

MICHIGAN DEPARTMENT
OF
STATE HIGHWAYS AND TRANSPORTATION

INTERIM GLAREFOIL REPORT

Report TSD 404-78

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INTERIM GLAREFOIL REPORT
MICHIGAN DEPARTMENT OF
STATE HIGHWAYS AND TRANSPORTATION
TRAFFIC AND SAFETY DIVISION
ENGINEERING STANDARDS UNIT

Introduction

Because of the narrow median and vertical and horizontal alignment along I-75 between Schaefer Road and Fort Street (which includes the Rouge River Bridge) some form of glare screen was desirable. A concrete median barrier was in existence and could be utilized as a base for a mountable glare screen. Two applications were considered:

1. Concrete glare screen. The screen is 19 inches high, six inches wide at the base and 3 1/2 inches wide on top.
2. Forward glare screen (glarefoil panels). The blades are poly-vinyl, elliptical in cross section and two, three, or four feet high.

The latter was chosen as an alternative to concrete because of its lighter weight, simpler installation requirements, and favorable experience in other states. The installation was approved as a Category II Experimental Project by the Federal Highway Administration.

Pertinent Facts

The project is 12,657 feet long (see attached print). The panels were installed at variable spacings of 20 inches to 23 inches and are either two, three, or four feet high depending on the vertical alignment of the roadway. The total cost of installing 6,904 panels was \$136,023; an average unit price of \$19.75 (\$11 per post).

The foils are attached to a bracket assembly with 4 1/4-inch \emptyset x 3/4-inch long hexagon head screws. The bracket is anchored to the median barrier with two 1/4-inch \emptyset x 2 1/2-inch long expansion anchors with nuts and lockwashers (see attached print). The hardware was recommended by the Syro Steel Company.

Maintenance

In November of 1977, six months after installation, about 200 units were replaced by the Wayne County Road Commission. On April 9, 1978, about 540 additional foils were missing (see photos). Several panels appeared to have been knocked sideways and others were vibrating in an unstable manner. Another count taken on July 13, 1978, determined about 639 panels were missing and others in conditions as previously stated.

Observations and Analyses

In those areas that the foils are missing but the brackets are in place, it appears that a vehicle climbed the barrier wall and sheared the panel from the bracket by pulling the screw head through the panel; possibly a washer would have reduced the occurrence. In other instances the panel and bracket were both missing (see photos). This seems to be a result of either wind vibration or a vehicle contacting the panel and causing the anchor bolts to break (see photos).

The foils are aesthetically pleasing (see photos); however, a buildup of salt and dirt was observed after the winter season. Later observations determined that normal rainfall had adequately cleaned the foils.

Current Status

In May of 1978, we initiated a request to the Syro Company that they, at their expense, furnish replacement foils (in addition to several units for reserve) with heavier hardware, similar to that being used in at least two other states, and including the larger 3/8-inch diameter anchor bolts to replace the current 1/4-inch diameter bolts (see photos). We have received no reply to that request.

Incidental to recent construction, a total of 2219 foils have been replaced with concrete glare screen at the approaches to the structure; 1,434 panels on the west approach and 785 panels on the east approach.

Operational Characteristics

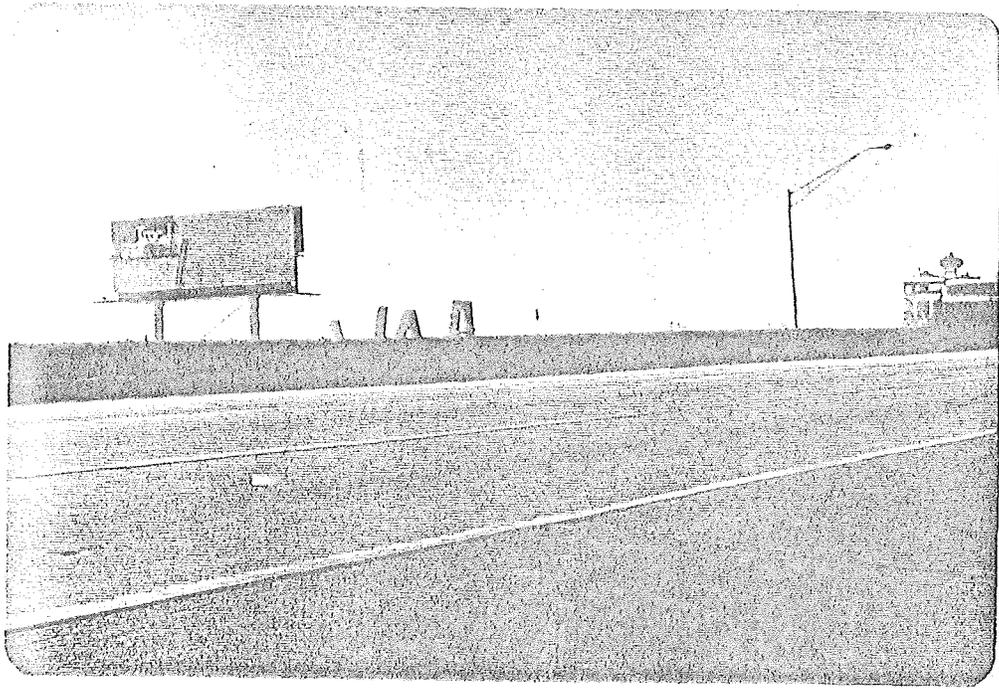
Operationally, the glarefoils are shielding the passenger vehicle-motorist from headlight glare. Drivers of trucks, particularly the cab-over-engine type where the driver is relatively high when compared to other vehicles, may not be well shielded. Since hundreds of new glarefoils have been reerected and hundreds are currently missing there is need for continual maintenance. Not only is the maintenance costly, (\$20. per unit), but persommel, because of the large traffic volumes, have a high potential of personal injury.

Recommendations

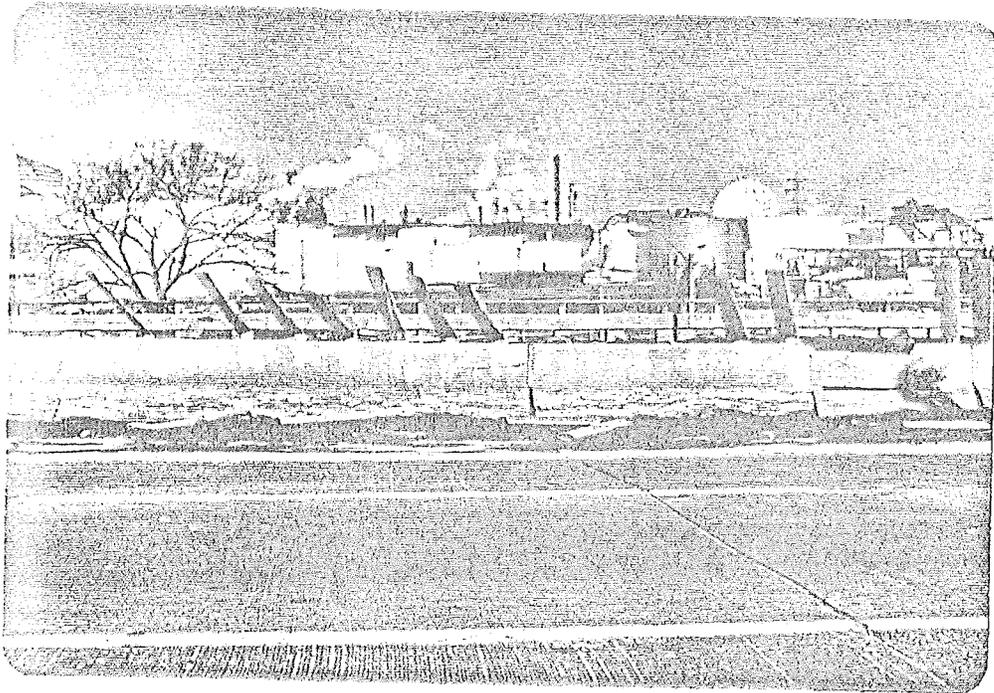
The Rouge River site has a narrow median with high traffic volumes and because of headlight glare has need for a glare screen. The existing glarefoils do shield the motorist from headlight glare. They are susceptible to being damaged by vehicles that climb high on the wall and are subject to fatiguing and breaking of the hardware as a result of the wind, strong air currents from large vehicles or vibration of the structure. Glarefoils are not suited to this location. Consequently a concrete glare screen, similar to that on I-94 at DeQuindre in the Detroit area, that is structurally adequate to restrain and redirect impacting vehicles should be programmed to replace the glarefoils.

It is recommended for motorists safety and driving comfort that the concrete glare screen be programmed as soon as possible.

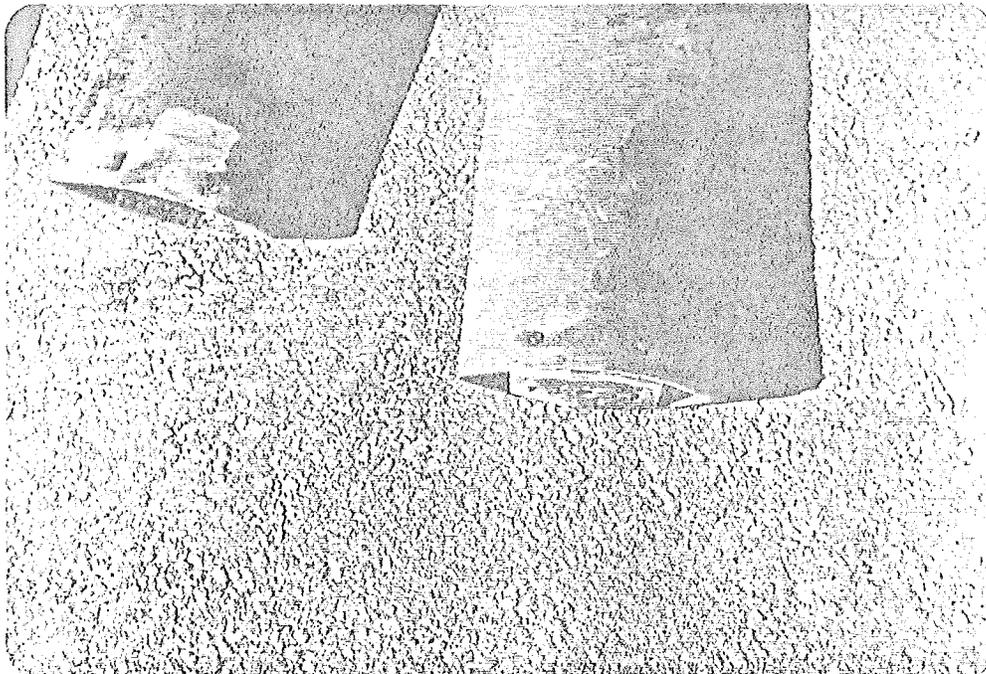
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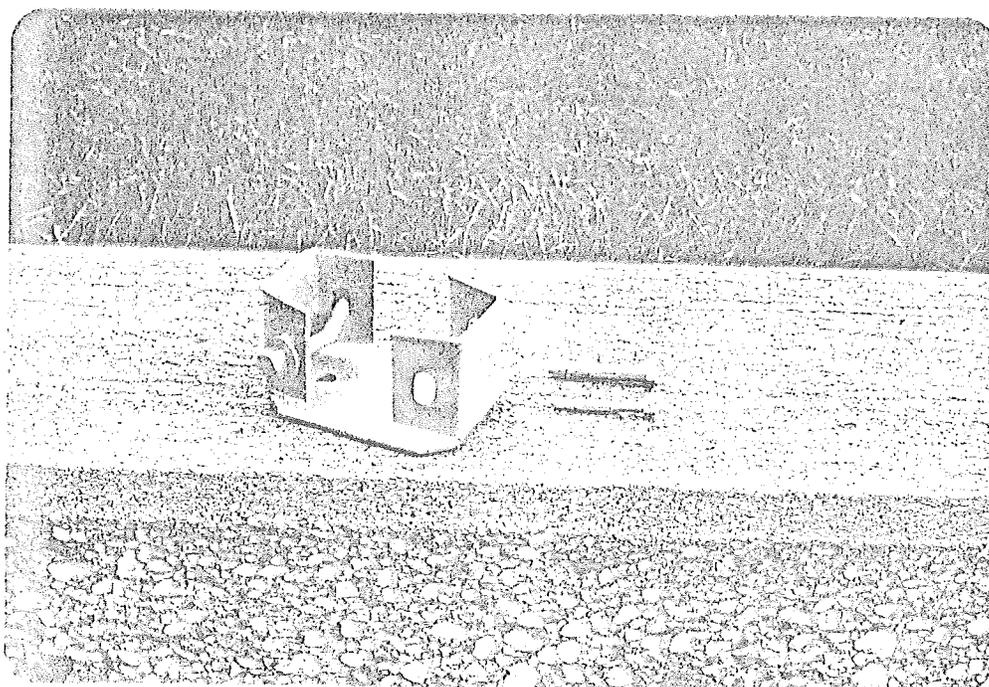
Missing Glarefoils



Foils Knocked Sideways



Glarefoil and Bracket Off Wall



Heavier Bracket and 3/8 inch
Anchor Bolt