



Finger Jointed Treated Pine – Span Tables

SPAN TABLES

- These span tables have been developed in accordance with the relevant Australian Standards, however please check for state and local government variations.
- These span tables are only for use in conjunction with timber products manufactured for Period Timber Mouldings (Aust) Pty Ltd. They cannot be used for timber products produced by any other timber manufacturer regardless of similarity of species or design. Our manufacturers products are produced to stringent quality assurance procedures which include the measurement of strength and stiffness ratings. Period Timber Mouldings (Aust) Pty Ltd and our manufacturers cannot assure other manufacturers comply with quality assurance procedures.
- All members are manufactured from H3 LOSP Radiata Pine to either F7 or GL* structural grade and are to be used in accordance with the relevant span table.
- Product grading of all members is compliant with AS1720: Timber Structures.
- Structural members deemed satisfactory to meet the provisions outlined in AS1170 parts 1 & 2: Structural Design Actions.
- Finger jointing and adhesives to meet service conditions outlined in AS5068: 2006 Finger Joints in Structural Products.
- Construction details should be in accordance with AS1684.2 Residential Timber-Framed Construction.
- A maximum roof pitch of 25 degrees is assumed.
- Refer to "Technical Drawings" where noted for explanation of maximum loads / spans.

F7 RAFTERS - 30mm

N1/N2 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N1 WIND	SHEET ROOF				
	N2 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 30	1400	1300	1200	1200	1100
90 x 30	1900	1800	1700	1600	1500
138 x 30	2900	2700	2600	2500	2350
185 x 30	3600	3400	3150	2950	2700

N3 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N3 WIND	SHEET ROOF				
	N3 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 30	1250	1150	1050	1000	950
90 x 30	1650	1550	1550	1400	1300
138 x 30	2600	2300	2150	2000	1800
185 x 30	3000	2650	2450	2350	2150
230 x 30	3050	2650	2450	2350	2150

N4 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N4 WIND	SHEET ROOF				
	N4 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 30	1050	950	850	800	700
90 x 30	1450	1300	1200	1100	1000
138 x 30	2150	1900	1700	1600	1500
185 x 30	2400	2200	1950	1850	1700
230 x 30	2450	2200	2000	1900	1750

N5 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N5 WIND	SHEET ROOF				
	N5 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 30	850	750	700	700	600
90 x 30	1200	1050	1000	900	850
138 x 30	1700	1550	1400	1300	1200
185 x 30	2000	1750	1600	1550	1400
230 x 30	2000	1800	1600	1550	1400

N6 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N6 WIND	SHEET ROOF				
	N6 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 30	700	650	600	550	500
90 x 30	1050	900	800	750	750
138 x 30	1450	1300	1200	1150	1050
185 x 30	1700	1500	1350	1350	1200
230 x 30	1700	1550	1400	1350	1200

F7 RAFTERS - 42mm

SHEET ROOF

N1/N2 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N1 WIND	SHEET ROOF				
	N2 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 42	1650	1630	1540	1480	1370
90 x 42	2400	2220	2100	2020	1900
138 x 42	3680	3400	3210	3100	2920
185 x 42	4590	4320	4140	4040	3860
230 x 42	5400	5090	4880	4750	4540
280 x 42	6260	5900	5650	5510	5260

N3 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N3 WIND	SHEET ROOF				
	N3 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 42	1530	1420	1340	1290	1220
90 x 42	2090	1930	1830	1760	1660
138 x 42	3200	2960	2800	2700	2540
185 x 42	4130	3900	3730	3620	3350
230 x 42	4870	4590	4400	4250	3810
280 x 42	5640	5250	4780	4500	4040

N4 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N4 WIND	SHEET ROOF				
	N4 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 42	1340	1240	1170	1110	1010
90 x 42	1830	1690	1600	1510	1380
138 x 42	2810	2590	2450	2360	2120
185 x 42	3740	3480	3180	2980	2660
230 x 42	4410	3980	3610	3390	3020
280 x 42	4800	4210	3830	3590	3210

N5 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N5 WIND	SHEET ROOF				
	N5 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 42	1170	1040	960	910	830
90 x 42	1620	1420	1300	1240	1130
138 x 42	2480	2250	2020	1900	1730
185 x 42	3260	2840	2560	2390	2150
230 x 42	3680	3220	2910	2720	2420
280 x 42	3900	3410	3090	2890	2570

N6 WIND – SHEET ROOF					
MAXIMUM RAFTER SPAN F7					
N6 WIND	SHEET ROOF				
	N6 WIND				
SPACING (mm)					
Rafter Size	600	760	900	1000	1200
66 x 42	1000	890	820	780	710
90 x 42	1390	1210	1120	1060	970
138 x 42	2200	1900	1710	1620	1480
185 x 42	2770	2410	2160	2020	1840
230 x 42	3130	2730	2460	2300	2070
280 x 42	3320	2900	2610	2440	2180

F7 RAFTERS - 42mm

TILE ROOF

N1/N2 WIND – TILE ROOF					
MAXIMUM RAFTER SPAN F7					
N1 WIND N2 WIND	TILE ROOF				
	SPACING (mm)				
Rafter Size	600	760	900	1000	1200
66 x 42	1280	1180	1110	1080	1010
90 x 42	1740	1610	1520	1470	1380
138 x 42	2660	2460	2330	2250	2120
185 x 42	3570	3300	3120	3010	2840
230 x 42	4440	4100	3880	3740	3520
280 x 42	5400	4990	4720	4560	4290

N3 WIND – TILE ROOF					
MAXIMUM RAFTER SPAN F7					
N3 WIND	TILE ROOF				
	SPACING (mm)				
Rafter Size	600	760	900	1000	1200
66 x 42	1280	1180	1110	1080	1010
90 x 42	1740	1610	1520	1470	1380
138 x 42	2660	2460	2330	2250	2120
185 x 42	3570	3300	3120	3010	2840
230 x 42	4440	4100	3880	3740	3520
280 x 42	5400	4990	4720	4560	4290

N4 WIND – TILE ROOF					
MAXIMUM RAFTER SPAN F7					
N4 WIND	TILE ROOF				
	SPACING (mm)				
Rafter Size	600	760	900	1000	1200
66 x 42	1280	1180	1110	1080	1010
90 x 42	1740	1610	1520	1470	1380
138 x 42	2660	2460	2330	2250	2120
185 x 42	3570	3300	3120	3010	2820
230 x 42	4410	4100	3840	3610	3230
280 x 42	5100	4480	4080	3830	3430

N5 WIND – TILE ROOF					
MAXIMUM RAFTER SPAN F7					
N5 WIND	TILE ROOF				
	SPACING (mm)				
Rafter Size	600	760	900	1000	1200
66 x 42	1190	1080	990	940	860
90 x 42	1620	1480	1360	1290	1170
138 x 42	2480	2290	2110	1970	1800
185 x 42	3320	2960	2670	2500	2230
230 x 42	3830	3350	3030	2840	2520
280 x 42	4060	3550	3220	3020	2680

N6 WIND – TILE ROOF					
MAXIMUM RAFTER SPAN F7					
N6 WIND	TILE ROOF				
	SPACING (mm)				
Rafter Size	600	760	900	1000	1200
66 x 42	1030	920	840	800	730
90 x 42	1430	1250	1150	1090	990
138 x 42	2230	1960	1760	1670	1520
185 x 42	2850	2480	2230	2080	1890
230 x 42	3230	2810	2530	2370	2130
280 x 42	3420	2980	2690	2520	2250

F7 VERANDAH BEAMS – 42mm

SHEET ROOF

N1/N2 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N1 WIND N2 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
138 x 42	2920	2920	2830	2640	2450	2300	2180	2070	1980
185 x 42	3920	3740	3560	3270	3040	2860	2710	2570	2460
230 x 42	4690	4410	4000	3680	3420	3210	3040	2890	2760
280 x 42	5290	4670	4220	3890	3620	3400	3210	3060	2920

N3 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N3 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
138 x 42	2800	2470	2240	2060	1910	1800	1700	1620	1550
185 x 42	2480	3070	2770	2550	2380	2230	2110	2010	1920
230 x 42	3910	3450	3120	2870	2670	2510	2370	2260	2160
280 x 42	4130	3640	3300	3030	2820	2650	2510	2380	2280

N4 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N4 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
138 x 42	2260	2000	1810	1660	1550	1450	1370	1310	1250
185 x 42	2810	2480	2240	2060	1920	1800	1710	1620	1550
230 x 42	3160	2790	2520	2320	2160	2030	1920	1820	1740
280 x 42	3340	2940	2660	2450	2280	2140	2030	1930	1840

N5 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N5 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
138 x 42	1850	1630	1480	1360	1260	1190	1120	1070	1020
185 x 42	2300	2020	1830	1680	1570	1470	1390	1330	1270
230 x 42	2580	2280	2060	1890	1760	1660	1570	1490	1420
280 x 42	2730	2410	2180	2000	1860	1750	1660	1570	1500

N6 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N6 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
138 x 42	1580	1400	1260	1160	1080	1020	960	910	870
185 x 42	1970	1730	1570	1440	1340	1260	1190	1130	1080
230 x 42	2210	1950	1760	1620	1510	1420	1340	1280	1220
280 x 42	2340	2060	1860	1710	1600	1500	1420	1350	1290

NOTES: Roof Load Width = Roof Span + Overhang | Maximum Overhang = 450mm
| See Technical Drawings P7

F7 VERANDAH BEAMS - 42mm

TILE ROOF

N1/N2/N3 WIND – TILE ROOF						
MAXIMUM VERANDAH BEAM SPAN (mm)						
N1 WIND N2 WIND N3 WIND	TILE ROOF					
	ROOF LOAD WIDTH (mm)					
Size D x B (mm)	1200	1800	2400	3000	4500	7500
138 x 42	1500	-	-	-	-	-
185 x 42	2450	2100	1900	1700	1550	-
230 x 42	3000	2600	2400	2200	1950	1650
280 x 42	3400	2850	2600	2400	2100	1800

NOTES: Roof Load Width = Roof Span + Overhang | Maximum Overhang = 450mm | See Technical Drawings P7

GL8 VERANDAH BEAMS

SHEET ROOF

N1/N2 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N1 WIND N2 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
140 x 65	3160	3000	2830	2640	2450	2300	2180	2070	1980
180 x 65	3990	3740	3560	3410	3290	3090	2920	2780	2660
240 x 65	4690	4410	4190	4020	3880	3760	3590	3420	3260
280 x 65	5440	5110	4860	4660	4500	4360	4170	3970	3790

N3 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N3 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
140 x 65	2800	2470	2240	2060	1910	1800	1700	1620	1550
180 x 65	3590	3310	3000	2760	2570	2410	2280	2170	2070
240 x 65	4230	3970	3680	3390	3150	2960	2800	2660	2550
280 x 65	4900	4600	4280	3930	3660	3440	3250	3100	2960

N4 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N4 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
140 x 65	2260	2000	1810	1660	1550	1450	1370	1310	1250
180 x 65	3040	2680	2420	2230	2070	1950	1840	1750	1670
240 x 65	3730	3290	2980	2740	2550	2390	2260	2150	2060
280 x 65	4330	3820	3460	3180	2960	2780	2630	2500	2390

N5 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N5 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
140 x 65	1850	1630	1480	1360	1260	1190	1120	1070	1020
180 x 65	2480	2190	1980	1820	1690	1590	1510	1430	1370
240 x 65	3050	2690	2430	2240	2080	1960	1850	1760	1680
280 x 65	3540	3120	2820	2600	2420	2270	2150	2040	1950

N6 WIND – SHEET ROOF									
MAXIMUM VERANDAH BEAM SPAN (mm)									
N6 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
140 x 65	1580	1400	1260	1160	1080	1020	960	910	870
180 x 65	2120	1870	1690	1560	1450	1360	1290	1230	1170
240 x 65	2610	2300	2080	1910	1780	1670	1580	1510	1440
280 x 65	3030	2670	2420	2220	2070	1950	1840	1750	1670

NOTES: Roof Load Width = Roof Span + Overhang | Maximum Overhang = 450mm | See Technical Drawings P7

GL8 VERANDAH BEAMS

TILE ROOF

N1/N2/N3 WIND – TILE ROOF					
MAXIMUM VERANDAH BEAM SPAN (mm)					
N1 WIND N2 WIND N3 WIND	TILE ROOF				
	SPACING (mm)				
Rafter Size	1200	1500	1800	2400	3000
140 x 65	2500	2400	2200	2100	1900
180 x 65	2900	2800	2600	2400	2200
240 x 65	4200	4000	3600	3200	3000
280 x 65	4600	4200	4000	3600	3400

NOTES: Roof Load Width = Roof Span + Overhang | Maximum Overhang = 450mm | See Technical Drawings P7

F7 RIDGE BEAMS - 42mm

SHEET ROOF

N1/N2 WIND – RIDGE BEAM F7									
MAXIMUM ALLOWABLE SPANS (mm)									
N1 WIND N2 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	1200	1800	2400	3000	3600	4200	4800	5400	6000
66 x 42	1040	1040	1010	980	930	860	800	760	720
90 x 42	1660	1660	1550	1390	1260	1170	1100	1030	980
138 x 42	2920	2740	2380	2120	1940	1800	1680	1580	1500
185 x 42	3860	2480	3180	2850	2600	2410	2250	2120	2010
230 x 42	4540	4100	3820	3540	3230	2990	2800	2640	2500
280 x 42	5260	4750	4420	4180	3940	3640	3410	3210	3050

N3 WIND – RIDGE BEAM F7									
MAXIMUM ALLOWABLE SPANS (mm)									
N3 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	1200	1800	2400	3000	3600	4200	4800	5400	6000
66 x 42	1040	1020	890	790	720	670	630	590	560
90 x 42	1660	1400	1210	1080	990	910	850	810	760
138 x 42	2640	2410	1850	1660	1510	1400	1310	1240	1170
185 x 42	3480	2870	2480	2220	2030	1880	1760	1660	1570
230 x 42	4090	3570	3090	2760	2520	2330	2180	2060	1950
280 x 42	4740	4290	3760	3360	3070	2840	2660	2510	2380

N4 WIND – RIDGE BEAM F7									
MAXIMUM ALLOWABLE SPANS (mm)									
N4 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	1200	1800	2400	3000	3600	4200	4800	5400	6000
66 x 42	1010	830	720	640	580	540	510	480	450
90 x 42	1380	1130	980	870	800	740	690	650	620
138 x 42	2120	1730	1500	1340	1220	1130	1060	1000	950
185 x 42	2900	2320	2010	1800	1640	1520	1420	1340	1270
230 x 42	3670	2880	2500	2230	2040	1890	1770	1660	1580
280 x 42	4300	3510	3040	2720	2480	2300	2150	2030	1920

N5 WIND – RIDGE BEAM F7									
MAXIMUM ALLOWABLE SPANS (mm)									
N5 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	1200	1800	2400	3000	3600	4200	4800	5400	6000
66 x 42	830	680	590	520	480	440	410	390	370
90 x 42	1130	920	800	710	650	600	560	530	500
138 x 42	1730	1410	1220	1090	1000	920	870	820	770
185 x 42	2320	1890	1640	1470	1340	1240	1160	1090	1040
230 x 42	2950	2350	2040	1820	1670	1540	1440	1360	1290
280 x 42	3650	2870	2480	2220	2030	1880	1760	1660	1570

N6 WIND – RIDGE BEAM F7									
MAXIMUM ALLOWABLE SPANS (mm)									
N6 WIND	SHEET ROOF								
	ROOF LOAD WIDTH (mm)								
Size D x B (mm)	1200	1800	2400	3000	3600	4200	4800	5400	6000
66 x 42	710	580	500	450	410	380	350	330	320
90 x 42	970	790	680	610	560	520	480	460	430
138 x 42	1480	1210	1050	940	860	790	740	700	660
185 x 42	1990	1620	1400	1260	1150	1060	990	940	890
230 x 42	2480	2020	1750	1560	1430	1320	1230	1160	1100
280 x 42	3090	2450	2130	1900	1740	1610	1500	1420	1340

NOTES: Max Ridge Load Width = Span / 2 | See Technical Drawings P7

F7 RIDGE BEAMS - 42mm

TILE ROOF

N1/N2 WIND – TILE ROOF					
MAXIMUM ALLOWABLE SPANS (mm)					
N1 WIND N2 WIND	TILE ROOF				
	SPACING (mm)				
Size D x B (mm)	1500	3000	4500	6000	7500
138 x 42	2000	1500	1300	1100	1000
185 x 42	2600	2000	1700	1500	1400
230 x 42	3150	2500	2100	1900	1800
280 x 42	4500	3600	3000	2700	2500

N3 WIND – TILE ROOF					
MAXIMUM ALLOWABLE SPANS (mm)					
N3 WIND	TILE ROOF				
	SPACING (mm)				
Size D x B (mm)	1500	3000	4500	6000	7500
138 x 42	1900	1450	1250	1050	950
185 x 42	2500	2000	1600	1500	1400
230 x 42	3100	2450	2100	1850	1700
280 x 42	4500	3500	3100	2650	2400

N4 WIND – TILE ROOF					
MAXIMUM ALLOWABLE SPANS (mm)					
N4 WIND	TILE ROOF				
	SPACING (mm)				
Size D x B (mm)	1500	3000	4500	6000	7500
138 x 42	1900	1450	1250	1050	950
185 x 42	2500	2000	1650	1500	1350
230 x 42	3150	2450	2150	1750	1600
280 x 42	3700	2800	2500	2000	1800

F7 INTERNAL FLOOR JOISTS - 42mm

F7 DECK JOISTS - 42mm

SINGLE SPAN

F7 KPa LIVE LOAD			
ALLOWABLE SPANS (mm)			
Size D x B (mm)	MAXIMUM JOIST SPACING (mm)		
	400	450	600
66 x 42	1060	1050	1030
90 x 42	1450	1450	1420
138 x 42	2260	2250	2220
185 x 42	3060	3050	3010
230 x 42	3830	3810	3770
280 x 42	4700	4670	4620

NOTES: Spans may be increased by 10% when continuous over 2 or more spans. See Technical Drawings P7

3.0 KPa LIVE LOAD			
ALLOWABLE SPANS (mm)			
Size D x B (mm)	MAXIMUM JOIST SPACING (mm)		
	400	450	600
66 x 42	1000	1000	950
90 x 42	1450	1400	1300
138 x 42	2200	2100	2000
185 x 42	3000	2900	2600
230 x 42	3600	3500	3300
280 x 42	4100	4000	3700

NOTES: Spans may be increased by 10% when continuous over 2 or more spans. See Technical Drawings P7

F7 DECK BEARERS - 42mm

GL8 DECK BEARERS

SINGLE SPAN

3.0 KPa LIVE LOAD

3.0 KPa LIVE LOAD

MAXIMUM ALLOWABLE SPANS (mm)

MAXIMUM ALLOWABLE SPANS (mm)

Size D x B (mm)	FLOOR LOAD WIDTH (mm)								
	1200	1800	2400	3000	3600	4200	4800	5400	6000
138 x 42	1530	1250	1100	1000	920	860	810	770	730
185 x 42	2070	1730	1530	1380	1270	1180	1110	1050	1000
230 x 42	2640	2210	1940	1750	1610	1490	1400	1330	1260
280 x 42	3290	2730	2390	2160	1980	1840	1730	1630	1550

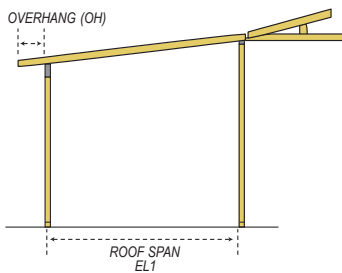
Size D x B (mm)	FLOOR LOAD WIDTH (mm)					
	1200	1800	2400	3000	3600	4200
140 x 65	1950	1650	1450	1320	1210	1120
180 x 65	2580	2160	1890	1720	1570	1460
240 x 65	3500	2920	2550	2310	2110	1960
280 x 65	4130	3440	3000	2710	2480	2290

NOTES: Spans may be increased by 10% when continuous over 2 or more spans
Max Floor Load Width = $(X + Y)/2$ | See Technical Drawings P7

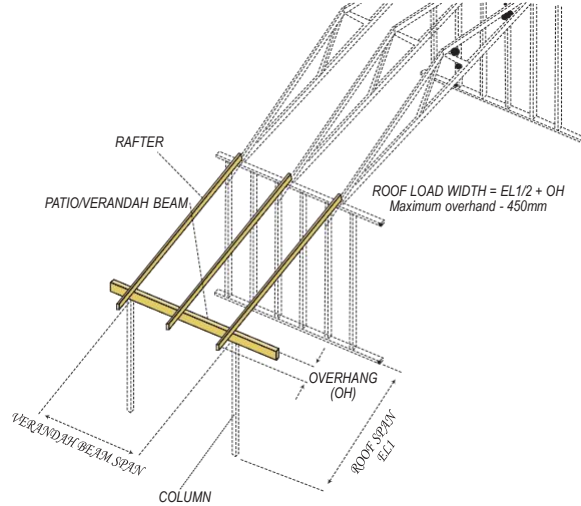
NOTES: Spans may be increased by 10% when continuous over 2 or more spans
Max Floor Load Width = $(X + Y)/2$ | See Technical Drawings P7

TECHNICAL DRAWINGS

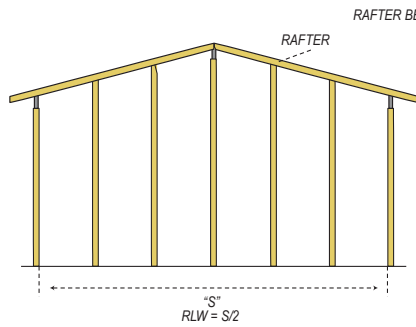
VERANDAH BEAM ELEVATION



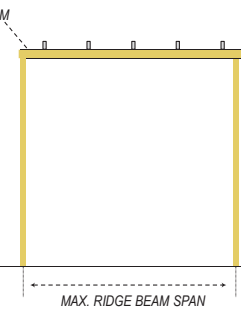
VERANDAH BEAMS



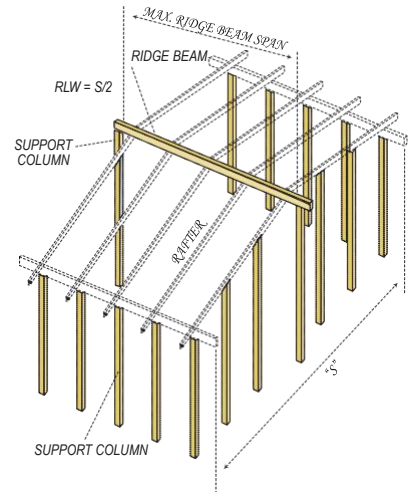
RIDGE BEAM ELEVATION



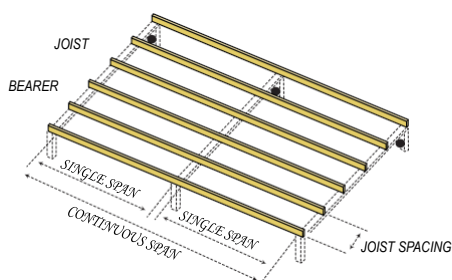
RIDGE BEAM SECTION



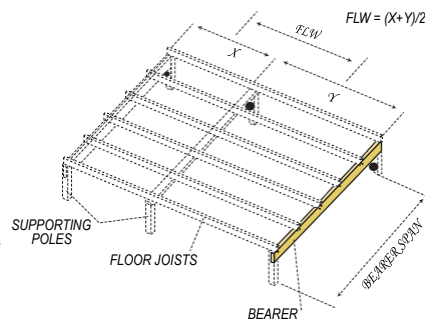
RIDGE BEAMS



INTERNAL FLOOR JOISTS AND DECK JOISTS



DECK BEARERS



RAFTERS AND BATTENS

