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SPAN TABLES

ALYSPAN
STRUCTURAL ALUMINIUM BEAM

ROSS Engineers have prepared these tables for use by people skilled in the design and specification of the type of structures covered. ROSS Engineers accepts no responsibility for misinterpretation of the information provided or omissions. Users should satisfy themselves as to the suitability of the span tables for their applications

Contents

Introduction

These span tables have been prepared for the use of Quickbuilt Systems ALYSPAN Structural Aluminium Beam for attached patio, awning, and carport designs only. For the purposes of these tables, roofs are deemed attached to an existing approved dwelling.

Australian Standards

The structural sections comply with the following Australian Standards.

- AS 1170.0 – 2002 Structural design actions – General Principles
- AS 1170.1 – 2002 Structural design actions – Permanent imposed and other actions
- AS 1170.2 – 2002 Structural design actions – Wind actions
- AS 4055 – 2006 Wind Loads for Housing
- AS 1664 – 1997 Aluminium Structures

All other proprietary products to be in accordance with the manufacturers specifications.

Design Loadings

Base Loads

- **Dead Load (DL)** - 0.2 kPa – Only roof sheeting is allowed for.

- **Live Load (LL)** – (1.8/A + 0.12 ≥ 0.25) kPa where A is the roof tributary area in m^2.
  Span tables are designed for non-trafficable roofs

Wind Loads

- Span tables have been designed for the following wind classification regions:
  N1, N2, N3, N4, N5

Where:

W_u *= ultimate wind load (upwards or downwards)*
W_s *= serviceability wind load (upwards or downwards)*

Ultimate Limit State

- **1.2 DL + 1.5 LL**
- **1.35 DL**
- **0.9 DL + W_u (upwards)**
- **1.2 DL + W_u (downwards)**

Serviceability Limit State

- **DL + W_s (upwards)**
- **DL + W_s (downwards)**

Serviceability Deflection Limits

- **Dead Load: Span/300**
- **Wind Load: Span/300**

Roof Pitch

Use recommended minimum roof pitches as specified by roof sheet supplier. The span tables in this report allow for a maximum roof pitch of 5°.

Posts

These span tables are designed for a minimum post size of 50 x 50 x 2.5 mm and up to a maximum height of 3.0 m.

Construction Notes

General

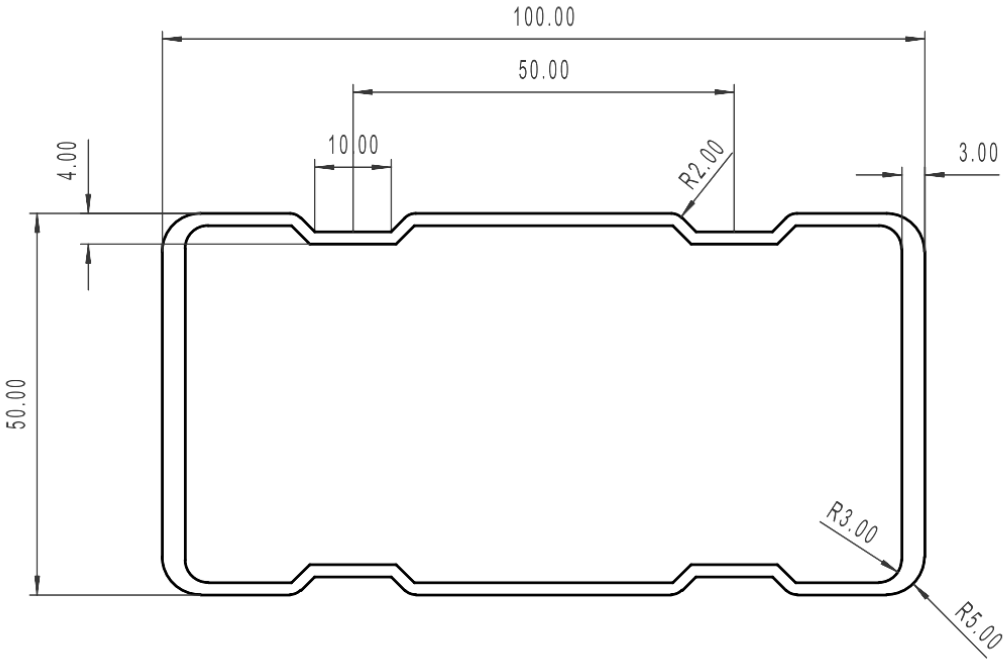
The following guidelines shall be adhered to at all stages of construction:

- Verify all setting out dimensions with architect. Contractor shall verify all dimensions, elevations, property lines etc. on the job site.
- Do not obtain dimensions by scaling the structural elements.
- Should any ambiguity, error, omission, discrepancy, inconsistency or other fault exist or seem to exist in the contract documents, immediately notify in writing to the superintendent.
- Maintain the structure in a stable condition during construction. No part shall be overstressed. Temporary bracing shall be provided by the contractor to keep the works stable at all times.
- All workmanship and materials shall be in accordance with the requirements of current SAA codes and the by-laws, ordinances or other requirements of the relevant building authorities.
- Where patio covers are to be installed on an existing patio slab, the slab shall be in good condition. Posts shall be located where the slab is free from cracks, deterioration, honeycombing or where other poor workmanship exists.
- It shall be the responsibility of the contractor to shore and brace as required.

Structural Aluminium

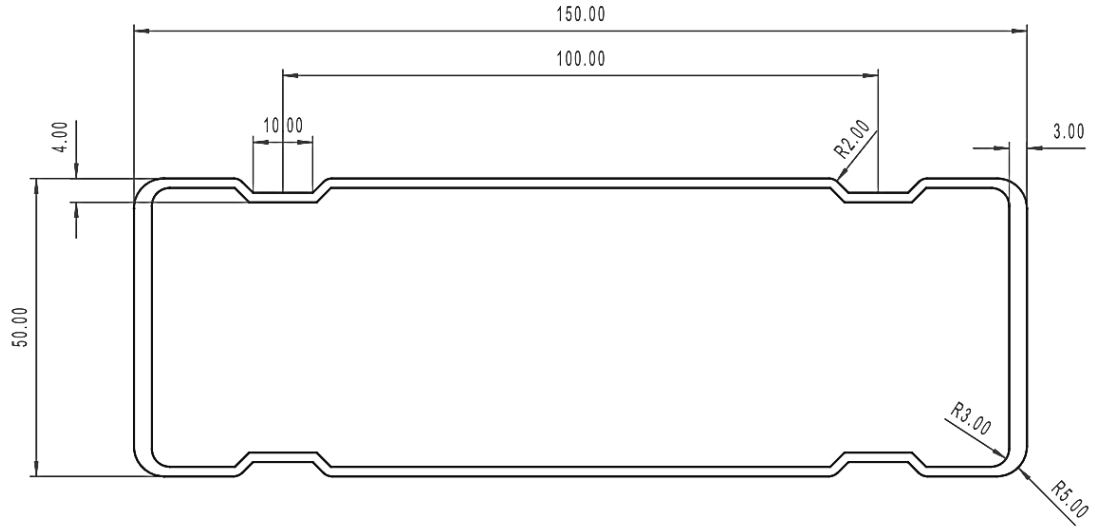
- All workmanship and materials to be in accordance with AS 1664 except where varied by contract documents
- Structural aluminium shall be erected plumb and true to line. Temporary bracing shall be installed and shall be left in place until other means are provided to adequately brace the structure.

Material Section Properties for 100 x 50 ALYSPAN Beam



- Alloy: 6063 – T6
- Ixx = 227424.285 mm^4
- Iyy = 900454.930 mm^4
- Area = 599 mm^2
- Weight = 1.635 kg/m

Material Section Properties for 150 x 50 ALYSPAN Beam

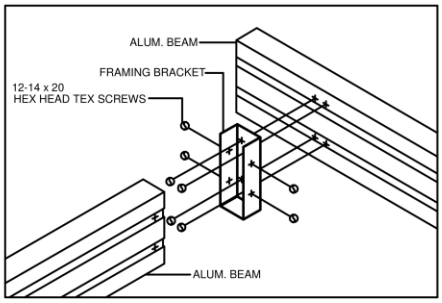


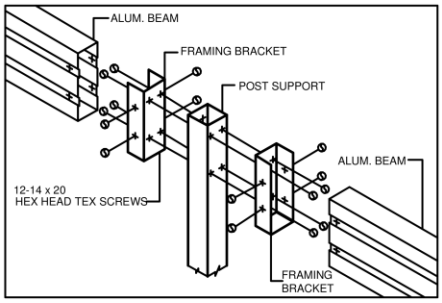
- Alloy: 6063 – T6
- Ixx = 321160.818 mm^4
- Iyy = 2369265.013 mm^4
- Area = 759 mm^2
- Weight = 2.072 kg/m

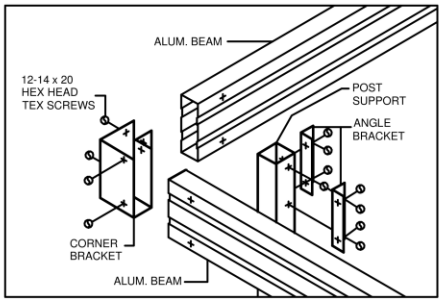
Connections Schematics

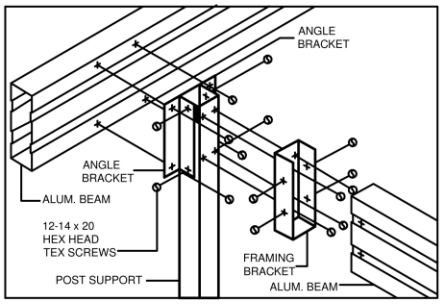
Refer to manufacturer for further details regarding brackets and fixings.

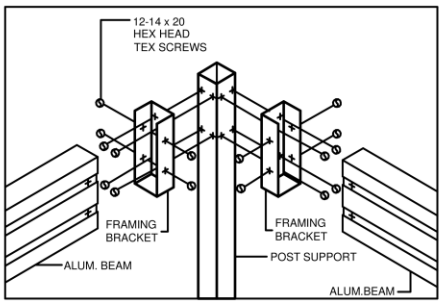
Standard Connections

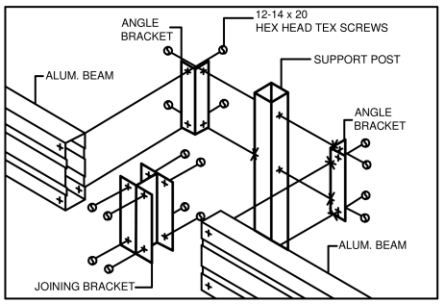


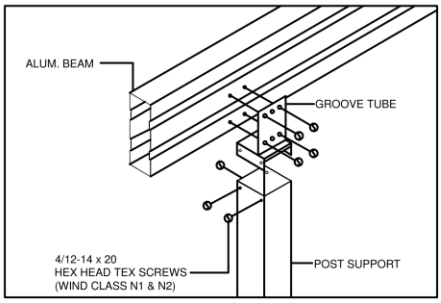


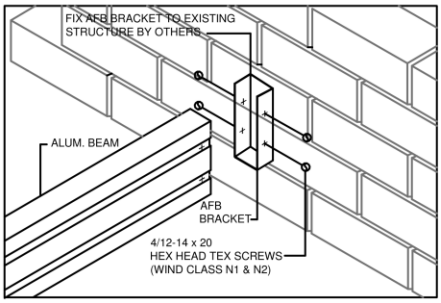


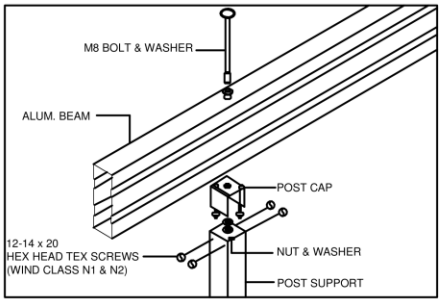


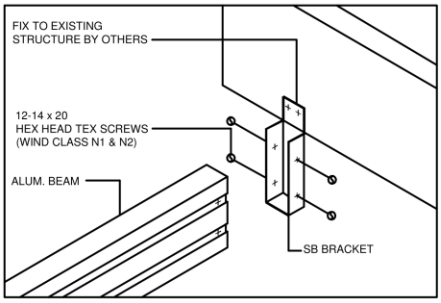












Wind Class

Wind classifications have been chosen as per AS4055. The table below show the design wind speeds for wind classes N1 through to N6.

Regional Wind Speed:

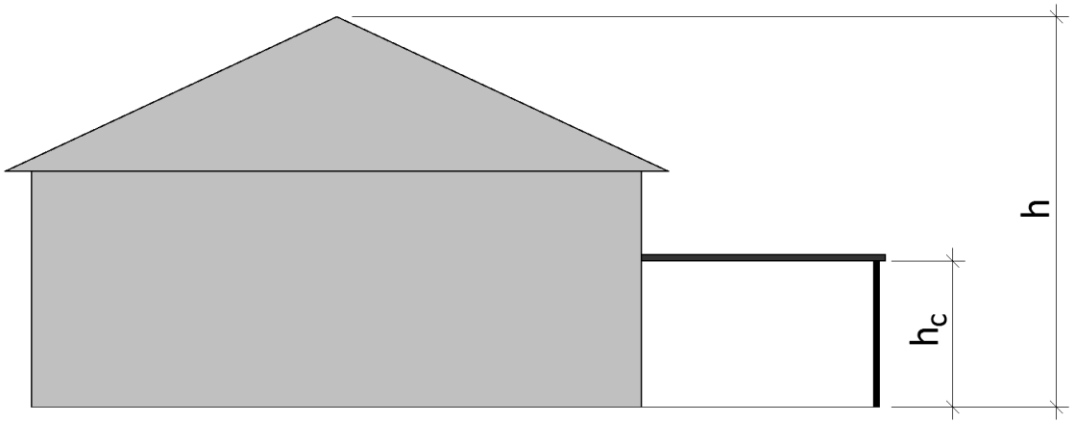
Design wind speeds where adopted from AS4055

Design Gust Wind Speed for Non-Cyclonic Regions A & B

Wind Classification	Design Gust Wind Speed (m/s)	
Regions A & B (Non-Cyclonic)	**Ultimate Limit State, V_u**	**Serviceability Limit State, V_s**
N1	34	26
N2	40	26
N3	50	32
N4	61	39
N5	74	47
N6	86	55

Pressure Coefficients:

Pressure coefficients were adopted from 1170.2:2011 Appendix D -Table D8.



Case 1

For the awning pitched roofs, with the following parameters:

- **Minimum Awning Height (h_c) = 2.4 m**
- **Maximum Building Height (h)= 4.8 m**

Pressure coefficients for attached roof for worse case for 0-5 degree pitch

Wind Direction	Net pressure Coefficient ($C_{p,n}$)
Uplift	-1.5
Downlift	0.5

Case 2

For the awning pitched roofs, with the following parameters:

- **Minimum Awning Height (h_c) = 2.4 m**
- **Maximum Building Height(h) = 12.0 m**

Pressure coefficients for attached roof for worse case for 0-5 degree pitch

Wind Direction	Net pressure Coefficient ($C_{p,n}$)
Uplift	-0.2
Downlift	0.7

Wind Pressures:

Wind Pressures for Case 1: Maximum Building Height = 4.8 m

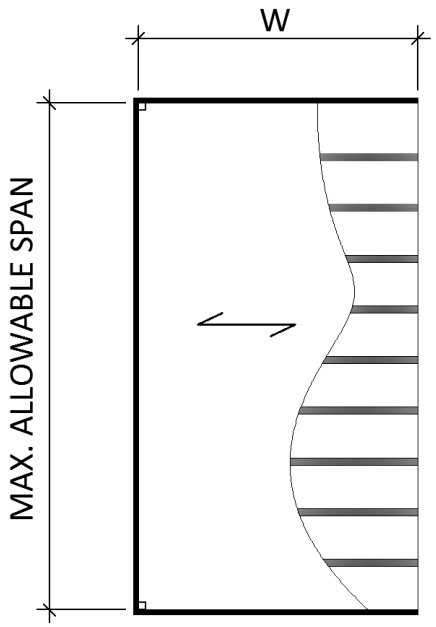
Wind Classification	Ultimate Case		Serviceability Case	
Regions A & B (Non-Cyclonic)	Upward Pressure (kPa)	Downward Pressure (kPa)	Upward Pressure (kPa)	Downward Pressure (kPa)
N1	-1.04	0.35	-0.61	0.20
N2	-1.44	0.48	-0.61	0.20
N3	-2.25	0.75	-0.92	0.31
N4	-3.35	1.12	-1.37	0.46
N5	-4.93	1.64	-1.99	0.66
N6	-6.66	2.22	-2.72	0.91

Wind Pressures for Case 2: Maximum Building Height = 12.0 m

Wind Classification	Ultimate Case		Serviceability Case	
Regions A & B (Non-Cyclonic)	Upward Pressure (kPa)	Downward Pressure (kPa)	Upward Pressure (kPa)	Downward Pressure (kPa)
N1	-0.14	0.49	-0.08	0.28
N2	-0.19	0.67	-0.08	0.28
N3	-0.30	1.05	-0.12	0.43
N4	-0.45	1.56	-0.18	0.64
N5	-0.66	2.30	-0.27	0.93
N6	-0.89	3.11	-0.36	1.27

Span Tables for Case 1: Maximum Building Height = 4.8 m

Single Span – No Overhang

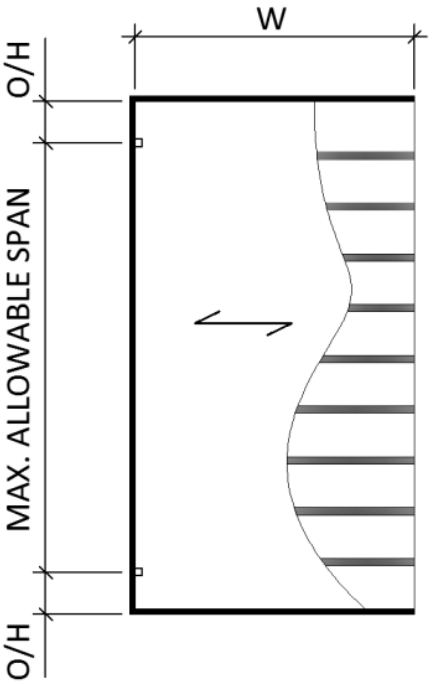


100 x 50 mm ALYSPAN Beam Single Span – No Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	3700	3700	3100	2600	2200
1800	3500	3500	2900	2400	2100
2100	3300	3300	2700	2300	1900
2400	3200	3200	2600	2200	1800
2700	3000	3000	2500	2100	1700
3000	2900	2900	2400	2000	1600
3300	2800	2800	2300	1900	1500
3600	2700	2700	2300	1800	1400
3900	2700	2700	2200	1700	1300
4200	2600	2600	2100	1600	1300
4500	2500	2500	2000	1500	1200

150 x 50 mm ALYSPAN Beam Single Span – No Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	5100	5100	4200	3600	3100
2000	4700	4700	3800	3300	2600
2500	4300	4300	3600	2900	2300
3000	4100	4100	3300	2600	2100
3500	3900	3900	3100	2400	1900
4000	3700	3700	2900	2300	1800
4500	3500	3500	2700	2100	1700
5000	3400	3300	2500	2000	1600
5500	3300	3100	2400	1900	1500
6000	3200	3000	2300	1800	1400
6500	3100	2900	2200	1700	1300
7000	3000	2800	2100	1600	1300

Span Tables for Case 1: Maximum Building Height = 4.8 m

Single Span – Up to 600mm Overhang

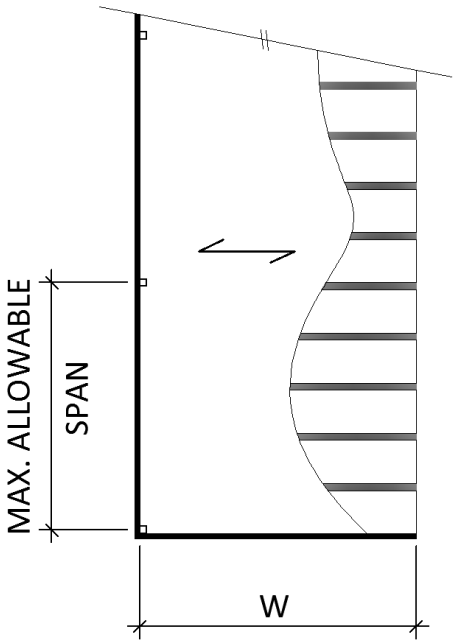


100 x 50 mm ALYSPAN Beam Single Span – Max. 600 mm Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	3300	3300	2800	2500	2200
1800	3100	3100	2700	2300	2100
2100	3000	3000	2600	2300	2000
2400	2900	2900	2500	2200	1900
2700	2800	2800	2400	2100	1800
3000	2700	2700	2300	2100	1700
3300	2600	2600	2300	2000	1600
3600	2600	2600	2200	1900	1500
3900	2500	2500	2200	1800	1500
4200	2500	2500	2100	1800	1400
4500	2400	2400	2100	1700	1400

150 x 50 mm ALYSPAN Beam Single Span – Max. 600 mm Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	4500	4500	3800	3200	2900
2000	4100	4100	3400	3000	2600
2500	3800	3800	3200	2800	2500
3000	3600	3600	3000	2600	2200
3500	3400	3400	2900	2500	2100
4000	3300	3300	2800	2400	1900
4500	3200	3200	2700	2200	1800
5000	3100	3100	2600	2100	1700
5500	3000	3000	2500	2000	1600
6000	2900	2900	2400	1900	1500
6500	2900	2900	2300	1800	1500
7000	2800	2800	2200	1800	1400

Span Tables for Case 1: Maximum Building Height = 4.8m

Equal Continuous Span – No Overhang

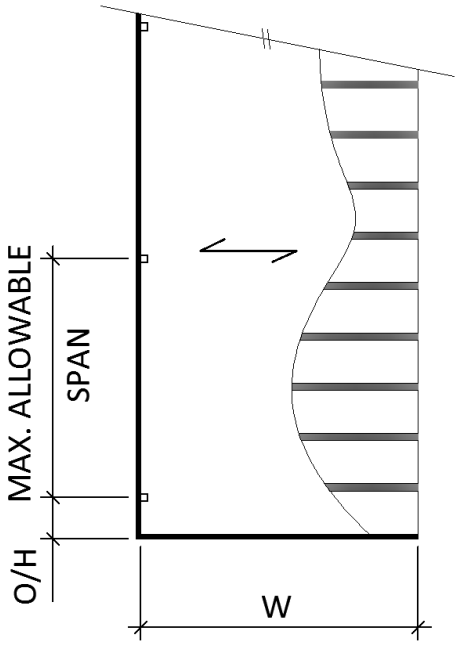


100 x 50 mm ALYSPAN Beam Equal Continuous Span – No Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	4900	4600	3600	2800	2300
1800	4700	4200	3200	2600	2000
2100	4400	3900	3000	2400	1900
2400	4200	3600	2600	2200	1700
2700	4100	3400	2500	2000	1600
3000	3900	3200	2400	1900	1500
3300	3700	3000	2300	1800	1400
3600	3600	2900	2200	1700	1300
3900	3400	2800	2100	1600	1300
4200	3300	2700	2000	1600	1200
4500	3200	2600	1900	1500	1200

150 x 50 mm ALYSPAN Beam Equal Continuous Span – No Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	6900	6100	4700	3800	3000
2000	6200	5300	4100	3200	2600
2500	5700	4700	3600	2900	2300
3000	5200	4300	3300	2600	2100
3500	4800	3900	3000	2400	1900
4000	4500	3700	2800	2200	1700
4500	4200	3500	2600	2100	1600
5000	4000	3300	2500	1900	1500
5500	3800	3100	2300	1800	1400
6000	3600	3000	2200	1700	1300
6500	3500	2800	2100	1600	1300
7000	3300	2700	2000	1600	1200

Span Tables for Case 1: Maximum Building Height = 4.8m

Equal Continuous Span – Up to 600mm Overhang

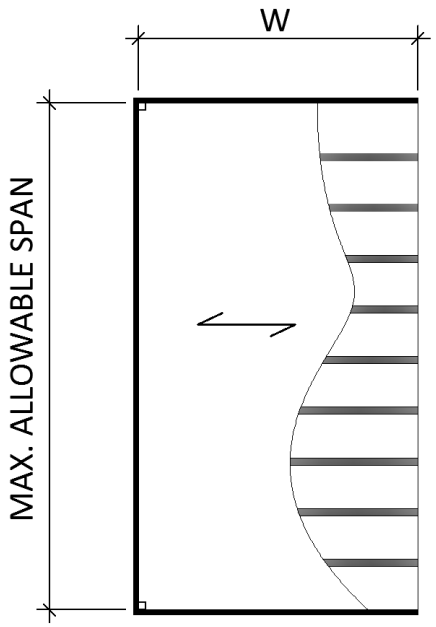


100 x 50 mm ALYSPAN Beam Equal Continuous Span Max. 600 mm Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	4200	4200	3600	2900	2300
1800	4000	4000	3300	2600	2100
2100	3800	3800	3000	2400	1900
2400	3700	3700	2800	2300	1800
2700	3600	3400	2700	2100	1700
3000	3500	3300	2500	2000	1600
3300	3400	3100	2400	1900	1500
3600	3300	3000	2300	1800	1400
3900	3200	2800	2200	1700	1400
4200	3200	2700	2100	1700	1300
4500	3100	2600	2000	1600	1300

150 x 50 mm ALYSPAN Beam Equal Continuous Span Max. 600 mm Overhang Max. Adjacent Building Height = 4.8 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	5700	5700	4800	3800	3100
2000	5200	5200	4100	3300	2700
2500	4800	4700	3700	2900	2400
3000	4600	4300	3300	2700	2100
3500	4400	4000	3100	2400	2000
4000	4200	3700	2900	2300	1800
4500	4100	3500	2700	2100	1700
5000	3900	3300	2500	2000	1600
5500	3800	3100	2400	1900	1500
6000	3700	3000	2300	1800	1400
6500	3500	2900	2200	1700	1400
7000	3400	2800	2100	1700	1300

Span Tables for Case 2: Maximum Building Height = 12.0 m

Single Span – No Overhang

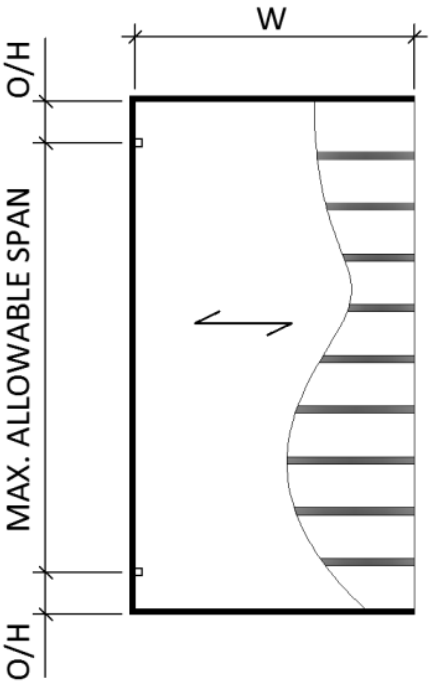


100 x 50 mm ALYSPAN Beam Single Span – No Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	3500	3500	3200	2900	2600
1800	3300	3300	3000	2700	2500
2100	3100	3100	2900	2600	2300
2400	3000	3000	2700	2500	2200
2700	2900	2900	2600	2400	2100
3000	2800	2800	2500	2300	2000
3300	2700	2700	2400	2200	1900
3600	2600	2600	2400	2200	1800
3900	2500	2500	2300	2100	1800
4200	2500	2500	2300	2000	1700
4500	2400	2400	2200	2000	1600

150 x 50 mm ALYSPAN Beam Single Span – No Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	4800	4800	4400	4000	3600
2000	4400	4400	4000	3600	3300
2500	4100	4100	3700	3400	3000
3000	3800	3800	3500	3200	2700
3500	3600	3600	3300	3000	2500
4000	3500	3500	3200	2800	2300
4500	3300	3300	3100	2700	2200
5000	3200	3200	2900	2500	2100
5500	3100	3100	2900	2400	2000
6000	3000	3000	2800	2300	1900
6500	2900	2900	2700	2200	1800
7000	2900	2900	2500	2100	1700

Span Tables for Case 2: Maximum Building Height = 12.0 m

Single Span – Up to 600mm Overhang

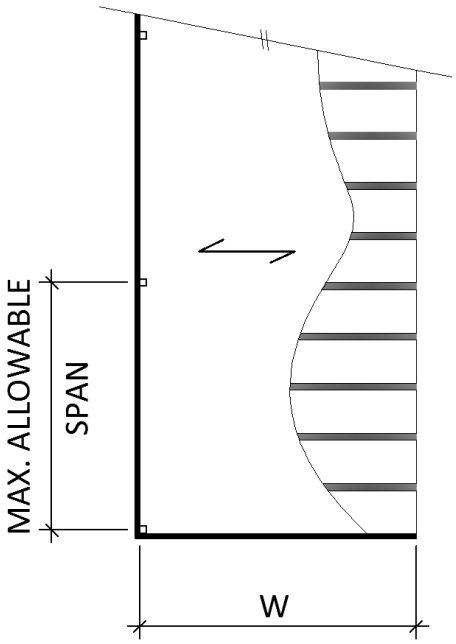


100 x 50 mm ALYSPAN Beam Single Span – Max. 600 mm Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	3200	3200	2900	2700	2500
1800	3000	3000	2800	2600	2400
2100	2900	2900	2700	2500	2300
2400	2800	2800	2600	2400	2200
2700	2700	2700	2500	2300	2100
3000	2600	2600	2400	2200	2100
3300	2500	2500	2300	2100	2000
3600	2500	2500	2300	2100	2000
3900	2400	2400	2300	2100	1900
4200	2400	2400	2200	2100	1800
4500	2300	2300	2200	2000	1800

150 x 50 mm ALYSPAN Beam Single Span – Max. 600 mm Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	4300	4300	3900	3600	3300
2000	3900	3900	3600	3300	3000
2500	3600	3600	3300	3100	2800
3000	3400	3400	3200	2900	2700
3500	3300	3300	3000	2800	2600
4000	3100	3100	2900	2700	2500
4500	3000	3000	2800	2600	2300
5000	2900	2900	2700	2500	2200
5500	2900	2900	2700	2500	2100
6000	2800	2800	2600	2400	2000
6500	2700	2700	2500	2300	1900
7000	2700	2700	2500	2200	1800

Span Tables for Case 2: Maximum Building Height = 12.0 m

Equal Continuous Span – No Overhang

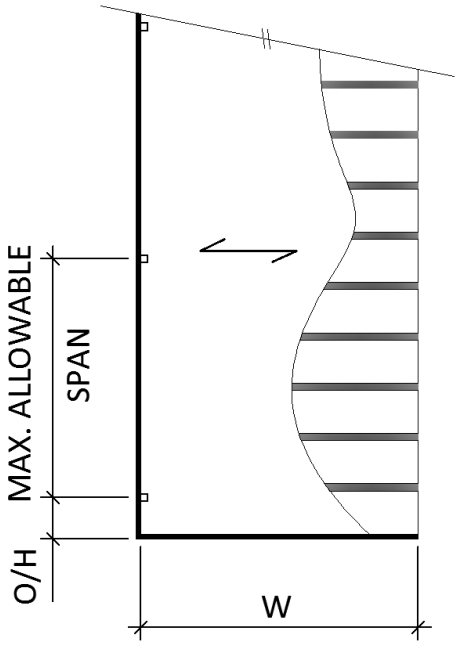


100 x 50 mm ALYSPAN Beam Equal Continuous Span – No Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	4700	4700	4300	3500	2900
1800	4400	4400	3900	3200	2700
2100	4200	4200	3600	3000	2400
2400	4000	4000	3300	2800	2300
2700	3800	3800	3100	2600	2100
3000	3700	3600	3000	2400	2000
3300	3600	3400	2800	2300	1900
3600	3500	3300	2700	2200	1800
3900	3400	3100	2600	2100	1700
4200	3300	3000	2500	2000	1600
4500	3200	2900	2400	1900	1600

150 x 50 mm ALYSPAN Beam Equal Continuous Span – No Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	6500	6500	5700	4700	3900
2000	5900	5900	4900	4100	3400
2500	5500	5300	4400	3600	3000
3000	5100	4800	4000	3300	2700
3500	4900	4400	3600	3000	2500
4000	4700	4100	3400	2800	2300
4500	4400	3900	3200	2600	2100
5000	4200	3700	3000	2500	2000
5500	4000	3500	2900	2300	1900
6000	3800	3300	2700	2200	1800
6500	3700	3200	2600	2100	1700
7000	3500	3100	2500	2000	1600

Span Tables for Case 2: Maximum Building Height = 12.0 m

Equal Continuous Span – Up to 600mm Overhang



100 x 50 mm ALYSPAN Beam Equal Continuous Span Max. 600 mm Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	4000	4000	3700	3400	3000
1800	3800	3800	3500	3300	2700
2100	3600	3600	3400	3000	2500
2400	3500	3500	3300	2800	2300
2700	3400	3400	3200	2700	2200
3000	3300	3300	3000	2500	2100
3300	3200	3200	2900	2400	2000
3600	3100	3100	2700	2300	1900
3900	3100	3100	2600	2200	1800
4200	3000	3000	2500	2100	1700
4500	3000	3000	2400	2000	1700

150 x 50 mm ALYSPAN Beam Equal Continuous Span Max. 600 mm Overhang Max. Adjacent Building Height = 12.0 m					
W	**Maximum Allowable Span (mm)**				
	N1	**N2**	**N3**	**N4**	**N5**
1500	5400	5400	5000	4500	4000
2000	4900	4900	4500	4100	3400
2500	4600	4600	4200	3700	3000
3000	4400	4400	4000	3300	2800
3500	4200	4200	3700	3100	2500
4000	4000	4000	3400	2900	2400
4500	3900	3900	3200	2700	2200
5000	3700	3700	3100	2500	2100
5500	3600	3500	2900	2400	2000
6000	3600	3400	2800	2300	1900
6500	3500	3200	2700	2200	1800
7000	3400	3100	2600	2100	1700

ROSS engineers

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Design Certificate

29th August 2014

Quickbuilt Systems
21 Econo Place
Silverdale, NSW 2752

To whom it may concern

Certificate for Roof Beam Span Tables for Attached Monoslope Roofs.

Ross Engineers, Practicing Structural Engineers, hereby certify that we have carried out computations in accordance with proper design principles, and we confirm that the design tables conform to the Building Code of Australia and the following codes:

- AS 1170.1 – 2002 Structural design actions – Permanent imposed and other actions
- AS 1170.2 – 2002 Structural design actions – Wind actions
- AS 4055 – 2006 Wind Loads for Housing
- AS 1664 – 1997 Aluminium Structures

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