



MINNESOTA DEPARTMENT OF TRANSPORTATION
Engineering Services Division
Technical Memorandum No. 06-04-T-02
January 11, 2006

To: Distribution 57, 612, 618, 650

From: Richard A. Stehr
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Subject: High Performance Sign Sheeting for
Temporary Rigid Signs and Barricades

Expiration

This is a new Technical Memorandum. This Technical Memorandum shall remain in effect until January 11, 2011, unless superceded before this date or included in the Traffic Engineering Manual.

Implementation

The provisions contained in this Technical Memorandum shall be implemented immediately, as detailed in the Implementation Schedule, for all Mn/DOT Construction and Maintenance Operations.

Scope

The provisions of this Technical Memorandum apply to temporary (work zone) signs and barricades for Mn/DOT construction and maintenance operations. Other agencies are encouraged to evaluate their requirements according to their needs for retroreflective temporary sign and barricade sheeting.

The provisions of this Technical Memorandum apply only to work zone signs and barricades on rigid substrates. Retroreflective sheeting for roll-up signs, cones, tubular markers, weighted channelizers, drums, and other channelizing devices has been included in other technical standards and guidelines and is not included in this Technical Memorandum.

Introduction

Temporary rigid signs and barricades used for Mn/DOT construction and maintenance work zones have used wide angle prismatic retroreflective sheeting (ASTM Type VII) since 1992. While this sheeting has provided good service in work zones, recent advancements in sheeting technology offer an opportunity to improve sign and barricade performance.

The visibility of signs and barricades in work zones is essential for motorist, pedestrian and worker safety. All of Mn/DOT's permanent rigid signs, markers and delineators have recently been upgraded to this newer high performance sheeting (Type HP and HP FLO) (see Technical Memorandum No. 06-02-T-01 dated January 4, 2006). Since signs and barricades in construction and maintenance work zones are often disadvantaged by location, alignment, dirt, etc. it is important that these signs and barricades offer at least the same performance as permanent signs, markers and delineators.

Purpose

The purpose of this Technical Memorandum is to establish a statewide guideline for the application of high performance sign sheeting on Mn/DOT temporary rigid signs and barricades.

The purposes for upgrading temporary sign and barricade sheeting are:

- To upgrade all temporary sign inventories to fluorescent orange.
- To make temporary signs and barricades brighter and more conspicuous for all drivers under more varied conditions.
- To insure uniform performance between temporary and permanent signs and barricades.

Materials

The retroreflective sheeting types and qualified products used for temporary signs and barricades by Mn/DOT can be found at: <http://www.dot.state.mn.us/trafficeng/products/MnDOTApprovedproductlist.xls>

The ASTM (American Society of Testing Materials) designation, common name and general application of retroreflective sheeting materials used in temporary construction and maintenance work zones are shown below:

Sheeting Type	Mn/DOT Common Name	Temporary Application
ASTM Type I	Engineer Grade	Not used by Mn/DOT
ASTM Type III or ASTM Type V	Sign Sheeting for Traffic Cones or Tube Delineators	Cones and Tubular Markers
ASTM Type VI	Roll Up Sign Sheeting	Roll Up Signs
ASTM Type VII	Sign Sheeting for Rigid Temporary Signs	Existing Rigid Temporary Signs
ASTM Type VIIMD	Sign Sheeting for Drums and Weighted Channelizers	Drums and Weighted Channelizers
ASTM Type IX	Sign Sheeting for Rigid Permanent Signs	Existing Mn/DOT Permanent Signs
Type HP	High Performance Sign Sheeting for Rigid Temporary or Permanent Signs and Barricades	As detailed in this tech memo and Technical Memorandum No. 06-02-T-01
Type HP FLO	High Performance Fluorescent Orange Sign Sheeting for Rigid Temporary or Permanent Signs	As detailed in this tech memo and Technical Memorandum No. 06-02-T-01

Note: Shaded areas are not temporary applications and are shown here for information only.

Guidelines

All temporary rigid orange warning and rigid orange guide signs shall be fabricated with Type HP FLO (High Performance Fluorescent Sign Sheeting for Rigid Temporary or Permanent Signs). All rigid signs installed, other than those with orange backgrounds, on a temporary basis shall be fabricated with Type HP (High Performance Sheeting for Rigid Permanent Signs). Inplace signs that still apply during temporary operations may remain in place with no change in sign sheeting required.

Barricades fabricated with either ASTM Type VII, Sign Sheeting for Rigid Temporary Signs or Type HP (High Performance Sheeting for Rigid Permanent Signs) may be intermixed and used on any project until the January 1, 2010 implementation date.

Identification Marking

Since the various sign sheeting types are difficult to visually identify in the field all High Performance Sheeting for Rigid Temporary Signs, both Type HP and Type HP FLO shall have an easily identifiable marking on the face. This marking shall be:

- visible from inside a passing vehicle when the device is installed;
- legible when viewed from 12 m (**40 feet**); and
- a maximum of 50 mm x 50 mm (**2 inches x 2 inches**) so it does not interfere with the sign message or distract passing motorists.

The marking shall be located at the bottom corner of diamond shaped signs and the lower left corner of rectangular sign panels.

Substitution for Other Materials

If a project requires the use of ASTM Type VII, Sign Sheeting for Rigid Temporary Signs, the contractor at his option may substitute Type HP FLO (High Performance Fluorescent Sign Sheeting for Rigid Temporary or Permanent Signs) for all orange signs and Type HP (High Performance Sign Sheeting for Rigid Temporary or Permanent Signs and Barricades) for all other signs. However, to insure uniform performance and appearance this substitution shall be for all signs on the entire project.

Implementation Schedule

For construction contracts the provisions contained in this Technical Memorandum for rigid signs shall be included on all projects beginning with the January 2008 letting. To meet this goal the following schedule has been developed:

- January 2006 letting for all multi-year projects
- January 2007 letting for all multi-year projects and projects with more than 90 working days
- January 2008 letting for all projects

For maintenance operations the provisions contained in this Technical Memorandum shall be implemented immediately. All new temporary rigid signs and barricades purchased for maintenance operations beginning January 1, 2006 shall be High Performance Sheeting for Rigid Temporary Signs and Barricades, both Type HP and Type HP FLO. For maintenance operations, existing district and State Sign Shop inventories of temporary rigid sign panels shall be used before high performance sheeting is provided. To accomplish this, sign and barricade orders will be filled from existing inventories at the State Sign Shop before they are fabricated with high performance sheeting. As stated above, rigid signs with Type HP, high performance sheeting shall not be used in the same work zone as the existing rigid signs with ASTM Type VII, Sign Sheeting. Therefore, implementation plans will need to account for replacing rigid temporary signs on a crew by crew basis rather than a sign by sign basis.

For both construction and maintenance operations all barricades shall be Type HP (High Performance Sheeting for Rigid Permanent Signs and Barricades) before January 1, 2010.

Questions

For information on the technical contents of this memorandum, please contact Jon Jackels, Work Zone, Pavement Marking and New Products Engineer at (651) 634-5428. Any questions regarding the publication and distribution of this Technical Memorandum should be referred to Sophia Wicklund, Design Standards Unit at 651-296-3190, or Mohammad Dehdashti, Design Standards Engineer at 651-296-4859. All active Memoranda and a list of historical Technical Memoranda can be viewed at <http://www.dot.state.mn.us/tecsup/tmemo/index.html>