

Table A.2M Beam Design Criteria Z_x , I_x , A

<i>Basic Section Properties</i>					<i>345 MPa Steel Values</i>				Rate of Change
Shape		Z_x (mm ³)	I_x (mm ⁴)	A_{web} (mm ²)	M_{Lp}	L_p	M_{Lr}	L_r	
Imperial	Metric				(kN-m)	(m)	(kN-m)	(m)	
W36X798	W920x1188	58,666 x10 ³	26,056 x10 ⁶	128,967	18,167	4.54	12,120	25.79	284.62
W36X650	W920x967	46,867 x10 ³	20,354 x10 ⁶	51,613	14,507	4.42	9,843	21.21	277.70
W40X593	W1000x883	45,228 x10 ³	20,978 x10 ⁶	49,677	14,100	4.08	9,517	17.22	348.82
W40X503	W1000x749	38,018 x10 ³	17,357 x10 ⁶	41,806	11,795	3.99	8,053	15.06	338.20
W36X527	W920x784	37,363 x10 ³	15,942 x10 ⁶	40,710	11,592	4.33	7,931	17.71	273.57
W40X431	W1000x641	32,119 x10 ³	14,485 x10 ⁶	35,677	9,965	3.93	6,874	23.77	155.78
W27X539	W690x802	30,972 x10 ³	10,656 x10 ⁶	41,290	9,612	3.93	6,386	23.77	162.62
W36X439	W920x653	30,644 x10 ³	12,903 x10 ⁶	33,613	9,504	4.24	6,589	15.27	264.18
W14X808	W360x1212	29,988 x10 ³	6,660 x10 ⁶	55,032	9,300	5.18	5,694	81.69	47.14
W40X397	W1000x554	29,497 x10 ³	13,319 x10 ⁶	32,258	9,151	3.93	6,345	12.83	315.32
W40X392	W1000x583	28,022 x10 ³	12,445 x10 ⁶	38,129	8,690	2.84	5,857	10.45	372.30
W40X372	W1000x554	27,530 x10 ³	12,320 x10 ⁶	30,387	8,541	3.87	5,938	12.22	311.68
W36X393	W920x585	27,366 x10 ³	11,446 x10 ⁶	29,742	8,487	4.21	5,898	14.23	258.23
W14X730	W360x1086	27,203 x10 ³	5,952 x10 ⁶	44,387	8,446	5.06	5,206	73.46	47.37
W40X362	W1000x539	26,875 x10 ³	12,029 x10 ⁶	29,355	8,338	3.87	5,775	12.16	309.07
W44X335	W1100x499	26,547 x10 ³	12,945 x10 ⁶	28,968	8,243	3.78	5,735	10.82	356.23
W33X387	W840x576	25,564 x10 ³	10,114 x10 ⁶	29,290	7,931	4.05	5,491	14.54	232.74
W36X359	W920x534	24,744 x10 ³	10,323 x10 ⁶	27,032	7,674	4.15	5,369	13.35	250.38
W14X665	W360x990	24,253 x10 ³	5,161 x10 ⁶	39,419	7,524	4.97	4,677	67.67	45.41
W40X324	W1000x483	23,925 x10 ³	10,656 x10 ⁶	25,935	7,430	3.84	5,206	11.46	291.79
W30X391	W760x582	23,761 x10 ³	8,616 x10 ⁶	29,161	7,375	3.96	5,084	15.88	192.25
W40X331	W1000x493	23,434 x10 ³	10,281 x10 ⁶	32,129	7,267	2.77	4,921	9.30	359.58
W44X290	W1100x432	23,270 x10 ³	11,280 x10 ⁶	24,452	7,226	3.75	5,043	10.36	330.01
W33X354	W840x527	23,270 x10 ³	9,157 x10 ⁶	26,645	7,226	4.02	5,043	13.59	228.07
W40X327	W1000x486	23,106 x10 ³	10,198 x10 ⁶	31,032	7,172	2.77	4,881	9.24	354.58
W36X328	W920x488	22,614 x10 ³	9,365 x10 ⁶	24,387	7,023	4.15	4,921	12.74	244.48
W40X297	W1000x443	21,795 x10 ³	9,657 x10 ⁶	23,871	6,765	3.81	4,759	10.94	281.33
W30X357	W760x531	21,631 x10 ³	7,784 x10 ⁶	26,258	6,711	3.93	4,637	14.81	190.63
W14X605	W360x900	21,631 x10 ³	4,495 x10 ⁶	35,032	6,711	4.91	4,230	61.87	43.55

Table A.2M Beam Design Criteria Z_x , I_x , A

Basic Section Properties				
Shape		Z _x (mm ³)	I _x (mm ⁴)	A _{web} (mm ²)
Imperial	Metric			
W44X262	W1100x390	20,812 x10 ³	10,073 x10 ⁶	22,064
W33X318	W840x473	20,812 x10 ³	8,117 x10 ⁶	23,613
W36X300	W920x446	20,648 x10 ³	8,449 x10 ⁶	22,387
W40X277	W1000x412	20,484 x10 ³	9,115 x10 ⁶	21,290
W27X368	W690x548	20,320 x10 ³	6,743 x10 ⁶	27,097
W40X278	W1000x414	19,501 x10 ³	8,533 x10 ⁶	26,452
W30X326	W760x484	19,501 x10 ³	6,993 x10 ⁶	23,806
W14X550	W360x818	19,337 x10 ³	3,925 x10 ⁶	31,032
W36X280	W920x417	19,173 x10 ³	7,867 x10 ⁶	20,839
W33X291	W840x433	19,009 x10 ³	7,367 x10 ⁶	21,548
W40X264	W1000x393	18,517 x10 ³	8,075 x10 ⁶	24,774
W27X336	W690x500	18,517 x10 ³	6,077 x10 ⁶	24,387
W24X370	W610x551	18,517 x10 ³	5,578 x10 ⁶	27,484
W40X249	W1000x371	18,354 x10 ³	8,158 x10 ⁶	19,097
W44X230	W1100x342	18,026 x10 ³	8,658 x10 ⁶	19,677
W36X260	W920x387	17,698 x10 ³	7,201 x10 ⁶	19,677
W30X292	W760x434	17,370 x10 ³	6,202 x10 ⁶	21,032
W14X500	W360x744	17,206 x10 ³	3,417 x10 ⁶	27,677
W36X256	W920x381	17,043 x10 ³	6,993 x10 ⁶	23,161
W33X263	W840x392	17,043 x10 ³	6,618 x10 ⁶	19,355
W27X307	W690x457	16,879 x10 ³	5,453 x10 ⁶	22,129
W24X335	W610x498	16,715 x10 ³	4,953 x10 ⁶	24,516
W40X235	W1000x350	16,551 x10 ³	7,242 x10 ⁶	21,290
W36X245	W920x365	16,551 x10 ³	6,701 x10 ⁶	18,645
W40X215	W1000x321	15,797 x10 ³	6,951 x10 ⁶	16,387
W36X230	W920x342	15,453 x10 ³	6,243 x10 ⁶	17,613
W30X261	W760x389	15,453 x10 ³	5,453 x10 ⁶	18,968
W33X241	W840x359	15,404 x10 ³	5,910 x10 ⁶	18,323
W36X232	W920x345	15,338 x10 ³	6,243 x10 ⁶	20,839
W27X281	W690x419	15,338 x10 ³	4,953 x10 ⁶	20,064
W14X455	W360x677	15,338 x10 ³	2,993 x10 ⁶	24,774
W24X306	W610x455	15,109 x10 ³	4,454 x10 ⁶	22,000
W40X211	W1000x314	14,847 x10 ³	6,452 x10 ⁶	19,097

345 MPa Steel Values				Rate of Change
M _{Lp} (kN-m)	L _p (m)	M _{Lr} (kN-m)	L _r (m)	
6,453	3.72	4,555	10.00	302.29
6,453	3.99	4,515	12.77	220.86
6,413	4.11	4,515	12.16	235.88
6,358	3.84	4,474	10.82	269.99
6,304	3.75	4,311	16.67	154.21
6,047	2.71	4,149	8.41	333.01
6,047	3.87	4,230	13.78	183.39
6,006	4.85	3,783	57.00	42.63
5,952	4.11	4,189	11.80	229.46
5,898	3.96	4,149	12.07	215.71
5,748	2.71	3,945	8.23	326.84
5,748	3.72	3,959	15.36	153.70
5,748	3.54	3,891	18.59	123.36
5,694	3.81	4,040	10.39	251.23
5,599	3.72	3,945	9.69	276.87
5,491	4.08	3,877	11.40	220.55
5,396	3.84	3,783	12.83	179.43
5,342	4.75	3,403	52.43	40.67
5,287	2.87	3,647	8.75	278.86
5,287	3.93	3,742	11.52	203.64
5,233	3.66	3,606	14.23	153.82
5,193	3.47	3,511	16.92	125.07
5,138	2.74	3,566	7.92	303.51
5,138	4.02	3,647	11.13	209.99
4,908	3.81	3,498	10.00	227.88
4,799	4.02	3,403	10.85	204.53
4,799	3.81	3,376	11.92	175.58
4,786	3.90	3,376	11.03	197.69
4,759	2.83	3,294	8.32	266.88
4,759	3.66	3,308	13.35	149.67
4,759	4.72	3,078	47.85	38.98
4,691	3.44	3,213	15.54	122.12
4,610	2.71	3,200	7.59	289.12

Table A.2M Beam Design Criteria Z_x , I_x , A

Basic Section Properties					345 MPa Steel Values				Rate of Change
Shape		Z_x (mm ³)	I_x (mm ⁴)	A_{web} (mm ²)	M_{Lp}	L_p	M_{Lr}	L_r	
Imperial	Metric				(kN-m)	(m)	(kN-m)	(m)	
W40X199	W1000x296	14,240 x10³	6,202 x10⁶	16,258	4,420	3.72	3,132	9.66	216.70
W14X426	W360x634	14,240 x10 ³	2,747 x10 ⁶	22,710	4,420	4.66	2,874	45.11	38.21
W33X221	W840x329	14,044 x10 ³	5,369 x10 ⁶	16,968	4,352	3.87	3,091	10.67	185.50
W27X258	W690x384	13,962 x10 ³	4,495 x10 ⁶	18,323	4,338	3.63	3,037	12.50	146.74
W30X235	W760x350	13,880 x10 ³	4,870 x10 ⁶	16,774	4,311	3.78	3,037	11.31	169.28
W24X279	W610x415	13,683 x10 ³	3,996 x10 ⁶	20,000	4,243	3.41	2,915	14.42	120.75
W36X210	W920x313	13,650 x10 ³	5,494 x10 ⁶	19,677	4,230	2.77	2,928	7.96	251.18
W14X398	W360x592	13,126 x10 ³	2,497 x10 ⁶	20,903	4,067	4.63	2,671	42.37	37.01
W40X183	W1000x272	12,831 x10³	5,536 x10⁶	16,387	3,986	2.68	2,779	7.28	262.17
W33X201	W840x299	12,667 x10 ³	4,828 x10 ⁶	15,548	3,932	3.84	2,793	10.30	176.24
W27X235	W690x350	12,651 x10 ³	4,037 x10 ⁶	16,839	3,932	3.60	2,752	11.77	144.39
W36X194	W920x289	12,569 x10 ³	5,036 x10 ⁶	19,290	3,905	2.74	2,698	7.71	242.87
W30X211	W760x314	12,307 x10 ³	4,287 x10 ⁶	15,419	3,823	3.75	2,712	10.73	159.27
W24X250	W610x372	12,192 x10 ³	3,534 x10 ⁶	17,677	3,783	3.38	2,617	13.17	119.17
W14X370	W360x551	12,061 x10 ³	2,264 x10 ⁶	19,161	3,742	4.60	2,467	39.32	36.71
W36X182	W920x271	11,766 x10³	4,703 x10⁶	17,097	3,647	2.74	2,535	7.56	230.85
W27X217	W690x323	11,651 x10 ³	3,709 x10 ⁶	15,226	3,620	3.57	2,549	11.22	140.00
W40X167	W1000x249	11,356 x10³	4,828 x10⁶	16,194	3,525	2.59	2,440	6.98	247.11
W30X191	W760x284	11,061 x10 ³	3,829 x10 ⁶	14,064	3,430	3.72	2,440	10.30	150.33
W24X229	W610x341	11,061 x10 ³	3,184 x10 ⁶	16,129	3,430	3.35	2,386	12.25	117.29
W14X342	W360x509	11,012 x10 ³	2,040 x10 ⁶	17,419	3,416	4.57	2,264	36.88	35.67
W36X170	W920x253	10,947 x10 ³	4,370 x10 ⁶	15,871	3,403	2.71	2,359	7.41	222.40
W27X194	W690x289	10,340 x10 ³	3,272 x10 ⁶	13,613	3,213	3.54	2,278	10.55	133.44
W33X169	W840x251	10,307 x10 ³	3,867 x10 ⁶	14,581	3,200	2.68	2,237	7.47	201.15
W36X160	W920x238	10,226 x10³	4,062 x10⁶	15,097	3,172	2.68	2,210	7.25	210.54
W30X173	W760x257	9,947 x10 ³	3,426 x10 ⁶	13,032	3,091	3.69	2,196	9.91	143.91
W24X207	W610x307	9,931 x10 ³	2,839 x10 ⁶	14,452	3,078	3.32	2,156	11.37	114.57
W14X311	W360x463	9,881 x10 ³	1,802 x10 ⁶	15,548	3,064	4.51	2,061	33.53	34.57
W12X336	W310x500	9,881 x10 ³	1,690 x10 ⁶	19,290	3,064	3.75	1,966	39.93	30.35
W40X149	W1000x222	9,799 x10³	4,079 x10⁶	15,548	3,037	2.47	2,088	6.64	227.27
W36X150	W920x223	9,521 x10 ³	3,763 x10 ⁶	14,452	2,956	2.65	2,047	7.10	204.12
W27X178	W690x265	9,341 x10 ³	2,922 x10 ⁶	13,032	2,901	3.51	2,061	10.06	128.27
W33X152	W840x226	9,160 x10 ³	3,396 x10 ⁶	13,742	2,847	2.65	1,979	7.22	189.78
W24X192	W610x285	9,160 x10 ³	2,606 x10 ⁶	13,355	2,847	3.29	1,993	10.85	112.99
W14X283	W360x421	8,882 x10 ³	1,598 x10 ⁶	13,871	2,752	4.48	1,871	30.48	33.89
W12X305	W310x454	8,800 x10 ³	1,478 x10 ⁶	17,161	2,725	3.72	1,776	36.58	28.88
W21X201	W530x300	8,685 x10 ³	2,210 x10 ⁶	13,484	2,698	3.26	1,871	12.50	89.55
W27X161	W690x240	8,439 x10 ³	2,626 x10 ⁶	11,742	2,617	3.47	1,857	9.66	122.70
W33X141	W840x210	8,423 x10³	3,101 x10⁶	12,968	2,617	2.62	1,817	7.01	182.24
W24X176	W610x262	8,374 x10 ³	2,364 x10 ⁶	12,194	2,603	3.26	1,830	10.27	110.23

Table A.2M Beam Design Criteria Z_x , I_x , A

Basic Section Properties				
Shape		Z _x (mm ³)	I _x (mm ⁴)	A _{web} (mm ²)
Imperial	Metric			
W36X135	W920x201	8,341 x10 ³	3,247 x10 ⁶	13,806
W30X148	W760x220	8,194 x10 ³	2,780 x10 ⁶	12,903
W14X257	W360x382	7,981 x10 ³	1,415 x10 ⁶	12,516
W12X279	W310x415	7,882 x10 ³	1,294 x10 ⁶	15,677
W21X182	W530x272	7,817 x10 ³	1,973 x10 ⁶	12,129
W24X162	W610x241	7,669 x10 ³	2,152 x10 ⁶	11,355
W33X130	W840x193	7,653 x10 ³	2,793 x10 ⁶	12,387
W27X146	W690x217	7,604 x10 ³	2,356 x10 ⁶	10,710
W30X132	W760x196	7,161 x10 ³	2,402 x10 ⁶	12,000
W14X233	W360x347	7,145 x10 ³	1,253 x10 ⁶	11,032
W21X166	W530x248	7,079 x10 ³	1,781 x10 ⁶	10,903
W12X252	W310x375	7,014 x10 ³	1,132 x10 ⁶	13,935
W24X146	W610x217	6,850 x10 ³	1,906 x10 ⁶	10,387
W33X118	W840x176	6,801 x10 ³	2,456 x10 ⁶	11,677
W30X124	W760x185	6,686 x10 ³	2,231 x10 ⁶	11,419
W18X175	W460x260	6,522 x10 ³	1,436 x10 ⁶	11,484
W27X129	W690x192	6,473 x10 ³	1,981 x10 ⁶	10,839
W14X211	W360x314	6,391 x10 ³	1,107 x10 ⁶	9,935
W12X230	W310x342	6,325 x10 ³	1,007 x10 ⁶	12,581
W30X116	W760x173	6,194 x10 ³	2,052 x10 ⁶	10,968
W21X147	W530x219	6,129 x10 ³	1,515 x10 ⁶	10,258
W24X131	W610x195	6,063 x10 ³	1,673 x10 ⁶	9,548
W18X158	W460x235	5,834 x10 ³	1,274 x10 ⁶	10,323
W14X193	W360x287	5,817 x10 ³	999 x10 ⁶	8,903
W12X210	W310x313	5,703 x10 ³	891 x10 ⁶	11,161
W30X108	W760x161	5,670 x10 ³	1,861 x10 ⁶	10,452
W27X114	W690x170	5,621 x10 ³	1,698 x10 ⁶	10,064
W21X132	W530x196	5,473 x10 ³	1,344 x10 ⁶	9,161
W24X117	W610x174	5,359 x10 ³	1,473 x10 ⁶	8,645
W18X143	W460x213	5,277 x10 ³	1,145 x10 ⁶	9,161
W14X176	W360x262	5,244 x10 ³	891 x10 ⁶	8,129
W30X99	W760x147	5,113 x10 ³	1,661 x10 ⁶	9,935
W12X190	W310x283	5,096 x10 ³	787 x10 ⁶	9,871
W21X122	W530x182	5,047 x10 ³	1,236 x10 ⁶	8,387
W27X102	W690x152	4,998 x10 ³	1,507 x10 ⁶	9,032
W18X130	W460x193	4,752 x10 ³	1,024 x10 ⁶	8,323
W24X104	W610x155	4,736 x10 ³	1,290 x10 ⁶	7,742
W14X159	W360x237	4,703 x10 ³	791 x10 ⁶	7,226

345 MPa Steel Values				
M _{Lp} (kN-m)	L _p (m)	M _{Lr} (kN-m)	L _r (m)	Rate of Change
2,589	2.56	1,790	6.83	187.45
2,549	2.44	1,776	6.95	171.31
2,481	4.45	1,695	27.92	33.50
2,440	3.63	1,613	33.53	27.66
2,427	3.23	1,695	11.61	87.34
2,386	3.29	1,681	9.88	107.08
2,373	2.56	1,654	6.86	167.19
2,359	3.44	1,681	9.30	115.83
2,223	2.44	1,546	6.68	160.00
2,223	4.42	1,532	25.42	32.92
2,196	3.20	1,546	10.88	84.72
2,183	3.60	1,437	30.48	27.74
2,129	3.23	1,505	9.33	102.30
2,115	2.50	1,464	6.61	158.15
2,074	2.41	1,451	6.52	151.56
2,020	2.99	1,396	12.62	64.75
2,007	2.38	1,410	6.77	135.91
1,979	4.39	1,369	23.16	32.49
1,966	3.57	1,306	28.04	26.98
1,925	2.35	1,338	6.37	145.91
1,898	3.17	1,342	10.00	81.41
1,884	3.20	1,338	8.87	96.37
1,817	2.96	1,261	11.58	64.44
1,803	4.36	1,261	21.37	31.89
1,776	3.54	1,188	25.66	26.59
1,762	2.32	1,216	6.22	140.04
1,749	2.35	1,216	6.46	129.49
1,695	3.14	1,204	9.45	77.79
1,668	3.17	1,184	8.50	90.74
1,640	2.93	1,147	10.76	63.00
1,627	4.33	1,143	19.66	31.57
1,586	2.26	1,094	6.04	130.21
1,586	3.51	1,070	23.35	26.03
1,573	3.14	1,114	9.45	72.63
1,546	2.32	1,086	6.22	117.80
1,478	2.90	1,041	10.00	61.47
1,464	3.14	1,049	8.20	81.99
1,464	4.30	1,033	17.95	31.57

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Shape		Z_x (mm ³)	I_x (mm ⁴)	A_{web} (mm ²)	M_{Lp}	L_p	M_{Lr}	L_r	
Imperial	Metric				(kN-m)	(m)	(kN-m)	(m)	
W30X90	W760x134	4,638 x10³	1,503 x10⁶	8,968	1,437	2.26	996	5.91	120.47
W24X103	W610x153	4,588 x10 ³	1,249 x10 ⁶	8,710	1,424	2.13	996	6.10	107.78
W21X111	W530x165	4,572 x10 ³	1,116 x10 ⁶	7,613	1,424	3.11	1,013	8.72	73.25
W27X94	W690x140	4,556 x10 ³	1,361 x10 ⁶	8,516	1,410	2.29	988	6.07	111.56
W12X170	W310x253	4,506 x10 ³	687 x10 ⁶	8,645	1,396	3.47	956	21.00	25.14
W18X119	W460x177	4,293 x10 ³	912 x10 ⁶	8,000	1,333	2.90	940	9.42	60.28
W14X145	W360x216	4,261 x10 ³	712 x10 ⁶	6,516	1,322	4.30	944	16.67	30.57
W24X94	W610x140	4,162 x10 ³	1,124 x10 ⁶	8,065	1,292	2.13	903	5.91	102.95
W21X101	W530x150	4,146 x10 ³	1,011 x10 ⁶	6,903	1,287	3.11	923	8.38	68.91
W27X84	W690x125	3,998 x10³	1,186 x10⁶	7,935	1,241	2.23	866	5.88	102.30
W12X152	W310x226	3,982 x10 ³	595 x10 ⁶	7,677	1,235	3.44	850	18.93	24.87
W14X132	W360x196	3,835 x10 ³	637 x10 ⁶	6,129	1,190	4.05	850	15.15	30.67
W18X106	W460x158	3,769 x10 ³	795 x10 ⁶	7,097	1,170	2.87	830	8.75	57.85
W24X84	W610x125	3,671 x10³	986 x10⁶	7,290	1,139	2.10	797	5.67	95.80
W21X93	W530x138	3,622 x10 ³	862 x10 ⁶	8,065	1,124	1.98	781	5.88	87.92
W12X136	W310x202	3,507 x10 ³	516 x10 ⁶	6,839	1,089	3.41	757	16.98	24.49
W14X120	W360x179	3,474 x10 ³	574 x10 ⁶	5,548	1,078	4.02	773	14.11	30.24
W18X97	W460x144	3,458 x10 ³	728 x10 ⁶	6,452	1,072	2.87	765	8.38	55.78
W24X76	W610x113	3,277 x10³	874 x10⁶	6,774	1,017	2.07	716	5.49	88.17
W16X100	W410x149	3,261 x10 ³	620 x10 ⁶	6,387	1,011	2.71	716	8.99	47.07
W21X83	W530x123	3,212 x10 ³	762 x10 ⁶	7,097	996	1.98	695	5.64	82.29
W14X109	W360x162	3,146 x10 ³	516 x10 ⁶	4,839	976	4.02	704	13.17	29.80
W18X86	W460x158	3,048 x10 ³	637 x10 ⁶	5,677	946	2.83	675	7.92	53.27
W12X120	W310x179	3,048 x10 ³	445 x10 ⁶	6,000	946	3.38	663	15.24	23.90
W24X68	W610x101	2,901 x10³	762 x10⁶	6,323	900	2.01	626	5.30	83.19
W16X89	W410x132	2,884 x10 ³	545 x10 ⁶	5,677	895	2.68	634	8.38	45.67
W14X99	W360x147	2,835 x10 ³	462 x10 ⁶	4,452	880	4.11	639	12.37	29.22
W21X73	W530x109	2,819 x10 ³	666 x10 ⁶	6,194	874	1.95	614	5.36	76.25
W12X106	W310x158	2,687 x10 ³	388 x10 ⁶	5,097	834	3.35	590	13.69	23.62
W18X76	W460x113	2,671 x10 ³	554 x10 ⁶	4,968	828	2.80	594	7.56	49.33
W21X68	W530x101	2,622 x10³	616 x10⁶	5,871	813	2.01	626	5.30	56.84
W14X90	W360x134	2,573 x10 ³	416 x10 ⁶	4,000	799	4.60	582	11.70	30.54
W24X62	W610x92	2,524 x10³	649 x10⁶	6,581	784	1.46	537	4.05	95.24
W16X77	W410x114	2,474 x10 ³	466 x10 ⁶	4,839	767	2.65	549	7.71	43.14
W12X96	W310x143	2,409 x10 ³	347 x10 ⁶	4,516	747	3.32	533	12.59	23.12
W10X112	W250x167	2,409 x10 ³	298 x10 ⁶	5,548	747	2.90	512	17.25	16.34
W18X71	W460x106	2,393 x10 ³	487 x10 ⁶	5,935	743	1.83	517	5.43	62.95
W21X62	W530x92	2,360 x10³	554 x10⁶	5,419	732	1.92	517	5.09	68.00
W14X82	W360x122	2,278 x10 ³	367 x10 ⁶	4,710	706	2.68	500	9.02	32.50

Table A.2M Beam Design Criteria Z_x , I_x , A

Basic Section Properties				
Shape		Z _x (mm ³)	I _x (mm ⁴)	A _{web} (mm ²)
Imperial	Metric			
W24X55	W610x82	2,212 x10 ³	566 x10 ⁶	6,000
W18X65	W460x97	2,179 x10 ³	445 x10 ⁶	5,355
W12X87	W310x129	2,163 x10 ³	308 x10 ⁶	4,129
W16X67	W410x100	2,147 x10 ³	401 x10 ⁶	4,129
W10X100	W250x149	2,130 x10 ³	259 x10 ⁶	4,839
W21X57	W530x85	2,114 x10 ³	487 x10 ⁶	5,484
W21X55	W530x82	2,065 x10 ³	475 x10 ⁶	5,032
W14X74	W360x110	2,065 x10 ³	331 x10 ⁶	4,129
W18X60	W460x89	2,016 x10 ³	410 x10 ⁶	4,903
W12X79	W310x118	1,950 x10 ³	276 x10 ⁶	3,742
W14X68	W360x101	1,885 x10 ³	301 x10 ⁶	3,742
W10X88	W250x131	1,852 x10 ³	222 x10 ⁶	4,194
W18X55	W460x82	1,835 x10 ³	370 x10 ⁶	4,581
W21X50	W530x74	1,819 x10 ³	412 x10 ⁶	5,097
W12X72	W310x107	1,770 x10 ³	248 x10 ⁶	3,419
W21X48	W530x66	1,753 x10 ³	399 x10 ⁶	4,645
W16X57	W410x85	1,721 x10 ³	316 x10 ⁶	4,581
W14X61	W360x91	1,671 x10 ³	266 x10 ⁶	3,355
W18X50	W460x74	1,655 x10 ³	333 x10 ⁶	4,129
W10X77	W250x115	1,599 x10 ³	189 x10 ⁶	3,613
W12X65	W310x97	1,586 x10 ³	222 x10 ⁶	2,710
W21X44	W530x66	1,570 x10 ³	353 x10 ⁶	4,645
W16X50	W410x74	1,508 x10 ³	274 x10 ⁶	4,000
W18X46	W460x68	1,486 x10 ³	296 x10 ⁶	4,194
W14X53	W360x79	1,427 x10 ³	225 x10 ⁶	3,290
W12X58	W310x86	1,416 x10 ³	198 x10 ⁶	2,839
W10X68	W250x101	1,398 x10 ³	164 x10 ⁶	3,161
W16X45	W410x67	1,349 x10 ³	244 x10 ⁶	3,613
W18X40	W460x60	1,285 x10 ³	255 x10 ⁶	3,613
W14X48	W360x72	1,285 x10 ³	202 x10 ⁶	3,032
W12X53	W310x79	1,277 x10 ³	177 x10 ⁶	2,710
W10X60	W250x89	1,222 x10 ³	142 x10 ⁶	2,774
W16X40	W410x60	1,196 x10 ³	216 x10 ⁶	3,161
W12X50	W310x74	1,178 x10 ³	163 x10 ⁶	2,903
W14X53	W360x64	1,141 x10 ³	178 x10 ⁶	3,290
W10X54	W250x80	1,091 x10 ³	126 x10 ⁶	2,387

345 MPa Steel Values				Rate of Change
M _{Lp} (kN-m)	L _p (m)	M _{Lr} (kN-m)	L _r (m)	
686	1.43	468	3.93	87.33
677	1.83	476	5.21	59.31
671	3.29	480	11.70	22.72
666	2.65	480	7.25	40.36
662	2.87	456	15.48	16.33
656	1.46	451	4.02	79.96
641	1.86	447	4.91	63.61
641	2.68	456	8.50	31.90
625	1.83	439	5.06	57.49
605	3.29	435	10.88	22.33
584	2.65	419	8.05	30.66
575	2.83	401	13.75	15.90
569	1.80	400	4.91	54.51
564	1.40	386	3.81	73.76
549	3.26	396	10.24	21.95
544	1.86	378	4.69	58.35
534	1.74	376	5.06	47.74
519	2.65	376	7.62	28.93
514	1.77	362	4.75	50.83
496	2.80	350	12.16	15.65
492	3.63	358	9.66	22.24
487	1.37	334	3.66	67.02
468	1.71	329	4.79	44.92
461	1.40	320	3.84	57.82
443	2.07	316	6.13	31.44
439	2.71	317	8.23	22.12
434	2.80	308	10.97	15.44
419	1.71	296	4.60	42.61
399	1.37	278	3.66	52.78
399	2.07	286	5.85	29.77
396	2.68	287	8.23	19.55
380	2.77	271	9.20	16.86
371	1.71	263	4.48	39.10
366	2.13	262	6.55	23.62
354	2.04	255	5.55	28.24
339	2.74	244	9.20	14.69

Table A.2M Beam Design Criteria Z_x , I_x , A

Basic Section Properties					345 MPa Steel Values				Rate of Change
Shape		Z_x (mm ³)	I_x (mm ⁴)	A_{web} (mm ²)	M_{Lp}	L_p	M_{Lr}	L_r	
Imperial	Metric				(kN-m)	(m)	(kN-m)	(m)	
W18X35	W460x52	1,090 x10 ³	212 x10 ⁶	3,419	338	1.31	235	3.51	46.95
W12X45	W310x67	1,052 x10 ³	145 x10 ⁶	2,645	327	2.13	235	6.19	22.74
W16X36	W410x54	1,049 x10 ³	186 x10 ⁶	3,032	325	1.65	230	4.30	35.79
W14X38	W360x57	1,001 x10 ³	159 x10 ⁶	2,839	310	1.68	221	4.54	31.23
W10X49	W250x73	990 x10 ³	113 x10 ⁶	2,194	308	2.74	222	8.63	14.52
W12X40	W310x60	934 x10 ³	128 x10 ⁶	2,258	290	2.10	210	5.85	21.34
W10X45	W250x68	900 x10 ³	103 x10 ⁶	2,258	279	2.16	199	7.35	15.44
W14X34	W360x51	888 x10 ³	140 x10 ⁶	2,581	275	1.65	197	4.36	28.99
W16X31	W410x46	885 x10 ³	156 x10 ⁶	2,839	275	1.25	193	3.35	39.32
W12X35	W310x51	839 x10 ³	119 x10 ⁶	2,452	260	1.65	186	4.63	24.96
W14X30	W360x45	769 x10 ³	120 x10 ⁶	2,387	239	1.62	169	4.18	27.01
W10X39	W250x59	767 x10 ³	87 x10 ⁶	2,000	239	2.13	171	6.64	15.03
W16X26	W410x39	724 x10 ³	125 x10 ⁶	2,516	225	1.22	156	3.17	35.45
W12X30	W310x45	706 x10 ³	99 x10 ⁶	2,065	220	1.65	157	4.36	22.99
W14X26	W360x39	654 x10 ³	101 x10 ⁶	2,258	203	1.16	142	3.11	31.28
W10X33	W310x49	636 x10 ³	71 x10 ⁶	1,806	198	2.10	142	6.04	14.14
W12X26	W310x39	610 x10 ³	85 x10 ⁶	1,806	190	1.62	136	4.21	20.93
W10X30	W250x45	600 x10 ³	71 x10 ⁶	2,065	186	1.46	132	4.45	18.06
W14X22	W360x33	537 x10 ³	82 x10 ⁶	2,065	167	1.13	116	2.96	27.58
W10X26	W310x39	510 x10 ³	60 x10 ⁶	1,742	159	1.46	113	4.15	16.83
W12X22	W310x33	480 x10 ³	65 x10 ⁶	2,065	149	0.91	103	2.56	27.84
W10X22	W250x33	426 x10 ³	49 x10 ⁶	1,548	132	1.43	94	3.87	15.51
W12X19	W310x28	405 x10 ³	54 x10 ⁶	1,871	126	0.88	87	2.44	25.03
W10X19	W250x27	354 x10 ³	40 x10 ⁶	1,677	110	0.94	76	2.71	18.87
W12X16	W310x24	329 x10 ³	43 x10 ⁶	1,677	102	0.82	70	2.26	22.81
W10X17	W250x25	306 x10 ³	34 x10 ⁶	1,548	95	0.91	66	2.56	17.71
W12X14	W310x21	285 x10 ³	37 x10 ⁶	1,548	88	0.82	61	2.19	20.26
W10X15	W250x21	262 x10 ³	29 x10 ⁶	1,484	81	0.88	56	2.41	16.55
W10X12	W250x18	206 x10 ³	22 x10 ⁶	1,226	64	0.88	44	2.29	14.12