



Table 5-3.
W-Shapes
Selection by Z_x

$F_y = 50 \text{ ksi}$
 $\phi_b = 0.90$
 $\phi_v = 0.90$

Table 5-3 (cont.).
W-Shapes
Selection by Z_x



Shape	X-X Axis						Y-Y Axis					
	Z_x	I_x	$\phi_b M_{px}$	$\phi_b M_{rx}$	L_p	L_r	B_F	$\phi_b V_h$	Z_y	I_y	$\phi_b M_{py}$	$\phi_b M_{ry}$
W36x79*	3580	62600	13400	6940	14.9	84.6	64.4	2700	743	4200	11600	11600
W36x65*	2860	48900	10700	7260	14.5	69.6	62.9	2150	580	3230	8200	8200
W40x69*	2780	50400	10400	7020	13.4	56.5	77.3	2080	481	2520	7100	7100
W40x58*	2320	41700	8700	5940	13.1	49.4	76.0	1750	395	2050	5200	5200
W36x52*	2280	38300	8550	5650	14.2	58.1	61.5	1700	454	2490	5200	5200
W40x43*	1960	34800	7350	5070	12.9	44.1	73.2	1480	328	1690	3800	3800
W27x53*	1890	25600	7090	4710	12.9	76.0	36.5	1730	437	2110	3600	3600
W36x49*	1870	31000	7010	4860	13.9	50.1	59.4	1410	367	1990	3600	3600
W14x80*	1830	16000	6860	4200	17.0	268	10.6	2300	927	5910	12000	12000
W40x39*	1800	32000	6750	4680	12.9	42.1	70.7	1350	300	1540	3300	3300
W40x32*	1710	29900	6410	4320	9.33	34.3	83.9	1590	212	803	2800	2800
W40x32*	1680	29600	6300	4380	12.7	40.1	70.2	1270	278	1420	2700	2700
W36x33*	1670	27500	6280	4350	13.8	46.7	56.1	1250	325	1750	2500	2500
W14x70*	1660	14300	6230	3840	16.6	241	10.6	1860	816	4720	10000	10000
W40x32*	1640	28900	6150	4260	12.7	39.9	66.5	1230	270	1380	2600	2600
W44x35	1620	31100	6080	4230	12.4	35.5	79.6	1210	236	1200	2400	2400
W33x38*	1560	24300	5650	4050	13.3	47.7	52.4	1220	312	1620	2100	2100
W36x39*	1510	24800	5660	3960	13.6	43.8	56.5	1130	292	1570	2000	2000
W14x66*	1480	12400	5550	3450	16.3	222	10.2	1650	730	4170	9000	9000
W40x34	1460	25600	5480	3840	12.6	37.6	65.6	1090	239	1220	2300	2300
W30x39*	1450	20700	5440	3750	13.0	52.1	43.1	1220	310	1550	2100	2100
W40x33	1430	24700	5360	3630	9.08	30.5	80.9	1340	172	644	2000	2000
W44x29	1420	27100	5330	3720	12.3	34.0	74.0	1020	206	1050	2000	2000
W33x35*	1420	22000	5330	3720	13.2	44.6	51.1	1110	282	1460	1900	1900
W40x32*	1410	24500	5290	3680	9.11	30.3	79.5	1390	170	640	1900	1900
W36x32*	1380	22500	5180	3630	13.6	41.8	54.8	1020	265	1420	1800	1800
W40x29	1330	23200	4990	3510	12.5	35.9	63.1	999	215	1050	1800	1800
W30x37*	1320	18700	4950	3420	12.9	48.6	42.8	1100	279	1390	1700	1700
W14x60*	1320	10800	4850	3120	16.1	203	9.79	1470	652	3660	8000	8000

*ASTM A6 tensile group 4 or 5 shape. Special requirements may apply per LRFD Specification Section A3.1c.

*ASTM A6 tensile group 4 or 5 shape. Special requirements may apply per LRFD Specification Section A3.1c.

Zx

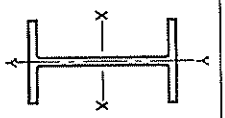
Table 5-3 (cont.)
W-Shapes
Selection by Z_x

F_y = 50 ksi
φ_b = 0.90
φ_v = 0.90

Shape	X-X Axis						Y-Y Axis				
	Z _x in ³	I _x in ⁴	φ _b M _{px} kip-ft	φ _b M _{px} kip-ft	L _p ft	L _r ft	BF	φ _v V _h kips	Z _y in ³	I _y in ⁴	φ _b M _{py} kip-ft
W16x31	54.0	375	203	142	4.13	11.0	8.06	118	7.03	12.4	25.3
W12x35	51.2	285	192	137	5.44	15.2	5.65	101	11.5	24.5	42.0
W14x30	46.9	288	176	125	5.26	13.7	6.05	101	8.97	19.6	42.0
W10x39	46.8	209	176	126	6.99	21.8	3.32	84.4	17.2	45.0	63.6
W16x26	44.2	301	166	115	3.96	10.4	7.83	106	5.48	9.59	19.6
W12x30	43.1	238	162	116	5.37	14.3	5.12	86.3	9.56	20.3	35.1
W14x28	39.9	243	150	105	3.81	10.2	7.01	95.7	5.53	8.90	19.6
W10x33	38.8	171	146	105	6.85	19.8	3.14	76.2	14.0	36.6	51.6
W12x26	37.2	204	140	100	5.33	13.8	4.66	75.8	8.17	17.3	30.0
W10x30	36.6	170	137	97.2	4.84	14.6	4.11	85.0	8.84	16.7	32.3
W14x22	32.8	197	123	85.8	3.67	9.65	6.22	85.1	4.37	7.00	15.6
W10x25	31.3	144	117	83.7	4.80	13.6	3.84	72.3	7.59	14.1	27.5
W12x22	29.3	156	110	76.2	3.00	8.42	6.21	86.3	3.66	4.66	13.0
W10x22	26.0	118	97.5	69.6	4.70	12.7	3.49	66.1	6.10	11.4	22.5
W12x19	24.7	130	92.6	63.9	2.90	7.95	5.69	77.4	2.98	3.76	10.6
W10x19	21.6	96.2	81.0	56.4	3.09	8.88	4.24	68.8	3.35	4.29	12.0
W12x16	20.1	103	75.4	51.3	2.73	7.44	5.11	71.3	2.26	2.82	7.93
W10x17	18.7	81.9	70.1	48.6	2.98	8.38	3.99	65.4	2.80	3.56	10.0
W12x14	17.4	88.5	65.2	44.7	2.66	7.17	4.55	64.3	1.90	2.36	6.89
W10x15	16.0	68.9	60.0	41.4	2.86	7.93	3.67	62.0	2.30	2.89	8.19
W10x12H	12.6	53.8	47.3	32.7	2.87	7.45	3.18	50.6	1.74	2.18	6.19

F_y = 50 ksi
φ_b = 0.90
φ_v = 0.90

Table 5-4.
W-Shapes
Maximum Total Factored Uniform Load^a



Shape	W44x				W40x			
	336*	280	262	230	593*	503*	431*	397*
19	2420	2050	1850	1640	4160	3500	2950	2700
20	2420	2050	1850	1640	4140	3480	2940	2620
21	2310	2030	1810	1570	3940	3310	2800	2570
22	2210	1940	1730	1500	3760	3160	2670	2450
23	2110	1850	1660	1430	3600	3030	2560	2350
24	2030	1780	1590	1380	3450	2900	2450	2250
25	1940	1700	1520	1320	3310	2780	2350	2160
26	1870	1640	1470	1270	3180	2680	2260	2080
27	1800	1580	1410	1220	3070	2580	2180	2000
28	1740	1520	1360	1180	2960	2480	2100	1930
29	1680	1470	1310	1140	2860	2400	2030	1860
30	1620	1420	1270	1100	2760	2330	1960	1800
32	1520	1330	1190	1030	2590	2180	1840	1690
34	1430	1250	1120	971	2440	2050	1730	1590
35	1350	1180	1060	917	2300	1930	1630	1500
36	1280	1120	1000	868	2180	1830	1550	1420
38	1220	1070	953	825	2070	1740	1470	1350
40	1160	1010	907	786	1970	1660	1400	1290
42	1100	968	866	750	1880	1580	1340	1230
44	1060	926	828	717	1800	1510	1280	1170
46	1010	888	794	688	1730	1450	1230	1130
48	972	852	762	660	1660	1390	1180	1080
50	935	819	733	635	1590	1340	1130	1040
52	900	789	706	611	1530	1290	1090	1000
54	868	761	680	589	1480	1240	1050	964
56	838	734	657	569	1430	1200	1010	931
58	810	710	635	550	1380	1160	980	900
60	784	687	615	532	1340	1120	948	871
62	759	666	595	516	1290	1090	919	844
64	736	645	577	500	1250	1050	891	818
66	715	626	560	485	1220	1020	865	794
68	694	609	544	471	1180	994	840	771
70	675	592	529	458	1150	967	817	750

Beam Properties

Shape	Z _x in ³	I _x in ⁴	φ _b M _{px} kip-ft	φ _b M _{px} kip-ft	L _p ft	L _r ft	BF	φ _v V _h kips	Z _y in ³	I _y in ⁴	φ _b M _{py} kip-ft
W16x31	1820	1420	1270	1180	2760	2320	1960	1800	1680	1640	1460
W12x35	48600	42600	38100	33000	82800	69600	58800	54000	50400	49200	43600
W14x30	1210	1020	924	822	2080	1750	1480	1350	1270	1230	1090
W10x39	79.6	74.0	68.3	61.7	77.3	76.0	73.2	70.7	70.2	69.5	65.6
W16x26	35.5	34.0	32.6	31.8	56.5	49.4	44.1	42.1	40.7	39.9	37.6
W12x30	12.4	12.3	12.2	12.1	13.4	13.1	12.9	12.9	12.7	12.7	12.6
W14x28	4230	3720	3360	2910	7020	5940	4980	4680	4380	4280	3840
W10x33	6080	5330	4760	4130	10400	8700	7350	6750	6300	6150	5480

^a11 Indicates flange is non-compact.
^bSpecial requirements may apply per LRFD Specification Section A3.1c.
^cSectional laterally unsupported, see Table 5-5.
^dMaximum design strength tabulated above heavy line is limited by design shear strength.



Table 5-3 (cont.)
W-Shapes
Selection by Z_x

F_y = 50 ksi
φ_b = 0.90
φ_v = 0.90

Shape	X-X Axis							Y-Y Axis			
	Z _x in ³	I _x in ⁴	φ _b M _{px} kip-ft	φ _b M _{px} kip-ft	L _p ft	L _r ft	BF kips	φ _v V _h kips	Z _y in ³	I _y in ⁴	φ _b M _{py} kip-ft
W27x84	244	2850	915	639	7.31	19.3	23.0	332	33.2	106	1191
W27x72	243	1430	911	627	11.3	62.1	5.99	322	454	410	1191
W27x60	234	1530	878	627	13.3	49.7	6.88	256	548	415	1191
W27x54	230	1910	863	612	9.40	28.7	13.0	298	220	222	1191
W27x48	224	2370	840	588	6.89	18.6	21.5	306	32.6	94.4	1191
W27x42	221	2070	829	576	6.50	19.3	19.7	338	34.7	92.9	1191
W27x36	214	1240	803	558	11.2	55.7	5.49	206	98.0	368	1191
W27x30	212	1380	785	570	13.2	46.3	6.81	231	102	485	1191
W27x24	211	1750	791	564	9.36	27.5	12.6	259	55.3	201	1191
W24x76	200	2100	750	528	6.78	18.0	19.8	284	28.6	82.5	1191
W24x68	199	1490	746	528	8.87	29.5	10.6	269	54.9	186	1191
W24x60	196	1830	735	513	6.46	18.5	18.5	298	30.5	81.4	1191
W24x54	192	1240	720	519	13.2	43.2	6.69	203	92.7	447	1191
W24x48	186	1530	698	499	9.29	26.0	11.9	238	48.4	175	1191
W24x42	186	1070	698	489	11.1	50.0	5.36	251	65.4	345	1191
W24x36	177	1830	684	482	6.61	17.4	18.6	266	24.5	70.4	1191
W24x30	176	1310	660	488	8.80	27.5	10.3	238	48.2	163	1191
W24x24	173	1110	649	471	13.5	40.6	6.56	186	83.6	402	1191
W21x73	172	1600	645	453	6.39	17.6	17.1	260	26.6	70.6	1191
W21x66	164	933	615	435	11.0	44.9	5.31	212	75.1	301	1191
W21x60	163	1330	611	439	9.22	24.8	11.1	209	42.2	152	1191
W21x54	160	1480	600	420	6.36	17.3	16.5	245	24.4	64.7	1191
W21x48	157	999	589	429	15.1	36.4	6.85	166	75.6	362	1191
W24x82	154	1560	578	396	4.84	13.3	21.6	275	15.8	34.5	1191
W16x77	151	1120	566	405	8.69	25.3	9.68	203	41.2	138	1191
W12x96	147	833	551	383	10.9	41.3	5.20	189	67.5	270	1191
W10x112	147	716	551	378	9.47	36.5	3.88	232	69.2	236	1191
W18x71	146	1170	548	381	6.00	17.8	14.1	247	24.7	60.3	1191
W21x62	144	1330	540	381	6.25	16.7	15.2	227	21.7	57.5	1191
W14x82	139	882	521	369	8.76	29.6	7.30	197	44.8	148	1191
W24x55	135	1360	506	345	4.73	12.9	19.8	252	13.4	29.1	1191
W18x65	133	1070	499	351	5.97	17.1	13.3	224	22.5	54.8	1191
W12x87	132	740	495	354	10.8	38.4	5.13	174	60.4	241	1191
W16x67	131	953	491	354	8.65	23.8	9.04	174	35.5	119	1191
W10x100	130	623	488	336	9.36	50.8	3.66	204	61.0	207	1191
W21x57	129	1170	484	333	4.77	13.2	17.8	231	14.9	30.7	1191

†† Indicates flange is non-compact.



Table 5-3 (cont.)
W-Shapes
Selection by Z_y

F_y = 50 ksi
φ_b = 0.90
φ_v = 0.90

Shape	X-X Axis							Y-Y Axis			
	Z _x in ³	I _x in ⁴	φ _b M _{px} kip-ft	φ _b M _{px} kip-ft	L _p ft	L _r ft	BF kips	φ _v V _h kips	Z _y in ³	I _y in ⁴	φ _b M _{py} kip-ft
W21x55	126	1140	786	473	6.11	16.1	14.3	211	18.4	48.4	66.4
W14x74	126	796	473	473	8.76	27.9	7.12	173	40.5	134	150
W18x60	123	984	461	461	5.93	16.6	12.9	204	20.6	50.1	74.8
W12x79	119	662	446	446	10.8	35.7	5.03	157	54.3	216	201
W14x69	115	722	431	431	8.69	26.4	6.91	157	36.9	121	136
W10x88	113	534	424	424	9.29	45.1	3.58	176	53.1	179	106
W18x55	112	890	420	420	5.90	16.1	12.2	191	18.5	44.9	66.9
W21x50	111	989	416	416	4.59	12.5	16.5	213	12.2	24.9	43.0
W12x72	108	597	405	405	10.7	33.6	4.93	143	49.2	195	192
W21x40††	107	959	401	401	6.09	15.4	13.2	195	14.9	38.7	53.5
W16x57	105	758	394	394	5.85	16.6	10.7	180	18.9	43.1	68.1
W14x61	102	640	383	383	8.65	25.0	6.50	141	32.8	107	121
W18x50	101	880	379	379	5.83	15.6	11.5	173	16.6	40.1	60.2
W10x77	97.6	455	366	366	9.18	39.9	3.53	152	45.9	154	189
W12x65††	96.8	533	363	363	11.9	31.7	5.01	127	44.1	174	164
W21x44	95.8	847	359	359	4.45	12.0	15.0	196	10.2	20.7	35.8
W18x50	92.0	659	345	345	5.62	15.7	10.1	167	16.3	37.2	59.1
W16x46	90.7	712	340	340	4.56	12.6	12.9	176	11.7	22.5	41.8
W14x53	87.1	541	327	327	6.78	20.1	7.01	139	22.0	57.7	80.4
W12x56	86.4	475	324	324	8.87	27.0	4.97	119	32.5	107	120
W10x68	85.3	394	320	320	9.15	36.0	3.45	132	40.1	134	149
W18x45	82.3	586	309	309	5.55	15.1	9.45	150	14.5	32.8	52.5
W18x40	78.4	612	294	294	4.49	12.0	11.7	152	9.95	19.1	35.7
W16x48	78.4	485	294	294	6.75	19.2	6.70	127	19.6	51.4	72.0
W12x53	77.9	425	292	292	8.76	25.6	4.76	113	28.1	95.8	108
W10x60	74.6	341	280	280	9.08	32.6	3.39	116	35.0	116	129
W18x40	73.0	518	274	274	5.85	14.7	8.71	132	12.7	28.9	46.4
W12x50	71.9	391	270	270	6.92	21.5	5.30	122	21.3	56.3	78.2
W14x43	69.6	428	261	261	6.88	18.2	6.31	113	17.3	45.2	63.6
W10x54	66.6	303	250	250	9.04	30.2	3.30	101	31.3	103	116
W18x35	66.5	510	249	249	4.31	11.5	10.7	143	8.06	15.3	28.8
W12x45	64.2	348	241	241	6.89	20.3	5.06	109	19.0	50.0	69.8
W16x36	64.0	448	240	240	5.37	14.1	8.11	127	10.8	24.5	39.4
W14x36	61.1	383	229	229	5.47	14.9	7.05	118	12.1	26.7	44.3
W10x49	60.4	272	227	227	8.97	28.3	3.24	91.6	28.3	93.4	105
W12x40	57.0	307	214	214	6.85	19.2	4.79	94.8	16.8	44.1	61.9
W14x34	54.9	248	206	206	7.10	24.1	3.44	95.4	20.3	53.4	74.8
W18x34	54.2	337	203	203	5.40	14.3	6.58	108	10.6	23.3	38.9

†† Indicates flange is non-compact.