

Table 5-1

 $F_y = 50$  ksi

 $F_u = 65$  ksi

Shape	A <sub>g</sub> in <sup>2</sup>	A <sub>e</sub> =0.75A <sub>g</sub> in <sup>3</sup>	Yielding		Rupture	
			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W44X335	98.5	73.9	2949	4433	2401	3601
W44X290	85.4	64.1	2557	3843	2082	3122
W44X262	76.9	57.7	2302	3461	1874	2812
W44X230	67.7	50.8	2027	3047	1650	2475
W40X593	174	130.5	5210	7830	4241	6362
W40X503	148	111.0	4431	6660	3608	5411
W40X431	127	95.3	3802	5715	3096	4643
W40X397	117	87.8	3503	5265	2852	4278
W40X372	109	81.8	3263	4905	2657	3985
W40X362	107	80.3	3204	4815	2608	3912
W40X324	95.3	71.5	2853	4289	2323	3484
W40X297	87.4	65.6	2617	3933	2130	3196
W40X277	81.4	61.1	2437	3663	1984	2976
W40X249	73.3	55.0	2195	3299	1787	2680
W40X215	63.4	47.6	1898	2853	1545	2318
W40X199	58.5	43.9	1751	2633	1426	2139
W40X392	115	86.3	3443	5175	2803	4205
W40X331	97.5	73.1	2919	4388	2377	3565
W40X327	96.0	72.0	2874	4320	2340	3510
W40X294	86.3	64.7	2584	3884	2104	3155
W40X278	82.0	61.5	2455	3690	1999	2998
W40X264	77.6	58.2	2323	3492	1892	2837
W40X235	69.0	51.8	2066	3105	1682	2523
W40X211	62.0	46.5	1856	2790	1511	2267
W40X183	53.3	40.0	1596	2399	1299	1949
W40X167	49.2	36.9	1473	2214	1199	1799
W40X149	43.8	32.9	1311	1971	1068	1601
W36X800	236	177.0	7066	10620	5753	8629
W36X652	192	144.0	5749	8640	4680	7020
W36X529	156	117.0	4671	7020	3803	5704
W36X487	143	107.3	4281	6435	3486	5228
W36X441	130	97.5	3892	5850	3169	4753
W36X395	116	87.0	3473	5220	2828	4241
W36X361	106	79.5	3174	4770	2584	3876
W36X330	97.0	72.8	2904	4365	2364	3547
W36X302	88.8	66.6	2659	3996	2165	3247
W36X282	82.9	62.2	2482	3731	2021	3031

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Shape	A <sub>g</sub> in <sup>2</sup>	A <sub>e</sub> =0.75A <sub>g</sub> in <sup>3</sup>	Yielding		Rupture	
			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W36X262	77.0	57.8	2305	3465	1877	2815
W36X247	72.5	54.4	2171	3263	1767	2651
W36X231	68.1	51.1	2039	3065	1660	2490
W36X256	75.4	56.6	2257	3393	1838	2757
W36X232	68.1	51.1	2039	3065	1660	2490
W36X210	61.8	46.4	1850	2781	1506	2260
W36X194	57.0	42.8	1707	2565	1389	2084
W36X182	53.6	40.2	1605	2412	1307	1960
W36X170	50.1	37.6	1500	2255	1221	1832
W36X160	47.0	35.3	1407	2115	1146	1718
W36X150	44.2	33.2	1323	1989	1077	1616
W36X135	39.7	29.8	1189	1787	968	1452
W33X387	114	85.5	3413	5130	2779	4168
W33X354	104	78.0	3114	4680	2535	3803
W33X318	93.6	70.2	2802	4212	2282	3422
W33X291	85.7	64.3	2566	3857	2089	3133
W33X263	77.5	58.1	2320	3488	1889	2834
W33X241	71.0	53.3	2126	3195	1731	2596
W33X221	65.2	48.9	1952	2934	1589	2384
W33X201	59.2	44.4	1772	2664	1443	2165
W33X169	49.5	37.1	1482	2228	1207	1810
W33X152	44.8	33.6	1341	2016	1092	1638
W33X141	41.6	31.2	1246	1872	1014	1521
W33X130	38.3	28.7	1147	1724	934	1400
W33X118	34.7	26.0	1039	1562	846	1269
W30X391	115	86.3	3443	5175	2803	4205
W30X357	105	78.8	3144	4725	2559	3839
W30X326	95.8	71.9	2868	4311	2335	3503
W30X292	85.9	64.4	2572	3866	2094	3141
W30X261	76.9	57.7	2302	3461	1874	2812
W30X235	69.2	51.9	2072	3114	1687	2530
W30X211	62.2	46.7	1862	2799	1516	2274
W30X191	56.3	42.2	1686	2534	1372	2058
W30X173	51.0	38.3	1527	2295	1243	1865
W30X148	43.5	32.6	1302	1958	1060	1590
W30X132	38.9	29.2	1165	1751	948	1422
W30X124	36.5	27.4	1093	1643	890	1335
W30X116	34.2	25.7	1024	1539	834	1250

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Shape	Ag in <sup>2</sup>	A <sub>e</sub> =0.75Ag in <sup>3</sup>	Yielding		Rupture	
			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W30X108	31.7	23.8	949	1427	773	1159
W30X99	29.1	21.8	871	1310	709	1064
W30X90	26.4	19.8	790	1188	644	965
W27X539	159	119.3	4760	7155	3876	5813
W27X368	108	81.0	3234	4860	2633	3949
W27X336	98.9	74.2	2961	4451	2411	3616
W27X307	90.4	67.8	2707	4068	2204	3305
W27X281	82.9	62.2	2482	3731	2021	3031
W27X258	76.0	57.0	2275	3420	1853	2779
W27X235	69.4	52.1	2078	3123	1692	2537
W27X217	64.0	48.0	1916	2880	1560	2340
W27X194	57.2	42.9	1713	2574	1394	2091
W27X178	52.5	39.4	1572	2363	1280	1920
W27X161	47.6	35.7	1425	2142	1160	1740
W27X146	43.1	32.3	1290	1940	1051	1576
W27X129	37.8	28.4	1132	1701	921	1382
W27X114	33.5	25.1	1003	1508	817	1225
W27X102	30.0	22.5	898	1350	731	1097
W27X94	27.7	20.8	829	1247	675	1013
W27X84	24.8	18.6	743	1116	605	907
W24X370	109	81.8	3263	4905	2657	3985
W24X335	98.4	73.8	2946	4428	2399	3598
W24X306	89.8	67.4	2689	4041	2189	3283
W24X279	82.0	61.5	2455	3690	1999	2998
W24X250	73.5	55.1	2201	3308	1792	2687
W24X229	67.2	50.4	2012	3024	1638	2457
W24X207	60.7	45.5	1817	2732	1480	2219
W24X192	56.3	42.2	1686	2534	1372	2058
W24X176	51.7	38.8	1548	2327	1260	1890
W24X162	47.7	35.8	1428	2147	1163	1744
W24X146	43.0	32.3	1287	1935	1048	1572
W24X131	38.5	28.9	1153	1733	938	1408
W24X117	34.4	25.8	1030	1548	839	1258
W24X104	30.6	23.0	916	1377	746	1119
W24X103	30.3	22.7	907	1364	739	1108
W24X94	27.7	20.8	829	1247	675	1013
W24X84	24.7	18.5	740	1112	602	903
W24X76	22.4	16.8	671	1008	546	819

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Shape	A <sub>g</sub> in <sup>2</sup>	A <sub>e</sub> =0.75A <sub>g</sub> in <sup>3</sup>	Yielding		Rupture	
			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W24X68	20.1	15.1	602	905	490	735
W24X62	18.2	13.7	545	819	444	665
W24X55	16.2	12.2	485	729	395	592
W21X201	59.2	44.4	1772	2664	1443	2165
W21X182	53.6	40.2	1605	2412	1307	1960
W21X166	48.8	36.6	1461	2196	1190	1784
W21X147	43.2	32.4	1293	1944	1053	1580
W21X132	38.8	29.1	1162	1746	946	1419
W21X122	35.9	26.9	1075	1616	875	1313
W21X111	32.7	24.5	979	1472	797	1196
W21X101	29.8	22.4	892	1341	726	1090
W21X93	27.3	20.5	817	1229	665	998
W21X83	24.3	18.2	728	1094	592	888
W21X73	21.5	16.1	644	968	524	786
W21X68	20.0	15.0	599	900	488	731
W21X62	18.3	13.7	548	824	446	669
W21X55	16.2	12.2	485	729	395	592
W21X48	14.1	10.6	422	635	344	516
W21X57	16.7	12.5	500	752	407	611
W21X50	14.7	11.0	440	662	358	537
W21X44	13.0	9.75	389	585	317	475
W18x311	91.6	68.7	2743	4122	2233	3349
W18x283	83.3	62.5	2494	3749	2030	3046
W18x258	75.9	56.9	2272	3416	1850	2775
W18x234	68.8	51.6	2060	3096	1677	2516
W18x211	62.1	46.6	1859	2795	1514	2271
W18x192	56.4	42.3	1689	2538	1375	2062
W18X175	51.3	38.5	1536	2309	1250	1876
W18X158	46.3	34.7	1386	2084	1129	1693
W18X143	42.1	31.6	1260	1895	1026	1539
W18X130	38.2	28.7	1144	1719	931	1397
W18X119	35.1	26.3	1051	1580	856	1283
W18X106	31.1	23.3	931	1400	758	1137
W18X97	28.5	21.4	853	1283	695	1042
W18X86	25.3	19.0	757	1139	617	925
W18X76	22.3	16.7	668	1004	544	815
W18X71	20.8	15.6	623	936	507	761
W18X65	19.1	14.3	572	860	466	698

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Shape	A <sub>g</sub> in <sup>2</sup>	A <sub>e</sub> =0.75A <sub>g</sub> in <sup>3</sup>	Yielding		Rupture	
			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W18X60	17.6	13.2	527	792	429	644
W18X55	16.2	12.2	485	729	395	592
W18X50	14.7	11.0	440	662	358	537
W18X46	13.5	10.1	404	608	329	494
W18X40	11.8	8.85	353	531	288	431
W18X35	10.3	7.73	308	464	251	377
W16X100	29.5	22.1	883	1328	719	1079
W16X89	26.2	19.7	784	1179	639	958
W16X77	22.6	17.0	677	1017	551	826
W16X67	19.7	14.8	590	887	480	720
W16X57	16.8	12.6	503	756	410	614
W16X50	14.7	11.0	440	662	358	537
W16X45	13.3	10.0	398	599	324	486
W16X40	11.8	8.85	353	531	288	431
W16X36	10.6	7.95	317	477	258	388
W16X31	9.13	6.85	273	411	223	334
W16X26	7.68	5.76	230	346	187	281
W14X730	215	161.3	6437	9675	5241	7861
W14X665	196	147.0	5868	8820	4778	7166
W14X605	178	133.5	5329	8010	4339	6508
W14X550	162	121.5	4850	7290	3949	5923
W14X500	147	110.3	4401	6615	3583	5375
W14X455	134	100.5	4012	6030	3266	4899
W14X426	125	93.8	3743	5625	3047	4570
W14X398	117	87.8	3503	5265	2852	4278
W14X370	109	81.8	3263	4905	2657	3985
W14X342	101	75.8	3024	4545	2462	3693
W14X311	91.4	68.6	2737	4113	2228	3342
W14X283	83.3	62.5	2494	3749	2030	3046
W14X257	75.6	56.7	2263	3402	1843	2764
W14X233	68.5	51.4	2051	3083	1670	2505
W14X211	62.0	46.5	1856	2790	1511	2267
W14X193	56.8	42.6	1701	2556	1385	2077
W14X176	51.8	38.9	1551	2331	1263	1894
W14X159	46.7	35.0	1398	2102	1138	1707
W14X145	42.7	32.0	1278	1922	1041	1561
W14X132	38.8	29.1	1162	1746	946	1419
W14X120	35.3	26.5	1057	1589	860	1291

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Shape	A <sub>g</sub> in <sup>2</sup>	A <sub>e</sub> =0.75A <sub>g</sub> in <sup>3</sup>	Yielding		Rupture	
			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W14X109	32.0	24.0	958	1440	780	1170
W14X99	29.1	21.8	871	1310	709	1064
W14X90	26.5	19.9	793	1193	646	969
W14X82	24.0	18.0	719	1080	585	878
W14X74	21.8	16.4	653	981	531	797
W14X68	20.0	15.0	599	900	488	731
W14X61	17.9	13.4	536	806	436	654
W14X53	15.6	11.7	467	702	380	570
W14X48	14.1	10.6	422	635	344	516
W14X43	12.6	9.45	377	567	307	461
W14X38	11.2	8.40	335	504	273	410
W14X34	10.0	7.50	299	450	244	366
W14X30	8.85	6.64	265	398	216	324
W14X26	7.69	5.77	230	346	187	281
W14X22	6.49	4.87	194	292	158	237
W12X336	98.8	74.1	2958	4446	2408	3612
W12X305	89.6	67.2	2683	4032	2184	3276
W12X279	81.9	61.4	2452	3686	1996	2994
W12X252	74.0	55.5	2216	3330	1804	2706
W12X230	67.7	50.8	2027	3047	1650	2475
W12X210	61.8	46.4	1850	2781	1506	2260
W12X190	55.8	41.9	1671	2511	1360	2040
W12X170	50.0	37.5	1497	2250	1219	1828
W12X152	44.7	33.5	1338	2012	1090	1634
W12X136	39.9	29.9	1195	1796	973	1459
W12X120	35.3	26.5	1057	1589	860	1291
W12X106	31.2	23.4	934	1404	761	1141
W12X96	28.2	21.2	844	1269	687	1031
W12X87	25.6	19.2	766	1152	624	936
W12X79	23.2	17.4	695	1044	566	848
W12X72	21.1	15.8	632	950	514	771
W12X65	19.1	14.3	572	860	466	698
W12X58	17.0	12.8	509	765	414	622
W12X53	15.6	11.7	467	702	380	570
W12X50	14.6	11.0	437	657	356	534
W12X45	13.1	9.83	392	590	319	479
W12X40	11.7	8.78	350	527	285	428
W12X35	10.3	7.73	308	464	251	377

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			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W12X30	8.79	6.59	263	396	214	321
W12X26	7.65	5.74	229	344	186	280
W12X22	6.48	4.86	194	292	158	237
W12X19	5.57	4.18	167	251	136	204
W12X16	4.71	3.53	141	212	115	172
W12X14	4.16	3.12	125	187	101	152
W10X112	32.9	24.7	985	1481	802	1203
W10X100	29.4	22.1	880	1323	717	1075
W10X88	25.9	19.4	775	1166	631	947
W10X77	22.6	17.0	677	1017	551	826
W10X68	20.0	15.0	599	900	488	731
W10X60	17.6	13.2	527	792	429	644
W10X54	15.8	11.9	473	711	385	578
W10X49	14.4	10.8	431	648	351	527
W10X45	13.3	10.0	398	599	324	486
W10X39	11.5	8.63	344	518	280	420
W10X33	9.71	7.28	291	437	237	355
W10X30	8.84	6.63	265	398	215	323
W10X26	7.61	5.71	228	342	185	278
W10X22	6.49	4.87	194	292	158	237
W10X19	5.62	4.22	168	253	137	205
W10X17	4.99	3.74	149	225	122	182
W10X15	4.41	3.31	132	198	107	161
W10X12	3.54	2.66	106	159	86	129
W8X67	19.7	14.8	590	887	480	720
W8X58	17.1	12.8	512	770	417	625
W8X48	14.1	10.6	422	635	344	516
W8X40	11.7	8.78	350	527	285	428
W8X35	10.3	7.73	308	464	251	377
W8X31	9.12	6.84	273	410	222	333
W8X28	8.24	6.18	247	371	201	301
W8X24	7.08	5.31	212	319	173	259
W8X21	6.16	4.62	184	277	150	225
W8X18	5.26	3.95	157	237	128	192
W8X15	4.44	3.33	133	200	108	162
W8X13	3.84	2.88	115	173	93.6	140
W8X10	2.96	2.22	88.6	133	72.2	108
W6X25	7.34	5.51	220	330	179	268

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Shape	Ag in <sup>2</sup>	A <sub>e</sub> =0.75Ag in <sup>3</sup>	Yielding		Rupture	
			ASD	LRFD	ASD	LRFD
			P <sub>n</sub> /Ω	φP <sub>n</sub>	P <sub>n</sub> /Ω	φP <sub>n</sub>
			kips	kips	kips	kips
W6X20	5.87	4.40	176	264	143	215
W6X15	4.43	3.32	133	199	108	162
W6X16	4.74	3.56	142	213	116	173
W6X12	3.55	2.66	106	160	86.5	130
W6X9	2.68	2.01	80.2	121	65.3	98
W6X8.5	2.52	1.89	75.4	113	61.4	92
W5X19	5.56	4.17	166	250	136	203
W5X16	4.71	3.53	141	212	115	172
W4X13	3.83	2.87	115	172	93.4	140