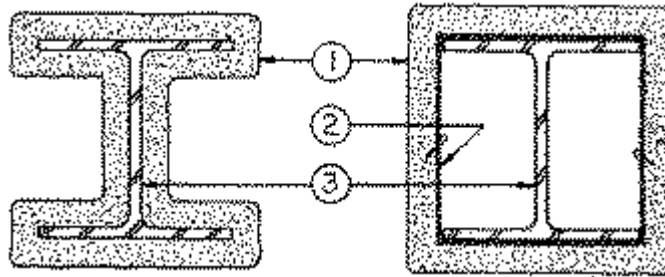


Design No. X854
 Ratings — 1, 1-1/2, 2, 3 and 4 h.



- Spray-Applied Fire Resistive Materials*** — Applied by mixing with water and spraying in more than one coat to the thicknesses shown below, to steel surfaces which are clean and free of dirt, loose scale, and oil. Min avg and min ind density of 15/14 pcf respectively. Min avg and min ind density of 22/19 pcf respectively for Types Z-106, Z-106/G, Z-106/HY. Min avg and min ind density of 40/36 pcf respectively for Types Z-146, Z-146PC and Z-146T cementitious mixture. Min avg and min ind density of 50/45 pcf respectively for Types Z-156, Z-156T and Z-156PC. For method of density determination, see Design Information Section, Sprayed Material.

The thickness of Spray-Applied Fire Resistive Materials to be applied to all surfaces of the column (Item 1) required for rating periods of 1 h, 1-1/2 h, 2 h, 3 h, 4 h may be determined by the equation:

$$h = \frac{R}{1.05(W/D) + 0.61}$$

Where:

h = Spray-Applied Fire Resistive Materials thickness in the range 0.25-3.875 in.

R = Fire resistance rating in hours (1 - 4 h)

D = Heated perimeter of steel column in inches

W = Weight of steel column in lbs per foot

W/D = 0.338 to 6.76

As an alternate to the equation, the minimum thickness of Spray-Applied Fire Resistive Materials required for various fire resistance ratings of contour sprayed or boxed columns may be determined from the table below:

TABLE 1

Col Size	W/D	Min Thk (In.)					
		1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr	
W4x13	0.556	11/16	1-3/16	1-5/8	2-1/2	3-3/8	
W5x16	0.55	11/16	1-3/16	1-5/8	2-1/2	3-3/8	
W5x19	0.644	5/8	1-1/8	1-7/16	2-5/16	3-1/8	
W6x9	0.338	15/16	1-1/2	2	2-1/2	3-13/16	
W6x12	0.448	13/16	1-3/8	1-13/16	2-1/2	3-3/4	
W6x15	0.431	13/16	1-3/8	1-13/16	2-1/2	3-13/16	
W6x16	0.584	11/16	1-3/16	1-9/16	2-7/16	3-5/16	
W6x20	0.563	11/16	1-3/16	1-9/16	2-1/2	3-3/8	
W6x25	0.696	5/8	1-1/16	1-3/8	2	2-11/16	
W8x13	0.421	13/16	1-3/8	1-7/8	2-1/2	3-13/16	
W8x15	0.481	3/4	1-5/16	1-3/4	2-1/2	3-5/8	
W8x18	0.499	3/4	1-1/4	1-11/16	2-1/2	3-1/2	
W8x21	0.577	11/16	1-3/16	1-9/16	2-1/2	3-5/16	
W8x24	0.591	11/16	1-1/8	1-9/16	2-7/16	3-5/16	
W8x28	0.688	5/8	1-1/16	1-3/8	2	2-11/16	
W8x31	0.665	5/8	1-1/16	1-7/16	2-5/16	3-1/16	
W8x35	0.749	9/16	1	1-5/16	2	2-11/16	
W8x40	0.849	9/16	3/4	1-1/8	1-11/16	2-1/2	
W8x48	1	1/2	3/4	1	1-11/16	2-5/16	
W8x58	1.2	7/16	3/4	13/16	1-3/8	1-15/16	
W8x67	1.37	3/8	5/8	3/4	1-1/4	1-11/16	
W10x12	0.347	7/8	1-1/2	2	2-1/2	3-13/16	
W10x15	0.429	13/16	1-3/8	1-7/8	2-1/2	3-13/16	
W10x17	0.482	3/4	1-5/16	1-3/4	2-1/2	3-5/8	
W10x19	0.538	3/4	1-1/4	1-5/8	2-1/2	3-7/16	
W10x22	0.523	3/4	1-1/4	1-11/16	2-1/2	3-1/2	
W10x26	0.612	11/16	1-1/8	1-1/2	2-3/8	3-1/4	
W10x30	0.699	5/8	1-1/16	1-3/8	2	2-11/16	
W10x33	0.661	5/8	1-1/16	1-7/16	2-5/16	3-1/8	
W10x39	0.78	9/16	1	1-1/4	2	2-11/16	
W10x45	0.888	1/2	3/4	1-1/8	1-11/16	2-1/2	
W10x49	0.84	9/16	3/4	1-1/8	1-11/16	2-1/2	
W10x54	0.922	1/2	3/4	1-1/16	1-11/16	2-1/2	
W10x60	1.01	1/2	3/4	1	1-5/8	2-5/16	
W10x68	1.15	7/16	3/4	7/8	1-7/16	2	
W10x77	1.28	7/16	11/16	3/4	1-5/16	1-13/16	
W10x88	1.45	3/8	5/8	11/16	1-3/16	1-5/8	
W10x100	1.64	3/8	9/16	11/16	1-1/8	1-1/2	
W10x112	1.81	5/16	1/2	11/16	1-1/8	1-1/2	
W12x14	0.363	7/8	1-1/2	2	2-1/2	3-13/16	
W12x16	0.41	13/16	1-7/16	1-7/8	2-1/2	3-13/16	
W12x19	0.485	3/4	1-5/16	1-3/4	2-1/2	3-5/8	
W12x22	0.56	11/16	1-3/16	1-5/8	2-1/2	3-3/8	
W12x26	0.531	3/4	1-1/4	1-5/8	2-1/2	3-7/16	
W12x30	0.607	11/16	1-1/8	1-1/2	2-7/16	3-1/4	
W12x35	0.703	5/8	1-1/16	1-3/8	2	2-11/16	
W12x40	0.734	5/8	1	1-5/16	2	2-11/16	
W12x45	0.829	9/16	15/16	1-3/16	1-15/16	2-11/16	

FIRE RESISTANCE DIRECTORY - W R GRACE DESIGNS

FIRE-RESISTANCE RATINGS - ANSI/UL 263 (BXUV)

Col Size	W/D	Min Thk (In.)					
		1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr	
W12x50	0.909	1/2	3/4	1-1/16	1-11/16	2-1/2	
W12x53	0.855	9/16	3/4	1-1/8	1-11/16	2-1/2	
W12x58	0.925	1/2	3/4	1-1/16	1-11/16	2-7/16	
W12x65	0.925	1/2	3/4	1-1/16	1-11/16	2-7/16	
W12x72	1.02	1/2	3/4	15/16	1-5/8	2-1/4	
W12x79	1.11	7/16	3/4	7/8	1-1/2	2-1/8	
W12x87	1.22	7/16	11/16	13/16	1-3/8	1-15/16	
W12x96	1.34	3/8	11/16	3/4	1-1/4	1-3/4	
W12x106	1.47	3/8	5/8	11/16	1-3/16	1-5/8	
W12x120	1.65	5/16	9/16	11/16	1-1/8	1-1/2	
W12x136	1.86	5/16	1/2	11/16	1-1/8	1-1/2	
W12x152	2.04	5/16	1/2	11/16	1-1/16	1-7/16	
W12x170	2.26	1/4	7/16	5/8	15/16	1-5/16	
W12x190	2.5	1/4	5/16	9/16	7/8	1-3/16	
W12x210	2.73	1/4	5/16	1/2	13/16	1-1/8	
W12x230	2.96	1/4	5/16	1/2	3/4	1-1/16	
W12x252	3.2	1/4	5/16	7/16	3/4	1	
W12x279	3.5	1/4	5/16	7/16	11/16	7/8	
W12x305	3.76	1/4	5/16	3/8	5/8	7/8	
W12x336	4.06	1/4	1/4	3/8	9/16	13/16	
W14x22	0.476	3/4	1-5/16	1-3/4	2-1/2	3-5/8	
W14x26	0.559	11/16	1-3/16	1-5/8	2-1/2	3-3/8	
W14x30	0.562	11/16	1-3/16	1-9/16	2-1/2	3-3/8	
W14x34	0.633	5/8	1-1/8	1-7/16	2-3/8	3 3/16	
W14x38	0.706	5/8	1-1/16	1-3/8	2	2-11/16	
W14x43	0.752	9/16	1	1-5/16	2	2-11/16	
W14x48	0.835	9/16	15/16	1-3/16	1-15/16	2-11/16	
W14x53	0.915	1/2	3/4	1-1/16	1-11/16	2-1/2	
W14x61	0.928	1/2	3/4	1-1/16	1-11/16	2-7/16	
W14x68	1.04	1/2	3/4	15/16	1-5/8	2-1/4	
W14x74	1.12	7/16	3/4	7/8	1-1/2	2-1/16	
W14x82	1.23	7/16	11/16	13/16	1-3/8	1-7/8	
W14x90	1.08	7/16	3/4	7/8	1-9/16	2-1/8	
W14x99	1.18	7/16	3/4	13/16	1-7/16	2	
W14x109	1.29	7/16	11/16	3/4	1-5/16	1-13/16	
W14x120	1.42	3/8	5/8	3/4	1-3/16	1-11/16	
W14x132	1.56	3/8	9/16	11/16	1-1/8	1-9/16	
W14x145	1.64	3/8	9/16	11/16	1-1/8	1-1/2	
W14x159	1.78	5/16	9/16	11/16	1-1/8	1-1/2	
W14x176	1.96	5/16	1/2	11/16	1-1/16	1-1/2	
W14x193	2.14	5/16	7/16	5/8	1	1-3/8	
W14x211	2.32	1/4	7/16	5/8	15/16	1-5/16	
W14x233	2.55	1/4	5/16	9/16	7/8	1-3/16	
W14x257	2.78	1/4	5/16	1/2	13/16	1-1/8	
W14x283	3.03	1/4	5/16	1/2	3/4	1	
W14x311	3.3	1/4	5/16	7/16	11/16	15/16	
W14x342	3.58	1/4	5/16	7/16	5/8	7/8	
W14x370	3.84	1/4	5/16	3/8	5/8	13/16	
W14x398	4.09	1/4	1/4	3/8	9/16	13/16	
W14x426	4.32	1/4	1/4	3/8	9/16	3/4	
W14x455	4.59	1/4	1/4	5/16	1/2	11/16	
W14x500	4.95	1/4	1/4	5/16	1/2	11/16	
W14x550	5.34	1/4	1/4	5/16	7/16	5/8	
W14x605	5.82	1/4	1/4	1/4	7/16	9/16	
W14x665	6.21	1/4	1/4	1/4	3/8	9/16	
W14x730	6.76	1/4	1/4	1/4	3/8	1/2	
W16x26	0.499	3/4	1-1/4	1-11/16	2-1/2	3-1/2	
W16x31	0.592	11/16	1-1/8	1-9/16	2-7/16	3-1/4	
W16x36	0.617	11/16	1-1/8	1-1/2	2-3/8	3 3/16	
W16x40	0.686	5/8	1-1/16	1-3/8	2-1/4	3-1/16	
W16x45	0.767	9/16	1	1-1/4	2	2-11/16	
W16x50	0.846	9/16	3/4	1-1/8	1-11/16	2-1/2	
W16x57	0.963	1/2	3/4	1	1-11/16	2-3/8	
W16x67	0.936	1/2	3/4	1-1/16	1-11/16	2-7/16	
W16x77	1.07	7/16	3/4	15/16	1-9/16	2-3/16	
W16x89	1.22	7/16	11/16	13/16	1-3/8	1-15/16	
W16x100	1.37	3/8	5/8	3/4	1-1/4	1-11/16	
W18x35	0.602	11/16	1-1/8	1-1/2	2-7/16	3-1/4	
W18x40	0.688	5/8	1-1/16	1-3/8	2	2-11/16	
W18x46	0.786	9/16	15/16	1-1/4	2	2-11/16	
W18x50	0.778	9/16	1	1-1/4	2	2-11/16	
W18x55	0.85	9/16	3/4	1-1/8	1-11/16	2-1/2	
W18x60	0.923	1/2	3/4	1-1/16	1-11/16	2-7/16	
W18x65	0.997	1/2	3/4	1	1-11/16	2-5/16	
W18x71	1.08	7/16	3/4	7/8	1-9/16	2-1/8	
W18x76	0.971	1/2	3/4	1	1-11/16	2-3/8	
W18x86	1.09	7/16	3/4	7/8	1-9/16	2-1/8	
W18x97	1.22	7/16	11/16	13/16	1-3/8	1-15/16	
W18x106	1.33	3/8	11/16	3/4	1-1/4	1-3/4	
W18x119	1.48	3/8	5/8	11/16	1-3/16	1-5/8	
W21x44	0.672	5/8	1-1/16	1-3/8	2-1/4	3-1/16	
W21x50	0.754	9/16	1	1-1/4	2	2-11/16	
W21x57	0.857	9/16	3/4	1-1/8	1-11/16	2-1/2	
W21x62	0.846	9/16	3/4	1-1/8	1-11/16	2-1/2	
W21x68	0.926	1/2	3/4	1-1/16	1-11/16	2-7/16	
W21x73	0.989	1/2	3/4	1	1-11/16	2-5/16	
W21x83	1.12	7/16	3/4	7/8	1-1/2	2-1/16	
W21x93	1.24	7/16	11/16	13/16	1-3/8	1-7/8	

FIRE RESISTANCE DIRECTORY - W R GRACE DESIGNS

FIRE-RESISTANCE RATINGS - ANSI/UL 263 (BXUV)

Col Size	W/D	Min Thk (In.)				
		1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr
W21x101	1.13	7/16	3/4	7/8	1-1/2	2-1/16
W21x111	1.24	7/16	11/16	13/16	1-3/8	1-7/8
W21x122	1.35	3/8	11/16	3/4	1-1/4	1-3/4
W21x132	1.45	3/8	5/8	11/16	1-3/16	1-5/8
W21x147	1.61	3/8	9/16	11/16	1-1/8	1-1/2
W24x55	0.749	9/16	1	1-5/16	2	2-11/16
W24x62	0.844	9/16	3/4	1-1/8	1-11/16	2-1/2
W24x68	0.837	9/16	15/16	1-3/16	1-15/16	2-11/16
W24x76	0.933	1/2	3/4	1-1/16	1-11/16	2-7/16
W24x84	1.02	1/2	3/4	15/16	1-5/8	2-1/4
W24x94	1.14	7/16	3/4	7/8	1-1/2	2-1/16
W24x104	1.07	7/16	3/4	15/16	1-9/16	2-3/16
W24x117	1.2	7/16	3/4	13/16	1-3/8	1-15/16
W24x131	1.33	3/8	11/16	3/4	1-1/4	1-3/4
W24x146	1.48	3/8	5/8	11/16	1-3/16	1-5/8
W24x162	1.63	3/8	9/16	11/16	1-1/8	1-1/2
W27x84	0.921	1/2	3/4	1-1/16	1-11/16	2-1/2
W27x94	1.03	1/2	3/4	15/16	1-5/8	2-1/4
W27x102	1.11	7/16	3/4	7/8	1-1/2	2-1/8
W27x114	1.23	7/16	11/16	13/16	1-3/8	1-7/8
W27x146	1.35	3/8	11/16	3/4	1-1/4	1-3/4
W27x161	1.48	3/8	5/8	11/16	1-3/16	1-5/8
W27x178	1.63	3/8	9/16	11/16	1-1/8	1-1/2
W30x99	1	1/2	3/4	1	1-11/16	2-5/16
W30x108	1.09	7/16	3/4	7/8	1-9/16	2-1/8
W30x116	1.16	7/16	3/4	13/16	1-7/16	2
W30x124	1.24	7/16	11/16	13/16	1-3/8	1-7/8
W30x132	1.32	3/8	11/16	3/4	1-1/4	1-3/4
W30x173	1.47	3/8	5/8	11/16	1-3/16	1-5/8
W30x191	1.62	3/8	9/16	11/16	1-1/8	1-1/2
W30x211	1.76	5/16	9/16	11/16	1-1/8	1-1/2
W33x118	1.08	7/16	3/4	7/8	1-9/16	2-1/8
W33x130	1.18	7/16	3/4	13/16	1-7/16	2
W33x141	1.28	7/16	11/16	3/4	1-5/16	1-13/16
W33x152	1.37	3/8	5/8	3/4	1-1/4	1-11/16
W33x201	1.58	3/8	9/16	11/16	1-1/8	1-1/2
W33x221	1.73	5/16	9/16	11/16	1-1/8	1-1/2
W33x241	1.87	5/16	1/2	11/16	1-1/8	1-1/2
W36x135	1.15	7/16	3/4	7/8	1-7/16	2
W36x150	1.27	7/16	11/16	3/4	1-5/16	1-7/8
W36x160	1.35	3/8	11/16	3/4	1-1/4	1-3/4
W36x170	1.43	3/8	5/8	3/4	1-3/16	1-5/8
W36x182	1.52	3/8	5/8	11/16	1-1/8	1-9/16
W36x194	1.62	3/8	9/16	11/16	1-1/8	1-1/2
W36x210	1.74	5/16	9/16	11/16	1-1/8	1-1/2
W36x230	1.69	5/16	9/16	11/16	1-1/8	1-1/2
W36x245	1.79	5/16	9/16	11/16	1-1/8	1-1/2
W36x260	1.9	5/16	1/2	11/16	1-1/8	1-1/2
W36x280	2.03	5/16	1/2	11/16	1-1/16	1-7/16
W36x300	2.17	1/4	7/16	5/8	1	1-3/8

The thicknesses contained in the table below are applicable when the Spray-Applied Fire Resistive Materials applied to columns' flange tips are reduced to one-half that shown in the table below:

TABLE 2

Min Col Size	Member	W/D	Half Flange Tip Thickness				
			1 hr	1.5 hr	2 hr	3 hr	4 hr
W4x13		0.556	7/8	1 5/16	1-11/16	2 9/16	3 3/8
W5x16		0.550	7/8	1 5/16	1-11/16	2 9/16	3 3/8
W5x19		0.644	13/16	1 3/16	1 9/16	2 3/8	3 1/8
W6x9		0.338	1-1/8	1 5/8	2 1/16	3 1/8	4 3/16
W6x12		0.448	15/16	1 7/16	1 7/8	2 13/16	3-13/16
W6x15		0.431	1	1 7/16	1-15/16	2 7/8	3-14/16
W6x16		0.584	7/8	1 1/4	1-11/16	2 1/2	3 5/16
W6x20		0.563	7/8	1 1/4	1-11/16	2 1/2	3 3/8
W6x25		0.696	3/4	1 1/8	1 1/2	2 1/4	2 15/16
W8x13		0.421	1	1 7/16	1-15/16	2 7/8	3-14/16
W8x15		0.481	15/16	1 3/8	1-13/16	2 3/4	3 11/16
W8x18		0.499	15/16	1 3/8	1-13/16	2-11/16	3 9/16
W8x21		0.577	7/8	1 1/4	1-11/16	2 1/2	3 5/16
W8x24		0.591	7/8	1 1/4	1-11/16	2 1/2	3 5/16
W8x28		0.688	13/16	1 3/16	1 1/2	2 1/4	2 15/16
W8x31		0.665	13/16	1 3/16	1 9/16	2 5/16	3 1/16
W8x35		0.749	3/4	1 1/8	1 7/16	2 3/16	2 7/8
W8x40		0.849	11/16	1	1 3/8	2	2-11/16
W8x48		1.000	5/8	15/16	1 1/4	1-13/16	2 7/16
W8x58		1.200	9/16	13/16	1 1/8	1 5/8	2 3/16
W8x67		1.370	1/2	3/4	1	1 1/2	2
W10x12		0.347	1-1/16	1 9/16	2 1/16	3 1/8	4 3/16
W10x15		0.429	1	1 7/16	1-15/16	2 7/8	3-14/16
W10x17		0.482	15/16	1 3/8	1-13/16	2 3/4	3 11/16
W10x19		0.538	7/8	1 5/16	1 3/4	2 9/16	3 7/16
W10x22		0.523	7/8	1 5/16	1 3/4	2 5/8	3 1/2
W10x26		0.612	13/16	1 1/4	1 5/8	2 7/16	3 1/4
W10x30		0.699	3/4	1 1/8	1 1/2	2 1/4	2 15/16
W10x33		0.661	13/16	1 3/16	1 9/16	2 5/16	3 1/8
W10x39		0.780	3/4	1 1/16	1 7/16	2 1/8	2 13/16
W10x45		0.888	11/16	1	1 5/16	2	2 5/8

FIRE RESISTANCE DIRECTORY - W R GRACE DESIGNS

FIRE-RESISTANCE RATINGS - ANSI/UL 263 (BXUV)

Min Col Size	Member	W/D	Half Flange Tip Thickness				
			1 hr	1.5 hr	2 hr	3 hr	4 hr
W10x49		0.840	11/16	1 1/16	1 3/8	2 1/16	2-11/16
W10x54		0.922	11/16	1	1 5/16	1-15/16	2 9/16
W10x60		1.010	5/8	15/16	1 1/4	1-13/16	2 7/16
W10x68		1.150	9/16	7/8	1 1/8	1-11/16	2 1/4
W10x77		1.280	9/16	13/16	1 1/16	1 9/16	2 1/16
W10x88		1.450	1/2	3/4	1	1 7/16	1-15/16
W10x100		1.640	7/16	11/16	7/8	1 5/16	1 3/4
W10x112		1.810	7/16	5/8	13/16	1 1/4	1 5/8
W12x14		0.363	1-1/16	1 9/16	2 1/16	3 1/16	4 1/8
W12x16		0.410	1	1 1/2	1-15/16	2 15/16	3-15/16
W12x19		0.485	15/16	1 3/8	1-13/16	2-11/16	3 5/8
W12x22		0.560	7/8	1 5/16	1-11/16	2 9/16	3 3/8
W12x26		0.531	7/8	1 5/16	1 3/4	2 5/8	3 7/16
W12x30		0.607	13/16	1 1/4	1 5/8	2 7/16	3 1/4
W12x35		0.703	3/4	1 1/8	1 1/2	2 1/4	2 15/16
W12x40		0.734	3/4	1 1/8	1 1/2	2 3/16	2 15/16
W12x45		0.829	11/16	1 1/16	1 3/8	2 1/16	2 3/4
W12x50		0.909	11/16	1	1 5/16	1-15/16	2 9/16
W12x53		0.855	11/16	1	1 3/8	2	2-11/16
W12x58		0.925	11/16	1	1 5/16	1-15/16	2 9/16
W12x65		0.925	11/16	1	1 5/16	1-15/16	2 9/16
W12x72		1.020	5/8	15/16	1 1/4	1-13/16	2 7/16
W12x79		1.110	5/8	7/8	1 3/16	1 3/4	2 5/16
W12x87		1.220	9/16	13/16	1 1/16	1 5/8	2 1/8
W12x96		1.340	1/2	3/4	1	1 1/2	2
W12x106		1.470	1/2	3/4	15/16	1 7/16	1 7/8
W12x120		1.650	7/16	11/16	7/8	1 5/16	1 3/4
W12x136		1.860	7/16	5/8	13/16	1 3/16	1 9/16
W12x152		2.040	3/8	9/16	3/4	1 1/8	1 1/2
W12x170		2.260	3/8	9/16	11/16	1 1/16	1 3/8
W12x190		2.500	5/16	1/2	5/8	15/16	1 1/4
W12x210		2.730	5/16	7/16	5/8	7/8	1 3/16
W12x230		2.960	5/16	7/16	9/16	13/16	1 1/8
W12x252		3.200	5/16	7/16	9/16	13/16	1 1/16
W12x279		3.500	1/4	3/8	1/2	3/4	15/16
W12x305		3.760	1/4	3/8	1/2	11/16	15/16
W12x336		4.060	1/4	5/16	7/16	5/8	7/8
W14x22		0.476	15/16	1 3/8	1-13/16	2 3/4	3 11/16
W14x26		0.559	7/8	1 5/16	1-11/16	2 9/16	3 3/8
W14x30		0.562	7/8	1 1/4	1-11/16	2 1/2	3 3/8
W14x34		0.633	13/16	1 3/16	1 5/8	2 3/8	3 3/16
W14x38		0.706	3/4	1 1/8	1 1/2	2 1/4	2 15/16
W14x43		0.752	3/4	1 1/8	1 7/16	2 3/16	2 7/8
W14x48		0.835	11/16	1 1/16	1 3/8	2 1/16	2 3/4
W14x53		0.915	11/16	1	1 5/16	1-15/16	2 9/16
W14x61		0.928	11/16	1	1 5/16	1-15/16	2 9/16
W14x68		1.040	5/8	15/16	1 3/16	1-13/16	2 3/8
W14x74		1.120	9/16	7/8	1 1/8	1-11/16	2 1/4
W14x82		1.230	9/16	13/16	1 1/16	1 5/8	2 1/8
W14x90		1.080	5/8	7/8	1 3/16	1 3/4	2 5/16
W14x99		1.180	9/16	13/16	1 1/8	1 5/8	2 3/16
W14x109		1.290	9/16	13/16	1 1/16	1 9/16	2 1/16
W14x120		1.420	1/2	3/4	1	1 7/16	1-15/16
W14x132		1.560	1/2	11/16	15/16	1 3/8	1-13/16
W14x145		1.640	7/16	11/16	7/8	1 5/16	1 3/4
W14x159		1.780	7/16	5/8	13/16	1 1/4	1 5/8
W14x176		1.960	3/8	9/16	3/4	1 1/8	1 1/2
W14x193		2.140	3/8	9/16	3/4	1 1/16	1 7/16
W14x211		2.320	3/8	1/2	11/16	1	1 3/8
W14x233		2.550	5/16	1/2	5/8	15/16	1 1/4
W14x257		2.780	5/16	7/16	5/8	7/8	1 3/16
W14x283		3.030	5/16	7/16	9/16	13/16	1 1/16
W14x311		3.300	1/4	3/8	1/2	3/4	1
W14x342		3.580	1/4	3/8	1/2	11/16	15/16
W14x370		3.840	1/4	3/8	7/16	11/16	7/8
W14x398		4.090	1/4	5/16	7/16	5/8	7/8
W14x426		4.320	1/4	5/16	7/16	5/8	13/16
W14x455		4.590	1/4	5/16	3/8	9/16	3/4
W14x500		4.950	1/4	5/16	3/8	9/16	3/4
W14x550		5.340	1/4	1/4	3/8	1/2	11/16
W14x605		5.820	1/4	1/4	5/16	1/2	5/8
W14x665		6.210	1/4	1/4	5/16	7/16	9/16
W14x730		6.760	1/4	1/4	5/16	7/16	9/16
W16x26		0.499	15/16	1 3/8	1-13/16	2-11/16	3 9/16
W16x31		0.592	13/16	1 1/4	1 5/8	2 7/16	3 1/4
W16x36		0.617	13/16	1 1/4	1 5/8	2 7/16	3 3/16
W16x40		0.686	13/16	1 3/16	1 9/16	2 5/16	3 1/16
W16x45		0.767	3/4	1 1/16	1 7/16	2 1/8	2 7/8
W16x50		0.846	11/16	1 1/16	1 3/8	2 1/16	2-11/16
W16x57		0.963	5/8	15/16	1 1/4	1 7/8	2 1/2
W16x67		0.936	11/16	1	1 5/16	1-15/16	2 9/16
W16x77		1.070	5/8	7/8	1 3/16	1 3/4	2 5/16
W16x89		1.220	9/16	13/16	1 1/16	1 5/8	2 1/8
W16x100		1.370	1/2	3/4	1	1 1/2	2
W18x35		0.602	13/16	1 1/4	1 5/8	2 7/16	3 1/4
W18x40		0.688	13/16	1 3/16	1 1/2	2 1/4	2 15/16
W18x46		0.786	3/4	1 1/16	1 7/16	2 1/8	2 13/16
W18x50		0.778	3/4	1 1/16	1 7/16	2 1/8	2 13/16

FIRE RESISTANCE DIRECTORY - W R GRACE DESIGNS

Min Col Size	Member	W/D	Half Flange Tip Thickness				
			1 hr	1.5 hr	2 hr	3 hr	4 hr
W18x55	0.850	11/16	1	1 3/8	2	2-11/16	
W18x60	0.923	11/16	1	1 5/16	1-15/16	2 9/16	
W18x65	0.997	5/8	15/16	1 1/4	1-13/16	2 7/16	
W18x71	1.080	5/8	7/8	1 3/16	1 3/4	2 5/16	
W18x76	0.971	5/8	15/16	1 1/4	1 7/8	2 1/2	
W18x86	1.090	5/8	7/8	1 3/16	1 3/4	2 5/16	
W18x97	1.220	9/16	13/16	1 1/16	1 5/8	2 1/8	
W18x106	1.330	1/2	3/4	1	1 1/2	2	
W18x119	1.480	1/2	3/4	15/16	1 7/16	1 7/8	
W21x44	0.672	13/16	1 3/16	1 9/16	2 5/16	3 1/16	
W21x50	0.754	3/4	1 1/8	1 7/16	2 3/16	2 7/8	
W21x57	0.857	11/16	1	1 3/8	2	2-11/16	
W21x62	0.846	11/16	1 1/16	1 3/8	2 1/16	2-11/16	
W21x68	0.926	11/16	1	1 5/16	1-15/16	2 9/16	
W21x73	0.989	5/8	15/16	1 1/4	1 7/8	2 7/16	
W21x83	1.120	9/16	7/8	1 1/8	1-11/16	2 1/4	
W21x93	1.240	9/16	13/16	1 1/16	1 5/8	2 1/8	
W21x101	1.130	9/16	7/8	1 1/8	1-11/16	2 1/4	
W21x111	1.240	9/16	13/16	1 1/16	1 5/8	2 1/8	
W21x122	1.350	1/2	3/4	1	1 1/2	2	
W21x132	1.450	1/2	3/4	1	1 7/16	1-15/16	
W21x147	1.610	7/16	11/16	7/8	1 5/16	1 3/4	
W24x55	0.749	3/4	1 1/8	1 7/16	2 3/16	2 7/8	
W24x62	0.844	11/16	1 1/16	1 3/8	2 1/16	2-11/16	
W24x68	0.837	11/16	1 1/16	1 3/8	2 1/16	2-11/16	
W24x76	0.933	11/16	1	1 5/16	1-15/16	2 9/16	
W24x84	1.020	5/8	15/16	1 1/4	1-13/16	2 7/16	
W24x94	1.140	9/16	7/8	1 1/8	1-11/16	2 1/4	
W24x104	1.070	5/8	7/8	1 3/16	1 3/4	2 5/16	
W24x117	1.200	9/16	13/16	1 1/8	1 5/8	2 3/16	
W24x131	1.330	1/2	3/4	1	1 1/2	2	
W24x146	1.480	1/2	3/4	15/16	1 7/16	1 7/8	
W24x162	1.630	7/16	11/16	7/8	1 5/16	1 3/4	
W27x84	0.921	11/16	1	1 5/16	1-15/16	2 9/16	
W27x94	1.030	5/8	15/16	1 3/16	1-13/16	2 3/8	
W27x102	1.110	5/8	7/8	1 3/16	1 3/4	2 5/16	
W27x114	1.230	9/16	13/16	1 1/16	1 5/8	2 1/8	
W27x146	1.350	1/2	3/4	1	1 1/2	2	
W27x161	1.480	1/2	3/4	15/16	1 7/16	1 7/8	
W27x178	1.630	7/16	11/16	7/8	1 5/16	1 3/4	
W30x99	1.000	5/8	15/16	1 1/4	1-13/16	2 7/16	
W30x108	1.090	5/8	7/8	1 3/16	1 3/4	2 5/16	
W30x116	1.160	9/16	7/8	1 1/8	1-11/16	2 1/4	
W30x124	1.240	9/16	13/16	1 1/16	1 5/8	2 1/8	
W30x132	1.320	9/16	13/16	1 1/16	1 9/16	2 1/16	
W30x173	1.470	1/2	3/4	15/16	1 7/16	1 7/8	
W30x191	1.620	7/16	11/16	7/8	1 5/16	1 3/4	
W30x211	1.760	7/16	5/8	7/8	1 1/4	1-11/16	
W33x118	1.080	5/8	7/8	1 3/16	1 3/4	2 5/16	
W33x130	1.180	9/16	13/16	1 1/8	1 5/8	2 3/16	
W33x141	1.280	9/16	13/16	1 1/16	1 9/16	2 1/16	
W33x152	1.370	1/2	3/4	1	1 1/2	2	
W33x201	1.580	1/2	11/16	15/16	1 3/8	1-13/16	
W33x221	1.730	7/16	5/8	7/8	1 1/4	1-11/16	
W33x241	1.870	7/16	5/8	13/16	1 3/16	1 9/16	
W36x135	1.150	9/16	7/8	1 1/8	1-11/16	2 1/4	
W36x150	1.270	9/16	13/16	1 1/16	1 9/16	2 1/16	
W36x160	1.350	1/2	3/4	1	1 1/2	2	
W36x170	1.430	1/2	3/4	1	1 7/16	1-15/16	
W36x182	1.520	1/2	11/16	15/16	1 3/8	1 7/8	
W36x194	1.620	7/16	11/16	7/8	1 5/16	1 3/4	
W36x210	1.740	7/16	5/8	7/8	1 1/4	1-11/16	
W36x230	1.690	7/16	11/16	7/8	1 5/16	1-11/16	
W36x245	1.790	7/16	5/8	13/16	1 1/4	1 5/8	
W36x260	1.900	7/16	5/8	13/16	1 3/16	1 9/16	
W36x280	2.030	3/8	9/16	3/4	1 1/8	1 1/2	
W36x300	2.170	3/8	9/16	3/4	1 1/16	1 7/16	

ARABIAN VERMICULITE INDUSTRIES —Types MK-6/HY, MK-6/HY Extended Set, MK-6/GF, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, Z-106, Z-106/G, Z-106/HY.

GRACE KOREA INC —Types MK-6/HY, MK-6/HY Extended Set, MK-6/GF, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, Z-106, Z-106/G, Z-106/HY.

W R GRACE & CO - CONN —Types MK-6/HY, MK-6/HY Extended Set, MK-6/GF, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, R/G, Z-106, Z-106/G, Z-106/HY, MK-1000/HB, MK-1000/HB Extended Set, Z-146, Z-146PC, Z-146T, Z-156, Z-156T and Z-156PC (Types Z-146, Z-146PC, Z-146T, Z-156, Z-156PC, Z-156T also investigated for exterior use).

2. **Metal Lath** — (Optional for contour application) — 3.4 lb/sq yd galvanized or painted expanded steel lath. Lath shall be lapped 1 in. and tied together with No. 18 SWG galvanized steel; wire spaced vertically 6 in. O.C.

3. **Steel Column** — Wide flange steel columns (36 ksi yield), min/max sizes as specified above.

*Bearing the UL Classification Mark