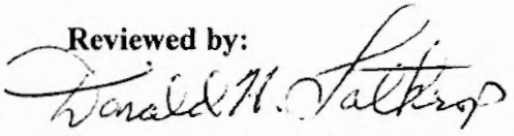


MATERIALS & RESEARCH

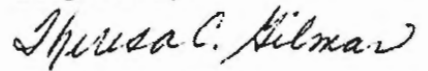
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February 12, 2003

RESEARCH UPDATE

U 2003-3

FIELD EVALUATION OF BRITESIDE® REFLECTIVE PANELS (Final Report)

REFERENCES

Work Plan 2001-R-10 (Product Evaluation)

INTRODUCTION

In the Agency's effort to incorporate the best technologies in highway construction that are both performance and cost effective, it researches and evaluates the performance of various materials, techniques, and practices.

This study looks at the durability and effectiveness of a reflective panel when attached to the support posts of both signs and delineators.

PRODUCT DESCRIPTION

Briteside® Reflective Panels, manufactured by Lordon, Inc., of Hackettstown, NJ, are a supplement to sign posts that aid in providing drivers with a heightened awareness in areas of special concern. The product, constructed of polyvinyl chloride (PVC) and reflective sheeting, is available in various types of reflective surfaces and colors. The molded PVC panels are manufactured to accommodate mounting both inside and outside of U-channel posts as well as attachment to square and round surfaces and are attached to the posts with self-tapping screws.

COST

The cost of the Briteside® Reflective Panels is based on three criteria, the size and type of the post on which they are mounted and the grade of the reflective sheeting used. At the time of installation, the total cost of the materials supplied was \$372.50. This price is based on:

- (6) 3" wide x 72" long, diamond grade panels, U-channel post ... \$26.50/each
- (14) 2" wide x 36" long, diamond grade panels, U-channel post ... \$10.50/each, and
- (7) 2" wide x 36" long, high intensity panels, U-channel post \$9.50/each.

For the purposes of this study, the materials were supplied at no cost and installed by the Agency's Operations Division.

PROJECT DESCRIPTION

Three independent sites were selected to evaluate the performance of this product. These sites were selected based on the recommendation of the Agency's Traffic Safety Engineer and District Maintenance personnel.

The first site, located on Vermont Route 125 (MM 0.20) in the town of Ripton, is situated on a sharp corner delineated with chevrons and has a history of off-road incidences during nighttime hours (Figure 1). The second site, located on Vermont Route 10 (MM 1.41-1.61) in the town of Chester, consists of an S-turn configuration. Delineated with simple button-type delineators, this site follows alongside a steep embankment with a stream below but has a narrow shoulder, which makes it an unsuitable candidate for guardrail. The third site is located along a sweeping curve on Interstate I-89 northbound (MM 73.64-73.89) in the town of Bolton.



Figure 1. Vermont Route 125 – Ripton, VT.

PERFORMANCE

The reflective strips were installed by personnel from the respective area Maintenance District Garages in January and February 2002. As a result of the time of year this product was installed, the frozen ground required some of the post supports to be modified to accommodate the U-channel type, reflective panels provided. A majority of the applications were installed using the self-tapping screws provided and a select few utilized bolts due to different support posts and modified post configurations.

Ripton – Vermont Route 125 (MM 0.20)

A total of six, 6-foot long strips with diamond grade sheeting were attached to each post support. Two of the three signs were equipped with U-channel posts and were mounted according to the manufacturer's recommendation (Figure 2). The third sign was supported by two, square-tube sign posts and the panels provided were adapted to accommodate the condition and attached with bolts (Figure 3).

After one-year in place, the Briteside® Reflective Panels placed on three, double-post chevron signs have remained well-intact and continue to provide improved delineation along a sharp corner. According to the District Area Supervisor, this designated trouble spot has been improved with the use of this device. Prior to the installation of

the panels, it was common for the district to receive complaints as much as weekly regarding this section of roadway. Since the reflective panels were added, very few complaints from the travelling public have been received. The district also reports, the site historically known for run-off-road incidents has not “totally eliminated all accidents but it has reduced them.”



Figure 2. Ripton – Vermont Route 125
U-Channel Posts w/ Diamond Grade Sheeting.



Figure 3. Ripton – Vermont Route 125
Square-Tube Posts w/ Diamond Grade Sheeting.

Chester – Vermont Route 10 (MM 1.41 – MM 1.61)

A total of fourteen, diamond grade sheeting panels were placed within U-channel delineator posts along a winding section of Vermont Route 10 in Chester. To better warn motorists of the road geometry, these panels were placed along the embankment facing both the eastbound and westbound traffic, alternating the direction at every other post (Figure 4). Most of these devices were attached according to the manufacturer’s instructions using self-tapping screws and a few with bolts.

Soon after the product’s installation at this site, a post and panel required replacement due to a vehicle collision. Since that time, no other reports of damage due to vehicles have been reported. During an inspection in January 2003, the condition of the panels appeared well intact, with three of the fourteen panels exhibiting some minor damage, likely associated to snowplow contact (Figure 5). The minor damage has had little effect on the overall performance of the product. The District Administrator reported that shortly after the installation of the product, personnel from the district garage said the Briteside® Reflective Panels “really stand out.”



Figure 4. Chester – Vermont Route 10
U-Channel Posts w/ Diamond Grade Sheeting.

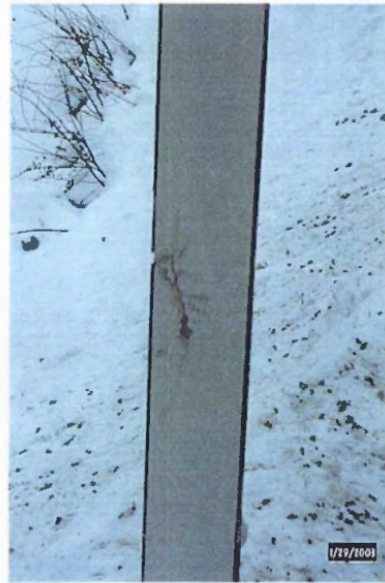


Figure 5. Chester – Vermont Route 10
Damage to Reflective Panel (right).

Bolton – Interstate I-89 Northbound (MM 73.64 – MM 73.89)

This site consists of seven, high-intensity reflective panels located on the outside edge of a sweeping curve along the interstate (Figure 6). Since the ground was frozen at the time of installation, the existing posts were modified to accommodate the attachment of the reflective panels and the panels were affixed with bolts (Figure 7). Due to the torque on the bolts, some of the panels cracked, causing some minor damage (Figure 8). The damage has not affected the performance of the reflective strips, which are quite visible to motorists.



Figure 6. Bolton
I-89 NB



Figure 7. Bolton
Modified post detail.



Figure 8. Bolton –
Damage to reflective strip

SUMMARY

After one year of service, the Briteside® Reflective Panels installed in Ripton, Chester, and Bolton, continue to provide an enhanced warning to motorists. According to area maintenance personnel, this device has been effective in providing advanced warning to drivers of upcoming changes in the roadway configuration. Despite some minor damage due to installation techniques and snowplow damage, all of the panels remain effective and well intact.

At the time of installation, this device was considered experimental. According to “Proposed Revision No. 2, dated May 21, 2002,” of the Manual on Uniform Traffic Control Devices (MUTCD), this type of product

is being considered for inclusion in the manual. As a portion of Section 2A.22, Posts and Mountings, the proposed language added reads:

Option:

A strip of retroreflective material may be used on regulatory and warning sign supports to draw attention to the sign during nighttime conditions.

Standard:

If a strip of retroreflective material is used on the sign support, it shall be at least 50 mm (2 in) in width, it shall be placed for the full length of the support from the sign to within 0.3 m (1 ft) of the ground level, and it shall be the same color as the background of the sign (red for STOP, YIELD, DO NOT ENTER, and WRONG WAY; white for regulatory; yellow for warning).

If this language is approved as part of MUTCD Revision No. 2, then these panels can be used wherever it is deemed necessary without the need for additional Agency approval. If not, the use of this item should still be considered for experimental and limited use for signs recognized as benefiting from an additional visual enhancement depicting an upcoming change in the road geometry.

DISCLAIMER

“The information contained in this report was compiled for the use of the Vermont Agency of Transportation. Conclusions and recommendations contained herein are based upon the research data obtained and the expertise of the researchers, and are not necessarily to be construed as Agency policy. This report does not constitute a standard, specification, or regulation. The Vermont Agency of Transportation assumes no liability for its contents or the use thereof.”