

# Design capacity tables

FOR HIGH CAPACITY SECTIONS



Width	Flange Thickness	Web Thickness	Depth Between Flanges	d <sub>1</sub>	d <sub>2</sub>	d <sub>1</sub> /t <sub>w</sub>	d <sub>2</sub> /t <sub>w</sub>	A <sub>g</sub>	About x-axis		About y-axis		S <sub>x</sub>	I <sub>x</sub>	S <sub>y</sub>	I <sub>y</sub>	Z <sub>x</sub>	Z <sub>y</sub>	e <sub>3</sub> mm <sup>3</sup>	e <sub>3</sub> mm <sup>3</sup>	mm	mm
									e <sub>4</sub> mm <sup>4</sup>	e <sub>3</sub> mm <sup>3</sup>	e <sub>4</sub> mm <sup>4</sup>	e <sub>3</sub> mm <sup>3</sup>										
430	80.0	8.9	211	80.0	211	8.9	8.9	5,810	210	935	1036	190	10.2	111.7	170	170	41.9	139.9	552	926	1020	119
430	91.0	8.9	211	91.0	211	8.9	8.9	6,936	237	998	1110	200	10.2	111.7	170	170	41.5	141.0	582	926	1020	119
430	102	10.3	211	102	211	10.3	10.3	7,280	281	1,380	1,320	213	15.4	147	228	228	46.2	160	644	1,020	1,120	145
430	112	10.3	211	112	211	10.3	10.3	7,530	343	1,580	1,460	218	15.4	147	225	225	45.3	179	644	1,020	1,120	145
430	122	10.3	211	122	211	10.3	10.3	7,780	421	1,740	1,560	227	15.4	147	225	225	44.8	182	644	1,020	1,120	145
430	132	10.3	211	132	211	10.3	10.3	8,030	515	1,900	1,680	236	15.4	147	225	225	44.2	181	644	1,020	1,120	145
430	142	10.3	211	142	211	10.3	10.3	8,280	625	2,060	1,800	246	15.4	147	225	225	43.7	181	644	1,020	1,120	145
430	152	10.3	211	152	211	10.3	10.3	8,530	745	2,220	1,920	256	15.4	147	225	225	43.2	181	644	1,020	1,120	145
430	162	10.3	211	162	211	10.3	10.3	8,780	875	2,380	2,040	266	15.4	147	225	225	42.7	181	644	1,020	1,120	145
430	172	10.3	211	172	211	10.3	10.3	9,030	1,015	2,540	2,160	276	15.4	147	225	225	42.2	181	644	1,020	1,120	145
430	182	10.3	211	182	211	10.3	10.3	9,280	1,165	2,700	2,280	286	15.4	147	225	225	41.7	181	644	1,020	1,120	145
430	192	10.3	211	192	211	10.3	10.3	9,530	1,325	2,860	2,400	296	15.4	147	225	225	41.2	181	644	1,020	1,120	145
430	202	10.3	211	202	211	10.3	10.3	9,780	1,495	3,020	2,520	306	15.4	147	225	225	40.7	181	644	1,020	1,120	145
430	212	10.3	211	212	211	10.3	10.3	10,030	1,675	3,180	2,640	316	15.4	147	225	225	40.2	181	644	1,020	1,120	145



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# High Capacity Columns (HCC)

## 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			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$				
		d	b <sub>f</sub>														t <sub>f</sub>			
327HCC156	327	310	25	16	277	17.3	5.9	19,932	383	2340	2647	139	124	801	1219	78.9	3607	2832	327HCC156	
327HCC165	327	310	25	20	277	13.9	5.8	21,040	390	2383	2724	136	124	802	1229	76.9	3968	2834	327HCC165	
327HCC176	327	310	25	25	277	11.1	5.7	22,425	399	2437	2820	133	124	803	1245	74.5	4672	2838	327HCC176	
327HCC197	327	310	32	20	263	13.2	4.5	25,100	464	2836	3272	136	159	1026	1564	79.6	7473	3461	327HCC197	
327HCC207	327	310	32	25	263	10.5	4.5	26,415	471	2882	3359	134	159	1027	1579	77.6	8142	3464	327HCC207	
327HCC222	327	310	32	32	263	8.2	4.3	28,256	482	2947	3480	131	160	1030	1605	75.2	9645	3472	327HCC222	
327HCC243	327	310	40	25	247	9.9	3.6	30,975	545	3336	3940	133	199	1283	1961	80.1	14513	4096	327HCC243	
327HCC257	327	310	40	32	247	7.7	3.5	32,704	554	3389	4047	130	199	1286	1985	78.1	15925	4104	327HCC257	
327HCC272	327	310	40	40	247	6.2	3.4	34,680	564	3451	4169	128	200	1290	2021	75.9	18496	4117	327HCC272	
327HCC300	327	310	50	32	227	7.1	2.8	38,264	632	3867	4706	129	249	1606	2461	80.6	28313	4774	327HCC300	
327HCC315	327	310	50	40	227	5.7	2.7	40,080	640	3915	4809	126	249	1609	2493	78.9	30676	4785	327HCC315	
327HCC332	327	310	50	50	227	4.5	2.6	42,350	650	3975	4938	124	251	1617	2544	76.9	35292	4808	327HCC332	
400HCC189	400	370	25	16	350	21.9	7.1	24,100	709	3543	3959	171	211	1141	1734	93.6	4332	7424	400HCC189	
400HCC200	400	370	25	20	350	17.5	7.0	25,500	723	3614	4081	168	211	1142	1746	91.0	4788	7428	400HCC200	
400HCC214	400	370	25	25	350	14.0	6.9	27,250	741	3703	4234	165	212	1143	1766	88.1	5677	7436	400HCC214	
400HCC239	400	370	32	20	336	16.8	5.5	30,400	867	4335	4922	169	270	1461	2224	94.3	8979	9154	400HCC239	
400HCC252	400	370	32	25	336	13.4	5.4	32,080	883	4414	5063	166	271	1463	2243	91.8	9833	9161	400HCC252	
400HCC270	400	370	32	32	336	10.5	5.3	34,432	905	4524	5260	162	271	1465	2276	88.7	11753	9177	400HCC270	
400HCC295	400	370	40	25	320	12.8	4.3	37,600	1031	5156	5968	166	338	1828	2788	94.8	17453	10955	400HCC295	
400HCC313	400	370	40	32	320	10.0	4.2	39,840	1050	5252	6147	162	339	1830	2820	92.2	19282	10969	400HCC313	
400HCC333	400	370	40	40	320	8.0	4.1	42,400	1072	5361	6352	159	339	1835	2866	89.5	22613	10996	400HCC333	
400HCC366	400	370	50	32	300	9.4	3.4	46,600	1213	6064	7195	161	423	2286	3499	95.3	34110	12952	400HCC366	
400HCC385	400	370	50	40	300	7.5	3.3	49,000	1231	6154	7375	158	424	2290	3543	93.0	37233	12976	400HCC385	
400HCC408	400	370	50	50	300	6.0	3.2	52,000	1253	6267	7600	155	425	2299	3610	90.4	43333	13023	400HCC408	
500HCC315	500	490	32	20	436	21.8	7.3	40,080	1858	7432	8289	215	628	2562	3885	125.1	11867	34373	500HCC315	
500HCC332	500	490	32	25	436	17.4	7.3	42,260	1892	7570	8526	212	628	2563	3910	121.9	12975	34388	500HCC332	
500HCC356	500	490	32	32	436	13.6	7.2	45,312	1941	7763	8859	207	629	2566	3953	117.8	15466	34422	500HCC356	
500HCC390	500	490	40	25	420	16.8	5.8	49,700	2233	8933	10119	212	785	3204	4868	125.7	23094	41520	500HCC390	
500HCC413	500	490	40	32	420	13.1	5.7	52,640	2276	9106	10427	208	785	3206	4910	122.2	25494	41552	500HCC413	
500HCC440	500	490	40	40	420	10.5	5.6	56,000	2326	9303	10780	204	787	3210	4970	118.5	29867	41609	500HCC440	

# High Capacity Columns (HCC)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield Stress		Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		k <sub>f</sub>	Compact-ness	Z <sub>ex</sub>	M <sub>sx</sub>	Compact-ness		Z <sub>ey</sub>	K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>	K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>	
	f <sub>y</sub>	f <sub>y</sub>	10 <sup>3</sup> mm <sup>3</sup>						kNm								10 <sup>3</sup> mm <sup>3</sup>
MPa	MPa													kN/mm			
327HCC156	300	300	1.000	C	2647	794	C	1202	1862	11.9	93	0.666	9.9	78	0.866	<b>5.60</b>	327HCC156
327HCC165	300	300	1.000	C	2724	817	C	1203	1854	11.2	88	0.681	9.3	73	0.884	<b>5.60</b>	327HCC165
327HCC176	300	300	1.000	C	2820	846	C	1205	1844	10.5	82	0.699	8.7	68	0.904	<b>5.60</b>	327HCC176
327HCC197	300	300	1.000	C	3272	982	C	1539	1854	9.4	74	0.728	7.8	62	0.933	<b>7.54</b>	327HCC197
327HCC207	300	300	1.000	C	3359	1008	C	1541	1844	8.9	70	0.743	7.4	58	0.949	<b>7.54</b>	327HCC207
327HCC222	300	300	1.000	C	3480	1044	C	1545	1830	8.3	65	0.764	6.9	54	0.968	<b>7.54</b>	327HCC222
327HCC243	280	300	1.000	C	3940	1103	C	1925	1844	7.6	60	0.787	6.3	50	0.989	<b>9.37</b>	327HCC243
327HCC257	280	300	1.000	C	4047	1133	C	1929	1830	7.1	56	0.803	5.9	46	1.004	<b>9.37</b>	327HCC257
327HCC272	280	280	1.000	C	4169	1167	C	1935	1814	6.7	52	0.822	5.5	43	1.020	<b>9.37</b>	327HCC272
327HCC300	280	300	1.000	C	4706	1318	C	2408	1830	6.1	48	0.846	5.1	40	1.040	<b>12.75</b>	327HCC300
327HCC315	280	280	1.000	C	4809	1346	C	2414	1814	5.8	45	0.860	4.8	38	1.052	<b>12.75</b>	327HCC315
327HCC332	280	280	1.000	C	4938	1383	C	2425	1794	5.4	42	0.878	4.5	35	1.066	<b>12.75</b>	327HCC332
400HCC189	300	300	1.000	C	3959	1188	C	1712	2248	11.9	93	0.666	9.9	78	0.866	<b>5.29</b>	400HCC189
400HCC200	300	300	1.000	C	4081	1224	C	1713	2240	11.2	88	0.682	9.3	73	0.884	<b>5.29</b>	400HCC200
400HCC214	300	300	1.000	C	4234	1270	C	1715	2230	10.4	82	0.701	8.7	68	0.904	<b>5.29</b>	400HCC214
400HCC239	300	300	1.000	C	4922	1476	C	2192	2240	9.4	74	0.729	7.8	62	0.933	<b>7.05</b>	400HCC239
400HCC252	300	300	1.000	C	5063	1519	C	2194	2230	8.9	70	0.745	7.4	58	0.949	<b>7.05</b>	400HCC252
400HCC270	300	300	1.000	C	5260	1578	C	2198	2216	8.2	64	0.765	6.8	54	0.969	<b>7.05</b>	400HCC270
400HCC295	280	300	1.000	C	5968	1671	C	2741	2230	7.6	59	0.788	6.3	49	0.989	<b>8.63</b>	400HCC295
400HCC313	280	300	1.000	C	6147	1721	C	2745	2216	7.1	56	0.805	5.9	46	1.005	<b>8.63</b>	400HCC313
400HCC333	280	280	1.000	C	6352	1779	C	2752	2200	6.6	52	0.824	5.5	43	1.021	<b>8.63</b>	400HCC333
400HCC366	280	300	1.000	C	7195	2015	C	3429	2216	6.1	48	0.847	5.0	40	1.040	<b>11.51</b>	400HCC366
400HCC385	280	280	1.000	C	7375	2065	C	3435	2200	5.7	45	0.862	4.8	37	1.053	<b>11.51</b>	400HCC385
400HCC408	280	280	1.000	C	7600	2128	C	3448	2180	5.3	42	0.880	4.4	35	1.067	<b>11.51</b>	400HCC408
500HCC315	300	300	1.000	N	8282	2485	N	3839	2920	9.3	73	0.732	7.7	61	0.937	<b>7.19</b>	500HCC315
500HCC332	300	300	1.000	C	8526	2558	C	3845	2910	8.8	69	0.747	7.3	57	0.952	<b>7.19</b>	500HCC332
500HCC356	300	300	1.000	C	8859	2658	C	3849	2896	8.1	64	0.767	6.8	53	0.972	<b>7.19</b>	500HCC356
500HCC390	280	300	1.000	C	10119	2833	C	4805	2910	7.5	59	0.791	6.2	49	0.993	<b>8.71</b>	500HCC390
500HCC413	280	300	1.000	C	10427	2920	C	4809	2896	7.0	55	0.808	5.8	46	1.008	<b>8.71</b>	500HCC413
500HCC440	280	280	1.000	C	10780	3018	C	4816	2880	6.6	51	0.826	5.4	43	1.024	<b>8.71</b>	500HCC440

- NOTES:
1. C: Compact Section; N: Non-compact Section; S: Slender Section
  2. For values of  $v_w^* > 2.93\text{kN/mm}$ , web to flange joints are double 9mm fillet welds

## High Capacity Columns (HCC)

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			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$			
		d	$t_f$																
500HCC485	500	490	50	32	400	12.5	4.6	61,800	2662	10646	12305	208	982	4006	6105	126.0	45202	49688	500HCC485
500HCC510	500	490	50	40	400	10.0	4.5	65,000	2704	10817	12625	204	983	4010	6163	122.9	49367	49741	500HCC510
500HCC542	500	490	50	50	400	8.0	4.4	69,000	2758	11030	13025	200	985	4019	6253	119.5	57500	49844	500HCC542
600HCC386	600	600	32	20	536	26.8	9.1	49,120	3357	11190	12342	261	1152	3841	5814	153.2	14537	92945	600HCC386
600HCC407	600	600	32	25	536	21.4	9.0	51,800	3421	11404	12701	257	1153	3842	5844	149.2	15899	92972	600HCC407
600HCC436	600	600	32	32	536	16.8	8.9	55,552	3511	11704	13204	251	1153	3845	5897	144.1	18962	93034	600HCC436
600HCC479	600	600	40	25	520	20.8	7.2	61,000	4063	13542	15130	258	1441	4802	7281	153.7	28308	112949	600HCC479
600HCC507	600	600	40	32	520	16.3	7.1	64,640	4145	13815	15603	253	1441	4805	7333	149.3	31280	113007	600HCC507
600HCC540	600	600	40	40	520	13.0	7.0	68,800	4238	14128	16144	248	1443	4809	7408	144.8	36693	113113	600HCC540
600HCC597	600	600	50	32	500	15.6	5.7	76,000	4883	16278	18500	253	1801	6005	9128	154.0	55461	136228	600HCC597
600HCC628	600	600	50	40	500	12.5	5.6	80,000	4967	16556	19000	249	1803	6009	9200	150.1	60667	136327	600HCC628
600HCC667	600	600	50	50	500	10.0	5.5	85,000	5071	16903	19625	244	1805	6017	9313	145.7	70833	136519	600HCC667

# High Capacity Columns (HCC)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield Stress		Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		k <sub>f</sub>	Compact-ness	Z <sub>ex</sub>	M <sub>sx</sub>	Compact-ness		Z <sub>ey</sub>	K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>	K <sub>sm</sub>	H <sub>p</sub> /A		r <sub>f</sub>
	f <sub>y</sub>	f <sub>y</sub>	10 <sup>3</sup> mm <sup>3</sup>						kNm								
MPa	MPa													kN/mm			
500HCC485	280	300	1.000	C	12305	3445	C	6009	2896	6.0	47	0.851	5.0	39	1.044	<b>11.43</b>	500HCC485
500HCC510	280	280	1.000	C	12625	3535	C	6016	2880	5.6	44	0.866	4.7	37	1.056	<b>11.43</b>	500HCC510
500HCC542	280	280	1.000	C	13025	3647	C	6028	2860	5.3	41	0.883	4.4	34	1.070	<b>11.43</b>	500HCC542
600HCC386	300	300	1.000	N	11972	3592	N	5497	3560	9.2	72	0.733	7.7	60	0.939	<b>7.16</b>	600HCC386
600HCC407	300	300	1.000	N	12303	3691	N	5511	3550	8.7	69	0.748	7.3	57	0.954	<b>7.16</b>	600HCC407
600HCC436	300	300	1.000	N	12773	3832	N	5531	3536	8.1	64	0.768	6.7	53	0.973	<b>7.16</b>	600HCC436
600HCC479	280	300	1.000	C	15130	4236	C	7203	3550	7.4	58	0.793	6.2	48	0.995	<b>8.62</b>	600HCC479
600HCC507	280	300	1.000	C	15603	4369	C	7207	3536	7.0	55	0.810	5.8	45	1.010	<b>8.62</b>	600HCC507
600HCC540	280	280	1.000	C	16144	4520	C	7214	3520	6.5	51	0.828	5.4	42	1.025	<b>8.62</b>	600HCC540
600HCC597	280	300	1.000	C	18500	5180	C	9007	3536	5.9	47	0.853	4.9	39	1.046	<b>11.20</b>	600HCC597
600HCC628	280	280	1.000	C	19000	5320	C	9013	3520	5.6	44	0.868	4.6	37	1.058	<b>11.20</b>	600HCC628
600HCC667	280	280	1.000	C	19625	5495	C	9026	3500	5.2	41	0.885	4.3	34	1.071	<b>11.20</b>	600HCC667

- NOTES:
1. C: Compact Section; N: Non-compact Section; S: Slender Section
  2. For values of  $v_w^* > 3.26$  kN/mm, web to flange joints are double 10mm fillet welds

# High Capacity Beam-Columns (HCBC)

## 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			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$				
		d	b <sub>f</sub>														t <sub>f</sub>			
400HCBC158	400	210	32	20	336	16.8	3.0	20,160	519	2597	3037	161	50	473	739	49.6	5484	1680	400HCBC158	
400HCBC171	400	210	32	25	336	13.4	2.9	21,840	535	2676	3179	157	50	475	758	47.8	6338	1687	400HCBC171	
400HCBC195	400	210	40	25	320	12.8	2.3	24,800	615	3074	3664	157	62	592	932	50.1	10627	2014	400HCBC195	
400HCBC212	400	210	40	32	320	10.0	2.2	27,040	634	3170	3843	153	63	596	964	48.1	12455	2029	400HCBC212	
400HCBC240	400	210	50	32	300	9.4	1.8	30,600	720	3598	4395	153	78	743	1179	50.5	20777	2389	400HCBC240	
400HCBC287	400	210	50	40	300	7.5	1.7	33,000	738	3688	4575	149	79	750	1223	48.9	23900	2412	400HCBC287	
400HCBC176	400	245	32	20	336	16.8	3.5	22,400	595	2977	3450	163	79	642	994	59.3	6248	2663	400HCBC176	
400HCBC189	400	245	32	25	336	13.4	3.4	24,080	611	3056	3591	159	79	644	1013	57.2	7102	2670	400HCBC189	
400HCBC217	400	245	40	25	320	12.8	2.8	27,600	706	3530	4168	160	98	804	1251	59.7	12120	3190	400HCBC217	
400HCBC234	400	245	40	32	320	10.0	2.7	29,840	725	3625	4347	156	99	807	1282	57.6	13949	3205	400HCBC234	
400HCBC268	400	245	50	32	300	9.4	2.1	34,100	827	4137	5008	156	123	1007	1577	60.1	23693	3778	400HCBC268	
400HCBC290	400	245	50	40	300	7.5	2.1	36,500	845	4227	5188	152	124	1013	1621	58.3	26817	3802	400HCBC290	
500HCBC174	500	210	32	20	436	21.8	3.0	22,160	875	3501	4095	199	50	473	749	47.3	5750	2720	500HCBC174	
500HCBC191	500	210	32	25	436	17.4	2.9	24,340	910	3639	4333	193	50	476	774	45.3	6858	2736	500HCBC191	
500HCBC214	500	210	40	25	420	16.8	2.3	27,300	1045	4181	4967	196	62	593	948	47.8	11148	3295	500HCBC214	
500HCBC237	500	210	40	32	420	13.1	2.2	30,240	1089	4354	5275	190	63	599	990	45.6	13548	3327	500HCBC237	
500HCBC265	500	210	50	32	400	12.5	1.8	33,800	1238	4953	6005	191	78	745	1205	48.1	21869	3962	500HCBC265	
500HCBC290	500	210	50	40	400	10.0	1.7	37,000	1281	5123	6325	186	79	755	1263	46.3	26033	4015	500HCBC290	
500HCBC192	500	245	32	20	436	21.8	3.5	24,400	998	3992	4620	202	79	643	1004	56.8	6515	4311	500HCBC192	
500HCBC209	500	245	32	25	436	17.4	3.4	26,580	1033	4130	4857	197	79	645	1029	54.5	7623	4326	500HCBC209	
500HCBC236	500	245	40	25	420	16.8	2.8	30,100	1194	4775	5611	199	99	805	1266	57.2	12641	5215	500HCBC236	
500HCBC259	500	245	40	32	420	13.1	2.7	33,040	1237	4948	5919	193	99	810	1308	54.8	15041	5247	500HCBC259	
500HCBC293	500	245	50	32	400	12.5	2.1	37,300	1416	5664	6793	195	124	1009	1603	57.6	24786	6259	500HCBC293	
500HCBC318	500	245	50	40	400	10.0	2.1	40,500	1459	5835	7113	190	125	1018	1661	55.5	28950	6312	500HCBC318	
600HCBC207	600	245	32	20	536	26.8	3.5	26,400	1523	5076	5890	240	79	643	1014	54.6	6781	6355	600HCBC207	
600HCBC228	600	245	32	25	536	21.4	3.4	29,080	1587	5289	6249	234	79	646	1044	52.2	8144	6382	600HCBC228	
600HCBC256	600	245	40	25	520	20.8	2.8	32,600	1832	6107	7178	237	99	806	1282	55.0	13162	7739	600HCBC256	
600HCBC284	600	245	40	32	520	16.3	2.7	36,240	1914	6381	7651	230	99	812	1334	52.4	16133	7798	600HCBC284	
600HCBC318	600	245	50	32	500	15.6	2.1	40,500	2191	7304	8738	233	124	1012	1629	55.3	25878	9371	600HCBC318	
600HCBC349	600	245	50	40	500	12.5	2.1	44,500	2275	7582	9238	226	125	1022	1701	53.0	31083	9470	600HCBC349	

# High Capacity Beam-Columns (HCBC)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield Stress		Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		Compactness	Z <sub>ex</sub>	M <sub>sx</sub>	Compactness	Z <sub>ey</sub>		K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>	K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>		
	f <sub>y</sub>	f <sub>y</sub>	k <sub>f</sub>						10 <sup>3</sup> mm <sup>3</sup>								kNm
400HCBC158	300	300	1.000	C	3037	911	C	709	1600	10.1	79	0.709	8.8	69	0.902	<b>4.00</b>	400HCBC158
400HCBC171	300	300	1.000	C	3179	954	C	712	1590	9.3	73	0.732	8.0	63	0.926	<b>4.00</b>	400HCBC171
400HCBC195	280	300	1.000	C	3664	1026	C	888	1590	8.2	64	0.767	7.1	56	0.960	<b>4.90</b>	400HCBC195
400HCBC212	280	300	1.000	C	3843	1076	C	894	1576	7.4	58	0.792	6.4	51	0.984	<b>4.90</b>	400HCBC212
400HCBC240	280	300	1.000	C	4395	1231	C	1114	1576	6.6	52	0.826	5.7	45	1.014	<b>6.53</b>	400HCBC240
400HCBC287	280	280	1.000	C	4575	1281	C	1125	1560	6.0	47	0.849	5.2	41	1.033	<b>6.53</b>	400HCBC287
400HCBC176	300	300	1.000	C	3450	1035	C	963	1740	9.9	78	0.715	8.5	67	0.911	<b>4.67</b>	400HCBC176
400HCBC189	300	300	1.000	C	3591	1077	C	966	1730	9.2	72	0.736	7.9	62	0.932	<b>4.67</b>	400HCBC189
400HCBC217	280	300	1.000	C	4168	1167	C	1206	1730	8.0	63	0.773	6.9	54	0.968	<b>5.72</b>	400HCBC217
400HCBC234	280	300	1.000	C	4347	1217	C	1211	1716	7.3	58	0.796	6.3	49	0.990	<b>5.72</b>	400HCBC234
400HCBC268	280	300	1.000	C	5008	1402	C	1511	1716	6.4	50	0.832	5.5	43	1.021	<b>7.62</b>	400HCBC268
400HCBC290	280	280	1.000	C	5188	1453	C	1520	1700	5.9	47	0.853	5.1	40	1.039	<b>7.62</b>	400HCBC290
500HCBC174	300	300	1.000	C	4095	1229	C	710	1800	10.3	81	0.703	9.1	72	0.890	<b>3.08</b>	500HCBC174
500HCBC191	300	300	1.000	C	4333	1300	C	714	1790	9.4	74	0.729	8.3	65	0.918	<b>3.39</b>	500HCBC191
500HCBC214	280	300	1.000	C	4967	1391	C	890	1790	8.4	66	0.760	7.4	58	0.949	<b>3.73</b>	500HCBC214
500HCBC237	280	300	1.000	C	5275	1477	C	898	1776	7.5	59	0.790	6.6	52	0.978	<b>4.29</b>	500HCBC237
500HCBC265	280	300	1.000	C	6005	1681	C	1118	1776	6.7	53	0.820	5.9	46	1.005	<b>4.90</b>	500HCBC265
500HCBC290	280	280	1.000	C	6325	1771	C	1133	1760	6.1	48	0.847	5.3	42	1.028	<b>4.96</b>	500HCBC290
500HCBC192	300	300	1.000	C	4620	1386	C	964	1940	10.1	80	0.708	8.8	69	0.899	<b>3.60</b>	500HCBC192
500HCBC209	300	300	1.000	C	4857	1457	C	967	1930	9.2	73	0.733	8.1	63	0.925	<b>3.60</b>	500HCBC209
500HCBC236	280	300	1.000	C	5611	1571	C	1207	1930	8.2	64	0.766	7.1	56	0.958	<b>4.36</b>	500HCBC236
500HCBC259	280	300	1.000	C	5919	1657	C	1215	1916	7.4	58	0.794	6.4	51	0.984	<b>4.41</b>	500HCBC259
500HCBC293	280	300	1.000	C	6793	1902	C	1514	1916	6.5	51	0.826	5.7	45	1.013	<b>5.72</b>	500HCBC293
500HCBC318	280	280	1.000	C	7113	1992	C	1527	1900	6.0	47	0.851	5.2	41	1.034	<b>5.72</b>	500HCBC318
600HCBC207	300	300	1.000	C	5890	1767	C	965	2140	10.3	81	0.703	9.1	72	0.890	2.93	600HCBC207
600HCBC228	300	300	1.000	C	6249	1875	C	969	2130	9.3	73	0.730	8.3	65	0.919	<b>3.38</b>	600HCBC228
600HCBC256	280	300	1.000	C	7178	2010	C	1209	2130	8.3	65	0.761	7.4	58	0.950	<b>3.52</b>	600HCBC256
600HCBC284	280	300	1.000	C	7651	2142	C	1218	2116	7.4	58	0.792	6.6	52	0.979	<b>4.29</b>	600HCBC284
600HCBC318	280	300	1.000	C	8738	2447	C	1517	2116	6.7	52	0.822	5.9	46	1.006	<b>4.57</b>	600HCBC318
600HCBC349	280	280	1.000	C	9238	2587	C	1533	2100	6.0	47	0.849	5.3	42	1.029	<b>4.98</b>	600HCBC349

- NOTES:
1. C: Compact Section; N: Non-compact Section; S: Slender Section
  2. For values of v\*<sub>w</sub> > 2.93kN/mm, web to flange joints are double 9mm fillet welds



# High Capacity Beam-Columns (HCBC)

## 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			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$				
		d	b <sub>f</sub>														t <sub>f</sub>			
600HCBC232	600	295	32	20	536	26.8	4.3	29,600	1781	5937	6798	245	137	931	1446	68.1	7874	11072	600HCBC232	
600HCBC253	600	295	32	25	536	21.4	4.2	32,280	1845	6151	7158	239	138	933	1476	65.3	9236	11100	600HCBC253	
600HCBC287	600	295	40	25	520	20.8	3.4	36,600	2146	7154	8298	242	172	1165	1822	68.5	15295	13471	600HCBC287	
600HCBC316	600	295	40	32	520	16.3	3.3	40,240	2228	7428	8771	235	173	1170	1874	65.5	18266	13529	600HCBC316	
600HCBC357	600	295	50	32	500	15.6	2.6	45,500	2570	8568	10113	238	215	1460	2304	68.8	30045	16282	600HCBC357	
600HCBC389	600	295	50	40	500	12.5	2.6	49,500	2654	8846	10613	232	217	1468	2376	66.1	35250	16381	600HCBC389	
700HCBC248	700	295	32	20	636	31.8	4.3	31,600	2537	7247	8328	283	137	931	1456	65.9	8140	15321	700HCBC248	
700HCBC273	700	295	32	25	636	25.4	4.2	34,780	2644	7554	8834	276	138	934	1492	62.9	9757	15367	700HCBC273	
700HCBC307	700	295	40	25	620	24.8	3.4	39,100	3070	8771	10191	280	172	1166	1837	66.3	15816	18726	700HCBC307	
700HCBC341	700	295	40	32	620	19.4	3.3	43,440	3209	9168	10863	272	173	1172	1899	63.1	19359	18823	700HCBC341	
700HCBC382	700	295	50	32	600	18.8	2.6	48,700	3698	10566	12468	276	216	1462	2329	66.5	31137	22770	700HCBC382	
700HCBC420	700	295	50	40	600	15.0	2.6	53,500	3842	10977	13188	268	217	1472	2416	63.7	37383	22935	700HCBC420	
700HCBC286	700	370	32	20	636	31.8	5.5	36,400	3072	8778	9932	291	271	1463	2254	86.2	9779	30184	700HCBC286	
700HCBC311	700	370	32	25	636	25.4	5.4	39,580	3180	9085	10437	283	271	1465	2290	82.7	11395	30229	700HCBC311	
700HCBC354	700	370	40	25	620	24.8	4.3	45,100	3724	10640	12171	287	338	1830	2835	86.6	19016	36862	700HCBC354	
700HCBC388	700	370	40	32	620	19.4	4.2	49,440	3863	11037	12843	280	339	1834	2897	82.9	22559	36958	700HCBC388	
700HCBC441	700	370	50	32	600	18.8	3.4	56,200	4492	12834	14905	283	424	2291	3576	86.8	37387	44758	700HCBC441	
700HCBC479	700	370	50	40	600	15.0	3.3	61,000	4636	13245	15625	276	425	2299	3663	83.5	43633	44923	700HCBC479	
800HCBC264	800	295	32	20	736	36.8	4.3	33,600	3450	8625	9958	320	137	932	1466	63.9	8407	20262	800HCBC264	
800HCBC293	800	295	32	25	736	29.4	4.2	37,280	3616	9040	10636	311	138	935	1507	60.8	10278	20331	800HCBC293	
800HCBC327	800	295	40	25	720	28.8	3.4	41,600	4189	10471	12208	317	172	1167	1853	64.3	16337	24849	800HCBC327	
800HCBC366	800	295	40	32	720	22.5	3.3	46,640	4406	11016	13115	307	173	1174	1925	60.9	20451	24998	800HCBC366	
800HCBC407	800	295	50	32	700	21.9	2.6	51,900	5069	12673	14983	313	216	1463	2355	64.5	32229	30354	800HCBC407	
800HCBC451	800	295	50	40	700	17.5	2.6	57,500	5298	13245	15963	304	218	1476	2456	61.5	39517	30610	800HCBC451	
800HCBC301	800	370	32	20	736	36.8	5.5	38,400	4158	10396	11802	329	271	1463	2264	84.0	10045	39907	800HCBC301	
800HCBC330	800	370	32	25	736	29.4	5.4	42,080	4324	10811	12479	321	271	1465	2305	80.3	11916	39976	800HCBC330	
800HCBC374	800	370	40	25	720	28.8	4.3	47,600	5056	12639	14488	326	339	1830	2851	84.3	19537	48897	800HCBC374	
800HCBC413	800	370	40	32	720	22.5	4.2	52,640	5274	13184	15395	317	340	1836	2922	80.3	23651	49046	800HCBC413	
800HCBC466	800	370	50	32	700	21.9	3.4	59,400	6126	15314	17795	321	424	2292	3602	84.5	38479	59628	800HCBC466	
800HCBC510	800	370	50	40	700	17.5	3.3	65,000	6354	15885	18775	313	426	2302	3703	80.9	45767	59884	800HCBC510	

# High Capacity Beam-Columns (HCBC)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield Stress		Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		$k_f$	Compactness	$Z_{ex}$	$M_{sx}$	Compactness		$Z_{ey}$	$K_{sm}$	$H_p/A$	$r_f$	$K_{sm}$	$H_p/A$		$r_f$
	$f_y$	$f_y$	$10^3\text{mm}^3$						kNm								
MPa	MPa													kN/mm			
600HCBC232	300	300	1.000	C	6798	2040	C	1396	2340	10.1	79	0.710	8.8	69	0.901	<b>3.52</b>	600HCBC232
600HCBC253	300	300	1.000	C	7158	2147	C	1399	2330	9.2	72	0.734	8.0	63	0.926	<b>3.52</b>	600HCBC253
600HCBC287	280	300	1.000	C	8298	2323	C	1747	2330	8.1	64	0.768	7.1	56	0.960	<b>4.24</b>	600HCBC287
600HCBC316	280	300	1.000	C	8771	2456	C	1755	2316	7.3	58	0.796	6.4	50	0.986	<b>4.44</b>	600HCBC316
600HCBC357	280	300	1.000	C	10113	2832	C	2190	2316	6.5	51	0.829	5.7	44	1.015	<b>5.51</b>	600HCBC357
600HCBC389	280	280	1.000	C	10613	2972	C	2203	2300	5.9	46	0.853	5.2	41	1.035	<b>5.51</b>	600HCBC389
700HCBC248	300	300	1.000	C	8328	2499	C	1397	2540	10.2	80	0.705	9.1	71	0.893	<b>2.97</b>	700HCBC248
700HCBC273	300	300	1.000	C	8834	2650	C	1401	2530	9.3	73	0.732	8.2	64	0.921	<b>3.41</b>	700HCBC273
700HCBC307	280	300	1.000	C	10191	2853	C	1749	2530	8.2	65	0.764	7.3	57	0.953	<b>3.55</b>	700HCBC307
700HCBC341	280	300	1.000	C	10863	3042	C	1758	2516	7.4	58	0.794	6.5	51	0.981	<b>4.33</b>	700HCBC341
700HCBC382	280	300	1.000	C	12468	3491	C	2192	2516	6.6	52	0.825	5.8	46	1.009	<b>4.59</b>	700HCBC382
700HCBC420	280	280	1.000	C	13188	3693	C	2208	2500	6.0	47	0.852	5.3	41	1.032	<b>5.03</b>	700HCBC420
700HCBC286	300	300	1.000	C	9932	2979	C	2194	2840	9.9	78	0.713	8.6	68	0.906	<b>3.72</b>	700HCBC286
700HCBC311	300	300	1.000	C	10437	3131	C	2197	2830	9.1	72	0.737	7.9	62	0.930	<b>3.72</b>	700HCBC311
700HCBC354	280	300	1.000	C	12171	3408	C	2745	2830	8.0	63	0.772	6.9	55	0.965	<b>4.46</b>	700HCBC354
700HCBC388	280	300	1.000	C	12843	3596	C	2752	2816	7.3	57	0.799	6.3	49	0.989	<b>4.52</b>	700HCBC388
700HCBC441	280	300	1.000	C	14905	4173	C	3436	2816	6.4	50	0.833	5.5	44	1.019	<b>5.76</b>	700HCBC441
700HCBC479	280	280	1.000	C	15625	4375	C	3448	2800	5.8	46	0.856	5.1	40	1.039	<b>5.76</b>	700HCBC479
800HCBC264	300	300	0.942	C	9958	2988	C	1397	2740	10.4	82	0.702	9.3	73	0.886	2.78	800HCBC264
800HCBC293	300	300	1.000	C	10636	3191	C	1402	2730	9.3	73	0.731	8.3	65	0.917	<b>3.32</b>	800HCBC293
800HCBC327	280	300	1.000	C	12208	3418	C	1750	2730	8.4	66	0.760	7.5	59	0.946	<b>3.47</b>	800HCBC327
800HCBC366	280	300	1.000	C	13115	3672	C	1760	2716	7.4	58	0.793	6.6	52	0.977	<b>4.22</b>	800HCBC366
800HCBC407	280	300	1.000	C	14983	4195	C	2195	2716	6.7	52	0.821	5.9	47	1.003	<b>4.40</b>	800HCBC407
800HCBC451	280	280	1.000	C	15963	4470	C	2214	2700	6.0	47	0.850	5.3	42	1.028	<b>4.91</b>	800HCBC451
800HCBC301	300	300	0.949	C	11802	3540	C	2194	3040	10.1	79	0.710	8.9	70	0.899	<b>3.22</b>	800HCBC301
800HCBC330	300	300	1.000	C	12479	3744	C	2198	3030	9.2	72	0.735	8.1	63	0.926	<b>3.48</b>	800HCBC330
800HCBC374	280	300	1.000	C	14488	4057	C	2746	3030	8.1	64	0.768	7.1	56	0.959	<b>3.84</b>	800HCBC374
800HCBC413	280	300	1.000	C	15395	4311	C	2754	3016	7.3	57	0.797	6.4	50	0.985	<b>4.42</b>	800HCBC413
800HCBC466	280	300	1.000	C	17795	4983	C	3438	3016	6.5	51	0.830	5.7	45	1.014	<b>4.93</b>	800HCBC466
800HCBC510	280	280	1.000	C	18775	5257	C	3453	3000	5.9	46	0.855	5.2	40	1.036	<b>5.14</b>	800HCBC510

NOTES:

1. C: Compact Section; N: Non-compact Section; S: Slender Section
2. For values of  $v_w^* > 2.93\text{kN/mm}$ , web to flange joints are double 9mm fillet welds

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	Thickness			$\frac{d_1}{t_w}$	$\frac{(b_f - t_w)}{2t_f}$		$A_g$	$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$				J	$I_w$
		d	t <sub>f</sub>																			
1000HCBC295	1000	295	32	20	936	46.8	4.3	37,600	5791	11582	13518	392	138	932	1486	60.5	8940	32220	1000HCBC295			
1000HCBC332	1000	295	32	25	936	37.4	4.2	42,280	6133	12266	14614	381	138	937	1539	57.2	11319	32360	1000HCBC332			
1000HCBC366	1000	295	40	25	920	36.8	3.4	46,600	7063	14126	16618	389	172	1168	1884	60.8	17378	39709	1000HCBC366			
1000HCBC416	1000	295	40	32	920	28.8	3.3	53,040	7517	15034	18099	376	174	1177	1976	57.2	22636	40012	1000HCBC416			
1000HCBC458	1000	295	50	32	900	28.1	2.6	58,300	8606	17212	20493	384	216	1467	2406	60.9	34414	48824	1000HCBC458			
1000HCBC514	1000	295	50	40	900	22.5	2.6	65,500	9092	18184	22113	373	219	1483	2536	57.8	43783	49352	1000HCBC514			
1000HCBC333	1000	370	32	20	936	46.8	5.5	42,400	6916	13832	15842	404	271	1464	2284	79.9	10579	63430	1000HCBC333			
1000HCBC370	1000	370	32	25	936	37.4	5.4	47,080	7258	14515	16937	393	271	1467	2337	75.9	12958	63570	1000HCBC370			
1000HCBC413	1000	370	40	25	920	36.8	4.3	52,600	8446	16892	19498	401	339	1832	2882	80.3	20578	78079	1000HCBC413			
1000HCBC463	1000	370	40	32	920	28.8	4.2	59,040	8900	17801	20979	388	340	1839	2974	75.9	25836	78382	1000HCBC463			
1000HCBC517	1000	370	50	32	900	28.1	3.4	65,800	10300	20600	24055	396	425	2295	3653	80.3	40664	95793	1000HCBC517			
1000HCBC573	1000	370	50	40	900	22.5	3.3	73,000	10786	21572	25675	384	427	2308	3783	76.5	50033	96321	1000HCBC573			
1000HCBC393	1000	490	32	20	936	46.8	7.3	50,080	8716	17431	19559	417	628	2564	3935	112.0	13200	147133	1000HCBC393			
1000HCBC430	1000	490	32	25	936	37.4	7.3	54,760	9057	18115	20654	407	629	2566	3988	107.1	15579	147272	1000HCBC430			
1000HCBC488	1000	490	40	25	920	36.8	5.8	62,200	10659	21318	24106	414	786	3206	4946	112.4	25698	180985	1000HCBC488			
1000HCBC539	1000	490	40	32	920	28.8	5.7	68,640	11113	22227	25587	402	787	3212	5038	107.1	30956	181288	1000HCBC539			
1000HCBC611	1000	490	50	32	900	28.1	4.6	77,800	13010	26020	29755	409	983	4012	6233	112.4	50664	221759	1000HCBC611			
1000HCBC667	1000	490	50	40	900	22.5	4.5	85,000	13496	26992	31375	398	985	4021	6363	107.7	60033	222288	1000HCBC667			
1200HCBC364	1200	370	32	20	1136	56.8	5.5	46,400	10522	17536	20282	476	271	1464	2304	76.4	11112	92394	1200HCBC364			
1200HCBC409	1200	370	32	25	1136	45.4	5.4	52,080	11132	18554	21895	462	272	1468	2368	72.2	13999	92641	1200HCBC409			
1200HCBC452	1200	370	40	25	1120	44.8	4.3	57,600	12888	21481	25008	473	339	1833	2913	76.7	21620	114088	1200HCBC452			
1200HCBC514	1200	370	40	32	1120	35.0	4.2	65,440	13708	22846	27203	458	341	1842	3025	72.2	28020	114627	1200HCBC514			
1200HCBC567	1200	370	50	32	1100	34.4	3.4	72,200	15790	26317	30955	468	425	2298	3704	76.7	42848	140553	1200HCBC567			
1200HCBC636	1200	370	50	40	1100	27.5	3.3	81,000	16678	27796	33375	454	428	2313	3863	72.7	54300	141499	1200HCBC636			
1200HCBC425	1200	490	32	20	1136	56.8	7.3	54,080	13142	21903	24767	493	628	2564	3955	107.8	13734	214258	1200HCBC425			
1200HCBC469	1200	490	32	25	1136	45.4	7.3	59,760	13752	22921	26380	480	629	2567	4019	102.6	16621	214504	1200HCBC469			
1200HCBC528	1200	490	40	25	1120	44.8	5.8	67,200	16119	26865	30576	490	786	3207	4977	108.1	26740	264338	1200HCBC528			
1200HCBC589	1200	490	40	32	1120	35.0	5.7	75,040	16939	28231	32771	475	787	3214	5089	102.4	33140	264876	1200HCBC589			
1200HCBC661	1200	490	50	32	1100	34.4	4.6	84,200	19760	32934	37855	484	983	4014	6284	108.1	52848	325141	1200HCBC661			
1200HCBC730	1200	490	50	40	1100	27.5	4.5	93,000	20648	34413	40275	471	986	4026	6443	103.0	64300	326087	1200HCBC730			

# High Capacity Beam-Columns (HCBC)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield	Stress	Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		Compact-ness	Z <sub>ex</sub>	M <sub>sx</sub>	Compact-ness	Z <sub>ey</sub>		K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>	K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>		
	f <sub>y</sub>	f <sub>y</sub>	k <sub>f</sub>						10 <sup>3</sup> mm <sup>3</sup>								kNm
MPa	MPa													kN/mm			
1000HCBC295	300	300	0.842	C	13518	4056	C	1399	3140	10.6	84	0.695	9.6	76	0.875	2.66	1000HCBC295
1000HCBC332	300	300	0.919	C	14614	4384	C	1405	3130	9.4	74	0.728	8.5	67	0.909	3.14	1000HCBC332
1000HCBC366	280	300	0.935	C	16618	4653	C	1753	3130	8.6	67	0.754	7.7	61	0.936	3.32	1000HCBC366
1000HCBC416	280	300	1.000	C	18099	5068	C	1766	3116	7.5	59	0.790	6.8	53	0.971	3.99	1000HCBC416
1000HCBC458	280	300	1.000	C	20493	5738	C	2201	3116	6.8	53	0.816	6.2	48	0.995	4.22	1000HCBC458
1000HCBC514	280	280	1.000	C	22113	6192	C	2224	3100	6.0	47	0.848	5.5	43	1.023	4.66	1000HCBC514
1000HCBC333	300	300	0.860	C	15842	4752	C	2195	3440	10.3	81	0.703	9.2	72	0.888	2.79	1000HCBC333
1000HCBC370	300	300	0.927	C	16937	5081	C	2200	3430	9.3	73	0.732	8.3	65	0.918	3.33	1000HCBC370
1000HCBC413	280	300	0.942	C	19498	5459	C	2748	3430	8.3	65	0.762	7.4	58	0.948	3.48	1000HCBC413
1000HCBC463	280	300	1.000	C	20979	5874	C	2758	3416	7.4	58	0.794	6.6	52	0.979	4.23	1000HCBC463
1000HCBC517	280	300	1.000	C	24055	6735	C	3442	3416	6.6	52	0.824	5.9	46	1.005	4.42	1000HCBC517
1000HCBC573	280	280	1.000	C	25675	7189	C	3461	3400	5.9	47	0.853	5.3	42	1.030	4.93	1000HCBC573
1000HCBC393	300	300	0.881	N	19543	5863	N	3841	3920	10.0	78	0.713	8.7	68	0.903	3.35	1000HCBC393
1000HCBC430	300	300	0.937	C	20654	6196	C	3849	3910	9.1	71	0.737	8.0	62	0.929	3.53	1000HCBC430
1000HCBC488	280	300	0.951	C	24106	6750	C	4809	3910	8.0	63	0.772	7.0	55	0.963	3.98	1000HCBC488
1000HCBC539	280	300	1.000	C	25587	7164	C	4817	3896	7.2	57	0.800	6.3	50	0.988	4.49	1000HCBC539
1000HCBC611	280	300	1.000	C	29755	8331	C	6018	3896	6.4	50	0.833	5.6	44	1.018	5.08	1000HCBC611
1000HCBC667	280	280	1.000	C	31375	8785	C	6032	3880	5.8	46	0.858	5.1	40	1.039	5.22	1000HCBC667
1200HCBC364	300	300	0.786	C	20282	6084	C	2197	3840	10.5	83	0.698	9.5	75	0.878	2.69	1200HCBC364
1200HCBC409	300	300	0.838	C	21895	6568	C	2202	3830	9.4	74	0.729	8.5	66	0.912	3.18	1200HCBC409
1200HCBC452	280	300	0.861	C	25008	7002	C	2750	3830	8.5	66	0.757	7.7	60	0.940	3.36	1200HCBC452
1200HCBC514	280	300	0.952	C	27203	7617	C	2763	3816	7.4	58	0.792	6.7	53	0.974	4.04	1200HCBC514
1200HCBC567	280	300	0.966	C	30955	8667	C	3447	3816	6.7	53	0.819	6.1	48	0.998	4.27	1200HCBC567
1200HCBC636	280	280	1.000	C	33375	9345	C	3470	3800	6.0	47	0.851	5.4	42	1.026	4.71	1200HCBC636
1200HCBC425	300	300	0.816	N	24745	7424	N	3842	4320	10.2	80	0.707	9.0	71	0.894	2.85	1200HCBC425
1200HCBC469	300	300	0.859	C	26380	7914	C	3851	4310	9.2	72	0.735	8.1	64	0.923	3.40	1200HCBC469
1200HCBC528	280	300	0.880	C	30576	8561	C	4811	4310	8.2	64	0.766	7.2	57	0.954	3.55	1200HCBC528
1200HCBC589	280	300	0.958	C	32771	9176	C	4821	4296	7.3	57	0.797	6.5	51	0.983	4.33	1200HCBC589
1200HCBC661	280	300	0.971	C	37855	10599	C	6021	4296	6.5	51	0.828	5.8	45	1.011	4.52	1200HCBC661
1200HCBC730	280	280	1.000	C	40275	11277	C	6038	4280	5.9	46	0.856	5.2	41	1.034	5.04	1200HCBC730

NOTES:

1. C: Compact Section; N: Non-compact Section; S: Slender Section
2. For values of  $v_w^* > 2.93\text{kN/mm}$ , web to flange joints are double 9mm fillet welds

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			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		$A_g$	$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$				J	$I_w$
		d	$b_f$																			
500HCB88	500	210	20	6	460	76.7	5.1	11,160	533	2131	2333	218	31	294	445	52.6	1153	1779	500HCB88			
500HCB104	500	210	25	6	450	75.0	4.1	13,200	638	2554	2798	220	39	368	555	54.1	2220	2177	500HCB104			
500HCB133	500	210	32	8	436	54.5	3.2	16,928	792	3169	3525	216	49	471	713	54.0	4662	2706	500HCB133			
500HCB165	500	210	40	10	420	42.0	2.5	21,000	953	3811	4305	213	62	588	893	54.2	9100	3268	500HCB165			
500HCB203	500	210	50	12	400	33.3	2.0	25,800	1132	4526	5205	209	77	736	1117	54.7	17730	3910	500HCB203			
500HCB99	500	245	20	6	460	76.7	6.0	12,560	613	2454	2669	221	49	400	604	62.5	1340	2824	500HCB99			
500HCB124	500	245	25	8	450	56.3	4.7	15,850	752	3009	3314	218	61	500	758	62.2	2629	3457	500HCB124			
500HCB157	500	245	32	10	436	43.6	3.7	20,040	929	3716	4144	215	78	641	971	62.6	5497	4297	500HCB157			
500HCB193	500	245	40	12	420	35.0	2.9	24,640	1114	4454	5037	213	98	801	1216	63.1	10695	5190	500HCB193			
500HCB243	500	245	50	16	400	25.0	2.3	30,900	1331	5323	6153	208	123	1002	1526	63.0	20963	6211	500HCB243			
600HCB103	600	245	20	6	560	93.3	6.0	13,160	912	3041	3312	263	49	400	605	61.0	1347	4123	600HCB103			
600HCB131	600	245	25	8	550	68.8	4.7	16,650	1124	3747	4127	260	61	500	759	60.7	2646	5067	600HCB131			
600HCB165	600	245	32	10	536	53.6	3.7	21,040	1394	4648	5171	257	78	641	974	61.1	5531	6330	600HCB165			
600HCB203	600	245	40	12	520	43.3	2.9	25,840	1680	5600	6299	255	98	801	1219	61.6	10753	7692	600HCB203			
600HCB255	600	245	50	16	500	31.3	2.3	32,500	2025	6749	7738	250	123	1002	1533	61.4	21099	9281	600HCB255			
600HCB128	600	295	20	8	560	70.0	7.2	16,280	1110	3700	4049	261	86	580	879	72.5	1669	7199	600HCB128			
600HCB159	600	295	25	10	550	55.0	5.7	20,250	1359	4529	4997	259	107	726	1102	72.7	3256	8845	600HCB159			
600HCB199	600	295	32	12	536	44.7	4.4	25,312	1678	5595	6224	258	137	929	1412	73.6	6753	11050	600HCB199			
600HCB251	600	295	40	16	520	32.5	3.5	31,920	2041	6803	7690	253	171	1162	1774	73.3	13297	13432	600HCB251			
600HCB294	600	295	50	16	500	31.3	2.8	37,500	2404	8013	9113	253	214	1452	2208	75.6	25266	16192	600HCB294			
700HCB118	700	245	20	8	660	82.5	5.9	15,080	1325	3785	4203	296	49	400	611	57.0	1419	5670	700HCB118			
700HCB137	700	245	25	8	650	81.3	4.7	17,450	1579	4512	4979	301	61	500	761	59.3	2663	6983	700HCB137			
700HCB173	700	245	32	10	636	63.6	3.7	22,040	1965	5614	6248	299	78	641	976	59.7	5564	8756	700HCB173			
700HCB212	700	245	40	12	620	51.7	2.9	27,040	2375	6787	7621	296	98	801	1223	60.2	10810	10686	700HCB212			
700HCB268	700	245	50	16	600	37.5	2.3	34,100	2881	8231	9403	291	123	1002	1539	60.0	21236	12966	700HCB268			
700HCB134	700	295	20	8	660	82.5	7.2	17,080	1556	4446	4883	302	86	580	881	70.8	1686	9896	700HCB134			
700HCB167	700	295	25	10	650	65.0	5.7	21,250	1910	5456	6034	300	107	726	1104	71.0	3290	12191	700HCB167			
700HCB208	700	295	32	12	636	53.0	4.4	26,512	2365	6757	7519	299	137	929	1415	71.9	6811	15284	700HCB208			
700HCB263	700	295	40	16	620	38.8	3.5	33,520	2891	8260	9326	294	171	1162	1780	71.5	13433	18661	700HCB263			
700HCB307	700	295	50	16	600	37.5	2.8	39,100	3410	9743	11028	295	214	1452	2214	74.0	25403	22619	700HCB307			

# High Capacity Beams (HCB)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield Stress		Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		Compactness	Z <sub>ex</sub>	M <sub>sx</sub>	Compactness	Z <sub>ey</sub>		K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>	K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>		
	f <sub>y</sub>	f <sub>y</sub>	k <sub>f</sub>						10 <sup>3</sup> mm <sup>3</sup>								kNm
MPa	MPa													kN/mm			
500HCB88	300	300	0.856	N	2329	699	C	441	1828	20.9	164	0.530	18.5	145	0.669	1.83	500HCB88
500HCB104	300	300	0.883	N	2797	839	C	551	1828	17.6	138	0.568	15.6	123	0.724	2.33	500HCB104
500HCB133	300	300	0.915	C	3525	1058	C	706	1824	13.7	108	0.629	12.1	95	0.805	3.08	500HCB133
500HCB165	280	300	0.952	C	4305	1205	C	883	1820	11.0	87	0.685	9.8	77	0.871	3.73	500HCB165
500HCB203	280	300	0.992	C	5205	1457	C	1103	1816	9.0	70	0.741	7.9	62	0.930	4.90	500HCB203
500HCB99	300	300	0.872	C	2669	801	C	600	1968	20.0	157	0.539	17.5	137	0.687	2.13	500HCB99
500HCB124	300	300	0.902	C	3314	994	C	751	1964	15.8	124	0.594	13.8	108	0.764	2.72	500HCB124
500HCB157	300	300	0.942	C	4144	1243	C	961	1960	12.5	98	0.654	10.9	86	0.838	3.60	500HCB157
500HCB193	280	300	0.982	C	5037	1410	C	1201	1956	10.1	79	0.709	8.8	69	0.900	4.36	500HCB193
500HCB243	280	300	1.000	C	6153	1723	C	1502	1948	8.0	63	0.771	7.0	55	0.962	5.72	500HCB243
600HCB103	300	300	0.832	N	3256	977	C	600	2168	21.0	165	0.528	18.6	146	0.666	1.75	600HCB103
600HCB131	300	300	0.859	C	4127	1238	C	751	2164	16.6	130	0.583	14.7	115	0.744	2.23	600HCB131
600HCB165	300	300	0.897	C	5171	1551	C	961	2160	13.1	103	0.641	11.6	91	0.819	2.93	600HCB165
600HCB203	280	300	0.937	C	6299	1764	C	1201	2156	10.6	83	0.695	9.4	74	0.881	3.52	600HCB203
600HCB255	280	300	1.000	C	7738	2167	C	1503	2148	8.4	66	0.758	7.5	59	0.946	4.57	600HCB255
600HCB128	300	300	0.850	C	4049	1215	C	870	2364	18.5	145	0.557	16.2	127	0.712	2.11	600HCB128
600HCB159	300	300	0.886	C	4997	1499	C	1088	2360	14.8	117	0.609	13.0	102	0.783	2.68	600HCB159
600HCB199	300	300	0.928	C	6224	1867	C	1393	2356	11.9	93	0.667	10.4	81	0.853	3.52	600HCB199
600HCB251	280	300	0.996	C	7690	2153	C	1742	2348	9.4	74	0.729	8.2	64	0.921	4.24	600HCB251
600HCB294	280	300	1.000	C	9113	2552	C	2177	2348	8.0	63	0.773	7.0	55	0.964	5.51	600HCB294
700HCB118	300	300	0.785	N	4167	1250	C	601	2364	20.0	157	0.539	17.9	141	0.679	1.48	700HCB118
700HCB137	300	300	0.819	N	4946	1484	C	751	2364	17.3	135	0.573	15.5	121	0.727	1.88	700HCB137
700HCB173	300	300	0.856	C	6248	1875	C	961	2360	13.6	107	0.630	12.2	96	0.803	2.47	700HCB173
700HCB212	280	300	0.895	C	7621	2134	C	1202	2356	11.1	87	0.684	9.9	78	0.866	2.95	700HCB212
700HCB268	280	300	0.958	C	9403	2633	C	1503	2348	8.8	69	0.747	7.9	62	0.932	3.81	700HCB268
700HCB134	300	300	0.811	C	4883	1465	C	871	2564	19.1	150	0.549	16.9	133	0.698	1.79	700HCB134
700HCB167	300	300	0.844	C	6034	1810	C	1088	2560	15.3	120	0.601	13.6	107	0.769	2.27	700HCB167
700HCB208	300	300	0.886	C	7519	2256	C	1393	2556	12.3	96	0.657	10.9	85	0.839	2.97	700HCB208
700HCB263	280	300	0.948	C	9326	2611	C	1743	2548	9.7	76	0.720	8.6	67	0.909	3.55	700HCB263
700HCB307	280	300	0.964	C	11028	3088	C	2178	2548	8.3	65	0.762	7.3	58	0.951	4.59	700HCB307

- NOTES:
1. C: Compact Section; N: Non-compact Section; S: Slender Section
  2. For values of  $v_w^* > 2.93\text{kN/mm}$ , web to flange joints are double 9mm fillet welds

# High Capacity Beams (HCB)

## 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			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$				
		d	t <sub>f</sub>														t <sub>w</sub>			
800HCB140	800	295	20	8	760	95.0	7.2	17,880	2088	5220	5757	342	86	580	882	69.2	1703	13021	800HCB140	
800HCB175	800	295	25	10	750	75.0	5.7	22,250	2567	6418	7122	340	107	726	1107	69.4	3323	16071	800HCB175	
800HCB218	800	295	32	12	736	61.3	4.4	27,712	3184	7961	8875	339	137	929	1419	70.3	6868	20205	800HCB218	
800HCB276	800	295	40	16	720	45.0	3.5	35,120	3909	9772	11042	334	171	1162	1787	69.9	13570	24749	800HCB276	
800HCB319	800	295	50	16	700	43.8	2.8	40,700	4612	11530	13023	337	214	1452	2220	72.5	25539	30118	800HCB319	
800HCB216	800	370	25	12	750	62.5	7.2	27,500	3201	8002	8856	341	211	1141	1738	87.6	4286	31707	800HCB216	
800HCB278	800	370	32	16	736	46.0	5.5	35,456	4025	10063	11260	337	270	1462	2238	87.3	9088	39872	800HCB278	
800HCB345	800	370	40	20	720	36.0	4.4	44,000	4900	12251	13840	334	338	1828	2810	87.7	17707	48831	800HCB345	
800HCB400	800	370	50	20	700	35.0	3.5	51,000	5783	14456	16325	337	423	2284	3493	91.0	32700	59425	800HCB400	
1000HCB190	1000	295	25	10	950	95.0	5.7	24,250	4221	8441	9447	417	107	726	1112	66.4	3390	25440	1000HCB190	
1000HCB222	1000	295	32	10	936	93.6	4.5	28,240	5108	10215	11328	425	137	929	1416	69.7	6756	32092	1000HCB222	
1000HCB272	1000	295	40	12	920	76.7	3.5	34,640	6219	12439	13867	424	171	1161	1774	70.3	13117	39463	1000HCB272	
1000HCB345	1000	295	50	16	900	56.3	2.8	43,900	7634	15268	17253	417	214	1452	2233	69.9	25812	48339	1000HCB345	
1000HCB235	1000	370	25	12	950	79.2	7.2	29,900	5255	10510	11726	419	211	1142	1745	84.0	4401	50191	1000HCB235	
1000HCB274	1000	370	32	12	936	78.0	5.6	34,912	6369	12738	14089	427	270	1461	2224	88.0	8622	63316	1000HCB274	
1000HCB348	1000	370	40	16	920	57.5	4.4	44,320	7862	15724	17594	421	338	1827	2797	87.3	17043	77875	1000HCB348	
1000HCB403	1000	370	50	16	900	56.3	3.5	51,400	9328	18656	20815	426	422	2283	3480	90.7	32062	95308	1000HCB403	
1200HCB254	1200	370	25	12	1150	95.8	7.2	32,300	7907	13179	14836	495	211	1142	1753	80.9	4517	72904	1200HCB254	
1200HCB329	1200	370	32	16	1136	71.0	5.5	41,856	10033	16721	18991	490	271	1462	2263	80.4	9634	92268	1200HCB329	
1200HCB373	1200	370	40	16	1120	70.0	4.4	47,520	11835	19724	22186	499	338	1827	2810	84.3	17316	113726	1200HCB373	
1200HCB463	1200	370	50	20	1100	55.0	3.5	59,000	14459	24099	27325	495	423	2286	3533	84.7	33767	139802	1200HCB463	
1200HCB301	1200	490	25	12	1150	95.8	9.6	38,300	9978	16631	18361	510	490	2002	3043	113.2	5767	169254	1200HCB301	
1200HCB389	1200	490	32	16	1136	71.0	7.4	49,536	12653	21088	23476	505	628	2563	3914	112.6	12255	214132	1200HCB389	
1200HCB484	1200	490	40	20	1120	56.0	5.9	61,600	15534	25889	29008	502	785	3204	4914	112.9	23893	264099	1200HCB484	
1200HCB601	1200	490	50	25	1100	44.0	4.7	76,500	18984	31640	35738	498	982	4008	6174	113.3	46563	324621	1200HCB601	
1500HCB374	1500	490	25	16	1450	90.6	9.5	47,700	17392	23189	26479	604	491	2003	3094	101.4	7084	266894	1500HCB374	
1500HCB427	1500	490	32	16	1436	89.8	7.4	54,336	20846	27795	31267	619	628	2563	3934	107.5	12665	338313	1500HCB427	
1500HCB531	1500	490	40	20	1420	71.0	5.9	67,600	25667	34223	38698	616	785	3205	4944	107.8	24693	418472	1500HCB531	
1500HCB659	1500	490	50	25	1400	56.0	4.7	84,000	31483	41977	47775	612	982	4009	6221	108.1	48125	516285	1500HCB659	
1500HCB418	1500	600	25	16	1450	90.6	11.7	53,200	20384	27178	30535	619	900	3002	4593	130.1	8230	489785	1500HCB418	

# High Capacity Beams (HCB)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield Stress		Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		Compactness	Z <sub>ex</sub>	M <sub>sx</sub>	Compactness	Z <sub>ey</sub>		K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>	K <sub>sm</sub>	H <sub>p</sub> /A	r <sub>f</sub>		
	f <sub>y</sub>	f <sub>y</sub>	k <sub>f</sub>						10 <sup>3</sup> mm <sup>3</sup>								kNm
MPa	MPa													kN/mm			
800HCB140	300	300	0.774	N	5636	1691	C	871	2764	19.7	155	0.542	17.6	138	0.685	1.55	800HCB140
800HCB175	300	300	0.807	N	7121	2136	C	1088	2760	15.8	124	0.594	14.1	111	0.757	1.97	800HCB175
800HCB218	300	300	0.847	C	8875	2663	C	1393	2756	12.7	99	0.649	11.3	89	0.827	2.57	800HCB218
800HCB276	280	300	0.905	C	11042	3092	C	1743	2748	10.0	78	0.713	8.9	70	0.898	3.06	800HCB276
800HCB319	280	300	0.926	C	13023	3646	C	2178	2748	8.6	68	0.752	7.7	60	0.939	3.93	800HCB319
800HCB216	300	300	0.840	C	8856	2657	C	1712	3056	14.2	111	0.621	12.4	98	0.797	2.47	800HCB216
800HCB278	300	300	0.899	C	11260	3378	C	2192	3048	11.0	86	0.688	9.6	76	0.875	3.22	800HCB278
800HCB345	280	300	0.963	C	13840	3875	C	2742	3040	8.8	69	0.746	7.7	61	0.937	3.84	800HCB345
800HCB400	280	300	0.976	C	16325	4571	C	3426	3040	7.6	60	0.786	6.7	52	0.975	4.93	800HCB400
1000HCB190	300	300	0.740	N	9220	2766	C	1089	3160	16.6	130	0.582	15.1	118	0.736	1.55	1000HCB190
1000HCB222	300	300	0.782	N	11095	3329	C	1393	3160	14.3	112	0.619	12.9	101	0.785	2.02	1000HCB222
1000HCB272	280	300	0.814	N	13838	3875	C	1742	3156	11.6	91	0.672	10.5	83	0.849	2.39	1000HCB272
1000HCB345	280	300	0.858	C	17253	4831	C	2179	3148	9.1	72	0.736	8.3	65	0.918	3.06	1000HCB345
1000HCB235	300	300	0.773	C	11726	3518	C	1712	3456	14.7	116	0.611	13.1	103	0.780	1.95	1000HCB235
1000HCB274	300	300	0.810	N	14042	4213	C	2191	3456	12.6	99	0.651	11.3	88	0.828	2.53	1000HCB274
1000HCB348	280	300	0.852	C	17594	4926	C	2741	3448	9.9	78	0.714	8.8	69	0.900	3.00	1000HCB348
1000HCB403	280	300	0.879	C	20815	5828	C	3425	3448	8.5	67	0.754	7.6	60	0.940	3.84	1000HCB403
1200HCB254	300	300	0.715	N	14448	4334	C	1713	3856	15.2	119	0.603	13.7	108	0.765	1.71	1200HCB254
1200HCB329	300	300	0.761	C	18991	5697	C	2194	3848	11.7	92	0.670	10.6	83	0.847	2.25	1200HCB329
1200HCB373	280	300	0.795	C	22186	6212	C	2741	3848	10.3	81	0.703	9.3	73	0.884	2.47	1200HCB373
1200HCB463	280	300	0.844	C	27325	7651	C	3428	3840	8.3	65	0.762	7.5	59	0.945	3.14	1200HCB463
1200HCB301	300	300	0.760	N	17648	5294	N	2826	4336	14.4	113	0.616	12.8	100	0.788	2.13	1200HCB301
1200HCB389	300	300	0.798	N	23431	7029	N	3834	4328	11.1	87	0.683	9.9	77	0.868	2.76	1200HCB389
1200HCB484	280	300	0.844	C	29008	8122	C	4807	4320	8.9	70	0.742	7.9	62	0.930	3.27	1200HCB484
1200HCB601	280	300	0.902	C	35738	10007	C	6011	4310	7.2	56	0.802	6.4	50	0.987	4.16	1200HCB601
1500HCB374	300	300	0.685	N	25171	7551	N	2834	4928	13.2	103	0.640	11.9	93	0.812	2.17	1500HCB374
1500HCB427	300	300	0.728	N	31201	9360	N	3834	4928	11.6	91	0.673	10.4	82	0.852	2.28	1500HCB427
1500HCB531	280	300	0.769	C	38698	10835	C	4808	4920	9.3	73	0.732	8.3	66	0.916	2.85	1500HCB531
1500HCB659	280	300	0.821	C	47775	13377	C	6014	4910	7.4	58	0.792	6.7	53	0.974	3.55	1500HCB659
1500HCB418	300	300	0.718	N	27852	8356	N	3988	5368	12.9	101	0.646	11.4	90	0.824	2.27	1500HCB418

- NOTES:
1. C: Compact Section; N: Non-compact Section; S: Slender Section
  2. For values of  $v_w^* > 2.93\text{kN/mm}$ , web to flange joints are double 9mm fillet welds



## High Capacity Beams (HCB)

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			$\frac{d_1}{t_w}$	$\frac{(b_f \cdot t_w)}{2t_f}$		$I_x$	$Z_x$	$S_x$	$r_x$	$I_y$	$Z_y$	$S_y$	$r_y$	J				$I_w$
		mm	mm			mm	mm		mm <sup>2</sup>	e6 mm <sup>4</sup>	e3 mm <sup>3</sup>	e3 mm <sup>3</sup>	mm	e6 mm <sup>4</sup>	e3 mm <sup>3</sup>	e3 mm <sup>3</sup>	mm				e3 mm <sup>4</sup>
1500HCB527	1500	600	32	20	1436	71.8	9.1	67,120	25627	34169	38496	618	1153	3843	5904	131.1	16937	621163	1500HCB527		
1500HCB655	1500	600	40	25	1420	56.8	7.2	83,500	31551	42068	47643	615	1442	4806	7422	131.4	32996	768361	1500HCB655		
1500HCB823	1500	600	50	32	1400	43.8	5.7	104,800	38867	51823	59180	609	1804	6013	9358	131.2	65292	948134	1500HCB823		

# High Capacity Beams (HCB)

## Design Information

Designation	Properties for Assessing Section Capacity								Fire Engineering Design Parameters						Fillet Weld (See Note 2)	Designation	
	Yield Stress		Form Factor	About x-axis			About y-axis		Profile Distance	4 sided			3 sided				
	Flange	Web		Compactness	$Z_{ex}$	$M_{sx}$	Compactness	$Z_{ey}$		$K_{sm}$	$H_p/A$	$r_f$	$K_{sm}$	$H_p/A$	$r_f$		$v_w^*$
$f_y$	$f_y$	$k_f$	$10^3\text{mm}^3$						kNm							$10^3\text{mm}^3$	
1500HCB527	300	300	0.763	N	37106	11132	N	5500	5360	10.2	80	0.707	9.0	71	0.894	2.84	1500HCB527
1500HCB655	280	300	0.814	C	47643	13340	C	7209	5350	8.2	64	0.767	7.2	57	0.954	<b>3.55</b>	1500HCB655
1500HCB823	280	300	0.885	C	59180	16570	C	9019	5336	6.5	51	0.829	5.8	45	1.011	<b>4.51</b>	1500HCB823

- NOTES:
1. C: Compact Section; N: Non-compact Section; S: Slender Section
  2. For values of  $v_w^* > 2.93\text{kN/mm}$ , web to flange joints are double 9mm fillet welds

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

### High Capacity Columns (HCC)

Designation	Design Moment Capacities $\phi M_x$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
327HCC156	715	711	679	644	608	575	543	514	487	462	440	419	381	349
327HCC165	736	731	698	662	626	592	560	531	503	478	455	434	396	363
327HCC176	761	756	722	686	650	616	585	555	528	503	480	458	419	386
327HCC197	884	881	847	811	776	743	712	683	655	629	605	582	540	503
327HCC207	907	904	869	833	797	764	733	703	675	649	624	601	558	520
327HCC222	940	936	901	865	830	797	766	736	709	683	658	635	591	553
327HCC243	993	993	966	936	906	879	852	827	802	779	757	735	695	658
327HCC257	1020	1020	992	962	932	904	878	852	828	804	782	760	719	681
327HCC272	1051	1051	1023	993	964	937	910	885	861	838	815	794	753	715
327HCC300	1186	1186	1166	1138	1111	1085	1060	1036	1013	990	968	947	906	868
327HCC315	1212	1212	1192	1164	1137	1111	1086	1062	1038	1016	994	972	931	893
327HCC332	1244	1244	1225	1198	1172	1146	1122	1098	1075	1052	1031	1009	969	930
400HCC189	1069	1069	1036	988	938	886	837	790	746	705	667	633	572	520
400HCC200	1102	1102	1066	1017	965	912	862	814	770	728	690	655	593	541
400HCC214	1143	1143	1105	1054	1001	948	897	850	805	764	726	691	628	575
400HCC239	1329	1329	1293	1242	1188	1136	1085	1037	992	949	910	873	805	746
400HCC252	1367	1367	1329	1276	1221	1168	1117	1068	1023	980	940	902	833	773
400HCC270	1420	1420	1380	1326	1271	1218	1167	1119	1074	1031	991	953	884	823
400HCC295	1504	1504	1477	1431	1384	1338	1294	1252	1212	1174	1138	1103	1038	979
400HCC313	1549	1549	1521	1473	1426	1380	1335	1293	1253	1214	1177	1142	1077	1017
400HCC333	1601	1601	1572	1524	1477	1431	1388	1346	1306	1268	1231	1196	1131	1070
400HCC366	1813	1813	1792	1746	1701	1658	1616	1576	1537	1500	1464	1430	1364	1302
400HCC385	1859	1859	1837	1791	1745	1702	1660	1620	1581	1543	1507	1472	1406	1343
400HCC408	1915	1915	1894	1848	1804	1761	1720	1680	1642	1605	1569	1534	1468	1406
500HCC315	2236	2236	2231	2167	2094	2017	1937	1858	1781	1706	1635	1568	1445	1335
500HCC332	2302	2302	2294	2228	2152	2072	1990	1910	1831	1755	1683	1615	1490	1379
500HCC356	2392	2392	2381	2311	2233	2151	2069	1987	1908	1833	1761	1693	1568	1457
500HCC390	2550	2550	2550	2492	2422	2350	2277	2205	2135	2068	2004	1942	1826	1721
500HCC413	2628	2628	2628	2565	2494	2420	2345	2272	2202	2134	2069	2006	1889	1782
500HCC440	2717	2717	2717	2650	2578	2503	2429	2357	2287	2219	2155	2093	1976	1870

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Columns (HCC)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
327HCC156	715	0.994	0.950	0.900	0.851	0.804	0.760	0.719	0.682	0.647	0.615	0.586	0.533	0.488	12.508
327HCC165	736	0.994	0.949	0.900	0.851	0.805	0.762	0.721	0.685	0.650	0.619	0.590	0.538	0.493	12.671
327HCC176	761	0.993	0.948	0.900	0.854	0.809	0.768	0.729	0.694	0.661	0.630	0.602	0.551	0.506	13.144
327HCC197	884	0.997	0.959	0.918	0.879	0.841	0.806	0.773	0.742	0.712	0.685	0.659	0.611	0.569	15.879
327HCC207	907	0.997	0.958	0.918	0.879	0.842	0.808	0.775	0.745	0.716	0.689	0.663	0.616	0.574	16.120
327HCC222	940	0.996	0.959	0.920	0.883	0.848	0.815	0.784	0.754	0.727	0.700	0.675	0.630	0.588	16.866
327HCC243	993	1.000	0.973	0.942	0.913	0.885	0.858	0.833	0.808	0.785	0.762	0.741	0.700	0.663	21.678
327HCC257	1020	1.000	0.973	0.943	0.914	0.887	0.861	0.835	0.811	0.788	0.766	0.745	0.705	0.668	22.122
327HCC272	1051	1.000	0.974	0.945	0.918	0.892	0.867	0.843	0.820	0.797	0.776	0.756	0.717	0.681	23.135
327HCC300	1186	1.000	0.983	0.959	0.937	0.915	0.894	0.874	0.854	0.835	0.817	0.799	0.764	0.732	28.233
327HCC315	1212	1.000	0.983	0.960	0.938	0.917	0.896	0.876	0.857	0.838	0.820	0.802	0.769	0.737	28.788
327HCC332	1244	1.000	0.985	0.963	0.942	0.921	0.901	0.882	0.864	0.846	0.828	0.811	0.779	0.748	30.110
400HCC189	1069	1.000	0.969	0.925	0.877	0.829	0.783	0.739	0.698	0.659	0.624	0.592	0.535	0.487	12.672
400HCC200	1102	1.000	0.967	0.923	0.875	0.828	0.782	0.739	0.698	0.661	0.626	0.595	0.538	0.491	12.799
400HCC214	1143	1.000	0.966	0.922	0.875	0.829	0.785	0.743	0.704	0.668	0.635	0.604	0.550	0.503	13.158
400HCC239	1329	1.000	0.973	0.934	0.894	0.855	0.816	0.780	0.746	0.715	0.685	0.657	0.606	0.561	15.520
400HCC252	1367	1.000	0.972	0.934	0.894	0.854	0.817	0.781	0.748	0.717	0.687	0.660	0.610	0.565	15.713
400HCC270	1420	1.000	0.972	0.934	0.895	0.857	0.822	0.788	0.756	0.726	0.698	0.671	0.622	0.579	16.373
400HCC295	1504	1.000	0.982	0.951	0.920	0.890	0.860	0.833	0.806	0.781	0.757	0.733	0.690	0.651	20.684
400HCC313	1549	1.000	0.982	0.951	0.920	0.891	0.862	0.835	0.809	0.784	0.760	0.737	0.695	0.656	21.083
400HCC333	1601	1.000	0.982	0.952	0.923	0.894	0.867	0.841	0.816	0.792	0.769	0.747	0.706	0.669	22.035
400HCC366	1813	1.000	0.988	0.963	0.938	0.914	0.891	0.869	0.848	0.827	0.808	0.788	0.752	0.718	26.531
400HCC385	1859	1.000	0.988	0.963	0.939	0.916	0.893	0.871	0.851	0.830	0.811	0.792	0.756	0.723	27.048
400HCC408	1915	1.000	0.989	0.965	0.942	0.920	0.898	0.877	0.857	0.838	0.819	0.801	0.767	0.734	28.314
500HCC315	2236	1.000	0.997	0.969	0.937	0.902	0.866	0.831	0.796	0.763	0.731	0.701	0.646	0.597	17.161
500HCC332	2302	1.000	0.997	0.968	0.935	0.900	0.865	0.829	0.795	0.762	0.731	0.702	0.647	0.599	17.266
500HCC356	2392	1.000	0.995	0.966	0.934	0.899	0.865	0.831	0.798	0.766	0.736	0.708	0.656	0.609	17.794
500HCC390	2550	1.000	1.000	0.977	0.950	0.922	0.893	0.865	0.837	0.811	0.786	0.762	0.716	0.675	21.965
500HCC413	2628	1.000	1.000	0.976	0.949	0.921	0.893	0.865	0.838	0.812	0.787	0.763	0.719	0.678	22.296
500HCC440	2717	1.000	1.000	0.976	0.949	0.921	0.894	0.868	0.842	0.817	0.793	0.770	0.727	0.688	23.162

**Key**  Slenderness Reduction Factor  $\alpha_s$  not less than 1/1.75

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

### High Capacity Columns (HCC)

Designation	Design Moment Capacities $\phi M_b$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
500HCC485	3101	3101	3101	3045	2973	2900	2827	2757	2688	2622	2558	2497	2380	2272
500HCC510	3182	3182	3182	3123	3049	2975	2902	2831	2762	2696	2631	2570	2452	2343
500HCC542	3282	3282	3282	3222	3148	3075	3002	2932	2864	2799	2735	2674	2557	2448
600HCC386	3232	3232	3232	3203	3123	3034	2938	2837	2735	2633	2532	2434	2248	2078
600HCC407	3322	3322	3322	3287	3205	3112	3013	2909	2804	2699	2596	2497	2308	2137
600HCC436	3449	3449	3449	3408	3322	3225	3122	3016	2909	2803	2699	2599	2410	2239
600HCC479	3813	3813	3813	3790	3705	3612	3514	3412	3310	3209	3110	3014	2831	2663
600HCC507	3932	3932	3932	3904	3816	3719	3618	3513	3409	3306	3205	3108	2923	2752
600HCC540	4068	4068	4068	4036	3944	3845	3741	3636	3531	3428	3327	3230	3046	2876
600HCC597	4662	4662	4662	4643	4549	4448	4344	4239	4134	4032	3932	3835	3650	3478
600HCC628	4788	4788	4788	4765	4668	4565	4459	4352	4246	4142	4042	3944	3757	3584
600HCC667	4946	4946	4946	4919	4820	4715	4608	4502	4396	4294	4194	4097	3912	3740

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Columns (HCC)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
500HCC485	3101	1.000	1.000	0.982	0.959	0.935	0.912	0.889	0.867	0.846	0.825	0.805	0.768	0.733	27.514
500HCC510	3182	1.000	1.000	0.981	0.958	0.935	0.912	0.890	0.868	0.847	0.827	0.808	0.771	0.736	27.985
500HCC542	3282	1.000	1.000	0.982	0.959	0.937	0.915	0.893	0.873	0.853	0.833	0.815	0.779	0.746	29.193
600HCC386	3232	1.000	1.000	0.991	0.966	0.939	0.909	0.878	0.846	0.814	0.783	0.753	0.695	0.643	19.135
600HCC407	3322	1.000	1.000	0.990	0.965	0.937	0.907	0.876	0.844	0.813	0.782	0.752	0.695	0.643	19.195
600HCC436	3449	1.000	1.000	0.988	0.963	0.935	0.905	0.874	0.843	0.813	0.783	0.754	0.699	0.649	19.617
600HCC479	3813	1.000	1.000	0.994	0.972	0.947	0.922	0.895	0.868	0.842	0.816	0.790	0.743	0.698	22.994
600HCC507	3932	1.000	1.000	0.993	0.971	0.946	0.920	0.894	0.867	0.841	0.815	0.790	0.743	0.700	23.224
600HCC540	4068	1.000	1.000	0.992	0.970	0.945	0.920	0.894	0.868	0.843	0.818	0.794	0.749	0.707	23.971
600HCC597	4662	1.000	1.000	0.996	0.976	0.954	0.932	0.909	0.887	0.865	0.843	0.823	0.783	0.746	28.020
600HCC628	4788	1.000	1.000	0.995	0.975	0.953	0.931	0.909	0.887	0.865	0.844	0.824	0.785	0.748	28.429
600HCC667	4946	1.000	1.000	0.995	0.975	0.953	0.932	0.910	0.889	0.868	0.848	0.828	0.791	0.756	29.545

**Key**  Slenderness Reduction Factor  $\alpha_s$  not less than 1/1.75

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

### High Capacity Beam-Columns (HCBC)

Designation	Design Moment Capacities $\phi M_x$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
400HCBC158	820	777	717	659	607	560	519	483	450	421	396	372	332	299
400HCBC171	858	812	750	691	638	591	549	511	478	448	421	396	354	320
400HCBC195	923	888	836	786	740	699	660	625	593	563	535	509	464	425
400HCBC212	968	931	878	827	781	739	700	664	630	599	571	544	497	456
400HCBC240	1108	1077	1027	980	937	896	858	822	788	756	726	698	646	600
400HCBC287	1153	1121	1071	1024	981	939	901	864	830	798	767	738	685	637
400HCBC176	931	903	846	788	734	685	641	600	564	531	501	474	427	387
400HCBC189	969	938	879	820	766	716	671	630	593	559	528	500	451	410
400HCBC217	1050	1029	978	928	881	838	798	761	726	693	663	635	584	539
400HCBC234	1095	1072	1020	970	923	879	838	800	765	731	700	671	618	572
400HCBC268	1262	1244	1195	1148	1104	1063	1023	986	951	917	886	855	799	748
400HCBC290	1307	1289	1240	1193	1148	1106	1067	1029	993	959	927	896	839	787
500HCBC174	1106	1035	937	842	757	684	621	567	521	481	446	415	364	324
500HCBC191	1170	1092	989	891	804	729	664	608	560	518	481	449	395	352
500HCBC214	1252	1190	1100	1015	938	870	808	754	705	661	621	585	524	473
500HCBC237	1329	1262	1169	1082	1004	933	870	814	763	717	675	637	572	517
500HCBC265	1513	1452	1365	1282	1207	1138	1074	1016	963	914	868	826	752	688
500HCBC290	1594	1530	1440	1357	1281	1211	1146	1086	1031	980	933	890	812	744
500HCBC192	1247	1200	1110	1016	929	849	780	718	664	617	575	538	475	425
500HCBC209	1311	1259	1164	1067	977	896	824	761	706	657	613	575	509	456
500HCBC236	1414	1374	1290	1206	1127	1055	989	930	876	826	782	741	669	608
500HCBC259	1492	1447	1360	1274	1193	1120	1053	992	936	885	838	796	721	657
500HCBC293	1712	1673	1589	1507	1430	1359	1293	1231	1174	1121	1072	1026	942	869
500HCBC318	1792	1751	1665	1582	1504	1432	1365	1303	1245	1190	1139	1092	1005	929
600HCBC207	1590	1521	1392	1255	1126	1011	912	827	754	691	637	591	514	455
600HCBC228	1687	1608	1469	1326	1192	1073	971	883	808	743	687	638	557	494
600HCBC256	1809	1746	1623	1496	1376	1268	1172	1086	1010	942	882	828	737	662
600HCBC284	1928	1857	1726	1593	1470	1359	1260	1172	1093	1023	960	903	806	726
600HCBC318	2202	2137	2008	1880	1760	1651	1552	1461	1378	1303	1234	1171	1059	965
600HCBC349	2328	2257	2123	1992	1870	1759	1658	1565	1480	1402	1330	1264	1147	1048

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Beam-Columns (HCBC)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
400HCBC158	820	0.948	0.874	0.803	0.740	0.683	0.633	0.589	0.549	0.514	0.482	0.454	0.405	0.365	8.426
400HCBC171	858	0.946	0.873	0.805	0.743	0.688	0.639	0.596	0.557	0.522	0.490	0.462	0.413	0.372	8.604
400HCBC195	923	0.962	0.905	0.851	0.802	0.757	0.715	0.677	0.642	0.609	0.579	0.552	0.502	0.460	11.270
400HCBC212	968	0.962	0.906	0.854	0.807	0.763	0.722	0.685	0.651	0.619	0.589	0.562	0.513	0.471	11.642
400HCBC240	1108	0.972	0.927	0.885	0.846	0.809	0.774	0.742	0.712	0.683	0.656	0.630	0.584	0.542	14.554
400HCBC287	1153	0.973	0.929	0.888	0.850	0.815	0.781	0.750	0.720	0.692	0.665	0.640	0.594	0.553	15.053
400HCBC176	931	0.969	0.908	0.846	0.788	0.736	0.688	0.645	0.606	0.570	0.538	0.509	0.458	0.416	9.972
400HCBC189	969	0.968	0.907	0.846	0.790	0.738	0.692	0.649	0.611	0.576	0.545	0.516	0.465	0.423	10.150
400HCBC217	1050	0.979	0.931	0.884	0.839	0.798	0.760	0.724	0.691	0.660	0.631	0.604	0.556	0.513	13.315
400HCBC234	1095	0.979	0.931	0.885	0.842	0.802	0.765	0.730	0.698	0.668	0.639	0.613	0.565	0.522	13.695
400HCBC268	1262	0.986	0.947	0.910	0.875	0.842	0.811	0.782	0.754	0.727	0.702	0.678	0.633	0.593	17.155
400HCBC290	1307	0.986	0.948	0.912	0.878	0.846	0.816	0.787	0.760	0.734	0.709	0.685	0.642	0.602	17.658
500HCBC174	1106	0.936	0.848	0.762	0.685	0.619	0.562	0.513	0.471	0.435	0.403	0.376	0.330	0.293	6.814
500HCBC191	1170	0.934	0.846	0.762	0.687	0.623	0.568	0.520	0.479	0.443	0.411	0.384	0.338	0.301	6.925
500HCBC214	1252	0.950	0.879	0.811	0.750	0.695	0.646	0.602	0.563	0.528	0.496	0.468	0.418	0.378	8.768
500HCBC237	1329	0.949	0.880	0.814	0.755	0.702	0.655	0.612	0.574	0.539	0.508	0.479	0.430	0.389	9.057
500HCBC265	1513	0.960	0.902	0.847	0.797	0.752	0.710	0.672	0.636	0.604	0.574	0.546	0.497	0.454	11.076
500HCBC290	1594	0.960	0.904	0.851	0.804	0.759	0.719	0.682	0.647	0.615	0.586	0.558	0.509	0.467	11.503
500HCBC192	1247	0.962	0.890	0.815	0.744	0.681	0.625	0.576	0.533	0.495	0.461	0.431	0.381	0.341	8.094
500HCBC209	1311	0.960	0.887	0.813	0.745	0.683	0.628	0.580	0.538	0.501	0.468	0.438	0.388	0.348	8.201
500HCBC236	1414	0.972	0.913	0.853	0.797	0.746	0.700	0.658	0.619	0.585	0.553	0.524	0.473	0.430	10.395
500HCBC259	1492	0.970	0.912	0.854	0.800	0.751	0.706	0.665	0.627	0.593	0.562	0.534	0.483	0.440	10.690
500HCBC293	1712	0.978	0.928	0.880	0.835	0.794	0.755	0.719	0.686	0.655	0.626	0.599	0.550	0.508	13.101
500HCBC318	1792	0.977	0.929	0.883	0.839	0.799	0.762	0.727	0.694	0.664	0.636	0.609	0.561	0.518	13.532
600HCBC207	1590	0.956	0.875	0.789	0.708	0.636	0.573	0.520	0.474	0.435	0.401	0.372	0.324	0.286	7.033
600HCBC228	1687	0.953	0.871	0.786	0.706	0.636	0.576	0.523	0.479	0.440	0.407	0.378	0.330	0.293	7.074
600HCBC256	1809	0.965	0.897	0.827	0.761	0.701	0.648	0.600	0.558	0.521	0.488	0.458	0.407	0.366	8.673
600HCBC284	1928	0.963	0.895	0.826	0.763	0.705	0.654	0.608	0.567	0.530	0.498	0.468	0.418	0.376	8.882
600HCBC318	2202	0.971	0.912	0.854	0.800	0.750	0.705	0.664	0.626	0.592	0.560	0.532	0.481	0.438	10.636
600HCBC349	2328	0.969	0.912	0.856	0.804	0.756	0.712	0.672	0.636	0.602	0.571	0.543	0.493	0.450	10.994

Key  Slenderness Reduction Factor  $\alpha_s$  not less than 1/1.75



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

### High Capacity Beam-Columns (HCBC)

Designation	Design Moment Capacities $\phi M_{sx}$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
600HCBC232	1836	1803	1692	1566	1439	1317	1206	1107	1020	943	875	815	715	635
600HCBC253	1933	1893	1775	1642	1508	1383	1269	1168	1078	999	929	867	763	680
600HCBC287	2091	2066	1958	1838	1719	1607	1502	1407	1321	1243	1172	1107	995	901
600HCBC316	2210	2179	2064	1939	1816	1700	1594	1497	1408	1328	1254	1188	1071	972
600HCBC357	2548	2524	2408	2285	2165	2052	1947	1849	1759	1676	1598	1526	1397	1285
600HCBC389	2674	2646	2524	2398	2276	2161	2054	1955	1864	1778	1699	1625	1491	1375
700HCBC248	2249	2202	2056	1888	1715	1550	1401	1269	1154	1054	968	894	773	679
700HCBC273	2385	2328	2170	1989	1806	1634	1479	1343	1225	1123	1034	957	831	733
700HCBC307	2568	2529	2384	2220	2054	1897	1753	1622	1506	1402	1310	1227	1087	973
700HCBC341	2738	2689	2531	2356	2183	2020	1872	1738	1618	1511	1415	1329	1182	1062
700HCBC382	3142	3101	2940	2766	2595	2434	2285	2148	2024	1911	1807	1713	1547	1407
700HCBC420	3323	3275	3104	2923	2747	2582	2430	2291	2164	2047	1940	1842	1670	1523
700HCBC286	2682	2682	2572	2431	2274	2113	1956	1808	1671	1547	1436	1336	1167	1032
700HCBC311	2818	2818	2694	2542	2376	2207	2043	1890	1750	1622	1508	1406	1233	1094
700HCBC354	3067	3067	2966	2825	2672	2518	2368	2226	2093	1971	1859	1756	1577	1426
700HCBC388	3236	3236	3121	2971	2810	2648	2493	2347	2211	2086	1971	1866	1681	1526
700HCBC441	3756	3756	3646	3491	3329	3168	3013	2867	2730	2602	2483	2372	2173	2000
700HCBC479	3938	3938	3815	3653	3485	3320	3162	3013	2874	2744	2622	2509	2305	2126
800HCBC264	2689	2625	2441	2224	2001	1788	1597	1429	1285	1162	1058	969	827	719
800HCBC293	2872	2793	2589	2354	2115	1891	1691	1518	1369	1242	1134	1042	894	781
800HCBC327	3076	3021	2834	2620	2401	2193	2003	1834	1684	1553	1438	1337	1169	1036
800HCBC366	3305	3235	3029	2797	2565	2348	2151	1975	1821	1685	1565	1459	1282	1141
800HCBC407	3776	3715	3504	3271	3039	2821	2621	2440	2278	2132	2001	1882	1679	1512
800HCBC451	4023	3949	3722	3476	3236	3011	2806	2621	2453	2302	2166	2043	1830	1653
800HCBC301	3186	3186	3045	2867	2669	2463	2262	2072	1898	1741	1601	1478	1272	1112
800HCBC330	3369	3364	3207	3014	2800	2582	2370	2172	1992	1830	1687	1560	1349	1183
800HCBC374	3651	3651	3518	3338	3140	2938	2741	2555	2382	2224	2080	1950	1727	1544
800HCBC413	3880	3880	3725	3529	3318	3105	2899	2706	2528	2365	2217	2084	1853	1663
800HCBC466	4484	4484	4334	4132	3917	3701	3494	3298	3116	2947	2792	2649	2396	2182
800HCBC510	4731	4731	4562	4347	4122	3899	3686	3485	3299	3126	2967	2821	2560	2338

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Beam-Columns (HCBC)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
600HCBC232	1836	0.982	0.922	0.853	0.784	0.718	0.657	0.603	0.556	0.514	0.477	0.444	0.390	0.346	8.654
600HCBC253	1933	0.980	0.918	0.849	0.780	0.716	0.657	0.604	0.558	0.517	0.481	0.449	0.395	0.352	8.692
600HCBC287	2091	0.988	0.936	0.879	0.822	0.768	0.719	0.673	0.632	0.594	0.560	0.530	0.476	0.431	10.662
600HCBC316	2210	0.986	0.934	0.877	0.821	0.769	0.721	0.677	0.637	0.601	0.568	0.537	0.484	0.440	10.876
600HCBC357	2548	0.991	0.945	0.896	0.849	0.805	0.764	0.726	0.690	0.658	0.627	0.599	0.548	0.504	13.050
600HCBC389	2674	0.989	0.944	0.897	0.851	0.808	0.768	0.731	0.697	0.665	0.635	0.607	0.558	0.514	13.414
700HCBC248	2249	0.979	0.914	0.839	0.762	0.689	0.623	0.564	0.513	0.469	0.431	0.398	0.344	0.302	7.870
700HCBC273	2385	0.976	0.910	0.834	0.757	0.685	0.620	0.563	0.514	0.471	0.434	0.401	0.348	0.307	7.848
700HCBC307	2568	0.985	0.928	0.864	0.800	0.739	0.682	0.632	0.586	0.546	0.510	0.478	0.423	0.379	9.357
700HCBC341	2738	0.982	0.925	0.861	0.797	0.738	0.684	0.635	0.591	0.552	0.517	0.485	0.432	0.388	9.486
700HCBC382	3142	0.987	0.936	0.880	0.826	0.775	0.727	0.684	0.644	0.608	0.575	0.545	0.492	0.448	11.122
700HCBC420	3323	0.985	0.934	0.880	0.827	0.777	0.731	0.689	0.651	0.616	0.584	0.554	0.502	0.458	11.409
700HCBC286	2682	1.000	0.959	0.906	0.848	0.788	0.729	0.674	0.623	0.577	0.535	0.498	0.435	0.385	10.126
700HCBC311	2818	1.000	0.956	0.902	0.843	0.783	0.725	0.671	0.621	0.576	0.535	0.499	0.438	0.388	10.101
700HCBC354	3067	1.000	0.967	0.921	0.871	0.821	0.772	0.726	0.682	0.643	0.606	0.573	0.514	0.465	12.038
700HCBC388	3236	1.000	0.964	0.918	0.868	0.818	0.770	0.725	0.683	0.645	0.609	0.577	0.520	0.471	12.158
700HCBC441	3756	1.000	0.971	0.929	0.886	0.843	0.802	0.763	0.727	0.693	0.661	0.631	0.578	0.532	14.286
700HCBC479	3938	1.000	0.969	0.928	0.885	0.843	0.803	0.765	0.730	0.697	0.666	0.637	0.585	0.540	14.582
800HCBC264	2689	0.976	0.908	0.827	0.744	0.665	0.594	0.531	0.478	0.432	0.393	0.360	0.307	0.267	7.341
800HCBC293	2872	0.973	0.902	0.820	0.737	0.659	0.589	0.528	0.477	0.433	0.395	0.363	0.311	0.272	7.268
800HCBC327	3076	0.982	0.921	0.851	0.780	0.713	0.651	0.596	0.548	0.505	0.468	0.435	0.380	0.337	8.491
800HCBC366	3305	0.979	0.916	0.846	0.776	0.710	0.651	0.598	0.551	0.510	0.474	0.442	0.388	0.345	8.546
800HCBC407	3776	0.984	0.928	0.866	0.805	0.747	0.694	0.646	0.603	0.565	0.530	0.499	0.445	0.401	9.815
800HCBC451	4023	0.982	0.925	0.864	0.804	0.749	0.698	0.652	0.610	0.572	0.539	0.508	0.455	0.411	10.026
800HCBC301	3186	1.000	0.956	0.900	0.838	0.773	0.710	0.650	0.596	0.546	0.503	0.464	0.399	0.349	9.477
800HCBC330	3369	0.998	0.952	0.894	0.831	0.766	0.703	0.645	0.591	0.543	0.501	0.463	0.400	0.351	9.398
800HCBC374	3651	1.000	0.963	0.914	0.860	0.805	0.751	0.700	0.652	0.609	0.570	0.534	0.473	0.423	10.954
800HCBC413	3880	1.000	0.960	0.910	0.855	0.800	0.747	0.698	0.652	0.610	0.572	0.537	0.478	0.429	11.004
800HCBC466	4484	1.000	0.967	0.921	0.873	0.825	0.779	0.735	0.695	0.657	0.623	0.591	0.534	0.486	12.645
800HCBC510	4731	1.000	0.964	0.919	0.871	0.824	0.779	0.737	0.697	0.661	0.627	0.596	0.541	0.494	12.860

**Key**  Slenderness Reduction Factor  $\alpha_s$  not less than 1/1.75

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

### High Capacity Beam-Columns (HCBC)

Designation	Design Moment Capacities $\phi M_{sx}$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
1000HCBC295	3650	3544	3269	2943	2604	2283	1996	1750	1544	1373	1231	1112	929	795
1000HCBC332	3946	3813	3501	3137	2768	2424	2121	1865	1651	1473	1326	1203	1011	871
1000HCBC366	4188	4090	3806	3474	3131	2805	2510	2252	2030	1840	1678	1539	1317	1148
1000HCBC416	4561	4435	4113	3743	3371	3024	2714	2444	2212	2014	1844	1699	1463	1283
1000HCBC458	5164	5052	4723	4348	3971	3616	3295	3010	2760	2542	2352	2185	1909	1691
1000HCBC514	5572	5434	5070	4666	4266	3895	3562	3267	3008	2781	2582	2406	2113	1880
1000HCBC333	4277	4267	4061	3800	3505	3199	2898	2616	2359	2131	1931	1757	1476	1264
1000HCBC370	4573	4550	4318	4028	3704	3372	3051	2752	2483	2246	2040	1860	1571	1352
1000HCBC413	4913	4913	4703	4433	4132	3821	3516	3228	2964	2725	2511	2322	2006	1758
1000HCBC463	5287	5279	5035	4734	4404	4069	3744	3441	3165	2917	2696	2500	2172	1913
1000HCBC517	6062	6062	5816	5504	5165	4820	4487	4173	3885	3621	3384	3169	2802	2502
1000HCBC573	6470	6467	6185	5846	5482	5119	4771	4446	4148	3877	3632	3410	3029	2717
1000HCBC393	5277	5277	5223	5034	4808	4555	4286	4011	3737	3473	3222	2989	2578	2240
1000HCBC430	5577	5577	5505	5297	5049	4774	4484	4189	3899	3621	3359	3116	2692	2344
1000HCBC488	6075	6075	6036	5838	5603	5342	5067	4786	4508	4239	3983	3743	3312	2947
1000HCBC539	6448	6448	6391	6172	5914	5631	5335	5036	4743	4461	4194	3945	3500	3125
1000HCBC611	7498	7498	7457	7222	6948	6650	6340	6029	5724	5430	5151	4888	4413	4004
1000HCBC667	7907	7907	7847	7592	7297	6980	6653	6328	6011	5707	5420	5151	4664	4244
1200HCBC364	5476	5449	5167	4809	4403	3981	3567	3181	2833	2528	2264	2038	1679	1415
1200HCBC409	5912	5863	5540	5133	4680	4214	3766	3353	2986	2667	2393	2158	1789	1517
1200HCBC452	6302	6292	5995	5620	5198	4760	4330	3926	3557	3228	2938	2685	2273	1959
1200HCBC514	6855	6823	6480	6052	5580	5098	4632	4200	3811	3467	3165	2902	2473	2145
1200HCBC567	7801	7793	7436	6994	6506	6007	5524	5071	4658	4286	3955	3662	3174	2789
1200HCBC636	8411	8380	7977	7486	6954	6418	5906	5431	5001	4615	4272	3968	3459	3056
1200HCBC425	6681	6681	6596	6343	6039	5698	5334	4960	4589	4231	3894	3581	3036	2595
1200HCBC469	7123	7123	7009	6725	6386	6009	5609	5203	4805	4423	4066	3738	3172	2718
1200HCBC528	7705	7705	7637	7369	7049	6692	6312	5923	5537	5163	4808	4476	3889	3402
1200HCBC589	8258	8258	8160	7858	7500	7104	6688	6266	5852	5454	5080	4733	4123	3619
1200HCBC661	9539	9539	9461	9139	8759	8342	7903	7460	7025	6605	6208	5836	5173	4613
1200HCBC730	10149	10149	10040	9683	9267	8814	8344	7873	7414	6976	6563	6178	5494	4918

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Beam-Columns (HCBC)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
1000HCBC295	3650	0.971	0.896	0.806	0.713	0.625	0.547	0.480	0.423	0.376	0.337	0.305	0.254	0.218	6.672
1000HCBC332	3946	0.966	0.887	0.795	0.701	0.614	0.538	0.473	0.418	0.373	0.336	0.305	0.256	0.221	6.539
1000HCBC366	4188	0.977	0.909	0.830	0.748	0.670	0.599	0.538	0.485	0.439	0.401	0.368	0.314	0.274	7.436
1000HCBC416	4561	0.972	0.902	0.821	0.739	0.663	0.595	0.536	0.485	0.442	0.404	0.372	0.321	0.281	7.380
1000HCBC458	5164	0.978	0.915	0.842	0.769	0.700	0.638	0.583	0.535	0.492	0.455	0.423	0.370	0.327	8.223
1000HCBC514	5572	0.975	0.910	0.837	0.766	0.699	0.639	0.586	0.540	0.499	0.463	0.432	0.379	0.337	8.305
1000HCBC333	4277	0.998	0.949	0.888	0.820	0.748	0.678	0.612	0.552	0.498	0.451	0.411	0.345	0.296	8.652
1000HCBC370	4573	0.995	0.944	0.881	0.810	0.737	0.667	0.602	0.543	0.491	0.446	0.407	0.344	0.296	8.502
1000HCBC413	4913	1.000	0.957	0.902	0.841	0.778	0.716	0.657	0.603	0.555	0.511	0.473	0.408	0.358	9.629
1000HCBC463	5287	0.998	0.952	0.896	0.833	0.770	0.708	0.651	0.599	0.552	0.510	0.473	0.411	0.362	9.566
1000HCBC517	6062	1.000	0.959	0.908	0.852	0.795	0.740	0.688	0.641	0.597	0.558	0.523	0.462	0.413	10.648
1000HCBC573	6470	1.000	0.956	0.903	0.847	0.791	0.737	0.687	0.641	0.599	0.561	0.527	0.468	0.420	10.723
1000HCBC393	5277	1.000	0.990	0.954	0.911	0.863	0.812	0.760	0.708	0.658	0.611	0.566	0.489	0.424	11.882
1000HCBC430	5577	1.000	0.987	0.950	0.905	0.856	0.804	0.751	0.699	0.649	0.602	0.559	0.483	0.420	11.701
1000HCBC488	6075	1.000	0.994	0.961	0.922	0.879	0.834	0.788	0.742	0.698	0.656	0.616	0.545	0.485	13.210
1000HCBC539	6448	1.000	0.991	0.957	0.917	0.873	0.827	0.781	0.736	0.692	0.650	0.612	0.543	0.485	13.131
1000HCBC611	7498	1.000	0.994	0.963	0.927	0.887	0.846	0.804	0.763	0.724	0.687	0.652	0.589	0.534	14.593
1000HCBC667	7907	1.000	0.992	0.960	0.923	0.883	0.841	0.800	0.760	0.722	0.686	0.651	0.590	0.537	14.663
1200HCBC364	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	8.147
1200HCBC409	5912	0.992	0.937	0.868	0.792	0.713	0.637	0.567	0.505	0.451	0.405	0.365	0.303	0.257	7.935
1200HCBC452	6302	0.998	0.951	0.892	0.825	0.755	0.687	0.623	0.564	0.512	0.466	0.426	0.361	0.311	8.871
1200HCBC514	6855	0.995	0.945	0.883	0.814	0.744	0.676	0.613	0.556	0.506	0.462	0.423	0.361	0.313	8.715
1200HCBC567	7801	0.999	0.953	0.897	0.834	0.770	0.708	0.650	0.597	0.549	0.507	0.469	0.407	0.358	9.523
1200HCBC636	8411	0.996	0.949	0.890	0.827	0.763	0.702	0.646	0.595	0.549	0.508	0.472	0.411	0.363	9.490
1200HCBC425	6681	1.000	0.987	0.949	0.904	0.853	0.798	0.742	0.687	0.633	0.583	0.536	0.454	0.388	11.234
1200HCBC469	7123	1.000	0.984	0.944	0.897	0.844	0.788	0.731	0.675	0.621	0.571	0.525	0.445	0.382	10.988
1200HCBC528	7705	1.000	0.991	0.956	0.915	0.869	0.819	0.769	0.719	0.670	0.624	0.581	0.505	0.441	12.230
1200HCBC589	8258	1.000	0.988	0.952	0.908	0.860	0.810	0.759	0.709	0.660	0.615	0.573	0.499	0.438	12.041
1200HCBC661	9539	1.000	0.992	0.958	0.918	0.874	0.828	0.782	0.736	0.692	0.651	0.612	0.542	0.484	13.118
1200HCBC730	10149	1.000	0.989	0.954	0.913	0.868	0.822	0.776	0.731	0.687	0.647	0.609	0.541	0.485	13.065

**Key**  Slenderness Reduction Factor  $\alpha_s$  not less than 1/1.75

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

### High Capacity Beams (HCB)

Designation	Design Moment Capacities $\phi M_{sx}$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
500HCB88	629	590	526	458	395	341	296	260	230	206	187	170	145	126
500HCB104	755	712	643	570	502	444	395	354	320	291	266	246	212	186
500HCB133	952	902	823	744	672	608	553	506	465	430	399	372	326	290
500HCB165	1085	1040	967	895	829	770	716	669	626	588	553	522	467	422
500HCB203	1312	1267	1194	1123	1059	999	945	895	849	806	767	730	665	610
500HCB99	721	695	638	572	507	447	394	350	312	281	255	233	198	172
500HCB124	895	864	796	722	649	582	523	473	429	392	361	333	289	254
500HCB157	1119	1084	1007	926	848	777	714	658	609	566	527	493	436	390
500HCB193	1269	1240	1168	1094	1024	959	900	847	798	754	713	676	611	556
500HCB243	1550	1521	1447	1373	1303	1239	1179	1123	1071	1023	978	936	860	794
600HCB103	879	847	774	689	604	525	456	398	351	312	279	253	211	181
600HCB131	1114	1072	982	880	779	687	607	539	482	434	395	361	308	268
600HCB165	1396	1347	1242	1127	1016	915	826	750	684	627	578	536	466	412
600HCB203	1587	1544	1442	1335	1231	1136	1051	975	907	847	793	745	663	595
600HCB255	1950	1903	1793	1681	1576	1479	1390	1309	1235	1168	1106	1050	950	866
600HCB128	1093	1076	1007	924	833	744	661	587	523	468	421	382	320	274
600HCB159	1349	1328	1247	1149	1046	944	851	767	694	630	576	529	452	394
600HCB199	1680	1657	1562	1451	1337	1227	1125	1033	952	880	816	760	666	591
600HCB251	1938	1920	1824	1716	1607	1503	1406	1317	1236	1162	1096	1035	930	841
600HCB294	2296	2283	2183	2075	1968	1867	1772	1684	1602	1527	1456	1391	1274	1172
700HCB118	1125	1075	973	855	737	629	537	461	400	351	311	279	230	195
700HCB137	1335	1282	1169	1039	909	790	688	603	532	474	426	387	325	280
700HCB173	1687	1622	1486	1335	1187	1053	936	837	753	683	623	573	492	430
700HCB212	1921	1861	1727	1581	1440	1310	1195	1094	1006	929	862	803	705	627
700HCB268	2369	2303	2153	1997	1848	1712	1590	1480	1382	1294	1215	1144	1022	921
700HCB134	1318	1295	1209	1103	989	875	769	675	594	526	469	421	347	293
700HCB167	1629	1601	1498	1373	1239	1107	986	878	784	704	636	578	487	419
700HCB208	2030	1998	1876	1732	1580	1434	1298	1177	1071	978	898	828	715	627
700HCB263	2350	2323	2197	2052	1904	1760	1627	1507	1398	1301	1215	1138	1007	900
700HCB307	2779	2756	2623	2475	2326	2185	2053	1931	1820	1718	1626	1541	1392	1266

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Beams (HCB)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
500HCB88	629	0.938	0.837	0.729	0.628	0.542	0.471	0.413	0.366	0.328	0.297	0.271	0.230	0.200	5.635
500HCB104	755	0.943	0.851	0.754	0.665	0.588	0.523	0.469	0.423	0.385	0.353	0.325	0.281	0.247	6.238
500HCB133	952	0.947	0.865	0.782	0.706	0.639	0.581	0.532	0.489	0.451	0.419	0.390	0.343	0.305	7.189
500HCB165	1085	0.959	0.891	0.825	0.764	0.709	0.660	0.617	0.577	0.542	0.510	0.481	0.431	0.389	9.148
500HCB203	1312	0.966	0.910	0.856	0.807	0.762	0.720	0.682	0.647	0.614	0.584	0.557	0.507	0.465	11.455
500HCB99	721	0.964	0.885	0.794	0.703	0.620	0.547	0.485	0.433	0.390	0.354	0.323	0.275	0.238	6.648
500HCB124	895	0.965	0.890	0.807	0.725	0.650	0.585	0.528	0.480	0.439	0.403	0.372	0.323	0.284	7.222
500HCB157	1119	0.969	0.900	0.827	0.758	0.694	0.638	0.588	0.544	0.505	0.471	0.441	0.390	0.348	8.363
500HCB193	1269	0.977	0.920	0.862	0.807	0.756	0.709	0.667	0.629	0.594	0.562	0.532	0.481	0.438	10.676
500HCB243	1550	0.981	0.933	0.885	0.841	0.799	0.760	0.724	0.691	0.660	0.631	0.604	0.555	0.512	13.282
600HCB103	879	0.963	0.880	0.784	0.687	0.597	0.519	0.453	0.399	0.355	0.318	0.287	0.241	0.206	6.308
600HCB131	1114	0.962	0.881	0.790	0.699	0.616	0.544	0.484	0.433	0.390	0.354	0.324	0.276	0.240	6.600
600HCB165	1396	0.965	0.890	0.807	0.728	0.655	0.592	0.537	0.490	0.449	0.414	0.384	0.334	0.295	7.353
600HCB203	1587	0.973	0.909	0.841	0.776	0.716	0.662	0.614	0.572	0.534	0.500	0.469	0.417	0.375	9.000
600HCB255	1950	0.976	0.920	0.862	0.808	0.758	0.713	0.671	0.633	0.599	0.567	0.538	0.487	0.444	10.859
600HCB128	1093	0.984	0.921	0.845	0.762	0.681	0.605	0.537	0.478	0.428	0.385	0.349	0.292	0.250	7.471
600HCB159	1349	0.985	0.924	0.852	0.775	0.700	0.631	0.569	0.514	0.467	0.427	0.392	0.335	0.292	7.951
600HCB199	1680	0.986	0.930	0.864	0.796	0.730	0.669	0.615	0.566	0.523	0.486	0.452	0.396	0.352	8.886
600HCB251	1938	0.991	0.941	0.886	0.829	0.775	0.725	0.679	0.638	0.600	0.565	0.534	0.480	0.434	10.813
600HCB294	2296	0.994	0.951	0.904	0.857	0.813	0.772	0.733	0.698	0.665	0.634	0.606	0.555	0.510	13.308
700HCB118	1125	0.956	0.865	0.760	0.655	0.559	0.477	0.410	0.355	0.312	0.277	0.248	0.204	0.173	5.856
700HCB137	1335	0.960	0.875	0.778	0.681	0.592	0.515	0.451	0.399	0.355	0.319	0.290	0.244	0.210	6.251
700HCB173	1687	0.962	0.881	0.791	0.704	0.624	0.555	0.496	0.447	0.405	0.370	0.339	0.291	0.255	6.746
700HCB212	1921	0.969	0.899	0.823	0.750	0.682	0.622	0.570	0.524	0.484	0.449	0.418	0.367	0.326	7.965
700HCB268	2369	0.972	0.909	0.843	0.780	0.723	0.671	0.625	0.583	0.546	0.513	0.483	0.431	0.389	9.305
700HCB134	1318	0.982	0.917	0.837	0.750	0.664	0.583	0.512	0.451	0.399	0.356	0.319	0.263	0.223	7.157
700HCB167	1629	0.983	0.919	0.842	0.760	0.680	0.605	0.539	0.481	0.432	0.390	0.355	0.299	0.257	7.483
700HCB208	2030	0.984	0.924	0.853	0.778	0.706	0.639	0.580	0.527	0.482	0.442	0.408	0.352	0.309	8.151
700HCB263	2350	0.989	0.935	0.873	0.810	0.749	0.692	0.641	0.595	0.554	0.517	0.484	0.428	0.383	9.557
700HCB307	2779	0.992	0.944	0.891	0.837	0.786	0.739	0.695	0.655	0.618	0.585	0.554	0.501	0.456	11.431

**Key**  Slenderness Reduction Factor  $\alpha_s$  not less than 1/1.75

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

### High Capacity Beams (HCB)

Designation	Design Moment Capacities $\phi M_{sx}$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
800HCB140	1522	1494	1393	1269	1133	997	871	759	663	583	515	460	374	313
800HCB175	1923	1886	1759	1604	1438	1274	1123	989	875	778	696	628	521	444
800HCB218	2396	2354	2203	2022	1831	1645	1473	1321	1188	1074	977	894	761	660
800HCB276	2782	2745	2587	2402	2209	2022	1849	1693	1555	1433	1326	1232	1075	952
800HCB319	3282	3248	3080	2887	2692	2504	2330	2170	2026	1897	1780	1675	1494	1344
800HCB216	2391	2391	2291	2156	2002	1839	1676	1520	1375	1245	1129	1027	861	736
800HCB278	3040	3040	2916	2751	2566	2372	2182	2000	1833	1682	1546	1426	1226	1070
800HCB345	3488	3488	3370	3202	3017	2826	2638	2459	2293	2140	2001	1875	1658	1481
800HCB400	4114	4114	3995	3818	3625	3431	3241	3060	2891	2735	2590	2456	2220	2020
1000HCB190	2490	2437	2266	2055	1826	1600	1391	1208	1052	922	815	726	590	493
1000HCB222	2996	2943	2750	2514	2260	2009	1775	1568	1390	1238	1110	1003	835	712
1000HCB272	3487	3439	3233	2984	2718	2456	2212	1993	1800	1633	1489	1365	1165	1014
1000HCB345	4348	4289	4041	3750	3447	3153	2881	2636	2418	2227	2059	1911	1666	1473
1000HCB235	3166	3165	3018	2828	2610	2377	2144	1921	1716	1533	1372	1233	1010	846
1000HCB274	3791	3791	3635	3423	3181	2924	2666	2420	2191	1985	1801	1640	1377	1176
1000HCB348	4434	4434	4274	4048	3791	3520	3251	2993	2753	2533	2336	2159	1863	1629
1000HCB403	5245	5245	5080	4834	4560	4275	3994	3726	3474	3243	3032	2840	2511	2241
1200HCB254	3901	3896	3710	3469	3190	2893	2594	2309	2047	1815	1611	1436	1159	957
1200HCB329	5128	5116	4866	4546	4181	3796	3415	3054	2726	2435	2181	1963	1614	1357
1200HCB373	5591	5591	5368	5063	4713	4343	3973	3618	3289	2990	2724	2489	2103	1807
1200HCB463	6886	6886	6623	6262	5857	5434	5015	4615	4245	3909	3607	3337	2885	2528
1200HCB301	4765	4765	4725	4558	4354	4122	3871	3608	3342	3082	2832	2597	2182	1843
1200HCB389	6326	6326	6262	6034	5758	5446	5112	4766	4421	4085	3766	3468	2945	2517
1200HCB484	7310	7310	7262	7019	6727	6399	6048	5686	5324	4971	4635	4318	3754	3282
1200HCB601	9006	9006	8953	8662	8317	7934	7530	7117	6709	6313	5936	5581	4945	4405
1500HCB374	6796	6796	6696	6427	6101	5731	5334	4923	4513	4116	3742	3397	2800	2326
1500HCB427	8424	8424	8313	7989	7597	7154	6677	6185	5694	5218	4768	4351	3626	3046
1500HCB531	9752	9752	9659	9312	8893	8419	7910	7384	6857	6344	5856	5400	4596	3938
1500HCB659	12039	12039	11932	11512	11010	10447	9847	9233	8622	8030	7467	6941	6011	5240
1500HCB418	7520	7520	7520	7381	7150	6880	6578	6252	5909	5557	5204	4856	4199	3615

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Beams (HCB)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
800HCB140	1522	0.981	0.915	0.834	0.744	0.655	0.572	0.499	0.436	0.383	0.339	0.302	0.246	0.206	7.012
800HCB175	1923	0.981	0.915	0.835	0.748	0.663	0.584	0.515	0.455	0.404	0.362	0.327	0.271	0.231	7.172
800HCB218	2396	0.982	0.919	0.844	0.764	0.686	0.615	0.551	0.496	0.448	0.408	0.373	0.317	0.275	7.667
800HCB276	2782	0.987	0.930	0.863	0.794	0.727	0.665	0.609	0.559	0.515	0.477	0.443	0.386	0.342	8.735
800HCB319	3282	0.990	0.938	0.880	0.820	0.763	0.710	0.661	0.618	0.578	0.542	0.510	0.455	0.410	10.175
800HCB216	2391	1.000	0.958	0.902	0.837	0.769	0.701	0.636	0.575	0.520	0.472	0.430	0.360	0.308	9.056
800HCB278	3040	1.000	0.959	0.905	0.844	0.780	0.718	0.658	0.603	0.553	0.509	0.469	0.403	0.352	9.620
800HCB345	3488	1.000	0.966	0.918	0.865	0.810	0.756	0.705	0.657	0.614	0.574	0.538	0.475	0.425	11.061
800HCB400	4114	1.000	0.971	0.928	0.881	0.834	0.788	0.744	0.703	0.665	0.630	0.597	0.540	0.491	12.852
1000HCB190	2490	0.979	0.910	0.825	0.734	0.643	0.559	0.485	0.423	0.371	0.327	0.291	0.237	0.198	6.843
1000HCB222	2996	0.982	0.918	0.839	0.754	0.671	0.593	0.524	0.464	0.413	0.371	0.335	0.279	0.238	7.293
1000HCB272	3487	0.986	0.927	0.856	0.779	0.704	0.634	0.571	0.516	0.468	0.427	0.392	0.334	0.291	7.999
1000HCB345	4348	0.987	0.930	0.863	0.793	0.725	0.663	0.606	0.556	0.512	0.474	0.440	0.383	0.339	8.683
1000HCB235	3166	1.000	0.953	0.893	0.824	0.751	0.677	0.607	0.542	0.484	0.433	0.389	0.319	0.267	8.533
1000HCB274	3791	1.000	0.959	0.903	0.839	0.771	0.703	0.638	0.578	0.523	0.475	0.433	0.363	0.310	9.113
1000HCB348	4434	1.000	0.964	0.913	0.855	0.794	0.733	0.675	0.621	0.571	0.527	0.487	0.420	0.368	9.999
1000HCB403	5245	1.000	0.969	0.922	0.869	0.815	0.761	0.710	0.662	0.618	0.578	0.542	0.479	0.427	11.170
1200HCB254	3901	0.999	0.951	0.889	0.818	0.742	0.665	0.592	0.525	0.465	0.413	0.368	0.297	0.245	8.295
1200HCB329	5128	0.998	0.949	0.887	0.815	0.740	0.666	0.596	0.532	0.475	0.425	0.383	0.315	0.265	8.366
1200HCB373	5591	1.000	0.960	0.906	0.843	0.777	0.711	0.647	0.588	0.535	0.487	0.445	0.376	0.323	9.302
1200HCB463	6886	1.000	0.962	0.909	0.851	0.789	0.728	0.670	0.617	0.568	0.524	0.485	0.419	0.367	9.919
1200HCB301	4765	1.000	0.992	0.957	0.914	0.865	0.812	0.757	0.701	0.647	0.594	0.545	0.458	0.387	11.455
1200HCB389	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	11.497
1200HCB484	7310	1.000	0.993	0.960	0.920	0.875	0.827	0.778	0.728	0.680	0.634	0.591	0.513	0.449	12.468
1200HCB601	9006	1.000	0.994	0.962	0.924	0.881	0.836	0.790	0.745	0.701	0.659	0.620	0.549	0.489	13.331
1500HCB374	6796	1.000	0.985	0.946	0.898	0.843	0.785	0.724	0.664	0.606	0.551	0.500	0.412	0.342	10.622
1500HCB427	8424	1.000	0.987	0.948	0.902	0.849	0.793	0.734	0.676	0.619	0.566	0.516	0.430	0.362	10.893
1500HCB531	9752	1.000	0.991	0.955	0.912	0.863	0.811	0.757	0.703	0.651	0.601	0.554	0.471	0.404	11.613
1500HCB659	12039	1.000	0.991	0.956	0.914	0.868	0.818	0.767	0.716	0.667	0.620	0.577	0.499	0.435	12.114
1500HCB418	7520	1.000	1.000	0.982	0.951	0.915	0.875	0.831	0.786	0.739	0.692	0.646	0.558	0.481	13.680



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

### High Capacity Beams (HCB)

Designation	Design Moment Capacities $\phi M_b$ (kNm) for Effective Length in metres													
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16
1500HCB527	10019	10019	10019	9810	9492	9122	8711	8270	7809	7341	6874	6418	5564	4812
1500HCB655	12006	12006	12006	11785	11421	10999	10532	10032	9512	8984	8458	7945	6980	6126
1500HCB823	14913	14913	14913	14646	14202	13692	13132	12538	11925	11307	10696	10101	8988	8000

## Slenderness Reduction Factor $\alpha_s$ for Members Without Full Lateral Restraint Subject to Bending about x-axis

### High Capacity Beams (HCB)

Designation	Slenderness Reduction Factor $\alpha_s$ For Effective Length in metres														Effective Length For $\alpha_s=1/1.75$
	$\phi M_{sx}$	2	3	4	5	6	7	8	9	10	11	12	14	16	
1500HCB527	10019	1.000	1.000	0.979	0.947	0.911	0.870	0.825	0.779	0.733	0.686	0.641	0.555	0.480	13.606
1500HCB655	11792	1.000	1.000	0.983	0.953	0.918	0.880	0.839	0.796	0.753	0.709	0.667	0.587	0.516	14.412
1500HCB823	14647	1.000	1.000	0.983	0.954	0.920	0.883	0.844	0.803	0.762	0.722	0.682	0.608	0.542	15.066

**Key**  Slenderness Reduction Factor  $\alpha_s$  not less than 1/1.75

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

### High Capacity Columns (HCC)

Designation	Design Axial Capacities $\phi N_{ex}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
327HCC156	5382	5340	5196	5044	4880	4696	4487	4251	3986	3698	3398	3098	2546	2088
327HCC165	5681	5632	5476	5313	5134	4934	4707	4449	4160	3847	3524	3204	2620	2143
327HCC176	6055	5995	5826	5647	5451	5231	4979	4692	4373	4029	3676	3332	2711	2210
327HCC197	6777	6718	6533	6337	6124	5885	5613	5304	4958	4585	4198	3816	3120	2551
327HCC207	7132	7063	6864	6654	6424	6164	5869	5533	5157	4754	4339	3934	3202	2611
327HCC222	7629	7546	7328	7096	6841	6553	6224	5848	5430	4984	4531	4093	3314	2694
327HCC243	7917	7849	7634	7406	7158	6880	6565	6206	5805	5371	4921	4476	3663	2996
327HCC257	8384	8303	8069	7822	7551	7247	6900	6504	6064	5589	5102	4625	3766	3070
327HCC272	8739	8649	8403	8141	7854	7530	7160	6739	6269	5766	5253	4753	3858	3141
327HCC300	9773	9673	9398	9105	8785	8423	8010	7540	7016	6454	5881	5322	4322	3518
327HCC315	10100	9991	9703	9397	9060	8680	8245	7749	7198	6609	6010	5430	4399	3576
327HCC332	10672	10544	10233	9902	9535	9119	8642	8098	7495	6855	6212	5595	4512	3658
400HCC189	6507	6507	6384	6241	6092	5932	5757	5565	5351	5115	4857	4580	3995	3424
400HCC200	6885	6885	6746	6592	6431	6257	6067	5856	5623	5364	5081	4779	4147	3539
400HCC214	7357	7358	7199	7031	6853	6661	6451	6218	5958	5670	5356	5022	4331	3678
400HCC239	8208	8208	8044	7861	7669	7463	7237	6988	6711	6404	6069	5710	4959	4235
400HCC252	8662	8662	8478	8282	8074	7851	7606	7334	7032	6697	6331	5942	5134	4366
400HCC270	9297	9296	9086	8869	8639	8391	8118	7814	7475	7099	6691	6257	5371	4543
400HCC295	9619	9619	9432	9220	8996	8757	8496	8208	7888	7533	7146	6730	5858	5011
400HCC313	10224	10224	10011	9779	9536	9273	8986	8668	8313	7921	7493	7036	6086	5181
400HCC333	10685	10685	10453	10208	9950	9671	9365	9025	8646	8227	7770	7284	6279	5330
400HCC366	11916	11916	11664	11393	11107	10799	10462	10087	9671	9210	8706	8170	7058	6001
400HCC385	12348	12348	12078	11793	11493	11169	10814	10419	9978	9491	8959	8394	7230	6132
400HCC408	13104	13098	12799	12490	12163	11808	11417	10982	10496	9958	9373	8754	7495	6327
500HCC315	10822	10822	10758	10573	10384	10187	9981	9760	9523	9267	8988	8686	8011	7260
500HCC332	11410	11410	11333	11134	10931	10719	10496	10257	10000	9722	9418	9089	8353	7540
500HCC356	12234	12234	12137	11919	11695	11462	11215	10950	10664	10353	10014	9645	8823	7923
500HCC390	12713	12713	12646	12431	12212	11984	11745	11491	11218	10922	10602	10255	9478	8611
500HCC413	13507	13507	13421	13188	12950	12702	12440	12161	11861	11536	11182	10798	9940	8989
500HCC440	14112	14112	14014	13768	13515	13252	12975	12679	12359	12012	11635	11225	10310	9300

# Design Axial Capacities for Members Without Full Lateral Restraint Subject to Bending about y-axis

## High Capacity Columns (HCC)

Designation	Design Axial Capacities $\phi N_{e,y}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
327HCC156	5375	5120	4833	4483	4048	3540	3015	2536	2130	1800	1533	1318	1000	782
327HCC165	5667	5389	5075	4687	4204	3646	3082	2577	2157	1817	1546	1327	1005	786
327HCC176	6030	5725	5373	4936	4391	3770	3158	2624	2187	1838	1560	1338	1012	790
327HCC197	6771	6453	6096	5662	5123	4491	3834	3230	2717	2297	1958	1684	1278	1000
327HCC207	7118	6774	6384	5906	5311	4621	3917	3282	2751	2320	1974	1696	1285	1005
327HCC222	7602	7220	6783	6241	5565	4791	4024	3349	2795	2350	1996	1712	1295	1012
327HCC243	7917	7564	7167	6689	6099	5400	4657	3954	3343	2837	2424	2088	1588	1245
327HCC257	8379	7988	7550	7019	6360	5586	4779	4032	3394	2872	2449	2107	1600	1252
327HCC272	8727	8311	7842	7269	6556	5725	4870	4092	3435	2901	2470	2123	1610	1260
327HCC300	9773	9344	8858	8275	7555	6703	5791	4924	4169	3540	3026	2608	1985	1555
327HCC315	10100	9642	9129	8510	7745	6841	5884	4986	4210	3569	3048	2624	1995	1563
327HCC332	10663	10163	9600	8917	8068	7074	6040	5089	4281	3619	3085	2653	2014	1576
400HCC189	6507	6290	6014	5696	5316	4860	4342	3804	3294	2842	2456	2133	1639	1292
400HCC200	6885	6639	6337	5985	5561	5052	4481	3898	3356	2884	2486	2154	1651	1300
400HCC214	7358	7075	6737	6341	5858	5281	4642	4006	3427	2932	2519	2179	1665	1309
400HCC239	8208	7939	7594	7198	6725	6158	5512	4838	4196	3624	3135	2724	2095	1652
400HCC252	8662	8359	7983	7547	7022	6393	5683	4955	4274	3677	3172	2751	2110	1662
400HCC270	9297	8945	8522	8028	7426	6706	5906	5105	4374	3745	3220	2786	2131	1675
400HCC295	9619	9328	8941	8500	7977	7352	6634	5870	5126	4450	3864	3367	2598	2053
400HCC313	10224	9891	9463	8972	8385	7682	6881	6043	5244	4531	3921	3408	2622	2068
400HCC333	10685	10319	9860	9329	8691	7927	7063	6171	5332	4593	3965	3441	2642	2081
400HCC366	11916	11560	11083	10541	9898	9132	8250	7309	6389	5551	4823	4204	3246	2565
400HCC385	12348	11963	11458	10881	10195	9374	8434	7441	6481	5616	4869	4238	3266	2579
400HCC408	13104	12666	12111	11472	10705	9786	8743	7659	6632	5722	4946	4296	3301	2602
500HCC315	10822	10677	10353	10006	9620	9180	8673	8095	7458	6790	6126	5497	4410	3564
500HCC332	11410	11240	10888	10509	10085	9599	9037	8397	7697	6971	6260	5596	4465	3597
500HCC356	12234	12026	11633	11208	10727	10172	9529	8799	8009	7204	6431	5721	4535	3640
500HCC390	12713	12566	12198	11807	11375	10885	10324	9684	8974	8219	7457	6723	5430	4406
500HCC413	13507	13327	12924	12491	12010	11462	10831	10112	9319	8486	7657	6873	5515	4457
500HCC440	14112	13906	13474	13010	12490	11896	11209	10427	9570	8678	7802	6980	5577	4496

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

### High Capacity Columns (HCC)

Designation	Design Axial Capacities $\phi N_{x,x}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
500HCC485	15804	15804	15703	15430	15151	14861	14555	14228	13877	13496	13081	12632	11627	10514
500HCC510	16380	16380	16267	15981	15689	15384	15062	14719	14348	13946	13509	13034	11973	10802
500HCC542	17388	17388	17250	16940	16622	16290	15939	15562	15156	14713	14231	13707	12539	11259
600HCC386	13262	13262	13262	13118	12931	12740	12543	12338	12123	11895	11653	11395	10823	10171
600HCC407	13986	13986	13986	13820	13619	13414	13202	12980	12748	12501	12239	11958	11335	10625
600HCC436	14999	14999	14999	14802	14581	14355	14121	13877	13619	13346	13054	12740	12044	11250
600HCC479	15606	15606	15606	15448	15231	15010	14782	14545	14297	14035	13757	13461	12805	12059
600HCC507	16589	16589	16589	16402	16166	15926	15677	15418	15147	14859	14554	14227	13503	12677
600HCC540	17338	17338	17338	17132	16882	16628	16364	16090	15802	15496	15171	14822	14050	13169
600HCC597	19440	19440	19440	19224	18949	18667	18377	18075	17758	17423	17066	16685	15840	14878
600HCC628	20160	20160	20160	19925	19636	19341	19037	18720	18386	18033	17657	17255	16363	15346
600HCC667	21420	21420	21420	21146	20832	20512	20180	19834	19469	19082	18668	18226	17241	16120

## Design Axial Capacities for Members Without Full Lateral Restraint Subject to Bending about y-axis

### High Capacity Columns (HCC)

Designation	Design Axial Capacities $\phi N_{e,y}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
500HCC485	15804	15624	15168	14683	14148	13543	12849	12058	11180	10246	9300	8389	6780	5504
500HCC510	16380	16177	15695	15182	14612	13965	13222	12375	11438	10447	9453	8504	6847	5545
500HCC542	17388	17143	16615	16049	15417	14694	13861	12911	11868	10779	9704	8692	6956	5613
600HCC386	13262	13227	12908	12577	12224	11838	11409	10928	10388	9792	9150	8482	7162	5984
600HCC407	13986	13931	13585	13225	12839	12415	11941	11407	10809	10149	9444	8717	7306	6072
600HCC436	14999	14914	14529	14127	13692	13212	12671	12060	11374	10622	9827	9019	7487	6182
600HCC479	15606	15586	15223	14847	14449	14015	13535	13000	12401	11738	11020	10265	8743	7352
600HCC507	16589	16544	16146	15732	15290	14808	14271	13668	12994	12248	11446	10610	8959	7485
600HCC540	17338	17273	16847	16403	15928	15406	14823	14168	13433	12622	11754	10858	9112	7581
600HCC597	19440	19417	18965	18499	18003	17464	16869	16204	15461	14638	13746	12808	10915	9182
600HCC628	20160	20120	19642	19148	18622	18048	17411	16699	15901	15019	14066	13069	11080	9286
600HCC667	21420	21347	20824	20280	19697	19059	18347	17547	16650	15660	14598	13499	11349	9453

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

### High Capacity Beam-Columns (HCBC)

Designation	Design Axial Capacities $\phi N_{ex}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
400HCBC158	5443	5440	5316	5187	5051	4904	4741	4560	4358	4134	3890	3633	3109	2624
400HCBC171	5897	5887	5749	5605	5453	5287	5103	4897	4667	4413	4138	3849	3270	2745
400HCBC195	6394	6392	6246	6096	5936	5764	5574	5363	5127	4866	4582	4281	3668	3099
400HCBC212	6998	6987	6822	6652	6470	6273	6055	5810	5537	5234	4907	4564	3877	3253
400HCBC240	7884	7872	7687	7496	7293	7072	6828	6554	6248	5910	5543	5159	4387	3684
400HCBC287	8316	8298	8100	7895	7677	7439	7174	6878	6546	6180	5784	5370	4548	3808
400HCBC176	6048	6048	5913	5773	5625	5465	5289	5093	4875	4633	4370	4090	3517	2978
400HCBC189	6502	6496	6346	6191	6027	5849	5652	5433	5188	4916	4622	4311	3682	3102
400HCBC217	7099	7099	6943	6780	6607	6420	6215	5988	5734	5453	5147	4821	4151	3520
400HCBC234	7704	7698	7520	7337	7142	6931	6699	6439	6149	5827	5479	5111	4365	3679
400HCBC268	8766	8759	8558	8349	8129	7889	7625	7330	7001	6636	6240	5823	4975	4194
400HCBC290	9198	9185	8971	8749	8513	8257	7973	7656	7302	6909	6485	6038	5140	4320
500HCBC174	5983	5983	5923	5811	5696	5576	5448	5310	5160	4996	4817	4622	4190	3726
500HCBC191	6572	6572	6495	6369	6239	6102	5955	5797	5624	5434	5227	5001	4504	3978
500HCBC214	7069	7069	6999	6868	6734	6593	6442	6281	6105	5913	5704	5476	4971	4426
500HCBC237	7862	7862	7771	7620	7464	7300	7125	6935	6728	6502	6253	5983	5389	4760
500HCBC265	8748	8748	8651	8486	8315	8135	7943	7736	7510	7263	6992	6698	6049	5357
500HCBC290	9324	9324	9213	9034	8848	8653	8444	8217	7970	7699	7403	7080	6371	5621
500HCBC192	6588	6588	6528	6407	6283	6154	6017	5869	5708	5534	5343	5135	4674	4174
500HCBC209	7177	7177	7101	6966	6827	6681	6526	6358	6175	5976	5757	5520	4994	4432
500HCBC236	7774	7774	7706	7565	7420	7268	7108	6935	6748	6545	6322	6080	5543	4958
500HCBC259	8568	8568	8478	8317	8152	7978	7793	7593	7376	7138	6878	6596	5971	5301
500HCBC293	9630	9630	9534	9355	9171	8978	8773	8552	8311	8049	7762	7449	6758	6013
500HCBC318	10206	10206	10096	9904	9705	9497	9275	9035	8774	8488	8175	7836	7084	6282
600HCBC207	7128	7128	7124	7015	6905	6791	6674	6550	6419	6279	6128	5966	5605	5194
600HCBC228	7852	7852	7837	7713	7588	7459	7325	7183	7032	6871	6697	6509	6089	5613
600HCBC256	8449	8449	8447	8319	8189	8056	7918	7773	7619	7455	7279	7090	6668	6188
600HCBC284	9432	9432	9415	9267	9117	8963	8801	8632	8451	8258	8049	7825	7322	6753
600HCBC318	10494	10494	10482	10320	10156	9987	9811	9625	9429	9219	8993	8750	8206	7588
600HCBC349	11214	11214	11194	11018	10840	10656	10464	10262	10047	9817	9569	9302	8705	8028

## Design Axial Capacities for Members Without Full Lateral Restraint Subject to Bending about y-axis

### High Capacity Beam-Columns (HCBC)

Designation	Design Axial Capacities $\phi N_{e,y}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
400HCBC158	5286	4829	4202	3385	2584	1962	1517	1200	970	799	669	568	424	328
400HCBC171	5709	5187	4457	3525	2653	1999	1539	1215	981	807	675	573	427	330
400HCBC195	6224	5711	5017	4103	3172	2426	1883	1493	1208	996	835	709	529	410
400HCBC212	6792	6196	5375	4311	3279	2486	1920	1518	1226	1010	845	718	535	414
400HCBC240	7680	7055	6212	5101	3958	3033	2357	1870	1514	1248	1046	889	664	514
400HCBC287	8088	7408	6483	5270	4054	3092	2396	1898	1535	1265	1060	900	672	520
400HCBC176	5947	5546	5040	4368	3586	2853	2264	1818	1483	1229	1034	880	660	512
400HCBC189	6379	5928	5350	4580	3706	2918	2302	1842	1499	1241	1042	887	664	515
400HCBC217	6995	6542	5980	5238	4355	3500	2795	2253	1842	1529	1287	1097	823	639
400HCBC234	7572	7057	6405	5540	4535	3601	2855	2291	1868	1548	1301	1108	830	645
400HCBC268	8641	8087	7401	6497	5418	4365	3491	2816	2303	1913	1610	1373	1030	800
400HCBC290	9055	8459	7713	6727	5563	4452	3546	2853	2330	1933	1626	1386	1039	807
500HCBC174	5789	5253	4500	3543	2658	1999	1538	1213	979	805	674	572	426	330
500HCBC191	6335	5706	4808	3701	2734	2041	1564	1230	991	815	681	577	430	333
500HCBC214	6856	6248	5407	4320	3277	2480	1914	1512	1221	1006	842	714	533	412
500HCBC237	7595	6871	5846	4559	3398	2547	1956	1542	1243	1022	855	725	540	418
500HCBC265	8489	7746	6719	5388	4099	3107	2400	1897	1533	1262	1057	897	669	518
500HCBC290	9030	8208	7061	5593	4215	3178	2448	1932	1560	1284	1074	911	680	526
500HCBC192	6460	5999	5405	4615	3723	2925	2304	1842	1499	1240	1042	886	663	515
500HCBC209	7018	6488	5792	4866	3859	2998	2347	1869	1517	1254	1052	894	669	518
500HCBC236	7638	7114	6449	5566	4545	3602	2852	2287	1865	1545	1298	1105	828	643
500HCBC259	8393	7781	6987	5929	4752	3716	2920	2331	1895	1567	1315	1119	837	649
500HCBC293	9466	8822	8006	6925	5669	4502	3568	2864	2335	1935	1626	1385	1038	806
500HCBC318	10016	9311	8409	7209	5842	4605	3634	2909	2368	1960	1647	1402	1050	814
600HCBC207	6971	6447	5758	4842	3843	2987	2339	1863	1513	1250	1049	892	667	517
600HCBC228	7654	7039	6214	5123	3990	3065	2385	1893	1533	1265	1060	901	673	521
600HCBC256	8279	7679	6902	5868	4712	3690	2902	2317	1884	1558	1308	1113	833	646
600HCBC284	9210	8493	7542	6280	4937	3813	2976	2366	1919	1584	1328	1129	844	654
600HCBC318	10287	9546	8590	7318	5889	4619	3635	2905	2363	1954	1641	1396	1045	811
600HCBC349	10972	10151	9077	7649	6084	4735	3710	2957	2402	1985	1665	1416	1059	821



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

### High Capacity Beam-Columns (HCBC)

Designation	Design Axial Capacities $\phi N_{e,x}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
600HCBC232	7992	7992	7992	7875	7755	7631	7502	7367	7225	7073	6911	6736	6347	5904
600HCBC253	8716	8716	8708	8575	8439	8300	8155	8003	7841	7669	7484	7284	6838	6332
600HCBC287	9457	9457	9457	9324	9183	9038	8887	8730	8564	8387	8198	7995	7542	7027
600HCBC316	10440	10440	10433	10274	10112	9946	9774	9592	9400	9195	8975	8737	8208	7606
600HCBC357	11754	11754	11753	11576	11396	11212	11021	10820	10608	10381	10138	9877	9294	8631
600HCBC389	12474	12474	12465	12275	12081	11882	11676	11458	11228	10982	10718	10434	9799	9077
700HCBC248	8532	8532	8532	8476	8365	8253	8138	8019	7896	7766	7630	7485	7168	6809
700HCBC273	9391	9391	9391	9316	9190	9063	8932	8797	8656	8507	8350	8184	7817	7400
700HCBC307	10132	10132	10132	10071	9941	9809	9674	9534	9389	9238	9078	8909	8539	8120
700HCBC341	11304	11304	11304	11216	11066	10913	10757	10595	10426	10248	10060	9861	9423	8925
700HCBC382	12618	12618	12618	12531	12366	12198	12027	11850	11665	11471	11267	11051	10576	10037
700HCBC420	13482	13482	13482	13379	13200	13018	12832	12639	12438	12227	12004	11767	11246	10655
700HCBC286	9828	9828	9828	9776	9652	9526	9398	9265	9127	8984	8832	8673	8324	7929
700HCBC311	10687	10687	10687	10617	10478	10338	10194	10045	9890	9728	9557	9376	8979	8530
700HCBC354	11644	11644	11644	11589	11444	11297	11146	10992	10831	10663	10487	10302	9896	9439
700HCBC388	12816	12816	12816	12736	12571	12404	12233	12056	11872	11679	11477	11262	10791	10259
700HCBC441	14508	14508	14508	14428	14244	14057	13866	13669	13465	13251	13026	12789	12269	11681
700HCBC479	15372	15372	15372	15277	15079	14878	14673	14461	14240	14009	13766	13509	12945	12306
800HCBC264	8548	8548	8548	8548	8415	8273	8131	7989	7845	7699	7551	7399	7083	6748
800HCBC293	10066	10066	10066	10046	9928	9809	9687	9563	9434	9301	9161	9015	8698	8344
800HCBC327	10807	10807	10807	10806	10683	10560	10435	10307	10176	10040	9898	9750	9431	9077
800HCBC366	12168	12168	12168	12147	12005	11861	11715	11565	11410	11250	11082	10907	10526	10101
800HCBC407	13482	13482	13482	13471	13316	13160	13001	12839	12671	12498	12318	12129	11721	11266
800HCBC451	14490	14490	14490	14468	14300	14129	13956	13779	13596	13406	13208	13000	12551	12049
800HCBC301	9844	9844	9844	9844	9709	9549	9390	9230	9068	8905	8738	8568	8215	7842
800HCBC330	11362	11362	11362	11355	11226	11095	10962	10826	10686	10542	10391	10233	9893	9514
800HCBC374	12319	12319	12319	12319	12198	12062	11923	11783	11638	11489	11334	11172	10826	10442
800HCBC413	13680	13680	13680	13676	13521	13365	13206	13044	12877	12704	12524	12336	11931	11479
800HCBC466	15372	15372	15372	15372	15208	15035	14860	14681	14497	14308	14110	13904	13461	12969
800HCBC510	16380	16380	16380	16378	16193	16006	15817	15623	15424	15218	15003	14779	14296	13759

## Design Axial Capacities for Members Without Full Lateral Restraint Subject to Bending about y-axis

### High Capacity Beam-Columns (HCBC)

Designation	Design Axial Capacities $\phi N_{e,y}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
600HCBC232	7923	7475	6943	6261	5416	4512	3691	3018	2490	2079	1757	1502	1131	881
600HCBC253	8620	8107	7486	6681	5694	4676	3786	3077	2529	2106	1777	1517	1141	887
600HCBC287	9390	8877	8274	7509	6556	5513	4543	3732	3088	2583	2186	1870	1410	1099
600HCBC316	10339	9741	9024	8100	6961	5760	4690	3824	3150	2626	2218	1895	1426	1110
600HCBC357	11673	11038	10294	9350	8174	6884	5678	4668	3864	3233	2736	2342	1766	1377
600HCBC389	12370	11675	10852	9799	8492	7087	5805	4752	3923	3276	2769	2368	1784	1389
700HCBC248	8443	7946	7349	6574	5623	4632	3760	3060	2517	2097	1770	1511	1137	885
700HCBC273	9268	8690	7980	7049	5925	4806	3860	3122	2558	2126	1791	1528	1147	892
700HCBC307	10041	9470	8789	7914	6832	5679	4639	3790	3126	2609	2204	1884	1418	1104
700HCBC341	11170	10491	9665	8588	7276	5943	4795	3888	3191	2655	2239	1910	1436	1116
700HCBC382	12507	11798	10955	9872	8532	7101	5805	4745	3914	3267	2761	2360	1777	1384
700HCBC420	13342	12557	11613	10390	8887	7322	5943	4837	3979	3315	2798	2389	1797	1399
700HCBC286	9828	9431	8968	8419	7747	6946	6069	5209	4439	3787	3248	2805	2141	1680
700HCBC311	10687	10215	9682	9042	8252	7317	6317	5369	4544	3857	3297	2841	2162	1694
700HCBC354	11644	11202	10672	10051	9295	8391	7387	6383	5467	4680	4023	3481	2662	2093
700HCBC388	12816	12276	11655	10916	10007	8926	7755	6625	5627	4789	4100	3537	2696	2115
700HCBC441	14508	13960	13302	12530	11593	10472	9225	7976	6835	5853	5032	4354	3331	2618
700HCBC479	15372	14755	14032	13177	12132	10884	9516	8172	6968	5946	5100	4406	3363	2640
800HCBC264	8414	7696	6912	6013	5055	4162	3412	2813	2343	1973	1680	1445	1099	861
800HCBC293	9914	9267	8461	7397	6135	4921	3925	3161	2583	2143	1804	1537	1153	896
800HCBC327	10691	10058	9294	8303	7088	5828	4724	3842	3159	2631	2220	1896	1425	1109
800HCBC366	11998	11235	10291	9049	7562	6103	4886	3944	3228	2681	2257	1924	1444	1122
800HCBC407	13340	12552	11603	10373	8863	7295	5917	4814	3959	3298	2783	2377	1787	1391
800HCBC451	14311	13431	12357	10953	9249	7532	6065	4912	4029	3350	2824	2409	1810	1407
800HCBC301	9844	9255	8609	7903	7117	6275	5443	4682	4022	3465	3001	2615	2026	1608
800HCBC330	11356	10828	10236	9518	8629	7583	6490	5478	4614	3904	3330	2865	2175	1703
800HCBC374	12319	11821	11239	10550	9707	8702	7601	6522	5558	4741	4065	3511	2679	2103
800HCBC413	13680	13063	12370	11536	10504	9286	7993	6777	5725	4855	4146	3571	2715	2127
800HCBC466	15372	14753	14028	13171	12123	10872	9501	8157	6953	5932	5088	4394	3354	2633
800HCBC510	16380	15677	14873	13913	12731	11327	9815	8366	7095	6032	5161	4450	3389	2657

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

## High Capacity Beam-Columns (HCBC)

Designation	Design Axial Capacities $\phi N_{ex}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
1000HCBC295	8548	8548	8548	8548	8548	8468	8358	8248	8139	8029	7919	7807	7580	7345
1000HCBC332	10489	10489	10489	10489	10474	10328	10184	10039	9894	9749	9602	9453	9148	8830
1000HCBC366	11366	11366	11366	11366	11366	11221	11068	10916	10764	10611	10457	10302	9983	9653
1000HCBC416	13896	13896	13896	13896	13857	13724	13590	13455	13317	13175	13030	12881	12566	12225
1000HCBC458	15210	15210	15210	15210	15184	15042	14898	14753	14606	14456	14302	14143	13810	13449
1000HCBC514	16506	16506	16506	16506	16467	16311	16153	15993	15831	15665	15495	15320	14951	14551
1000HCBC333	9844	9844	9844	9844	9844	9765	9641	9517	9393	9269	9144	9019	8762	8498
1000HCBC370	11785	11785	11785	11785	11785	11630	11471	11313	11154	10995	10835	10672	10341	9996
1000HCBC413	12882	12882	12882	12882	12882	12744	12576	12408	12240	12072	11902	11731	11382	11020
1000HCBC463	15408	15408	15408	15408	15389	15246	15103	14958	14810	14660	14506	14347	14015	13656
1000HCBC517	17100	17100	17100	17100	17095	16940	16784	16627	16467	16305	16138	15967	15609	15223
1000HCBC573	18396	18396	18396	18396	18380	18211	18041	17869	17694	17516	17334	17147	16754	16330
1000HCBC393	11918	11918	11918	11918	11918	11840	11692	11546	11399	11252	11104	10955	10652	10340
1000HCBC430	13859	13859	13859	13859	13859	13709	13528	13347	13166	12985	12802	12618	12241	11851
1000HCBC488	15304	15304	15304	15304	15304	15176	14982	14789	14596	14402	14207	14010	13610	13197
1000HCBC539	17827	17827	17827	17827	17827	17677	17518	17357	17193	17027	16857	16683	16319	15927
1000HCBC611	20124	20124	20124	20124	20124	19974	19797	19619	19439	19255	19068	18875	18474	18045
1000HCBC667	21420	21420	21420	21420	21420	21246	21055	20863	20668	20469	20267	20059	19624	19158
1200HCBC364	9844	9844	9844	9844	9844	9844	9806	9705	9604	9504	9403	9303	9100	8895
1200HCBC409	11785	11785	11785	11785	11785	11785	11685	11557	11429	11301	11173	11045	10786	10521
1200HCBC452	12925	12925	12925	12925	12925	12925	12842	12705	12568	12432	12295	12158	11882	11601
1200HCBC514	16318	16318	16318	16318	16318	16293	16104	15916	15729	15541	15353	15164	14780	14388
1200HCBC567	18181	18181	18181	18181	18181	18172	17894	17618	17342	17066	16788	16507	15939	15362
1200HCBC636	20412	20412	20412	20412	20412	20378	20219	20060	19899	19736	19571	19403	19056	18690
1200HCBC425	11918	11918	11918	11918	11918	11918	11884	11764	11644	11524	11405	11285	11044	10800
1200HCBC469	13859	13859	13859	13859	13859	13859	13767	13619	13473	13326	13179	13032	12736	12434
1200HCBC528	15354	15354	15354	15354	15354	15354	15284	15125	14967	14809	14651	14493	14174	13850
1200HCBC589	18741	18741	18741	18741	18741	18741	18550	18342	18134	17926	17718	17509	17087	16655
1200HCBC661	21208	21208	21208	21208	21208	21208	20951	20640	20330	20019	19706	19392	18754	18107
1200HCBC730	23436	23436	23436	23436	23436	23436	23262	23086	22909	22729	22548	22363	21984	21585

# Design Axial Capacities for Members Without Full Lateral Restraint Subject to Bending about y-axis

## High Capacity Beam-Columns (HCBC)

Designation	Design Axial Capacities $\phi N_{cy}$ (kNm) for Effective Length in metres													
	1	2	3	4	5	6	7	8	9	10	11	12	14	16
1000HCBC295	8414	7697	6914	6015	5057	4164	3414	2815	2345	1974	1681	1446	1100	862
1000HCBC332	10232	9252	8150	6886	5610	4506	3631	2959	2444	2046	1734	1487	1125	879
1000HCBC366	11159	10175	9091	7846	6536	5341	4356	3578	2972	2498	2124	1825	1386	1085
1000HCBC416	13647	12702	11497	9897	8058	6373	5039	4038	3290	2724	2289	1949	1460	1133
1000HCBC458	14998	14044	12864	11312	9453	7629	6108	4930	4035	3351	2822	2406	1805	1403
1000HCBC514	16240	15158	13798	11998	9886	7889	6272	5041	4115	3412	2870	2445	1833	1423
1000HCBC333	9844	9256	8610	7904	7118	6276	5445	4684	4023	3466	3002	2617	2027	1609
1000HCBC370	11762	10940	10081	9124	8057	6952	5913	5007	4250	3630	3123	2708	2083	1646
1000HCBC413	12882	12074	11207	10254	9192	8063	6960	5963	5106	4389	3794	3303	2554	2025
1000HCBC463	15373	14625	13776	12734	11435	9931	8405	7034	5891	4966	4224	3628	2749	2149
1000HCBC517	17100	16329	15463	14420	13130	11607	9991	8471	7156	6068	5183	4464	3394	2659
1000HCBC573	18375	17507	16529	15339	13859	12130	10340	8700	7312	6178	5264	4526	3434	2687
1000HCBC393	11918	11626	11078	10512	9912	9261	8560	7825	7086	6375	5716	5121	4127	3363
1000HCBC430	13859	13421	12731	12012	11239	10395	9491	8563	7656	6811	6049	5378	4285	3466
1000HCBC488	15304	14911	14197	13460	12675	11823	10906	9947	8988	8070	7223	6462	5196	4229
1000HCBC539	17827	17435	16810	16120	15327	14395	13311	12100	10835	9601	8466	7460	5841	4653
1000HCBC611	20124	19748	19084	18359	17536	16579	15467	14212	12867	11516	10236	9076	7163	5733
1000HCBC667	21420	20978	20245	19441	18520	17443	16190	14784	13298	11831	10466	9245	7260	5795
1200HCBC364	9844	9256	8610	7905	7119	6278	5446	4685	4024	3467	3003	2618	2028	1610
1200HCBC409	11762	10941	10082	9126	8060	6955	5916	5010	4253	3632	3125	2710	2085	1647
1200HCBC452	12925	12113	11241	10284	9216	8082	6974	5973	5114	4395	3799	3307	2557	2027
1200HCBC514	16228	15033	13769	12348	10772	9178	7724	6488	5476	4657	3994	3455	2648	2087
1200HCBC567	18145	16454	14695	12911	11194	9619	8234	7052	6061	5237	4552	3983	3106	2479
1200HCBC636	20340	19320	18153	16705	14899	12833	10782	8976	7491	6300	5351	4591	3473	2713
1200HCBC425	11918	11626	11078	10513	9912	9262	8561	7826	7087	6376	5717	5121	4127	3363
1200HCBC469	13859	13421	12731	12013	11240	10396	9493	8564	7658	6812	6051	5379	4287	3467
1200HCBC528	15354	14958	14240	13499	12710	11854	10932	9968	9005	8083	7234	6470	5202	4233
1200HCBC589	18741	18076	17105	16087	14983	13777	12492	11190	9939	8793	7775	6887	5459	4400
1200HCBC661	21208	20341	18932	17474	15992	14527	13114	11785	10561	9455	8469	7597	6160	5056
1200HCBC730	23436	22882	22037	21098	20011	18730	17240	15588	13884	12248	10762	9458	7379	5868

## 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 notations, 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  $\epsilon$



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 un stiffened 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. Over sized welds have the potential to increase distortions and lead-times.

Larger fillet welds are available by negotiation, a 12mm fillet can be achieved in a single pass with larger leg lengths requiring multiple passes.

4. For further advice and technical support contact:

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

Facsimile 09-266-3080

**STELTECH STRUCTURAL LTD**