

BEAMS FULLY RESTRAINED ON COMPRESSION FLANGE

Glulam Grade = GL8				k1 = 0.8		SLS Deflection Limit = Span / 400									
Section Size dxb (mm)	Area A (mm <sup>2</sup> )	Section Modulus Z (10 <sup>3</sup> mm <sup>3</sup> )	Moment of Inertia I (10 <sup>6</sup> mm <sup>4</sup> )	φV <sub>n</sub>	Span (m) ≥	φM <sub>b</sub> (kNm) - ULS, w (ULS) (kN/m) & w (SLS, k <sub>2</sub> =1.5) (kN/m) giving deflection = SLS Deflection Limit for Span (Note in both cases w is limited where necessary to prevent shear failure for the span)									
						1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
135 x 65	8775	197	13.3	16.6	φM <sub>b</sub>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
					w (ULS)	17.8	7.9	4.4	2.8	2.0	1.5	1.1	0.9	0.7	0.6
					w (SLS)	13.6	4.0	1.7	0.9	0.5					
180 x 65	11700	351	31.6	22.9	φM <sub>b</sub>	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
					w (ULS)	34.1	15.2	8.5	5.5	3.8	2.8	2.1	1.7	1.4	1.1
					w (SLS)	32.3	9.6	4.0	2.1	1.2	0.8	0.5			
225 x 65	14625	548	61.7	28.6	φM <sub>b</sub>	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
					w (ULS)	56.0	24.9	14.0	9.0	6.2	4.6	3.5	2.8	2.2	1.9
					w (SLS)	63.2	18.7	7.9	4.0	2.3	1.5	1.0	0.7	0.5	
225 x 90	20250	759	85.4	39.6	φM <sub>b</sub>	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
					w (ULS)	77.6	34.5	19.4	12.4	8.6	6.3	4.8	3.8	3.1	2.6
					w (SLS)	87.5	25.9	10.9	5.6	3.2	2.0	1.4	1.0	0.7	0.5
270 x 90	24300	1094	147.6	47.5	φM <sub>b</sub>	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
					w (ULS)	94.9	51.4	28.9	18.5	12.8	9.4	7.2	5.7	4.6	3.8
					w (SLS)		44.8	18.9	9.7	5.6	3.5	2.4	1.7	1.2	0.9
315 x 90	28350	1488	234.4	55.4	φM <sub>b</sub>	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
					w (ULS)		71.2	40.1	25.6	17.8	13.1	10.0	7.9	6.4	5.3
					w (SLS)		71.1	30.0	15.4	8.9	5.6	3.8	2.6	1.9	1.4
360 x 90	32400	1944	349.9	63.3	φM <sub>b</sub>	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1
					w (ULS)		84.4	52.2	33.4	23.2	17.1	13.1	10.3	8.4	6.9
					w (SLS)			44.8	22.9	13.3	8.4	5.6	3.9	2.9	2.2
405 x 90	36450	2460	498.2	71.2	φM <sub>b</sub>	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
					w (ULS)		94.9	65.9	42.2	29.3	21.5	16.5	13.0	10.5	8.7
					w (SLS)			63.8	32.7	18.9	11.9	8.0	5.6	4.1	3.1
450 x 90	40500	3038	683.4	79.1	φM <sub>b</sub>	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
					w (ULS)			79.1	51.9	36.0	26.5	20.3	16.0	13.0	10.7
					w (SLS)			87.5	44.8	25.9	16.3	10.9	7.7	5.6	4.2
495 x 90	44550	3675	909.7	87.0	φM <sub>b</sub>	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8
					w (ULS)			87.0	62.5	43.4	31.9	24.4	19.3	15.6	12.9
					w (SLS)			59.6	34.5	21.7	14.6	10.2	7.5	5.6	
540 x 90	48600	4374	1181	94.9	φM <sub>b</sub>	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9
					w (ULS)			94.9	74.1	51.5	37.8	28.9	22.9	18.5	15.3
					w (SLS)			77.4	44.8	28.2	18.9	13.3	9.7	7.3	
585 x 90	52650	5133	1502	102.8	φM <sub>b</sub>	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6
					w (ULS)				82.3	60.1	44.2	33.8	26.7	21.6	17.9
					w (SLS)				98.4	56.9	35.9	24.0	16.9	12.3	9.2
630 x 90	56700	5954	1875	110.7	φM <sub>b</sub>	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1
					w (ULS)				88.6	69.4	51.0	39.0	30.8	25.0	20.6
					w (SLS)					71.1	44.8	30.0	21.1	15.4	11.5
675 x 135	91125	10252	3460	178.0	φM <sub>b</sub>	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8
					w (ULS)						87.4	66.9	52.9	42.8	35.4
					w (SLS)						82.6	55.4	38.9	28.3	21.3
720 x 135	97200	11664	4199	189.8	φM <sub>b</sub>	151.6	151.6	151.6	151.6	151.6	151.6	151.6	151.6	151.6	151.6
					w (ULS)						99.0	75.8	59.9	48.5	40.1
					w (SLS)							67.2	47.2	34.4	25.8
765 x 135	103275	13168	5037	201.7	φM <sub>b</sub>	170.4	170.4	170.4	170.4	170.4	170.4	170.4	170.4	170.4	170.4
					w (ULS)							85.2	67.3	54.5	45.1
					w (SLS)							80.6	56.6	41.3	31.0
810 x 135	109350	14762	5979	213.6	φM <sub>b</sub>	190.2	190.2	190.2	190.2	190.2	190.2	190.2	190.2	190.2	190.2
					w (ULS)							95.1	75.1	60.9	50.3
					w (SLS)							95.7	67.2	49.0	36.8
855 x 135	115425	16448	7032	225.4	φM <sub>b</sub>	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0
					w (ULS)								83.4	67.5	55.8
					w (SLS)								79.0	57.6	43.3
900 x 135	121500	18225	8201	237.3	φM <sub>b</sub>	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8
					w (ULS)								92.0	74.5	61.6
					w (SLS)								92.2	67.2	50.5
945 x 135	127575	20093	9494	249.2	φM <sub>b</sub>	255.7	255.7	255.7	255.7	255.7	255.7	255.7	255.7	255.7	255.7
					w (ULS)									81.8	67.6
					w (SLS)									77.8	58.4



**BEAMS FULLY RESTRAINED ON COMPRESSION FLANGE – Continued**

Glulam Grade = GL8				k1 = 0.8		SLS Deflection Limit = Span / 400											
Section Size dxb (mm)	Area A (mm <sup>2</sup> )	Section Modulus Z (10 <sup>3</sup> mm <sup>3</sup> )	Moment of Inertia I (10 <sup>6</sup> mm <sup>4</sup> )	φV <sub>n</sub>	Span (m) ≥	φM <sub>b</sub> (kNm) - ULS, w (ULS) (kN/m) & w (SLS, k <sub>2</sub> =1.5) (kN/m) giving deflection = SLS Deflection Limit for Span (Note in both cases w is limited where necessary to prevent shear failure for the span)											
						5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0		
135 x 65	8775	197	13.3	16.6	φM <sub>b</sub>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
						w (ULS)	0.6										
						w (SLS)											
180 x 65	11700	351	31.6	22.9	φM <sub>b</sub>	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	
						w (ULS)	1.1	0.9	0.8	0.7	0.6	0.5					
						w (SLS)											
225 x 65	14625	548	61.7	28.6	φM <sub>b</sub>	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
						w (ULS)	1.9	1.6	1.3	1.1	1.0	0.9	0.8	0.7	0.6	0.6	
						w (SLS)											
225 x 90	20250	759	85.4	39.6	φM <sub>b</sub>	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	
						w (ULS)	2.6	2.2	1.8	1.6	1.4	1.2	1.1	1.0	0.9	0.8	
						w (SLS)	0.5										
270 x 90	24300	1094	147.6	47.5	φM <sub>b</sub>	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	
						w (ULS)	3.8	3.2	2.7	2.4	2.1	1.8	1.6	1.4	1.3	1.2	
						w (SLS)	0.9	0.7	0.6								
315 x 90	28350	1488	234.4	55.4	φM <sub>b</sub>	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
						w (ULS)	5.3	4.5	3.8	3.3	2.8	2.5	2.2	2.0	1.8	1.6	
						w (SLS)	1.4	1.1	0.9	0.7	0.6						
360 x 90	32400	1944	349.9	63.3	φM <sub>b</sub>	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	
						w (ULS)	6.9	5.8	4.9	4.3	3.7	3.3	2.9	2.6	2.3	2.1	
						w (SLS)	2.2	1.7	1.3	1.0	0.8	0.7	0.6				
405 x 90	36450	2460	498.2	71.2	φM <sub>b</sub>	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	
						w (ULS)	8.7	7.3	6.2	5.4	4.7	4.1	3.6	3.3	2.9	2.6	
						w (SLS)	3.1	2.4	1.9	1.5	1.2	1.0	0.8	0.7	0.6	0.5	
450 x 90	40500	3038	683.4	79.1	φM <sub>b</sub>	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	
						w (ULS)	10.7	9.0	7.7	6.6	5.8	5.1	4.5	4.0	3.6	3.2	
						w (SLS)	4.2	3.2	2.5	2.0	1.7	1.4	1.1	1.0	0.8	0.7	
495 x 90	44550	3675	909.7	87.0	φM <sub>b</sub>	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8	
						w (ULS)	12.9	10.9	9.2	8.0	6.9	6.1	5.4	4.8	4.3	3.9	
						w (SLS)	5.6	4.3	3.4	2.7	2.2	1.8	1.5	1.3	1.1	0.9	
540 x 90	48600	4374	1181	94.9	φM <sub>b</sub>	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	
						w (ULS)	15.3	12.9	11.0	9.5	8.2	7.2	6.4	5.7	5.1	4.6	
						w (SLS)	7.3	5.6	4.4	3.5	2.9	2.4	2.0	1.7	1.4	1.2	
585 x 90	52650	5133	1502	102.8	φM <sub>b</sub>	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	
						w (ULS)	17.9	15.0	12.8	11.0	9.6	8.5	7.5	6.7	6.0	5.4	
						w (SLS)	9.2	7.1	5.6	4.5	3.6	3.0	2.5	2.1	1.8	1.5	
630 x 90	56700	5954	1875	110.7	φM <sub>b</sub>	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	
						w (ULS)	20.6	17.4	14.8	12.7	11.1	9.8	8.6	7.7	6.9	6.2	
						w (SLS)	11.5	8.9	7.0	5.6	4.6	3.8	3.1	2.6	2.2	1.9	
675 x 135	91125	10252	3460	178.0	φM <sub>b</sub>	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	
						w (ULS)	35.4	29.7	25.3	21.9	19.0	16.7	14.8	13.2	11.9	10.7	
						w (SLS)	21.3	16.4	12.9	10.3	8.4	6.9	5.8	4.9	4.1	3.5	
720 x 135	97200	11664	4199	189.8	φM <sub>b</sub>	151.6	151.6	151.6	151.6	151.6	151.6	151.6	151.6	151.6	151.6	151.6	
						w (ULS)	40.1	33.7	28.7	24.8	21.6	19.0	16.8	15.0	13.4	12.1	
						w (SLS)	25.8	19.9	15.7	12.5	10.2	8.4	7.0	5.9	5.0	4.3	
765 x 135	103275	13168	5037	201.7	φM <sub>b</sub>	170.4	170.4	170.4	170.4	170.4	170.4	170.4	170.4	170.4	170.4	170.4	
						w (ULS)	45.1	37.9	32.3	27.8	24.2	21.3	18.9	16.8	15.1	13.6	
						w (SLS)	31.0	23.9	18.8	15.0	12.2	10.1	8.4	7.1	6.0	5.2	
810 x 135	109350	14762	5979	213.6	φM <sub>b</sub>	190.2	190.2	190.2	190.2	190.2	190.2	190.2	190.2	190.2	190.2	190.2	
						w (ULS)	50.3	42.3	36.0	31.1	27.1	23.8	21.1	18.8	16.9	15.2	
						w (SLS)	36.8	28.3	22.3	17.8	14.5	12.0	10.0	8.4	7.1	6.1	
855 x 135	115425	16448	7032	225.4	φM <sub>b</sub>	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	211.0	
						w (ULS)	55.8	46.9	40.0	34.5	30.0	26.4	23.4	20.8	18.7	16.9	
						w (SLS)	43.3	33.3	26.2	21.0	17.1	14.1	11.7	9.9	8.4	7.2	
900 x 135	121500	18225	8201	237.3	φM <sub>b</sub>	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	
						w (ULS)	61.6	51.7	44.1	38.0	33.1	29.1	25.8	23.0	20.6	18.6	
						w (SLS)	50.5	38.9	30.6	24.5	19.9	16.4	13.7	11.5	9.8	8.4	
945 x 135	127575	20093	9494	249.2	φM <sub>b</sub>	255.7	255.7	255.7	255.7	255.7	255.7	255.7	255.7	255.7	255.7	255.7	
						w (ULS)	67.6	56.8	48.4	41.7	36.4	32.0	28.3	25.3	22.7	20.5	
						w (SLS)	58.4	45.0	35.4	28.3	23.0	19.0	15.8	13.3	11.3	9.7	



## BEAMS FULLY RESTRAINED ALONG TENSION FLANGE

Glulam Grade = GL8				k1 = 0.8		SLS Deflection Limit = Span / 400										
Section Size dxb (mm)	Area A (mm <sup>2</sup> )	Section Modulus Z (10 <sup>3</sup> mm <sup>3</sup> )	Moment of Inertia I (10 <sup>6</sup> mm <sup>4</sup> )	φV <sub>n</sub>	Span (m) ≥	φM <sub>b</sub> (kNm) - ULS, w (ULS) (kN/m) & w (SLS, k <sub>s</sub> =1.5) (kN/m) giving deflection = SLS Deflection Limit for Span										
						1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	
135 x 65	8775	197	13.3	16.6	φM <sub>b</sub>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
					w (ULS)	17.8	7.9	4.4	2.8	2.0	1.5	1.1	0.9	0.7	0.6	
					w (SLS)	13.6	4.0	1.7	0.9	0.5						
180 x 65	11700	351	31.6	22.9	φM <sub>b</sub>	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
					w (ULS)	34.1	15.2	8.5	5.5	3.8	2.8	2.1	1.7	1.4	1.1	
					w (SLS)	32.3	9.6	4.0	2.1	1.2	0.8	0.5				
225 x 65	14625	548	61.7	28.6	φM <sub>b</sub>	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
					w (ULS)	56.0	24.9	14.0	9.0	6.2	4.6	3.5	2.8	2.2	1.9	
					w (SLS)	63.2	18.7	7.9	4.0	2.3	1.5	1.0	0.7	0.5		
225 x 90	20250	759	85.4	39.6	φM <sub>b</sub>	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
					w (ULS)	77.6	34.5	19.4	12.4	8.6	6.3	4.8	3.8	3.1	2.6	
					w (SLS)	87.5	25.9	10.9	5.6	3.2	2.0	1.4	1.0	0.7	0.5	
270 x 90	24300	1094	147.6	47.5	φM <sub>b</sub>	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
					w (ULS)	94.9	51.4	28.9	18.5	12.8	9.4	7.2	5.7	4.6	3.8	
					w (SLS)		44.8	18.9	9.7	5.6	3.5	2.4	1.7	1.2	0.9	
315 x 90	28350	1488	234.4	55.4	φM <sub>b</sub>	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
					w (ULS)		71.2	40.1	25.6	17.8	13.1	10.0	7.9	6.4	5.3	
					w (SLS)		71.1	30.0	15.4	8.9	5.6	3.8	2.6	1.9	1.4	
360 x 90	32400	1944	349.9	63.3	φM <sub>b</sub>	26.1	26.1	26.0	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
					w (ULS)		84.4	51.9	32.9	22.9	16.8	12.9	10.2	8.2	6.8	
					w (SLS)			44.8	22.9	13.3	8.4	5.6	3.9	2.9	2.2	
405 x 90	36450	2460	498.2	71.2	φM <sub>b</sub>	33.0	33.0	32.4	31.6	31.3	31.3	31.3	31.3	31.3	31.3	31.3
					w (ULS)		94.9	64.9	40.4	27.8	20.5	15.7	12.4	10.0	8.3	
					w (SLS)			63.8	32.7	18.9	11.9	8.0	5.6	4.1	3.1	
450 x 90	40500	3038	683.4	79.1	φM <sub>b</sub>	40.5	40.5	39.4	37.8	36.5	36.5	36.5	36.5	36.5	36.5	36.5
					w (ULS)			78.8	48.4	32.4	23.8	18.2	14.4	11.7	9.6	
					w (SLS)			87.5	44.8	25.9	16.3	10.9	7.7	5.6	4.2	
495 x 90	44550	3675	909.7	87.0	φM <sub>b</sub>	48.8	48.7	46.8	44.4	42.2	40.9	40.9	40.9	40.9	40.9	40.9
					w (ULS)			87.0	56.8	37.5	26.7	20.5	16.2	13.1	10.8	
					w (SLS)				59.6	34.5	21.7	14.6	10.2	7.5	5.6	
540 x 90	48600	4374	1181	94.9	φM <sub>b</sub>	57.9	57.6	54.8	51.1	47.9	45.2	44.5	44.5	44.5	44.5	44.5
					w (ULS)			94.9	65.4	42.5	29.5	22.2	17.6	14.2	11.8	
					w (SLS)				77.4	44.8	28.2	18.9	13.3	9.7	7.3	
585 x 90	52650	5133	1502	102.8	φM <sub>b</sub>	67.6	67.1	63.1	58.1	53.6	49.9	47.1	47.0	47.0	47.0	47.0
					w (ULS)				74.4	47.6	32.6	23.6	18.6	15.0	12.4	
					w (SLS)				98.4	56.9	35.9	24.0	16.9	12.3	9.2	
630 x 90	56700	5954	1875	110.7	φM <sub>b</sub>	78.1	77.3	72.0	65.3	59.3	54.5	50.7	48.5	48.5	48.5	48.5
					w (ULS)				83.6	52.7	35.6	25.4	19.2	15.5	12.8	
					w (SLS)					71.1	44.8	30.0	21.1	15.4	11.5	
720 x 135	97200	11664	4199	189.8	φM <sub>b</sub>	151.6	151.6	151.6	150.1	146.0	141.3	136.7	132.7	130.3	130.3	130.3
					w (ULS)						92.3	68.4	52.4	41.7	34.5	
					w (SLS)							67.2	47.2	34.4	25.8	
765 x 135	103275	13168	5037	201.7	φM <sub>b</sub>	170.4	170.4	170.5	168.1	162.6	156.4	150.4	145.0	140.3	138.9	138.9
					w (ULS)							75.2	57.3	44.9	36.7	
					w (SLS)								80.6	56.6	41.3	31.0
810 x 135	109350	14762	5979	213.6	φM <sub>b</sub>	190.2	190.2	190.3	186.9	179.9	171.9	164.2	157.3	151.3	146.2	146.2
					w (ULS)							82.1	62.1	48.4	38.7	
					w (SLS)								95.7	67.2	49.0	36.8
855 x 135	115425	16448	7032	225.4	φM <sub>b</sub>	211.0	211.0	211.1	206.6	197.8	187.9	178.2	169.6	162.1	155.8	155.8
					w (ULS)							89.1	67.0	51.9	41.2	
					w (SLS)								79.0	57.6	43.3	
900 x 135	121500	18225	8201	237.3	φM <sub>b</sub>	232.8	232.8	232.9	227.2	216.4	204.3	192.5	181.9	172.7	165.0	165.0
					w (ULS)							96.2	71.9	55.3	43.6	
					w (SLS)								92.2	67.2	50.5	
945 x 135	127575	20093	9494	249.2	φM <sub>b</sub>	255.7	255.7	255.6	248.6	235.7	221.1	206.9	194.2	183.2	173.9	173.9
					w (ULS)								76.7	58.6	46.0	
					w (SLS)									77.8	58.4	



## BEAMS FULLY RESTRAINED ALONG TENSION FLANGE – Continued

Glulam Grade = GL8				k1 = 0.8		SLS Deflection Limit = Span / 400									
Section Size dxb (mm)	Area A (mm <sup>2</sup> )	Section Modulus Z (10 <sup>3</sup> mm <sup>3</sup> )	Moment of Inertia I (10 <sup>6</sup> mm <sup>4</sup> )	φV <sub>n</sub>	Span (m) ≥	φM <sub>b</sub> (kNm) - ULS, w (ULS) (kN/m) & w (SLS, k <sub>2</sub> =1.5) (kN/m) giving deflection = SLS Deflection Limit for Span									
						5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
135 x 65	8775	197	13.3	16.6	φM <sub>b</sub>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
					w (ULS)	0.6									
					w (SLS)										
180 x 65	11700	351	31.6	22.9	φM <sub>b</sub>	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
					w (ULS)	1.1	0.9	0.8	0.7	0.6	0.5				
					w (SLS)										
225 x 65	14625	548	61.7	28.6	φM <sub>b</sub>	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
					w (ULS)	1.9	1.6	1.3	1.1	1.0	0.9	0.8	0.7	0.6	0.6
					w (SLS)										
225 x 90	20250	759	85.4	39.6	φM <sub>b</sub>	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
					w (ULS)	2.6	2.2	1.8	1.6	1.4	1.2	1.1	1.0	0.9	0.8
					w (SLS)	0.5									
270 x 90	24300	1094	147.6	47.5	φM <sub>b</sub>	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
					w (ULS)	3.8	3.2	2.7	2.4	2.1	1.8	1.6	1.4	1.3	1.2
					w (SLS)	0.9	0.7	0.6							
315 x 90	28350	1488	234.4	55.4	φM <sub>b</sub>	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
					w (ULS)	5.3	4.5	3.8	3.3	2.8	2.5	2.2	2.0	1.8	1.6
					w (SLS)	1.4	1.1	0.9	0.7	0.6					
360 x 90	32400	1944	349.9	63.3	φM <sub>b</sub>	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
					w (ULS)	6.8	5.7	4.9	4.2	3.7	3.2	2.8	2.5	2.3	2.1
					w (SLS)	2.2	1.7	1.3	1.0	0.8	0.7	0.6			
405 x 90	36450	2460	498.2	71.2	φM <sub>b</sub>	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
					w (ULS)	8.3	7.0	5.9	5.1	4.5	3.9	3.5	3.1	2.8	2.5
					w (SLS)	3.1	2.4	1.9	1.5	1.2	1.0	0.8	0.7	0.6	0.5
450 x 90	40500	3038	683.4	79.1	φM <sub>b</sub>	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
					w (ULS)	9.6	8.1	6.9	6.0	5.2	4.6	4.0	3.6	3.2	2.9
					w (SLS)	4.2	3.2	2.5	2.0	1.7	1.4	1.1	1.0	0.8	0.7
495 x 90	44550	3675	909.7	87.0	φM <sub>b</sub>	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9
					w (ULS)	10.8	9.1	7.7	6.7	5.8	5.1	4.5	4.0	3.6	3.3
					w (SLS)	5.6	4.3	3.4	2.7	2.2	1.8	1.5	1.3	1.1	0.9
540 x 90	48600	4374	1181	94.9	φM <sub>b</sub>	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5
					w (ULS)	11.8	9.9	8.4	7.3	6.3	5.6	4.9	4.4	3.9	3.6
					w (SLS)	7.3	5.6	4.4	3.5	2.9	2.4	2.0	1.7	1.4	1.2
585 x 90	52650	5133	1502	102.8	φM <sub>b</sub>	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
					w (ULS)	12.4	10.4	8.9	7.7	6.7	5.9	5.2	4.6	4.2	3.8
					w (SLS)	9.2	7.1	5.6	4.5	3.6	3.0	2.5	2.1	1.8	1.5
630 x 90	56700	5954	1875	110.7	φM <sub>b</sub>	48.5	48.5	48.5	48.5	48.5	48.5	48.5	48.5	48.5	48.5
					w (ULS)	12.8	10.8	9.2	7.9	6.9	6.1	5.4	4.8	4.3	3.9
					w (SLS)	11.5	8.9	7.0	5.6	4.6	3.8	3.1	2.6	2.2	1.9
720 x 135	97200	11664	4199	189.8	φM <sub>b</sub>	130.3	130.3	130.3	130.3	130.3	130.3	130.3	130.3	130.3	130.3
					w (ULS)	34.5	29.0	24.7	21.3	18.5	16.3	14.4	12.9	11.6	10.4
					w (SLS)	25.8	19.9	15.7	12.5	10.2	8.4	7.0	5.9	5.0	4.3
765 x 135	103275	13168	5037	201.7	φM <sub>b</sub>	138.9	138.9	138.9	138.9	138.9	138.9	138.9	138.9	138.9	138.9
					w (ULS)	36.7	30.9	26.3	22.7	19.8	17.4	15.4	13.7	12.3	11.1
					w (SLS)	31.0	23.9	18.8	15.0	12.2	10.1	8.4	7.1	6.0	5.2
810 x 135	109350	14762	5979	213.6	φM <sub>b</sub>	146.2	146.1	146.1	146.1	146.1	146.1	146.1	146.1	146.1	146.1
					w (ULS)	38.7	32.5	27.7	23.8	20.8	18.3	16.2	14.4	12.9	11.7
					w (SLS)	36.8	28.3	22.3	17.8	14.5	12.0	10.0	8.4	7.1	6.1
855 x 135	115425	16448	7032	225.4	φM <sub>b</sub>	155.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8	151.8
					w (ULS)	41.2	33.7	28.7	24.8	21.6	19.0	16.8	15.0	13.5	12.1
					w (SLS)	43.3	33.3	26.2	21.0	17.1	14.1	11.7	9.9	8.4	7.2
900 x 135	121500	18225	8201	237.3	φM <sub>b</sub>	165.0	158.5	156.0	156.0	156.0	156.0	156.0	156.0	156.0	156.0
					w (ULS)	43.6	35.2	29.5	25.5	22.2	19.5	17.3	15.4	13.8	12.5
					w (SLS)	50.5	38.9	30.6	24.5	19.9	16.4	13.7	11.5	9.8	8.4
945 x 135	127575	20093	9494	249.2	φM <sub>b</sub>	173.9	166.1	159.6	158.9	158.9	158.9	158.9	158.9	158.9	158.9
					w (ULS)										
					w (SLS)										



## PRECAMBERED BEAMS

Glulam Grade = GL8				k1 = 0.8		SLS Deflection Limit = Span / 400									
Section Size dxb (mm)	Area A (mm <sup>2</sup> )	Section Modulus Z (10 <sup>3</sup> mm <sup>3</sup> )	Moment of Inertia I (10 <sup>6</sup> mm <sup>4</sup> )	φV <sub>n</sub>	Effective Length and Span (m) ≥	φM <sub>b</sub> (kNm) - ULS, w (ULS) (kN/m) & w (SLS, k <sub>2</sub> =1.5) (kN/m) giving deflection = SLS Deflection Limit for Span (Note in both cases w is limited where necessary to prevent shear failure for the span)									
						1	1.5	2	2.5	3	3.5	4	4.5	5	5.5
135 x 65	8775	197	13.3	16.6	φM <sub>b</sub>	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0
					w (ULS)	17.8	7.9	4.4	2.8	2.0	1.4	1.1	0.8	0.7	0.5
					w (SLS)	13.6	4.0	1.7	0.9	0.5					
180 x 65	11700	351	31.6	22.9	φM <sub>b</sub>	4.3	4.3	4.2	4.2	4.1	3.9	3.8	3.7	3.5	3.3
					w (ULS)	34.1	15.2	8.5	5.3	3.6	2.6	1.9	1.4	1.1	0.9
					w (SLS)	32.3	9.6	4.0	2.1	1.2	0.8	0.5			
225 x 65	14625	548	61.7	28.6	φM <sub>b</sub>	7.0	7.0	6.8	6.6	6.3	6.0	5.7	5.4	5.0	4.7
					w (ULS)	56.0	24.7	13.6	8.4	5.6	3.9	2.8	2.1	1.6	1.3
					w (SLS)	63.2	18.7	7.9	4.0	2.3	1.5	1.0	0.7	0.5	
225 x 90	20250	759	85.4	39.6	φM <sub>b</sub>	9.7	9.7	9.7	9.7	9.7	9.6	9.5	9.3	9.1	8.9
					w (ULS)	77.6	34.5	19.4	12.4	8.6	6.3	4.7	3.7	2.9	2.4
					w (SLS)	87.5	25.9	10.9	5.6	3.2	2.0	1.4	1.0	0.7	0.5
270 x 90	24300	1094	147.6	47.5	φM <sub>b</sub>	14.5	14.5	14.5	14.4	14.2	13.9	13.6	13.3	12.9	12.5
					w (ULS)	94.9	51.4	28.9	18.4	12.6	9.1	6.8	5.3	4.1	3.3
					w (SLS)		44.8	18.9	9.7	5.6	3.5	2.4	1.7	1.2	0.9
315 x 90	28350	1488	234.4	55.4	φM <sub>b</sub>	20.0	20.0	19.9	19.6	19.2	18.7	18.1	17.5	16.8	16.2
					w (ULS)		71.2	39.8	25.1	17.0	12.2	9.0	6.9	5.4	4.3
					w (SLS)		71.1	30.0	15.4	8.9	5.6	3.8	2.6	1.9	1.4
360 x 90	32400	1944	349.9	63.3	φM <sub>b</sub>	26.1	26.1	25.5	24.9	24.2	23.3	22.4	21.4	20.5	19.5
					w (ULS)		84.4	51.1	31.9	21.5	15.2	11.2	8.5	6.5	5.2
					w (SLS)			44.8	22.9	13.3	8.4	5.6	3.9	2.9	2.2
405 x 90	36450	2460	498.2	71.2	φM <sub>b</sub>	33.0	32.7	31.5	30.4	29.2	28.0	26.6	25.3	23.9	22.7
					w (ULS)		94.9	63.0	38.9	26.0	18.3	13.3	10.0	7.7	6.0
					w (SLS)			63.8	32.7	18.9	11.9	8.0	5.6	4.1	3.1
450 x 90	40500	3038	683.4	79.1	φM <sub>b</sub>	40.5	39.8	37.8	35.9	34.3	32.5	30.7	28.9	27.2	25.6
					w (ULS)			75.6	46.0	30.5	21.2	15.4	11.4	8.7	6.8
					w (SLS)			87.5	44.8	25.9	16.3	10.9	7.7	5.6	4.2
495 x 90	44550	3675	909.7	87.0	φM <sub>b</sub>	48.9	47.3	44.3	41.3	39.1	36.8	34.5	32.3	30.2	28.3
					w (ULS)			87.0	52.8	34.7	24.0	17.3	12.8	9.7	7.5
					w (SLS)				59.6	34.5	21.7	14.6	10.2	7.5	5.6
540 x 90	48600	4374	1181	94.9	φM <sub>b</sub>	57.8	55.2	51.0	46.4	43.6	40.8	38.0	35.4	33.0	30.8
					w (ULS)			94.9	59.3	38.7	26.6	19.0	14.0	10.6	8.1
					w (SLS)				77.4	44.8	28.2	18.9	13.3	9.7	7.3
585 x 90	52650	5133	1502	102.8	φM <sub>b</sub>	67.2	63.3	57.8	51.8	47.6	44.4	41.2	38.2	35.5	33.2
					w (ULS)				66.3	42.3	29.0	20.6	15.1	11.4	8.8
					w (SLS)				98.4	56.9	35.9	24.0	16.9	12.3	9.2
630 x 90	56700	5954	1875	110.7	φM <sub>b</sub>	77.1	71.7	64.5	57.2	51.2	47.5	44.0	40.8	38.0	35.7
					w (ULS)				73.2	45.5	31.0	22.0	16.1	12.2	9.4
					w (SLS)					71.1	44.8	30.0	21.1	15.4	11.5
675 x 135	91125	10252	3460	178.0	φM <sub>b</sub>	133.8	133.8	132.9	129.5	124.8	120.3	116.8	113.1	109.3	105.3
					w (ULS)						78.6	58.4	44.7	35.0	27.9
					w (SLS)						82.6	55.4	38.9	28.3	21.3
720 x 135	97200	11664	4199	189.8	φM <sub>b</sub>	151.6	151.7	149.6	145.0	138.9	132.2	128.1	123.6	119.0	114.3
					w (ULS)						86.4	64.0	48.8	38.1	30.2
					w (SLS)							67.2	47.2	34.4	25.8
765 x 135	103275	13168	5037	201.7	φM <sub>b</sub>	170.4	170.4	167.0	160.8	153.2	144.8	138.9	133.7	128.3	122.9
					w (ULS)						94.5	69.4	52.8	41.1	32.5
					w (SLS)						80.6	56.6	41.3	31.0	
810 x 135	109350	14762	5979	213.6	φM <sub>b</sub>	190.2	189.8	185.0	177.1	167.6	157.5	149.1	143.2	137.1	130.9
					w (ULS)							74.6	56.6	43.9	34.6
					w (SLS)							95.7	67.2	49.0	36.8
855 x 135	115425	16448	7032	225.4	φM <sub>b</sub>	211.0	210.0	203.5	193.6	182.2	170.2	158.7	152.0	145.2	138.4
					w (ULS)							79.3	60.1	46.5	36.6
					w (SLS)							79.0	57.6	43.3	
900 x 135	121500	18225	8201	237.3	φM <sub>b</sub>	232.8	231.0	222.4	210.3	196.7	182.8	169.0	160.2	152.7	145.3
					w (ULS)							84.5	63.3	48.9	38.4
					w (SLS)							92.2	67.2	50.5	
945 x 135	127575	20093	9494	249.2	φM <sub>b</sub>	255.7	252.5	241.7	227.2	211.3	195.2	179.6	167.6	159.6	151.7
					w (ULS)							89.8	66.2	51.1	40.1
					w (SLS)								77.8	58.4	



**PRECAMBERED BEAMS – Continued**

Glulam Grade = GL8				k1 = 0.8		SLS Deflection Limit = Span / 400									
Section Size dxb (mm)	Area A (mm <sup>2</sup> )	Section Modulus Z (10 <sup>3</sup> mm <sup>3</sup> )	Moment of Inertia I (10 <sup>6</sup> mm <sup>4</sup> )	φV <sub>n</sub>	Effective Length and Span (m) ≥	φM <sub>b</sub> (kNm) - ULS, w (ULS) (kN/m) & w (SLS, k <sub>2</sub> =1.5) (kN/m) giving deflection = SLS Deflection Limit for Span (Note in both cases w is limited where necessary to prevent shear failure for the span)									
						5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
135 x 65	8775	197	13.3	16.6	φM <sub>b</sub>	2.0	1.9	1.9	1.8	1.8	1.7	1.6	1.6	1.5	1.5
					w (ULS)	0.5									
					w (SLS)										
180 x 65	11700	351	31.6	22.9	φM <sub>b</sub>	3.3	3.2	3.0	2.9	2.8	2.6	2.5	2.4	2.3	2.2
					w (ULS)	0.9	0.7	0.6							
					w (SLS)										
225 x 65	14625	548	61.7	28.6	φM <sub>b</sub>	4.7	4.5	4.2	4.0	3.7	3.5	3.4	3.2	3.1	2.9
					w (ULS)	1.3	1.0	0.8	0.6	0.5					
					w (SLS)										
225 x 90	20250	759	85.4	39.6	φM <sub>b</sub>	8.9	8.7	8.5	8.3	8.1	7.8	7.6	7.4	7.2	6.9
					w (ULS)	2.4	1.9	1.6	1.4	1.1	1.0	0.8	0.7	0.6	0.6
					w (SLS)	0.5									
270 x 90	24300	1094	147.6	47.5	φM <sub>b</sub>	12.5	12.1	11.7	11.3	10.9	10.5	10.1	9.7	9.4	9.0
					w (ULS)	3.3	2.7	2.2	1.8	1.6	1.3	1.1	1.0	0.8	0.7
					w (SLS)	0.9	0.7	0.6							
315 x 90	28350	1488	234.4	55.4	φM <sub>b</sub>	16.2	15.5	14.9	14.2	13.6	13.0	12.5	11.9	11.4	10.9
					w (ULS)	4.3	3.4	2.8	2.3	1.9	1.6	1.4	1.2	1.0	0.9
					w (SLS)	1.4	1.1	0.9	0.7	0.6					
360 x 90	32400	1944	349.9	63.3	φM <sub>b</sub>	19.5	18.6	17.6	16.8	16.0	15.2	14.5	13.8	13.2	12.6
					w (ULS)	5.2	4.1	3.3	2.7	2.3	1.9	1.6	1.4	1.2	1.0
					w (SLS)	2.2	1.7	1.3	1.0	0.8	0.7	0.6			
405 x 90	36450	2460	498.2	71.2	φM <sub>b</sub>	22.7	21.4	20.2	19.1	18.1	17.2	16.4	15.6	15.0	14.3
					w (ULS)	6.0	4.8	3.8	3.1	2.6	2.2	1.8	1.5	1.3	1.1
					w (SLS)	3.1	2.4	1.9	1.5	1.2	1.0	0.8	0.7	0.6	0.5
450 x 90	40500	3038	683.4	79.1	φM <sub>b</sub>	25.6	24.1	22.6	21.4	20.2	19.2	18.3	17.4	16.6	15.9
					w (ULS)	6.8	5.3	4.3	3.5	2.9	2.4	2.0	1.7	1.5	1.3
					w (SLS)	4.2	3.2	2.5	2.0	1.7	1.4	1.1	1.0	0.8	0.7
495 x 90	44550	3675	909.7	87.0	φM <sub>b</sub>	28.3	26.5	24.9	23.5	22.4	21.2	20.1	19.1	18.2	17.4
					w (ULS)	7.5	5.9	4.7	3.8	3.2	2.6	2.2	1.9	1.6	1.4
					w (SLS)	5.6	4.3	3.4	2.7	2.2	1.8	1.5	1.3	1.1	0.9
540 x 90	48600	4374	1181	94.9	φM <sub>b</sub>	30.8	28.8	27.2	25.7	24.2	22.9	21.8	20.7	19.7	18.9
					w (ULS)	8.1	6.4	5.1	4.2	3.4	2.9	2.4	2.0	1.7	1.5
					w (SLS)	7.3	5.6	4.4	3.5	2.9	2.4	2.0	1.7	1.4	1.2
585 x 90	52650	5133	1502	102.8	φM <sub>b</sub>	33.2	31.2	29.3	27.6	26.0	24.6	23.4	22.3	21.2	20.3
					w (ULS)	8.8	6.9	5.6	4.5	3.7	3.1	2.6	2.2	1.9	1.6
					w (SLS)	9.2	7.1	5.6	4.5	3.6	3.0	2.5	2.1	1.8	1.5
630 x 90	56700	5954	1875	110.7	φM <sub>b</sub>	35.7	33.3	31.3	29.4	27.8	26.3	25.0	23.8	22.7	21.7
					w (ULS)	9.4	7.4	5.9	4.8	4.0	3.3	2.8	2.4	2.0	1.7
					w (SLS)	11.5	8.9	7.0	5.6	4.6	3.8	3.1	2.6	2.2	1.9
675 x 135	91125	10252	3460	178.0	φM <sub>b</sub>	105.3	101.4	97.5	93.6	89.9	86.2	82.7	79.4	76.3	73.3
					w (ULS)	27.9	22.5	18.5	15.3	12.8	10.8	9.2	7.8	6.8	5.9
					w (SLS)	21.3	16.4	12.9	10.3	8.4	6.9	5.8	4.9	4.1	3.5
720 x 135	97200	11664	4199	189.8	φM <sub>b</sub>	114.3	109.7	105.1	100.7	96.4	92.3	88.4	84.7	81.3	78.1
					w (ULS)	30.2	24.4	19.9	16.4	13.7	11.5	9.8	8.4	7.2	6.2
					w (SLS)	25.8	19.9	15.7	12.5	10.2	8.4	7.0	5.9	5.0	4.3
765 x 135	103275	13168	5037	201.7	φM <sub>b</sub>	122.9	117.6	112.4	107.4	102.6	98.0	93.7	89.8	86.1	82.8
					w (ULS)	32.5	26.1	21.3	17.5	14.6	12.3	10.4	8.9	7.6	6.6
					w (SLS)	31.0	23.9	18.8	15.0	12.2	10.1	8.4	7.1	6.0	5.2
810 x 135	109350	14762	5979	213.6	φM <sub>b</sub>	130.9	124.9	119.1	113.6	108.3	103.4	98.9	94.7	91.0	87.7
					w (ULS)	34.6	27.8	22.6	18.5	15.4	12.9	10.9	9.4	8.1	7.0
					w (SLS)	36.8	28.3	22.3	17.8	14.5	12.0	10.0	8.4	7.1	6.1
855 x 135	115425	16448	7032	225.4	φM <sub>b</sub>	138.4	131.8	125.5	119.4	113.8	108.7	104.0	99.7	96.2	92.2
					w (ULS)	36.6	29.3	23.8	19.5	16.2	13.6	11.5	9.9	8.5	7.4
					w (SLS)	43.3	33.3	26.2	21.0	17.1	14.1	11.7	9.9	8.4	7.2
900 x 135	121500	18225	8201	237.3	φM <sub>b</sub>	145.3	138.2	131.4	125.0	119.1	113.8	109.1	104.9	100.4	96.3
					w (ULS)	38.4	30.7	24.9	20.4	16.9	14.2	12.1	10.4	8.9	7.7
					w (SLS)	50.5	38.9	30.6	24.5	19.9	16.4	13.7	11.5	9.8	8.4
945 x 135	127575	20093	9494	249.2	φM <sub>b</sub>	151.7	144.1	136.9	130.3	124.4	119.1	114.2	109.2	104.5	100.3
					w (ULS)	40.1	32.0	25.9	21.3	17.7	14.9	12.6	10.8	9.3	8.0
					w (SLS)	58.4	45.0	35.4	28.3	23.0	19.0	15.8	13.3	11.3	9.7

