



# Florida Department of Transportation

**CHARLIE CRIST**  
GOVERNOR

605 Suwannee Street  
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**STEPHANIE KOPELOUSOS**  
SECRETARY

January 30, 2008

Dr. Leslie McCarthy, PhD, P.E.  
Program Operations Engineer  
Federal Highway Administration  
545 John Knox Road, Suite 200  
Tallahassee, Florida 32303

Re: Office of Design, Specifications  
Section 993  
Proposed Specification: 9930200 – Object Markers and Delineators

Dear Dr. McCarthy:

We are submitting, for your approval, two copies of a proposed Supplemental Specification for Object Markers and Delineators.

This change was proposed by Chester Henson of the State Traffic Standards Engineer, the changes will clarify acceptance of manufacturers products.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965DB or [duane.brautigam@dot.state.fl.us](mailto:duane.brautigam@dot.state.fl.us).

If you have any questions relating to this specification change, please call Duane F. Brautigam, State Specifications Engineer at 414-4110.

Sincerely,

Signature on file

Duane F. Brautigam, P.E.  
State Specifications Engineer

DFB/sh

Attachment

cc: Gregory Jones, General Counsel  
Florida Transportation Builders' Assoc.  
State Construction Engineer

**993 OBJECT MARKERS AND DELINEATORS.****(REV 1-30-08)**

ARTICLE 993-2 (of the Supplemental Specifications) is deleted and the following substituted:

**993-2 Delineators.**

**993-2.1 General:** Delineators shall be classified into four types: recycled flexible post delineators, nonflexible post delineators, high visibility median separator delineators, and high performance delineators.

**993-2.2 Recycled Flexible Post Delineators:** Meet the requirements of Section 972.

**993-2.3 Nonflexible Post Delineators:**

**993-2.3.1 Posts:** The post shall be 1.1 #/Ft. steel U-Channel posts meeting the requirements of 700-2.3.

**993-2.3.2 Retroreflective Sheeting:** The retroreflective sheeting shall be Type I-III, IV, V or VII sheeting and meet the requirements of Section 994. The reflective sheeting shall have a minimum width of 4 inches and have a minimum area of 32 square inches. The retroreflective sheeting shall be permanently adhered to 0.040 inch sheet aluminum.

**993-2.4 High Visibility Median Separator Delineators:**

**993-2.4.1 Dimensions:** The delineator shall have a minimum height of 42 inches above the surface of the separator.

**993-2.4.2 Post Base:** The base shall be manufactured to accommodate the replacement of the post. The base shall be mechanically anchored to the separator and be capable of withstanding ten vehicle impacts without damage.

**993-2.4.3 Color:** The plastic post shall be opaque white. The yellowness index shall not exceed 12 when tested in accordance with ASTM D 1925 or ASTM E 313. The daylight 45 degree, 0 degree luminous directional reflectance shall be a minimum of 70 when tested in accordance with ASTM E 1347 *or ASTM E 1164*.

**993-2.4.4 Retroreflective Sheeting:** The reflective sheeting shall be Types III, IV, V or VII and meet the requirements of Section 994. The reflective sheeting shall have a minimum width of 8 inches and have a minimum area of 230 square inches facing the approach to the separator.

**993-2.4.5 Impact Performance:** The post, installed according to manufacturer's recommendations, shall be capable of returning to a vertical position  $\pm 5$  degrees when tested according to National Testing Product Evaluation Program (NTPEP). *The NTPEP requirement of one-half of the hits at 32°F is waived. All hits may be at 65°F or greater.* NTPEP data or independent test lab data shall be submitted for product approval.

**993-2.5 High Performance Delineators:**

**993-2.5.1 Dimensions:** The delineator shall have a minimum height of 48 inches above the pavement surface and have a minimum ~~diameter~~ *dimension* ~~or width~~ of ~~2.7~~ inches.

**993-2.5.2 Post Base:** The base shall be manufactured to accommodate the replacement of the post. The base shall be mechanically anchored to the ~~separator~~ *pavement* and be capable of withstanding fifty vehicle impacts without damage.

**993-2.5.3 Color:** The plastic post shall be opaque white. The yellowness index shall not exceed 12 when tested in accordance with ASTM D 1925 or ASTM E 313. The daylight 45 degree, 0 degree luminous directional reflectance shall be a minimum of 70 when tested in accordance with ASTM E 1347 *or E 1164*.

**993-2.5.4 Retroreflective Sheeting:** The reflective sheeting shall be Type ~~IV-V~~ abrasion resistant sheeting and meet the requirements of Section 994. The reflective sheeting shall have a minimum ~~width of 3 inches and have a minimum~~ omni directional area of 30 square inches.

**993-2.5.5 Marking:** ~~The top of the post on the side away from traffic shall be date stamped showing the month and year of fabrication. The numerals shall be at least 1/2 inch in height and shall be either die stamped or legibly stamped with permanent ink.~~

**993-2.5.56 Impact Performance:** The post, installed according to manufacturer's recommendations, shall be capable of returning to a vertical position  $\pm 5$  degrees with no delaminating after receiving fifty vehicle impacts when tested according to National testing Product Evaluation Program (NTPEP). The NTPEP requirement of one-half of the hits at 32° F is waived. All hits shall be at ~~6570~~ *85 F or greater*. NTPEP data or independent test lab data shall be submitted for product approval. *For acceptance purposes there should be no post failures and no more than two posts may list between 5° and 10° after receiving fifty vehicle impacts.*

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**993-2.3.2 Retroreflective Sheeting:** The retroreflective sheeting shall be Type III, IV, V or VII sheeting and meet the requirements of Section 994. The reflective sheeting shall have a minimum width of 4 inches and have a minimum area of 32 square inches. The retroreflective sheeting shall be permanently adhered to 0.040 inch sheet aluminum.

**993-2.4 High Visibility Median Separator Delineators:**

**993-2.4.1 Dimensions:** The delineator shall have a minimum height of 42 inches above the surface of the separator.

**993-2.4.2 Post Base:** The base shall be manufactured to accommodate the replacement of the post. The base shall be mechanically anchored to the separator and be capable of withstanding ten vehicle impacts without damage.

**993-2.4.3 Color:** The plastic post shall be opaque white. The yellowness index shall not exceed 12 when tested in accordance with ASTM D 1925 or ASTM E 313. The daylight 45 degree, 0 degree luminous directional reflectance shall be a minimum of 70 when tested in accordance with ASTM E 1347 or ASTM E 1164

**993-2.4.4 Retroreflective Sheeting:** The reflective sheeting shall be Types III, IV, V or VII and meet the requirements of Section 994. The reflective sheeting shall have a minimum width of 8 inches and have a minimum area of 230 square inches facing the approach to the separator.

**993-2.4.5 Impact Performance:** The post, installed according to manufacturer's recommendations, shall be capable of returning to a vertical position  $\pm 5$  degrees when tested according to National Testing Product Evaluation Program (NTPEP). The NTPEP requirement of one-half of the hits at 32°F is waived. All hits may be at 65°F or greater. NTPEP data or independent test lab data shall be submitted for product approval.

**993-2.5 High Performance Delineators:**

**993-2.5.1 Dimensions:** The delineator shall have a minimum height of 48 inches above the pavement surface and have a minimum dimension of 2 inches.

**993-2.5.2 Post Base:** The base shall be manufactured to accommodate the replacement of the post. The base shall be mechanically anchored to the pavement and be capable of withstanding fifty vehicle impacts without damage.

**993-2.5.3 Color:** The plastic post shall be opaque white. The yellowness index shall not exceed 12 when tested in accordance with ASTM D 1925 or ASTM E 313. The daylight 45 degree, 0 degree luminous directional reflectance shall be a minimum of 70 when tested in accordance with ASTM E 1347 or E 1164.

**993-2.5.4 Retroreflective Sheeting:** The reflective sheeting shall be Type V abrasion resistant sheeting and meet the requirements of Section 994. The reflective sheeting shall have a minimum omni directional area of 30 square inches.

**993-2.5.5 Impact Performance:** The post, installed according to manufacturer's recommendations, shall be capable of returning to a vertical position  $\pm 5$  degrees with no delaminating after receiving fifty vehicle impacts when tested according to National testing Product Evaluation Program (NTPEP). The NTPEP requirement of one-half of the hits at 32° F is waived. All hits shall be at 65° F or greater. NTPEP data or independent test lab data shall be submitted for product approval. For acceptance purposes there should be no post failures and no more than two posts may list between 5° and 10° after receiving fifty vehicle impacts.