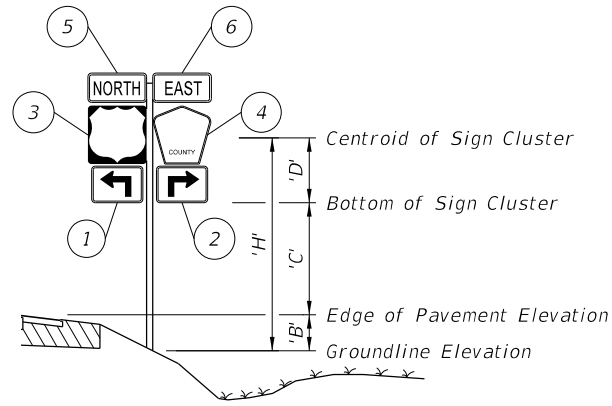


STEP 1: Calculate the area and the centroid for an individual sign or a sign cluster. Note that the centroid and areas have been calculated for frequently used signs. These are shown on Sheets 6, 7, 8 and 9.



Size H x V	Centroid			'A <sub>n</sub> ' (in. <sup>2</sup> )	'X <sub>n</sub> ' x 'A <sub>n</sub> ' (in. <sup>3</sup> )	'Y <sub>n</sub> ' x 'A <sub>n</sub> ' (in. <sup>3</sup> )
	Local 'Y <sub>n</sub> '	Global 'X <sub>n</sub> '	Global 'Y <sub>n</sub> '			
(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
<b>TOTALS</b>				<b>2,218</b>	<b>-1,890</b>	<b>60,133</b>

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

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

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<sub>c</sub> = -0.1 ft., Y<sub>c</sub> = 'D' 2.26 ft.

Since X<sub>c</sub> = -0.1 < 6", it is not a cantilever sign, only dark-bold lines in the table will be referenced to.

'H' = 'B' + 'C' + 'D' = 10.26 ft. ==> **USE 11 ft.**    Σ ('A<sub>n</sub>') = 15.4 ft.<sup>2</sup> ==> **USE 16 ft.<sup>2</sup>**

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

		ALUMINUM COLUMN (POST) SELECTION TABLE													
		'H' (FT)													
TOTAL PANEL AREA (SF)		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	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	3.5
	5 sf	2.5	3	3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	6 sf	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4
	7 sf	3	3.5	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	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	4
	10 sf	3.5	3.5	3.5	3.5	3.5	4	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	4	4.5	4.5
	12 sf	3.5	3.5	3.5	4	4	4	4	4	4	4	4	4	4.5	4.5
	13 sf	3.5	3.5	4	4	4	4	4	4	4	4	4	4	4.5	4.5
	14 sf	3.5	3.5	4	4	4	4	4	4	4	4	4	4	4.5	4.5
15 sf	3.5	4	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	4.5	4.5	5	5	5	6	
17 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
18 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
19 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
20 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
21 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
22 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
23 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
24 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
25 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
26 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
27 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
28 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
29 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	
30 sf	4	4	4	4	4	4	4	4	4.5	4.5	5	5	5	6	

For 'H' = 11 ft., Area = 16 ft.<sup>2</sup>

- Refer to the Aluminum Column (Post) Selection Table, as copied from Sheet 3 and shown here.

- 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" concludes that the design requires a 4.0" diameter and 1/4" 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.

GENERAL NOTES:

- Shop Drawings: This Index is considered fully detailed. Submit Shop Drawings for minor modifications not detailed in the Plans.
- Aluminum Sign, Wind Beams and Column (Post) Materials:
  - Aluminum Plates: ASTM B209, Alloy 6061-T6
  - Aluminum Bars and Extruded Shapes: ASTM B221, Alloy 6061-T6
  - Aluminum Structural Shapes: ASTM B308 Alloy 6061-T6
  - Cast Aluminum: ASTM B26 Alloy A356-T6
  - Aluminum Weld Material: ER 5556 or 5356
- Sign Mounting Bolts, Nuts and Washers:
  - Aluminum Button Head and Flat Head Bolts: ASTM F468 Alloy 2024-T4
  - Aluminum Hex Nuts: ASTM F467 Alloy 6061-T6 or 6262-T9
  - Aluminum Washers: ASTM B221, Alloy 7075-T6
- Stainless Steel Bolts, Nuts and Washers may be used in lieu of the Aluminum button head and flat head bolts as follows:
  - Stainless Steel Bolts: ASTM F 593 Alloy Group 2, Condition A, CW1 or SH1
  - Stainless Steel Nuts: ASTM F594
- Sign Column (Post) Bolts, Nuts and Washers:
  - Galvanized U-Bolt (Column): ASTM A449 or ASTM A193 B7 according to ASTM F2329 with nuts and washers
  - 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
  - Galvanized High Strength Hex Head Bolts (BaseBolts): ASTM F3125, Grade A325, Type 1
  - Galvanized Hex Nuts: ASTM A563 Grade DH
  - Galvanized Washers: ASTM F436
  - Galvanized Bolts (Sleeve): ASTM A307 with Galvanized Hex Nuts and Washers
- Coatings:
  - Aluminum Fasteners: Anodic coating (0.0002 inches min.) and chromate sealed
  - High Strength Steel Bolts Nuts and Washers: ASTM F2329
  - All other steel items (excluding stainless steel): Hot-dip Galvanize - ASTM A123
  - Repair damaged galvanizing in accordance with Specification Section 562
- BREAKAWAY SUPPORTS REQUIREMENTS: Install non-frangible aluminum column (post) (larger than 3 1/2") with breakaway supports as shown on Sheet 4. Signs shielded by barrier wall or guardrail do not require breakaway supports.

Corrected 4

GUIDE TO USE THIS INDEX

NOTES AND EXAMPLE

10/27/2017 10:03:02 AM

LAST REVISION 11/01/17	DESCRIPTION:	FY 2018-19 STANDARD PLANS	SINGLE COLUMN GROUND SIGNS	INDEX 700-010	SHEET 1 of 9
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