Montana Department of Transportation
Research Program
February, 2000

EVALUATION REPORT

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

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

Project No.: IM90-7(63)331

FHWA No.: MT 00-01

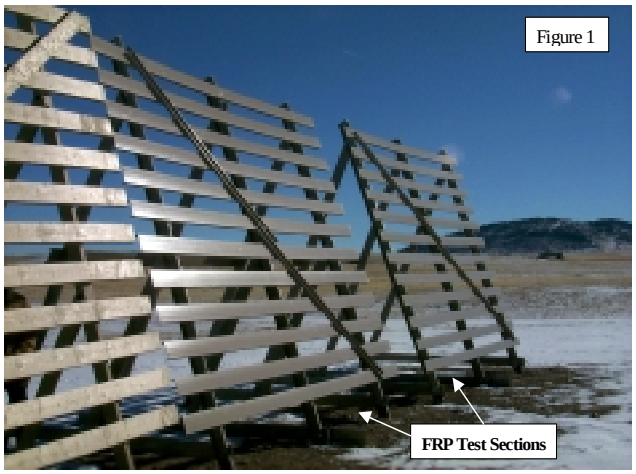
Description: First semi-annual evaluation of two test sections of snow fencing using two proprietary materials; EZ-Deck FRP and A. B. Chance Helical Anchoring System.

Evaluation Date: February 18, 2000

Participants: Craig Abernathy-Research Specialist, John Perry, Operational Engineer-FHWA, Angela Whitman-FHWA (EIT)

Objective

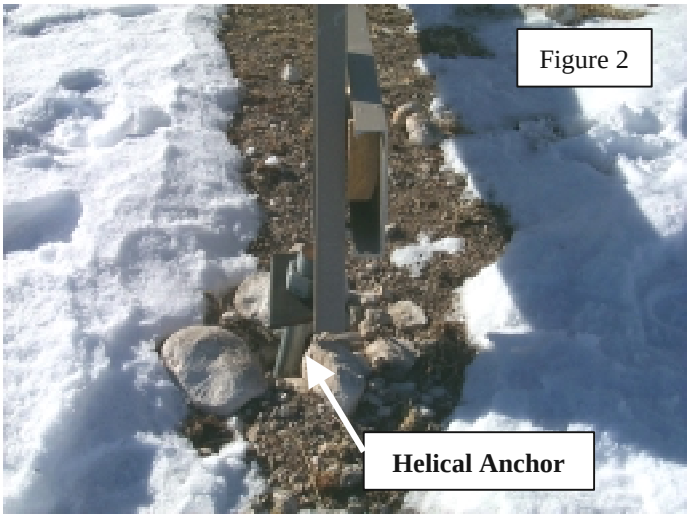
The purpose of this study is to evaluate the feasibility of using a fiber-reinforced polymer (FRP) material in the construction of snow fences. FRP is a process where continuous glass-fiber strands are pulled through a thermosetting polyester resin to form a composite. The main purpose of testing the FPR product is to determine its structural integrity based on MDT's current snow fence specifications, especially with the harsh climate these structures are subjected to in the state of Montana. A secondary purpose of testing this material is to determine its design function as a possible alternative for MDT design specifications for the construction of snow fences. The final purpose was to test the Helical Anchoring System as a reliable ground attachment for snow fences. Inspections will be held in late winter and late fall. This will document the environmental effects of seasonal extremes of the FRP material as well as stability of design.



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 (setting screws, FRP clips) and the Helical Anchors used to secure the section to ground. At this time all connections used to attach the FRP planking to the frame are intact with no evidence of loose screws or chipping of the FRP rail attachments. All bolts used to secure the frame to the Helical Anchors were tight with no visual evidence of sawing action. There has been no apparent shifting of the overall frame assembly since construction in October 1999. Visual appearance of the FRP material shows no signs of sun or wind degradation. Figure 1 shows a frontal

view of the test site that has been positioned to the current plastic wood sections. The rebars used to assist constraint for lateral movements of the sill were still tight with no signs of the bars pulling up from the ground.

There was some movement with the post Helical Anchor on test section two (TS2) with the rear sill to frame attachment. The post, as seen in Figure 2, has shifted slightly to the right. Most likely caused by wind turbulence against the frame or by freeze/thaw action with the sub-soil. This threaded post is an extension attached to a u-shaped bracket bolt, which is located about ten inches below the surface. If the Helical Anchor had been rotated approximately 90° to the right this slight shift may not have occurred. At this time this is not considered to be a detriment. Further explanation of how this attachment system was installed can be found in the construction report.



These test sections are located next to the plastic wood snow fence sections that have been under construction since early fall of 1999. Unfortunately the material specifications (plastic wood), which were used to select this material, has been found inaccurate (based on a previous testing). The modulus of elasticity was found to be half of what the original specifications of the plastic wood were qualified on. Currently there has been premature failure of this plastic wood material and construction has been halted pending solution to the problem. The original two plastic wood sections installed in 1998 are performing satisfactory.

The consensus of the inspection team that the materials used in this project is performing well. The next scheduled evaluation will be conducted in October 2000.