SINGLE COLUMN GROUND SIGN NOTES:

1) DESIGN WIND SPEED: See Wind Speeds by County.

2) GENERAL SPECIFICATIONS: Current FDOT Standard Specifications for Road and Bridge Construction and supplements thereto.

3) DESIGN SPECIFICATIONS: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, as modified by the FDOT Structures Manual.

4) ALUMINUM: Aluminum Materials shall meet the requirements of Aluminum Association Alloy 6061-T6 (ASTM B209, B221, or B308), except as noted below.

5) CONCRETE: Class I.

6) SIGN PANELS: 0.08 inches min. thick Aluminum Plate with all corners rounded.

7) ALUMINUM BOLTS, NUTS, AND LOCK WASHERS:
   a. Aluminum bolts: ASTM F468, Alloy 2042-T4 with at least 0.0002 inches thick anodic coating and chromate sealed.
   b. Nuts: ASTM F467, Alloy 6061-T6 or 6262-T9.
   c. Lockwashers: ASTM B221, Alloy 7075-T6.

8) STAINLESS STEEL BOLTS, NUTS, AND LOCKWASHERS:
   Stainless Steel Bolts, Nuts, and Lockwashers: ASTM F593 and ASTM F594, Alloy Group 2. Condition A, CW2, or SH4 may be provided in lieu of Aluminum Bolts, Nuts, and Washers.

9) U-BOLTS, NUTS, AND LOCKWASHERS:
   U-bolts, Nuts, and Lockwashers: ASTM A307, Grade A, galvanized in accordance with ASTM F2329.

10) BREAKAWAY SUPPORTS REQUIREMENTS: Install non-frangible aluminum column (post) (larger than 3½") with breakaway supports as shown on Sheet 5 of 8. Signs shielded by barrier wall or guardrail do not require breakaway support.

11) QPL: Manufacturers seeking approval of alternates to aluminum round tube, such as steel U-channel and steel square tube single post ground sign assemblies for inclusion on the Qualified Products List (QPL), must submit a QPL application, design calculations, detailed drawings and design tables showing the product meets all the requirements.

WIND SPEEDS BY COUNTY:

110 MPH
Alachua, Baker, Bradford, Clay, Columbia, Gadsden, Gilchrist, Hamilton, Hardee, Jackson, Jefferson, Lafayette, Lake, Leon, Madison, Marion, Polk, Putnam, Sumter, Suwannee and Union counties.

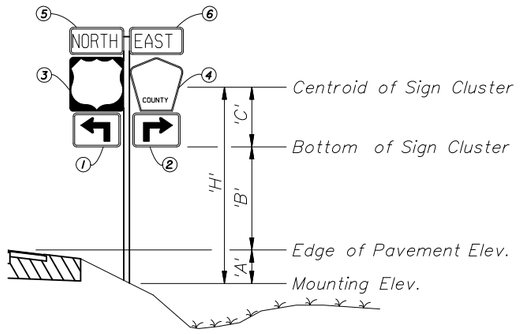
130 MPH
Bay, Brevard, Calhoun, Charlotte, Citrus, De Soto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hendry, Hernando, Highlands, Hillsborough, Holmes, Lee, Levy, Liberty, Manatee, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Pasco, Pinellas, Sarasota, Seminole, St Johns, Taylor, Volusia, Wakulla, Walton and Washington counties.

150 MPH
Broward, Collier, Dade, Escambia, Indian River, Martin, Monroe, Palm Beach, Santa Rosa and St. Lucie counties.

GUIDE TO USE THIS STANDARD:

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 Sheet No. 6, 7 & 8 of 8.
2. Determine the height 'H' from groundline for the individual sign or the cluster.
3. Select the appropriate Column (Post) Selection Tables by Wind Speed and find the intersection point.
4. Design the post and the foundation according to the dark-bold lines or shaded area (if cantilever sign) in the Column (Post) Selection Tables and Post and Foundation Table. For sign posts with signs oriented in two directions, only the sign with the largest area should be analyzed to determine the post requirements.

EXAMPLE:



	Size H x V	Centroid: local $'Y_n'$	Centroid: global $'X_n'$	Centroid: global $'Y_n'$	$'A_n'$	$'X_n' \times 'A'_n$	$'Y_n' \times 'A'_n$	
	(IN x IN)	(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	
					2,218	-1,890	60,133	TOTALS

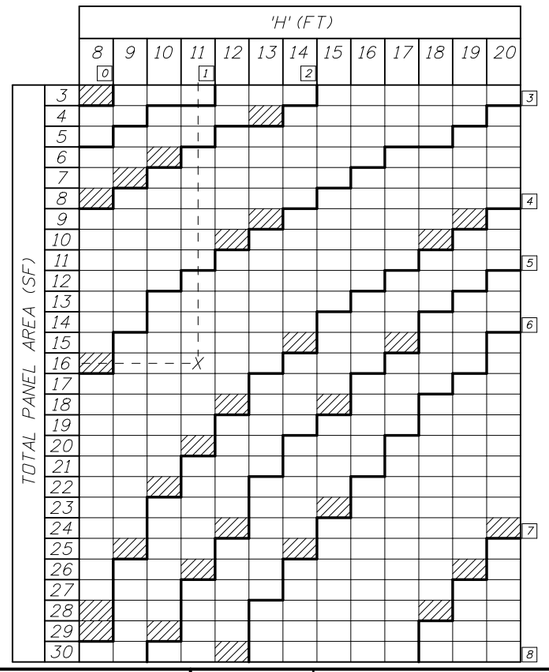
$\Sigma('A_n') = 2{,}218\ IN^2 = 15.4\ FT^2$ $\quad \Sigma('X_n' \times 'A_n') = -1{,}890\ IN^3 = -1.09\ FT^3$ $\quad \Sigma('Y_n' \times 'A_n') = 60{,}133\ IN^3 = 34.8\ FT^3$

$'X'_c = \frac{\Sigma('X'_n \times 'A'_n)}{\Sigma'A'_n} = -0.1\ FT$ $\quad 'Y'_c = \frac{\Sigma('Y'_n \times 'A'_n)}{\Sigma'A'_n} = 2.26\ FT$

Assume: Bay County, 'A' = 1 FT, 'B' = 7 FT
Calculated: $'X'_c = -0.1$ FT 'C' = $'Y'_c = 2.26$ FT
Since $'X'_c < 6''$, it is not a cantilever sign, only dark-bold lines in the table will be referenced to.

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

ALUMINUM COLUMN (POST) SELECTION TABLE (WIND SPEED = 130 MPH)



For WIND SPEED = 130 MPH,
'H' = 11 FT, Area = 16 FT^2

- Refer to the 130 mph Column (Post) Selection Table, as copied from Sheet 3 of 8 and shown here.
- Using the 16 ft^2 area on the left hand side of the table, go across to the 11 ft height and find the cell marked with X.
- find the symbol [4] which the dark-bold line under the X cell leads to.
- In the Post and Foundation Table, the symbol [4] concludes that the design requires a 4.0" diameter and 0.25" thick Aluminum Column (Post) and a 2.0' diameter and 4.0' deep Concrete Foundation.

▨ = If CANTILEVER SIGN configuration (see Cantilever Sign Details) falls in this region, use next larger post size than that indicated.

NOTES AND EXAMPLE

REVISIONS

DATE	BY	DESCRIPTION
01/01/08	DYW	Changed SINGLE COLUMN GROUND SIGN NOTES Note 11 and GUIDE TO USE THIS STANDARD Note 4. Changed '5.0"' to '4.0"'.
01/01/09	DYW	Modified concrete classification.
07/01/09	DYW	Modified 'Aluminum Column (Post) Selection Table' in Example.

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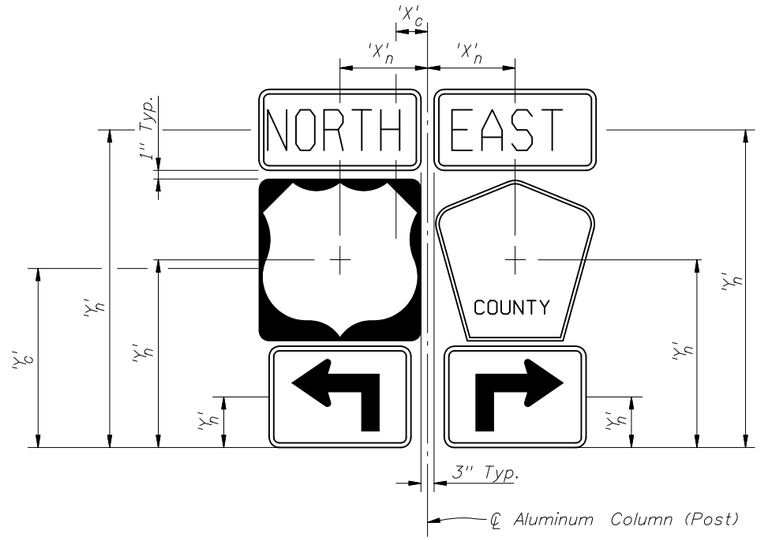


SIGN CLUSTER

CALCULATION OF SIGN CLUSTER CENTROID:

$$'X'_c = \frac{\Sigma('X'_n \times 'A'_n)}{\Sigma'A'_n}$$

$$'C' = 'Y'_c = \frac{\Sigma('Y'_n \times 'A'_n)}{\Sigma'A'_n}$$

'X'c = Centroid horizontal location of sign or cluster from ℄ Column (post)

'Yc' = Centroid height of sign or cluster from bottommost edge

'H' = Height of sign or cluster centroid from groundline

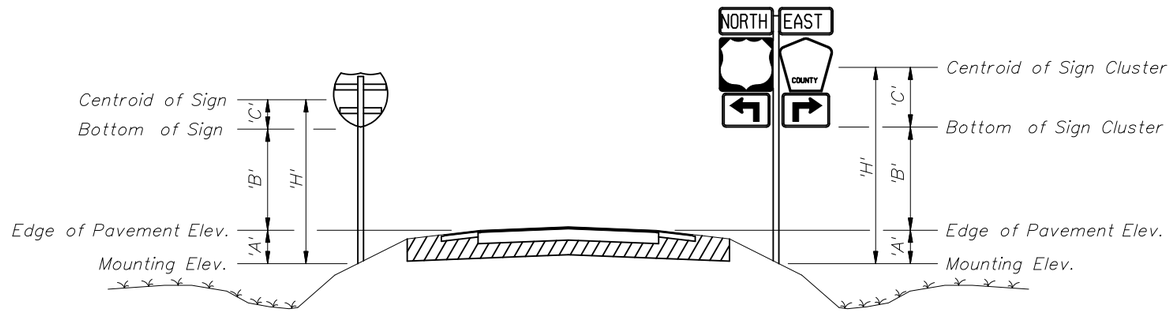
'X'n = Individual sign centroid horizontal location from ℄ Column (post)

'Yn' = Individual sign centroid height from bottommost edge

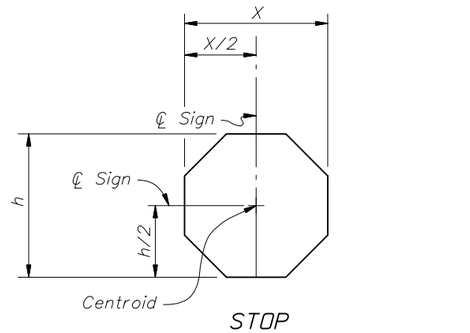
'An' = Area of individual sign

For 'A' & 'B' see Index No. 17302 and Roadway Plans.

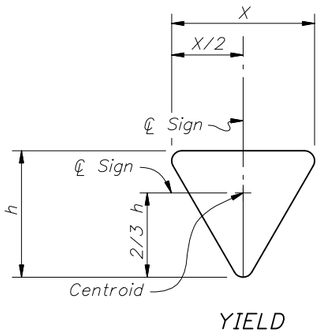
NOTE:
No sign or sign cluster area shall exceed 30 SF nor shall any sign or sign cluster have a total width exceeding 60 inches.



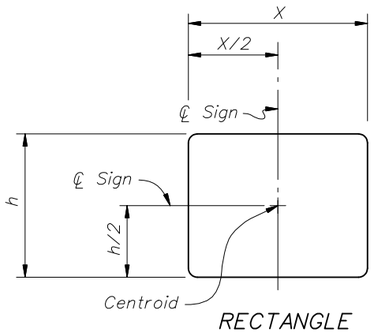
TYPICAL SECTION



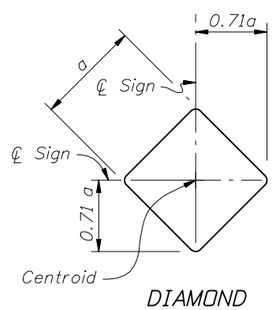
STOP



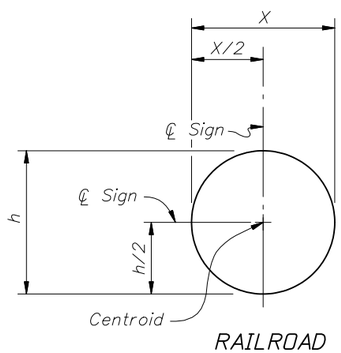
YIELD



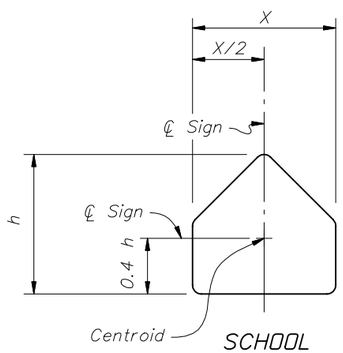
RECTANGLE



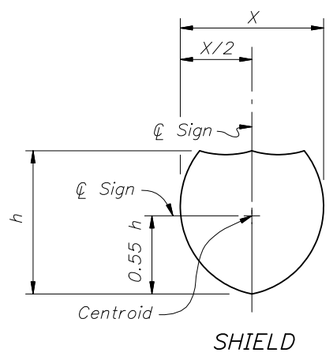
DIAMOND



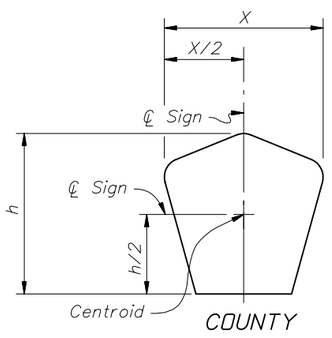
RAILROAD



SCHOOL



SHIELD



COUNTY

CENTROID AND HEIGHT

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed "horizontal" to "size" in NOTE.			
07/01/09	DYW	Changed maximum limits of sign cluster area and width in NOTE.			

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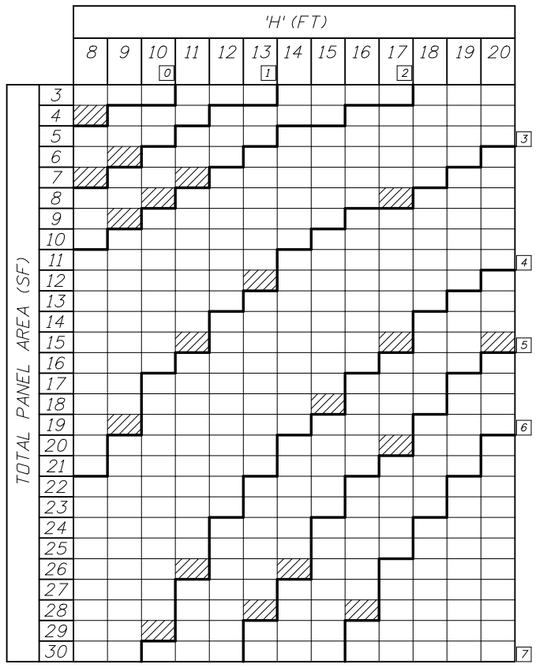
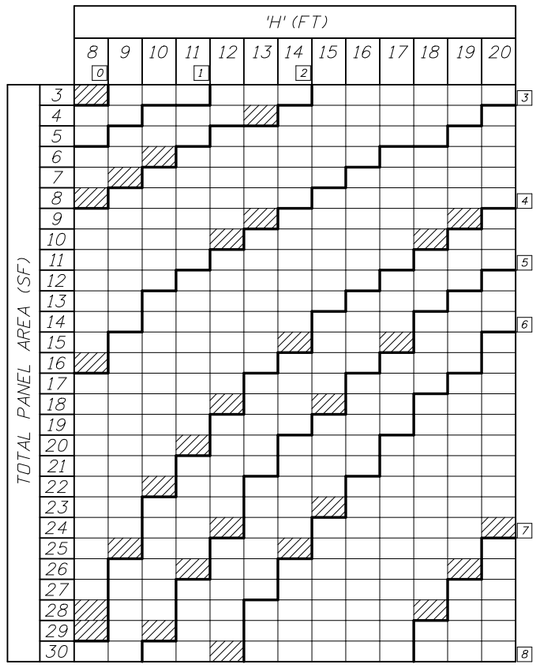
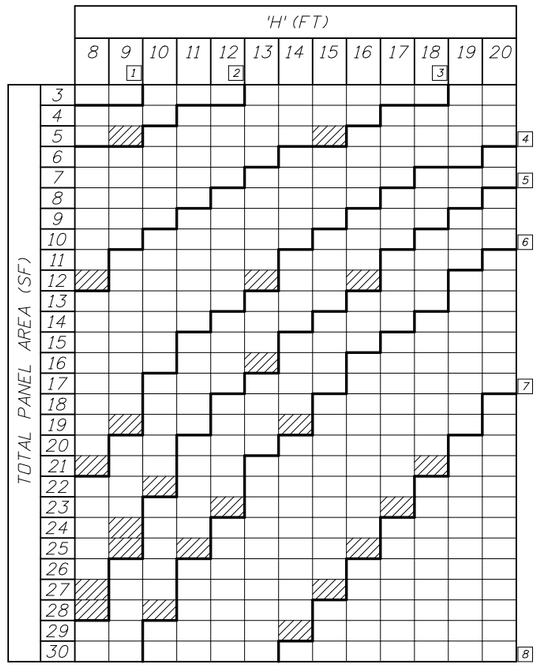
ALUMINUM COLUMN (POST) SELECTION TABLE (WIND SPEED = 110 MPH)

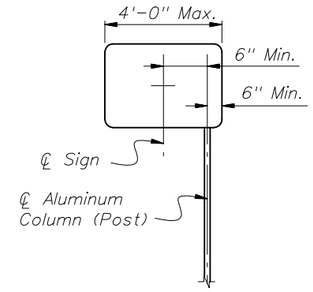


ALUMINUM COLUMN (POST) SELECTION TABLE (WIND SPEED = 130 MPH)



ALUMINUM COLUMN (POST) SELECTION TABLE (WIND SPEED = 150 MPH)





CANTILEVER SIGN

NOTE:
All cantilever sign installations shall comply with Standard Index 17302.

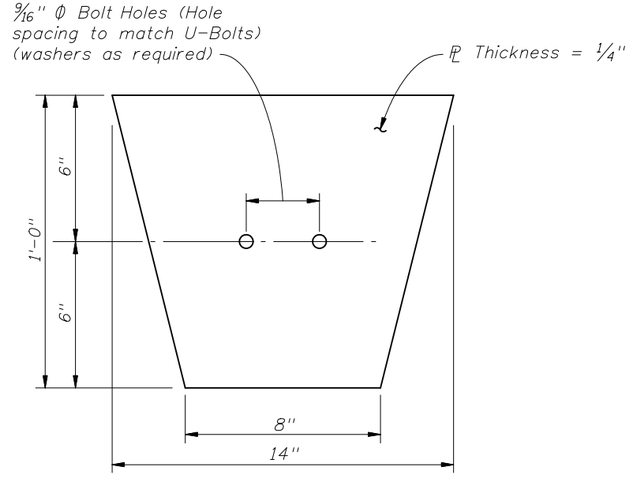
/////// = If CANTILEVER SIGN configuration (see Cantilever Sign Details) falls in this region, use next larger post size than that indicated.

POST AND FOUNDATION TABLE

	Foundation Alternatives					
	Post Size		Driven Post *		Concrete **	
			Depth (FT)			
	Diameter (IN)	Wall (IN)	without Soil Plate	with Soil Plate	Diameter (FT)	Depth (FT)
0	2.0	1/8	4.5	2.5	2.0	2.0
1	2.5	1/8	5	3	2.0	2.0
2	3.0	1/8	5	3.5	2.0	2.5
3	3.5	3/16	6	4.5	2.0	3.0
4	4.0	1/4	---	---	2.0	4.0
5	4.5	1/4	---	---	2.0	4.0
6	5.0	1/4	---	---	2.0	4.5
7	6.0	1/4	---	---	2.0	5.0
8	8.0	5/16	---	---	2.0	5.5

* INSTALLING FRANGIBLE COLUMN SUPPORTS:
Columns (posts) may be installed by driving the columns in accordance with this Index, or as an alternate method, the columns (posts) may be set to the depth indicated in preformed holes backfilled with suitable material tamped in layers not thicker than 6" to provide adequate compaction or filled with flowable fill or bagged concrete.

** See Note 5 on Sheet 1 of 8.



ALUMINUM SOIL PLATE DETAILS

NOTES: 1. Align Soil Plate bottom at 2/3 of foundation depth.
2. Slot up to 15/16" long is allowed to accommodate various post sizes.

POST AND FOUNDATION TABLES

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed plate dimensions and notes.			
07/01/08	DYW	Changed soil plate details.			
07/01/09	DYW	Modified 'Aluminum Column (Post)Selection Tables'.			

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