Montana Department of Transportation
Research Program
March 2002

EVALUATION REPORT

FIBER-REINFORCED POLYMER (FRP) PULTRUDED DECKING MATERIAL AND HELICAL ANCHORING SYSTEM FOR USE IN SNOW FENCE APPLICATIONS

Livingston, Montana

Interstate 90, MP-332, Park County

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Location: Livingston, Montana. Interstate 90, MP-332, Park County

Project No.: IM90-7(63)331

FHWA No.: Experimental Project MT 00-01

Description: Seventh semi-annual evaluation of remaining test section of snow fence using proprietary EZ-Deck Fiber-Reinforced Polymer (FRP).

Evaluation Date: March 4, 2003

Report Origin: Craig Abernathy

Objective

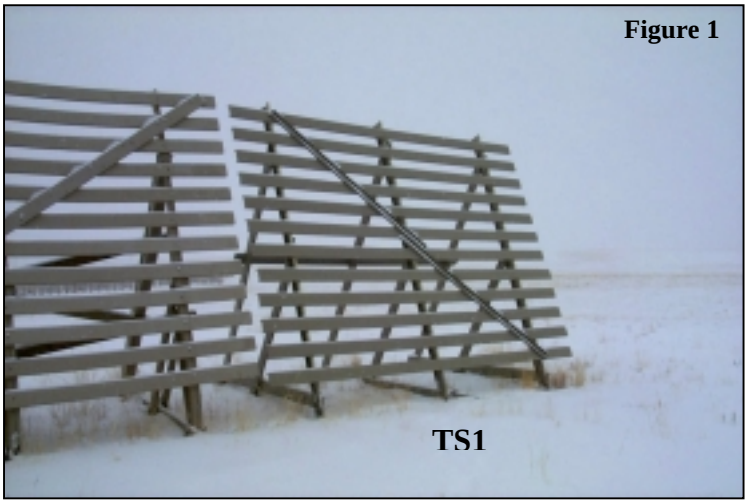

Figure 1

The purpose of this study is to evaluate the feasibility of using a fiber-reinforced polymer (FRP) material in the construction of snow fences. FRP is a process where continuous glass-fiber strands are pulled through a thermosetting polyester resin (or matrix) to form a composite. The main purpose of testing the FRP product is to determine its structural integrity based on MDT's current snow fence design specifications, especially with the harsh climate these structures are subjected to in the state of Montana. In addition, to compare this material in determining its design function as a possible alternative for MDT's current design specifications for the construction of snow fences (Test Section 1 [TS1] vs. Test Section 2 [TS2], as explained in the November 1999 construction report: http://mdtinfo/research/docs/epsl/livingston/ livingston_constrpt.pdf). As noted in the Spring 2001 report, TS2 was found collapsed and was assumed a structural-related failure due to the three rear (sole) supports buckling or snapping in high winds.

The final purpose was to test the Helical Anchoring System as a reliable ground attachment for snow fences (used only in TS2). As stated earlier, section TS2 was found collapsed, the helical anchors were not affected by this failure. In addition, the anchor supports competently held the FRP braces on the ground preventing FRP sections becoming missiles that may have caused a safety concern to the nearby interstate. (refer to May, 2001 report; http://mdtinfo/research/docs/epsl/livingston/livingston_may01.pdf).

Inspections are held in late winter or early spring and late fall to document the environmental effects of seasonal extremes to the FRP material as well as stability of design. Figure 1 shows the remaining TS1 as seen on March 4, 2003.

Evaluation

The evaluation consisted of a visual inspection of the FRP material and the structural supports. Special attention was given to the attachments of the FRP planks, (setting screws, bolts, FRP clips).

No additional deterioration of the attachment hardware and planking material was observed since the last inspection. Snow accumulation on the leeward drift was an approximate depth of 60 centimeters (2 feet). Snow depth on the windward side of the fence was approximately half that of the leeward. The trapping efficiency of this design appears to be the same as observed with the other sections of snow fence in this general snow transport area. TS1 has been rated as performing well. The next evaluation will be conducted in October 2003.

To view this and other snow fence reports, visit the Research experimental website at; http://mdtinfo/research/projects/livingston_snowfence.html.