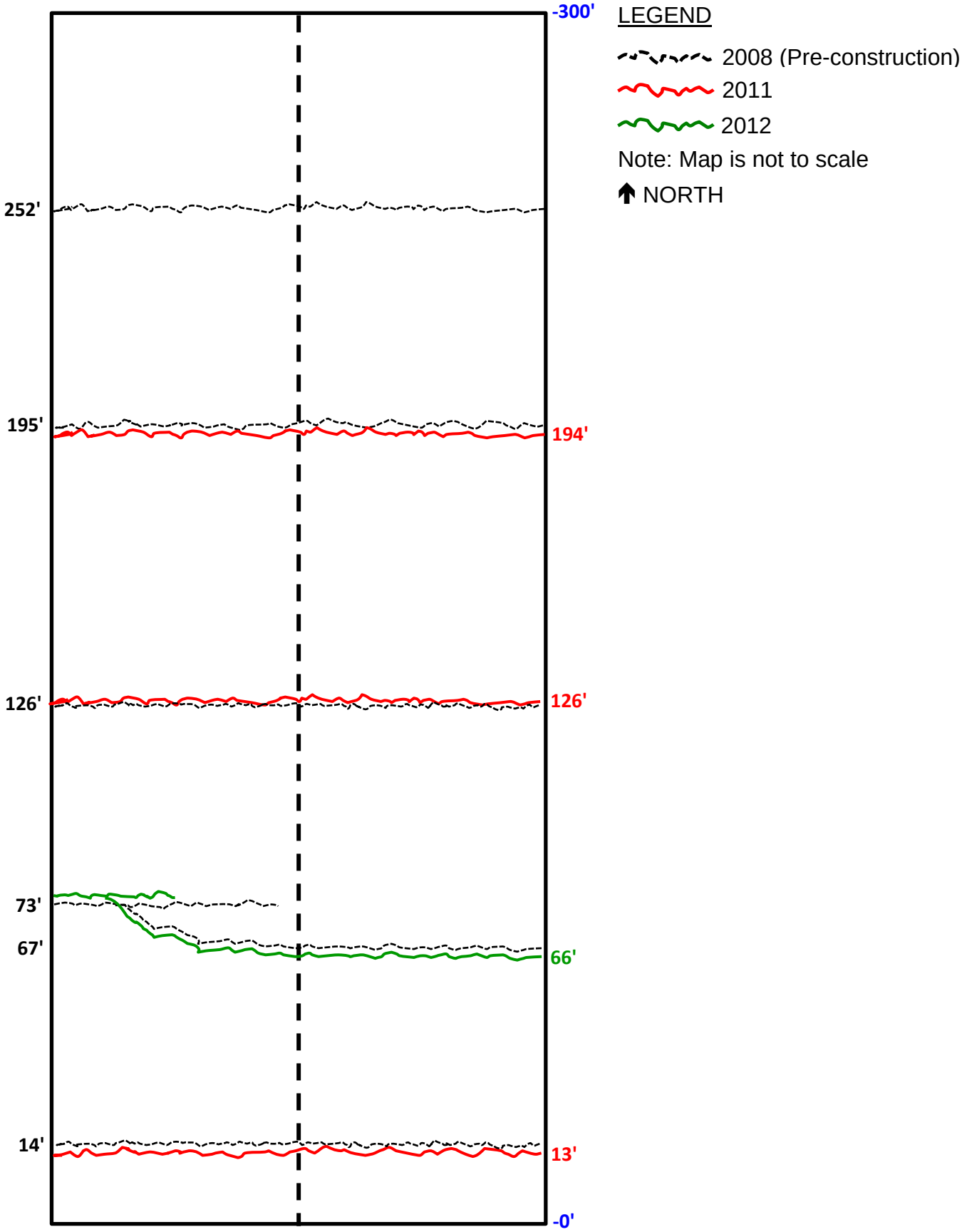
2008

2011

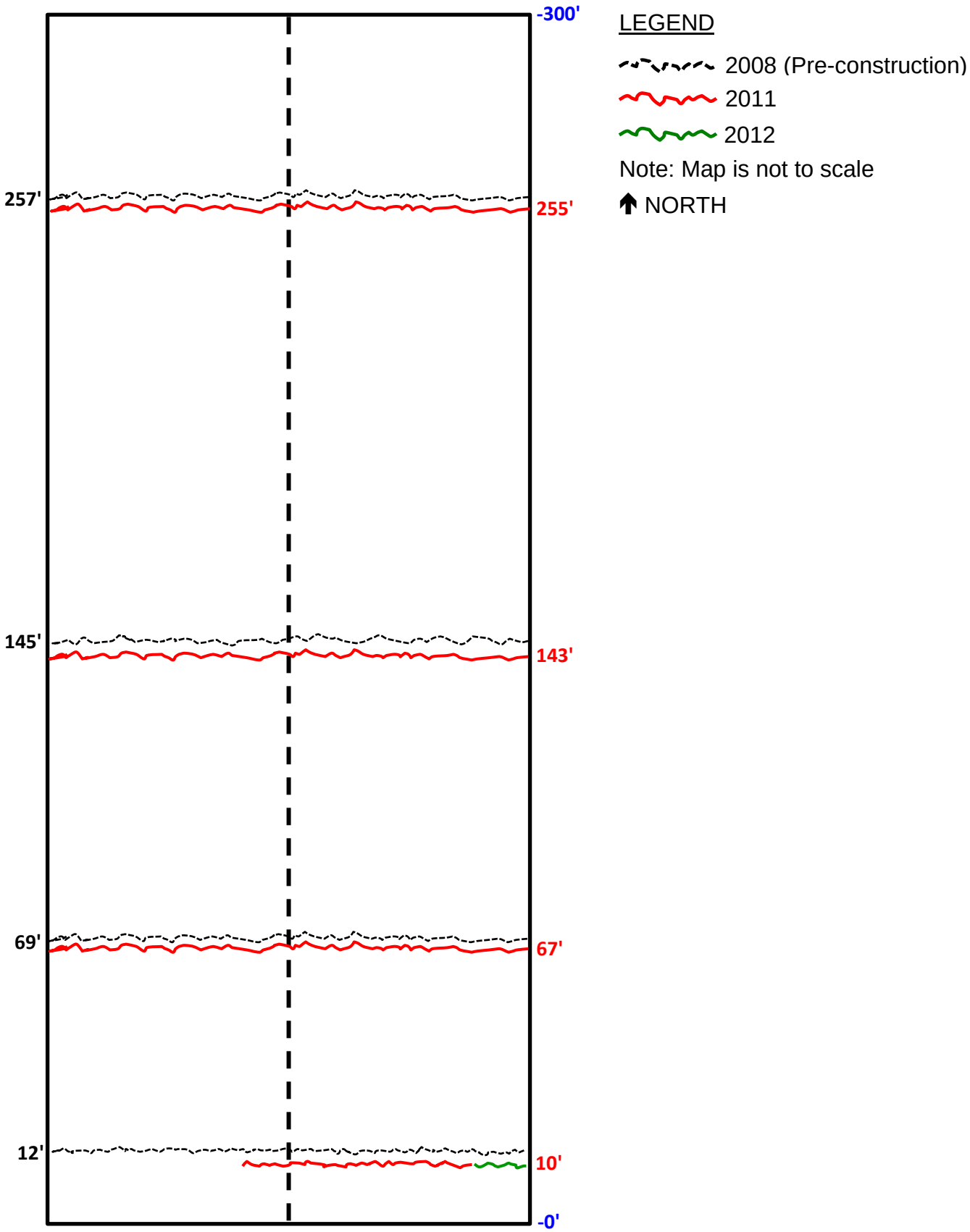
NORTH

Note: Map is not to scale

Section 6: PavePrep



Section 7: Control



Section 8: GlasGrid