

Design capacity tables

FOR WELDED SECTIONS



		Slenderness Reduction Factor α , for Effective Length in metres										
		2	3	4	5	6	7	8	9	10	11	
ϕM_{xx}	0.863	0.709	0.570	0.460	0.378	0.318	0.273	0.239	0.212	0.191	0.173	0.159
	0.860	0.702	0.558	0.446	0.363	0.303	0.259	0.226	0.200	0.179	0.162	0.149
	0.744	0.606	0.490	0.402	0.339	0.283	0.240	0.208	0.186	0.168	0.152	0.140
	0.737	0.596	0.478	0.389	0.323	0.267	0.224	0.199	0.177	0.160	0.146	0.133
	0.587	0.468	0.379	0.302	0.246	0.203	0.170	0.147	0.128	0.114	0.103	0.093
	0.578	0.458	0.368	0.291	0.235	0.192	0.159	0.136	0.117	0.104	0.093	0.083
	0.424	0.335	0.269	0.213	0.170	0.137	0.114	0.095	0.080	0.069	0.060	0.052
	0.335	0.256	0.200	0.156	0.123	0.099	0.080	0.065	0.054	0.046	0.039	0.033
	0.291	0.212	0.156	0.112	0.088	0.069	0.054	0.043	0.035	0.029	0.024	0.019
	0.247	0.168	0.112	0.078	0.054	0.040	0.030	0.023	0.018	0.014	0.011	0.008
A PRODUCT OF NEW ZEALAND STEEL												

INTRODUCTION

Steltech Structural is New Zealand's only domestic manufacturer of structural steel sections. Their method of manufacturing utilises welded beam technology which enables New Zealand designers access to the widest range of structural steel members available anywhere in the world. For further information, contact Steltech Structural for the "Welded Beam Guide for Design Engineers"

Welded Beam Product Categories

1. Welded Sections

The range of welded sections designated in these Design Capacity Tables have been extended to include:-

- LB, SB and HB now up to 1200 mm in depth
- EB and SC now contain equivalent beams and columns to imported WB and WC sections
- the new WS series (Wide Sections) that are equivalent to imported WF sections
- the new NB series (Narrow Beam), with narrow flanges suitable for concealing within wall cavities

These sections are designated in the usual format of depth and weight per meter i.e. 575SB79. However, unlike hot rolled sections, the depth prefix for welded sections is the total depth of section "d". If the designer uses the LB, SB and HB range then the external dimensions (d and b_y) remain the same, thereby simplifying detailing and fitout.

2. Designer Welded Sections.

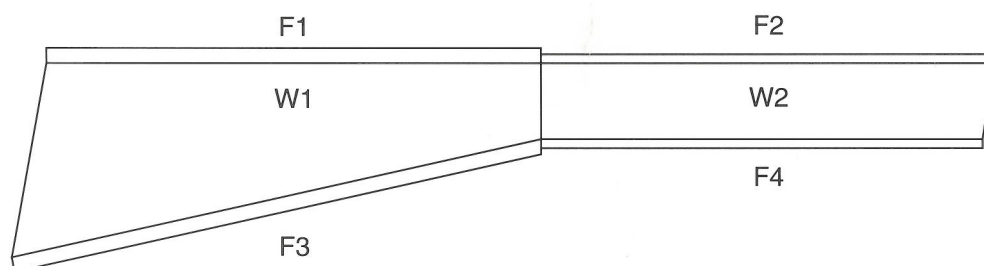
If the designer is unable to find a suitable steel section from the above range, they can design their own customised steel member. Typical situations where this may be used to maximise efficiency include:

- Reducing the thickness of the top flange of composite floor beams. Designers can optimise the physical dimensions of their own sections or use the FB range of welded sections as outlined in "Composite floor preliminary design charts" (available from Steltech Structural).
- To avoid flange plating a section and altering the physical dimensions of the member, the designer can increase section capacity by increasing the web or flange thickness.
- Crane and monorail beams often require larger top flanges, which can be easily incorporated into the manufacture of the welded section

To assist designers to customise welded sections, use the CWB Section Type function in MEMDES, or contact Steltech Structural for a section property calculation spreadsheet.

3. Custom Tapered Welded Sections

These members represent the most efficient use of welded beam technology. The beams incorporate haunches, tapers, optimised web and flange dimensions, curves and precambers, and are manufactured to the required length and shape. For advice and design assistance, please contact the structural engineer at Steltech Structural.



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Light Welded Beams (LB)

Dimensions and Properties

Designation	Depth of Section	Flange		Web Thickness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick-ness			$\frac{d_1}{t_w}$	$\frac{(bf-t_w)}{2t_f}$													
									A_g	I_x	Z_x	S_x	r_x	I_y	Z_y	S_y	r_y			
	d	bf	tf	tw	d1												J	Iw		
	mm	mm	mm	mm	mm			mm ²	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
450LB46	450	183	10	5	430	86.0	8.9	5,810	210	935	1036	190	10.2	111.7	170	41.9	139.9	495	450LB46	
475LB47	475	183	10	5	455	91.0	8.9	5,935	237	998	1110	200	10.2	111.7	170	41.5	141.0	552	475LB47	
500LB52	500	210	10	5	480	96.0	10.3	6600	298	1190	1320	213	15.4	147	224	48.4	160	926	500LB52	
525LB57	525	210	10	6	505	84.2	10.2	7230	343	1310	1460	218	15.4	147	225	46.2	177	1020	525LB57	
550LB58	550	210	10	6	530	88.3	10.2	7380	381	1380	1560	227	15.4	147	225	45.7	179	1130	550LB58	
575LB59	575	210	10	6	555	92.5	10.2	7530	421	1460	1650	236	15.4	147	225	45.3	181	1230	575LB59	
600LB60	600	210	10	6	580	96.7	10.2	7680	463	1540	1740	246	15.4	147	226	44.8	182	1340	600LB60	
625LB71	625	210	10	8	605	75.6	10.1	9040	545	1740	2020	245	15.5	147	230	41.4	245	1460	625LB71	
650LB78	650	245	10	8	630	78.8	11.9	9940	668	2060	2360	259	24.5	200	310	49.7	273	2510	650LB78	
675LB80	675	245	10	8	655	81.9	11.9	10100	729	2160	2490	268	24.5	200	311	49.2	277	2710	675LB80	
700LB81	700	245	10	8	680	85.0	11.9	10300	793	2270	2620	277	24.5	200	311	48.7	281	2920	700LB81	
725LB83	725	245	10	8	705	88.1	11.9	10500	860	2370	2750	286	24.5	200	311	48.3	285	3130	725LB83	
750LB84	750	245	10	8	730	91.3	11.9	10700	930	2480	2880	294	24.5	200	312	47.8	290	3360	750LB84	
775LB86	775	245	10	8	755	94.4	11.9	10900	1000	2590	3010	303	24.5	200	312	47.4	294	3590	775LB86	
800LB113	800	295	14	8	772	96.5	10.3	14400	1580	3960	4440	331	59.9	406	622	64.4	674	9250	800LB113	
850LB129	850	295	14	10	822	82.2	10.2	16500	1910	4490	5140	340	60.0	407	630	60.3	818	10500	850LB129	
900LB161	900	370	16	10	868	86.8	11.3	20500	2860	6350	7120	373	135	731	1120	81.2	1310	26400	900LB161	
1000LB192	1000	370	20	10	960	96.0	9.0	24,400	4291	8583	9556	419	169	913	1393	83.2	2293	40558	1000LB192	
1200LB225	1200	370	20	12	1160	96.7	9.0	28,720	6713	11189	12769	483	169	914	1411	76.7	2641	58833	1200LB225	

NOTES.

1. **'LB'** welded members are suitable as Category 4 beams.
2. Shear should be checked as webs may be thinner than equivalent hot rolled members.
3. Web to flange weld is single sided with v^*_{wv} defined in Item 3 on the back inside cover. Double side welding is available by negotiation.

Light Welded Beams (LB)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield	Stress	Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web														
	f_y	f_y	k_f	Compact-ness	Z_{ex}	M_{sx}	Compact-ness	Z_{ey}	K_{sm}	H_p/A	r_f	K_{sm}	H_p/A	r_f	v^*_w	
	MPa	MPa			10^3mm^3	KNm		10^3mm^3	m^2/T	m^{-1}	(15 min)	m^2/T	m^{-1}	(15 min)	kN/mm	
450LB46	300	300	0.767	N	1007	302	N	161	35.6	279	0.427	31.6	248	0.494	0.85	450LB46
475LB47	300	300	0.751	N	1077	323	N	161	35.9	282	0.426	32.0	251	0.490	0.80	475LB47
500LB52	300	300	0.757	N	1250	375	N	204	35.3	277	0.429	31.3	245	0.497	0.88	500LB52
525LB57	300	300	0.740	N	1381	414	N	204	33.1	260	0.439	29.4	231	0.517	0.86	525LB57
550LB58	300	300	0.725	N	1465	439	N	204	33.3	261	0.438	29.7	233	0.514	0.85	550LB58
575LB59	300	300	0.711	N	1551	465	N	204	33.5	263	0.438	29.9	235	0.511	0.85	575LB59
600LB60	300	300	0.697	N	1638	491	N	204	33.6	264	0.437	30.2	237	0.509	0.84	600LB60
625LB71	300	300	0.691	N	1880	564	N	205	29.2	229	0.462	26.3	206	0.553	1.03	625LB71
650LB78	300	300	0.699	N	2109	633	N	265	29.0	228	0.463	25.9	203	0.558	1.06	650LB78
675LB80	300	300	0.685	N	2216	665	N	265	29.1	228	0.463	26.0	204	0.556	1.05	675LB80
700LB81	300	300	0.672	N	2325	697	N	265	29.1	229	0.462	26.1	205	0.555	1.04	700LB81
725LB83	300	300	0.659	N	2436	731	N	265	29.2	229	0.462	26.2	206	0.554	1.03	725LB83
750LB84	300	300	0.647	N	2548	764	N	265	29.2	229	0.462	26.3	207	0.552	1.02	750LB84
775LB86	300	300	0.635	N	2663	799	N	265	29.3	230	0.461	26.4	207	0.551	1.01	775LB86
800LB113	300	300	0.714	N	4179	1254	N	563	24.4	191	0.497	21.8	171	0.614	1.14	800LB113
850LB129	300	300	0.695	N	4797	1439	N	564	22.1	174	0.517	19.8	156	0.645	1.34	850LB129
900LB161	300	300	0.733	N	6566	1970	N	983	20.2	159	0.536	17.9	141	0.678	1.43	900LB161
1000LB192	300	300	0.738	N	9254	2776	N	1309	18.1	142	0.562	16.1	127	0.713	1.54	1000LB192
1200LB225	300	300	0.676	N	12294	3688	N	1311	17.1	134	0.575	15.5	121	0.727	1.63	1200LB225

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of $v^*_w > 1.09\text{kN/mm}$, web to flange joints are single sided 6mm fillet welds unless negotiated otherwise.

Standard Welded Beams (SB)

Dimensions and Properties

Designation	Depth of Section	Flange		Web Thickness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick-ness			$\frac{d_1}{t_w}$	$\frac{(b_f-t_w)}{2t_f}$													
									A_g	I_x	Z_x	S_x	r_x	I_y	Z_y	S_y	r_y			
	mm	mm	mm	mm	mm			mm ²	e ⁶ mm ⁴	E ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
400SB49	400	183	12	5	376	75.2	7.42	6270	187	937	1030	173	12.3	134	203	44.2	226	461	400SB49	
425SB53	425	183	12	6	401	66.8	7.38	6800	220	1030	1150	180	12.3	134	205	42.5	240	523	425SB53	
450SB55	450	183	12	6	426	71.0	7.38	6950	249	1110	1230	189	12.3	134	205	42.0	241	588	450SB55	
475SB56	475	183	12	6	451	75.2	7.38	7100	281	1180	1320	199	12.3	134	205	41.6	243	657	475SB56	
500SB68	500	210	14	6	472	78.7	7.29	8710	400	1600	1760	214	21.6	206	313	49.8	418	1280	500SB68	
525SB77	525	210	14	8	497	62.1	7.21	9860	466	1770	2000	217	21.6	206	317	46.8	469	1410	525SB77	
550SB79	550	210	14	8	522	65.3	7.21	10100	517	1880	2120	227	21.6	206	317	46.4	473	1550	550SB79	
575SB81	575	210	14	8	547	68.4	7.21	10300	572	1990	2250	236	21.6	206	317	45.9	478	1700	575SB81	
600SB82	600	210	14	8	572	71.5	7.21	10500	630	2100	2380	245	21.6	206	318	45.5	482	1860	600SB82	
625SB84	625	210	14	8	597	74.6	7.21	10700	691	2210	2510	255	21.6	206	318	45.1	486	2020	625SB84	
650SB100	650	245	16	8	618	77.3	7.41	12800	945	2910	3250	272	39.2	320	490	55.4	774	3940	650SB100	
675SB112	675	245	16	10	643	64.3	7.34	14300	1070	3180	3620	274	39.3	321	496	52.5	883	4260	675SB112	
700SB114	700	245	16	10	668	66.8	7.34	14500	1170	3330	3800	283	39.3	321	497	52.0	892	4590	700SB114	
725SB116	725	245	16	10	693	69.3	7.34	14800	1260	3480	3980	292	39.3	321	498	51.6	900	4940	725SB116	
750SB118	750	245	16	10	718	71.8	7.34	15000	1360	3640	4170	301	39.3	321	498	51.1	908	5290	750SB118	
775SB120	775	245	16	10	743	74.3	7.34	15300	1470	3800	4360	310	39.3	321	499	50.7	917	5660	775SB120	
800SB152	800	295	20	10	760	76.0	7.13	19400	2160	5400	6050	334	85.6	581	889	66.4	1830	13000	800SB152	
850SB169	850	295	20	12	810	67.5	7.08	21500	2560	6030	6870	345	85.7	581	899	63.1	2040	14800	850SB169	
900SB208	900	370	22	12	856	71.3	8.14	26600	3770	8370	9350	377	186	1010	1540	83.7	3120	35800	900SB208	
1000SB265	1000	370	25	16	950	59.4	7.1	33,700	5541	11082	12629	405	211	1143	1772	79.2	5151	50235	1000SB265	
1200SB290	1200	370	25	16	1150	71.9	7.1	36,900	8414	14024	16159	478	211	1143	1785	75.7	5424	72982	1200SB290	

- NOTES.
1. '**SB**' welded members are suitable as Category 3 beams.
 2. Shear should be checked as webs may be thinner than equivalent hot rolled members.
 3. Web to flange weld is single sided with v_w defined in Item 3 on the back inside cover. Double side welding is available by negotiation.

Standard Welded Beams (SB)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web													v* _w	
	F _y	f _y	k _f	Compact-ness	Z _{ex}	M _{sx}	Compact-ness	Z _{ey}	K _{sm}	H _p /A	r _f	K _{sm}	H _p /A	r _f		
	MPa	MPa			10 ³ mm ³	KNm		10 ³ mm ³	m ² /T	m ⁻¹	(15 min)	m ² /T	m ⁻¹	(15 min)	kN/mm	
400SB49	300	300	0.828	N	1027	308	N	200	30.9	243	0.451	27.2	213	0.542	1.17	400SB49
425SB53	300	300	0.815	N	1147	344	N	201	29.4	231	0.460	26.0	204	0.556	1.10	425SB53
450SB55	300	300	0.798	N	1232	370	N	201	29.7	233	0.459	26.3	207	0.552	1.03	450SB55
475SB56	300	300	0.781	N	1320	396	N	201	30.0	235	0.457	26.7	209	0.548	0.97	475SB56
500SB68	300	300	0.807	C	1763	529	C	309	26.7	210	0.478	23.7	186	0.587	1.25	500SB68
525SB77	300	300	0.804	C	1996	599	C	309	24.2	190	0.498	21.5	169	0.618	1.18	525SB77
550SB79	300	300	0.788	C	2121	636	C	309	24.4	191	0.497	21.7	170	0.615	1.15	550SB79
575SB81	300	300	0.773	C	2248	674	C	309	24.5	192	0.496	21.9	172	0.612	1.14	575SB81
600SB82	300	300	0.758	C	2377	713	C	309	24.7	194	0.494	22.1	173	0.609	1.13	600SB82
625SB84	300	300	0.744	C	2509	753	C	309	24.8	195	0.493	22.3	175	0.607	1.12	625SB84
650SB100	300	300	0.773	N	3243	973	N	479	22.6	177	0.513	20.1	158	0.640	1.27	650SB100
675SB112	300	300	0.773	N	3614	1084	N	480	20.6	162	0.532	18.4	145	0.669	1.39	675SB112
700SB114	300	300	0.760	N	3793	1138	N	480	20.7	163	0.531	18.6	146	0.667	1.38	700SB114
725SB116	300	300	0.747	N	3976	1193	N	480	20.8	163	0.530	18.7	147	0.665	1.37	725SB116
750SB118	300	300	0.735	N	4162	1249	N	480	20.9	164	0.530	18.8	147	0.663	1.36	750SB118
775SB120	300	300	0.723	N	4351	1305	N	480	20.9	164	0.529	18.9	148	0.661	1.35	775SB120
800SB152	300	300	0.773	C	6046	1814	C	871	18.1	142	0.561	16.2	127	0.712	1.55	800SB152
850SB169	300	300	0.762	C	6865	2060	C	871	16.9	133	0.578	15.2	119	0.734	1.67	850SB169
900SB208	300	300	0.786	N	9196	2759	N	1474	15.6	123	0.597	13.8	109	0.763	1.90	900SB208
1000SB265	300	300	0.792	C	12629	3789	C	1714	13.0	102	0.642	11.6	91	0.452	2.23	1000SB265
1200SB290	300	300	0.723	C	16159	4848	C	1714	13.3	104	0.637	12.0	94	0.434	2.14	1200SB290

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of v*_w > 1.09kN/mm, web to flange joints are single sided 6mm fillet welds unless negotiated otherwise.

Heavy Welded Beams (HB)

Dimensions and Properties

Designation	Depth of Section	Flange		Web Thickness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick-ness			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$													
									d_1	I_x	Z_x	S_x	r_x	I_y	Z_y	S_y	r_y			
	mm	mm	mm	mm	mm			mm ²	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
350HB46	350	162	12	6	326	54.3	6.50	5840	128	734	816	148	8.51	105	160	38.2	210	243	350HB46	
375HB47	375	162	12	6	351	58.5	6.50	5990	150	799	890	158	8.51	105	161	37.7	212	280	375HB47	
400HB58	400	183	12	8	376	47.0	7.29	7400	201	1000	1130	165	12.3	134	207	40.7	275	462	400HB58	
425HB60	425	183	12	8	401	50.1	7.29	7600	230	1080	1230	174	12.3	134	207	40.2	279	523	425HB60	
450HB61	450	183	12	8	426	53.3	7.29	7800	262	1170	1320	183	12.3	134	208	39.7	284	589	450HB61	
475HB63	475	183	12	8	451	56.4	7.29	8000	297	1250	1420	193	12.3	134	208	39.2	288	658	475HB63	
500HB76	500	210	14	8	472	59.0	7.21	9660	417	1670	1870	208	21.6	206	316	47.3	465	1280	500HB76	
525HB85	525	210	14	10	497	49.7	7.14	10900	486	1850	2120	212	21.7	206	321	44.7	550	1410	525HB85	
550HB87	550	210	14	10	522	52.2	7.14	11100	541	1970	2260	221	21.7	206	322	44.2	558	1560	550HB87	
575HB89	575	210	14	10	547	54.7	7.14	11400	599	2080	2400	230	21.7	206	322	43.7	566	1700	575HB89	
600HB91	600	210	14	10	572	57.2	7.14	11600	661	2200	2540	239	21.7	206	323	43.2	575	1860	600HB91	
625HB93	625	210	14	10	597	59.7	7.14	11900	726	2320	2690	248	21.7	206	324	42.8	583	2020	625HB93	
650HB120	650	245	16	12	618	51.5	7.28	15300	1020	3150	3630	259	39.3	321	502	50.8	1030	3950	650HB120	
675HB122	675	245	16	12	643	53.6	7.28	15600	1120	3310	3820	268	39.3	321	503	50.3	1040	4270	675HB122	
700HB124	700	245	16	12	668	55.7	7.28	15900	1220	3470	4020	277	39.3	321	504	49.8	1050	4600	700HB124	
725HB127	725	245	16	12	693	57.8	7.28	16200	1320	3640	4220	286	39.3	321	505	49.3	1070	4940	725HB127	
750HB129	750	245	16	12	718	59.8	7.28	16500	1430	3800	4420	294	39.3	321	506	48.9	1080	5300	750HB129	
775HB143	775	245	16	14	743	53.1	7.22	18200	1610	4150	4910	297	39.4	322	517	46.5	1350	5670	775HB143	
800HB176	800	295	20	14	760	54.3	7.03	22400	2310	5770	6620	321	85.7	581	907	61.8	2270	13000	800HB176	
850HB182	850	295	20	14	810	57.9	7.03	23100	2650	6240	7190	339	85.8	581	910	60.9	2310	14800	850HB182	
900HB222	900	370	22	14	856	61.1	8.09	28300	3870	8600	9710	370	184	1010	1550	81.1	3410	35800	900HB222	
1000HB303	1000	370	32	16	936	58.5	5.5	38,656	6643	13285	14966	415	270	1462	2250	83.6	9361	63359	1000HB303	
1200HB364	1200	370	32	20	1136	56.8	5.5	46,400	10522	17536	20282	476	271	1464	2304	76.4	11112	92394	1200HB364	

- NOTES.
- 'HB' welded members are suitable as Category 2 beams ($N^*/\phi N_S < 0.2$).
'HB' welded members are suitable as Category 3 columns ($N^*/\phi N_S < 0.65$).
 - Shear should be checked as webs may be thinner than equivalent hot rolled members.
 - Web to flange weld is single sided with v^*_w defined in Item 3 on the back inside cover. Double side welding is available by negotiation.

Heavy Welded Beams (HB)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web													v* _w	
	f _y	f _y	k _f	Compact-ness	Z _{ex}	M _{sx}	Compact-ness	Z _{ey}	K _{sm}	H _p /A	r _f	K _{sm}	H _p /A	r _f		
	MPa	MPa			10 ³ mm ³	KNm		10 ³ mm ³	M ² /T	m ⁻¹	(15 min)	m ² /T	m ⁻¹	(15 min)	kN/mm	
350HB46	300	300	0.862	C	816	245	C	158	29.1	229	0.462	25.6	201	0.561	1.19	350HB46
375HB47	300	300	0.841	C	890	267	C	158	29.5	231	0.460	26.0	204	0.556	1.11	375HB47
400HB58	300	300	0.870	C	1135	340	C	201	26.1	205	0.483	22.9	180	0.597	1.17	400HB58
425HB60	300	300	0.847	C	1229	369	C	201	26.2	206	0.482	23.2	182	0.594	1.14	425HB60
450HB61	300	300	0.825	C	1325	397	C	201	26.4	207	0.481	23.4	184	0.591	1.13	450HB61
475HB63	300	300	0.805	C	1424	427	C	201	26.5	208	0.480	23.6	185	0.588	1.11	475HB63
500HB76	300	300	0.821	C	1874	562	C	309	24.1	189	0.499	21.3	167	0.622	1.25	500HB76
525HB85	300	300	0.836	C	2120	636	C	309	22.0	172	0.519	19.5	153	0.651	1.38	525HB85
550HB87	300	300	0.818	C	2257	677	C	309	22.0	173	0.518	19.6	154	0.649	1.37	550HB87
575HB89	300	300	0.800	C	2397	719	C	309	22.1	174	0.517	19.8	155	0.647	1.36	575HB89
600HB91	300	300	0.782	C	2541	762	C	309	22.2	174	0.516	19.9	156	0.644	1.34	600HB91
625HB93	300	300	0.766	C	2687	806	C	309	22.3	175	0.516	20.0	157	0.643	1.33	625HB93
650HB120	300	300	0.815	C	3631	1089	C	481	18.8	148	0.552	16.8	132	0.700	1.62	650HB120
675HB122	300	300	0.800	C	3824	1147	C	481	18.9	148	0.552	16.9	132	0.699	1.61	675HB122
700HB124	300	300	0.785	C	4020	1206	C	481	18.9	149	0.551	17.0	133	0.697	1.59	700HB124
725HB127	300	300	0.770	C	4220	1266	C	481	19.0	149	0.551	17.0	134	0.695	1.58	725HB127
750HB129	300	300	0.756	C	4424	1327	C	481	19.0	149	0.550	17.1	134	0.694	1.56	750HB129
775HB143	300	300	0.773	C	4907	1472	C	482	17.5	137	0.570	15.8	124	0.721	1.73	775HB143
800HB176	300	300	0.805	C	6624	1987	C	872	15.6	123	0.597	13.9	109	0.761	1.91	800HB176
850HB182	300	300	0.781	C	7193	2158	C	872	15.7	123	0.595	14.1	111	0.758	1.88	850HB182
900HB222	300	300	0.798	N	9552	2865	N	1477	14.7	115	0.612	13.0	102	0.783	1.99	900HB222
1000HB303	300	300	0.824	C	14966	4490	C	2193	11.4	89	0.678	10.1	80	0.524	2.53	1000HB303
1200HB364	300	300	0.786	C	20282	6084	C	2197	10.5	83	0.698	9.5	75	0.556	2.69	1200HB364

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of v*_w > 1.09kN/mm, web to flange joints are double sided 6mm fillet welds unless negotiated otherwise.

Perimeter Welded Beams (PB)

Dimensions and Properties

Designation	Depth Of Section	Flange		Web Thick- ness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick- ness			$\frac{d_1}{t_w}$	$\frac{(b_f-t_w)}{2t_f}$		I_x	Z_x	S_x	r_x	I_y	Z_y	S_y	r_y				
																	D			
	Mm	mm	mm	mm	mm			mm ²	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
250PB44	250	162	12	8	226	28.3	6.42	5700	62.8	502	565	105	8.51	105	161	38.7	225	121	250PB44	
275PB50	275	162	12	10	251	25.1	6.33	6400	80.5	585	669	112	8.52	105	164	36.5	270	147	275PB50	
300PB52	300	162	12	10	276	27.6	6.33	6650	98.2	655	750	122	8.53	105	164	35.8	279	177	300PB52	
325PB68	325	183	14	12	297	24.8	6.11	8690	150	924	1060	131	14.3	157	245	40.6	506	347	325PB68	
350PB71	350	183	14	12	322	26.8	6.11	8990	178	1020	1170	141	14.3	157	246	40.0	520	405	350PB71	
375PB79	375	210	14	12	347	28.9	7.07	10000	233	1250	1420	152	21.7	206	321	46.4	584	706	375PB79	
400PB87	400	210	14	14	372	26.6	7.00	11100	279	1400	1620	159	21.7	207	327	44.2	724	808	400PB87	
425PB112	425	245	18	14	389	27.8	6.42	14300	434	2040	2320	174	44.2	361	559	55.7	1310	1830	425PB112	
450PB121	450	245	18	16	414	25.9	6.36	15400	506	2250	2590	181	44.3	361	567	53.5	1520	2070	450PB121	
475PB147	475	295	20	16	435	27.2	6.98	18800	721	3040	3440	196	85.7	581	898	67.6	2170	4440	475PB147	
500PB158	500	295	20	18	460	25.6	6.93	20100	826	3300	3780	203	85.8	582	908	65.4	2470	4940	500PB158	

- NOTES.
1. Perimeter Welded Beams are specifically intended for use in moment resisting framed seismic resisting systems.
 2. **'PB'** welded members are suitable as Category 2 beams and columns ($N^*/\phi N_S < 0.5$).
'PB' welded members are suitable as Category 3 columns ($N^*/\phi N_S < 1.0$).
 3. Shear should be checked as webs may be thinner than equivalent hot rolled members.
 4. Web to flange weld is single sided with v^*_w defined in Item 3 on the front inside cover. Double side welding is available by negotiation.

Perimeter Welded Beams (PB)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web														
	f_y	f_y	k_f	Compact-ness	Z_{ex}	M_{sx}	Compact-ness	Z_{ey}	K_{sm}	H_p/A	r_f	K_{sm}	H_p/A	r_f	v^*_w	
	MPa	MPa			10^3mm^3	KNm		10^3mm^3	m^2/T	m^{-1}	(15 min)	m^2/T	m^{-1}	(15 min)	kN/mm	
250PB44	300	300	1.000	C	565	169	C	158	25.3	199	0.489	21.7	170	0.616	1.72	250PB44
275PB50	300	300	1.000	C	669	201	C	158	23.5	184	0.505	20.2	159	0.639	1.55	275PB50
300PB52	300	300	1.000	C	750	225	C	158	23.5	185	0.504	20.4	160	0.635	1.42	300PB52
325PB68	300	300	1.000	C	1061	318	C	235	19.9	156	0.540	17.2	135	0.692	1.73	325PB68
350PB71	300	300	1.000	C	1172	352	C	235	20.0	157	0.539	17.4	136	0.689	1.68	350PB71
375PB79	300	300	1.000	C	1423	427	C	309	19.9	156	0.540	17.2	135	0.692	1.70	375PB79
400PB87	300	300	1.000	C	1619	486	C	310	18.5	145	0.556	16.1	126	0.714	1.91	400PB87
425PB112	300	300	1.000	C	2324	697	C	541	16.1	126	0.589	13.9	109	0.762	2.27	425PB112
450PB121	300	300	1.000	C	2591	777	C	542	15.2	120	0.603	13.2	104	0.778	2.24	450PB121
475PB147	300	300	1.000	C	3441	1032	C	872	14.2	112	0.619	12.2	96.1	0.802	2.71	475PB147
500PB158	300	300	1.000	C	3784	1135	C	873	13.6	107	0.631	11.7	92.1	0.816	2.57	500PB158

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of $v^*_w > 2.16\text{kN/mm}$, web to flange joints are double sided 6mm fillet welds unless negotiated otherwise.

Wide Sections (WS)

Dimensions and Properties

Designation	Depth Of Section	Flange		Web Thick- ness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick- ness			d1	(bf-tw) 2tf		Ix	Zx	Sx	rx	Iy	Zy	Sy	ry				
																	D			
	Mm	mm	mm	mm	mm			Mm ²	e ⁶ mm ⁴	E ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
546WS93	546	210	16	10	514	51.4	6.3	11,860	585	2144	2441	222	24.7	236	366	45.7	745	1737	546WS93	
550WS120	550	210	22	12	506	42.2	4.5	15,312	774	2814	3207	225	34.0	324	503	47.1	1782	2372	550WS120	
550WS163	550	295	25	12	500	41.7	5.7	20,750	1142	4153	4622	235	107	726	1106	71.8	3361	7376	550WS163	
560WS217	560	370	25	18	510	28.3	7.0	27,680	1524	5442	6119	235	211	1142	1753	87.4	4846	15120	560WS217	
610WS100	610	245	14	10	582	58.2	8.4	12,680	774	2536	2891	247	34.4	281	435	52.1	642	3052	610WS100	
617WS139	617	245	22	12	573	47.8	5.3	17,656	1143	3704	4192	254	54.0	441	681	55.3	2069	4780	617WS139	
617WS171	617	370	20	12	577	48.1	9.0	21,724	1511	4899	5417	264	169	913	1390	88.2	2306	15052	617WS171	
625WS217	625	370	25	16	575	35.9	7.1	27,700	1919	6142	6873	263	211	1142	1748	87.3	4639	19013	625WS217	
682WS120	682	245	18	10	646	64.6	6.5	15,280	1197	3510	3972	280	44.2	361	556	53.8	1168	4869	682WS120	
685WS153	685	295	20	12	645	53.8	7.1	19,540	1573	4594	5172	284	85.7	581	893	66.2	1945	9471	685WS153	
719WS240	719	370	25	18	669	37.2	7.0	30,542	2678	7448	8434	296	211	1143	1765	83.2	5155	25452	719WS240	
755WS162	755	295	18	14	719	51.4	7.8	20,686	1876	4970	5723	301	77.2	523	818	61.1	1805	10481	755WS162	
766WS181	766	295	22	14	722	51.6	6.4	23,088	2236	5838	6653	311	94.3	639	993	63.9	2754	13049	766WS181	
779WS287	779	370	32	18	715	39.7	5.5	36,550	3854	9894	11145	325	271	1462	2248	86.0	9473	37735	779WS287	
835WS168	835	295	20	12	795	66.3	7.1	21,340	2462	5898	6705	340	85.7	581	899	63.4	2031	14229	835WS168	
853WS204	853	295	25	14	803	57.4	5.6	25,992	3133	7346	8363	347	107	726	1127	64.2	3807	18365	853WS204	
862WS359	862	490	32	18	798	44.3	7.4	45,724	6166	14306	15880	367	628	2563	3906	117.2	12256	108131	862WS359	
905WS197	905	295	22	14	861	61.5	6.4	25,034	3275	7238	8325	362	94	640	999	61.4	2882	18387	905WS197	
910WS254	910	295	32	16	846	52.9	4.4	32,416	4448	9775	11151	370	137	930	1447	65.1	7599	26443	910WS254	
921WS294	921	370	32	16	857	53.6	5.5	37,392	5520	11987	13464	384	270	1462	2245	85.0	9253	53434	921WS294	
921WS381	921	490	32	20	857	42.9	7.3	48,500	7248	15739	17612	387	628	2563	3927	113.8	12990	124087	921WS381	

- NOTES.
1. **'WS'** welded members are suitable as Category 2 beams and columns ($N^*/\phi N_S < 0.5$).
'WS' welded members are suitable as Category 3 columns ($N^*/\phi N_S < 1.0$).
 2. Shear should be checked as webs may be thinner than equivalent hot rolled members.

Wide Sections (WS)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web		k _f	Compact- ness	Z _{ex}	M _{Sx}	Compact- ness	Z _{ey}	K _{sm}	H _p /A	r _f	K _{sm}	H _p /A	r _f	
	f _y	f _y	10 ³ mm ³													
546WS93	300	300	0.836	C	2441	732	C	353	20.5	161	0.533	18.3	144	0.672	1.41	400NB47
550WS120	300	300	0.904	C	3207	962	C	486	15.9	125	0.592	14.2	111	0.755	1.83	425NB51
550WS163	300	300	0.933	C	4622	1387	C	1089	13.9	109	0.627	12.0	95	0.807	2.95	450NB52
560WS217	300	300	1.000	C	6119	1836	C	1713	11.8	93	0.668	10.1	79	0.861	3.63	475NB53
610WS100	300	300	0.793	N	2821	846	N	409	21.9	172	0.519	19.4	153	0.652	1.38	500NB63
617WS139	300	300	0.871	C	4192	1258	C	661	15.8	124	0.594	14.0	110	0.759	1.88	525NB72
617WS171	300	300	0.893	N	5261	1578	N	1311	15.8	124	0.594	13.6	107	0.769	2.56	550NB73
625WS217	300	300	0.963	C	6873	2062	C	1713	12.4	97	0.655	10.7	84	0.844	3.22	575NB75
682WS120	300	300	0.786	C	3972	1191	C	541	19.4	152	0.546	17.3	136	0.690	1.42	600NB76
685WS153	300	300	0.839	C	5172	1551	C	871	16.5	129	0.584	14.5	114	0.747	1.83	625NB78
719WS240	300	300	0.945	C	8434	2530	C	1714	12.0	94	0.663	10.5	82	0.850	2.77	650NB89
755WS162	300	300	0.816	N	5654	1696	N	775	16.4	129	0.585	14.6	114	0.746	1.89	675NB101
766WS181	300	300	0.833	C	6653	1996	C	959	14.8	116	0.610	13.2	103	0.779	1.96	700NB103
779WS287	300	300	0.931	C	11145	3343	C	2193	10.5	82	0.700	9.2	72	0.889	3.31	725NB105
835WS168	300	300	0.769	C	6705	2011	C	871	16.9	132	0.578	15.1	119	0.735	1.68	750NB107
853WS204	300	300	0.808	C	8363	2509	C	1090	14.0	110	0.624	12.6	99	0.794	1.97	775NB109
862WS359	300	300	0.912	N	15859	4758	N	3837	10.2	80	0.707	8.8	69	0.901	3.93	800NB123
905WS197	300	300	0.769	C	8325	2498	C	959	15.1	118	0.605	13.6	107	0.770	1.90	850NB139
910WS254	300	300	0.835	C	11151	3345	C	1395	11.7	92	0.671	10.5	82	0.849	2.27	900NB152
921WS294	300	300	0.852	C	13464	4039	C	2193	11.2	88	0.681	9.9	78	0.866	2.76	1000NB210
921WS381	300	300	0.910	N	17598	5279	N	3841	9.9	78	0.715	8.6	67	0.908	3.66	1200NB235

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of v*_w > 2.16kN/mm, web to flange joints are double sided 6mm fillet welds unless negotiated otherwise.

Equivalent Welded Beams (EB)

Dimensions and Properties

Designation	Depth Of Section	Flange		Web Thick- ness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick- ness			$\frac{d_1}{T_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		I_x	Z_x	S_x	r_x	I_y	Z_y	S_y	r_y				
																	D			
	Mm	mm	mm	mm	mm			mm ²	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
410EB48	406	210	10	5	386	77.2	10.3	6130	189	929	1020	175	15.4	147	223	50.2	156	605	410EB48	
410EB55	406	210	12	5	382	76.4	8.58	6950	219	1078	1180	177	18.5	176	267	51.6	258	719	410EB55	
460EB57	460	210	12	5	436	87.2	8.54	7220	287	1250	1370	200	18.5	176	267	50.7	260	930	460EB57	
460EB63	460	210	14	5	432	86.4	7.32	8040	326	1420	1550	201	21.6	206	311	51.8	402	1080	460EB63	
460EB70	460	210	16	5	428	85.6	6.41	8860	364	1580	1720	203	24.7	235	355	52.8	591	1220	460EB70	
530EB72	530	210	16	5	498	99.6	6.41	9210	495	1870	2040	232	24.7	235	356	51.8	594	1630	530EB72	
530EB79	530	210	18	5	494	98.8	5.69	10000	546	2060	2240	233	27.8	265	400	52.6	837	1820	530EB79	
610EB89	607	245	16	6	575	95.8	7.47	11300	780	2570	2810	263	39.2	320	485	58.9	710	3430	610EB89	
610EB96	607	245	18	6	571	95.2	6.64	12200	858	2830	3090	265	44.1	360	545	60.0	994	3830	610EB96	
610EB111	607	245	22	6	563	93.8	5.43	14200	1010	3330	3630	267	53.9	440	665	61.7	1780	4610	610EB111	
700EB114	700	245	16	10	668	66.8	7.3	14,520	1166	3330	3797	283	39.3	321	497	52.0	892	4593	700EB114	
700EB130	710	245	20	10	670	67.0	5.9	16,500	1417	3993	4503	293	49.1	401	617	54.5	1530	5841	700EB130	
700EB149	720	245	25	10	670	67.0	4.7	18,950	1731	4807	5379	302	61.3	501	767	56.9	2775	7406	700EB149	
800EB122	800	245	16	10	768	76.8	7.3	15,520	1582	3956	4548	319	39.3	321	499	50.3	925	6036	800EB122	
800EB144	810	295	18	10	774	77.4	7.9	18,360	2052	5067	5703	334	77.1	523	803	64.8	1405	12088	800EB144	
800EB162	815	295	22	10	771	77.1	6.5	20,690	2423	5946	6633	342	94.2	639	977	67.5	2351	14809	800EB162	
900EB175	910	295	20	12	870	72.5	7.1	22,240	2996	6584	7522	367	85.7	581	902	62.1	2074	16971	900EB175	
900EB213	910	370	25	10	860	86.0	7.2	27,100	4153	9128	10035	391	211	1141	1733	88.3	4141	41340	900EB213	
900EB253	915	370	32	10	851	85.1	5.6	32,190	5131	11216	12265	399	270	1461	2212	91.6	8366	52672	900EB253	
1000EB207	1000	295	22	14	956	68.3	6.4	26,364	4124	8247	9546	395	94.4	640	1004	59.8	2969	22561	1000EB207	
1000EB251	1010	370	25	14	960	68.6	7.1	31,940	5520	10932	12337	416	211	1142	1758	81.3	4732	51246	1000EB251	
1000EB291	1016	370	32	14	952	68.0	5.6	37,008	6741	13269	14823	427	270	1461	2237	85.5	8954	65446	1000EB291	
1200EB239	1170	295	25	14	1120	80.0	5.6	30,430	6474	11067	12835	461	107	727	1143	59.4	4097	35143	1200EB239	
1200EB309	1180	370	32	14	1116	79.7	5.6	39,304	9426	15976	17951	490	270	1462	2245	82.9	9104	89092	1200EB309	
1200EB337	1200	490	25	16	1150	71.9	9.5	42,900	10485	17476	19684	494	491	2002	3075	106.9	6674	169333	1200EB337	
1200EB389	1200	490	32	16	1136	71.0	7.4	49,536	12653	21088	23476	505	628	2563	3914	112.6	12255	214132	1200EB389	

- NOTES
1. Shear should be checked as webs may be thinner than equivalent hot rolled members.
 2. Web to flange weld is single sided with v_w defined in Item 3 on the front inside cover. Double side welding is available by negotiation.
 3. The smaller sections, 410EB48 to 610EB111 are equivalent to 410UB54 to 610UB125, while the larger sections are equivalent to the Australian "WB" range.

Equivalent Welded Beams (EB)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield	Stress	Form	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web	Factor													
	f_y	f_y	k_f	Compact- ness	Z_{ex}	M_{sx}	Compact- ness	Z_{ey}	K_{sm}	H_p/A	r_f	K_{sm}	H_p/A	r_f	v^*_w	
	MPa	MPa			10^3mm^3	KNm		10^3mm^3	m^2/T	m^{-1}	(15 min)	m^2/T	m^{-1}	(15 min)	kN/mm	
410EB48	300	300	0.815	N	970	291	N	204	34.1	268	0.434	29.8	234	0.513	1.09	410EB48
410EB55	300	300	0.840	N	1153	346	N	256	30.1	236	0.456	26.2	206	0.553	1.32	410EB55
460EB57	300	300	0.809	N	1340	402	N	256	30.9	242	0.452	27.2	213	0.542	1.16	460EB57
460EB63	300	300	0.831	N	1544	463	N	309	27.7	218	0.471	24.4	192	0.577	1.36	460EB63
460EB70	300	300	0.849	N	1704	511	C	353	25.2	198	0.490	22.1	174	0.609	1.57	460EB70
530EB72	300	300	0.816	N	1991	597	C	353	26.1	205	0.483	23.2	182	0.593	1.35	530EB72
530EB79	300	300	0.833	N	2192	658	C	397	24.0	188	0.500	21.3	167	0.621	1.53	530EB79
610EB89	300	300	0.796	N	2805	842	N	478	24.6	193	0.495	21.9	172	0.613	1.36	610EB89
610EB96	300	300	0.814	N	3028	908	C	540	22.7	178	0.511	20.1	158	0.640	1.54	610EB96
610EB111	300	300	0.843	N	3566	1070	C	660	19.6	154	0.543	17.4	137	0.688	1.91	610EB111
700EB114	300	300	0.760	N	3793	1138	N	480	20.7	163	0.531	18.6	146	0.667	1.38	700EB114
700EB130	300	300	0.788	C	4503	1351	C	601	18.4	144	0.558	16.5	129	0.706	1.46	700EB130
700EB149	300	300	0.815	C	5379	1614	C	751	16.1	127	0.589	14.5	114	0.748	1.83	700EB149
800EB122	300	300	0.711	N	4543	1363	N	480	21.0	165	0.528	19.0	149	0.659	1.34	800EB122
800EB144	300	300	0.752	N	5632	1690	N	771	19.3	151	0.547	17.2	135	0.692	1.43	800EB144
800EB162	300	300	0.782	C	6633	1990	C	958	17.2	135	0.574	15.4	121	0.729	1.68	800EB162
900EB175	300	300	0.737	C	7522	2257	C	872	17.0	134	0.576	15.4	121	0.730	1.65	900EB175
900EB213	300	300	0.801	C	10035	3011	C	1712	15.4	121	0.600	13.7	107	0.767	2.15	900EB213
900EB253	300	300	0.835	N	12145	3644	C	2191	13.0	102	0.642	11.6	91	0.820	2.78	900EB253
1000EB207	300	300	0.730	C	9546	2864	C	959	15.2	120	0.603	13.8	108	0.764	1.85	1000EB207
1000EB251	300	300	0.775	C	12337	3701	C	1713	13.8	109	0.627	12.4	97	0.799	2.00	1000EB251
1000EB291	300	300	0.809	C	14823	4447	C	2192	12.0	94	0.664	10.7	84	0.843	2.49	1000EB291
1200EB239	300	300	0.691	N	12733	3820	C	1090	14.6	115	0.613	13.4	105	0.774	1.84	1200EB239
1200EB309	300	300	0.762	N	17844	5353	C	2192	12.4	97	0.656	11.2	88	0.831	2.12	1200EB309
1200EB337	300	300	0.762	N	18806	5642	N	2833	12.9	101	0.646	11.4	89	0.824	2.27	1200EB337
1200EB389	300	300	0.798	N	23431	7029	N	3834	11.1	87	0.683	9.9	77	0.868	2.76	1200EB389

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of $v^*_w > 1.09\text{kN/mm}$, web to flange joints are single sided 6mm fillet welds unless negotiated otherwise.

Standard Welded Columns (SC)

Dimensions and Properties

Designation	Depth Of Section	Flange		Web Thick- Ness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick- ness			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		I_x	Z_x	S_x	r_x	I_y	Z_y	S_y	r_y				
																	D			
	Mm	mm	mm	Mm	mm			mm ²	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
245SC56	245	245	10	10	225	22.5	11.8	7150	77.2	630	702	104	24.5	200	306	58.6	238	339	245SC56	
245SC71	245	245	14	10	217	21.7	8.39	9030	100	817	910	105	34.3	280	426	61.7	521	458	245SC71	
245SC89	245	245	18	12	209	17.4	6.47	11300	123	1000	1130	104	44.1	360	548	62.4	1070	569	245SC89	
245SC104	245	245	22	12	201	16.8	5.30	13200	143	1160	1320	104	54.0	440	668	64.0	1860	671	245SC104	
295SC77	295	295	12	10	271	27.1	11.9	9790	158	1070	1190	127	51.4	348	529	72.4	430	1030	295SC77	
295SC95	295	295	16	10	263	26.3	8.91	12100	199	1350	1490	128	68.5	464	703	75.3	893	1330	295SC95	
295SC117	295	295	20	12	255	21.3	7.08	14900	240	1630	1820	127	85.6	580	879	75.9	1720	1620	295SC117	
295SC139	295	295	25	12	245	20.4	5.66	17700	284	1930	2170	127	107	725	1100	77.8	3210	1950	295SC139	
370SC125	370	370	16	12	338	28.2	11.2	15900	410	2220	2440	161	135	730	1110	92.2	1210	4230	370SC125	
370SC147	370	370	20	12	330	27.5	8.95	18800	490	2650	2920	162	169	913	1380	94.9	2160	5170	370SC147	
370SC185	370	370	25	16	320	20.0	7.08	23600	595	3220	3600	159	211	1140	1730	94.6	4290	6280	370SC185	
370SC246	370	370	32	25	306	12.2	5.4	31,330	738	3989	4587	153	271	1462	2238	92.9	9677	7727	370SC246	
389SC143	389	370	18	14	353	25.2	9.9	18,262	510	2622	2907	167	152	822	1249	91.2	1761	5232	389SC143	
390SC182	390	370	22	20	346	17.3	8.0	23,200	621	3184	3594	164	186	1005	1541	89.5	3549	6296	390SC182	
420SC209	420	370	25	22	370	16.8	7.0	26,640	815	3883	4407	175	211	1143	1756	89.1	5167	8245	420SC209	
434SC259	434	370	32	25	370	14.8	5.4	32,930	1064	4904	5615	180	271	1463	2248	90.7	10010	10934	434SC259	
500SC226	500	490	20	20	460	23.0	11.8	28,800	1292	5167	5762	212	393	1602	2447	116.7	3840	22606	500SC226	
500SC263	500	490	25	20	450	22.5	9.4	33,500	1535	6140	6831	214	491	2002	3046	121.0	6304	27668	500SC263	
510SC283	510	490	25	25	460	18.4	9.3	36,000	1645	6450	7264	214	491	2003	3073	116.8	7500	28862	510SC283	

- NOTES.
1. Shear should be checked as webs may be thinner than equivalent hot rolled members.
 2. Web to flange weld is single sided with v_w defined in Item 3 on the front inside cover. Double side welding is available by negotiation.
 3. The heavier standard columns, 370SC246 and above, are equivalent to the Australian "WC" sections

Standard Welded Columns (SC)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web													v* _W	
	f _y	f _y	k _f	Compact-ness	Z _{ex}	M _{Sx}	Compact-ness	Z _{ey}	K _{sm}	H _p /A	r _f	K _{sm}	H _p /A	r _f		
	MPa	MPa			10 ³ mm ³	kNm		10 ³ mm ³	m ² /T	m ⁻¹	(15 min)	m ² /T	m ⁻¹	(15 min)	kN/mm	
245SC56	300	300	1.000	N	644	193	N	266	25.8	203	0.485	21.5	169	0.619	2.18	245SC56
245SC71	300	300	1.000	N	892	267	N	408	20.5	161	0.534	17.0	133	0.696	3.16	245SC71
245SC89	300	300	1.000	C	1132	340	C	541	16.3	128	0.587	13.5	106	0.771	4.22	245SC89
245SC104	300	300	1.000	C	1323	397	C	661	14.0	110	0.625	11.6	91.0	0.819	5.36	245SC104
295SC77	300	300	1.000	N	1092	328	N	460	22.8	179	0.511	18.9	149	0.661	2.61	295SC77
295SC95	300	300	1.000	N	1449	435	N	667	18.5	145	0.557	15.4	121	0.730	3.59	295SC95
295SC117	300	300	1.000	C	1818	545	C	871	15.0	117	0.607	12.4	97.6	0.797	4.63	295SC117
295SC139	300	300	1.000	C	2171	651	C	1088	12.6	98.7	0.651	10.4	82.0	0.851	6.02	295SC139
370SC125	300	300	1.000	N	2280	684	N	985	17.6	138	0.568	14.6	115	0.745	3.50	370SC125
370SC147	300	300	1.000	N	2836	851	N	1311	14.9	117	0.608	12.4	97.3	0.798	4.48	370SC147
370SC185	300	300	1.000	C	3601	1080	C	1712	11.8	92.6	0.668	9.81	77.0	0.870	5.78	370SC185
370SC246	300	300	1.000	C	4587	1376	C	2194	8.8	69	0.746	7.3	57	0.951	7.74	370SC246
389SC143	300	300	1.000	N	2773	832	N	1150	15.6	122	0.598	13.0	102	0.784	3.77	389SC143
390SC182	300	300	1.000	N	3545	1064	N	1482	12.2	96	0.659	10.2	80	0.859	4.71	390SC182
420SC209	300	300	1.000	C	4407	1322	C	1714	10.9	85	0.689	9.1	72	0.891	5.00	420SC209
434SC259	300	300	1.000	C	5615	1685	C	2194	8.9	70	0.744	7.5	59	0.946	6.40	434SC259
500SC226	300	300	1.000	N	5279	1584	N	2124	12.9	101	0.644	10.7	84	0.842	4.26	500SC226
500SC263	300	300	1.000	N	6567	1970	N	2839	11.1	87	0.684	9.2	73	0.887	5.44	500SC263
510SC283	300	300	1.000	N	6967	2090	N	2848	10.4	81	0.702	8.6	68	0.906	5.33	510SC283

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of $v^*_w > 2.16\text{kN/mm}$, web to flange joints are double sided 6mm fillet welds unless negotiated otherwise.

Narrow Welded Beams (NB)

Dimensions and Properties

Designation	Depth Of Section	Flange		Web Thick- ness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick- ness			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		I_x	Z_x	S_x	r_x	I_y	Z_y	S_y	r_y				
																	D			
	Mm	mm	mm	mm	mm			mm ²	e ⁶ mm ⁴	E ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
400NB47	400	128	16	5	368	73.6	3.8	5,936	172	859	956	170	5.6	87	133	30.7	365	206	400NB47	
425NB51	425	128	16	6	393	65.5	3.8	6,454	202	949	1069	177	5.6	87	135	29.5	378	234	425NB51	
450NB52	450	128	16	6	418	69.7	3.8	6,604	229	1020	1151	186	5.6	87	135	29.1	380	264	450NB52	
475NB53	475	128	16	6	443	73.8	3.8	6,754	259	1092	1234	196	5.6	88	135	28.8	381	295	475NB53	
500NB63	500	145	18	6	464	77.3	3.9	8,004	353	1413	1581	210	9.2	126	193	33.8	597	532	500NB63	
525NB72	525	145	18	8	489	61.1	3.8	9,132	414	1575	1802	213	9.2	126	197	31.7	647	589	525NB72	
550NB73	550	145	18	8	514	64.3	3.8	9,332	460	1673	1917	222	9.2	126	197	31.3	651	649	550NB73	
575NB75	575	145	18	8	539	67.4	3.8	9,532	509	1772	2035	231	9.2	126	198	31.0	656	711	575NB75	
600NB76	600	145	18	8	564	70.5	3.8	9,732	562	1873	2155	240	9.2	126	198	30.7	660	777	600NB76	
625NB78	625	145	18	8	589	73.6	3.8	9,932	617	1975	2278	249	9.2	126	199	30.4	664	845	625NB78	
650NB89	650	162	20	8	610	76.3	3.9	11,360	795	2445	2785	264	14.2	175	272	35.4	968	1409	650NB89	
675NB101	675	162	20	10	635	63.5	3.8	12,830	909	2692	3130	266	14.2	176	278	33.3	1076	1526	675NB101	
700NB103	700	162	20	10	660	66.0	3.8	13,080	989	2825	3292	275	14.2	176	279	33.0	1084	1645	700NB103	
725NB105	725	162	20	10	685	68.5	3.8	13,330	1073	2961	3457	284	14.2	176	280	32.7	1092	1768	725NB105	
750NB107	750	162	20	10	710	71.0	3.8	13,580	1162	3098	3625	292	14.2	176	280	32.4	1101	1896	750NB107	
775NB109	775	162	20	10	735	73.5	3.8	13,830	1255	3238	3797	301	14.2	176	281	32.1	1109	2028	775NB109	
800NB123	800	183	22	10	756	75.6	3.9	15,612	1579	3947	4561	318	22.5	246	387	38.0	1551	3410	800NB123	
850NB139	850	183	22	12	806	67.2	3.9	17,724	1904	4480	5282	328	22.6	247	397	35.7	1763	3871	850NB139	
900NB152	900	183	25	12	850	70.8	3.4	19,350	2366	5258	6171	350	25.7	280	449	36.4	2396	4911	900NB152	
1000NB210	1000	183	32	16	936	58.5	2.6	26,688	3838	7676	9173	379	33.0	361	596	35.2	5276	7732	1000NB210	
1200NB235	1200	183	32	16	1136	71.0	2.6	29,888	5950	9917	12002	446	33.0	361	609	33.3	5549	11280	1200NB235	

- NOTES.
1. 'NB' welded members are suitable as Category 3 beams.
 2. Shear should be checked as webs may be thinner than equivalent hot rolled members.
 3. Web to flange weld is single sided with v_w defined in Item 3 on the front inside cover. Double side welding is available by negotiation.

Narrow Welded Beams (NB)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web													v* _w	
	f _y	F _y	k _f	Compact-ness	Z _{ex}	M _{sx}	Compact-ness	Z _{ey}	K _{sm}	H _p /A	r _f	K _{sm}	H _p /A	r _f		
	MPa	MPa			10 ³ mm ³	kNm		10 ³ mm ³	m ² /T	m ⁻¹	(15 min)	m ² /T	m ⁻¹	(15 min)	KN/mm	
400NB47	300	300	0.825	C	956	287	C	131	27.9	219	0.470	25.2	198	0.566	1.11	400NB47
425NB51	300	300	0.813	C	1069	321	C	131	26.6	209	0.479	24.1	189	0.581	1.04	425NB51
450NB52	300	300	0.794	C	1151	345	C	131	27.0	212	0.476	24.5	193	0.575	0.98	450NB52
475NB53	300	300	0.777	C	1234	370	C	131	27.3	215	0.474	24.9	196	0.570	0.92	475NB53
500NB63	300	300	0.796	N	1576	473	C	189	25.0	196	0.492	22.6	178	0.601	1.13	500NB63
525NB72	300	300	0.796	C	1802	540	C	190	22.5	177	0.513	20.5	161	0.634	1.13	525NB72
550NB73	300	300	0.778	C	1917	575	C	190	22.7	178	0.511	20.7	163	0.630	1.12	550NB73
575NB75	300	300	0.762	C	2035	610	C	190	22.9	180	0.510	21.0	165	0.627	1.11	575NB75
600NB76	300	300	0.746	C	2155	647	C	190	23.1	181	0.508	21.2	166	0.623	1.10	600NB76
625NB78	300	300	0.731	C	2278	683	C	190	23.3	183	0.506	21.4	168	0.620	1.09	625NB78
650NB89	300	300	0.750	N	2780	834	C	263	21.7	170	0.521	19.8	156	0.645	1.13	650NB89
675NB101	300	300	0.754	C	3130	939	C	263	19.6	154	0.543	18.0	142	0.677	1.33	675NB101
700NB103	300	300	0.740	C	3292	988	C	263	19.8	155	0.542	18.2	143	0.674	1.32	700NB103
725NB105	300	300	0.726	C	3457	1037	C	263	19.9	156	0.540	18.3	144	0.672	1.31	725NB105
750NB107	300	300	0.712	C	3625	1088	C	264	20.0	157	0.539	18.4	145	0.669	1.30	750NB107
775NB109	300	300	0.700	C	3797	1139	C	264	20.1	157	0.538	18.6	146	0.667	1.29	775NB109
800NB123	300	300	0.720	N	4556	1367	C	369	18.9	148	0.552	17.4	136	0.689	1.35	800NB123
850NB139	300	300	0.714	C	5282	1585	C	370	17.3	136	0.572	16.0	126	0.716	1.52	850NB139
900NB152	300	300	0.711	C	6171	1851	C	421	16.5	130	0.583	15.3	120	0.731	1.55	900NB152
1000NB210	300	300	0.745	C	9173	2752	C	541	12.9	101	0.645	12.0	94	0.808	1.99	1000NB210
1200NB235	300	300	0.666	C	12002	3601	C	542	13.2	104	0.639	12.4	98	0.797	1.88	1200NB235

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of v*_w > 1.09kN/mm, web to flange joints are single sided 6mm fillet welds unless negotiated otherwise.

Welded 'H' Piles (HP) Dimensions and Properties

Designation	Depth Of Section	Flange		Web Thick- ness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation
		Width	Thick- ness			$\frac{d_1}{t_w}$	$\frac{(b_f-t_w)}{2t_f}$													
									D	b _f	t _f	t _w	d ₁	A _g	I _x	Z _x	S _x	r _x	I _y	
	Mm	mm	mm	mm	mm			mm ²	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ⁶ mm ⁴	e ³ mm ³	e ³ mm ³	mm	e ³ mm ⁴	e ⁹ mm ⁶		
273HP73	273	245	14	10	245	24.5	8.25	9310	127	933	1040	117	34.3	280	426	60.7	530	576	273HP73	
273HP84	273	295	14	10	245	24.5	10.2	10700	151	1110	1220	119	59.9	406	615	74.8	621	1000	273HP84	
281HP103	281	295	18	10	245	24.5	7.92	13100	196	1400	1550	123	77.0	522	789	76.8	1230	1330	281HP103	
295HP135	295	295	25	10	245	24.5	5.70	17200	282	1910	2140	128	107	725	1090	78.9	3150	1950	295HP135	

Welded Bearing Piles (BP) Dimensions and Properties

Designation	Depth of Section	Flange		Web Thick-ness	Depth Between Flanges			Gross Section Area	About x-axis					About y-axis				Torsion Constant	Warping Constant	Designation	
		Width	Thick-ness			$\frac{d_1}{t_w}$	$\frac{(bf-t_w)}{2t_f}$														
									d	bf	tf	tw	d1	Ag	Ix	Zx	Sx	rx	Iy		Zy
	mm	mm	mm	mm	mm			mm2	e6 mm4	e3 mm3	e3 mm3	mm	e6 mm4	e3 mm3	e3 mm3	mm	e3 mm4	e9 mm6			
274BP147	274	210	32	25	210	8.40	2.89	18700	217	1590	1900	108	49.7	473	738	51.5	5680	727	274BP147		

- NOTES.
1. Shear should be checked as webs may be thinner than equivalent hot rolled members.
 2. Web to flange is double side welded with v^*_w defined in Item 3 on the front inside cover.

Welded 'H' Piles (HP)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web													v* _w	
	f _y	f _y		k _f	Compact-ness	Z _{ex}	M _{Sx}	Compact-ness	Z _{ey}	K _{Sm}	H _p /A	r _f	K _{Sm}	H _p /A		
	MPa	MPa			10 ³ mm ³	kNm		10 ³ mm ³	m ² /T	m ⁻¹	(15 min)	m ² /T	m ⁻¹	(15 min)	kN/mm	
273HP73	300	300	1.000	N	1018	305	N	408	20.6	162	0.532	17.3	135	0.691	2.80	273HP73
273HP84	300	300	1.000	N	1160	348	N	564	20.3	159	0.536	16.8	132	0.700	3.37	273HP84
281HP103	300	300	1.000	N	1530	459	N	771	16.8	132	0.579	13.9	109	0.762	4.33	281HP103
295HP135	300	300	1.000	C	2141	642	C	1088	13.0	102	0.643	10.8	84.6	0.842	6.02	295HP135

Welded Bearing Piles (BP)

Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld	Designation
	Yield Stress		Form Factor	About x-axis			About y-axis		4 sided			3 sided			(See Note 2)	
	Flange	Web														
	f _y	f _y	k _f	Compact-ness	Z _{ex}	M _{Sx}	Compact-ness	Z _{ey}	K _{Sm}	H _p /A	r _f	K _{Sm}	H _p /A	r _f	v* _w	
	MPa	MPa			10 ³ mm ³	kNm		10 ³ mm ³	m ² /T	m ⁻¹	(15 min)	m ² /T	m ⁻¹	(15 min)	kN/mm	
274BP147	300	300	1.000	C	1902	571	C	710	9.12	71.6	0.737	7.69	60.3	0.938	6.40	274BP147

- NOTES.
1. C: Compact Section; N: Non-compact Section; S; Slender Section
 2. For values of $v^*_w > 2.16\text{kN/mm}$, web to flange joints are double sided 6mm fillet welds unless negotiated otherwise.

Design Moment Capacities for Members Without Full Lateral Restraint Subject to Bending about x-axis

Light Welded Beams (LB)

Dimensions and Properties

Designation	Design Moment Capacities ϕM_b (kNm) For Effective Length in metres													
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16
450LB46	273	243	203	163	129	103	84	70	59	51	45	40	41	28
475LB47	289	257	215	172	136	108	87	72	61	53	46	41	42	28
500LB52	339	314	274	230	188	153	125	104	88	75	66	58	59	39
525LB57	373	344	298	248	201	163	133	110	93	79	69	61	62	41
550LB58	396	364	315	261	211	170	138	114	96	82	71	63	63	42
575LB59	419	385	332	275	221	178	144	118	99	85	73	64	65	43
600LB60	444	407	351	289	232	186	150	123	103	87	76	66	66	44
625LB71	508	460	391	318	253	201	162	133	111	95	83	73	73	49
650LB78	569	539	481	414	347	287	237	197	166	142	123	108	108	70
675LB80	598	566	504	433	362	299	246	204	172	146	126	111	110	72
700LB81	628	593	528	452	377	310	255	211	177	151	130	114	113	74
725LB83	658	620	552	472	393	322	264	219	183	155	134	117	116	75
750LB84	688	648	576	492	408	334	274	226	189	160	138	120	119	77
775LB86	719	677	600	511	424	346	283	233	194	165	141	123	121	79
800LB113	1134	1108	1026	925	815	706	605	518	444	383	333	293	298	190
850LB129	1295	1259	1160	1039	908	780	665	565	483	416	361	317	321	205
900LB161	1773	1773	1691	1584	1459	1325	1190	1060	940	832	738	657	710	433
1000LB192	2453	2454	2340	2193	2021	1838	1652	1474	1310	1162	1033	921	1004	613
1200LB225	3235	3224	3061	2849	2605	2346	2087	1842	1619	1423	1253	1109	1170	719

Slenderness Reduction Factor α_s for Members Without Full Lateral Restraint Subject to Bending about x-axis

Light Welded Beams (LB)

Designation	Slenderness Reduction Factor α_s For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16	
450LB46	272	0.895	0.752	0.607	0.482	0.385	0.313	0.260	0.221	0.191	0.167	0.149	0.122	0.103	4.199
475LB47	291	0.893	0.748	0.601	0.474	0.377	0.305	0.252	0.213	0.184	0.161	0.143	0.116	0.098	4.179
500LB52	338	0.930	0.814	0.684	0.562	0.459	0.376	0.313	0.264	0.227	0.198	0.175	0.141	0.117	4.844
525LB57	373	0.924	0.804	0.671	0.547	0.443	0.362	0.300	0.253	0.217	0.189	0.166	0.134	0.112	4.722
550LB58	396	0.923	0.801	0.667	0.541	0.437	0.356	0.294	0.247	0.211	0.183	0.161	0.129	0.108	4.692
575LB59	419	0.922	0.798	0.662	0.536	0.432	0.350	0.288	0.242	0.206	0.179	0.157	0.125	0.104	4.640
600LB60	442	0.920	0.795	0.658	0.531	0.426	0.345	0.283	0.237	0.201	0.174	0.153	0.122	0.101	4.594
625LB71	508	0.910	0.776	0.634	0.506	0.403	0.325	0.267	0.224	0.191	0.166	0.146	0.117	0.097	4.407
650LB78	569	0.949	0.849	0.733	0.616	0.511	0.423	0.353	0.297	0.254	0.220	0.193	0.153	0.126	5.336
675LB80	598	0.948	0.847	0.730	0.612	0.506	0.418	0.348	0.292	0.249	0.215	0.189	0.149	0.123	5.296
700LB81	628	0.947	0.845	0.727	0.608	0.502	0.413	0.343	0.288	0.245	0.211	0.185	0.146	0.120	5.264
725LB83	658	0.946	0.843	0.724	0.604	0.497	0.409	0.339	0.284	0.241	0.208	0.181	0.143	0.117	5.224
750LB84	688	0.945	0.841	0.721	0.600	0.493	0.404	0.334	0.280	0.237	0.204	0.178	0.140	0.114	5.188
775LB86	719	0.944	0.839	0.718	0.597	0.489	0.400	0.330	0.276	0.234	0.201	0.175	0.137	0.112	5.153
800LB113	1128	0.978	0.908	0.821	0.726	0.631	0.542	0.465	0.400	0.345	0.301	0.264	0.209	0.171	6.558
850LB129	1295	0.974	0.899	0.807	0.707	0.609	0.520	0.443	0.379	0.327	0.284	0.249	0.197	0.162	6.331
900LB161	1773	1.001	0.956	0.897	0.828	0.753	0.678	0.605	0.537	0.477	0.423	0.377	0.303	0.249	8.376
1000LB192	2499	1.000	0.954	0.895	0.825	0.750	0.675	0.602	0.535	0.475	0.422	0.377	0.304	0.250	8.420
1200LB225	3319	0.996	0.946	0.880	0.805	0.725	0.645	0.569	0.500	0.439	0.386	0.342	0.272	0.221	7.970

Key



Slenderness Reduction Factor α_s not less than 1/1.75

Design Moment Capacities for Members Without Full Lateral Restraint Subject to Bending about x-axis

Standard Welded Beams (SB)

Designation	Design Moment Capacities ϕM_o (kNm) for Effective Length in metres													
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16
400SB49	277	250	213	175	143	118	98	84	72	64	57	51	43	37
425SB53	310	277	234	191	154	126	104	88	76	67	59	53	44	38
450SB55	333	297	250	203	163	132	109	91	78	68	61	54	45	39
475SB56	356	317	266	215	171	138	113	95	81	70	62	56	46	39
500SB68	476	442	388	329	274	228	191	162	140	122	109	97	80	69
525SB77	539	497	432	362	299	246	205	174	149	130	115	103	85	73
550SB79	573	527	457	382	313	257	213	180	154	134	118	106	87	74
575SB81	607	557	482	401	328	268	221	186	158	138	121	108	89	75
600SB82	642	588	508	421	343	279	229	192	163	141	124	110	90	76
625SB84	677	620	534	441	358	290	237	198	168	145	127	113	92	77
650SB100	876	833	750	654	557	470	396	336	289	251	221	196	160	135
675SB112	976	923	825	713	602	504	423	358	307	266	234	208	170	143
700SB114	1024	968	864	745	627	524	438	369	316	273	240	213	173	145
725SB116	1074	1013	903	777	652	543	453	381	325	280	246	218	176	148
750SB118	1124	1059	943	809	678	562	467	392	333	288	251	222	180	150
775SB120	1175	1106	983	842	703	582	482	404	342	295	257	227	183	153
800SB152	1632	1596	1481	1341	1189	1040	903	783	682	598	528	471	383	321
850SB169	1854	1804	1667	1499	1319	1145	987	851	738	644	567	504	409	342
900SB208	2483	2483	2369	2222	2051	1870	1688	1514	1353	1210	1083	974	798	668
1000SB265	3410	3399	3230	3014	2767	2507	2251	2009	1790	1596	1427	1283	1052	883
1200SB290	4363	4338	4108	3813	3477	3124	2777	2453	2161	1906	1688	1502	1211	1001

Slenderness Reduction Factor α_s for Members Without Full Lateral Restraint Subject to Bending about x-axis

Standard Welded Beams (SB)

Designation	Slenderness Reduction Factor α_s For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16	
400SB49	277	0.902	0.768	0.633	0.516	0.424	0.354	0.301	0.261	0.229	0.204	0.184	0.154	0.132	4.500
425SB53	310	0.895	0.756	0.617	0.498	0.406	0.337	0.285	0.245	0.215	0.191	0.172	0.143	0.123	4.354
450SB55	333	0.893	0.751	0.609	0.489	0.396	0.326	0.275	0.236	0.206	0.182	0.164	0.136	0.116	4.290
475SB56	356	0.891	0.747	0.602	0.480	0.386	0.317	0.265	0.227	0.198	0.175	0.156	0.129	0.110	4.232
500SB68	476	0.929	0.816	0.692	0.576	0.479	0.401	0.341	0.294	0.257	0.228	0.204	0.169	0.144	5.045
525SB77	539	0.921	0.801	0.672	0.554	0.457	0.381	0.322	0.277	0.242	0.214	0.192	0.158	0.135	4.841
550SB79	573	0.920	0.798	0.667	0.547	0.449	0.372	0.314	0.269	0.234	0.206	0.185	0.152	0.129	4.783
575SB81	607	0.918	0.794	0.661	0.540	0.441	0.364	0.306	0.261	0.227	0.200	0.178	0.146	0.124	4.727
600SB82	642	0.917	0.791	0.656	0.534	0.434	0.357	0.299	0.254	0.220	0.193	0.172	0.141	0.119	4.680
625SB84	677	0.915	0.788	0.651	0.528	0.428	0.350	0.292	0.248	0.214	0.188	0.167	0.136	0.114	4.628
650SB100	876	0.952	0.857	0.747	0.636	0.537	0.452	0.384	0.330	0.287	0.252	0.224	0.183	0.154	5.633
675SB112	976	0.946	0.846	0.731	0.617	0.517	0.434	0.367	0.314	0.273	0.240	0.213	0.174	0.146	5.436
700SB114	1024	0.945	0.843	0.727	0.613	0.511	0.427	0.361	0.308	0.267	0.234	0.208	0.169	0.142	5.382
725SB116	1074	0.944	0.841	0.723	0.608	0.506	0.422	0.355	0.302	0.261	0.229	0.203	0.164	0.138	5.338
750SB118	1124	0.943	0.839	0.720	0.603	0.500	0.416	0.349	0.297	0.256	0.224	0.198	0.160	0.134	5.291
775SB120	1175	0.942	0.837	0.716	0.599	0.495	0.411	0.344	0.291	0.251	0.219	0.193	0.156	0.130	5.247
800SB152	1632	0.977	0.907	0.821	0.728	0.637	0.553	0.480	0.418	0.366	0.323	0.288	0.235	0.196	6.768
850SB169	1854	0.973	0.899	0.809	0.712	0.618	0.533	0.459	0.398	0.347	0.306	0.272	0.220	0.184	6.526
900SB208	2483	1.000	0.954	0.895	0.826	0.753	0.680	0.610	0.545	0.487	0.436	0.392	0.322	0.269	8.575
1000SB265	3410	0.997	0.947	0.884	0.811	0.735	0.660	0.589	0.525	0.468	0.419	0.376	0.309	0.259	8.263
1200SB290	4363	0.994	0.942	0.874	0.797	0.716	0.636	0.562	0.495	0.437	0.387	0.344	0.278	0.230	7.863

Key



Slenderness Reduction Factor α_s not less than 1/1.75

Design Moment Capacities for Members Without Full Lateral Restraint Subject to Bending about x-axis

Heavy Welded Beams (HB)

Designation	Design Moment Capacities ϕM_b (kNm) For Effective Length in metres													
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16
350HB46	220	191	158	127	103	84	71	61	53	47	43	39	33	28
375HB47	240	208	170	136	109	89	74	63	55	49	44	39	33	29
400HB58	306	273	229	187	152	125	104	89	77	68	61	55	46	40
425HB60	332	294	246	200	161	131	109	92	80	70	63	56	47	40
450HB61	358	316	264	212	170	137	113	96	82	72	64	58	48	41
475HB63	384	339	281	225	178	144	118	99	85	74	66	59	49	42
500HB76	506	467	407	343	284	236	197	168	145	127	112	101	84	71
525HB85	572	524	453	378	310	256	213	181	156	137	121	109	91	77
550HB87	609	557	479	398	326	267	222	187	161	141	125	112	92	79
575HB89	647	590	507	419	341	278	230	194	166	144	128	114	94	80
600HB91	686	624	534	440	356	289	238	200	171	148	131	117	96	81
625HB93	726	658	562	461	372	301	247	206	176	152	134	119	98	83
650HB120	980	924	823	709	599	502	423	360	310	270	239	213	175	149
675HB122	1032	972	864	743	625	522	438	371	319	278	245	218	179	151
700HB124	1085	1020	905	776	651	542	453	383	328	285	251	223	182	154
725HB127	1139	1070	947	810	677	562	468	395	337	292	257	228	186	157
750HB129	1194	1120	990	844	704	582	484	406	346	300	263	233	189	159
775HB143	1325	1233	1083	916	759	625	519	436	372	322	283	252	206	174
800HB176	1788	1738	1604	1441	1268	1102	953	825	718	630	558	498	408	344
850HB182	1942	1885	1736	1555	1363	1180	1015	875	758	662	584	520	423	355
900HB222	2579	2576	2453	2295	2114	1922	1731	1550	1384	1236	1106	995	816	684
1000HB303	4041	4040	3854	3617	3348	3064	2784	2517	2273	2054	1861	1693	1420	1213
1200HB364	5476	5449	5167	4809	4403	3981	3567	3181	2833	2528	2264	2038	1679	1415

Slenderness Reduction Factor α_s for Members Without Full Lateral Restraint Subject to Bending about x-axis

Heavy Welded Beams (HB)

Designation	Slenderness Reduction Factor α_s For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16	
350HB46	220	0.867	0.715	0.576	0.465	0.383	0.322	0.277	0.242	0.215	0.193	0.176	0.148	0.128	4.035
375HB47	240	0.863	0.707	0.564	0.452	0.368	0.308	0.263	0.229	0.202	0.181	0.164	0.138	0.119	3.944
400HB58	306	0.890	0.749	0.611	0.496	0.407	0.340	0.290	0.252	0.223	0.199	0.180	0.151	0.130	4.318
425HB60	332	0.887	0.743	0.602	0.485	0.395	0.328	0.278	0.241	0.212	0.189	0.170	0.142	0.122	4.237
450HB61	358	0.884	0.737	0.593	0.474	0.384	0.317	0.268	0.231	0.202	0.180	0.161	0.134	0.115	4.164
475HB63	384	0.881	0.731	0.585	0.464	0.373	0.307	0.258	0.221	0.193	0.171	0.154	0.128	0.109	4.100
500HB76	506	0.923	0.805	0.678	0.562	0.466	0.390	0.331	0.286	0.250	0.222	0.200	0.165	0.141	4.910
525HB85	572	0.915	0.791	0.660	0.542	0.447	0.373	0.316	0.273	0.239	0.212	0.191	0.158	0.135	4.733
550HB87	609	0.913	0.787	0.653	0.534	0.438	0.364	0.307	0.264	0.231	0.204	0.183	0.152	0.129	4.669
575HB89	647	0.911	0.783	0.647	0.527	0.430	0.355	0.299	0.256	0.223	0.197	0.176	0.145	0.124	4.608
600HB91	686	0.909	0.779	0.641	0.520	0.422	0.347	0.291	0.249	0.216	0.191	0.170	0.140	0.119	4.552
625HB93	726	0.907	0.775	0.636	0.513	0.415	0.340	0.284	0.242	0.210	0.185	0.164	0.135	0.114	4.499
650HB120	980	0.943	0.840	0.724	0.611	0.512	0.431	0.367	0.316	0.276	0.244	0.218	0.179	0.152	5.381
675HB122	1032	0.941	0.837	0.719	0.605	0.506	0.424	0.360	0.309	0.269	0.237	0.211	0.173	0.147	5.322
700HB124	1085	0.940	0.834	0.715	0.600	0.499	0.418	0.353	0.302	0.262	0.231	0.206	0.168	0.142	5.268
725HB127	1139	0.939	0.832	0.711	0.594	0.493	0.411	0.346	0.296	0.256	0.225	0.200	0.163	0.137	5.216
750HB129	1194	0.937	0.829	0.707	0.589	0.487	0.405	0.340	0.290	0.251	0.220	0.195	0.159	0.133	5.164
775HB143	1325	0.931	0.817	0.691	0.572	0.472	0.391	0.329	0.281	0.243	0.214	0.190	0.155	0.131	5.008
800HB176	1788	0.972	0.897	0.806	0.709	0.616	0.533	0.461	0.402	0.352	0.312	0.279	0.228	0.192	6.519
850HB182	1942	0.971	0.894	0.800	0.702	0.607	0.523	0.450	0.390	0.341	0.301	0.268	0.218	0.183	6.408
900HB222	2579	0.999	0.951	0.890	0.820	0.745	0.671	0.601	0.537	0.479	0.429	0.386	0.316	0.265	8.440
1000HB303	4041	1.000	0.954	0.895	0.829	0.758	0.689	0.623	0.563	0.508	0.461	0.419	0.351	0.300	8.839
1200HB364	5476	0.995	0.944	0.878	0.804	0.727	0.651	0.581	0.517	0.462	0.413	0.372	0.307	0.258	8.143

Key Slenderness Reduction Factor α_s not less than 1/1.75

Design Moment Capacities for Members Without Full Lateral Restraint Subject to Bending about x-axis

Perimeter Welded Beams (PB)

Designation	Design Moment Capacities ϕM_b (kNm) For Effective Length in metres													
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	12	14	18	22
250PB44	153	134	114	96	82	71	62	55	49	44	37	32	25	20
275PB50	181	157	132	110	93	80	69	61	54	49	41	35	27	22
300PB52	203	175	146	120	100	84	73	64	57	51	42	36	28	23
325PB68	287	257	222	189	161	139	122	108	96	87	73	63	49	40
350PB71	316	283	242	204	173	147	128	112	100	90	75	64	50	41
375PB79	384	355	313	269	230	198	172	151	134	120	100	85	66	53
400PB87	437	402	352	301	257	220	191	167	149	134	111	94	73	59
425PB112	628	600	547	488	432	382	339	303	272	247	207	178	138	113
450PB121	699	666	604	537	474	417	369	329	296	268	224	192	149	122
475PB147	929	911	852	783	712	643	581	526	477	436	369	318	248	203
500PB158	1022	999	932	854	774	697	628	567	514	469	396	341	266	217

Slenderness Reduction Factor α_s for Members Without Full Lateral Restraint Subject to Bending about x-axis

Perimeter Welded Beams (PB)

Designation	Slenderness Reduction Factor α_s For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	12	14	18	22	
250PB44	153	0.879	0.749	0.633	0.538	0.463	0.405	0.359	0.321	0.291	0.244	0.210	0.164	0.134	4.613
275PB50	181	0.869	0.732	0.611	0.515	0.440	0.383	0.338	0.302	0.272	0.228	0.195	0.152	0.124	4.378
300PB52	203	0.863	0.719	0.592	0.493	0.417	0.359	0.315	0.280	0.251	0.209	0.179	0.139	0.113	4.185
325PB68	287	0.898	0.775	0.660	0.563	0.486	0.424	0.375	0.336	0.303	0.254	0.218	0.170	0.139	4.905
350PB71	316	0.893	0.766	0.645	0.545	0.466	0.404	0.355	0.316	0.285	0.237	0.203	0.157	0.128	4.713
375PB79	384	0.925	0.814	0.701	0.600	0.516	0.447	0.393	0.349	0.313	0.260	0.221	0.171	0.139	5.311
400PB87	437	0.918	0.804	0.689	0.587	0.503	0.436	0.383	0.340	0.306	0.253	0.216	0.167	0.136	5.170
425PB112	628	0.956	0.871	0.778	0.689	0.609	0.540	0.483	0.434	0.394	0.330	0.284	0.221	0.180	6.520
450PB121	699	0.952	0.864	0.768	0.677	0.597	0.528	0.471	0.423	0.383	0.320	0.275	0.214	0.175	6.346
475PB147	929	0.980	0.917	0.843	0.766	0.692	0.625	0.566	0.514	0.469	0.397	0.342	0.267	0.219	7.892
500PB158	1022	0.978	0.912	0.836	0.757	0.682	0.615	0.555	0.503	0.459	0.387	0.334	0.260	0.212	7.709

Key Slenderness Reduction Factor α_s not less than 1/1.75

Design Moment Capacities for Members Without Full Lateral Restraint Subject to Bending about x-axis

Wide Sections (WS)

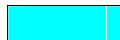
Designation	Design Moment Capacities ϕM_b (kNm) for Effective Length in metres													
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	12	14	18	22
546WS93	659	606	526	442	366	304	255	218	189	166	133	111	83	67
550WS120	866	802	707	608	519	445	385	337	299	267	221	188	144	117
550WS163	1248	1228	1153	1065	972	882	799	725	660	604	512	442	345	283
560WS217	1652	1652	1587	1500	1405	1307	1211	1120	1036	959	829	725	574	472
610WS100	762	721	646	559	474	397	334	283	243	211	165	135	98	77
617WS139	1132	1079	977	861	749	648	562	492	434	387	316	266	202	163
617WS171	1420	1420	1365	1288	1201	1107	1014	924	841	766	638	540	406	322
625WS217	1856	1856	1780	1680	1568	1451	1337	1228	1127	1036	882	761	590	479
682WS120	1072	1018	913	794	676	571	482	411	355	310	244	201	147	116
685WS153	1396	1365	1268	1151	1025	903	791	694	611	541	435	360	265	210
719WS240	2277	2276	2173	2041	1894	1740	1589	1447	1316	1199	1004	855	650	522
755WS162	1527	1483	1368	1228	1081	939	811	702	611	535	423	346	251	197
766WS181	1796	1751	1622	1466	1301	1141	996	871	765	676	542	449	331	261
779WS287	3009	3009	2883	2719	2535	2345	2158	1981	1818	1670	1422	1227	952	774
835WS168	1810	1763	1629	1466	1292	1123	969	837	726	634	498	404	290	225
853WS204	2258	2202	2041	1845	1638	1437	1255	1096	963	852	682	564	416	328
862WS359	4282	4282	4250	4106	3934	3742	3539	3330	3123	2922	2552	2234	1746	1412
905WS197	2248	2183	2012	1804	1584	1373	1183	1020	885	773	608	495	357	278
910WS254	3011	2941	2733	2483	2221	1968	1738	1538	1367	1223	999	840	632	506
921WS294	3635	3635	3475	3267	3033	2786	2542	2311	2098	1906	1588	1344	1012	807
921WS381	4751	4751	4708	4542	4344	4123	3889	3649	3411	3182	2760	2400	1855	1489

Slenderness Reduction Factor α_s for Members Without Full Lateral Restraint Subject to Bending about x-axis

Wide Sections (WS)

Designation	Slenderness Reduction Factor α_s For Effective Length in metres														Effective Length
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	12	14	18	22	For $\alpha_s=1/1.75$
546WS93	659	0.919	0.798	0.670	0.556	0.461	0.387	0.331	0.286	0.252	0.202	0.168	0.126	0.101	4.848
550WS120	866	0.926	0.816	0.702	0.599	0.514	0.444	0.389	0.345	0.309	0.255	0.217	0.167	0.135	5.302
550WS163	1248	0.984	0.924	0.853	0.779	0.707	0.641	0.581	0.529	0.484	0.410	0.354	0.277	0.226	8.179
560WS217	1652	1.000	0.960	0.908	0.850	0.791	0.733	0.678	0.627	0.581	0.502	0.439	0.347	0.286	10.207
610WS100	762	0.947	0.848	0.734	0.622	0.522	0.439	0.372	0.319	0.277	0.217	0.177	0.129	0.101	5.490
617WS139	1132	0.953	0.863	0.761	0.661	0.572	0.497	0.434	0.383	0.342	0.279	0.235	0.178	0.144	6.010
617WS171	1420	1.000	0.961	0.907	0.845	0.780	0.714	0.651	0.592	0.539	0.449	0.380	0.286	0.227	9.368
625WS217	1856	1.000	0.959	0.905	0.845	0.782	0.720	0.662	0.607	0.558	0.475	0.410	0.318	0.258	9.715
682WS120	1072	0.949	0.852	0.740	0.630	0.532	0.450	0.383	0.331	0.289	0.228	0.187	0.137	0.108	5.582
685WS153	1396	0.978	0.908	0.824	0.734	0.647	0.567	0.497	0.437	0.387	0.311	0.258	0.190	0.150	6.936
719WS240	2277	1.000	0.954	0.897	0.832	0.764	0.698	0.635	0.578	0.527	0.441	0.375	0.286	0.229	9.113
755WS162	1527	0.972	0.896	0.805	0.708	0.615	0.531	0.460	0.400	0.351	0.277	0.227	0.165	0.129	6.505
766WS181	1796	0.975	0.903	0.816	0.724	0.635	0.555	0.485	0.426	0.377	0.302	0.250	0.184	0.146	6.776
779WS287	3009	1.000	0.958	0.904	0.843	0.779	0.717	0.658	0.604	0.555	0.472	0.408	0.316	0.257	9.651
835WS168	1810	0.974	0.900	0.810	0.714	0.620	0.535	0.462	0.401	0.350	0.275	0.223	0.160	0.124	6.560
853WS204	2258	0.975	0.904	0.817	0.725	0.636	0.556	0.486	0.426	0.377	0.302	0.250	0.184	0.145	6.791
862WS359	4282	1.000	0.993	0.959	0.919	0.874	0.826	0.778	0.729	0.682	0.596	0.522	0.408	0.330	12.622
905WS197	2248	0.971	0.895	0.803	0.705	0.611	0.526	0.454	0.394	0.344	0.270	0.220	0.159	0.124	6.447
910WS254	3011	0.977	0.908	0.825	0.738	0.654	0.577	0.511	0.454	0.406	0.332	0.279	0.210	0.168	7.081
921WS294	3635	1.000	0.956	0.899	0.834	0.766	0.699	0.636	0.577	0.524	0.437	0.370	0.279	0.222	9.095
921WS381	4751	1.000	0.991	0.956	0.914	0.868	0.818	0.768	0.718	0.670	0.581	0.505	0.391	0.313	12.230

Key



Slenderness Reduction Factor α_s not less than 1/1.75

Design Moment Capacities for Members Without Full Lateral Restraint Subject to Bending about x-axis

Equivalent Welded Beams (EB)

Designation	Design Moment Capacities ϕM_b (kNm) For Effective Length in metres													
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16
410EB48	262	245	216	184	153	127	106	90	77	67	59	53	43	37
410EB55	311	291	258	221	186	156	132	113	98	86	77	69	57	49
460EB57	362	338	297	253	211	175	146	124	106	93	82	73	60	51
460EB63	417	390	344	295	248	209	177	151	131	116	103	93	77	66
460EB70	460	432	384	332	284	242	207	180	158	140	126	114	96	83
530EB72	537	503	446	383	323	272	230	197	171	151	134	121	100	86
530EB79	592	556	494	428	365	310	266	230	202	179	161	145	122	105
610EB89	757	726	658	579	499	425	362	310	268	234	206	184	151	127
610EB96	818	786	716	635	552	475	409	354	309	272	242	218	180	153
610EB111	963	928	850	761	670	587	514	452	401	358	323	293	247	213
700EB114	1024	968	864	745	627	524	438	369	316	273	240	213	173	145
700EB130	1216	1156	1040	907	776	658	559	479	415	363	322	288	238	202
700EB149	1452	1388	1259	1111	966	834	722	629	554	492	441	399	335	288
800EB122	1227	1154	1023	875	729	601	497	415	351	302	263	232	186	155
800EB144	1521	1484	1375	1241	1096	954	823	710	614	535	470	417	336	279
800EB162	1791	1753	1630	1479	1316	1156	1009	879	769	677	601	538	440	371
900EB175	2031	1974	1820	1632	1431	1236	1060	910	784	682	598	530	427	355
900EB213	2710	2710	2596	2443	2265	2076	1885	1701	1531	1377	1240	1121	928	783
900EB253	3279	3279	3158	2985	2787	2576	2365	2162	1972	1799	1644	1507	1280	1104
1000EB207	2577	2497	2294	2047	1786	1536	1313	1124	968	840	737	653	527	439
1000EB251	3331	3325	3164	2958	2721	2471	2222	1986	1770	1578	1411	1267	1037	868
1000EB291	4002	4002	3825	3594	3331	3053	2776	2511	2268	2049	1856	1687	1412	1205
1200EB239	3438	3330	3057	2725	2374	2037	1736	1481	1271	1101	962	850	682	566
1200EB309	4818	4815	4590	4301	3969	3617	3265	2931	2624	2350	2110	1901	1567	1319
1200EB337	5078	5078	5020	4832	4603	4344	4065	3776	3487	3205	2937	2688	2252	1900
1200EB389	6326	6326	6262	6034	5758	5446	5112	4766	4421	4085	3766	3468	2945	2517

Slenderness Reduction Factor α_s for Members Without Full Lateral Restraint Subject to Bending about x-axis

Equivalent Welded Beams (EB)

Designation	Slenderness Reduction Factor α_s For Effective Length in metres														Effective Length
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16	For $\alpha_s=1/1.75$
410EB48	262	0.934	0.824	0.702	0.585	0.486	0.405	0.342	0.294	0.255	0.225	0.201	0.165	0.139	5.124
410EB55	311	0.936	0.828	0.710	0.598	0.502	0.425	0.364	0.316	0.277	0.247	0.222	0.185	0.158	5.259
460EB57	362	0.933	0.821	0.699	0.583	0.484	0.404	0.342	0.294	0.256	0.226	0.202	0.166	0.141	5.102
460EB63	417	0.934	0.826	0.707	0.596	0.500	0.423	0.363	0.315	0.277	0.247	0.222	0.185	0.158	5.236
460EB70	460	0.938	0.835	0.722	0.616	0.525	0.451	0.391	0.343	0.305	0.274	0.248	0.209	0.180	5.466
530EB72	537	0.936	0.829	0.712	0.601	0.506	0.428	0.367	0.319	0.280	0.250	0.225	0.187	0.160	5.289
530EB79	592	0.939	0.835	0.723	0.616	0.524	0.449	0.389	0.341	0.303	0.271	0.246	0.206	0.178	5.464
610EB89	757	0.958	0.869	0.765	0.659	0.561	0.478	0.409	0.353	0.309	0.272	0.243	0.199	0.168	5.891
610EB96	818	0.961	0.876	0.776	0.675	0.582	0.501	0.433	0.378	0.333	0.296	0.266	0.220	0.188	6.115
610EB111	963	0.964	0.883	0.790	0.696	0.609	0.533	0.469	0.416	0.372	0.335	0.305	0.257	0.222	6.479
700EB114	1024	0.945	0.843	0.727	0.613	0.511	0.427	0.361	0.308	0.267	0.234	0.208	0.169	0.142	5.388
700EB130	1216	0.951	0.855	0.746	0.638	0.541	0.460	0.394	0.341	0.299	0.265	0.237	0.196	0.166	5.667
700EB149	1452	0.956	0.867	0.765	0.665	0.574	0.497	0.433	0.381	0.339	0.304	0.275	0.231	0.198	6.036
800EB122	1227	0.941	0.834	0.713	0.594	0.490	0.405	0.338	0.287	0.246	0.214	0.189	0.152	0.126	5.206
800EB144	1521	0.976	0.904	0.816	0.721	0.627	0.541	0.467	0.404	0.352	0.309	0.274	0.221	0.184	6.634
800EB162	1791	0.979	0.910	0.826	0.735	0.646	0.563	0.491	0.430	0.378	0.336	0.300	0.246	0.207	6.893
900EB175	2031	0.972	0.896	0.803	0.704	0.609	0.522	0.448	0.386	0.336	0.294	0.261	0.210	0.175	6.414
900EB213	2710	1.000	0.958	0.901	0.836	0.766	0.696	0.628	0.565	0.508	0.458	0.414	0.343	0.289	8.891
900EB253	3279	1.000	0.963	0.910	0.850	0.786	0.721	0.659	0.601	0.549	0.501	0.460	0.390	0.337	9.555
1000EB207	2577	0.969	0.890	0.794	0.693	0.596	0.509	0.436	0.375	0.326	0.286	0.253	0.204	0.170	6.271
1000EB251	3331	0.998	0.950	0.888	0.817	0.742	0.667	0.596	0.531	0.474	0.424	0.380	0.311	0.261	8.369
1000EB291	4002	1.000	0.956	0.898	0.832	0.763	0.694	0.627	0.567	0.512	0.464	0.422	0.353	0.301	8.918
1200EB239	3438	0.969	0.889	0.793	0.690	0.592	0.505	0.431	0.370	0.320	0.280	0.247	0.198	0.165	6.228
1200EB309	4818	0.999	0.953	0.893	0.824	0.751	0.678	0.608	0.545	0.488	0.438	0.395	0.325	0.274	8.567
1200EB337	5078	1.000	0.989	0.952	0.907	0.856	0.801	0.744	0.687	0.631	0.578	0.529	0.444	0.374	11.134
1200EB389	6326	1.000	0.990	0.954	0.910	0.861	0.808	0.753	0.699	0.646	0.595	0.548	0.465	0.398	11.493

Key Slenderness Reduction Factor α_s not less than 1/1.75

Design Moment Capacities for Members Without Full Lateral Restraint Subject to Bending about x-axis

Narrow Welded Beams (NB)

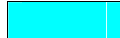
Designation	Design Moment Capacities ϕM_b (kNm) for Effective Length in metres													
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16
400NB47	258	206	160	125	100	83	70	61	54	48	44	40	34	30
425NB51	289	226	174	134	106	87	73	63	56	50	45	41	35	30
450NB52	311	242	184	140	110	89	75	64	56	50	45	41	35	30
475NB53	333	258	194	146	114	92	77	66	57	51	46	42	35	31
500NB63	426	354	282	221	177	145	122	105	92	81	73	67	57	49
525NB72	486	397	311	240	189	154	129	110	96	86	77	70	59	51
550NB73	518	420	327	250	196	158	132	112	98	87	78	71	60	52
575NB75	549	444	343	261	202	162	135	115	100	88	79	72	60	52
600NB76	582	468	359	271	209	167	138	117	101	89	80	72	61	53
625NB78	615	492	376	281	216	171	141	119	103	91	81	73	61	53
650NB89	751	638	514	403	317	256	212	179	155	137	122	111	93	80
675NB101	845	707	561	434	339	272	224	190	164	145	129	117	98	84
700NB103	889	741	586	450	349	279	229	193	167	147	131	118	99	85
725NB105	933	776	610	466	360	286	234	197	170	149	133	119	100	86
750NB107	979	811	635	482	371	293	239	201	173	151	134	121	101	87
775NB109	1025	846	660	499	381	300	244	205	175	153	136	122	102	87
800NB123	1230	1077	889	707	559	449	369	310	266	232	206	185	154	131
850NB139	1426	1231	1000	783	612	487	398	334	286	249	221	198	164	141
900NB152	1666	1446	1182	933	735	588	483	406	349	305	271	243	202	173
1000NB210	2477	2138	1748	1388	1105	897	746	634	550	486	434	392	329	284
1200NB235	3240	2747	2194	1693	1310	1038	846	708	607	530	470	422	350	300

Slenderness Reduction Factor α_s for Members Without Full Lateral Restraint Subject to Bending about x-axis

Narrow Welded Beams (NB)

Designation	Slenderness Reduction Factor α_s For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	ϕM_{sx}	2	3	4	5	6	7	8	9	10	11	12	14	16	
400NB47	258	0.796	0.622	0.485	0.389	0.321	0.273	0.237	0.209	0.187	0.169	0.154	0.131	0.114	3.332
425NB51	289	0.784	0.602	0.463	0.367	0.300	0.253	0.219	0.192	0.172	0.155	0.141	0.120	0.105	3.191
450NB52	311	0.779	0.592	0.450	0.353	0.287	0.241	0.207	0.182	0.162	0.146	0.133	0.113	0.098	3.123
475NB53	333	0.773	0.582	0.438	0.341	0.275	0.230	0.197	0.172	0.153	0.138	0.125	0.106	0.092	3.064
500NB63	426	0.831	0.663	0.520	0.415	0.340	0.286	0.246	0.215	0.191	0.172	0.157	0.133	0.115	3.610
525NB72	486	0.815	0.639	0.493	0.389	0.316	0.264	0.227	0.198	0.176	0.158	0.144	0.122	0.105	3.428
550NB73	518	0.811	0.631	0.484	0.378	0.305	0.254	0.217	0.189	0.168	0.151	0.137	0.115	0.100	3.370
575NB75	549	0.808	0.624	0.474	0.368	0.296	0.245	0.209	0.181	0.160	0.144	0.130	0.110	0.095	3.318
600NB76	582	0.804	0.617	0.466	0.359	0.287	0.237	0.201	0.174	0.154	0.137	0.124	0.105	0.090	3.271
625NB78	615	0.800	0.610	0.457	0.350	0.278	0.229	0.193	0.167	0.147	0.132	0.119	0.100	0.086	3.228
650NB89	751	0.850	0.685	0.536	0.422	0.341	0.282	0.239	0.207	0.182	0.163	0.147	0.124	0.106	3.743
675NB101	845	0.837	0.664	0.513	0.401	0.321	0.265	0.225	0.194	0.171	0.153	0.138	0.116	0.100	3.583
700NB103	889	0.834	0.659	0.506	0.393	0.313	0.258	0.218	0.188	0.165	0.147	0.133	0.111	0.096	3.541
725NB105	933	0.831	0.653	0.499	0.386	0.306	0.251	0.211	0.182	0.160	0.142	0.128	0.107	0.092	3.501
750NB107	979	0.828	0.648	0.493	0.379	0.299	0.244	0.205	0.176	0.154	0.137	0.124	0.103	0.088	3.466
775NB109	1025	0.826	0.643	0.486	0.372	0.293	0.238	0.200	0.171	0.150	0.133	0.119	0.099	0.085	3.427
800NB123	1230	0.876	0.723	0.575	0.455	0.365	0.300	0.252	0.216	0.189	0.168	0.150	0.125	0.107	4.025
850NB139	1426	0.863	0.701	0.549	0.429	0.342	0.279	0.234	0.200	0.175	0.155	0.139	0.115	0.099	3.839
900NB152	1666	0.868	0.710	0.560	0.441	0.353	0.290	0.244	0.209	0.183	0.163	0.146	0.121	0.104	3.917
1000NB210	2477	0.863	0.706	0.561	0.446	0.362	0.301	0.256	0.222	0.196	0.175	0.158	0.133	0.115	3.917
1200NB235	3240	0.848	0.677	0.522	0.404	0.320	0.261	0.219	0.187	0.163	0.145	0.130	0.108	0.093	3.659

Key



Slenderness Reduction Factor α_s not less than 1/1.75

About these Tables.

1. To ensure the timely manufacture of the welded beams, the specifying design engineer should liaise with Steltech Structural Ltd. as soon as a potential need for a possible welded beam supply is identified. There is no commitment to order at this early stage, the contact is simply to assist forward programming, scheduling and inventory control. From this first contact point onwards the project can be regularly monitored with tentative delivery dates matching the proposed construction program.
2. All notation, symbols and derivations are in accordance with NZS3404:1997 Steel Structures Standard.
3. The design force per unit length of the flange to web fillet weld v^*_w , is derived from the following two equations, which ever is greatest.

$$v^*_w = 0.6 f_y(\text{web}) t_w d_1 b_f t_f (d_1 + t_f) / (2 I_x)$$

$$v^*_w = b_f t_f f_y(\text{flange}) / (1.5 d_1)$$

This does not take into consideration the tensile forces generated between the flange and web when a concentrated load is applied through the flange to an unstiffened web. Transfer of this force will be limited to the nominated design capacity of the flange to web fillet weld, unless an alternative load path is provided through stiffeners.

The weld size is determined from v^*_w for each particular member, or defaults to an alternative size as nominated on each table. When the value of v^*_w is **highlighted in bold italics** the default weld size applies.

For specific applications, weld sizes should be based on actual design loadings rather than on section capacity parameters. Weld type (ie. single or double sided) should be assessed on factors such as member category, fatigue, need for galvanising and other environmental considerations. Over sized welds have the potential to increase distortions and leadtimes.

4. For further advice and technical support contact:

Telephone **09-268-3052**
Free Phone 0508-783-335
0508-STE-EEL

Facsimilie **09-266-3080**

STELTECH STRUCTURAL LTD

