

Standard Guidelines for Product Review
TRAFFIC DELINEATORS – TYPE 2;

Section 00840.10

September 23, 2009

00840.10 – TRAFFIC DELINEATORS – TYPE 2

We use five types of Delineators.

- Type 1 are flat, metal and designed to be driven into the ground.
- Type 1U are flat, metal, utility grade and designed to be driven into the ground.
- **Type 2 are flat and designed to be driven into the ground.**
- Type 3 are round and designed to be driven into the ground.
- Type 4 Alt - 1 are flat and designed to be mounted on guard rail posts.
- Type 4 Alt - 2 are flat, metal and designed to be mounted on guard rail posts.
- Type 5 are barrier markers, designed to be mounted on top of concrete barrier.

To submit a Type 2 Delineator for review:

- Submit a completed [Preliminary Information Form for Product Evaluation](#).
- Submit 6 samples, a set of shop drawings, brochures, pictures, and independent testing to cover the following items described below:
 1. General
 2. Marking
 3. Dimensions
 4. Base Anchoring
 5. Color
 6. Heat Resistance
 7. Cold Resistance
 8. Weatherometer
 9. Impact Resistance
 10. Retro-Reflectivity of Reflective Sheeting

It is your responsibility to determine if your product is crash-worthy in compliance with NCHRP Report 350. To determine this crashworthiness, you should use crash tests and or an engineering analysis. You can find information about this at:

http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/QPL/QPLInfo.shtml#NCHRP_Report_350

Submit a “Self-Certification” form indicating compliance with [NCHRP 350 Category 1](#).

You can find our version of a form to do this at:

<http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/QPL/Docs/SelfCertificationNCHRP350Category1.pdf>

Ensure that your installations will comply with TM 570 of the [ODOT Standard Drawing](#),

http://www.oregon.gov/ODOT/HWY/ENGSERVICES/traffic_drawings.shtml#Traffic_500_Pavement_Marking

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Specifications:

- (1) **General** - Material for the portion of flexible delineators which extends above the ground level shall:
 - Be flexible, durable plastic, resistant to impact, ultraviolet light, ozone, hydrocarbons, and other effects of atmospheric weathering.
 - Exhibit good workmanship and be free of burns, discoloration, contamination and other objectionable marks or defects which affect appearances or serviceability.
- (2) **Marking** - Mark the top of the post on the side away from traffic with the manufacturer's name, symbol or brand and the month and year of fabrication. The legend shall be at least ¼" in height and shall be either die stamped or legibly stamped with permanent ink.
- (3) **Dimensions** - The post shall have a width of 3" ± 1", facing traffic and of such length to provide a height above the pavement surface as indicated on the plans, unless otherwise specified, and provide the required anchoring specified under (4) Base Anchoring.

The top 12" of the Type 2 delineator posts shall have a uniformly smooth, flat surface at least 3" by 12" in size to mount the reflective material. The 3" x 12" surface may be slightly rounded, provided the minimum brightness value is not significantly reduced.

- (4) **Base Anchoring** - The delineator post shall resist overturning, twisting and displacement from wind and impact forces and be able to pass the impact resistance requirements shown in item 9, below. Detailed installation instructions shall be provided by the manufacturer. Special soft soil or high wind anchors shall be used unless it is determined that conditions don't require them.

Material for the portion of Type 2 delineators to be installed below ground level shall either be the same as the portion above ground or other durable material suitable for firmly anchoring the post in the ground. If the portion installed in the ground is either iron or steel, galvanize it according to AASHTO M 232, Class B-2 (ASTM A 153, Class B-2).

- (5) **Color** - The delineator posts shall be either yellow in color or opaque white as designated. The yellowness index of the white posts shall not exceed 12 when tested according to ASTM D 1925 or E 313. The daylight 45°, 0° luminous directional reflectance shall be a minimum of 70 when tested according to ASTM E 1347. Yellow posts shall meet the requirements for Highway Color Tolerance Chart Color No. 13538 of Federal Standard 595a.

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- (6) **Heat Resistance** - Condition one delineator post a minimum of two hours in an oven at $140\text{ }^{\circ}\text{F} \pm 3\text{ }^{\circ}\text{F}$. Firmly grasp the heat conditioned post at one end so as to be vertical. The free end shall be brought down so as to make a tight 180° bend in the middle of the post with the viewing face on the outside of the bend. When released the post shall straighten itself to within 1" of its original straightness within 30 seconds. Repeat the bend test three more times within three minutes of removal from the oven or return the post to the oven for one hour before completing the test.
- (7) **Cold Resistance** - Condition two delineator posts a minimum of two hours at $-5\text{ }^{\circ}\text{F} \pm 3\text{ }^{\circ}\text{F}$ in an environmentally controlled test chamber or cold box. If possible, testing should be performed in the environmental chamber.

Subject one cold conditioned post to a tight 90° bend at its midpoint four times with the viewing face on the outside of the bend. The post shall not be adversely affected and shall be capable of straightening itself after each bend to within 1" of original straightness within 60 seconds after being released. If the test is performed outside of an environmental chamber the first two bends shall be made within three minutes of removal from the cold box. Return the specimen to the cold box for one hour before making the last two bends which shall also be made within three minutes of removal from the cold box.

Test one cold conditioned post, not the one used in the test described in the previous paragraph, by dropping a 2" diameter tup (mass approximately 2.37 pounds) a distance of 5' through a virtually frictionless vertical guide to impact the surface of the post. Place the post in a horizontal position with the traffic face up and supported on cylindrical bearings approximately 6" in diameter, spaced 36" apart. Subject the post to five impact tests concentrated at the midpoint of the post. Cracking or splitting of the post shall constitute failure. If a cold box is used the test shall be completed within two minutes of removal from the cold box or return the post to the cold box for one hour before completing the test.

- (8) **Weatherometer** - The delineator post material shall be exposed for 1000 hours in a weatherometer conforming to ASTM G 26, (Method 1, standard cam, 50 - 60% relative humidity, $145\text{ }^{\circ}\text{F}$ black-panel temperature) with no significant yellowing or darkening of the white posts or change of color of the yellow posts and no significant loss of pliability.
- (9) **Impact Resistance** - Manufacture delineator posts from impact resistant material and design so that an installed post is capable of self-erecting, remaining in installed position and serviceable after being subjected to a series of straddle hits by a typical sedan. The impacting vehicle shall suffer little or no damage during the impact test series.

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Use 5 delineator posts in the impact tests which shall be made when the temperature is 40 °F or above. The posts to be tested shall be complete with attached reflective material proposed for use and shall be installed according to the manufacturer's recommendations. The 5 posts shall withstand a series of 10 impacts head on (90°) into the traffic face of the post at 35 mph and a series of five impacts at an angle of 75° to the traffic face of the post at 55 mph. Four of the posts must pass the test.

- (10) Reflective Sheeting** - Retro-reflective sheeting shall meet the following as tested in accordance with ASTM D4956:

Entrance Angle	Observation Angle	Coefficient of Retroreflection (cd/lx•m ²)	
		White	Yellow
-4°	0.2°	250	170
+30°	0.2°	150	100

Mount the reflective sheeting on the posts as detailed on the plans by an approved positive means which has adequate strength to prevent loss of the reflective material during the life of the post.

Please forward your information and/or questions to:

OREGON DEPARTMENT OF TRANSPORTATION

ATTN: MIKE DUNNING (503) 986-3059

MATERIALS LABORATORY

800 AIRPORT RD SE

SALEM OR 97301-4798

<http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/QPL/QPIndex.shtml>