

ONTARIO PROVINCIAL STANDARD SPECIFICATION

METRIC OPSS 2012 NOVEMBER 1984

# MATERIAL SPECIFICATION FOR FLEXIBLE DELINEATOR POSTS

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# 2012.01 SCOPE

This specification defines the requirements for reflective flexible delineator posts.

# 2012.02 REFERENCES

This specification refers to the following standards, specifications or publications:

## Canadian General Standards Board:

CGSB 62-GP-11M (1978) - Marking Material, Retroreflective Enclosed Lens, Adhesive Backing

### American Society for Testing Materials:

ASTM D 523-85 - Specular Gloss

ASTM D 1925-70 (R1977) - Yellowness Index of Plastics

ASTM E97-82 - Directional Reflectance Factor, of, 45-deg 0-deg, of Opaque Specimens by Broad-Band Filter Reflectometry

ASTM E313-73 (R1979) - Indexes of Whiteness and Yellowness of Near-White, Opaque Materials

ASTM G26-77 - Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

### 2010.04 SUBMISSION AND DESIGN REQUIREMENTS

# 2012.04.01 Design and Anchoring

The delineator post shall be designed to resist twisting and displacement from wind and impact forces with a specified anchoring depth of 45 to 60 cm.

### 2012.04.02 Design of Post

The post shall be designed so that an installed post is capable of self erecting and remaining serviceable after being subjected to a series of direct impacts, in accordance to the Impact Resistance Test, by a 2000 kg passenger vehicle at temperatures above 5°C.

The post shall be capable of resisting outdoor exposure for a minimum period of two years.

# 2012.05 MATERIALS

2012.05.01 Post

# 2012.05.01.01 General

The post shall be durable flexible opaque white plastic with or without a black top, resistant to impact, ultraviolet light, ozone and hydrocarbons.

### 2012.05.01.02 Colour

The yellowness index of the white post shall not exceed 12 when tested conforming to ASTM D1925 or E313. The daylight  $45^{\circ}$ ,  $0^{\circ}$  luminous directional reflectance shall be a minimum of 70 when tested conforming to ASTM E97.

# 2012.05.01.03 Heat Resistance Test

When conditioned a minimum of 2 hours in an oven at 60°C, the conditioned post shall be capable of straightening itself within 30 seconds when bent 180° at the midpoint for each of 4 bends. The test on each post shall be completed within 2 minutes of removal from the oven.

# 2012.05.01.04 Cold Resistance Test

The post shall be conditioned a minimum of 2 hours at -21°C in an environmentally controlled test chamber. Testing shall be performed in the environmentally controlled chamber.

- a. The post shall not be adversely affected when a person standing approximately at the centre of the post, bends the free half of the post to a 90° angle with the remaining section being stood upon. The post shall return to its original shape within 60 seconds for each of four separate bends.
- b. A steel ball weighing 907.18 g shall be dropped a distance of 1.52 m through a virtually frictionless vertical guide to impact the surface of the post. The surface of the post being struck by the steel ball shall be in a horizontal position, with the post supported and held in position at both ends. The post shall be subjected to 5 impact tests concentrated near the middle of the post. Fracturing, cracking or splitting of the post shall constitute failure.

# 2012.05.01.05 Colourfastness Test

The post materials shall be exposed for 1000 hours in an Atlas Type B or BH Xenon-Arc Weatherometer (ASTM G26) with no significant yellowing or darkening.

# 2012.05.01.06 Impact Resistance Test

The post shall be installed according to the manufacturer's instructions, and shall be furnished complete with the reflectors proposed for use attached. Posts shall be capable of withstanding a series of 10 impacts - head on (90°) in the traffic face of the post at a speed of 55 km/h. Posts shall be capable of withstanding a series of 5 impacts at an angle of 75° to the traffic face of the post at a speed of 90 km/h. The impacting vehicle shall suffer little or no damage during the impact test series and the post shall self-erect each time after the load is removed.

## 2012.05.02 Reflector

#### 2012.05.02.01 General

The reflector shall be impact resistant reflective sheeting Type 1, Class 1 reflectivity level 2 in accordance with CGSB 62-GP-11M. The reflective material shall be either white or yellow, and there shall be no significant difference between day and night reflective colour.

### 2012.05.02.02 Specular Gloss

The reflective sheeting shall have an 85° specular gloss of not less than 40 when tested conforming to ASTM D523.

## 2012.07 PRODUCTION

### 2012.07.01 General Requirements

The post shall be free of discolouration, contamination and other objectionable marks or defects which might affect appearance or serviceability.

The posts shall be provided complete with the reflectors attached.

Installation instructions shall be included with each shipment.

#### 2012.07.02 Dimensions

The installed delineator shall be a height of 1.2 m above the edge of pavement (1.35 m above ground level). It shall have an 8.0 cm minimum width with an effective reflective area of at least 200 cm<sup>2</sup> over the top 35 cm of post facing in the direction of oncoming traffic.

### 2012.07.03 Mounting

The reflector shall be mounted by an approved positive means which has an adequate strength to prevent loss of the reflector during the life of the post.

### 2012.07.05 Marking

Each post shall have identification marking showing the manufacturer's name or trade mark, date of fabrication and the number 2012 to designate the OPSS specification. This marking shall be either die stamped or legibly stamped with permanent ink.

### 2012.08 QUALITY ASSURANCE

#### 2012.08.01 Certification

All batches of delineator posts shall be supplied complete with a certificate from an approved testing laboratory attesting to the fact that the post complies with the requirements of this specification.

# 2012.08.02 Sampling

A sample shall consist of four randomly selected posts from batch quantities up to 1000. For lots larger than 1000 an additional post shall be sampled for each additional 500 posts or fraction thereof. A resample will consist of twice as many posts as originally sampled. The lot size shall not exceed 5000 posts.

## 2012.08.03 Acceptance

Where 100 percent of the original sampling of each lot complies with all the requirements the lot will be accepted. Where the sampling does not comply, a resample of the lot will be allowed at the request of the Contractor when at least 75 percent of the original sample complies with all the requirements. Any failure in the resample will be cause for rejection of the entire lot or shipment and further testing or resampling will not be allowed. Resampling costs will be charged to the Contractor at the prevailing test rate.

# 2012.09 AUTHORITY PURCHASE OF MATERIALS BY PURCHASE ORDER

# 2012.09.01 Measurement for Payment

Reflective flexible delineator posts will be measured on the basis of each post.

# 2012.09.02 Basis of Payment

Payment at the contract price shall be full compensation for all labour, equipment and materials, testing, packaging, shipment and delivery of the posts at the time and place indicated on the Purchase Order.