MINNESOTA DEPARTMENT OF TRANSPORTATION
Engineering Services Division
Technical Memorandum No. 06-02-T-01
January 4, 2006

To: Distribution 57, 612, 618, and 650

From: Richard Stehr
Division Director, Engineering Services

Subject: Retroreflective Sheeting Materials for
Permanent Signs, Markers and Delineators

Expiration
The provisions of this Technical Memorandum supercede Technical Memorandum No. 05-17-T-02, dated September 28, 2005. This Technical Memorandum shall remain in force until August 16, 2010, or until this information is included in the Traffic Engineering Manual.

Implementation
The provisions of this technical memorandum shall be implemented immediately

For construction contracts the provisions contained in this technical memorandum shall be included on all projects with permanent signs, markers, and delineators beginning with the November 16, 2005 letting.

For maintenance operations the provisions contained in this technical memorandum shall be implemented immediately.

Introduction
Signs provide road users important information about regulations, warnings and guidance while traveling on the transportation system. Section 1405 Roadway Safety Improvement for Older Drivers and Pedestrians of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) states, "The Secretary shall carry out a program to improve traffic signs and pavement markings in all States in a manner consistent with the recommendations included in the publication of the Federal Highway Administration entitled "Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians Dated October 2001." In addition, improving roadway signs was identified as a strategy in Minnesota's Comprehensive Highway Safety Plan (CHSP), for cost effective intersection improvements and for reducing lane departure crashes.

The guidelines contained in this Technical Memorandum require the use of brighter sign sheeting to assist older drivers and all drivers in safely navigating the trunk highways in Minnesota.

Purpose
The purposes for upgrading sign sheeting are:

- To make signs more conspicuous by making them brighter for all drivers.
- To make signs easier to read at further distances by increasing the contrast ratio.

This Technical Memorandum establishes uniform statewide practice in the application of reflective sheeting for permanent signs, markers and delineators that meets the intent of the SAFETEA-LU and Minnesota's CHSP to improve highway safety in Minnesota.

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Scope
The provisions of this Technical Memorandum apply to permanent signs, markers and delineators installed and maintained by Mn/DOT. Other agencies and road authorities have different needs that may require modified evaluation criteria and processes.

Materials
The retroreflective sheeting types and qualified products used for permanent signs, markers and delineators 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 are:

Sheeting Type	Mn/DOT Common Name	Application
ASTM Type I	Engineer Grade	Not used by Mn/DOT
ASTM Type III or ASTM Type V	Yellow Sign Sheeting	Yellow Cylinder Delineators
ASTM Type VII or ASTM Type IX	Sign Sheeting for Rigid Permanent Signs	Existing Mn/DOT Permanent Signs
Type HP	High Performance Sign Sheeting for Rigid Permanent Signs	Mn/DOT Permanent Signs
Type HP FLY	High Performance Fluorescent Yellow Sign Sheeting for Rigid Permanent Signs	Mn/DOT Permanent Fluorescent Yellow Signs
Type HP FLYG	High Performance Fluorescent Yellow Green Sign Sheeting for Rigid Permanent Signs	Mn/DOT Permanent Fluorescent Yellow Green Signs

Guidelines
Existing signs, markers and delineators shall be upgraded through normal attrition.

For maintenance operations, existing district and State Sign Shop inventories of ASTM Type IX sign panels shall be used before High Performance sheeting is installed. To accomplish this sign orders will be filled from existing inventories of sign panels at the State Sign Shop before signs, markers and delineators are fabricated with High Performance sheeting.

All permanent regulatory signs, guide signs, markers and delineators shall be fabricated with Type HP (High Performance) sheeting. In addition, all warning signs, yellow delineators and yellow markers shall use **fluorescent yellow** Type HP FLY sheeting **except**:

- Warning signs W11-1, W11-2 and S1-1, (and W16-7P, W20-100P and W13-1 when used with these signs), and S4-3 shall use **fluorescent yellow-green** Type HP FLYG reflective sheeting.
- White cylinder style delineators shall use flexible ASTM Type IX sheeting.
- Yellow cylinder style delineators shall use either flexible ASTM Type III or ASTM Type V sheeting.

Questions
For information on the technical contents of this memorandum, please contact Mike Weiss, State Signing Engineer at (651) 634-5442. 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

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