

## Index 20511 Bearing Plates (Type 1) - Prestressed Florida-I and AASHTO Type II Beams (Rev. 07/13)

### Design Criteria

**AASHTO LRFD Bridge Design Specifications**, 6th Edition; **Structures Design Guidelines (SDG)**

### Design Assumptions and Limitations

This standard is intended for use on bridge widenings (with or without end diaphragms) where squared end beams are not feasible as determined by the EOR. For all other cases, use Index 20512 and its Instructions. Index 20512 may be used for all projects with squared end beams, with or without end diaphragms.

This standard contains generic details and notes for beveled and embedded bearing plates for prestressed concrete Florida-I Beams with or without skewed end conditions.

Use this standard with Indexes 20010, 20036, 20045, 20054, 20063, 20072, 20078, 20084, 20096, 20120 and 20510.

Embedded Bearing Plates A are required for all Florida-I Beams. Embedded Bearing Plates A and Beveled Bearing Plates B are required for beams on grades greater than 2%.

### Plan Content Requirements

In the Structures Plans:

Bearing seats (pedestals) may be finished level for beam grades less than 0.5%. Use Embedded Bearing Plates A but do not use Beveled Bearing Plates B.

For beam grades between 0.5% and 2%, show the bearing seats (pedestals) to be finished parallel to the beam grade with no allowance for beam camber or deflection when less than the limits specified in **SDG** 6.5.1. Use Embedded Bearing Plates A for Florida-I Beams but do not use Beveled Bearing Plates B.

For beam grades greater than 2%, show the bearing seats (pedestals) to be finished level and use Bearing Plates A and B. Refer to **SDG** 6.5.1 for consideration of beam camber and deflection effects.

See also instructions for Index 20510.

Complete the following "BEARING PLATE DATA TABLE" and include it in the plans. Fill in the table to correspond with data on the appropriate "TABLE OF BEAM VARIABLES" using inch units for Beveled Plate dimensions 'W', 'X', 'Y' & 'Z' rounded to 1/16th of an inch. If Beveled Bearing Plates B are not required, fill in the corresponding columns with "N/A". See [Introduction I.3](#) for more information regarding use of Data Tables.

Use the following equations to determine the Beveled Bearing Plate B thicknesses for "PLAN VIEW CASES" and "END ELEVATION CONDITIONS" corresponding to those shown on Index 20010 or 20120. The Slope parameter in these equations requires decimal units and correct sign convention:

END 1	END 2
<b>(I) PLAN VIEW CASE 1:</b>	
<b>(a) END ELEVATION CONDITION 1 or 2 (Positive Slope)</b>	
$W = X = 0.5" + (C) \times \text{Slope}$	$W = X = 0.5"$
$Y = Z = 0.5"$	$Y = Z = 0.5" + (C) \times \text{Slope}$
<b>(b) END ELEVATION CONDITION 1 or 3 (Negative Slope)</b>	
$W = X = 0.5"$	$W = X = 0.5" - (C) \times \text{Slope}$
$Y = Z = 0.5" - (C) \times \text{Slope}$	$Y = Z = 0.5"$
<b>(II) PLAN VIEW CASE 2:</b>	
<b>(a) END ELEVATION CONDITION 1 or 2 (Positive Slope)</b>	
$W = 0.5" + (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$	$W = 0.5" + (D / \tan \Phi) \times \text{Slope}$
$X = 0.5" + (C / \sin \Phi) \times \text{Slope}$	$X = 0.5"$
$Y = 0.5"$	$Y = 0.5" + (C / \sin \Phi) \times \text{Slope}$
$Z = 0.5" + (D / \tan \Phi) \times \text{Slope}$	$Z = 0.5" + (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$
<b>(b) END ELEVATION CONDITION 1 or 3 (Negative Slope)</b>	
$W = 0.5"$	$W = 0.5" - (C / \sin \Phi) \times \text{Slope}$
$X = 0.5" - (D / \tan \Phi) \times \text{Slope}$	$X = 0.5" - (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$
$Y = 0.5" - (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$	$Y = 0.5" - (D / \tan \Phi) \times \text{Slope}$
$Z = 0.5" - (C / \sin \Phi) \times \text{Slope}$	$Z = 0.5"$
<b>(III) PLAN VIEW CASE 3:</b>	
<b>(a) END ELEVATION CONDITION 1 or 2 (Positive Slope)</b>	
$W = 0.5" + (C / \sin \Phi) \times \text{Slope}$	$W = 0.5"$
$X = 0.5" + (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$	$X = 0.5" + (D / \tan \Phi) \times \text{Slope}$
$Y = 0.5" + (D / \tan \Phi) \times \text{Slope}$	$Y = 0.5" + (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$
$Z = 0.5"$	$Z = 0.5" + (C / \sin \Phi) \times \text{Slope}$
<b>(b) END ELEVATION CONDITION 1 or 3 (Negative Slope)</b>	
$W = 0.5" - (D / \tan \Phi) \times \text{Slope}$	$W = 0.5" - (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$
$X = 0.5"$	$X = 0.5" - (C / \sin \Phi) \times \text{Slope}$
$Y = 0.5" - (C / \sin \Phi) \times \text{Slope}$	$Y = 0.5"$
$Z = 0.5" - (C / \sin \Phi + D / \tan \Phi) \times \text{Slope}$	$Z = 0.5" - (D / \tan \Phi) \times \text{Slope}$

For all cases:

$$E = C / \sin \Phi$$

$$G = 13.5" / \sin \Phi$$

