ORIGINATION FORM

Proposed Revisions to a Standard Plans Index

(Please provide all information — Incomplete forms will be returned)

Contact Information:

Date: June 15, 2020

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Standard Plans:

Index Number: 700-010

Sheet Number (s): 1, 2, 5, 6, and 7 of 10

Index Title: Single Column Ground Signs

Summary of the changes:

Sheet 1: Updated Sheet Title in the Table of Contents; Change Note 2.C reference to ASTM B308 to ASTM B221 throughout Standard Plans as an administrative change; Added Nut and lock washer option to Note 5.A; Added new Note 3 for Galvanized Steel Slip Base Materials.

Sheet 2: Updated Note 2-Welded Stub Base; Clarified Aluminum Required and Galvanized Steel Options in the SLIP BASE FOUNDATIONS and DETAIL 'A'.

Sheet 5: Added Concrete/Stub Details for Traffic Separators; Added Note for the 2" Grout Seal in the DRIVEN POST DETAIL; Updated Sheet Title

Sheet 6 and 7: Updated sheets with the Nut and Lock Washer Option.

Commentary / Background:

Districts have commented that double nuts are more difficult to install with negligible safety benefits.
ASTM withdrew B308-10 so we need to change it to ASTM B221

Other Affected Offices / Documents: (Provide name of person contacted)

Yes	No	
☐	☑	Other Standard Plans –
☐	☑	FDOT Design Manual –
☐	☑	Basis of Estimates Manual –
☐	☑	Standard Specifications –
☐	☑	Approved Product List –
☐	☑	Construction –
☐	☑	Maintenance –

Origination Package Includes:

(Email or hand deliver package to Rick Jenkins)

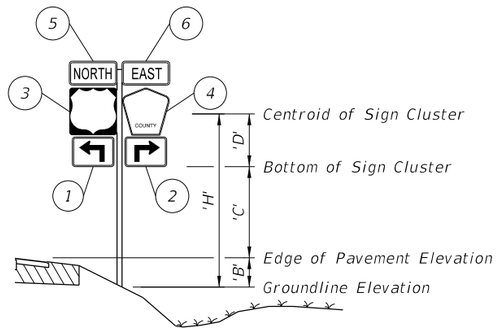
Yes	N/A	
☑	☐	Redline Mark-ups
☐	☐	Proposed Standard Plan Instruction (SPI)
☐	☐	Revised SPI
☐	☐	Other Support Documents

Implementation:

- ☐ Design Bulletin (Interim)
- ☐ DCE Memo
- ☐ Program Mgmt. Bulletin
- ☑ FY-Standard Plans (Next Release)

Contact the Roadway Design Office for assistance in completing this form

STEP 1: Calculate the area and the centroid for an individual sign or a sign cluster. Note that the centroid and areas have been calculated for frequently used sign clusters. These are shown on Sheets 7, 8, and 9.



	Size a x h	Centroid Local $'Y_n'$	Centroid Global $'X_n'$	Centroid Global $'Y_n'$	$'A_n'$	$'X_n'$ x $'A_n'$	$'Y_n'$ x $'A_n'$
	(in. x in.)	(in.)	(in.)		(in.²)	(in.³)	(in.³)
1	21 x 15	7.5	–10.5–1.5–1.5 = –13.5	7.5	315	–4,252.5	2,362.5
2	21 x 15	7.5	10.5+1.5+1.5 = 13.5	7.5	315	+4,252.5	2,362.5
3	24 x 24	12	–12–1.5 = –13.5	15+1+12 = 28	576	–7,776	16,128
4	24 x 24	12	12+1.5 = 13.5	15+1+12 = 28	436	5,886	12,208
5	24 x 12	6	–12–1.5 = –13.5	15+1+24+1+6 = 47	288	–3,888	13,536
6	24 x 12	6	12+1.5 = 13.5	15+1+24+1+6 = 47	288	3,888	13,536
				TOTALS	2,218	–1,890	60,133

$\Sigma\ ('A_n')$ = 2,218 in.² = 15.4 ft.² $\quad \Sigma\ ('X_n' \times 'A_n')$ = –1,890 in.³ = –1.09 ft.³ $\quad \Sigma\ ('Y_n' \times 'A_n')$ = 60,133 in.³ = 34.8 ft.³

$$'X_c' = \frac{\Sigma\ ('X_n' \times 'A_n')}{\Sigma\ 'A_n'} = -0.1 \text{ ft.} \qquad 'Y_c' = \frac{\Sigma\ ('Y_n' \times 'A_n')}{\Sigma\ 'A_n'} = 2.26 \text{ ft.}$$

STEP 2: Determine the height 'H' from groundline to the centroid of the individual sign or sign cluster.

Assume: 'B' = 1 ft., 'C' = 7 ft.

Calculated: X_c' = –0.1 ft., $'Y_c'$ = 'D' 2.26 ft.

'H' = 'B' + 'C' + 'D' = 10.26 ft. ==> USE 11 ft. $\quad \Sigma\ ('A_n')$ = 15.4 ft.² ==> USE 16 ft.²

STEP 3: Refer to the Aluminum Column (Post) Selection Tables and find the intersection point. See Sheet 3.

ALUMINUM COLUMN (POST) SELECTION TABLE

TOTAL PANEL AREA (SF) \ 'H' (FT)	8 ft	9 ft	10 ft	11 ft	12 ft	13 ft	14 ft	15 ft	16 ft	17 ft	18 ft	19 ft	20 ft
3 sf	2	2.5	2.5	2.5	3	3	3	3	3.5	3.5	3.5	3.5	3.5
4 sf	2.5	2.5	3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
5 sf	2.5	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4
6 sf	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4
7 sf	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4
8 sf	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4
9 sf	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4
10 sf	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4.5	4.5
11 sf	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4.5	4.5	4.5
12 sf	3.5	3.5	3.5	4	4	4	4	4	4	4	4.5	4.5	4.5
13 sf	3.5	3.5	4	4	4	4	4	4	4	4.5	4.5	4.5	5
14 sf	3.5	3.5	4	4	4	4	4	4	4.5	4.5	4.5	5	5
15 sf	3.5	4	4	4	4	4	4	4.5	4.5	4.5	5	5	5
16 sf	3.5	4	4	4	4	4	4	4.5	4.5	5	5	5	6
17 sf	4	4	4	4	4	4	4.5	4.5	4.5	5	5	6	6
18 sf	4	4	4	4	4	4.5	4.5	4.5	5	5	5	6	6
19 sf	4	4	4	4	4	4.5	4.5	4.5	5	5	6	6	6
20 sf	4	4	4	4	4.5	4.5	4.5	5	5	5	6	6	6
21 sf	4	4	4	4	4.5	4.5	5	5	5	6	6	6	6
22 sf	4	4	4	4.5	4.5	4.5	5	5	6	6	6	6	6
23 sf	4	4	4	4.5	4.5	5	5	5	6	6	6	6	6
24 sf	4	4	4.5	4.5	4.5	5	5	6	6	6	6	6	6
25 sf	4	4	4.5	4.5	5	5	5	6	6	6	6	6	8
26 sf	4	4.5	4.5	4.5	5	5	5	6	6	6	6	8	8
27 sf	4	4.5	4.5	4.5	5	5	6	6	6	6	6	8	8
28 sf	4	4.5	4.5	5	5	5	6	6	6	6	6	8	8
29 sf	4.5	4.5	4.5	5	5	6	6	6	6	6	8	8	8
30 sf	4.5	4.5	5	5	5	6	6	6	6	6	8	8	8

For 'H' = 11 ft., Area = 16 ft.²

- Refer to the Aluminum Column (Post) Selection Table, from Sheet 3 and shown here for reference.
- To determine the required post size, find the intersection of the row labeled "16 SF" and the column labeled "11 FT". For the example the intersection value is "4" (4" OD).
- In the Column (Post) and Foundation Table, the value "4" shows the design requires a 4.0" diameter and ¼" thick Aluminum Column (Post) and a 2.0' diameter and 3.5' deep Concrete Foundation and 3.0' Stub.

STEP 4: For sign assemblies with signs oriented in two directions, only the sign with the largest area should be analyzed to determine the Column (Post) requirements.

GUIDE TO USE THIS INDEX

SHEET	CONTENTS
1	General Notes and Design Example
2	Design Example – Centroid
3	Column and Foundation Tables
4	~~Slip Base and Foundation Details~~
5	Driven Post and Soil Plate Detail
6	~~Wind Beam Connection~~
7, 8 & 9	Frequently Used Sign Clusters

Updated Title

GENERAL NOTES:

1. Shop Drawings:
   This Index is considered fully detailed. Submit Shop Drawings only for minor modifications not detailed in the Plans.

B221

2. Aluminum Sign, Wind Beams and Column (Post) Materials:
   A. Aluminum Plates: ASTM B209, Alloy 6061-T6
   B. Aluminum Bars and Extruded Shapes: ASTM B221, Alloy 6061-T6
   C. Aluminum Structural Shapes: ASTM ~~B308~~ Alloy 6061-T6
   D. Cast Aluminum: ASTM B26 Alloy A356-T6
   E. Aluminum Weld Material: ER 5556 or 5356

3. Sign Mounting Bolts, Nuts and Washers:
   A. Aluminum Button Head and Flat Head Bolts: ASTM F468 Alloy 2024-T4
   B. Aluminum Hex Nuts: ASTM F467 Alloy 6061-T6 or 6262-T9
   C. Aluminum Washers: ASTM B221, Alloy 7075-T6

Added: Nut and Lock washer Optional

4. Stainless Steel Bolts, Nuts and Washers may be used in lieu of the Aluminum button head and flat head bolts as follows:
   A. Stainless Steel Bolts: ASTM F 593 Alloy Group 2, Condition A, CW1 or SH1
   B. Stainless Steel Nuts: ASTM F594

5. Sign Column (Post) Bolts, Nuts and Washers:
   A. Galvanized U-Bolt (Column): ASTM A449 or ASTM A193 B7 according to ASTM F2329 with double nuts.
   B . Aluminum Bolts (Sleeve): ASTM F468, Alloy 6061-T6 or 2024-T4 with Hex Nuts F467 6061-T6 or 6262-T9 and Washers B221, Alclad 2024-T4
   C. Galvanized High Strength Hex Head Bolts (Base Bolts): ASTM F3125, Grade A325, Type 1
   D. Galvanized Hex Nuts: ASTM A563 Grade DH
   E. Galvanized Washers: ASTM F436
   F. Galvanized Bolts (Sleeve): ASTM A307 with Galvanized Hex Nuts and Washers

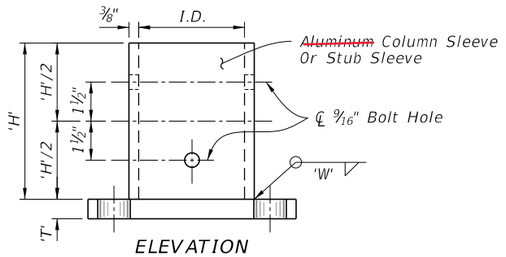
6. Coatings:
   A. Aluminum Fasteners: Anodic coating (0.0002 inches min.) and chromate sealed
   B. High Strength Steel Bolts Nuts and Washers: ASTM F2329
   C. All other steel items (excluding stainless steel): Hot-dip Galvanize – ASTM A123
   D. Repair damaged galvanizing in accordance with Specification 562

7. BREAKAWAY SUPPORTS REQUIREMENTS: Install non-frangible aluminum column (post) (larger than 3½") with breakaway supports as shown on Sheet 4. Signs shielded by barrier wall or guardrail do not require breakaway support.

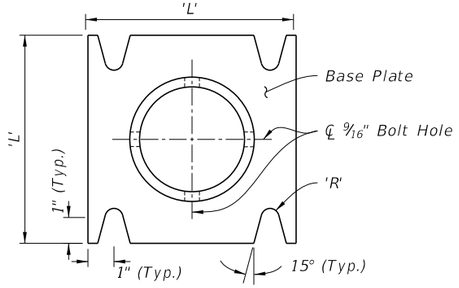
Add the following as a new Note 3 and Renumber existing Notes 3 through 7.:

3. Galvanized Steel Slip Base Stub Materials:
   A. Steel Plate and Structural Shapes: ASTM A36 or ASTM A709, Grade 36
   B. Steel Weld Metal: E70XX

GENERAL NOTES AND DESIGN EXAMPLE



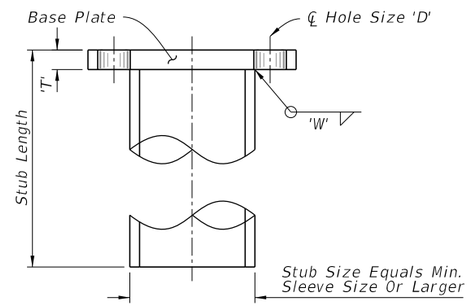
ELEVATION



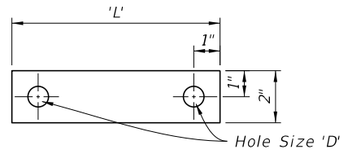
PLAN

(Welded Or Sandcast)

STUB/SLEEVE & BASE PLATE DETAILS

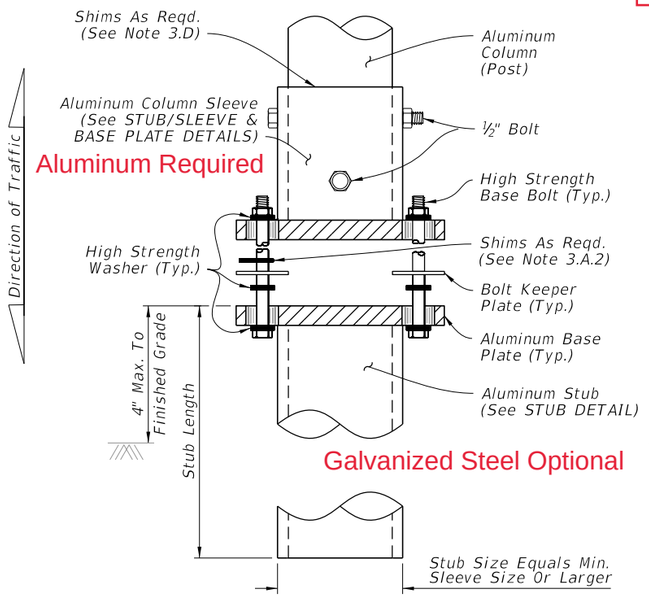


(Welded)



28 Ga. Thick Aluminum Strip
2 Reqd. Per Base

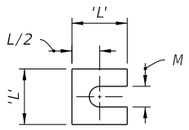
BOLT KEEPER PLATE DETAIL



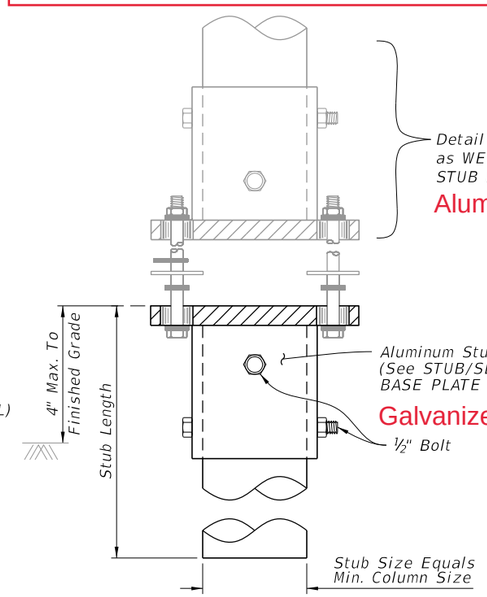
Aluminum Required

Galvanized Steel Optional

WELDED STUB BASE



B. The WELDED STUB BASE and lower STUB/SLEEVE BASE PLATE may be fabricated using galvanized steel as an option to aluminum. The upper portion of the SLIP BASE must be aluminum.



BOLTED STUB/SLEEVE BASE

NOTES:

1. Foundation Notes for Slip Base:

   A. Place Stub into concrete foundation given in the FOUNDATION TABLE using Class I Concrete.

2. Slip Base Fabrication Notes:

   A. The difference between the O.D. of the post and I.D. of the Sleeve must be 1/16" or less.

   C. Either a Welded Stub Base or Bolted Stub/Sleeve Base may be used in Slip Base.

   D. For cast base plates bolted to foundation stubs, use a foundation stub the same size as the sign column (Post).

3. Slip-Base Assembly Instructions:

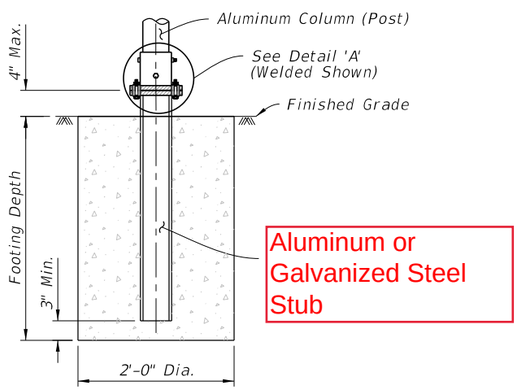
   A. Assemble the Slip Base as follows:
      1. Insert Post into Sleeve and connect using 2 ~ ½" diameter Sleeve Bolts.
      2. Assemble top base plate to bottom Base Plate using Base Bolts (High strength) with 3 washers per bolt. (See Detail 'A'):
         a. Place one washer on each Base Bolt between the bottom Base Plate and the Base Bolt head.
         b. Place the next washer between the Bottom Base Plate and the Bolt Keeper Plate.
         c. Use brass or galvanized steel shims to plumb the post.
         d. Add the top base plate section.
         e. Place the third washer between the Top Base Plate and the Nut.

   B. Orient the Bolt Keeper Plates in the Direction of Traffic.

   C. Tighten Base Bolts as follows:
      1. Tighten Base Bolts to the maximum possible with a 12" to 15" wrench (this will bed the washers and shims and clear the bolt threads).
      2. Loosen each Base Bolt one turn.
      3. Under the supervision of the Engineer, use a calibrated wrench to tighten bolts to the torque prescribed in the SLIP BASE DETAILS Table. Over tightened Base Bolts are not permitted.
      4. Distort bolt threads at the junction with nuts to prevent loosening. Repair damaged galvanizing.

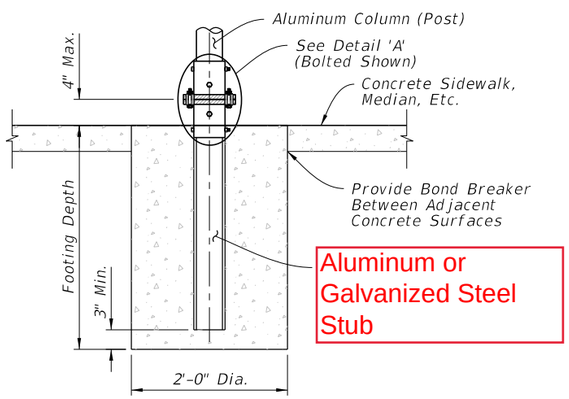
   D. Obtain a tight sleeve connection by placing 4 galvanized steel shims between the column (post) and sleeve. Space the shims evenly around the perimeter of the column (1 between each bolt hole, 4 total). Use shims that are 1" shorter than the height of the sleeve.

STUB DETAIL



SLIP BASE AND FOUNDATION DETAIL
(Non-Frangible Column, Typ.)

DETAIL 'A'



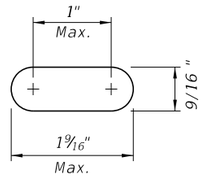
SLIP BASE AND FOUNDATION DETAIL IN CONCRETE
(Non-Frangible Column In Crossovers, Medians & Sidewalks)

Column (Post) Size	SLIP BASE DETAILS												
Outside Dia.	Wall Thickness	Sleeve I.D. (Max.)	Sleeve Height 'H'	Weld 'W'	Base Plate 'L'	Base Plate 'T'	Radius 'R'	Base Bolt Size	Base Bolt Length	Base Plate Torque ft-lbs	Base Plate Torque in.-lbs	Hole Size 'D'	SHIM L	SHIM M
4"	¼"	4 1/16"	6"	¼"	8"	¾"	1 1/32"	⅝"	3"	29	345	1 1/16"	1 3/8"	1 1/16"
4½"	¼"	4 9/16"	6"	¼"	8"	⅞"	1 1/32"	⅝"	3¼"	29	345	1 1/16"	1 3/8"	1 1/16"
5"	¼"	5 1/16"	7"	¼"	8"	⅞"	1 1/32"	⅝"	3¼"	29	345	1 1/16"	1 3/8"	1 1/16"
6"	¼"	6 1/16"	8"	¼"	9"	1"	1 3/32"	¾"	3½"	46	554	1 3/16"	1 3/4"	1 3/16"
8"	¼"	8 1/16"	10"	¼"	11"	1"	1 5/32"	⅞"	3¾"	53	640	1 5/16"	2 3/8"	1 1/16"

SLIP BASE AND FOUNDATION DETAILS

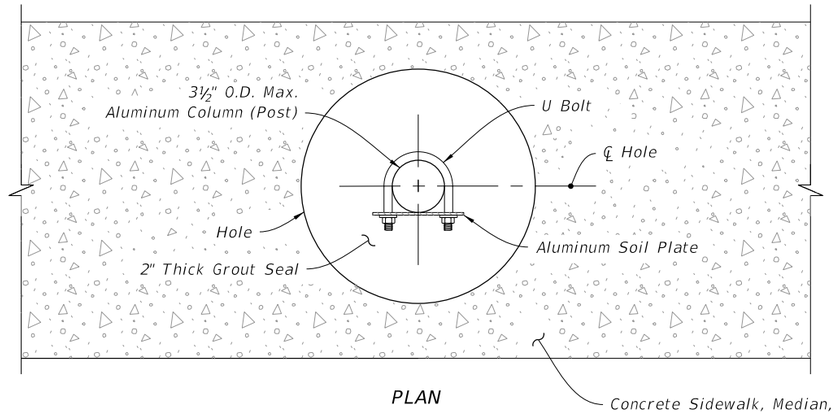
10/14/2019 2:25:14 PM

LAST REVISION	REVISION	DESCRIPTION:			
~~11/01/19~~		11/01/20	FDOT FY 2020-21 STANDARD PLANS	SINGLE COLUMN GROUND SIGNS	INDEX 700-010 / SHEET 4 of 10



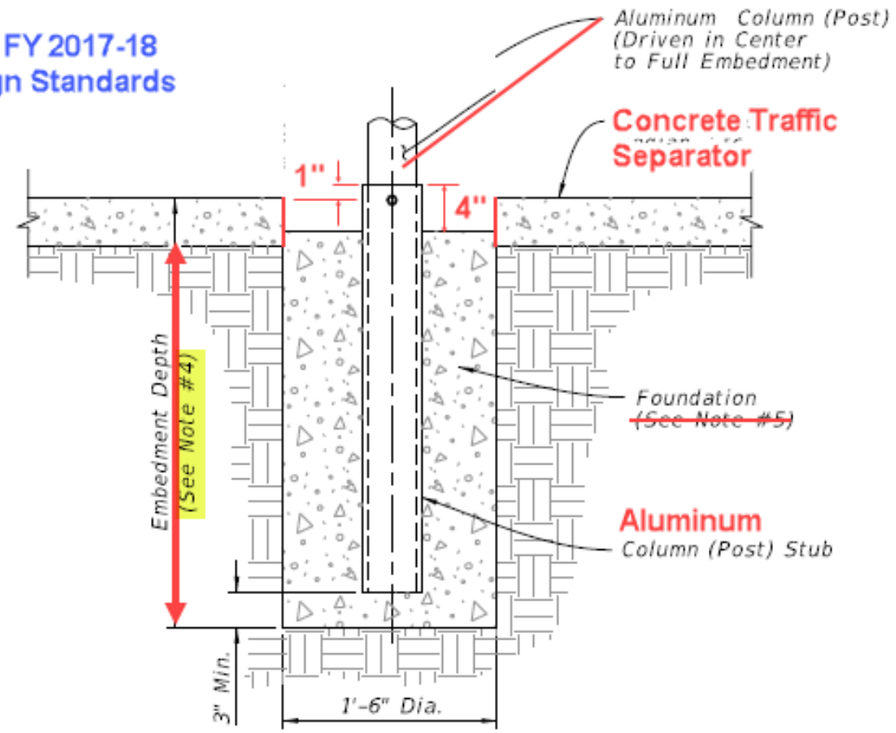
Optional Slotted Holes

DETAIL "B"



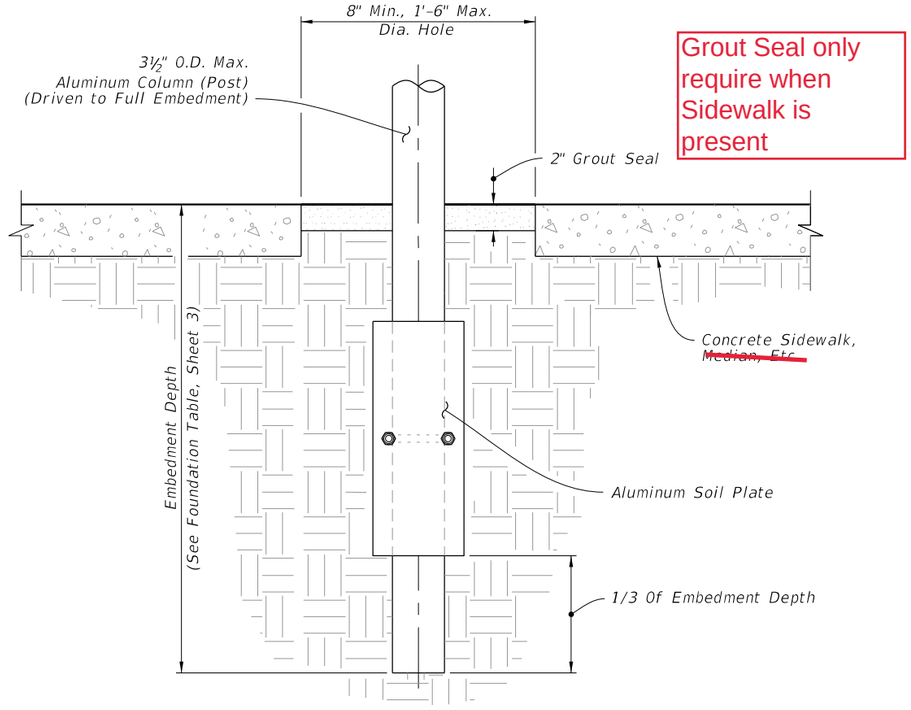
PLAN

ADD: Concrete Stub Detail



TRAFFIC SEPARATOR
CONCRETE/STUB DETAIL
(Frangible Post In Crossovers, Medians & Sidewalks)

4. Embedment Depth is 2'-6" for 2.0" and 2.5" Column (Post) Stubs and 3'-6" for 3.0" and 3.5" Column (Post) Stubs.



Grout Seal only require when Sidewalk is present

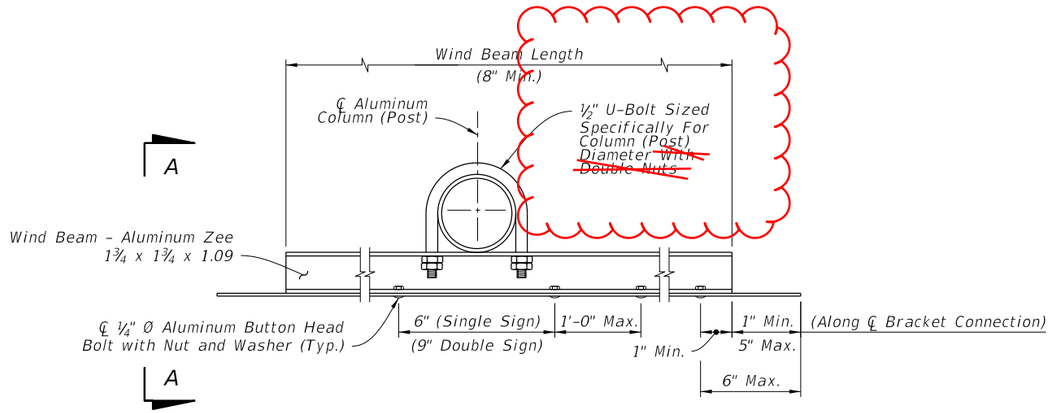
ELEVATION

DRIVEN POST DETAIL

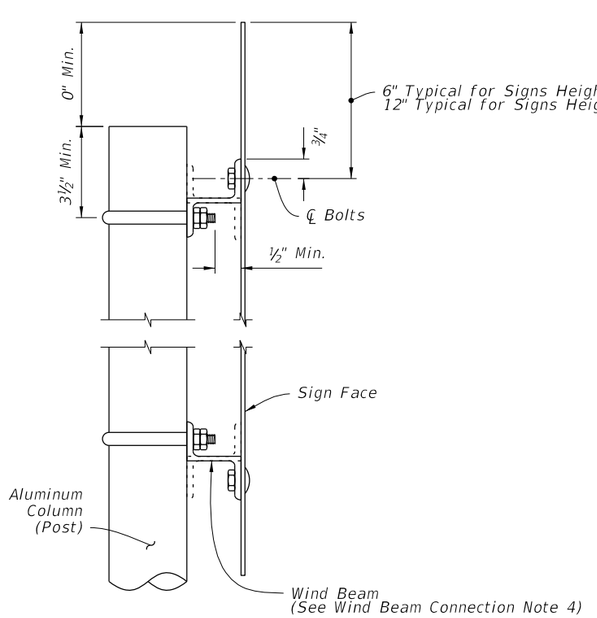
(Frangible Post In Through Sidewalk Shown, Installations Without Sidewalk Similar)

10/14/2019 2:25:15 PM

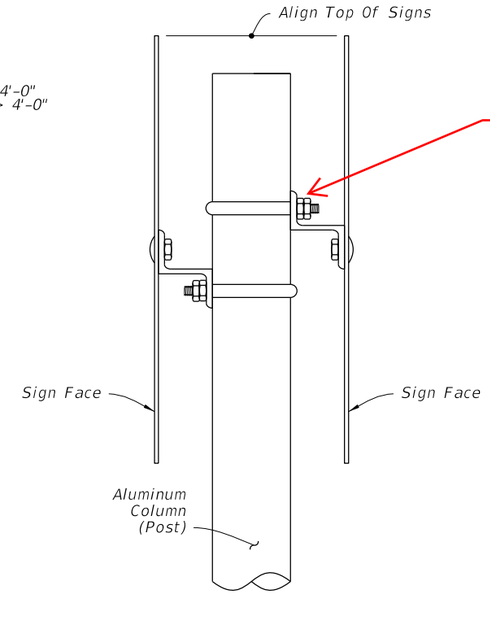
LAST REVISION	REVISION	DESCRIPTION:		INDEX	SHEET
~~11/01/19~~		~~FY 2020-21 STANDARD PLANS~~	~~MN GROUND SIGNS~~	700-010	5 of 10
11/01/20		Changed Title to: DRIVEN POST, CONCRETE/STUB, AND SOIL PLATE DETAILS	DRIVEN POST AND SOIL PLATE DETAIL		



WIND BEAM CONNECTIONS DETAILS



SINGLE SIGN DETAIL



NOTE: Use the area and the centroid location of the largest sign to determine aluminum column (post) size.

BACK-TO-BACK SIGN DETAIL

Added:
Double Nut (Typ)
(Nut and Lock Washer Ootional)
(See General Note 6A

NOTES:

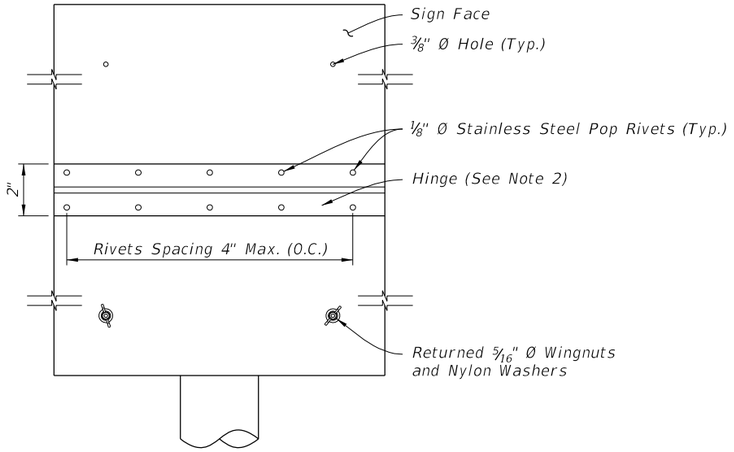
1. 5/16" Ø Stainless Steel Hex Head Bolts with Flat Washer under Head and Washer under Nut may be used in lieu of ¼" Ø Aluminum Button or Flat Head Bolts.
2. Use Nylon washers (provided by the sheeting supplier) under the button bolt heads to protect sign sheeting.
3. Slots up to 2" long are allowed in wind beams to accommodate U-Bolts for varying Column (Post) diameters.
4. Wind beams may be oriented in either direction.
5. For signs greater than 66" in height, install a third wind beam evenly spaced between the top and bottom wind beams. For signs up to 12" in height, use only one wind beam at ℄ Sign. Install two wind beams on signs with heights greater than 12" and less than or equal to 66".

VIEW A-A

WIND BEAM CONNECTION

10/29/2019 8:23:06 AM

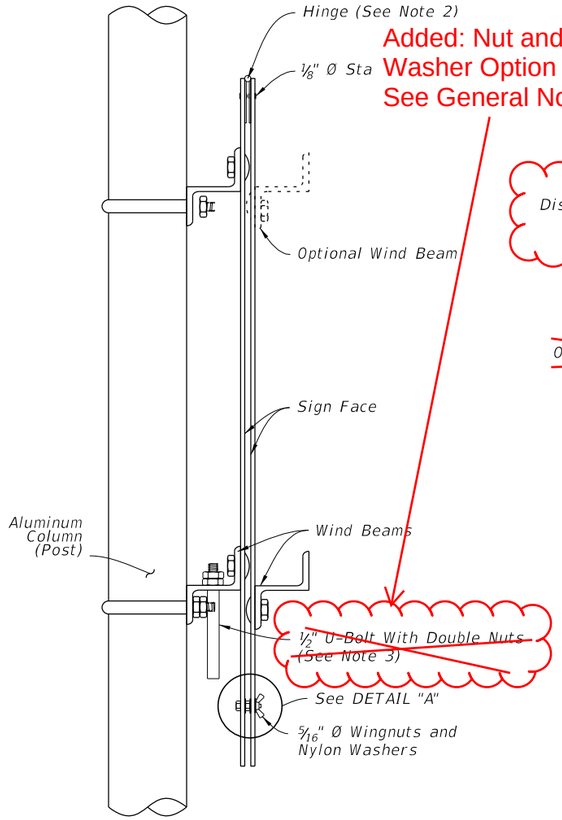
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2020-21 STANDARD PLANS	SINGLE COLUMN GROUND SIGNS	INDEX	SHEET
11/01/19		11/01/20				700-010	6 of 10



SIGN PANEL FRONT VIEW

NOTES:

1. Install sign in the undeployed (down) position.
2. Provide a continuous stainless steel hinge with minimum 0.060" leaf thickness, 2" open width and 0.120" pin diameter. Stake the hinge at both ends to prevent pin movement.
3. Stowed 1 or 2 pcs of U-Bolt sized specifically for column (post) diameter with ~~double nuts.~~ Stowed on Wind Beam and displaced while deploying the sign.
4. ~~Bolts, Wingnuts, and washers at the bottom corners of the~~ sign hold the sign panels closed when in the undeployed (down) position. Store bolts, wingnuts, and washers in the bottom corner of the sign when in the deployed (up) position.

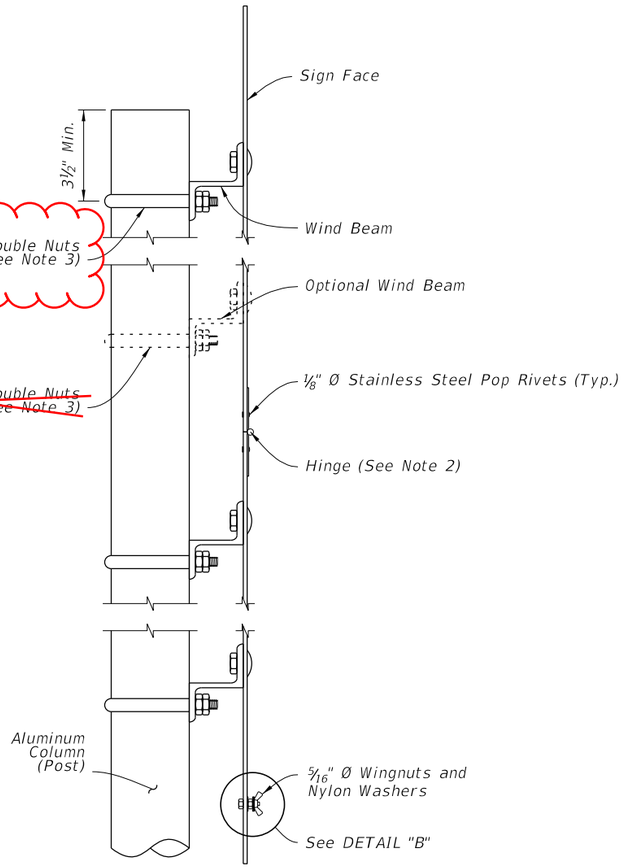


UNDEPLOYED SIGN DETAIL

Added: Nut and Lock Washer Option and See General Note 6A

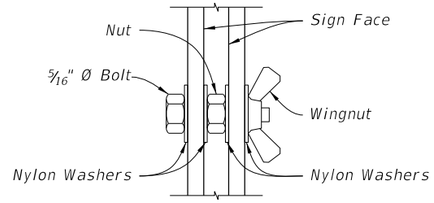
Displaced U-Bolt With Double Nuts (See Note 3)

~~Optional U-Bolt With Double Nuts (See Note 3)~~

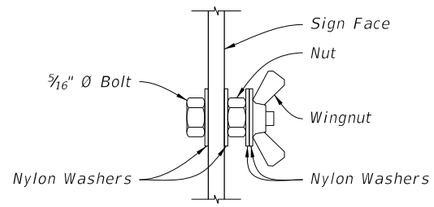


DEPLOYED SIGN DETAIL

SIGN PANEL SIDE VIEW



DETAIL "A"



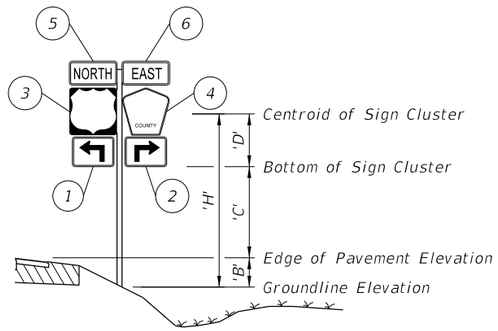
DETAIL "B"

10/29/2019 8:23:07 AM

WIND BEAM CONNECTION FOR FLIP UP SIGN

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2020-21 STANDARD PLANS	SINGLE COLUMN GROUND SIGNS	INDEX	SHEET
~~11/01/19~~		11/01/20				700-010	7 of 10

STEP 1: Calculate the area and the centroid for an individual sign or a sign cluster. Note that the centroid and areas have been calculated for frequently used sign clusters. These are shown on Sheets 7, 8, and 9.



	Size a x h	Centroid Local $'Y_n'$	Centroid Global $'X_n'$	Centroid Global $'Y_n'$	$'A_n'$	$'X_n'$ x $'A_n'$	$'Y_n'$ x $'A_n'$
	(in. x in.)	(in.)	(in.)		($in.^2$)	($in.^3$)	($in.^3$)
1	21 x 15	7.5	–10.5–1.5–1.5 = –13.5	7.5	315	–4,252.5	2,362.5
2	21 x 15	7.5	10.5+1.5+1.5 = 13.5	7.5	315	+4,252.5	2,362.5
3	24 x 24	12	–12–1.5 = –13.5	15+1+12 = 28	576	–7,776	16,128
4	24 x 24	12	12+1.5 = 13.5	15+1+12 = 28	436	5,886	12,208
5	24 x 12	6	–12–1.5 = –13.5	15+1+24+1+6 = 47	288	–3,888	13,536
6	24 x 12	6	12+1.5 = 13.5	15+1+24+1+6 = 47	288	3,888	13,536
				TOTALS	2,218	–1,890	60,133

$\Sigma\ ('A_n')$ = 2,218 $in.^2$ = 15.4 $ft.^2$ $\quad$ $\Sigma\ ('X_n' \times 'A_n')$ = –1,890 $in.^3$ = –1.09 $ft.^3$ $\quad$ $\Sigma\ ('Y_n' \times 'A_n')$ = 60,133 $in.^3$ = 34.8 $ft.^3$

$$'X_c' = \frac{\Sigma\ ('X_n' \times 'A_n')}{\Sigma\ 'A_n'} = -0.1 \text{ ft.} \qquad 'Y_c' = \frac{\Sigma\ ('Y_n' \times 'A_n')}{\Sigma\ 'A_n'} = 2.26 \text{ ft.}$$

STEP 2: Determine the height 'H' from groundline to the centroid of the individual sign or sign cluster.

Assume: 'B' = 1 ft., 'C' = 7 ft.

Calculated: X_c' = –0.1 ft., $'Y_c'$ = 'D' 2.26 ft.

'H' = 'B' + 'C' + 'D' = 10.26 ft. ==> USE 11 ft. $\quad$ $\Sigma\ ('A_n')$ = 15.4 $ft.^2$ ==> USE 16 $ft.^2$

STEP 3: Refer to the Aluminum Column (Post) Selection Tables and find the intersection point. See Sheet 3.

ALUMINUM COLUMN (POST) SELECTION TABLE

TOTAL PANEL AREA (SF) \ 'H' (FT)	8 ft	9 ft	10 ft	11 ft	12 ft	13 ft	14 ft	15 ft	16 ft	17 ft	18 ft	19 ft	20 ft
3 sf	2	2.5	2.5	2.5	3	3	3	3	3.5	3.5	3.5	3.5	3.5
4 sf	2.5	2.5	3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
5 sf	2.5	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4
6 sf	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4
7 sf	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4
8 sf	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4
9 sf	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4
10 sf	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4.5	4.5
11 sf	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4.5	4.5	4.5
12 sf	3.5	3.5	3.5	4	4	4	4	4	4	4	4.5	4.5	4.5
13 sf	3.5	3.5	4	4	4	4	4	4	4	4.5	4.5	4.5	5
14 sf	3.5	3.5	4	4	4	4	4	4	4.5	4.5	4.5	5	5
15 sf	3.5	4	4	4	4	4	4	4.5	4.5	4.5	5	5	5
16 sf	3.5	4	4	4	4	4	4	4.5	4.5	5	5	5	6
17 sf	4	4	4	4	4	4	4.5	4.5	4.5	5	5	6	6
18 sf	4	4	4	4	4	4.5	4.5	4.5	5	5	5	6	6
19 sf	4	4	4	4	4	4.5	4.5	4.5	5	5	6	6	6
20 sf	4	4	4	4	4.5	4.5	4.5	5	5	5	6	6	6
21 sf	4	4	4	4	4.5	4.5	5	5	5	6	6	6	6
22 sf	4	4	4	4.5	4.5	4.5	5	5	6	6	6	6	6
23 sf	4	4	4	4.5	4.5	5	5	5	6	6	6	6	6
24 sf	4	4	4.5	4.5	4.5	5	5	6	6	6	6	6	6
25 sf	4	4	4.5	4.5	5	5	5	6	6	6	6	6	8
26 sf	4	4.5	4.5	4.5	5	5	5	6	6	6	6	8	8
27 sf	4	4.5	4.5	4.5	5	5	6	6	6	6	6	8	8
28 sf	4	4.5	4.5	5	5	5	6	6	6	6	6	8	8
29 sf	4.5	4.5	4.5	5	5	6	6	6	6	6	8	8	8
30 sf	4.5	4.5	5	5	5	6	6	6	6	6	8	8	8

For 'H' = 11 ft., Area = 16 $ft.^2$

- Refer to the Aluminum Column (Post) Selection Table, from Sheet 3 and shown here for reference.
- To determine the required post size, find the intersection of the row labeled "16 SF" and the column labeled "11 FT". For the example the intersection value is "4" (4" OD).
- In the Column (Post) and Foundation Table, the value "4" shows the design requires a 4.0" diameter and ¼" thick Aluminum Column (Post) and a 2.0' diameter and 3.5' deep Concrete Foundation and 3.0' Stub.

STEP 4: For sign assemblies with signs oriented in two directions, only the sign with the largest area should be analyzed to determine the Column (Post) requirements.

GUIDE TO USE THIS INDEX

SHEET	CONTENTS
1	General Notes and Design Example
2	Design Example – Centroid
3	Column and Foundation Tables
4	Slip Base and Foundation Details
5	Driven Post, Concrete Stub, and Soil Plate Details
6	Wind Beam Connection
7, 8 & 9	Frequently Used Sign Clusters

GENERAL NOTES:

1. Shop Drawings:
   This Index is considered fully detailed. Submit Shop Drawings only for minor modifications not detailed in the Plans.

2. Aluminum Sign, Wind Beams and Column (Post) Materials:
   A. Aluminum Plates: ASTM B209, Alloy 6061–T6
   B. Aluminum Bars and Extruded Shapes: ASTM B221, Alloy 6061–T6
   C. Aluminum Structural Shapes: ASTM B221 Alloy 6061–T6
   D. Cast Aluminum: ASTM B26 Alloy A356–T6
   E. Aluminum Weld Material: ER 5556 or 5356

3. Galvanized Steel Slip Base Stub Materials:
   A. Steel Plate and Structural Shapes: ASTM A36 or ASTM A709, Grade 36
   B. Steel Weld Metal: E70XX

4. Sign Mounting Bolts, Nuts and Washers:
   A. Aluminum Button Head and Flat Head Bolts: ASTM F468 Alloy 2024–T4
   B. Aluminum Hex Nuts: ASTM F467 Alloy 6061–T6 or 6262–T9
   C. Aluminum Washers: ASTM B221, Alloy 7075–T6

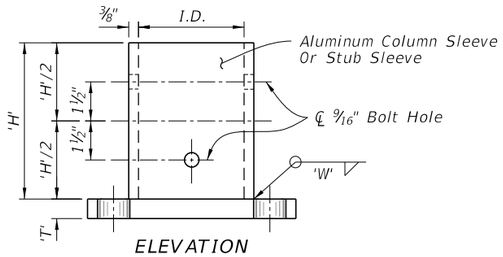
5. Stainless Steel Bolts, Nuts and Washers may be used in lieu of the Aluminum button head and flat head bolts as follows:
   A. Stainless Steel Bolts: ASTM Ft 593 Alloy Group 2, Condition A, CW1 or SH1
   B. Stainless Steel Nuts: ASTM F594

6. Sign Column (Post) Bolts, Nuts and Washers:
   A. Galvanized U–Bolt (Column): ASTM A449 or ASTM A193 B7 according to ASTM F2329 with double nuts (nut and lock washer optional).
   B . Aluminum Bolts (Sleeve): ASTM F468, Alloy 6061–T6 or 2024–T4 with Hex Nuts F467 6061–T6 or 6262–T9 and Washers B221, Al clad 2024–T4
   C. Galvanized High Strength Hex Head Bolts (Base Bolts): ASTM F3125, Grade A325, Type 1
   D. Galvanized Hex Nuts: ASTM A563 Grade D
   E. Galvanized Washers: ASTM F436
   Ft. Galvanized Bolts (Sleeve): ASTM A307 with Galvanized Hex Nuts and Washers

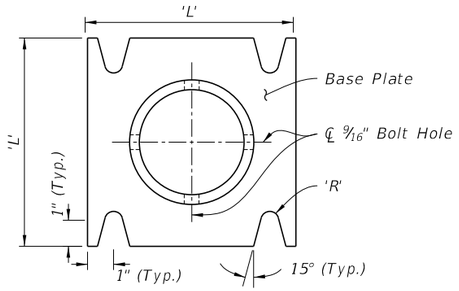
7. Coatings:
   A. Aluminum Fasteners: Anodic coating (0.0002 inches mint.) and chromate sealed
   B. High Strength Steel Bolts Nuts and Washers: ASTM F2329
   C. All other steel items (excluding stainless steel): Hot –dip Galvanize – ASTM A123
   D. Repair damaged galvanizing in accordance with Specification 562

8. BREAKAWAY SUPPORTS REQUIREMENTS: Install non –frangible aluminum column (post) (larger than 3½") with breakaway supports as shown on Sheet 4. Signs shielded by barrier wall or guardrail do not require breakaway support.

7/30/2020 9:29:55 AM



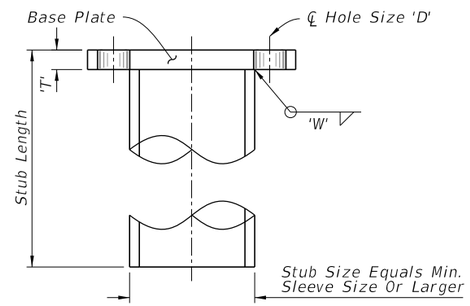
ELEVATION



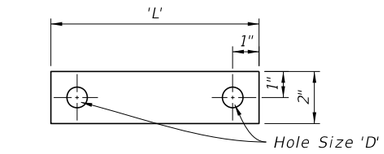
PLAN

(Welded Or Sandcast)

STUB/SLEEVE & BASE PLATE DETAILS

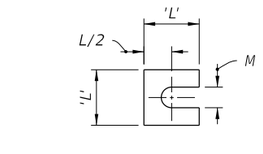


(Welded)



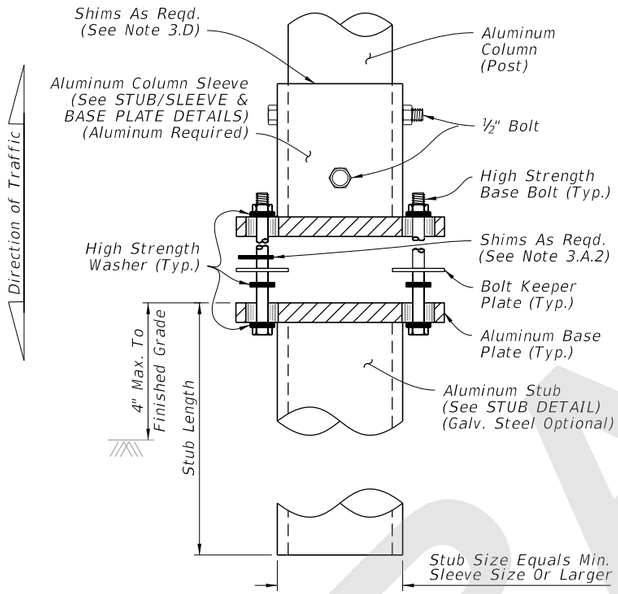
28 Ga. Thick Aluminum Strip
2 Reqd. Per Base

BOLT KEEPER PLATE DETAIL

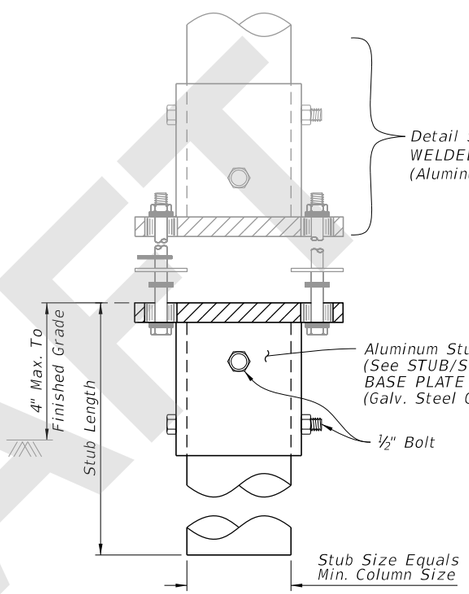


Provide 2~0.0149" Thick (28 gauge)
and 2~0.0329" Thick (21 gauge)
Brass Shims Per Post

SHIM DETAIL

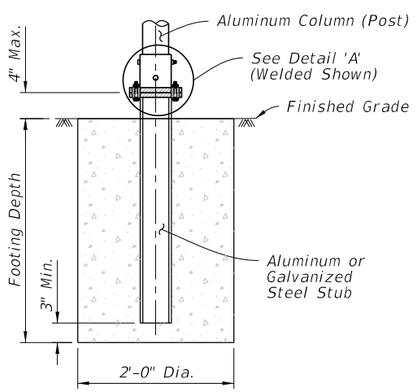


WELDED STUB BASE

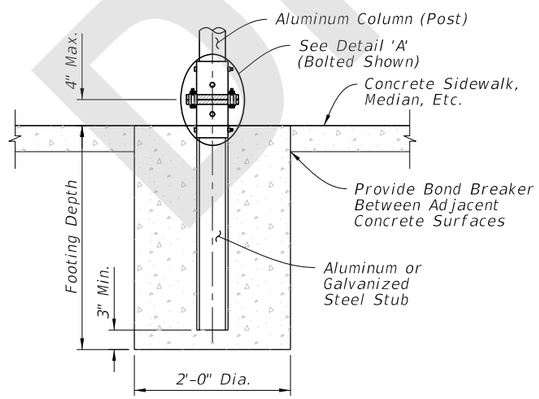


BOLTED STUB/SLEEVE BASE

STUB DETAIL



DETAIL 'A'



SLIP BASE AND FOUNDATION DETAIL
(Non-Frangible Column, Typ.)

SLIP BASE AND FOUNDATION DETAIL IN CONCRETE
(Non-Frangible Column In Crossovers, Medians & Sidewalks)

NOTES:

1. Foundation Notes for Slip Base:

   A. Place Stub into concrete foundation given in the FOUNDATION TABLE using Class I Concrete.

2. Slip Base Fabrication Notes:

   A. The difference between the O.D. of the post and I.D. of the Sleeve must be 1/16" or less.

   B. The WELDED STUB BASE and lower STUB/SLEEVE BASE PLATE may be fabricated using galvanized steel as an option to aluminum. The upper portion of the SLIP BASE must be aluminum.

   C. Either a Welded Stub Base or Bolted Stub/Sleeve Base may be used in Slip Base.

   D. For cast base plates bolted to foundation stubs, use a foundation stub the same size as the sign column (Post).

3. Slip-Base Assembly Instructions:

   A. Assemble the Slip Base as follows:
      1. Insert Post into Sleeve and connect using 2 ~ ½" diameter Sleeve Bolts.
      2. Assemble top base plate to bottom Base Plate using Base Bolts (High strength) with 3 washers per bolt. (See Detail 'A'):
         a. Place one washer on each Base Bolt between the bottom Base Plate and the Base Bolt head.
         b. Place the next washer between the Bottom Base Plate and the Bolt Keeper Plate.
         c. Use brass or galvanized steel shims to plumb the post.
         d. Add the top base plate section.
         e. Place the third washer between the Top Base Plate and the Nut.

   B. Orient the Bolt Keeper Plates in the Direction of Traffic.

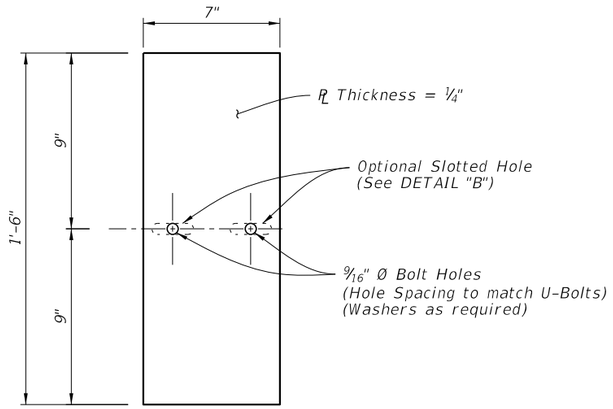
   C. Tighten Base Bolts as follows:
      1. Tighten Base Bolts to the maximum possible with a 12" to 15" wrench (this will bed the washers and shims and clear the bolt threads).
      2. Loosen each Base Bolt one turn.
      3. Under the supervision of the Engineer, use a calibrated wrench to tighten bolts to the torque prescribed in the SLIP BASE DETAILS Table. Over tightened Base Bolts are not permitted.
      4. Distort bolt threads at the junction with nuts to prevent loosening. Repair damaged galvanizing.

   D. Obtain a tight sleeve connection by placing 4 galvanized steel shims between the column (post) and sleeve. Space the shims evenly around the perimeter of the column (1 between each bolt hole, 4 total). Use shims that are 1" shorter than the height of the sleeve.

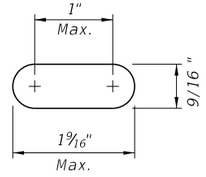
Column (Post) Size	SLIP BASE DETAILS													
Outside Dia.	Wall Thickness	Sleeve I.D. (Max.)	Sleeve Height 'H'	Weld 'W'	Base Plate 'L'	Base Plate 'T'	Radius 'R'	Base Bolt Size	Base Bolt Length	Base Plate Torque ft-lbs	Base Plate Torque in.-lbs	Hole Size 'D'	SHIM L	SHIM M
4"	¼"	4 1/16"	6"	¼"	8"	¾"	11/32"	⅝"	3"	29	345	1 1/16"	1⅜"	1 1/16"
4½"	¼"	4 9/16"	6"	¼"	8"	⅞"	11/32"	⅝"	3¼"	29	345	1 1/16"	1⅜"	1 1/16"
5"	¼"	5 1/16"	7"	¼"	8"	⅞"	11/32"	⅝"	3¼"	29	345	1 1/16"	1⅜"	1 1/16"
6"	¼"	6 1/16"	8"	¼"	9"	1"	13/32"	¾"	3½"	46	554	1 3/16"	1¾"	1 3/16"
8"	¼"	8 1/16"	10"	¼"	11"	1"	15/32"	⅞"	3¾"	53	640	1 5/16"	2⅜"	1 1/16"

SLIP BASE AND FOUNDATION DETAILS

9/4/2020 7:11:09 AM

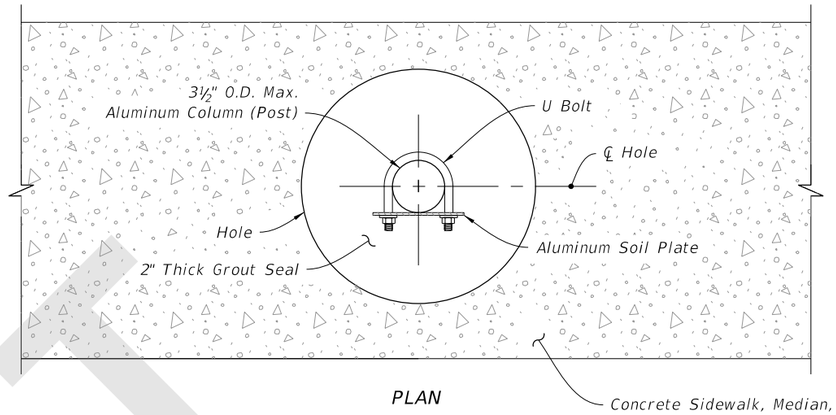


ALUMINUM SOIL PLATE DETAIL

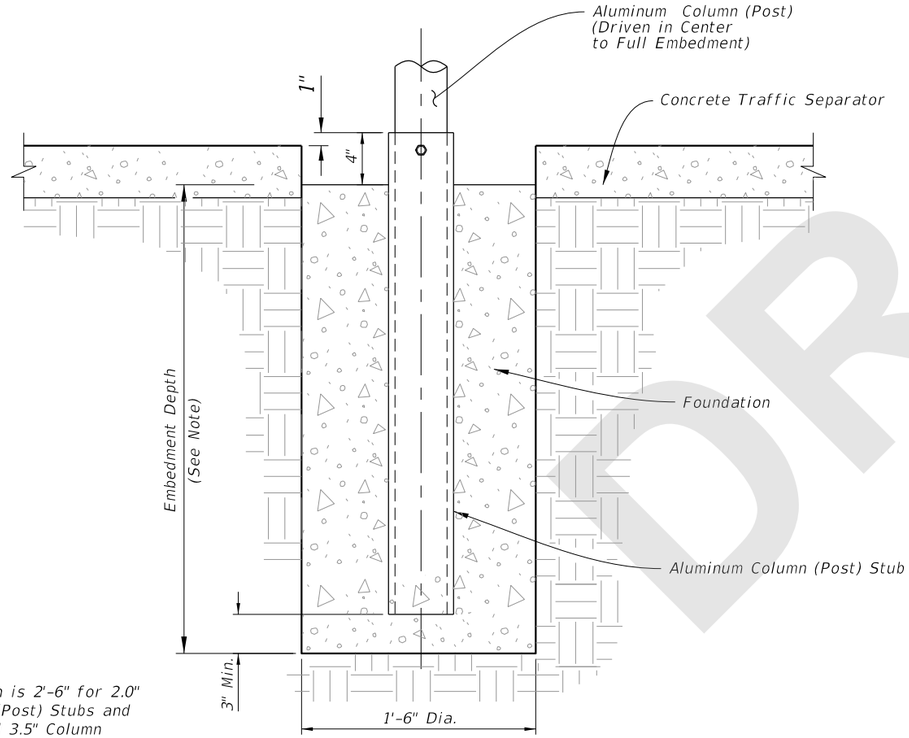


Optional Slotted Holes

DETAIL "B"



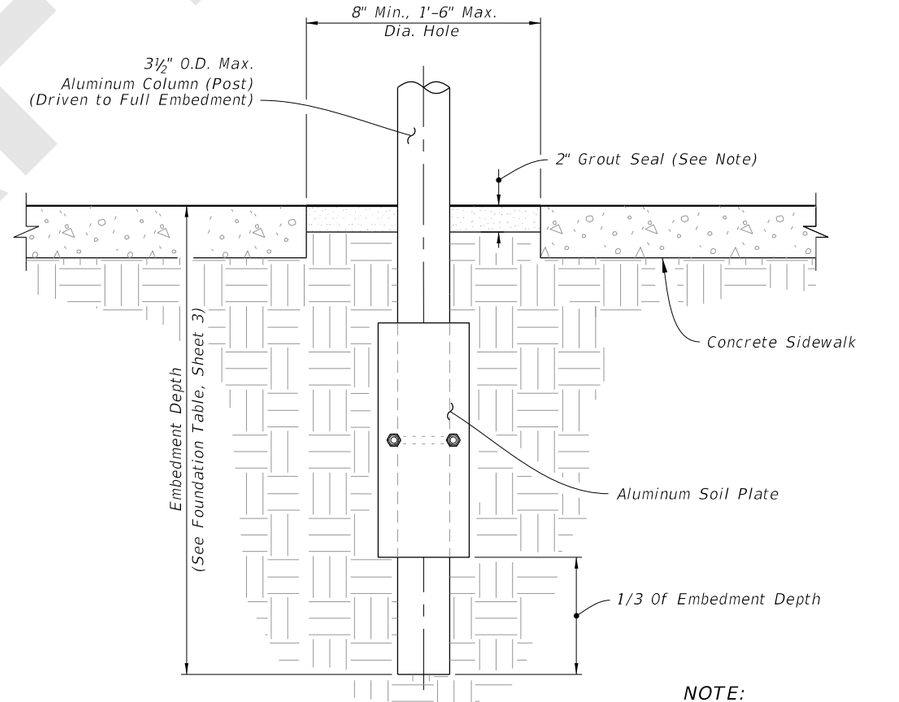
PLAN



NOTE:
Embedment Depth is 2'-6" for 2.0" and 2.5" Column (Post) Stubs and 3'-6" for 3.0" and 3.5" Column (Post) Stubs.

ELEVATION

CONCRETE/STUB DETAIL
(Traffic Separator)



NOTE:
Grout seal only required when sidewals is present.

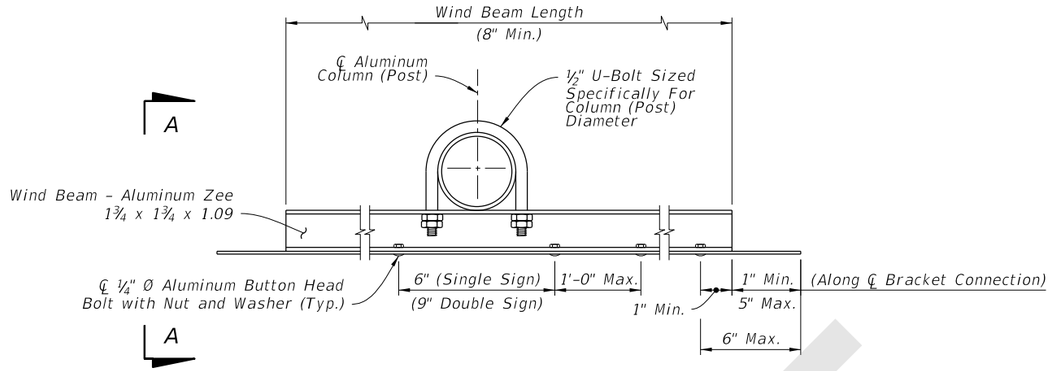
ELEVATION

DRIVEN POST DETAIL
(Frangible Post In Through Sidewalk Shown
Installations without Sidewalk Similar)

DRIVEN POST, CONCRETE/STUB, AND SOIL PLATE DETAILS

9/4/2020 7:13:49 AM

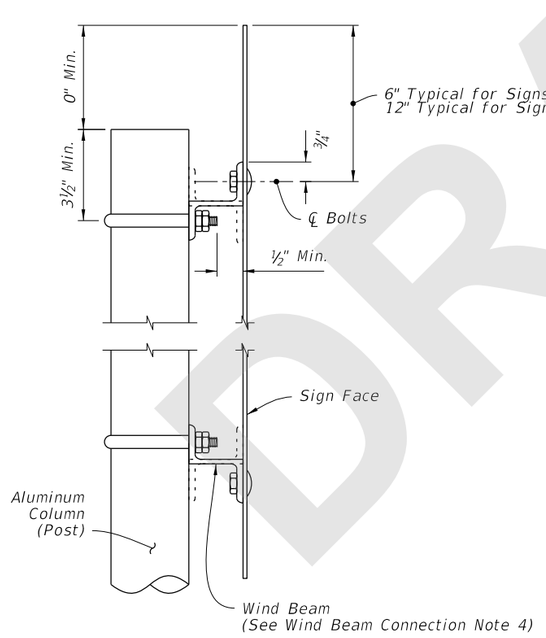
LAST REVISION	REVISION	DESCRIPTION:				
11/01/20			FDOT FY 2021-22 STANDARD PLANS	SINGLE COLUMN GROUND SIGNS	INDEX 700-010	SHEET 5 of 10



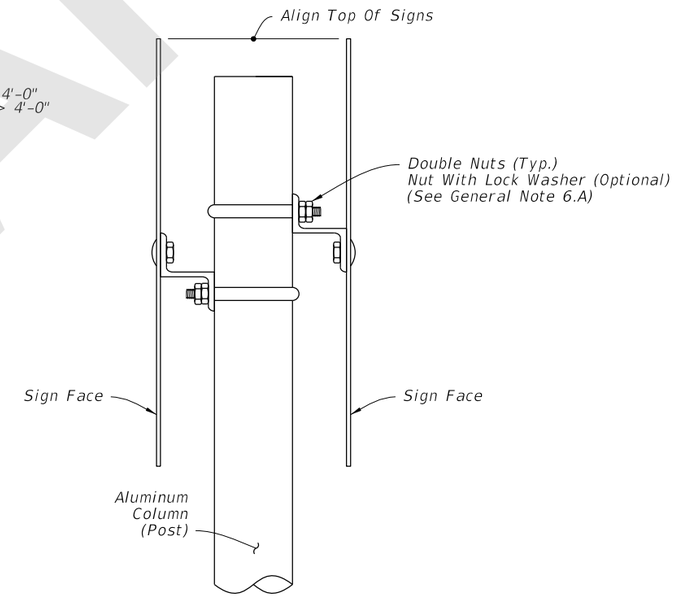
WIND BEAM CONNECTIONS DETAILS

NOTES:

1. 5/16" Ø stainless steel hex head bolts with nylon washer under head and washer under nut may be used in lieu of ¼" Ø aluminum button or flat head bolts.
2. Use nylon washers (provided by the sheeting supplier) under the bolt heads to protect sign sheeting.
3. Slots up to 2" long are allowed in wind beams to accommodate U-Bolts for varying Column (Post) diameters.
4. Wind beams may be oriented in either direction.
5. For signs greater than 66" in height, install a third wind beam evenly spaced between the top and bottom wind beams. For signs up to 12" in height, use only one wind beam at ℄ Sign. Install two wind beams on signs with heights greater than 12" and less than or equal to 66".



SINGLE SIGN DETAIL



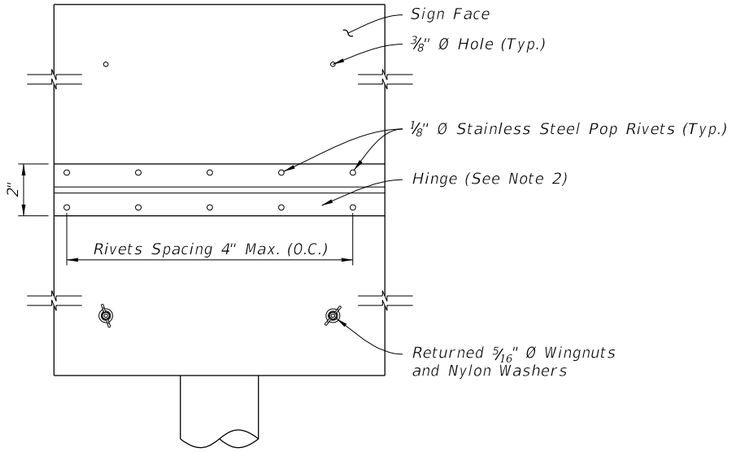
NOTE: Use the area and the centroid location of the largest sign to determine aluminum column (post) size.

BACK-TO-BACK SIGN DETAIL

VIEW A-A

7/30/2020 9:30:10 AM

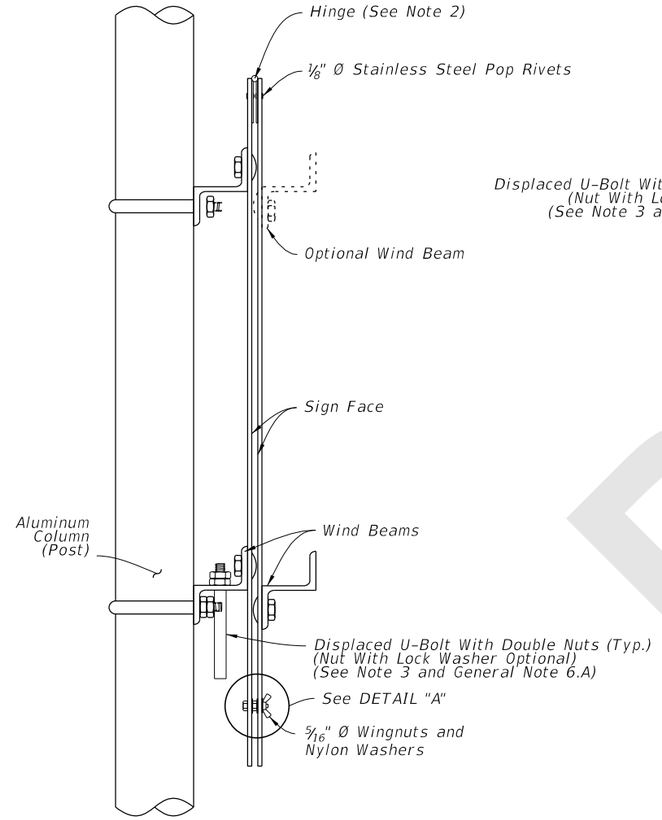
WIND BEAM CONNECTION



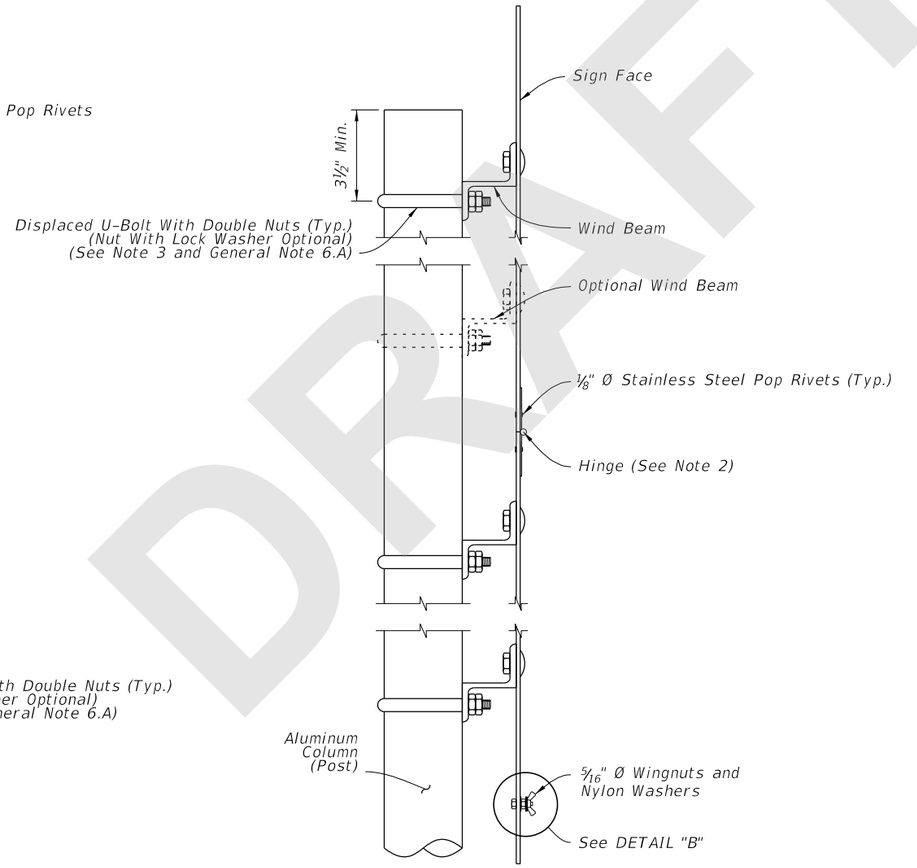
SIGN PANEL FRONT VIEW

NOTES:

1. Install sign in the undeployed (down) position.
2. Provide a continuous stainless steel hinge with minimum 0.060" leaf thickness, 2" open width and 0.120" pin diameter. Stake the hinge at both ends to prevent pin movement.
3. Stowed 1 or 2 pcs of U-Bolt sized specifically for column (post) diameter. Stowed on Wind Beam and displaced while deploying the sign.
4. Bolts, Wingnuts, and washers at the bottom corners of the sign hold the sign panels closed when in the undeployed (down) position. Store bolts, wingnuts, and washers in the bottom corner of the sign when in the deployed (up) position.

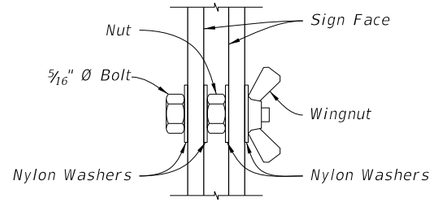


UNDEPLOYED SIGN DETAIL

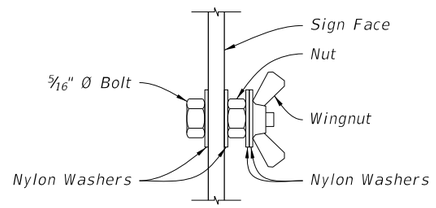


DEPLOYED SIGN DETAIL

SIGN PANEL SIDE VIEW



DETAIL "A"



DETAIL "B"

7/30/2020 9:30:12 AM

WIND BEAM CONNECTION FOR FLIP UP SIGN

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	SINGLE COLUMN GROUND SIGNS	INDEX	SHEET
11/01/20					700-010	7 of 10