



## SECTION 1044

### POSTS FOR MARKERS AND DELINEATORS

**1044.1 Scope.** This specification covers galvanized steel and flexible posts used for mounting mile and object markers, delineators, drain and right of way markers signs and other similar purposes.

**1044.2 Steel Posts.** Posts shall be rerolled rail steel, in accordance with the mechanical requirements of ASTM A 499, Grade 60, and to the chemical requirements of ASTM A 1.

**1044.2.1 Shape and Dimensions.** Posts shall be of a channel or modified channel section. Posts for mile markers, object markers and delineators shall be of the dimensions and weights (masses) shown on the plans.

**1044.2.2 Drainage and Right of Way Markers.** Posts for drainage and right of way markers shall weigh (have a mass of) no less than 1.80 or more than 2.25 pounds per foot (2.68 or more than 3.35 kg/m), all tolerances included, and shall be of the lengths shown on the plans. Permissible variations in length will be a maximum of one inch (25 mm) under and 2 inches (50 mm) over that shown on the plans. Posts shall have no less than five drilled or punched 3/8-inch (9.5 mm) holes along the centerline of the web. Holes shall be on 2-inch (50 mm) centers, beginning one inch (25 mm) from the top of posts. Anchors or pointed ends on posts will not be required.

**1044.2.3 Fiberglass Composite Right of Way Markers.** Fiberglass reinforced polymer composite posts for right of way markers shall be 3 and 3/4 inches wide of a multi rib design weighing no less than 0.35 pounds per foot and shall be of the color and length as shown on the plans. The markers shall have a right of way decal meeting the description as shown on the plans. The markers shall be pointed on one end for installation into the ground to the depth as shown on the plans.

**1044.2.4 Galvanizing.** Posts shall be galvanized after fabrication in accordance with AASHTO M 111.

**1044.3 Flexible Delineator Posts.** Flexible delineator posts shall be manufactured from new or recycled polymer, copolymer or elastomers, which will enable the delineators to meet the requirements of this specification. Clean rework material generated from the manufacturer's own production will be permitted. Posts shall be pigmented and stabilized against fading or deterioration by ultraviolet or other light rays by the incorporation of adequate inhibitors. Posts shall be white or yellow in color, and shall meet the requirements for testing described in this specification. Each post shall be marked with the manufacturer's identification and the month and year produced. The marking shall be permanently affixed on the face of the post, away from oncoming traffic with 1/4-inch (6 mm) minimum height letters, and shall be visible after installation. Flexible delineator posts shall be a minimum of 3 inches (75 mm) wide at the major axis. The delineator post shall provide an area suitable for the application of retroreflective sheeting. If caps are furnished as a part of the delineator posts, the caps shall be firmly fastened to the top of the delineator posts by adhesive. The flexible delineator posts shall be capable of attaching to an anchor, which will hold the post in a vertical position by a locking mechanism. The mechanism shall be such that when a post is no longer serviceable, the post can be removed and a new post inserted to the anchor and locked into place.

**1044.3.1 Anchors.** Anchoring systems for flexible delineator posts may be one of the following classes:

(a) Class A. A drivable, reusable metal anchor shall be a minimum of 18 inches (450 mm) long, onto which a post can be attached and held in place by a locking mechanism.

(b) Class B. A metal anchor designed for embedment in either Portland cement or bituminous concrete into which a post can be inserted and held in place by a locking mechanism.

(c) Class C. A surface mount held in place with a bonding epoxy and a locking device to secure the post.

**1044.3.2 Testing Criteria.** The testing criteria for flexible delineator posts will be in accordance with the AASHTO NTPEP, *Flexible Delineator Impact Testing* report. A flexible delineator post will be accepted to the qualified list if a minimum of 5 of 8 posts tested have not failed. A flexible delineator post will be considered failed if:

(a) The flexible delineator post has torn loose.

(b) The flexible delineator post has been pulled out of the ground.

(c) The flexible delineator post has lost more than 10 percent of the post's exposed length.

(d) The flexible delineator post is at an angle greater than 30 degrees from a vertical position.

(e) The flexible delineator post has less than 50 percent of the reflectorized sheeting remaining.

**1044.3.3 Prismatic Retroreflective Sheeting.** Retroreflective sheeting shall be Type 5, in accordance with [Sec 1042](#). The sheeting shall provide a minimum of 12 square inches (7740 mm<sup>2</sup>) of reflective surface with a minimum width of 3 inches (75 mm).

**1044.3.4 Manufacturer and Brand Name Approval.** To obtain manufacturer and brand name approval of flexible delineator posts, the manufacturer shall submit to Construction and Materials, three complete posts, including the anchoring system if any, test results from the NTPEP *Flexible Delineator Impact Testing Report* for the properties specified in [Sec 1044.3](#) of this specification, and certification for the retroreflective sheeting.

**1044.3.4.1 Report.** The NTPEP *Flexible Delineator Impact Testing Report* information shall include the name of the manufacturer, brand name of the post, date of manufacture or lot number tested, and post dimensions.

**1044.3.4.2 Retroreflective Sheeting.** The post manufacturer shall submit the sheeting manufacturer's test results for the specified properties of the retroreflective sheeting that will be used in the fabrication of the flexible delineator posts. The report for the retroreflective sheeting shall include the name of the manufacturer, brand name of the sheeting, color and lot, and run number or date of manufacture of the material tested.

**1044.3.4.3 Qualified List.** Upon review and acceptance of the test reports for the flexible post and the retroreflective sheeting, the manufacturer's brand name will be placed on a qualified list.

**1044.3.4.4 Acceptance.** Prior to installation of the posts, the manufacturer of the posts shall submit certification to the engineer that the posts and retroreflective sheeting furnished are of the same composition as originally qualified for manufacturer and brand name approval, and in no way has been altered or changed. Final acceptance will be based on brand name, satisfactory manufacturer's certification and any sampling or testing deemed necessary by the engineer.

**1044.4 Square Steel Perforated Posts.**

**1044.4.1 Material.**

**1044.4.1.1 Steel.** Steel shall be in accordance with ASTM A 1011, Grade 50, for hot rolled carbon sheet steel, structural quality. The average minimum yield strength after cold-forming shall be a minimum of 50,000 psi (345 MPa).

**1044.4.1.2 Coating.** Posts shall be hot-dip galvanized steel in accordance with ASTM A 653, G90, structural quality, Grade 50, Class 1. The corner weld shall be zinc coated after the scarfing operation. The steel shall also be coated with a chromate conversion coating and a clear organic polymer topcoat. Both the interior and the exterior of the post shall be galvanized.

**1044.4.2 Dimensions.**

**1044.4.2.1 Dimensional Tolerances.** All dimensional tolerances shall be in accordance with ASTM A 513, excepted as noted.

**1044.4.2.2 Length.** The length of each post shall be as shown on the plans.

**1044.4.2.3 Weight Per Foot.** The weight per foot (m) shall be in accordance with the following or as specified:

<b>Square Steel Perforated Post Requirements</b>			
<b>Size</b>	<b>Thickness</b>	<b>Weight (mass)</b>	<b>Tolerance</b>
2 in. x 2 in.	12 Gage	2.42 lbs/foot	± 0.12 lbs/ft
51 mm x 51 mm	2.77 mm	3.6 kg/m	± 0.18 kg/m

**1044.4.3 Cross Section.** The cross section of the post shall be square tube formed of 12 gage (2.77 mm) steel, carefully rolled to size and shall be welded directly in the corner by high frequency resistance welding and externally scarfed to agree with corner radii.

**1044.4.4 Hole Punching.** All holes shall be  $7/16 \pm 1/64$  inch ( $11 \pm 4$  mm) in diameter on one-inch (25 mm) centers on all four sides down the entire length of the post. The holes shall be on the centerline of each side in true alignment and opposite each other directly and diagonally.

**1044.4.5 Telescoping Properties.** Finished posts for telescoping post systems shall be in accordance with the general dimensional requirements and shall permit consecutive square tubes to telescope freely, for no less than 10 feet (3 m) without the necessity of matching any particular face to any other face. The finished posts shall be straight, and shall have a smooth, uniform finish. All holes and ends shall be free from burrs, and ends shall be cut square.

**1044.4.6 Bases.** If bases are specified on the plans, one of the following FHWA accepted "Breakaway Anchor" systems shall be used.

a) Single. The anchor shall be one size larger than the signpost and driven using an appropriate sized drive cap. All anchors shall be driven into the ground leaving one to two holes exposed for signpost connection.

b) Two-Piece. An additional 18-inch (457 mm) outer sleeve, one size larger than the anchor, shall be used to double the anchor wall thickness at the critical bending area.

**1044.4.7 Connecting Bolts and Nuts.** Bolts used to connect posts to bases shall be 5/16 inch (8 mm), 18NC threads, bent-truss head bolts in accordance with ASTM A 307, Grade A. The bolts shall be mechanically zinc galvanized in accordance with ASTM B 695, Class 25. The nuts shall be 5/16 inch (8 mm), 18NC threads, serrated flange nuts in accordance with ASTM A 194 and zinc electroplated in accordance with ASTM B 633.

**1044.4.8 Certification.** The fabricator shall furnish to the engineer, a certification stating that the posts furnished comply with all requirements of this specification. The certification shall include or have attached specific results of tests of the mechanical and chemical properties. The certification shall accompany each shipment of the material to the destination.

**1044.5 Acceptance.** Acceptance of posts furnished under this specification will be based on appropriate certification and on the results of any tests deemed necessary by the engineer at destination to ascertain compliance with these specifications. If requested, two posts shall be furnished for testing purposes from such lots as the engineer may determine.