

## **Session 57**

### **Chester Henson**

Florida Dept. of Transportation

### ***New Single Column Sign Standards***

#### **Topic Description**

The Department is in the process of adopting the 2001 AASHTO Code and the creating new county wind speed maps based on the ASCE 7 (05) wind speed map. The session will review the impacts of the changes and the proposed format of the new single column sign Standard Indexes.

#### **Speaker Biography**

Chester has more than 35 years of transportation experience in the areas of planning, design, construction and management of highway, bridge, and general civil engineering projects. He is currently the State Traffic Standards Engineer and is responsible for policy, standards and specifications in the areas of signing, pavement marking, signalization and lightings.

## Session 57

### New Single Column Sign Standards

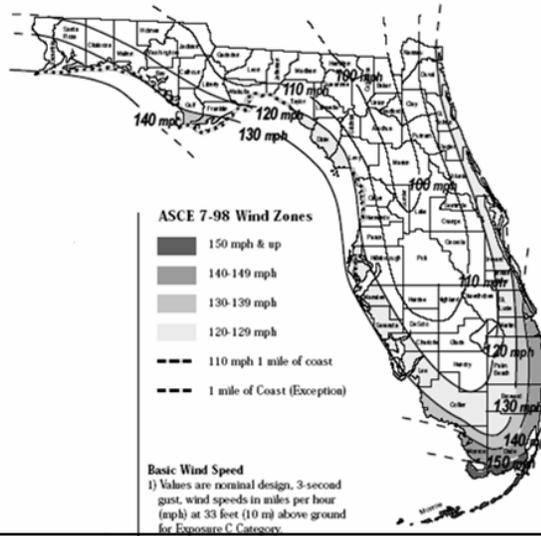


### Why New Standards

- Existing Standards Based on 1994 AASHTO Code
- New Standards Based on 2001 AASHTO Code and ASCE 7 Wind Speed Map

## Wind Speeds

State of Florida



## Pressure Equation

$$P_z = 0.00256 K_z G V^2 I_R C_d$$

Where  $I_R =$

1.0	(50 yr. Design)
0.80	(25 yr. Design)
0.54	(10 yr. Design)

## Wind Speeds By County

### ZONE NO. 1 (110 MPH)

*Alachua, Baker, Bradford, Clay, Columbia, Gadsden, Gilchrist, Hamilton, Hardee, Jackson, Jefferson, Lafayette, Lake, Leon, Madison, Marion, Polk, Putnam, Sumter, Suwanee, Union.*

### ZONE NO. 2 (130 MPH)

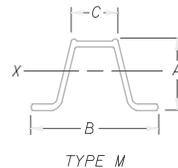
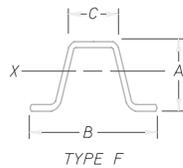
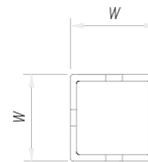
*Bay, Brevard, Calhoun, Charlotte, Citrus, De Soto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hendry, Hernando, Highlands, Hillsborough, Holmes, Lee, Levy, Liberty, Manatee, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Pasco, Pinellas, Sarasota, Seminole, St. Johns, Taylor, Volusia, Wakulla, Walton,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

### ZONE NO. 3 (150 MPH)

*Broward, Collier, Dade, Escambia, Indian River, Martin, Monroe, Palm Beach, Santa Rosa, St. Lucie.*

## Posts Analyzed

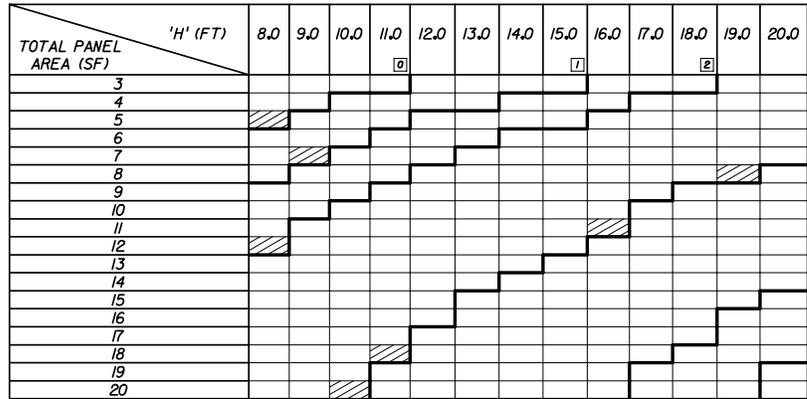
- Round Aluminum
- Steel Square Tube
- Steel Flanged Channel





## Basis of Analysis

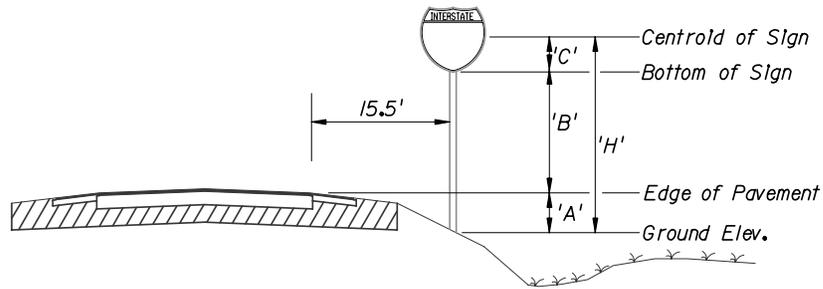
WIND SPEED = 110 MPH



## Results of Analysis

- Limited Use for Square and Flanged Channel Sections
- Standards Will Only Include Round Aluminum Post and Aluminum Post Details

## Example No. 1



TYPICAL SECTION

## Example No. 1

- Orange County

*ZONE NO. 1 (110 MPH)*

*Alachua, Baker, Bradford, Clay, Columbia, Gadsden, Gilchrist, Hamilton, Hardee, Jackson, Jefferson, Lafayette, Lake, Leon, Madison, Marion, Polk, Putnam, Sumter, Suwanee, Union.*

*ZONE NO. 2 (130 MPH)*

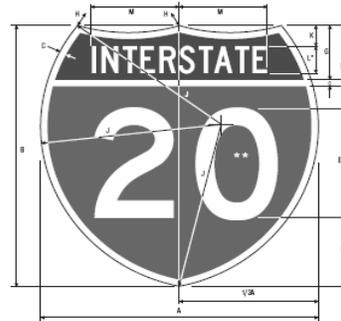
*Bay, Brevard, Calhoun, Charlotte, Citrus, De Soto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hendry, Hernando, Highlands, Hillsborough, Holmes, Lee, Levy, Liberty, Manatee, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Pasco, Pinellas, Sarasota, Seminole, St Johns, Taylor, Volusia, Wakulla, Walton,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

*ZONE NO. 3 (150 MPH)*

*Broward, Collier, Dade, Escambia, Indian River, Martin, Monroe, Palm Beach, Santa Rosa, St. Lucie.*

## Example No. 1

- Interstate Shield



M1-1  
INTERSTATE SHIELD

\*Series 2000 Standard Alphabets.  
\*\*Typical space numbers about vertical centerline.

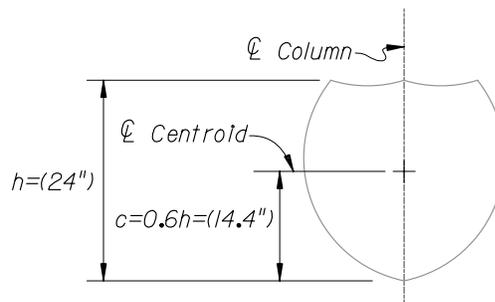
SHW	A	B	C	D	E	F	G	H	J	K	L	M
1.2 digits	24	24	8	7.620	10.0	8.375	8	16	16	2	2	2
1.2 digits	36	36	7.5	11.5	10.0	9.5	7.5	22.5	22.5	2.75	4.0	12.245
1.2 digits	48	48	1	15.375	20.0	11	10	30	30	4	6	16.507
3 digits	30	24	8	7.620	10.0	8.375	8	24	17	2	2.5	10.011
3 digits	45	36	7.5	11.5	15.0	9.5	7.5	30	25.5	2.75	4.0	17.455
3 digits	60	48	1	15.375	20.0	11	10	40	34	4	6	21.618

COLORS: LEGEND - WHITE (RETROREFLECTIVE)  
TOP - RED (RETROREFLECTIVE)  
BOTTOM - BLUE (RETROREFLECTIVE)

5-1

## Example No. 1

- Interstate Shield

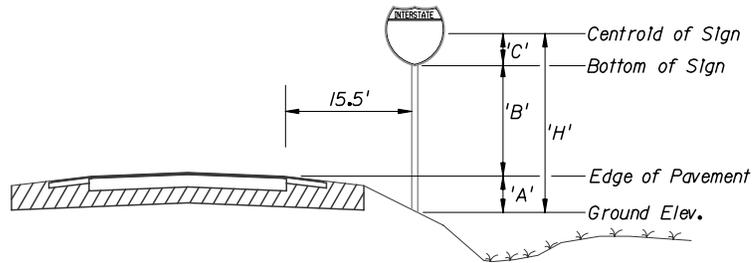


Area = 3.20 sf

Centroid =  $14.4/12 = 1.20$  ft

SHIELD

## Example No. 1



TYPICAL SECTION

$$A = (12 \times 0.06) + (3.5/6) = 1.30 \text{ ft}$$

$$B = 7.0 \text{ ft} \quad C = 1.20 \text{ ft}$$

$$H = 9.50 \text{ ft}$$

## Example No. 1

Wind Speed = 130 mph

Area = 3.20 sf

Height = 9.50 ft

WIND SPEED = 130 MPH

TOTAL PANEL AREA (SF)	'H' (FT)	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
3			0				1			2				
4														
5														
6														3
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20														6

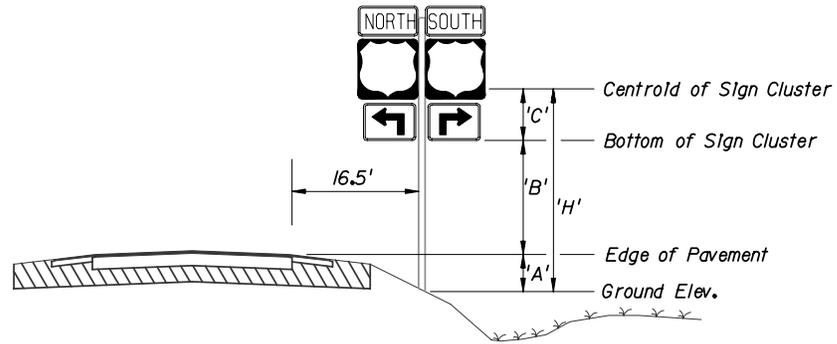
## Example No. 1

	Post Size		Foundation Alternatives		
			Set Post	Concrete	
	Diameter (IN)	Wall (IN)	Depth (FT)	Diameter (FT)	Depth (FT)
0	2.0	1/8	6.0	2.0	3.0
1	2.5	1/8	7.0	2.0	3.0
2	3.0	1/8	7.0	2.0	4.0
3	3.5	3/16	8.0	2.0	4.0
4	4.0	1/4	---	2.0	5.0
5	4.5	1/4	---	2.0	5.0
6	5.0	1/4	---	2.0	6.0
7	6.0	1/4	---	2.0	6.0

## Example No. 2



## Example No. 2



TYPICAL SECTION

## Example No. 2

- Broward County

*ZONE NO. 1 (110 MPH)*

*Alachua, Baker, Bradford, Clay, Columbia, Gadsden, Gilchrist, Hamilton, Hardee, Jackson, Jefferson, Lafayette, Lake, Leon, Madison, Marion, Polk, Putnam, Sumter, Suwanee, Union.*

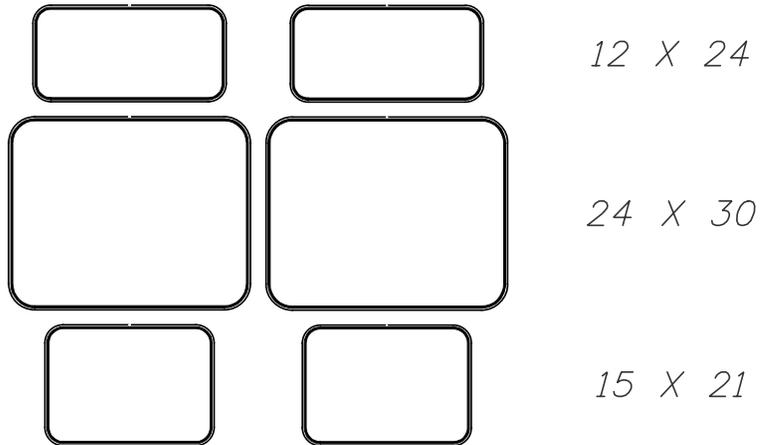
*ZONE NO. 2 (130 MPH)*

*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, Washington.*

*ZONE NO. 3 (150 MPH)*

*Broward, Collier, Dade, Escambia, Indian River, Martin, Monroe, Palm Beach, Santa Rosa, St. Lucie.*

## Example No. 2

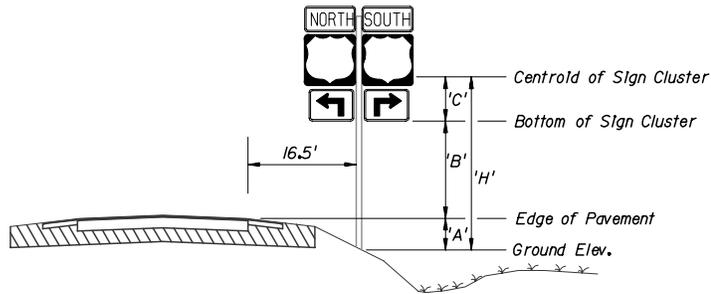


## Example No. 2

Sign Size	Centroid		Area (A)	$(y_n)(A)$
	Local	Global ( $y_n$ )		
15 X 21	7.5	7.5	315	2,362.5
15 X 21	7.5	7.5	315	2,362.5
24 X 30	12	15+1+12= 28	720	20,160
24 X 30	12	15+1+12= 28	720	20,160
12 X 24	6	15+1+24+1+6= 47	288	13,356
12 X 24	6	15+1+24+1+6= 47	288	13,356
<b>Totals</b>			<b>2,646</b>	<b>72,117</b>

$$C = \frac{\sum(y_n)(A)}{\sum(A)} = \frac{72,117}{2,646} = 27.26 \text{ in. or } 2.27 \text{ ft.}$$

## Example No. 2



TYPICAL SECTION

$$A = (12 \times 0.06) + (4.5/6) = 1.47 \text{ ft}$$

$$B = 7.0 \text{ ft} \quad C = 2.27 \text{ ft}$$

$$H = 10.74 \text{ ft}$$

## Example No. 2

Wind Speed = 150 mph

Area =  $2,646 / 144 = 18.38 \text{ sf}$

Height = 10.74 ft

WIND SPEED = 150 MPH

TOTAL PANEL AREA (SF)	'H' (FT)	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
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## Example No. 2

	Post Size		Foundation Alternatives	
	Diameter (IN)	Wall (IN)	Set Post Depth (FT)	Concrete Diameter (FT) Depth (FT)
0	2.0	1/8	6.0	2.0 3.0
1	2.5	1/8	7.0	2.0 3.0
2	3.0	1/8	7.0	2.0 4.0
3	3.5	3/16	8.0	2.0 4.0
4	4.0	1/4	---	2.0 5.0
5	4.5	1/4	---	2.0 6.0
6	5.0	1/4	---	2.0 6.0
7	6.0	1/4	---	2.0 6.0



Questions ???