

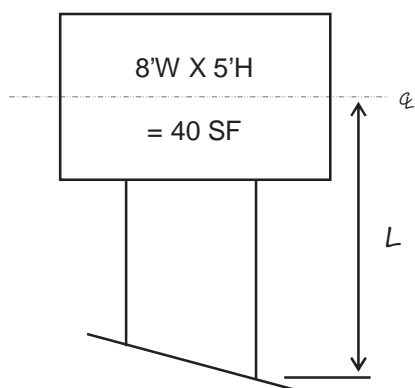
**Appendix A-5**

**GROUND MOUNTED SUPPORT CHARTS**

**WOOD SUPPORTS**

Wood supports are selected using the tables included in this section of the Appendix. For standard signs, the Book of Standards gives the required number and size of wood supports. The tables given here list the maximum sign area for each combination of longest support, post size, and number of supports. To read these tables, find your longest support length (L) in the left most column, read across that row to find the sign area (Square Feet) equal to or next larger than your sign, and read up to find the size and number of supports.

As an example, consider the support size necessary for the following sign:



Using the wood support chart for Districts 1,2, and 5 with L= 9.5 Feet and an area of 40 SF, we can use 2-6"x8" supports (62 SF). This presents the designer with some choices, because two 6"x8" supports must be 7'-0" apart to meet breakaway requirements. These are:

1. The first choice in this situation would be to use the 6"x8" supports and clearly mark on the plans that a minimum of 7'-0" spacing must be used. This deviates from SHA spacing standards. This allows the preferred support size to be used.

2. The second choice in this situation would be to mount the sign on two 6"x8" supports or three 6"x6" supports (nonbreakaway) and to install w-beam to protect the sign.
3. The third, will be to use breakaway steel supports. This would be extremely oversized.

These types of situations are frequently encountered when designing sign supports. The designer should use engineering judgement to ensure that the type of support is matched with the intended function of the sign.

**NON-BREAKAWAY STEEL SUPPORTS**

Non-Breakaway steel supports are selected based on the sign width (W), the sign height (H), and L<sub>MAX</sub>, the maximum distance between the top of footing and the bottom of sign. Use the following steps to determine the appropriate support size. Note that L<sub>MAX</sub> is calculated based on your support spacing and roadside elevations (see the chapters on Field Review and Sign Supports).

- The information in these tables is grouped by sign width, so in the left most column of the table, find the appropriate sign width. Since the table is incremented every two feet, use the next higher grouping for odd values of W.
- Within width group W, find the appropriate value of L<sub>MAX</sub> in column 2.
- From L<sub>MAX</sub>, read horizontally until you reach the column representing the height of your sign (H).
- You now have the required steel support size.

The sizes listed in the table take the form W6x9, and represent the structural shape, followed by the beam depth, followed by the weight of the beam in pounds per foot. All of the sizes used in this table have a Category Code Number, however, if you are working with an existing contract you should try to work with the sizes used in the contract. Areawide contracts typically use W6x9, W6x15, W8x21, W10x26, W14x30, W16x31, W18x35, W18x40, and W21x44 supports. For non-breakaway foundation details refer to Standard MD 801.04.

## BREAKAWAY STEEL SUPPORTS

Breakaway steel supports are selected based on the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" requirements. These requirements include the wind speed, structure design life, yield stress, width and height of sign panel, number of sign posts, distance between posts and the maximum under sign clearance. SHA requires designers to use the Transpo Industries "Break-Safe" sign post selection program for selecting the appropriate steel supports in their design. This software incorporates the AASHTO requirements listed above and allows users to input data for each parameter.

Square Tube and I-Beam are the two types of breakaway steel supports to be used in Maryland. Based on AASHTO guidelines, the clear distance between the inside edge of the two breakaway steel supports using the Transpo 'B' system must be greater than 7 feet. Therefore, for signs that cannot accommodate two supports while maintaining 7' of clear distance, one breakaway steel square tube post must be used. For all other applications with clear distances exceeding 7' between supports, I-Beams must be used. The 'Break-Safe' sign post selection software has programs for both I-Beam and Square Tube supports.

The designer must select either the I-Beam or the Square Tube Program from the list of programs in the 'Break-Safe' menu. Both programs require the following parameters to be input the designer:

- Basic Wind Speed for Location (mph): Input **100 mph** for all applications.
- Structure Design Life / Recurrence Interval (10, 25, 50, or 100 years): Input **10 years** for all applications in accordance with the AASHTO recommendation for typical roadside sign structures.
- Yield Stress for Steel I-Beam Post (psi): Use **36,000 psi** (ASTM A36) for standard steel I-beam shapes.

Use **46,000 psi** (ASTM A500), Grade B for structural square steel tube post.

- Width of Sign Panel (ft): Measured horizontally from left edge to right edge of sign panel.
- Height of Sign Panel (ft): Measured vertically from top edge to bottom edge of sign panel.
- Maximum Under Sign Clearance (ft): Measured vertically from the bottom edge of the sign panel to the ground at the location of the longest post. May include fractions of a foot, for example 12.75 ft. Note that multiple-post breakaway signs must have an under sign clearance of at least 7.0 ft, in accordance with Section 12.5.3 of the AASHTO Specifications.
- Number of Posts (1, 2, 3, 4, or 5): Must be an integer. The program assumes that all posts in the sign structure are the same size, type and material.
- Clear Distance Between Adjacent Posts (ft): Measured horizontally from inside edge of one post to inside edge of the adjacent post. May include fractions of a foot, for example 7.25 ft. This distance is zero (0) for single-post signs. For multiple-post signs, the program assumes that all posts are evenly spaced i.e. *both* distances between adjacent posts in a 3-post sign are equal.

When all the parameters have been input by the designer, the program outputs the correct minimum steel support size required to satisfy loading conditions that correspond to the input parameters.

The steel I-Beam size calculated by the I-Beam program is in the form W6x12, and represents the structural shape, followed by the beam depth, followed by the weight of the beam in pounds per foot.

The steel square tube calculated by the Square Tube Post Program is in the form 4 x 4 x 3/16, and represents the width of each side followed by the thickness of the steel.

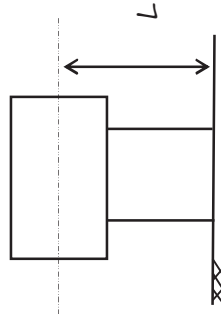
The designer now has the correct steel support size to be used in the design.

For breakaway foundation details refer to Standards MD 801.04, MD 801.04-01 and MD 801.04-02.

NOTE: W6X9 I-Beam supports shall not be placed on Breakaway System 'B' as per SHA requirements. W6X9 I-Beam supports shall only be installed on Breakaway System 'A'.

**Breakaway Wood Support Selection Chart**  
 Districts 1, 2 and 5

L (FEET)	Allowable Sign Area (SF)											
	One Post				Two Post				Three Post			
	4" x 4"	4" x 6"	6" x 6"	6" x 8"	4" x 4"	4" x 6"	6" x 6"	6" x 8"	4" x 4"	4" x 6"	6" x 6"	6" x 8"
7	7	16	25	45	14	33	50	90	21	49	75	134
8	6	14	22	39	12	29	43	78	18	43	65	117
9	5	13	19	35	11	25	38	69	16	38	58	104
10	5	11	17	31	10	22	34	62	14	33	52	93
11	4	10	16	28	8	20	31	56	13	30	47	84
12	4	9	14	26	8	18	28	51	11	27	43	77
13	3	8	13	24	7	16	26	47	10	24	39	71
14	3	7	12	22	6	16	24	44	9	22	36	65
15	3	7	11	20	6	13	22	40	8	20	33	61

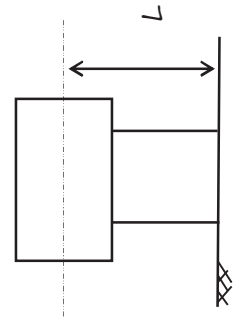


Based on 65 MPH Wind Speed.

**Breakaway Wood Support Selection Chart**  
 Districts 3, 4, 6 and 7

L (FEET)	Allowable Sign Area (SF)											
	One Post				Two Post				Three Post			
	4" x 4"	4" x 6"	6" x 6"	6" x 8"	4" x 4"	4" x 6"	6" x 6"	6" x 8"	4" x 4"	4" x 6"	6" x 6"	6" x 8"
7	8	19	29	53	17	39	58	105	25	58	87	158
8	7	17	25	46	14	33	51	92	22	50	76	138
9	6	15	23	41	13	29	45	81	19	44	68	122
10	6	13	20	36	11	26	40	73	17	39	61	109
11	5	12	18	33	10	23	37	66	15	35	55	99
12	4	10	17	30	9	21	33	60	13	31	50	90
13	4	9	15	28	8	19	31	55	12	28	46	83
14	4	9	14	26	7	17	28	51	11	26	42	77
15	3	8	13	24	7	16	26	47	10	24	39	71

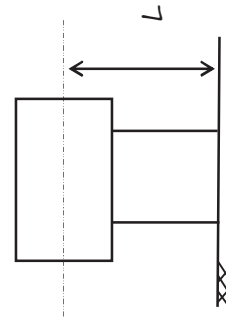
Based on 60 MPH Wind Speed.



**Non-Breakaway Wood Support Selection Chart**  
 Districts 1, 2 and 5

L (FEET)	Allowable Sign Area (SF)											
	One Post				Two Post				Three Post			
	4" x 4"	4" x 6"	6" x 6"	6" x 8"	4" x 4"	4" x 6"	6" x 6"	6" x 8"	4" x 4"	4" x 6"	6" x 6"	6" x 8"
7	7	18	29	53	14	36	57	107	21	53	86	160
8	6	15	25	47	12	31	50	93	18	45	75	140
9	5	14	22	41	11	27	44	82	16	42	66	124
10	5	12	20	37	9	24	40	74	14	36	59	111
11	4	11	18	33	8	22	36	67	13	33	54	100
12	4	10	16	30	8	19	33	61	11	30	49	92
13	3	9	15	28	7	18	30	56	10	27	45	84
14	3	8	14	26	6	16	27	52	9	24	42	78
15	3	7	13	24	6	15	26	48	8	21	39	72

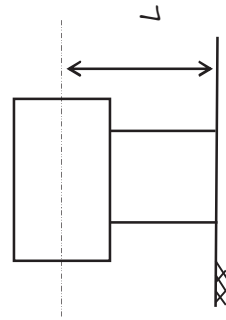
Based on 65 MPH Wind Speed.



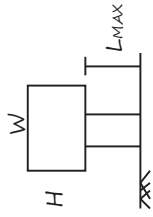
**Non-Breakaway Wood Support Selection Chart**  
 Districts 3, 4, 6 and 7

L (FEET)	<u>Allowable Sign Area (SF)</u>											
	<u>One Post</u>				<u>Two Post</u>				<u>Three Post</u>			
	<u>4" x 4"</u>	<u>4" x 6"</u>	<u>6" x 6"</u>	<u>6" x 8"</u>	<u>4" x 4"</u>	<u>4" x 6"</u>	<u>6" x 6"</u>	<u>6" x 8"</u>	<u>4" x 4"</u>	<u>4" x 6"</u>	<u>6" x 6"</u>	<u>6" x 8"</u>
7	8	21	34	63	17	42	67	125	25	63	101	188
8	7	18	29	55	14	36	59	109	22	54	88	164
9	6	16	26	48	13	32	52	97	19	48	78	145
10	5	14	23	43	11	28	47	87	17	42	70	130
11	5	13	21	39	10	25	42	79	15	38	63	118
12	4	11	19	36	9	23	38	72	13	34	58	108
13	4	10	18	33	8	21	35	66	12	31	53	99
14	4	9	16	30	7	19	32	61	11	28	49	91
15	3	9	15	28	7	17	30	56	10	26	45	85

Based on 60 MPH Wind Speed.



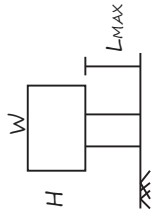
**Non-Breakaway Steel Supports  
 Two Post Selection Chart (A36 Steel)  
 100 MPH  
 10 Year Recurrence**



W (FEET)	L MAX (FEET)	HEIGHT 'H' IN FEET																
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
<b>6</b>	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	10	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	12	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	14	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	16	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
<b>8</b>	18	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	20	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	10	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	12	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
<b>10</b>	14	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
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	20	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
<b>12</b>	10	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
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	14	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	16	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	18	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12
	20	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12

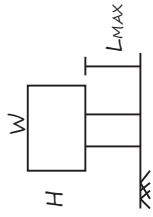


**Non-Breakaway Steel Supports  
 Two Post Selection Chart (A36 Steel)  
 100 MPH  
 10 Year Recurrence**



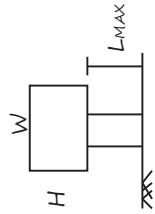
W (FEET)	L MAX (FEET)	HEIGHT 'H' IN FEET																			
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18					
<b>14</b>	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	8	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	10	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	12	W6x12	W6x12	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
	14	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
	16	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
<b>16</b>	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
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	10	W6x9	W6x12	W6x12	W6x15	W6x15	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
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	14	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
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<b>18</b>	6	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	8	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W6x15	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	10	W6x12	W6x12	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	12	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
	14	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
	16	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
<b>20</b>	6	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	8	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W6x15	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	10	W6x12	W6x12	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35	
	12	W6x15	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
	14	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35
	16	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W18x35

**Non-Breakaway Steel Supports  
 Two Post Selection Chart (A36 Steel)  
 100 MPH  
 10 Year Recurrence**



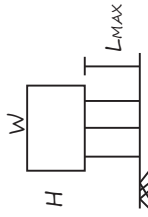
W (FEET)	L MAX (FEET)	HEIGHT 'H' IN FEET																			
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18					
<b>22</b>	6	W6x9	W6x9	W6x12	W6x12	W6x15	W6x12	W6x15	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W14x30	W16x31	W18x35	W16x31	W18x35	
	8	W6x9	W6x12	W6x12	W6x15	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	
	10	W6x9	W6x12	W6x15	W8x18	W8x18	W8x18	W8x21	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44
	12	W6x12	W8x18	W8x18	W8x18	W8x21	W8x21	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44
	14	W6x15	W8x18	W8x18	W8x18	W8x21	W10x22	W10x22	W10x26	W10x26	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44
	16	W8x18	W8x18	W8x21	W10x22	W10x22	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44
	18	W8x18	W8x21	W8x21	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44
	20	W8x21	W8x21	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44
	6	W6x9	W6x9	W6x12	W6x12	W6x15	W6x12	W6x15	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W14x30	W16x31	W18x35	W16x31	W18x35	W18x35
	8	W6x9	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44
10	W6x12	W8x18	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	
12	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
14	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
16	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
18	W8x18	W8x21	W10x26	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44	
20	W8x21	W10x26	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44	
6	W6x9	W6x9	W6x12	W6x12	W6x15	W6x12	W6x15	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W14x30	W16x31	W18x35	W16x31	W18x35	W18x35	
8	W6x9	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	
10	W6x12	W8x18	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	
12	W6x15	W8x18	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
14	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
16	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
18	W8x21	W10x22	W10x26	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44	
20	W8x21	W10x26	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44	
6	W6x9	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W14x30	W16x31	W18x35	W16x31	W18x35	W18x35	
8	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	
10	W6x15	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
12	W8x18	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
14	W8x18	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
16	W8x21	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x22	W10x26	W10x26	W12x26	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	
18	W8x21	W10x22	W10x26	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44	
20	W8x21	W10x26	W10x26	W10x26	W10x26	W10x26	W14x30	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	W21x44	W21x44	W21x44	

**Non-Breakaway Steel Supports  
 Two Post Selection Chart (A36 Steel)  
 100 MPH  
 10 Year Recurrence**



W (FEET)	L MAX (FEET)	HEIGHT 'H' IN FEET																
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
<b>30</b>	6	W6x9	W6x12	W6x15	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W21x44	W21x44	-	
	8	W6x12	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W21x44	-	-	
	10	W6x15	W6x18	W8x21	W8x21	W8x21	W8x21	W8x21	W10x26	W10x26	W10x26	W12x26	W14x30	W16x31	W21x44	-	-	
	12	W6x18	W8x21	W8x21	W8x21	W8x21	W8x21	W8x21	W10x26	W10x26	W10x26	W12x26	W14x30	W16x31	W21x44	-	-	
	14	W8x18	W8x21	W8x21	W8x21	W8x21	W8x21	W8x21	W10x26	W10x26	W10x26	W12x26	W14x30	W16x31	W21x44	-	-	
	16	W8x18	W8x21	W8x21	W8x21	W8x21	W8x21	W8x21	W10x26	W10x26	W10x26	W12x26	W14x30	W16x31	W21x44	-	-	
	18	W8x21	W10x26	W10x26	W10x26	W10x26	W10x26	W10x26	W12x26	W12x26	W12x26	W14x30	W16x31	W18x35	W21x44	-	-	
	20	W10x22	W10x26	W14x30	W14x30	W14x30	W14x30	W14x30	W16x31	W16x31	W16x31	W18x35	W18x35	W21x44	W21x44	-	-	

**Non-Breakaway Steel Supports**  
**Three Post Selection Chart (A36 Steel)**      **100 MPH**  
**10 Year Recurrence**

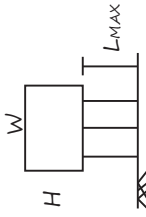


W (FEET)	L MAX (FEET)	HEIGHT 'H' IN FEET																
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
<b>6</b>	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>8</b>	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	10	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	12	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	14	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	
	16	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	
<b>10</b>	18	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	
	20	W6x12	W6x12	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	W6x15	
	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	
	10	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	
	12	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	14	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
<b>12</b>	16	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	18	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	20	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	
	10	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	
	12	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	

**Non-Breakaway Steel Supports**

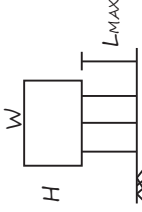
**Three Post Selection Chart (A36 Steel)**

**100 MPH**  
**10 Year Recurrence**



W (FEET)	L MAX (FEET)	HEIGHT 'H' IN FEET																	
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
<b>14</b>	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	-	-	-	-	-	-		
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	-	-	-	-	-	-		
	10	W6x9	W6x9	W6x9	W6x9	W6x12	W6x15	W6x15	-	-	-	-	-	-	-	-	-		
	12	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	-	-	-	-	-	-	-	-	-	-		
	14	W6x9	W6x12	W6x12	W6x15	W6x15	-	-	-	-	-	-	-	-	-	-	-		
	16	W6x12	W6x12	W6x15	W6x15	-	-	-	-	-	-	-	-	-	-	-	-		
<b>16</b>	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W8x18	W10x22	W10x22	W10x22	W10x22			
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22			
	10	W6x9	W6x9	W6x9	W6x9	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22			
	12	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22			
	14	W6x12	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	W8x21	-	-	-	-	-			
	16	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	-	-	-	-	-	-	-	-	-		
<b>18</b>	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W8x18	W8x21	W10x22	W10x22	W10x22			
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22			
	10	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22			
	12	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22	W10x22	W10x22			
	14	W6x12	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	W8x21	-	-	-	-	-			
	16	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	-	-	-	-	-	-	-	-	-		
<b>20</b>	6	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W8x18	W8x18	W10x22	W10x22	W10x22			
	8	W6x9	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22			
	10	W6x9	W6x9	W6x9	W6x12	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22			
	12	W6x9	W6x12	W6x12	W6x15	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	W8x18	W10x22	W10x22	W10x22			
	14	W6x12	W6x12	W6x15	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	W8x21	-	-	-	-	-			
	16	W6x12	W6x15	W8x18	W8x18	W8x18	W8x18	W8x18	-	-	-	-	-	-	-	-	-		

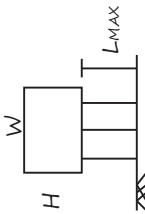
**Non-Breakaway Steel Supports**  
**Three Post Selection Chart (A36 Steel)**  
**100 MPH**  
**10 Year Recurrence**



W (FEET)	L MAX (FEET)	HEIGHT 'H' IN FEET																									
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18											
<b>22</b>	6	W6x9	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12							
	8	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12						
	10	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12					
	12	W6x9	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18				
	14	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18			
	16	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18		
<b>24</b>	6	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12			
	8	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12		
	10	W6x9	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	
	12	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	
	14	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	
	16	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	
<b>26</b>	6	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	8	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	10	W6x9	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	
	12	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18
	14	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18
	16	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18
<b>28</b>	6	W6x9	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	8	W6x9	W6x9	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	W6x12	
	10	W6x9	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	
	12	W6x12	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18
	14	W6x15	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18
	16	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18	W6x18

Office of Traffic and Safety  
 Traffic Engineering Design Division  
 Traffic Control Devices Design Manual

**Non-Breakaway Steel Supports**  
**Three Post Selection Chart (A36 Steel)**  
**100 MPH**  
**10 Year Recurrence**



		HEIGHT 'H' IN FEET																
W (FEET)	L MAX (FEET)	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
<b>30</b>	6	W6x9	W6x9	W6x9	W6x12	W6x15	W8x18	W8x21	W10x22	W10x22	W10x22	W12x26	W12x26	W14x30	W14x30	W21x44	-	
	8	W6x9	W6x9	W6x12	W6x15	W6x15	W8x18	W8x21	W10x22	W10x22	W10x22	W12x26	W14x30	W16x31	W18x35	W21x44	-	
	10	W6x9	W6x12	W6x15	W6x15	W6x18	W8x18	W10x22	W10x22	W10x22	W10x26	W12x26	W14x30	W16x31	W18x35	W21x44	-	
	12	W6x12	W6x15	W8x18	W8x18	W8x21	W8x21	W10x22	W10x22	W10x26	W12x26	W14x30	W16x31	W18x35	W21x44	-	-	
	14	W6x15	W8x18	W8x18	W8x21	W8x21	W10x22	W10x22	W10x26	W12x26	W14x30	W18x35	W18x35	-	-	-	-	
	16	W8x18	W8x18	W8x21	W8x21	W8x21	W10x22	W10x26	W12x26	W14x30	W18x35	-	-	-	-	-	-	
	18	W8x18	W8x21	W8x21	W10x26	W10x26	W10x26	W10x26	W14x30	-	-	-	-	-	-	-	-	
	20	W8x18	W8x21	W10x26	W10x26	W10x26	W14x30	-	-	-	-	-	-	-	-	-	-	